DCHC

DURHAM-CHAPEL HILL-CARRBORO METROPOLITAN PLANNING ORGANIZATION

Member Governments
Town of Carrboro
Town of Chapel Hill
County of Chatham
City of Durham
County of Durham
Town of Hillsborough
NC Department of Transportation
County of Orange

DURHAM – CHAPEL HILL-CARRBORO METROPOLITAN PLANNING ORGANIZATION TRANSPORTATION ADVISORY COMMITTEE (TAC)

August 11, 2010 **Committee Room**
9:00 AM **2nd Floor Durham City Hall**

1. **Roll Call**
2. **Adjustments to the Agenda**
3. **Public Comments**
4. **Directives to Staff (Attachment 4)**

ACTION ITEMS

5. **June 9, 2010 TAC Meeting Minutes**
(Attachment 5)

A copy of the June 9, 2010 TAC meeting minutes is enclosed as Attachment 5.

TAC Action: Approve minutes of the June 9, 2010 TAC meeting.

6. **NC 54 Corridor Study-Update**
(Attachment 6-6J posted online in sections due to large file size)
Leta Huntsinger, LPA Staff

The DCHC MPO has initiated the NC 54 Corridor Study to analyze the issues within the NC 54 corridor, evaluate mitigation measures, and identify transportation and land use strategies for accommodating current and future transportation needs. Current documents are posted on the study website http://www.nc54-i40corridorstudy.com/. The preliminary draft report is provided as Attachment 6-6J. The appendices were not printed for TAC members due to size but can be viewed online.

TCC Recommendation: Recommend that the TAC authorize staff to release the draft report for local government and public review.

TAC Action: Authorize staff to release the draft report for local government and public review.

7. **Congestion Mitigation Air Quality Program for FY 2013-2015**
(Attachment 7, 7A, 7B)
Felix Nwoko, LPA Staff
Ellen Beckmann, LPA Staff

NCDOT provided an update on the Congestion Mitigation Air Quality (CMAQ) program (Attachment 7). The DCHC MPO approved projects for FY 2013 through 2017 in August 2009 based on our estimated annual funding of $2.0M (Attachment 7A). NCDOT's memo and table indicates that the estimated annual funding for the DCHC MPO has increased to approximately $3.4M and that they will only be programming CMAQ projects through FY 2015 in the next TIP. NCDOT needs a revised schedule and applications by September 30, 2010.

The TCC has developed a recommended program and schedule for CMAQ projects for FY 2013-2015. The recommendation is to fully fund all previously selected projects and increase funding for certain projects with revised cost estimates. Attachment 7B is a resolution and table displaying the recommended program and schedule.

In addition, NCDOT will be soliciting project proposals for the regional and statewide CMAQ allocations. Regional projects must span two or more non-attainment regions and be administered locally. Statewide projects must be large-scale improvements that NCDOT would administer.

TCC Recommendation: That the TAC approve a resolution adopting the schedule and program for Congestion Mitigation Air Quality funds for FY 2013-2015.

TAC Action: Approve a resolution adopting the schedule and program for Congestion Mitigation Air Quality funds for FY 2013-2015.

8. <u>FY 2009-2015 MTIP Amendment #16 – Purchase of Automatic Passenger Counters (APC) with STP-DA Funds</u>
(Attachment 8, 8A, 8B)
Felix Nwoko, LPA Staff

The MPO's three transit operators, DATA, Chapel Hill Transit, and Triangle Transit, need funding to purchase Automatic Passenger Counters (APCs). The APCs will allow the transit agencies to collect more extensive passenger and travel time data that is used for required Federal Transit Administration reporting and the Triangle Regional Model.

The TCC recommends funding the purchase of the APCs in FY 2011 with Surface Transportation Program - Direct Attributable (STP-DA) funds previously programmed for Transit Studies in FY 2012. Attachment 8 is a resolution amending the FY 2009-2015 MTIP reflecting this change. Attachment 8A is an amended STP-DA table. Attachment 8B is a letter to NCDOT requesting that the funds be flexed from the Federal Highway Administration to the Federal Transit Administration.

TCC Recommendation: That the TAC approve the resolution adopting FY 2009-2015 MTIP Amendment #16 for the purchase of Automatic Passenger Counters (APC) and amend the STP-DA table.

TAC Action: Approve the resolution adopting FY 2009-2015 MTIP Amendment #16 for the purchase of Automatic Passenger Counters (APC), amend the STP-DA table, and authorize the TAC Chair to request that the funds be flexed to the Federal Transit Administration.

9. HUD Sustainable Communities Regional Planning Grant
(Attachment 9, 9A, 9B)
John Hodges-Copple, TJCOG

The Department of Housing and Urban Development (HUD), in partnership with US DOT and US EPA, has issued a Notice Of Funding Availability (NOFA) for a Sustainable Communities Regional Planning Grant Program. TJ COG is applying for a grant as the "managing partner" of the Triangle Development & Infrastructure Partnership. The grant program is expected to be extremely competitive. The grant program is designed to:

> "support metropolitan and multijurisdictional planning efforts that integrate housing, land use, economic and workforce development, transportation, and infrastructure investments in a manner that empowers jurisdictions to consider the interdependent challenges of:
>
> (1) economic competitiveness and revitalization;
> (2) social equity, inclusion, and access to opportunity;
> (3) energy use and climate change; and
> (4) public health and environmental impact."

Attachment 9 is a brief description of the grant opportunity. Attachment 9A is a brief description of the application being prepared by TJ COG. Attachment 9B is a resolution in support of the grant application.

TCC Recommendation: Recommend that the TAC approve a resolution in support of the grant application for the HUD Sustainable Communities Regional Planning Grant.

TAC Action: Approve a resolution in support of the HUD Sustainable Communities Regional Planning Grant application.

10. TIGER II Discretionary Grants and USDOT TIGER II-HUD Community Challenge Planning Grants
(Attachment 10, 10A, 10B, 10C, 10D, 10E, 10F)
Felix Nwoko, LPA Staff
Ellen Beckmann, LPA Staff

DOT is authorized to award $600 million in TIGER II Discretionary Grants pursuant to Title I of the FY 2010 Appropriations Act. This appropriation is similar, but not identical to the appropriation for the Transportation Investment Generating Economic Recovery, or "TIGER Discretionary Grant", program authorized and implemented pursuant to the American Recovery and Reinvestment Act of 2009. Because of the similarity in program structure and objectives, DOT is referring to the grants for National Infrastructure Investments under the FY 2010 Appropriations Act as "TIGER II Discretionary Grants". As with the TIGER program, funds for

the TIGER II program are to be awarded on a competitive basis for projects that will have a significant impact on the nation, a metropolitan area, or a region.

A fact sheet on the program is provided as Attachment 10. There are two funding opportunities through TIGER II: one for capital projects and one for planning projects. The planning grant opportunity is being coordinated with HUD's Community Challenge Planning Grants.

Attachment 10A is a copy of the five pre-applications submitted in the DCHC MPO area from the City of Raleigh, Town of Hillsborough, Town of Chapel Hill, Chatham County, and City of Durham. Attachment 10B, 10C, 10D, 10E, and 10F are resolutions in support of each grant application.

TCC Recommendation: That the TAC approve resolutions in support of the grant applications for TIGER II Discretionary and Planning Grants.

TAC Action: Approve resolutions in support of the grant applications for TIGER II Discretionary and Planning Grants.

11. Draft FY 2012-2018 State Transportation Improvement Program and Urban Loop Schedule
(Attachment 11, 11A)
Mark Ahrendsen, TCC Chair
Ellen Beckmann, LPA Staff

The NC Board of Transportation is scheduled to release the draft FY 2012-2018 State Transportation Improvement Program (STIP) at its August meeting. The draft STIP is provided as Attachment 11A. As part of the development of the draft STIP, NCDOT developed a ranking process and schedule for urban loop projects. The result of the ranking process and the urban loop schedule has been released by NCDOT and is provided as Attachment 11.

TAC Action: Receive the draft FY 2012-2018 State Transportation Improvement Program and Urban Loop Schedule.

12. Regional Transit Planning - Update
(No Attachments)
Patrick McDonough, Triangle Transit
Andy Henry, LPA Staff
Ellen Beckmann, LPA Staff

Durham, Orange, and Wake counties are developing county-level transit plans as required by HB 148, the legislation authorizing a half-cent sales tax for regional transit projects subject to a referendum. The current schedule is to hold the transit referendum in fall 2011. The county plans must be adopted by the counties and the MPO by spring 2011. The alternatives analysis will be occurring concurrently with the development of the county plans. An update on the status of transit planning will be provided at the meeting.

TAC Action: Receive update on the Regional Transit Planning process.

REPORTS:

13. **Report from the TAC Chair**
Mike Woodard, TAC Chair

TAC Action: Receive Report from TAC Chair

14. **Report from Staff**
(Attachment 14)
Felix Nwoko, LPA Staff

TAC Action: Receive Report from Staff

15. **Report from the TCC Chair**
Mark Ahrendsen, TCC Chair

TAC Action: Receive Report from TCC Chair

16. **NCDOT Report**
(Attachment 16)
Wally Bowman, Division 5 – NCDOT
Mike Mills, Division 7 – NCDOT

TAC Action: Receive report of NCDOT

INFORMATIONAL ITEMS

17. **Recent News Articles and Updates**
(Attachment 17)

18. **Letter from Governor Perdue re Mobility Fund – June 28, 2010**
(Attachment 18)

19. **Letter from NCDOT re East End Connector – July 8, 2010**
(Attachment 19)

Adjourn

Next meeting: September 8, 2010

Dates of Upcoming Transportation-Related Meetings:

8/20/2010, 10:30 a.m. Tri-MAP @ RDU Airport Authority
8/24/2010, noon Durham Chamber Transportation Committee @ Durham Chamber
9/29/2010, 9:00 a.m. DCHC MPO/CAMPO Joint TAC meeting @ RDU Airport Authority

TAC Directives to Staff

06/11/03 – 12/31/08 (Pending/In Progress/On Going)
01/01/09 – Present (Completed/Pending/In Progress)

Meeting Date	Directive	Status
4/12/06	Investigate use of peer review for Triangle Regional Model (TRM)	In Progress: TRM committee has taken up this project
4/12/06	Address cost splits for TRM tasks	In Progress: TRM Executive Committee has taken up this project.
8/09/06	Follow up with the BPAC and DATA Boards regarding public involvement for MPO activities.	In Progress:
2/14/07	Develop a long-term and short-term strategy for addressing funding needs working with other MPOs and the Metropolitan Coalition	In Progress: See 10/31/07 Joint TAC Agenda.
3/12/08	Provide an update on the state's human services transportation plan	In Progress:
12/10/08	Develop a recommendation for the bridge replacement on State Forest Rd.	In Progress: NCDOT is currently reviewing the issue including meeting with stakeholders.
1/14/09	Re-order projects and respond to the issues raised by the TAC on the draft FY 2011-2017 TIP Regional Priority List.	Completed: See Attachment 7 of 2/11/09 TAC Agenda.
1/14/09	Investigate the relationship between projected transit ridership and revenue	Completed: See Attachment 6 of 2/11/09 TAC Agenda.
2/11/09	Send a letter to the MPO's congressional delegation regarding the urbanized area's 5307 apportionment	Completed: See Attachment 19 of 3/11/09 TAC Agenda.
4/08/09	Send a letter to the MPO's congressional delegation and member jurisdictions regarding S1001/H881	Completed: See Attachment 16 of 5/13/09 TAC Agenda.
5/13/09	Send a letter to Brier Creek shopping center management requesting bus shelters.	In Progress: LPA, CAT, and DATA staff are discussing transit access and passenger amenities.
5/13/09	Send a letter to the Town of Cary and Chatham County regarding trailhead parking areas for the American Tobacco Trail	Completed: See Attachment 15 of 8/12/09 TAC Agenda.
10/14/09	Present to the Durham City Council on the status of the Durham Walks Plan	Completed: Occurred 2/4/2010
10/14/09	Work with NCDOT and Durham City/County Planning to ensure that developers in the Hopson Road project area make contributions to the road improvements	Completed: See Attachment 8 of 4/14/2010 TAC Agenda.

10/14/09	Present to the Orange County BOCC on MAB expansion	Completed: 11/17/2009
11/11/09	Meet with the Secretary of Transportation to discuss the East End Connector and the urban loop prioritization process	Completed: Meeting occurred 1/8/2010
11/11/09	Provide the TAC a summary of the Regional Transit Leadership Group meetings and status of the county transit plans.	In Progress: Will be provided by the TAC Chair on an ongoing basis
11/11/09	Provide additional information to the TAC on the Complete Streets policy and legislation.	In Progress:
1/13/10	Send letter to Chatham County BOCC regarding MAB expansion	Completed: See Attachment 19 of 2/10/10 TAC Agenda.
1/13/10	Send letter to NCDOT describing the ranking of multi-modal projects in the DCHC MPO's FY 2012-2018 TIP Regional Priority List	Completed: See Attachment 28 of 3/10/10 TAC Agenda.
2/10/10	Provide a recommendation for how to proceed with programming funding for alternatives to U-3808, Elizabeth Brady Road.	In Progress: See 3/10/10 TAC Agenda.
3/10/10	Address the issues raised regarding the Farrington Road Corridor Study.	In Progress
5/12/10	Send letter to Secretary Conti regarding funding for the East End Connector	Completed: See 5/12/10 TAC Agenda.

TRANSPORTATION ADVISORY COMMITTEE

June 9, 2010

MINUTES OF MEETING

The Transportation Advisory Committee met on June 9, 2010, at 9:00 a.m. in the Council Committee Room on the second floor of Durham City Hall. The following attended:

**William "Bill" V. Bell	City of Durham
*Diane Catotti	City of Durham
**Alice Gordon	Orange County
**Eric Hallman	Town of Hillsborough
*Ed Harrison	Town of Chapel Hill
**Mark Kleinschmidt	Town of Chapel Hill
**Sally Kost	Chatham County
**Lydia Lavelle	Town of Carrboro (TAC Vice-Chair)
**Ellen Reckhow	Durham County
**Chuck Watts	NCDOT - BOT
**Mike Woodard	City of Durham (TAC Chair)
Mark Ahrendsen	City of Durham/Transportation
David Bonk	Town of Chapel Hill
Wally Bowman	NCDOT – Division 5
Maricia Brown	City of Durham/Transportation
Jeff Brubaker	Town of Carrboro
Aaron Cain	City/County Planning
Bonnie Estes	City/County Planning
Damien Graham	Triangle Transit
Andy Henry	City of Durham/Transportation
John Hodges Copple	Triangle J COG
Bill Houppermans	Triangle Transit – URS
Leta Huntsinger	City of Durham/Transportation
Karen Lincoln	Orange County
Bill Martin	Martin/Alexiou/Bryson
Dale McKeel	City of Durham/Transportation
Ryan Mickles	Town of Chapel Hill
Mike Mills	NCDOT – Division 7
Greg Northcutt	Triangle Transit
Felix Nwoko	City of Durham/Transportation
Jonathan Parker	Triangle Transit
Brian Rhodes	City of Durham/Transportation
Sam Veraldi	Duke University
Michael Waldroup	Citizen
Julie White	NC MMC

**Voting Member

*Alternate or Non-Voting Member

Mike Woodard, TAC Chair, called the meeting to order at 9:09 a.m. and the Roll Call was conducted.

PRELIMINARIES:

Adjustments to the Agenda

Mike Woodard stated that agenda item #9 – NC Mobility Fund will be moved to after agenda item #6 – Regional Transit Planning – Update.

Mark Ahrendsen stated handouts were distributed at the beginning of the meeting.

Public Comments

There were no public comments.

Directives to Staff (Attachment 4)

The Directives to Staff are attached for review.

ACTION ITEMS:

May 12, 2010 TAC Meeting Minutes (Attachment 5)

A motion was made by Mark Kleinschmidt and seconded by Sally Kost to approve the May 12, 2010 TAC Meeting Minutes. The motion carried unanimously.

Regional Transit Planning – Update (No attachments)

Greg Northcutt, Triangle Transit, provided an introduction for the Regional Transit Planning – Update, a well as an introduction of team members.

Triangle Transit staff member Damien Graham provided a presentation on the legislation and schedule related to regional transit planning and the Alternatives Analysis for regional passenger rail. Ellen Reckhow asked if the MPO would vote on the County Financial Plan before the Board of County Commissioners. Mr. Graham believed it would be best to have the votes close together, perhaps even in the same week. Alice Gordon asked whether the Durham and Raleigh votes will be coordinated. Mr.

Graham stated that this coordination will be monitored and a decision can be made later. Ellen Reckhow stated that the sunset of the additional one-percent sales tax would be a key for deciding when the referendum vote would take place. Several TAC members voiced a concern and desire to have the "drop dead" dates available for putting the referendum on the ballot so a support campaign can be implemented with adequate time.

Bill Houppermans, URS Corporation, reviewed the contents and schedule of the upcoming Alternatives Analysis. The Alternatives Analysis needs to identify the transit corridor and right-sized project for the first federal New Starts application. Ellen Reckhow asked if both commuter and light rail transit would be analyzed, and Mr. Houppermans stated that yes, both would be part of the study. Bill Bell stated that he was a proponent of a seamless transit system. Mr. Houppermans reminded members that the New Starts corridor will likely be just one part of a much larger planned transit system. Alice Gordon stated that she was concerned that the Alternatives Analysis schedule was too tight to properly inform the County Financial Plan, and did not leave enough time for public debate and a support campaign.

Damien Graham presented the public involvement plan. Bill Martin, Martin/Alexiou/Bryson, presented the corridors to be studied. The study starts with the 2035 Long Range Transportation Plan (2035 LRTP) which includes 57 miles of corridors. Cost information that is adequate for informing the County Financial Plans will be available about mid-way through the Alternatives Analysis and the metrics will be based on the year 2035 and any interim years. Ellen Reckhow was concerned about the land use assumptions because in five years the local land use plans might be more transit supportive, such as densification in certain areas of the Research Triangle Park. Mr. Martin noted that the federal process requires using the existing land use plans.

Ellen Reckhow asked if commuter rail could provide service directly to the airport. Mr. Martin stated that airports tend to not support passenger rail but some type of transit connection will likely be

planned for the airport. Alice Gordon asked about the financial support for commuter rail. Mr. Martin noted that the Federal Transit Administration (FTA) has not funded much commuter service but instead has shown stronger support for light rail transit. Mark Kleinschmidt believes the referendum's success might hinge on the public understanding of how access will be provided to the airport and noted that the Chapel Hill Town Council has shown support for transit to the airport. Mike Woodard thought that the airport was to complete a "white paper" explaining the transit access issue from the airport's perspective.

Ellen Reckhow believed that not including commuter rail west of Durham in the Alternatives Analysis was a fatal flaw, and that adding it to the study would not seem to add much to the overall study effort. Alice Gordon and Eric Hallman agreed with her concerns. Andy Henry stated that only light rail transit was included in the 2035 Long Range Transportation Plan in the DCHC MPO. Commuter rail was not included.

MPO Policy and Procedures (Attachment 7, 7A, and 7B)

Maricia Brown provided an introduction for the MPO Policy and Procedures, along with the attachments.

There were no questions regarding Policy 1 and Policy 2. Ellen Reckhow asked if reports need to be submitted during the grace period and Maricia Brown stated no. They will get noticed when they are nine months past the obligation date. Ellen Reckhow asked if it could be moved to six months instead of nine months and Maricia Brown stated she will make the change. Alice Gordon asked about the monitoring of the expenditure of funds and Maricia Brown stated they haven't decided to what extent the expenditures will be monitored.

A motion was made by Ellen Reckhow and seconded by Lydia Lavelle to approve the three MPO policies and procedures with the amendment mentioned in policy 3 from nine to six months. The motion carried unanimously.

Section 5307 Allocation (Attachments 8 and 8A)

Maricia Brown provided an overview for the Section 5307 Allocation, along with the attachments. The MPO has a method to allocate funds in this area which is the same as the FTA formula.

Mark Kleinschmidt wants to offer input into the formula. Maricia Brown stated staff will be addressing the formula at the MPO level in the future per the attached memo.

A motion was made by Lydia Lavelle and seconded by Ellen Reckhow to approve the allocation of Section 5307 funds. The motion carried unanimously.

NC Mobility Fund (Attachments 9 and 9A)

Mark Ahrendsen provided an introduction for the NC Mobility Fund, along with the attachments. The TCC expressed support for the Governor's proposal but offered a few further comments that would help to strengthen the concept and be more in line with the MPO's priorities. These comments are identified in bullets in the agenda. The TCC's position was supportive of the NC Mobility Fund but suggested these five points be made as part of the support.

Sally Kost asked how a large project is defined. Mark Ahrendsen stated it would be more than $1 million but less than $10 million.

Julie White with the N.C. Metropolitan Mayors Coalition spoke regarding the N.C. Mobility Fund. Ms. White stated the motivator for this fund was the Yakin River Bridge. It was funded through DMV fees and stopping the transfer from the highway trust fund and the highway fund to the general fund. The N.C. Metropolitan Mayors Coalition is asking the TAC to pass a resolution in support of it and asking that the Governor's Powell Bill and Dedicated Interstate Maintenance fund provisions be added back in. NCDOT is also requesting that they put more funds in than the House Bill did.

Chuck Watts has concerns with the caveats suggested by TCC and wanted Ms. White's view. Ms. White stated there is no thought that the Mobility Fund compromises the need to reform the Equity

Formula. The MPO is still involved in developing the criteria; it's the law. The request that the fund be limited to large projects will reduce support by small communities.

Sally Kost stated the issue of large versus small projects needs a lot more debate and she would like it removed. Chuck Watts suggests supporting the resolution, expressing the concerns in the resolution regarding the Powell Bill and Interstate Maintenance funds.

Julie White recommends that the TAC members contact Representative Michaux to keep House support solid.

A motion was made by Ellen Reckhow and seconded by Lydia Lavelle to approve the resolution in support of the Mobility Fund including the Powell Bill and Dedicated Interstate Maintenance Fund as was originally proposed by the Governor. The motion carried unanimously.

NC 54 Corridor Study – Update (Attachment 10)

Leta Huntsinger provided an overview of the NC 54 Corridor Study – Update, along with the attachment.

Ms. Huntsinger stated because we want to get it right we decided to extend the schedule to add information on the long-term solutions to the draft report. The Technical Steering Committee will be meeting tomorrow to hear the results of the additional analysis. When the draft report comes to the TAC, there will actually be time to review prior to the August TAC meeting. The updated schedule is in the packet. Ed Harrison suggested meeting with UNC earlier in case they are not happy with the report. Ms. Huntsinger stated it will only be delayed a month. However, after meeting with the local staff and elected officials, it might shift a little. Ms. Huntsinger stated staff will coordinate with Triangle Transit and the Alternatives Analysis will use the NC 54 study contact list.

REPORTS:

Report from the TAC Chair

There will be a joint TAC meeting on September 29, 2010 at the RDU Airport Authority. They hope to bring the STAC members back to the meeting. There will not be a July TAC meeting.

Report from Staff (Attachment 12)

Felix Nwoko stated the Report from Staff is attached for review. Karen Lincoln stated that Orange County's Bike Map is now available.

Report from the TCC Chair

There will be an update on the N.C. Railroad Commuter Rail Ridership Study at the joint MPO meeting. There was an opening of the Chatham County section of the American Tobacco Trail this past weekend. Durham should be open next year, including the bridge and remaining trail section.

NCDOT Report (Attachment 14)

Mike Mills, Division 7 Engineer, provided an update on projects. The stimulus projects have been let and are in progress with the exception of the Columbia Street resurfacing. The Columbia Street project is scheduled to be let next November and the Weaver Dairy Road project is scheduled to be let sometime in August. They are working on Smith Level Road.

Wally Bowman, Division 5 Engineer, provided an update on projects. The one-on-one meetings to discuss the next TIP are on hold. US 15-501 should be done in the fall. It is running slightly behind schedule. There is a tremendous amount of resurfacing being done between the hours 9 p.m. and 6 a.m. on I-40. It should be complete by the end of the year.

INFORMATIONAL ITEMS:

Recent News Articles and Updates (Attachment 15)

The recent news articles and updates are attached for review.

DCHC MPO Letter to Secretary Conti regarding East End Connector – May 13, 2010 (Attachment 16)

The DCHC MPO Letter to Secretary Conti regarding East End Connector – May 13, 2010 is attached for review.

Regional Support Letter to Secretary Conti regarding East End Connector – May 14, 2010 (Attachment 17)

The Regional Support Letter to Secretary Conti regarding East End Connector – May 14, 2010 is attached for review.

Adjournment

There being no further business before the Transportation Advisory Committee, the meeting was adjourned at 12:01 p.m.

NC 54/I-40
CORRIDOR STUDY

TRANSPORTATION-LAND USE MASTER PLAN

EXECUTIVE SUMMARY

AUGUST 2010

Durham-Chapel Hill-Carrboro
Metropolitan Planning Organization

RENAISSANCE PLANNING GROUP

Executive Summary

Overview

A primary route connecting much of southern Orange, Durham and Wake Counties, as well as new growth occurring in Chatham County, with the academic and medical destinations at the University of North Carolina at Chapel Hill (UNC) and the Research Triangle Park, the NC 54/I-40 corridor is facing pressures unlike many others in the region. In addition to the regional access that NC 54 provides for UNC and its medical facilities for commuters, patients and visitors from across the state and region, the corridor is facing rising traffic levels that relate both to regional growth and substantial development activity within the corridor. NC 54 is in transition as both institutional and private development activity lead to long-term changes in the corridor's character. These potential land use changes require careful planning with needed transportation improvements to serve the long-term vitality of the corridor and its surrounding neighborhoods. With environmental, physical and policy constraints limiting expansion of portions of the roadway and the development of parallel roadway connections, the corridor requires a multimodal solution to meet future demand while improving safety for all users and traffic operations.

The corridor is also extremely important to the communities in both Durham and Chapel Hill, where it serves residential and commercial land uses, creating an eclectic mix of local and regional traffic competing for limited space. The corridor is fast becoming the most congested in the region, and has begun a transition from low-density suburban development with a semi-rural feel to a more urban pattern, with approved and pending development proposals expected to accelerate that transition as the economy rebounds. With more than 600 acres of vacant developable land surrounding it and likely development of UNC-owned properties along the corridor in the next several years to expand its health care-related facilities, NC 54 is poised for dramatic changes. As a result, the corridor is rising in statewide importance and regional prominence.

However, rising congestion levels threaten property values and economic growth for both jurisdictions, as well as the ability for UNC to compete for jobs and patients. There are policies in place in Chapel Hill and on the University of North Carolina campus that restrict the amount of available parking, and encourage the use of transit in reaching destinations served by this corridor. Yet the heavy traffic, high speeds and lack of multimodal facilities along the corridor create barriers that limit the usefulness and safety of walking and bicycling for transportation. This also influences transit usage, where heavy demand exists due to the parking constraints, but better pedestrian access is needed to make transit more effective as a travel option. As a result of those existing and anticipated future demands, NC 54 is an extremely complex corridor, serving multiple travel markets and a diverse array of stakeholder and community interests focused on the success of different transportation modes, protection of neighborhoods and the economic viability of their land.

Study Objectives

In that context, the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) initiated the NC 54/I-40 Corridor Study to develop a land use – transportation blueprint for this regionally significant corridor. With its development potential and the plan to construct a regional light rail system that would serve this corridor, the goal of the study is to define complementary land use and transportation strategies that will guide public and private actions, investments and capital project priorities to improve mobility, safety and access for all modes. The dynamic nature of this critical corridor

requires a bold vision supported by practical, achievable strategies in the near term and set the right foundation for longer term improvements through the 2035 horizon year.

Through a planning process that examined future land use-transportation scenarios, the NC 54/I-40 Corridor Study seeks to build upon various transportation and land use plans and engage corridor stakeholders and the public in finding solutions that are effective and find the right balance between mobility and accessibility for all users. Study recommendations in the draft final report offer a multimodal approach to meeting existing and future transportation needs. They address the functional design for specific geometric improvements at intersections along NC 54 and at the interchange with I-40, the expansion and integration of various types of transit services to help more people reach their destinations as an alternative to driving, an interconnected network of bicycle and pedestrian facilities to provide a more comfortable environment with safe access along the corridor for walking and cycling, and a phased implementation plan for capital projects and service improvements.

These transportation recommendations support a land use strategy designed to create more opportunities for location-efficient housing and transportation in the corridor to improve livability and regional mobility. The corridor is becoming increasingly employment-oriented, and more proximate housing choices – particularly for a range of income levels – will create shorter trip distances and help make the use of non-auto travel options more viable. The report includes design guidelines to provide further support for implementing the recommended land use and transportation strategies.

Study Partners and Process

The DCHC MPO led the study, serving as the project manager in partnership with the consultant team hired for the project, Renaissance Planning Group, in association with ICF International and Michael Baker Corporation. The MPO coordinated the active involvement of a broad group of study partners that include the North Carolina Department of Transportation (NCDOT), Triangle Transit Authority (TTA), the City of Durham, Durham County, the Town of Chapel Hill, the University of North Carolina (UNC), Chapel Hill Transit and the Durham Area Transit Authority (DATA). The MPO, the City of Durham, Durham County, and the Town of Chapel Hill funded the study. The study partners formed a steering committee that met monthly to guide the process, provide input at key milestones, and review study work products.

While the NC 54 corridor study limits are from I-40 to US 15-501, the study did not just focus on the linear right-of-way along NC 54. It captured a regional context, including growth patterns, transportation plans and the planned regional light rail system anticipated to connect this corridor to other points in the Triangle Region. The study area boundaries encompass surrounding neighborhoods and the existing and planned street networks, including Ephesus Church Road, Barbee Chapel Road, Farrington Road, NC 751 and others providing parallel routes or interconnecting with NC 54.

Public engagement is critically important to the study. A part of the corridor's complexity is the multitude of interested stakeholders with diverse expectations about the future of the NC 54 corridor. These include landowners, institutions, businesses, neighborhood residents, students and, of course, the commuting public. A vigorous public participation process was employed to guide the development of study recommendations. This entailed a series of in-depth focus group discussions with each of the key stakeholder groups (residents and non-residents alike) early in the project and again once initial recommendations were nearing completion. In addition, a series of three public workshops at key milestones defined priority issues and opportunities, provided the basis for creation and evaluation of scenarios, and enabled participants to react and suggest refinements to draft land use and transportation master plan recommendations.

These outreach activities were augmented through use of a project web site (http://www.nc54-i40corridorstudy.com/) to share information and provide additional opportunities for the community to review materials and weigh in with ideas or issues of concern. The DCHC MPO staff and consultant team also met informally with various individuals and groups throughout the study. The recommendations contained in this report are a direct reflection of the input provided over the year-long public engagement process.

Vision for the Corridor

Through the study process, analysis and broad-based feedback, a vision emerged for a regionally significant multimodal corridor that serves both regional and local travel through an expanded and more efficient network of streets, bus routes, bicycle facilities and pedestrian enhancements. The integrated land use and transportation vision is to promote community livability by guiding future development into targeted mixed-use areas to reduce trip lengths, enable greater use of non-auto travel options and provide location-efficient choices for housing and transportation. These areas are within ¼ to ½ mile of the four planned light rail stations in the corridor. This will effectively support the investment in rail passenger service that will strengthen regional and local travel options between the UNC campus, Orange County, Durham County and elsewhere in the Triangle Region. Over time, the centers help transform the corridor from a drive-by strip into highly accessible, well-connected places that function as vibrant focal points serving local and regional needs.

Land Use Strategy

Figure ES-1 presents the recommended nodal development vision for the corridor. This land use-transportation blueprint embraces livability principles that provide more transportation choices, promote equitable, affordable housing through location and energy-efficiency, enhance economic competitiveness through reliable and timely access to employment, educational opportunities and services, and by supporting existing communities through transit-oriented, mixed-use development that will help safeguard existing neighborhoods and preserve rural landscapes.

Table ES-1 shows the recommended height and density targets for the nodal development plan, which provides the compact, mixed-use framework necessary to create a series of vibrant walking districts that enables reliance primarily on non-auto travel modes as they approach build-out of the development program. The density minimum and maximum thresholds identified in the table provide a targeted range that allows some flexibility and variation along the corridor, and the upper limit does not have to be achieved to make the transit-oriented development work effectively. There is no one-size-fits-all approach, but having good jobs-housing balance and sufficient numbers of households in the ¼ mile core radius from the station have proven to be essential to strong transit ridership elsewhere in the country, particularly from those who can access the station by walking and bicycling.

The creation of highly developed mixed-use centers can help mitigate automobile travel demand by creating an environment where walking and access to transit is the priority. It also provides a mechanism to advance transportation funding opportunities that are unlikely to be available with the status quo or trend development pattern. For instance, allowing more dense development in the core and immediately adjacent areas of planned light rail stations to create mixed-use “nodes” along the corridor provides the incentive to obtain mitigation funding from future development to advance funding for the roadway improvements that eventually will be needed in the corridor even without the development. This is because

higher density development typically increases the return on investment and the development community depends on good access to support their projects. If development is overly constrained in the corridor despite market demand, growth will continue to occur elsewhere at lower densities in the nearby parts of the region and people will still need to reach the corridor, primarily by automobile.

The traffic projections for the MPO's adopted 2035 Long Range Transportation Plan – without the nodal development plan in the NC 54 corridor – show that major capacity improvements to NC 54 and I-40 will be needed. Higher densities also enable developers to incorporate a greater percentage of workforce housing into the development program, helping to shorten trip lengths and creating more purchasing power for those residents who can effectively lower both housing and transportation costs.

Figure ES-1: Recommended Corridor Land Use Concept

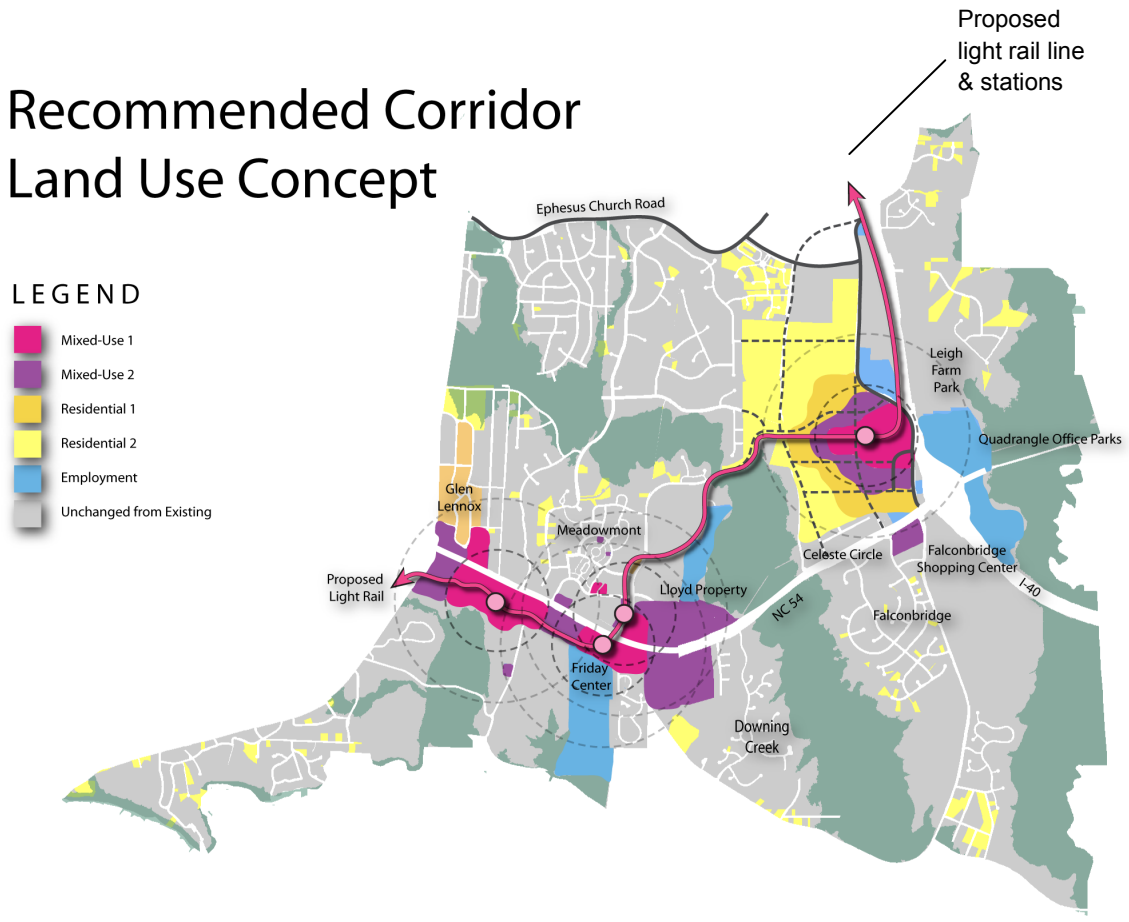

Table ES-1: Concept Land Uses

	Mixed Use 1	Mixed Use 2	Residential 1	Residential 2	Employment
No. of stories	3 – 8	2 – 4	2 – 4	1 – 3	4 – 12
Floor-to-area ratios (non-residential	1.25 – 2.25	1.0 – 1.5	-	-	0.5 – 1.0
Dwelling Units per Acre	35 – 75	25 – 35	15 – 35	6 – 10	-
Employees per Acre	45 – 90	25 – 50	9 – 15	6 – 12	35 – 175

Transportation has a profound influence to shape growth in a region and along a corridor. The parking constraints on the UNC campus and elsewhere in the Town of Chapel Hill have certainly influenced the use of transit, and, at least to a certain extent, where people choose to live. Developers and their clients (businesses, residents) respond to transportation conditions when they decide where to build, live, or locate their business. A new or improved roadway or transit project can make access to a location easier – making it more attractive to develop. A transportation improvement can also improve visibility – an important consideration for commercial developers. Many businesses rely on being seen by "pass-by" traffic and want to locate where there is a lot of vehicle and/or pedestrian traffic. This has been the case at the NC 54/Farrington Road intersection, where development depends on highway visibility. Conversely, rail transit is likely to result in more compact development clustered within walking distance of the station, and opens up new opportunities for how people choose to live and travel.

The response is also strongly influenced by the land use policy and planning context – for example, when the predominant mode of travel is the automobile, rail transit needs to be accompanied by strong land use policies in order to concentrate development in station areas. This type of strategy in the NC 54 corridor is necessary to avoid a future scenario where rising levels of congestion will occur due to regional growth forecasts, which will still increase the demands placed on the NC 54 corridor and its I-40 interchange for major improvements. A well-designed, but intense nodal development program will enhance the potential for higher levels of financial support from planned development within the corridor.

The timing of the nodal development plan is dependent on the schedule for light rail in the corridor, as well as interim higher-capacity transit strategies like Bus Rapid Transit (BRT) and expansion of fixed route bus service throughout the corridor. If the funding mechanism is approved and the light rail plan moves forward, detailed station area plans would guide the development for the areas around each station in the corridor. Build-out of the nodal development plan depends on the rail network or comparable BRT service that can effectively support the planned development program and mitigate the demand for automobile traffic driving to the development. In the interim, it is imperative that the corridor stakeholders work to advance premium transit in the form of BRT (such as through bus signal priority, queue jump lanes or other BRT strategies) to properly complement the phasing of proposed development plans. Due to the significant roadway capacity challenges of this corridor, increases in development intensity must be timed to occur with expansion of fixed route bus service, introduction of the higher capacity BRT service, and, ultimately, when the light rail system becomes operational. Timing development with the interim BRT and planned light rail network will help ensure that adequate transportation options exist as more intensive development occurs.

Transportation Strategy

Table ES-2 presents the phased multimodal transportation recommendations associated with the recommended nodal development plan. The recommendations are divided into short-term, mid-term and long-term strategies. These are described in detail in the full report, with supporting data in a series of appendices. In general, the short-term roadway strategies consist of a series of geometric modifications at selected intersections to improve traffic flow and operational efficiency. These phased improvements serve as interim components of the ultimate intersection design to make the most efficient use of the roadway. Commonly referred to as a "superstreet," this strategy reduces delay and supports anticipated traffic growth in the corridor through at least 2025.

The critical intersection along this corridor is the Farrington Road intersection, which causes significant congestion due to its proximity to the I-40 interchange. Beyond the short-term modifications that provide additional capacity for a time, in the mid-term, a direct access flyover ramp from eastbound NC 54 on the west side of Farrington Road to eastbound I-40 is needed to maintain functionality of the Farrington Road/NC 54 intersection. Other modifications to the interchange are also identified in the intermediate term. Longer term, with the recommended nodal development, a more complete redesign of the I-40 interchange at NC 54 will be needed, involving construction of additional ramps providing direct access from the interstate into the proposed Leigh Village light rail station area.

Transit is an integral part of this overall strategy. In addition to the planned light rail system, a network of premium Bus Rapid Transit lines, expanded local bus service, and additional park-and-ride lots are recommended for the corridor. The key park-and-ride strategy is the relocation of the existing commuter lot at the Friday Center to a parking structure near the I-40/NC 54 interchange in the vicinity of the proposed Leigh Village development. This location would capture commuting trips entering the corridor at that location, and the parking garage would eventually support additional development capacity at the planned light rail station area in Leigh Village. This facility would become an intermodal hub, with transit, bicycle and pedestrian access in addition-to-park and ride. While it will not eliminate trips from the corridor, it shifts their location to a point where impacts on intersections will be reduced and a street network is planned to help better disperse traffic than at the current park-and-ride location.

From a bicycle and pedestrian network standpoint, the recommended plan fills in gaps and improves safety and access along NC 54 through geometric modifications and the creation of a 10' to 15' shared use path adjacent to the roadway along the northern side. This is a critical gap in the corridor, and high speed traffic precludes an on-road solution for the section east of the Friday Center. A 15' path would allow more comfortable use in both directions for pedestrians and cyclists, but 10' is the minimum width for safety. Additional non-motorized transportation recommendations are identified throughout the corridor, including along Barbee Chapel Road and at US 15-501.

Table ES-2: List of Transportation Recommendations

PARK-AND-RIDE					
Description	**Location**	**Jurisdiction**	**Phase**	**O&M Cost**	**Capital Cost**
Increase visibility and capacity at the Southpoint Mall park-and-ride facility. Increase transit frequency to 15-minute headways or less.	Southpoint Mall park-and-ride facility on the southwest quadrant of the I-40/ Fayetteville Rd interchange	Durham	Short Term (2012-2017)	$670,000	$1,170,000 (3 buses at $390,000 each)[1]
Construct NC 751 park-and-ride facility.	Along Southpoint Auto Park Blvd off of NC 751 just north of I-40	Durham	Short Term (2012-2017)	$50,000[2]	$625,000[3]
Construct highly visible structured park-and-ride facility with easy access from I-40 and US 15-501 near proposed light rail station.	At the I-40/ US 15-501 interchange with easy access to light rail station	Chapel Hill	Mid Term (2017-2022)	$50,000[2]	$30,000,000[4]
Implement a structured park-and-ride facility at the Leigh Village station area to be phased with transportation improvements.	Leigh Village light rail transit station area	Durham	Mid Term (2017-2022)	$400,000[2]	$40,000,000[5]

TRANSIT					
Description	**Location**	**Jurisdiction**	**Phase**	**O&M**	**Capital**
Expanded Local Bus Service with 30 minute frequency.	North along Burning Tree Dr & Pinehurst Dr from NC 54 to Ephesus Church Road	Chapel Hill	Short Term (2012-2017)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Expanded Local Bus Service with 30 minute frequency.	Southeast along Barbee Chapel Rd and returning north back to NC 54 along Farrington Rd	Durham	Short Term (2012-2017)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Express Bus along NC 54 from Route 751 Park-and-ride.	From NC 751 park-and-ride lot north of I-40 to downtown Chapel Hill alongNC 751 and NC 54	Durham & Chapel Hill	Short Term (2012-2017)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Expanded Local Bus Service with 30 minute frequency.	North of NC 54 along Farrington Rd & SW Durham Dr to US 15-501 (Durham- Chapel Hill Blvd)	Durham	Mid-Term (2015-2020)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Bus Rapid Transit - Phase 1. Five minute frequency with daily peak vehicle need of six buses.	From Meadowmont along NC 54 to downtown Chapel Hill	Chapel Hill	Mid-Term (2015-2020)	$11,566,080[3]	$3,400,000
Bus Rapid Transit - Phase 2. Five minute frequency with daily peak vehicle need of six buses.	From NC 751 park-and-ride lot north of I-40 along NC 54 towards Chapel Hill, aligning with Bus Rapid Transit - Phase 1	Durham	Long Term (2022-2035)	$11,566,080[3]	$3,400,000
Flex Route	General service north and south of study area along Barbee Chapel Rd, Pinehurst Dr, Farrington Rd, Ephesus Church Rd, serving	Chapel Hill	Long Term (2022-2035)	$4,066,200[4]	$307,200 (4 buses at $76,800 each)[2]

TRANSIT					
Description	**Location**	**Jurisdiction**	**Phase**	**O&M**	**Capital**
	the Falconbridge Community, Donwing Creek community, and Glen Lennox				
Light Rail Transit (Preliminary Engineering and Design)	Durham to Chapel Hill	Durham & Chapel Hill	Long Term (2022-2035)	TBD[5]	$2,750,000[2]

PEDESTRIAN AND BICYCLE				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
Install crosswalks and pedestrian signals at signalized intersections with pedestrian refuge islands and street lighting for crossing NC 54.[1]	Burning Tree Dr/ Finley Golf Course Rd & NC 54	Chapel Hill	Short Term (2012-2017)	$80,000
	W Barbee Chapel Rd & NC 54	Chapel Hill	Short Term (2012-2017)	
	Meadowmont Ln/ Friday Center Dr & NC 54	Chapel Hill	Short Term (2012-2017)	
	E Barbee Chapel Rd & NC 54	Chapel Hill	Short Term (2012-2017)	
	Huntingridge Rd & NC 54	Durham	Short Term (2012-2017)	

PEDESTRIAN AND BICYCLE				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
	Farrington Road (northern, southern and eastern approaches) & NC 54	Durham	Short Term (2012-2017)	
	Leigh Farm Rd/ Quadrangle Dr & NC 54	Durham	Short Term (2012-2017)	
Install crosswalks with pedestrian-activated flashers and expand refuge islands.	US 15-501 on/off ramps	Chapel Hill	Short Term (2012-2017)	$40,000
Extend the solid marking designating the westbound exclusive right turn lane for US 15-501 on–ramps to minimize weaving movements at interchange and increase safety for on-road bicyclists.	From SB US 15-501 on ramp to 500 feet to the east	Chapel Hill	Short Term (2012-2017)	$2,700,000
Provide a minimum 5-foot wide on-road bicycle lane by restriping travel lanes to be 11 feet wide and making minor median modifications.	NC 54 from Burning Tree Dr/ Finley Golf Course Rd to the west	Chapel Hill	Short Term (2012-2017)	
Modify sloped abutment wall to provide 8-foot wide sidewalk behind overpass structural piers.	NC 54 underneath US 15-501 overpass	Chapel Hill	Short Term (2012-2017)	
Pave road shoulders to accommodate bicyclists on select roads to provide connections to the American Tobacco Trail.	From NC 54 to the American Tobacco Trail via Barbee Chapel Rd, Farrington Rd, Stagecoach Rd, NC 751, and Massey Chapel Rd	Durham	Short Term (2012-2017)	$4,000,000
Ensure adequate facilities for cyclists are available. Provide a 5-foot wide bicycle lane where possible, or provide	Farrington Road through the study area (Old Chapel Hill Rd to Stagecoach Rd)	Durham	Short Term (2012-2017)	Variable cost. Paving five-foot wide bike lanes

PEDESTRIAN AND BICYCLE				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
"share the road" signage and a paved shoulder or sharrow markings for on-road bicycle travel. Many of the collector streets are designed with for low vehicular speeds with the intent for bicycles to share the travel lane. Fill in sidewalk gaps[2].				on both sides of the roadway would cost approximately $1,200,000 per lane assuming medium duty pavement. Striping a bike lane without paving would cost approximately $5,000 per mile. Installing signage would cost about $1,500 per sign.
	Ephesus Church Rd from Farrington Rd to E Franklin St	Durham & Chapel Hill	Short Term (2012-2017)	
	George King Rd & Crossland Dr (proposed collector street) from Ephesus Church Rd to NC 54	Durham	Short Term (2012-2017)	
	SW Durham Dr from Ephesus Church Rd to NC 54	Durham & Chapel Hill	Short Term (2012-2017)	
	Lancaster Dr and E/W collector street from Farrington Rd to Pinehurst Dr	Durham & Chapel Hill	Short Term (2012-2017)	
	Pinehurst Dr from Ephesus Church Rd to Burning Tree Dr	Chapel Hill	Short Term (2012-2017)	
	Burning Tree Dr from Pinehurst Dr to NC 54	Chapel Hill	Short Term (2012-2017)	
	Hamilton Rd from NC 54 to Brandon Rd	Chapel HIll	Short Term (2012-2017)	
Construct an off-road shared-use path, with a boardwalk bridge as an alternative solution in environmentally sensitive areas. Path should have minimum 10-foot width; ideally 15 feet if possible.	Along north side of NC 54 from E Barbee Chapel Rd to Farrington Rd	Durham & Chapel Hill	Mid-Term (2017-2022)	The cost for these improvements is included in the roadway projects list
	Through the Glen Lennox	Chapel Hill	Mid-Term	

PEDESTRIAN AND BICYCLE				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
	property from Hamilton Rd at Brandon Rd to connect to S Estes Dr utilizing existing trail and along the NC 54 frontage to connect to the existing multi-use path at Burning Tree Dr		(2017-2022)	under the item "Widen NC 54 to six lanes in the Durham section. Construct the multi-use path concurrent with the road project."
Construct an off-road shared-use path on the south side of NC 54 with accompanying signage to cross. Path should have minimum 10-foot width; ideally 15 feet if possible.	NC 54 from Farrington Rd to I-40 overpass	Durham	Mid-Term (2017-2022)	
Construct sidewalk on south side of NC 54 to connect to I-40 overpass.	South side of NC 54 from Huntingridge Rd east to I-40 overpass	Durham	Mid-Term (2017-2022)	
Construct a 10-foot wide shared use path on south side of overpass.	NC 54 bridge over I-40	Durham	Mid-Term (2017-2022)	
Implement crosswalks and landscaped median refuges at primary superstreet intersections.	Meadowmont Ln/ Friday Center Dr & NC 54	Chapel Hill	Mid-Term (2017-2022)	The cost for these improvements is included in the roadway projects list under the item "Construct EB NC 54 to EB I-40 flyover from Farrington Road to I-40 EB on-ramp."
	Huntingridge Rd & NC 54	Durham	Mid-Term (2017-2022)	
Adequately sign reverse superstreet intersections.	E Barbee Chapel Rd & NC 54	Chapel Hill	Mid-Term (2017-2022)	
	Falconbridge Rd & NC 54	Durham	Mid-Term (2017-2022)	

PEDESTRIAN AND BICYCLE				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
During construction of superstreet modifications, implement crosswalks and landscaped medians on the northern, southern and eastern approaches, and provide adequate signage for pedestrians to cross to south side to travel over I-40 bridge.	Farrington Rd & NC 54	Durham	Mid-Term (2017-2022)	
Design and construct light rail bridge over NC 54 to serve as an elevated pedestrian crossing.	Across NC 54 connecting Meadowmont and Friday Center	Chapel Hill	**Long Term (2022-2035)	TBD
Continue to make regional connections with greenways.	where possible	Durham & Chapel Hill	Long Term (2022-2035)	Variable cost

ROADWAY				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
Construct channelized free flow lane for eastbound right turns into East Barbee Chapel Road	Along NC 54 at E Barbee Chapel Rd	Chapel Hill	Short Term (2012-2017)	$700,000
Construct northbound right turn channelization to free flow merge lane onto eastbound NC 54	Friday Center Dr	Chapel Hill	Short Term (2012-2017)	$900,000
Construct Farrington Road slip ramp for northbound traffic on Farrington Road to access eastbound I-40 directly. Modify on-ramp to allow	Farrington Rd	Durham	Short Term (2012-2017)	$3,300,000

ROADWAY				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
for transition.				
Construct collector street system including turn lanes on NC 54.	As specified in the adopted Southwest Durham – Southeast Chapel Hill Collector Street Plan	Durham	Short Term (2012-2017 and beyond)	$31,400,000
Construct access road behind the Farrington Road shopping center for connection between Farrington Road and Falconbridge Road.	Between Farrington Rd and Falconbridge Rd	Durham	Short Term (2012-2017)	$400,000
Obtain Marriot Way, then upgrade to NCDOT standards and extend to Barbee Chapel Road.	Between Friday Center Dr and E Barbee Chapel Rd	Chapel Hill	Short Term (2012-2017)	$800,000
Construct other connections as opportunities arise through development proposals.	Through study area	Durham & Chapel Hill	Short to Long Term	Variable cost
Improve I-40 interchange to add new partial cloverleaf ramp for I-40 EB to NC54 EB, remove existing signal and install yield sign at the I-40 EB to NC54 WB ramp with addition of merge lane.	I-40 Interchange with NC 54	Durham	Mid-Term (2017-2022)	$1,100,000
Construct EB NC 54 to EB I-40 flyover from Farrington Road to I-40 EB on-ramp.	I-40 Interchange with NC 54	Durham	Mid-Term (2017-2022)	$10,800,000
Construct auxiliary lane widening for I-40 westbound offramp to match the two lane section of the ramp.	I-40 Interchange with NC 54	Durham	Mid-Term (2017-2022)	$1,100,000

ROADWAY				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
Widen the bridge over I-40 to accommodate 4 lanes of westbound NC 54 laneage. In conjunction with this, widen the westbound approach to two lanes for 500 feet as needed for intersection capacity.	I-40 Interchange with NC54	Durham	Mid-Term (2017-2022)	$2,300,000
Reconstruct the Farrington Road intersection to only allow the northbound left turn through the intersection. Channelize for freeflow westbound right turn lane.	Farrington Rd	Durham	Mid-Term (2017-2022)	$3,700,000
Widen NC54 to six lanes in the Durham section. Construct the multiuse path concurrent with the road project.	Durham section of NC54	Durham	Mid-Term (2017-2022)	$18,700,000
Implement superstreet configurations at Falconbridge Rd, Huntingridge Rd, E Barbee Chapel Rd and Friday Center Dr intersections.	Falconbridge Rd, Huntingridge Rd, E Barbee Chapel Rd and Friday Center Dr	Durham	Mid-Term (2017-2022)	$3,800,000
Install triple southbound lefts at Falconbridge Road.	Falconbridge Rd	Durham	Long Term (2022-2035)	$400,000
Construct I-40 ramps into the northern development (Leigh Village) area	I-40 Interchange with NC54 and area to the north	Durham	Long Term (2022-2035)	$27,700,000
Monitor for potential need to grade separate key intersections through the corridor.	Corridorwide	Durham & Chapel Hill	Beyond 2035	Variable cost.

Conclusions

The analysis of growth and transportation indicates that substantial capacity improvements will be needed by 2035 with or without new development anticipated to occur in the corridor. The I-40 interchange at NC 54 is fast approaching its capacity, and the proximity of the Farrington Road intersection creates operational challenges that affect much of the corridor. Heavy through traffic volumes projected along the corridor require intersection modifications that will help reduce delay. While the planned light rail transit system will help when it becomes operational sometime around 2025, it will not eliminate congestion. Rather, the light rail network provides a sound basis to guide future growth into the planned station areas as part of a nodal development strategy that will help reduce trip lengths, lower vehicle miles traveled per capita, and provide for more location-efficient housing choices to increase the financial flexibility of those residents. Implementation of an interim service of higher-capacity Bus Rapid Transit can enable some phasing of more intense development along the corridor until light rail becomes operational. Gaps in the local transit network need to be filled with higher frequency service in the peak periods.

While the recommended land use plan increases growth in the corridor beyond the levels assumed for the adopted Long Range Transportation Plan, most of that additional growth is expected to occur in Orange County because the LRTP assumptions appear low relative to development potential and future plans on the part of the University of North Carolina.

The recommended phasing plan for the transportation network creates better mobility for the next 15 to 20 years through the "superstreet" operational improvements. The elevated bypass from eastbound NC 54 to eastbound I-40 will also be needed between 2015 and 2020 to maintain a functioning intersection at Farrington Road and NC 54, allowing access to adjacent properties. Additional direct access ramps from I-40 into the proposed Leigh Village development will be necessary before 2035 to support anticipated growth that should only occur with the construction of a light rail system. These ramps can be designed to avoid impacts to Leigh Farm Park and other sensitive neighborhoods. Geometric functional designs have been developed to guide these needed capacity improvements.

As indicated, due to traffic impacts, much of the anticipated future growth will need to wait until the light rail system is operational and can help moderate auto travel demand. However, the plan calls for expanded park-and-ride opportunities, including a new parking structure immediately northwest of the I-40/NC 54 interchange to improve mobility and regional access into the corridor. Additional park-and-ride lots would serve other travel markets. Expanded local bus, Bus Rapid Transit, and commuter express routes are planned to meet the corridor's growing needs in the interim to light rail, and these services will complement the rail system when it is built.

A network of non-motorized transportation facilities, along with signage/markings for shared on-road use where appropriate, is needed to create a more accessible corridor and study area. This addresses travel along the NC 54 corridor by bicyclists and pedestrians, as well as crossing the corridor safely and efficiently. Elsewhere in the study area, the network provides additional connections between residential areas, commercial destinations and regional facilities, such as the American Tobacco Trail.

Establishing benchmarks and targets is an effective way to measure progress toward plan implementation. The NC 54/I-40 Corridor Study is a multi-year, multi-phase master plan aimed at improving overall mobility and accessibility, consistent with plans to create development focal points as places that become multipurpose destinations. Given the concerns of some residents and many stakeholders about traffic

conditions and future development plans, it makes sense to take an approach in partnership with NCDOT and the local governments that addresses various aspects of this report to track progress toward achieving outcomes of this planning effort, not merely the programming and construction of capital projects.

The recommended approach is for the MPO to prepare a biannual monitoring report every two years to document progress toward achieving the mobility goals outlined in this study. This monitoring report would document transportation system conditions over time using the performance measures defined through this study and expanded to address specific implementation activities and accomplishments on the part of each study partner or jurisdiction. The report would fit within the MPO's established Congestion Management Process, and should document actions from a land development, transportation and urban design framework to implement the recommendations for improved livability, mobility, safety and access.

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NC 54/I-40 Corridor Study Introduction and Vision

Overview

The NC 54/I-40 corridor is facing tremendous challenges from the Triangle Region's fast-paced growth over the last decade and the increasing demands for statewide research and health care at the University of North Carolina at Chapel Hill. The NC 54 corridor is the primary east-west access into the main UNC campus and medical center from I-40. Despite the recent national economic downturn, the corridor is experiencing significant growth pressures that will likely resume in earnest as the economy rebounds. The corridor is also extremely important to the communities in both Durham and Chapel Hill, where it serves residential and commercial land uses that depend on the corridor for access to services and regional mobility. Rising levels of traffic congestion along NC 54 and at the interchange with I-40 – one of the state's most severely congested locations – threatens property values and economic growth for both jurisdictions. Environmental constraints posed by the corridor's proximity to the Jordan Lake watershed create an additional challenge that places greater emphasis on sustainable, environmentally sensitive mobility solutions.

"NC 54 is an extremely complex corridor, involving multiple travel markets with each having unique characteristics and needs."

This is an extremely complex corridor, with multiple travel markets that are competing for service within a very limited space. These travel markets have distinct characteristics and needs, including university students, faculty and staff, medical facility commuters, patients and visitors, commuters from Chapel Hill traveling into the Research Triangle Park, and residents of Durham seeking to access employment, education and shopping destinations along the corridor. The corridor serves both local and regional travel, creating conflicts between those who just want to get between US 15-501 and I-40 as quickly as possible and those who need to access NC 54 from adjacent developments. It includes many transit riders who depend on bus service due to parking constraints and other factors. And, based on comments from the community, there is also latent demand for walking and bicycling in the corridor if NC 54 could become less of a barrier.

Within this context, the NC 54/I-40 corridor requires an intensive examination of the future options for improving mobility and accessibility, with a phased implementation plan that links land use with transportation decision-making to create a blueprint for the corridor's evolution. The dynamic nature of this critical corridor requires a bold vision supported by practical, achievable strategies that can guide public and private decisions over the next 20 to 30 years.

Study Objectives

Against that backdrop, the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) initiated the NC 54/I-40 Corridor Study to develop a land use – transportation blueprint for this regionally significant high growth corridor. A scenario planning process was employed to explore long term development and transportation options for the corridor, with the use of analytical methods to evaluate the anticipated transportation impacts and benefits of the various alternatives. The outcomes anticipated for this study include development of a strategic master than that accomplishes the following:

- Integrates and synthesizes various plans and studies that affect the corridor
- Engages corridor stakeholders and the public at large in the study process to understand, define and build consensus toward a corridor blueprint
- Defines multimodal transportation strategies to improve accessibility, safety and mobility, lessen environmental impacts and reduce congestion-related delay
- Identifies the optimum land use and urban form that complements planned transportation investments in the corridor, including the proposed Triangle Region light rail system
- Provides functional design recommendations for specific geometric improvements along NC 54 and at the interchange with NC 54 to improve regional mobility
- Creates a phased implementation plan with priority projects linked to the timing of growth, and
- Preparation of design guidelines to provide further support for implementing recommended land use and transportation strategies.

Study Partners

The DCHC MPO led the study, serving as the project manager in partnership with the consultant team hired for the project, Renaissance Planning Group, in association with ICF International and Michael Baker Corporation. The MPO, through its administrative arrangement with the City of Durham, provided the contractual oversight of the consultant, and coordinated the active involvement of a broad group of study partners. These partners included the North Carolina Department of Transportation (NCDOT), Triangle Transit (TTA), the City of Durham, Durham County, the Town of Chapel Hill, the University of North Carolina (UNC), Chapel Hill Transit and the Durham Area Transit Authority (DATA). Funding partners included the MPO, the City of Durham, Durham County, and the Town of Chapel Hill.

A steering committee comprised of various staff representing each of the study partners was established to guide the process, provide input and feedback at key milestones, and review study work products. The steering committee met monthly throughout the duration of the year-long study process, and was instrumental in reviewing and refining the analysis and development of recommendations. In addition to monthly meetings, at several points in the process, a subcommittee of the steering committee met to work through various issues, such as the phasing of the transit recommendations and the analysis for development of the roadway recommendations. The study partners were extremely helpful in sharing data and offering guidance throughout the process.

Study Area

Figure 1-1 on the following page shows the NC 54/I-40 corridor study area. In light of the regional influence of the University of North Carolina, the potential land use changes in this dynamic corridor, and the need for an integrated multimodal transportation strategy to meet the corridor's future needs, the study area had to be drawn larger than the relatively narrow alignment of NC 54 itself. While the focus of the study is on how to address the transportation and land use issues affecting NC 54, the adjacent neighborhoods, potential development areas and intersecting roadways all had to be carefully considered in the study process. Thus, the corridor study limits were drawn to encompass Ephesus Church Road on the north, NC 751 on the east, the entrance to UNC campus on the west, and bounded by the Jordan Lake watershed, residential areas and Finley Golf Course to the south of the corridor.

Study Process

Contributing to the corridor's complexity, there are multiple interested stakeholders with expectations about the future of the NC 54 corridor. Their interests range from the convenient access to medical services for patients from all across the state to the protection of adjacent neighborhoods from diminished property values associated with cut-through traffic and noise. Both the Town of Chapel Hill and City of Durham have expectations for quality development in the corridor and convenient transportation options that meet their respective needs. Each study partner brought to the table issues and expectations for the corridor. Equally important to the various agencies involved, however, was the ability for the public at large and key constituent groups to raise issues and help develop solutions to improve the corridor. Toward that end, a vigorous public participation process was developed that helped guide the development of study recommendations. Detailed summaries of this process are included in the report appendix.

The public engagement process involved a series of in-depth focus group discussions with residents and area neighborhoods, representatives of the local jurisdictions and entities along the corridor, transit riders, bicycle and pedestrian advocates, and developers, property owners and businesses operating within the corridor. In addition to those meetings, a series of three public workshops were held at key milestones. The first workshop identified priority issues and opportunities, and provided the basis for creation of scenarios that would explore land use and transportation options. The second workshop provided an analysis of the scenarios, and an opportunity to refine the alternatives prior to development of study recommendations. Finally, a third public workshop presented a draft set of recommendations for land use and transportation, at which the participants were able to react and suggest refinements to the plan.

In addition, a project web site (http://www.nc54-i40corridorstudy.com/) was created to share information and provide opportunities for the community to weigh in on issues of importance. The DCHC MPO staff and consultant also met informally with various individuals and groups to discuss the study. The recommendations contained in this report are a direct reflection of the input provided over the year-long public engagement process.

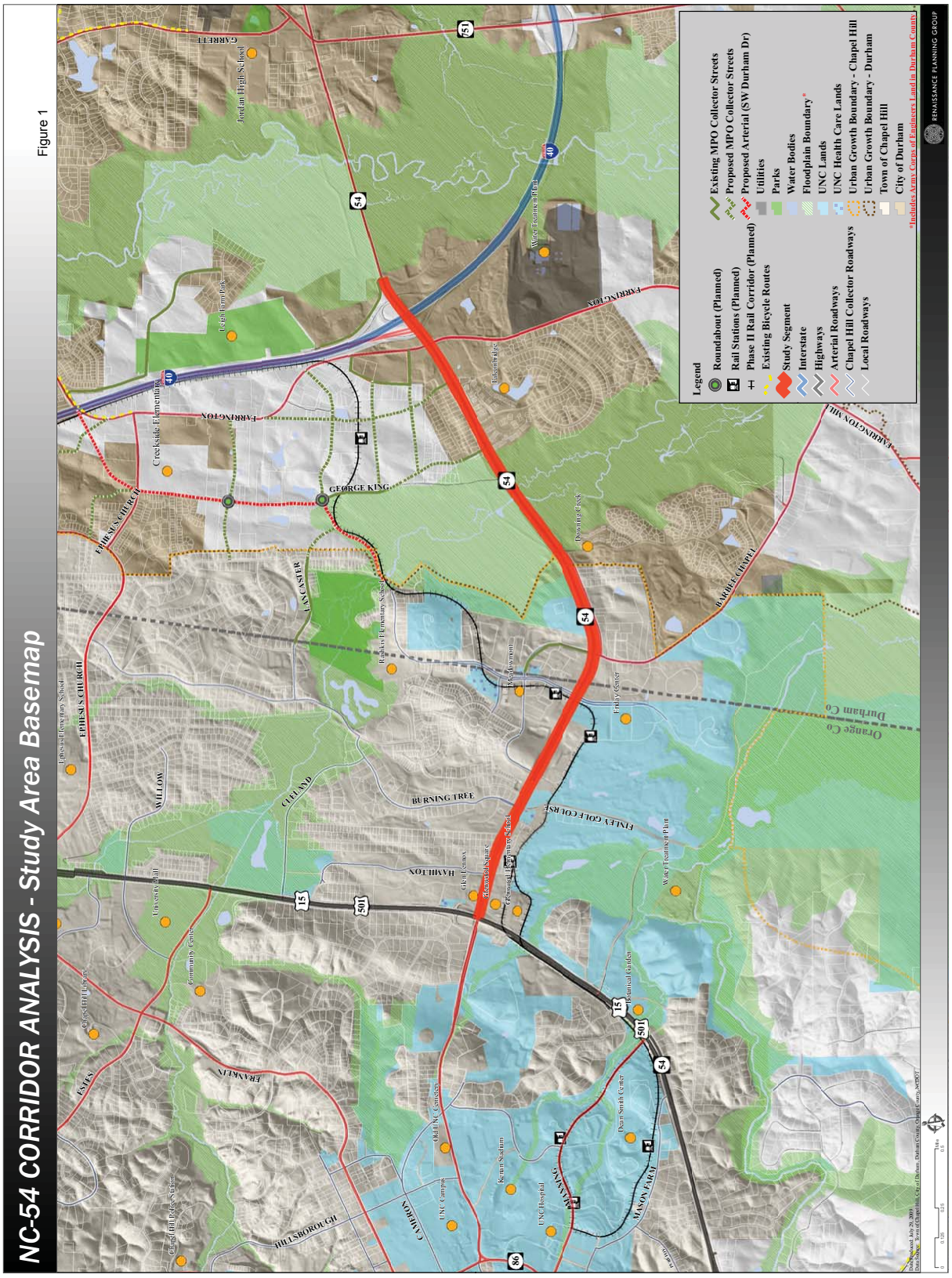

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Figure 1-1: Study Area

Vision for the Corridor

Through the study process, analysis and broad-based feedback, a vision emerged for a regionally significant multimodal corridor that serves both regional and local travel through an expanded and more efficient network of streets, bus routes, bicycle facilities and pedestrian enhancements. The integrated land use and transportation vision is to promote community livability by guiding future development into targeted mixed use areas to reduce trip lengths, enable greater use of non-auto travel options and provide choices for housing and transportation. These nodes will be supported by an expanded and higher-capacity bus transit network, along with a planned light rail system connecting the UNC campus to Durham and elsewhere in the Triangle Region. The centers help transform the corridor from a drive-by strip into a highly accessible place defined by unique and vibrant focal points that serve as gateways to Durham, Chapel Hill and the University of North Carolina at Chapel Hill.

"The NC 54 Corridor Master Plan promotes location-efficient decisions to help lower combined housing and transportation costs per household. It puts people and jobs closer together, served by a more energy efficient transportation system that enables more trips to be made by walking, bicycling and transit. The plan defines target growth areas that help reduce sprawl in outlying areas."

Land Use Strategy

Figure 1-2 presents the recommended nodal development vision for the corridor. This land use blueprint is explained in further detail in the next section of this report.

This nodal development plan embraces key livability principles that provide more transportation choices, create opportunities for affordable housing through location-efficient, higher density miuxed-use development around transit station areas, enhance economic competitiveness along the corridor through reliable and timely access to employment, educational opportunities and services, and support of existing communities through transit-oriented, compact development that will help safeguard existing neighborhoods and preserve the rural landscapes.

The creation of highly developed mixed use centers can help reduce automobile travel demand by creating an environment where walking and access to transit is the priority. Trips to work are only one part of the solution, and many people need their car throughout the work day. However, if only 20-25 percent of daily travel nationwide is for commuting to and from work, then the potential exists for well-designed compact, mixed use development to enable ore trips to be made by walking, bicycling and transit for shopping, to restaurants, social activities and the like. The nodal development plan also provides a mechanism to advance transportation funding opportunities that are unlikely to be available with the lower density development scenario. For instance, more intense development at the planned Leigh Village station and other "nodes" along the corridor can provide sufficient incentive to obtain funds to offset transportation costs for roadway improvements that eventually will be needed in the corridor even without the development. The traffic projections for the MPO's adopted 2035 LRTP – without the nodal development plan in the NC 54 corridor – show that major capacity improvements will be needed. Higher densities also enable developers to incorporate a greater percentage of workforce housing into the development program, which will help shorten trip lengths and create more purchasing power for those residents who can effectively lower both housing and transportation costs.

Transportation has a profound influence to shape growth in a region and along a corridor. The parking constraints on the UNC campus and elsewhere in the Town of Chapel Hill have certainly influenced the use of transit, and, at least to a certain extent, where people choose to live. Developers and their

clients (businesses, residents) respond to transportation conditions when they decide where to build, live, or locate their business. A new or improved roadway or transit project can make access to a location easier – making it more attractive to develop. A transportation improvement can also improve visibility – an important consideration for commercial developers. Many businesses rely on being seen by "pass-by" traffic and want to locate where there is a lot of vehicle and/or pedestrian traffic. This has been the case at the NC 54/ Farrington Road intersection, where development depends on highway visibility. Conversely, rail transit is likely to result in more compact development clustered within walking distance of the station, and opens up new opportunities for how people choose to live and travel.

The response is also strongly influenced by the land use policy and planning context – for example, when the predominant mode of travel is the automobile, rail transit needs to be accompanied by strong land use policies in order to concentrate development in station areas. This type of strategy in the NC 54 corridor is necessary to avoid a future scenario where rising levels of congestion will occur due to growth occurring throughout the region, and the demands placed on the NC 54 corridor and its interchange with I-40 will lack any financial support from planned development.

"The timing of future development is largely dependent on the schedule for light rail and an interim expansion of regular bus service with a higher-capacity Bus Rapid Transit (BRT) service operating in the corridor. These transit lines will be needed to help meet the traffic demand from new development, which cannot be completely met by existing or planned roadways."

If the funding mechanism is approved and the light rail plan moves forward, detailed station area plans would guide the development plans for each station in the corridor. Build-out of the nodal development plan depends on the rail network or a comparable form of Bus Rapid Transit that can effectively support the planned development program and mitigate the demand for automobile traffic driving to the development. In the interim, it is imperative that the corridor stakeholders work to advance premium transit in the form of BRT (such as through bus signal priority, queue jump lanes or other BRT strategies) to properly complement the phasing of proposed development plans. Due to the significant roadway capacity challenges of this corridor, increases in development intensity must be timed to occur with expansion of fixed route bus service, introduction of the higher capacity BRT service, and, ultimately, when the light rail system becomes operational. Timing development with the interim BRT and ultimate light rail network will help ensure that adequate transportation options exist as more intensive development occurs.

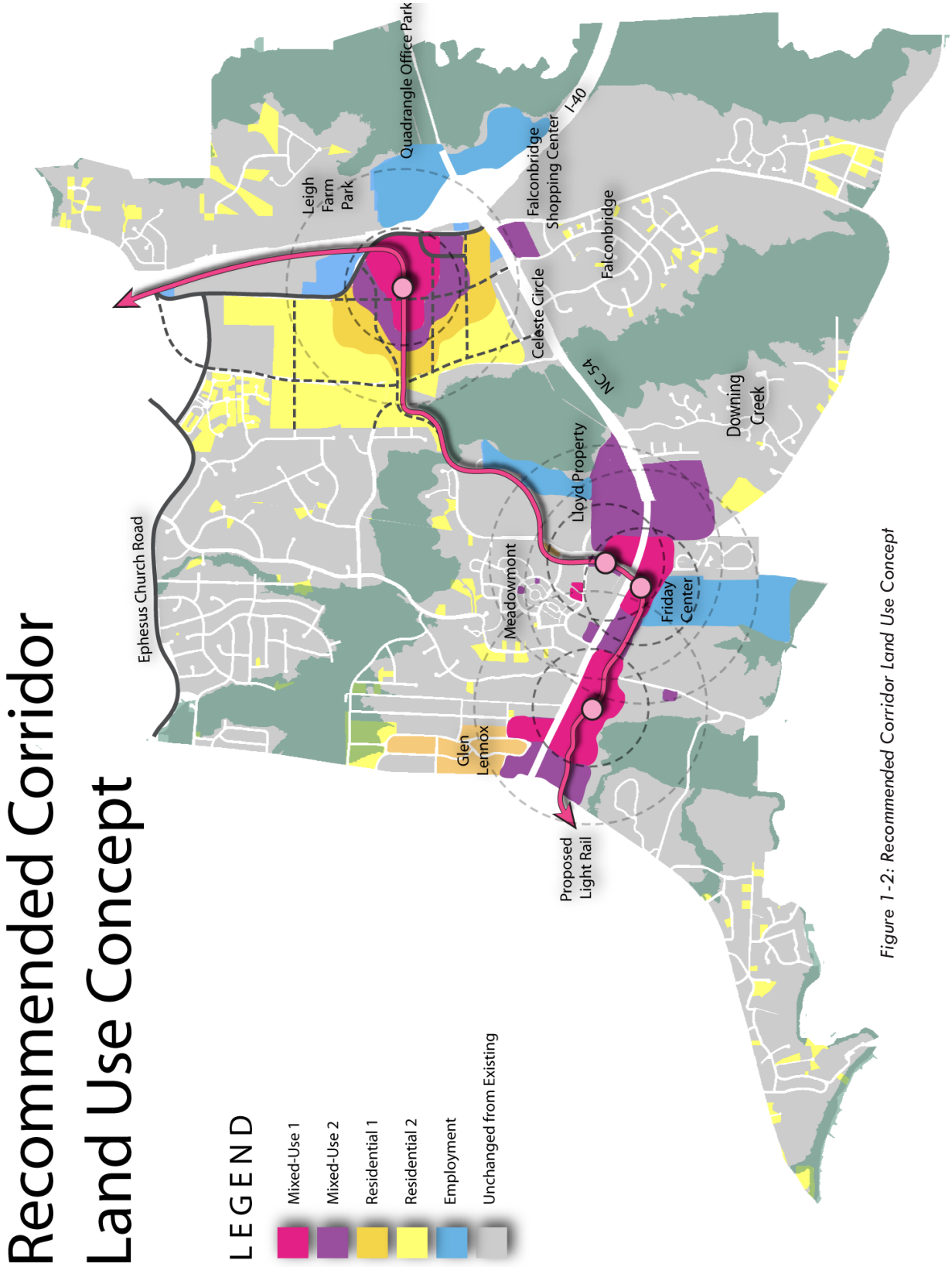

Figure 1-2: Recommended Corridor Land Use Concept

Transportation Strategy

Table 1-1 presents the phased multimodal transportation recommendations associated with the recommended nodal development plan. The recommendations are divided into short, mid-term and long term strategies. These are described in detail in Sections 3 – 6 of this report. In general, the short term roadway strategies consist of a series of minor geometric modifications at selected intersections to improve traffic flow and operational efficiency. These phased improvements serve as interim components of the ultimate intersection design to make the most efficient use of the roadway. Commonly referred to as a "superstreet," this strategy reduces delay and support anticipated traffic growth in the corridor through at least 2025.

The critical intersection along this corridor is the Farrington Road intersection, which causes significant congestion due to its proximity to the I-40 interchange. Beyond the short term modifications that provide additional capacity for a time, in the mid-term, a direct access flyover ramp from eastbound NC 54 on the west side of Farrington Road to eastbound I-40 is needed to maintain functionality of the Farrington Road/NC 54 intersection. Other modifications to the interchange are also identified in the intermediate term. Longer term, with the recommended nodal development, a more complete redesign of the I-40 interchange at NC 54 will be needed, involving construction of additional ramps providing direct access from the interstate into the Leigh Village station area.

Transit is an integral part of this overall strategy. In addition to the planned light rail system, a network of premium Bus Rapid Transit lines, expanded local bus service, and additional park-and-ride lots are recommended for the corridor. The key park-and-ride strategy is the relocation of the existing commuter lot at the Friday Center to a parking structure near the I-40/NC 54 interchange in the vicinity of the proposed Leigh Village development. This location would capture commuting trips entering the corridor at that location, and the parking garage would eventually support additional development capacity at the planned light rail station area in Leigh Village. This facility would become an intermodal hub, with transit, bicycle and pedestrian access in addition to park-and-ride.

From a bicycle and pedestrian network standpoint, the recommended plan fills in gaps and improves safety and access along NC 54 through geometric modifications and the creation of a 15' shared use path adjacent to the roadway along the northern side. This is a critical gap in the corridor, and high-speed traffic precludes an on-road solution for the section east of the Friday Center. Additional non-motorized transportation recommendations are identified throughout the corridor, including along Barbee Chapel Road and at US 15-501.

Table 1-1: List of Transportation Recommendations

PARK-AND-RIDE					
Description	**Location**	**Jurisdiction**	**Phase**	**O&M Cost**	**Capital Cost**
Increase visibility and capacity at the Southpoint Mall park-and-ride facility. Increase transit frequency to 15-minute headways or less.	Southpoint Mall park-and-ride facility on the southwest quadrant of the I-40/ Fayetteville Rd interchange	Durham	Short Term (2012-2017)	$670,000	$1,170,000 (3 buses at $390,000 each)[1]
Construct NC 751 park-and-ride facility.	Along Southpoint Auto Park Blvd off of NC 751 just north of I-40	Durham	Short Term (2012-2017)	$50,000[2]	$625,000[3]
Construct highly visible structured park-and-ride facility with easy access from I-40 and US 15-501 near proposed light rail station.	At the I-40/ US 15-501 interchange with easy access to light rail station	Chapel Hill	Mid Term (2017-2022)	$50,000[2]	$30,000,000[4]
Implement a structured park-and-ride facility at the Leigh Village station area to be phased with transportation improvements.	Leigh Village light rail transit station area	Durham	Mid Term (2017-2022)	$400,000[2]	$40,000,000[5]

1 Operating and vehicle capital cost assumptions from Triangle Transit

2 On-going operating and maintenance costs are assumed to be $200 per space. Assumes ownership of facility.

3 Park-and-ride cost for construction of an open-air lot is assumed to be $2,500 per space (industry estimation standard). Planning level cost estimate assumes 250 spaces at this facility.

4 Park-and-ride cost for construction of a multi-level structure (attached or detached from other uses) is assumed to be $20,000 per space (industry estimation standard). Planning level cost estimate assumes 1,500 spaces at this facility.

5 Park-and-ride cost for construction of a multi-level structure (attached or detached from other uses) is assumed to be $20,000 per space (industry estimation standard). Planning level cost estimate assumes 2,000 spaces at this facility. Capacity at this facility should be implemented in a phased manner with transportation improvements. Detailed market analyses should be conducted to determine the appropriate capacity of the facility.

TRANSIT					
Description	**Location**	**Jurisdiction**	**Phase**	**O&M**	**Capital**
Expanded Local Bus Service with 30 minute frequency.	North along Burning Tree Dr & Pinehurst Dr from NC 54 to Ephesus Church Road	Chapel Hill	Short Term (2012-2017)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Expanded Local Bus Service with 30 minute frequency.	Southeast along Barbee Chapel Rd and returning north back to NC 54 along Farrington Rd	Durham	Short Term (2012-2017)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Express Bus along NC 54 from Route 751 Park-and-ride.	From NC 751 park-and-ride lot north of I-40 to downtown Chapel Hill alongNC 751 and NC 54	Durham & Chapel Hill	Short Term (2012-2017)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Expanded Local Bus Service with 30 minute frequency.	North of NC 54 along Farrington Rd & SW Durham Dr to US 15-501 (Durham- Chapel Hill Blvd)	Durham	Mid-Term (2015-2020)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Bus Rapid Transit - Phase 1. Five minute frequency with daily peak vehicle need of six buses.	From Meadowmont along NC 54 to downtown Chapel Hill	Chapel Hill	Mid-Term (2015-2020)	$11,566,080[3]	$3,400,000
Bus Rapid Transit - Phase 2. Five minute frequency with daily peak vehicle need of six buses.	From NC 751 park-and-ride lot north of I-40 along NC 54 towards Chapel Hill, aligning with Bus Rapid Transit - Phase 1	Durham	Long Term (2022-2035)	$11,566,080[3]	$3,400,000
Flex Route	General service north and south of study area along Barbee Chapel Rd, Pinehurst Dr, Farrington Rd, Ephesus Church Rd, serving the Falconbridge Community, Donwing Creek community, and Glen Lennox	Chapel Hill	Long Term (2022-2035)	$4,066,200[4]	$307,200 (4 buses at $76,800 each)[2]
Light Rail Transit (Preliminary Engineering and Design)	Durham to Chapel Hill	Durham & Chapel Hill	Long Term (2022-2035)	TBD[5]	$2,750,000[2]

1 Operating cost for normal fixed route service with 30 minute frequency is based on Long Range Transportation Plan.
2 Source of vehicle cost is 2011 Transportation Improvement Program.
3 Bus Rapid Transit costs are based on the 2009 Long Range Transit Plan study conducted by the Town of Chapel Hill. They include the cost of roadway improvements.
4 Flex Route costs are based on the normal operations of a fixed route service. Flex service is essentially the same type of service, only different in the method of delivery.
5 Operating cost estimates for the light rail project cannot be provided. The project has a more complete analysis and cost estimated being conducted by Triangle Transit. The current cost for this project is limited to an estimate of preliminary engineering and design.

PEDESTRIAN AND BICYCLE				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
Install crosswalks and pedestrian signals at signalized intersections with pedestrian refuge islands and street lighting for crossing NC 54.[1]	Burning Tree Dr/ Finley Golf Course Rd & NC 54	Chapel Hill	Short Term (2012-2017)	$80,000
	W Barbee Chapel Rd & NC 54	Chapel Hill	Short Term (2012-2017)	
	Meadowmont Ln/ Friday Center Dr & NC 54	Chapel Hill	Short Term (2012-2017)	
	E Barbee Chapel Rd & NC 54	Chapel Hill	Short Term (2012-2017)	
	Huntingridge Rd & NC 54	Durham	Short Term (2012-2017)	
	Farrington Road (northern, southern and eastern approaches) & NC 54	Durham	Short Term (2012-2017)	
	Leigh Farm Rd/ Quadrangle Dr & NC 54	Durham	Short Term (2012-2017)	
Install crosswalks with pedestrian-activated flashers and expand refuge islands.	US 15-501 on/off ramps	Chapel Hill	Short Term (2012-2017)	$40,000
Extend the solid marking designating the westbound exclusive right turn lane for US 15-501 on–ramps to minimize weaving movements at interchange and increase safety for on-road bicyclists.	From SB US 15-501 on ramp to 500 feet to the east	Chapel Hill	Short Term (2012-2017)	$2,700,000
Provide a minimum 5-foot wide on-road bicycle lane by restriping travel lanes to be 11 feet wide and making minor median modifications.	NC 54 from Burning Tree Dr/ Finley Golf Course Rd to the west	Chapel Hill	Short Term (2012-2017)	
Modify sloped abutment wall to provide 8-foot wide sidewalk behind overpass structural piers.	NC 54 underneath US 15-501 overpass	Chapel Hill	Short Term (2012-2017)	
Pave road shoulders to accommodate bicyclists on select roads to provide connections to the American Tobacco Trail.	From NC 54 to the American Tobacco Trail via Barbee Chapel Rd, Farrington Rd, Stagecoach Rd, NC 751, and Massey Chapel Rd	Durham	Short Term (2012-2017)	$4,000,000

1 Crosswalks, refuge islands, pedestrian signals and street lighting can be installed with developer mitigation funds. They may also be implemented concurrently with road maintenance projects such as resurfacing, or as part of more substantial road improvements (i.e., construction of the superstreet intersections)

PEDESTRIAN AND BICYCLE				
Ensure adequate facilities for cyclists are available. Provide a 5-foot wide bicycle lane where possible, or provide "share the road" signage and a paved shoulder or sharrow markings for on-road bicycle travel. Many of the collector streets are designed with for low vehicular speeds with the intent for bicycles to share the travel lane. Fill in sidewalk gaps[2].	Farrington Road through the study area (Old Chapel Hill Rd to Stagecoach Rd)	Durham	Short Term (2012-2017)	Variable cost. Paving five-foot wide bike lanes on both sides of the roadway would cost approximately $1,200,000 per lane assuming medium duty pavement. Striping a bike lane without paving would cost approximately $5,000 per mile. Installing signage would cost about $1,500 per sign.
	Ephesus Church Rd from Farrington Rd to E Franklin St	Durham & Chapel Hill	Short Term (2012-2017)	
	George King Rd & Crossland Dr (proposed collector street) from Ephesus Church Rd to NC 54	Durham	Short Term (2012-2017)	
	SW Durham Dr from Ephesus Church Rd to NC 54	Durham & Chapel Hill	Short Term (2012-2017)	
	Lancaster Dr and E/W collector street from Farrington Rd to Pinehurst Dr	Durham & Chapel Hill	Short Term (2012-2017)	
	Pinehurst Dr from Ephesus Church Rd to Burning Tree Dr	Chapel Hill	Short Term (2012-2017)	
	Burning Tree Dr from Pinehurst Dr to NC 54	Chapel Hill	Short Term (2012-2017)	
	Hamilton Rd from NC 54 to Brandon Rd	Chapel HIll	Short Term (2012-2017)	
Construct an off-road shared-use path, with a boardwalk bridge as an alternative solution in environmentally sensitive areas. Path should have minimum 10-foot width; ideally 15 feet if possible.	Along north side of NC 54 from E Barbee Chapel Rd to Farrington Rd	Durham & Chapel Hill	Mid-Term (2017-2022)	The cost for these improvements is included in the roadway projects list under the item "Widen NC 54 to six lanes in the Durham section. Construct the multi-use path concurrent with th road project."
	Through the Glen Lennox property from Hamilton Rd at Brandon Rd to connect to S Estes Dr utilizing existing trail and along the NC 54 frontage to connect to the existing multi-use path at Burning Tree Dr	Chapel Hill	Mid-Term (2017-2022)	
Construct an off-road shared-use path on the south side of NC 54 with accompanying signage to cross. Path should have minimum 10-foot width; ideally 15 feet if possible.	NC 54 from Farrington Rd to I-40 overpass	Durham	Mid-Term (2017-2022)	
Construct sidewalk on south side of NC 54 to connect to I-40 overpass.	South side of NC 54 from Huntingridge Rd east to I-40 overpass	Durham	Mid-Term (2017-2022)	
Construct a 10-foot wide shared use path on south side of overpass.	NC 54 bridge over I-40	Durham	Mid-Term (2017-2022)	

2 Although it may not be feasible to provide bike lanes or paved shoulders and construct sidewalks on all of these roads within the next five years, these recommendations should remain a priority and should be constructed as soon as funds are available.

PEDESTRIAN AND BICYCLE				
Implement crosswalks and landscaped median refuges at primary superstreet intersections.	Meadowmont Ln/ Friday Center Dr & NC 54	Chapel Hill	Mid-Term (2017-2022)	The cost for these improvements is included in the roadway projects list under the item "Construct EB NC 54 to EB I-40 flyover from Farrington Road to I-40 EB on-ramp."
	Huntingridge Rd & NC 54	Durham	Mid-Term (2017-2022)	
Adequately sign reverse superstreet intersections.	E Barbee Chapel Rd & NC 54	Chapel Hill	Mid-Term (2017-2022)	
	Falconbridge Rd & NC 54	Durham	Mid-Term (2017-2022)	
During construction of superstreet modifications, implement crosswalks and landscaped medians on the northern, southern and eastern approaches, and provide adequate signage for pedestrians to cross to south side to travel over I-40 bridge.	Farrington Rd & NC 54	Durham	Mid-Term (2017-2022)	
Design and construct light rail bridge over NC 54 to serve as an elevated pedestrian crossing.	Across NC 54 connecting Meadowmont and Friday Center	Chapel Hill	**Long Term (2022-2035)	TBD
Continue to make regional connections with greenways.	where possible	Durham & Chapel Hill	Long Term (2022-2035)	Variable cost

ROADWAY				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
Construct channelized free flow lane for eastbound right turns into East Barbee Chapel Road	Along NC 54 at E Barbee Chapel Rd	Chapel Hill	Short Term (2012-2017)	$700,000
Construct northbound right turn channelization to free flow merge lane onto eastbound NC 54	Friday Center Dr	Chapel Hill	Short Term (2012-2017)	$900,000
Construct Farrington Road slip ramp for northbound traffic on Farrington Road to access eastbound I-40 directly. Modify on-ramp to allow for transition.	Farrington Rd	Durham	Short Term (2012-2017)	$3,300,000
Construct collector street system including turn lanes on NC 54.	As specified in the adopted Southwest Durham – Southeast Chapel Hill Collector Street Plan	Durham	Short Term (2012-2017 and beyond)	$31,400,000
Construct access road behind the Farrington Road shopping center for connection between Farrington Road and Falconbridge Road.	Between Farrington Rd and Falconbridge Rd	Durham	Short Term (2012-2017)	$400,000
Obtain Marriot Way, then upgrade to NCDOT standards and extend to Barbee Chapel Road.	Between Friday Center Dr and E Barbee Chapel Rd	Chapel Hill	Short Term (2012-2017)	$800,000
Construct other connections as opportunities arise through development proposals.	Through study area	Durham & Chapel Hill	Short to Long Term	Variable cost
Improve I-40 interchange to add new partial cloverleaf ramp for I-40 EB to NC54 EB, remove existing signal and install yield sign at the I-40 EB to NC54 WB ramp with addition of merge lane.	I-40 Interchange with NC 54	Durham	Mid-Term (2017-2022)	$1,100,000
Construct EB NC 54 to EB I-40 flyover from Farrington Road to I-40 EB on-ramp.	I-40 Interchange with NC 54	Durham	Mid-Term (2017-2022)	$10,800,000
Construct auxiliary lane widening for I-40 westbound offramp to match the two lane section of the ramp.	I-40 Interchange with NC 54	Durham	Mid-Term (2017-2022)	$1,100,000
Widen the bridge over I-40 to accommodate 4 lanes of westbound NC 54 laneage. In conjunction with this, widen the westbound approach to two lanes for 500 feet as needed for intersection capacity.	I-40 Interchange with NC54	Durham	Mid-Term (2017-2022)	$2,300,000

ROADWAY				
Reconstruct the Farrington Road intersection to only allow the northbound left turn through the intersection. Channelize for freeflow westbound right turn lane.	Farrington Rd	Durham	Mid-Term (2017-2022)	$3,700,000
Widen NC54 to six lanes in the Durham section. Construct the multiuse path concurrent with the road project.	Durham section of NC54	Durham	Mid-Term (2017-2022)	$18,700,000
Implement superstreet configurations at Falconbridge Rd, Huntingridge Rd, E Barbee Chapel Rd and Friday Center Dr intersections.	Falconbridge Rd, Huntingridge Rd, E Barbee Chapel Rd and Friday Center Dr	Durham	Mid-Term (2017-2022)	$3,800,000
Install triple southbound lefts at Falconbridge Road.	Falconbridge Rd	Durham	Long Term (2022-2035)	$400,000
Construct I-40 ramps into the northern development (Leigh Village) area	I-40 Interchange with NC54 and area to the north	Durham	Long Term (2022-2035)	$27,700,000
Monitor for potential need to grade separate key intersections through the corridor.	Corridorwide	Durham & Chapel Hill	Beyond 2035	Variable cost.

Report Contents

This final report includes sections addressing each element of the corridor blueprint strategy: land use and the various components of the multimodal transportation network that are necessary to support the corridor's future growth, economic vitality and environmental sustainability. The transportation recommendations are presented in sections addressing park-and-ride, transit, bicycle and pedestrian and roadway modifications, and include a phasing plan. These sections of the main body of the report are followed by a separate package of appendices that provide back-up information covering the community profile and foundational data development activities, modeling methodology, traffic growth projections, and an extensive summary of public participation activities and comments received throughout this process.

Land Use in the NC 54 Corridor

Overview

Driving along the NC 54 corridor in the Triangle Region today it is easy to experience the change in character from the area's rural agrarian past to a more intensely developed array of residential, office, and retail land uses. This change has been fueled by years of economic growth in the Research Triangle Park, expansion of the Raleigh-Durham Airport, the presence of the universities and related health care institutions. These are fairly dramatic changes, from undeveloped tree-lined stretches broken only by the occasional church or produce stand, to regional shopping malls, hotel agglomerations, office parks and fast food restaurants. Nowhere is this more evident than the eastern approach to the NC 54/I-40 study area, where land owned by the Army Corps of Engineers in the Lake Jordan watershed sets a tranquil scene along this two-lane roadway as it approaches I-40. A jarring transition occurs where the ramps, additional travel lanes and adjacent commercial development create a confusing juxtaposition of brake lights, merging traffic and signage as the corridor reverts to a suburban pattern.

Those uneven transitions reflect the way that growth has occurred in the region over the last decade. While the cities have all experienced revitalization and strengthening of their core areas to a substantial degree, the region has also continued to experience suburban, lower density automobile-oriented development along its major corridors to provide the residential and commercial needs that support the economic engines of the universities, medical institutions, the airport, and the RTP and its environs. Despite the current economic recession that has slowed development activity in the region, there is evidence from building permit data that growth is continuing, and will likely accelerate as national and statewide economic conditions improve. North Carolina and the Triangle region in particular, will continue to be among the highest growth areas in the country because of its potential for continued job growth, temperate climate, proximity to cultural and educational opportunities, and excellent regional transportation network.

The key land use issue in the NC 54/I-40 corridor study area is whether this corridor is to become more urban, such as the new East 54 project, or maintain a suburban, campus-like context, as evidenced even by the Meadowmont mixed-use development. With a planned light rail transit system intended to broaden the region's mobility choices and direct growth toward specific areas where stations are planned, the future evolution of the NC 54/I-40 corridor study area depends on careful planning and the right mix of land use-transportation strategies to target quality growth that meets the area's needs while protecting its existing communities and natural resources, and reducing the negative impacts of growth on traffic congestion, air pollution and energy consumption.

NC 54 Corridor Land Use Context

In general, a good way to think about land use and its associated transportation relationships is around the "Four Ds" of Density, Diversity, Design and Destinations. The original "three Ds," coined by Cervero and Kockelman (1997), of density, diversity, and design have evolved to include several variants of additional "Ds" that include distance to transit, demographics and development scale. The research literature examining Smart Growth, or land use-transportation interaction, has gravitated toward these measures as a way to characterize the ability of places to support an effective array of travel mode options and reduce Vehicle Miles of Travel (VMT). For this study's purposes, Destinations is a more general fourth "D" that helps evaluate the changing nature of the NC 54 study area. Collectively, these elements influence trip rates, mode splits, and trip distances – the three factors that influence VMT. VMT, arguably, is the most widely used single index of "sustainability" in the urban transportation sector. **Density** – A measure of land use intensity, typically expressed as dwelling units per acre for residential uses, and Floor Area Ratio (FAR) for non-residential uses. Floor Area Ratio is the ratio of the total floor area of buildings on a certain location to the size of the land of that location. For example, a four story building built on ¼ of a given site would achieve an FAR of 1.0. Sometimes FAR is calculated to include non-leasable building space such as a parking garage on the first few floors, depending on whether it is used as a measure of the building's physical presence or as a measure of employment or potential transit ridership (in which case the garage portion of the use should be excluded).

"The key land use issue in the NC 54/I-40 corridor study area is whether this corridor is to become more urban and supportive of pedestrian mobility, or maintain a suburban, campus-like context primarily oriented to automobile access."

Diversity – This is a measure of the number of complementary land uses for a given site, corridor or district, often referred to as mix. Diversity can be achieved through horizontal or vertical mix (e.g., apartments above retail stores), and is typically evaluated in terms of the percentage use for either residential or non-residential uses. Horizontally mixed land uses need to have sufficient proximity, such as through small block sizes, narrow streets and substantially reduced on-site parking requirements to achieve a place that is walkable and supportive of higher levels of transit service.

Design – In the context of transit and walkable cities, design is typically a reflection of the physical layout of space as it relates to the buildings, streets, parking areas and open space. Design incorporates the geometric dimensions of the street realm, such as the width of the street and sidewalks, the presence of on-street parking and turning radii at intersections, as well the orientation of the building, parking and pedestrian access areas on a particular site. Walkable design also relates to the nature of the buildings themselves, such as the presence of windows and protection from the elements.

Destinations – Often overlooked in terms of a land use strategy, this is simply the number of accessible destinations within a given area. The concept relates to reducing vehicle trip lengths by creating centers with a diversity of land uses that serve as regional or community focal points for trip making. Research by Reid Ewing, Robert Cervero and others indicate that that having sufficient destinations for work, shopping, education can reduce VMT by much greater percentages than changes in density, diversity and design. Destinations can come in a variety of scales, depending on the area of analysis, and their location generally relates to the distance or time people are willing to travel by mode to access these destinations.

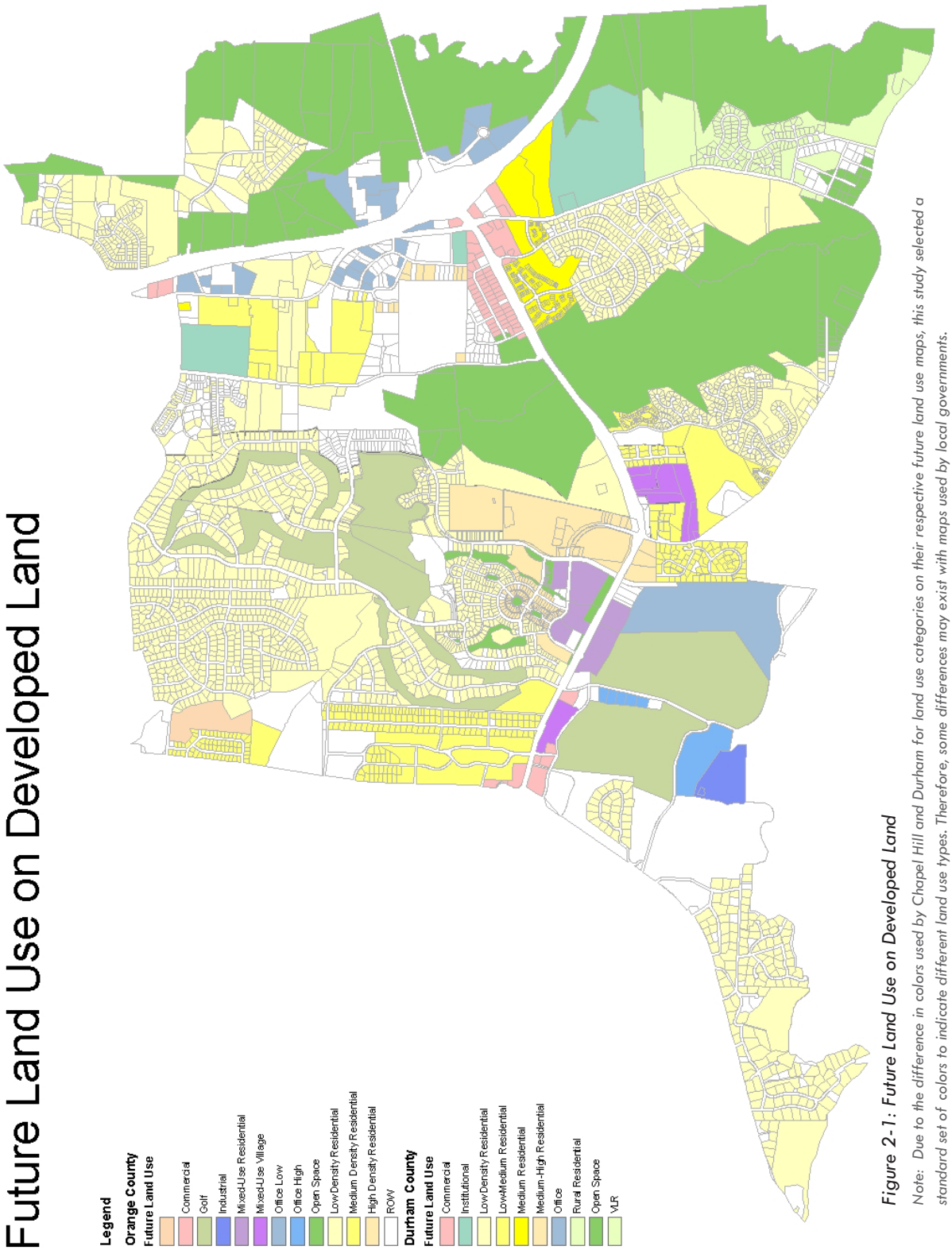

Figure 2-1: Future Land Use on Developed Land

Note: Due to the difference in colors used by Chapel Hill and Durham for land use categories on their respective future land use maps, this study selected a standard set of colors to indicate different land use types. Therefore, some differences may exist with maps used by local governments.

Today, the NC 54/I-40 corridor study area is predominantly suburban, with mostly lower density residential neighborhoods, commercial and institutional land uses. Figure 2-1 shows the future land use on developed land in the study corridor. As indicated in the figure, almost two-thirds (64%) of the study area reflects a future land use ranging from low to medium-high density residential. An equivalent amount of land is open space, much of which is deed restricted or preserved through ownership by the Corps of Engineers. About 22 percent of the land is in the office/institutional category. Furthermore, the corridor primarily consists of single use areas, whether residential, commercial or institutional, with the exception of the Meadowmont town center and, arguably, the Glen Lennox neighborhood. But each of these mixed use areas are relatively low density and depend primarily on automobile access. The Finley Golf Course and environmental constraints of the Jordan Lake watershed help separate land uses in the corridor. The presence of these development constraints, including established neighborhoods, also lends the corridor to a more nodal development pattern as a way to better focus the built environment and reduce impervious surfaces and minimize impacts on established neighborhoods.

"The NC 54 Corridor has a high potential for development, with more than 650 acres of vacant land. The largest components of developable land are in the Office/ Institutional and Low to Medium-High Residential future land use categories."

Figure 2-2 presents the future land use on vacant land as planned by the Town of Chapel Hill and the City of Durham. There is roughly 665 acres of vacant land in the corridor, with the two largest components being in the Office/ Institutional category (primarily at the Friday Center) and low, medium and medium-high density residential (including the area where the proposed Leigh Village development is planned). Together, these future land use categories comprise more than 80 percent of the vacant land in the corridor.

From a design perspective, the corridor today is automobile-oriented, with a combination of highway commercial uses on the eastern end of the NC 54 corridor near I-40, and a roadway cross-section designed to move traffic at higher speeds and enable easy automobile access to non-residential developments. Multimodal facilities exist, but are discontinuous, and NC 54 is extremely challenging for non-motorized travel. Destinations like the Friday Center and even the older Glen Lennox commercial development are designed for efficient auto access, with parking placed prominently in front of the site between the roadway and buildings.

However, the corridor has begun to see a marked change over the last several years, with a shift toward a more urban, pedestrian-oriented design framework. The relatively new Meadowmont development, for example, has an internal modified grid network that uses narrower streets to slow down traffic and provide ample areas for walking and bicycling. Further west toward US 15-501, the 54 East development brings multi-story mixed use buildings closer to the street edge, providing a sense of vertical enclosure that is an important framework for an effective multimodal environment.

The dominant destination is really at the western end of the corridor – the UNC Chapel Hill campus and medical center. With its proximity to the commercial center of the relatively compact Town of Chapel Hill, it is a true mixed use destination that serves multiple trip purposes in a pedestrian-friendly environment. The Meadowmont town center is the other primary destination in the corridor, with a mix of office and retail commercial uses that not only serve the surrounding residential uses, but attract work, shopping and social/recreational types of trips from the surrounding area. Otherwise, the Friday Center today is primarily a destination for park-and-ride access that reflects the lack of parking on the campus proper, and for special events. This, too, is changing. With the completion of the 54 East development, approved development plans and potential changes to existing developments or on vacant parcels, the corridor is expected to capture an increasing share of office, medical and retail employment, some of which will occur as mixed use design to provide additional destinations for various types of trips.

Growth Projections for Corridor Development

Appendix A contains the Community Profile summary of existing land use conditions in the corridor, which includes an analysis of historical development patterns, the environmental context and an analysis of development capacity for the Durham County and Orange County portions of the study area. This analysis, along with in-depth discussions with stakeholders, serves as an important basis for estimating how much future development is likely to occur in the corridor, and how that growth is expected to influence transportation demand. In preparing the development of land use alternatives and the final recommendation, an analysis was performed for parcels in the study area in terms of their likelihood of change. This analysis took into account whether land was vacant, its location relative to planned development, its underlying future land use, and the presence of environmental or access constraints.

Figure 2-3 presents the results of the analysis of areas likely to change. This served as a basis for examining potential future growth in the study corridor, and enabled the scenarios to explore differences in density, diversity and design for those targeted parcels.

The land use analysis also examined ownership patterns, both for vacant and developed parcels. While much of the corridor is in multiple ownership comprised of smaller lots, there are significantly large parcels in single ownership, indicating potential for more intensive development along the corridor. One finding of the examination of ownership patterns is that a large amount of land is in public ownership, and the University of North Carolina at Chapel Hill has a significant and growing presence along the corridor. While some of its land holdings are expected to be developed for University academic or health care purposes, UNC also owns land through its Foundation along the corridor that could be developed for private uses to generate income, or sold to private interests to develop. Along NC 54 between I-40 and US 15-501, 750 acres or about 13 percent, is owned by the University of North Carolina at Chapel Hill.

Future Land Use on Vacant Land

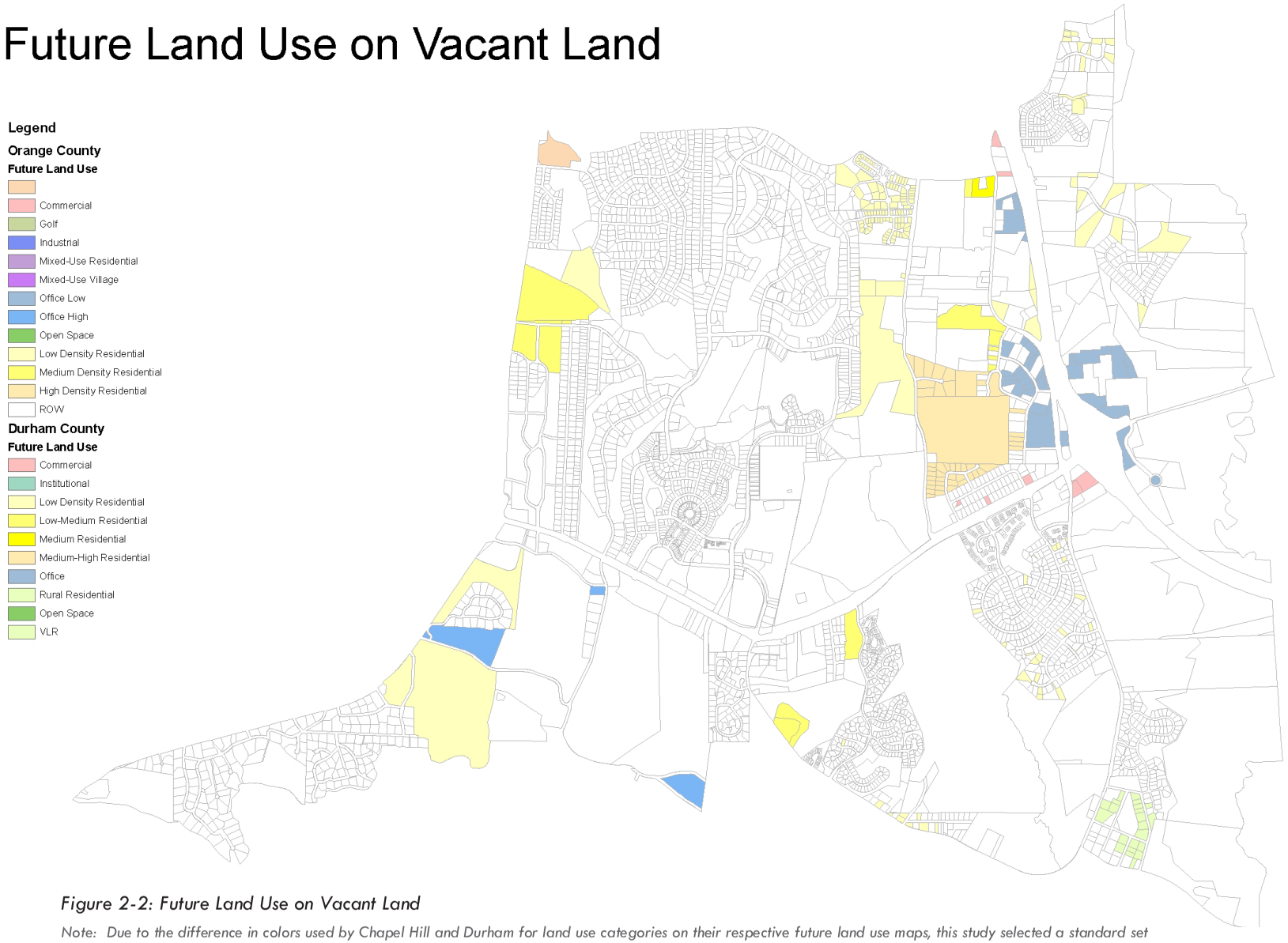

Figure 2-2: Future Land Use on Vacant Land

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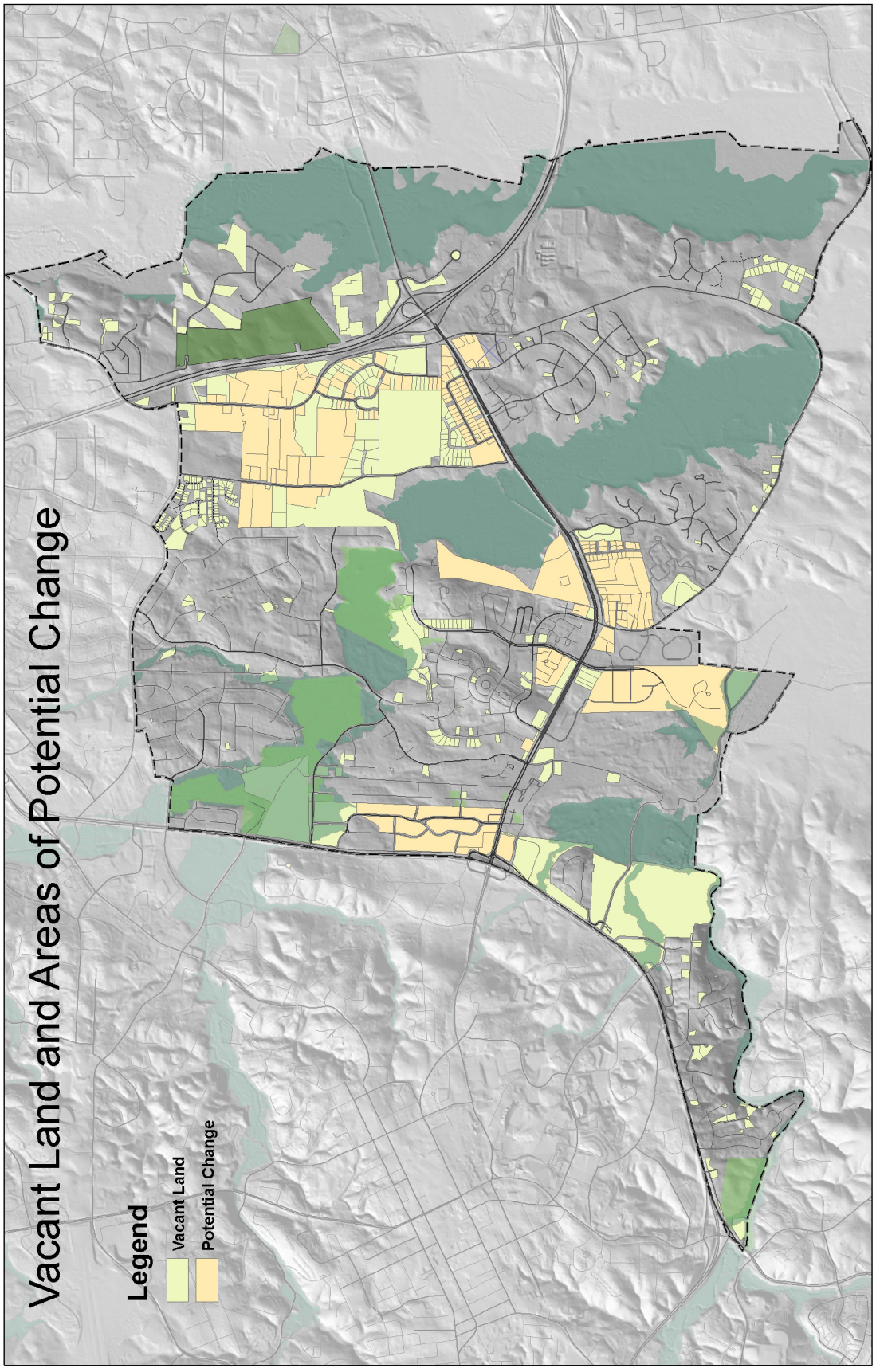

Figure 2-3: Vacant Land and Areas of Potential Change

Study Area Growth

The land use-transportation analysis examined different amounts of potential growth in the NC 54/I-40 corridor study area through the year 2035. The starting point for this analysis was the projected employment and population growth used in development of the DCHC MPO adopted 2035 Long Range Transportation Plan. This has been defined as a "policy-based" growth projection that is tied to the transit element of the LRTP. In other words, while the projection is based upon adopted land use plans and development potential using a regional growth control total, it took into account the plan for a light rail system and concentrations of development at potential LRT stations.

As described in the next section, three distinct growth scenarios were explored: a Trend scenario that essentially kept development intensity to historical levels and limited activity primarily to vacant parcels; a scenario generally consistent with the adopted LRTP that explores some intensification and mix of uses related to planned transit investments, and a high-growth scenario that essentially reflects the capacity for future development in relation given the planned transit investment and the corridor's value in terms of its accessibility and proximity.

Figures 2-4 present a series of growth charts for the Durham County and Orange County portions of the NC 54 study area. The bars in the charts represent the amount of additional growth assumed for each of the three scenarios tested – Trend, Scenario 1 and Scenario 2 – for both population and employment. Each chart has a line showing the existing amount, the LRTP projection, and the amount projected for the recommended plan. The recommended plan is generally closer to Scenario 2 in terms of the amount of growth projected for the corridor. The charts merely indicate how each scenario compares with the employment and households in the baseline existing condition and the recommended nodal development plan.

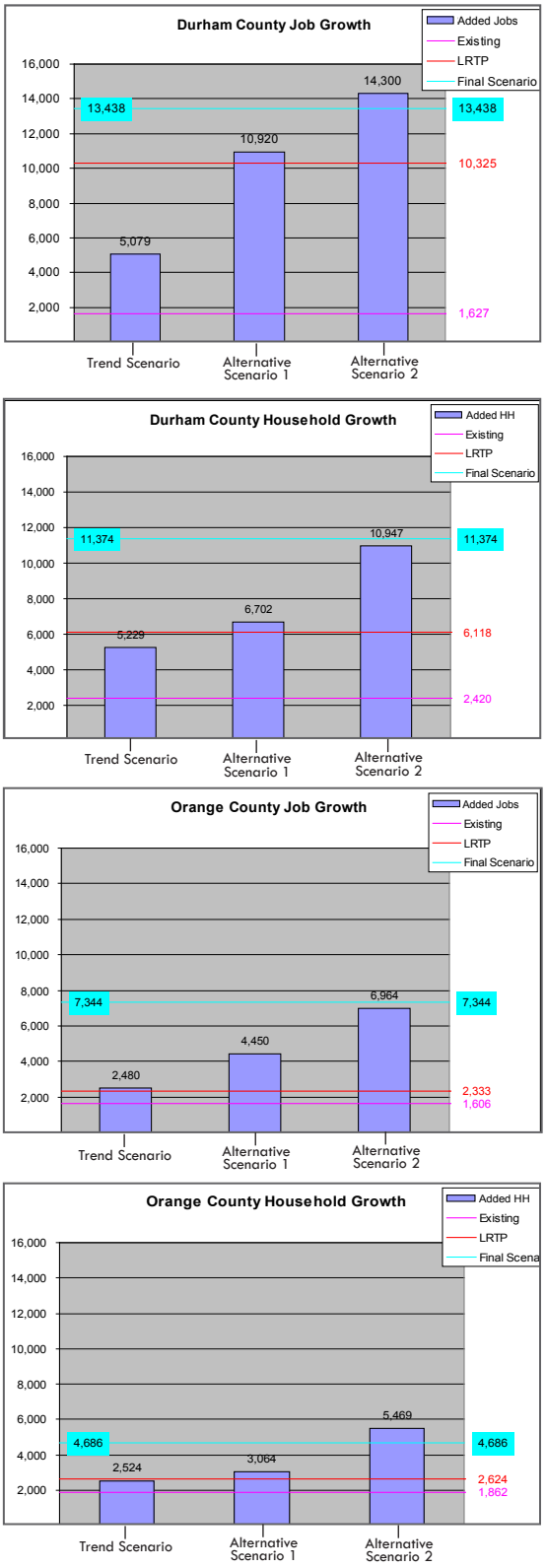

Figure 2-4: Projected Growth for Scenarios and Recommended Plan

As indicated in the series of charts, the increase in Orange County over the LRTP projection is primarily due to anticipated health care development activity at the Friday Center location, as well as the likely build-out of the Woodmont and Lloyd properties, which are located east of the Friday Center on the south and north sides of the roadway, respectively. Figure 2-5 indicates the locations of these potential development sites. Each of these locations is within a ¼ to ½ mile of a planned transit station, and the LRT alignment could be adjusted slightly to more directly serve these potential land uses. Based on the input of the relevant stakeholders and analysis of the capacity for future development, this projection appears to be quite reasonable and appropriate for a corridor that is clearly becoming more urban in character, with the close proximity to significant regional destinations.

The following sections describe the specific changes in the recommended plan.

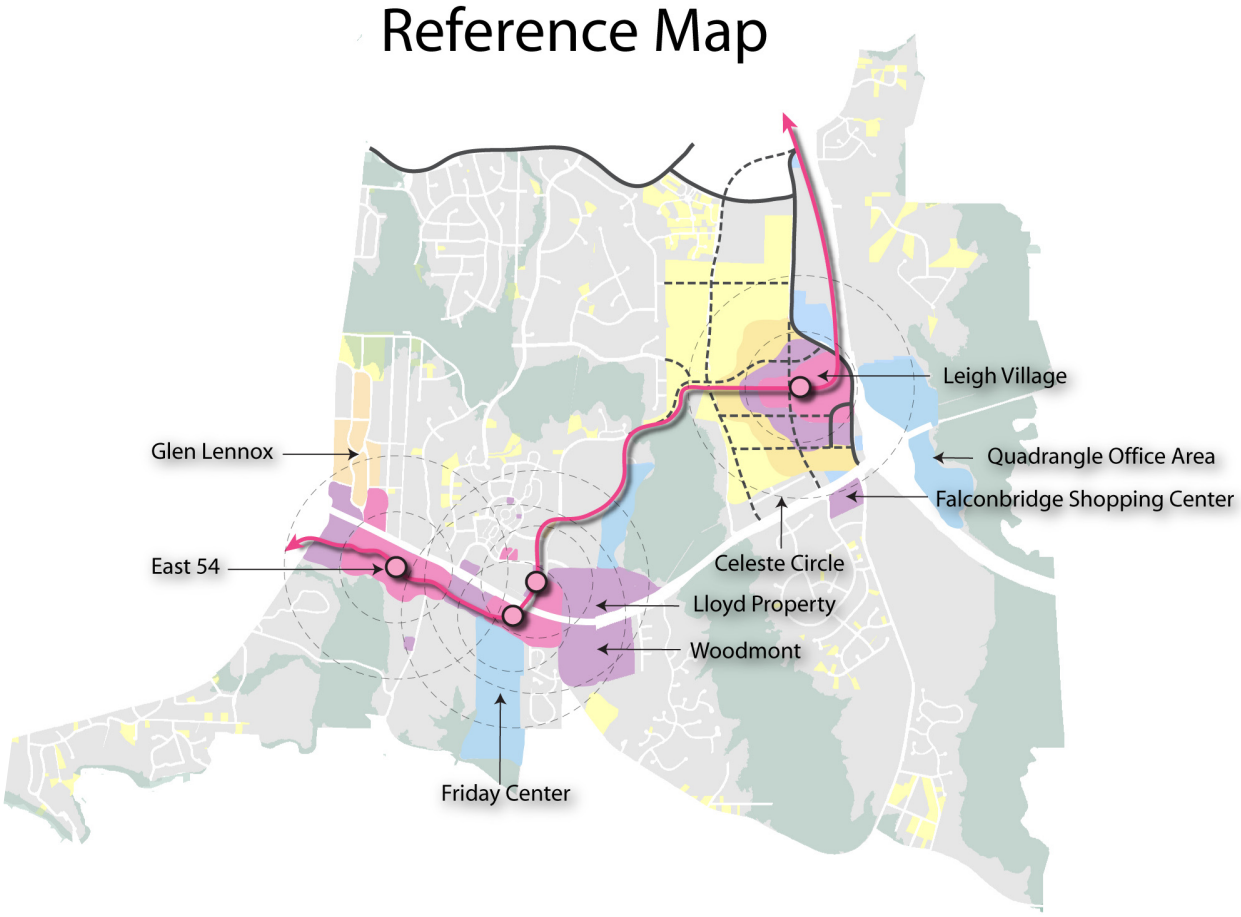

Figure 2-5: Locations of Potential Development Sites

Nodal Development

The recommended land use plan for the NC 54/I-40 study area is a nodal development pattern that guides future growth into existing and emerging centers. A nodal development pattern, as opposed to the linear or strip development pattern, creates more opportunities to capture shorter trips by walking, bicycling and transit, and by creating centers of relatively dense and diverse land use types, the nodes provide a focal point for longer trips by transit, as well as the convenient interchange between modes. The nodal pattern primarily follows the planned future light rail station locations, with the understanding that it is likely these exact locations may change during more detailed transit alignment planning to be undertaken by the Triangle Transit through 2011. These locations have been defined at a planning level through the DCHC MPO's Long Range Transportation Plan, and there is a reasonable expectation that these will be the final locations.

The NC 54/I-40 corridor land use blueprint needs to be considered in a regional context of growth expected to occur throughout the Triangle Region. The nodal development plan assumes more growth in the study area than the adopted 2035 Long Range Transportation Plan, particularly in the Orange County portion of the study area, where employment and population projections were very low. For the most part, on the Durham side of the corridor, the growth totals in the recommended plan are consistent with the adopted LRTP. The regional context is an important consideration, because the growth identified in this plan is likely to happen elsewhere in the region if it does not occur within the study corridor, yet the trips will continue to be made by automobile into the study corridor.

According to the relatively modest growth projections in the adopted LRTP, by 2035, the NC 54 corridor will become a severely congested roadway, even with an investment in light rail transit. Widening the road to six lanes is needed, but only makes it easier for long distance trips to navigate through the corridor to their ultimate destination. Only by creating a nodal, mixed use development plan that provides opportunities for shorter distance trips through walking and bicycling can the NC 54 corridor contribute to lower levels of VMT and resulting lower energy demands and air pollution.

Station Areas

As shown in the figure, there are four identified LRT station areas in the corridor study area. These can generally be defined as the area of the proposed Leigh Village, northwest of the I-40/NC 54 interchange and Farrington Road, at the Meadowmont development on the north side of NC 54 near the middle of the study corridor, at the Friday Center south of NC 54, and at the southeast quadrant of the US 15-501 and NC 54 interchange, between the 54 East development and the Finley Golf Course.

It is expected that with the approval of a future referendum for the light rail system the local governments will develop and adopt detailed station area plans for each planned stop on the transit line.. Details may then be developed and refined through a charrette process involving both land owners and area residents. This land use blueprint is intended to provide overall guidance for the potential station areas in the NC 54 corridor. For the Leigh Village station area, the master plan recommends the City of Durham consider allowing for an increase in the allowable density for the core ¼ mile area assigned to this suburban transit area, which would be in keeping with the planned light rail investment and pedestrian focus. The Master Plan suggests a target range of up to 75 dwelling unit/acre in the core area, which is 15 units per acre higher than is currently allowed in the City of Durham.

Station Area Core

The first ¼ mile from the station is the most intense and walkable area of development. Parking ratios are kept as low as possible in this zone with access primarily to occur directly from transit, walking trips from the adjacent community, or potential park-and-ride facilities (such as currently at the Friday Center or as proposed for the Leigh Village area). This zone is rich in employment and amenities to attract pedestrians and enable the station to function as a destination as well as a place for trip origins. It includes restaurants and other retail businesses that thrive on walk-in traffic. In the immediate vicinity of station areas, on-site parking requirements should be waived. To the extent possible, parking should be accommodated in shared structured facilities or on-street.

Station Area Support Development

The second ¼ mile from the stations has local-serving mixed use developments and relatively dense housing stock. These may include townhouses, apartment/ condominiums and small lot single-family residences. The street network is connected with relatively small blocks. This retains the ease of walking through the district. In the second ¼ mile, except for residential uses, on-site parking requirements should be waived. To the extent possible, parking should be accommodated in shared surface facilities or on-street. This takes advantage of different peaks in demand.

Specific land use recommendations are discussed below, from west to east along NC 54:

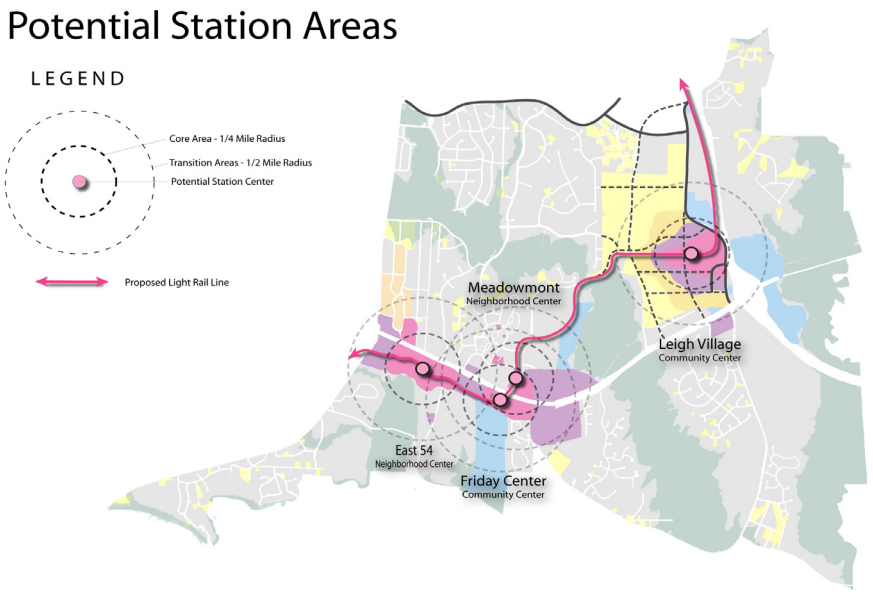

Figure 2-6: Potential Station Areas

East 54 Station Area

This area is beginning to emerge in a transit-oriented pattern, and with build-out has the potential to become a very strong anchor for the NC 54 corridor's transformation into a multimodal environment. This portion of the corridor has traditionally provided auto-oriented shopping with access directly onto NC 54, serving land uses with parking in front and large building setbacks (e.g., Glen Lennox Shopping Center on the north and Glenwood Square Shopping Center and other retail uses on the south). The Glen Lennox apartments are behind the existing retail and have potential to redevelop. On the south side, Glenwood Elementary School and Finley Golf Course are located behind the existing retail. In 2009, the 54 East development began construction – a mixed-use community consisting of several multi-story buildings with an urban feel, pedestrian orientation and minimal front setbacks facing NC 54. The visual impact of this development has created a sense of spatial enclosure that fits the street width of NC 54, providing both visual interest and a perception that slower speeds are appropriate. This spatial enclosure contributes to a sense of arrival that has helped begin the transformation of this section of the corridor into a more urban context. This development footprint provides the framework for the planned LRT station.

There is potential for Glen Lennox to redevelop as a mixed use project within ¼ mile of the planned transit station, with multi-story multi-family residential behind. A mixed-use, transit oriented redevelopment plan previously was submitted to the Town, but it has been withdrawn. Redevelopment would provide more opportunities for workforce housing along with providing ground floor retail and mixed-use development, and would allow for greater internal connectivity and linkages to adjacent developments to the north and east to minimize impacts on NC 54. As redevelopment occurs, there may be some adjustment for school sites, as Glenwood Elementary School is located in the area where high-density mixed use could occur. During meetings with UNC representatives, there was a suggestion of moving the LRT station to the north side of the roadway, effectively tying in with potential redevelopment plans for Glen Lennox and serving a more intensely developed area than if the station is south of NC 54. However, the recommendation is to keep the station on the south side because of the desired connection with the Friday Center as a destination, and to avoid potential conflicts with the US 15-501 interchange. This matter should be resolved during the next phase of the rail planning process.

Friday Center Station Area

The Friday Center is a unique focal point along the corridor. The Center includes other institutional buildings and is used for institutional uses, conferences, conventions and myriad university-related functions. UNC owns the property and has indicated that it could intensify with health care related land uses, and perhaps even student housing. The most recent UNC campus master plan has led to redevelopment on the main campus, and according to the University that trend will expand to UNC's holdings within the NC 54 corridor. No specific plans have been formulated for the Friday Center area, so this plan uses a more general "employment" designation, and anticipates that substantial increases in development intensity will occur over time, perhaps beginning within the next 10 years.

The key issue is the location of the 1600 park-and-ride spaces that offer relatively seamless transit service onto the UNC main campus, where parking is severely constrained and is not being expanded. The existing park-and-ride lot will be moved as part of a development proposal and relocated to Leigh Village. Furthermore, with redevelopment of the Friday Center, some level of parking will be needed on-site to support future development, although this should be at ratios consistent with transit-oriented development guidelines shown in the Appendix. Therefore, the land use blueprint recommends removing the park-and-ride facility from the Friday Center to the proposed Leigh Village station area where additional spaces could be provided.

Greater internal connectivity is needed at this location as it develops, particularly immediately to the east of Friday Center Drive, where Marriott Way should connect with Barbee Chapel Road to improve east-west access south of NC 54. Further to east there are older very low-density homes, which is the location of the planned Woodmont development. Phase I of the master plan is approved; phases II and III require review and approval by the Chapel Hill Town Council and there

is an opportunity for the master plan to be revised to conform to the proposed land use plan and TOD guidelines contained in the report appendix.

As conditions improve, this may be one of the first areas to redevelop. It is imperative that the initial development activity enables pedestrian-oriented, mixed use development to occur as part of subsequent development phases. This area has the potential for a strong mixed-use development with direct pedestrian connections to the Friday Center station.

Meadowmont Station Area

This area is the least likely area of change because it has been developed so recently and much of its large open space area is deed-restricted from any other type of use. This is already a mixed-use development with single family homes, multi-family homes and retail areas, and has become a principal focal point along the corridor. Upon implementation of the light rail system the surface parking areas for existing retail could become available for development if structured or on-street parking can offset the need. The area to east of the proposed light rail transit station, beyond the existing apartment complex, has the potential to develop into a walkable mix of uses with direct pedestrian connections to the transit station, with the core mixed use area located immediately east of the Meadowmont town center. The land use concept designates the southern portion of the Lloyd property, which is under UNC ownership, for moderately intense mixed-use development, and the northern piece as employment (e.g., office, institutional, health care). In light of the established nature of the relatively new Meadowmont development, there is potential for adjusting the LRT station location to the east to more directly serve the Lloyd property and make it the more intense focal point for transit-oriented development. This, too, should be resolved during the next phase of the rail planning process.

Leigh Village Station Area

The land use blueprint recommends significant changes in this area, which is currently designated in the City's Comprehensive Plan as a suburban transit area and zoned for medium and medium-high residential development. The station's proximity to the interstate and its visibility from I-40 means that it has tremendous potential for transit-oriented development, and it offers the potential to function as a unique multimodal gateway into the corridor and the University of North Carolina. The land use blueprint anticipates that this area will develop as a cornerstone destination in its own right, with a mix of residential, office, health care-related uses and retail. The plan identifies the core highest density mixed-use within ¼ mile of proposed station, subject to final refinements during the next phase of the transit planning process, and development intensity is scaled down in concentric ring pattern. The Leigh Village area is largely surrounded by established single family residential neighborhoods to the north, west and south, so it must develop in a way that is compatible and helps protect the existing character of those neighborhoods. Thus, the plan recommends single family residential on the fringes of the station area, with multi-family residential development closer to the core.

Concerns have been expressed by the public during workshop forums about retail development at the site leading to cut-through traffic without an adequate collector road network or the nearby sufficient residential land uses at the site to support this kind of development. Thus, development of the Leigh Village site is dependent on the completion of Durham's collector street plan to help distribute traffic and provide alternative means of access to the site. The phasing of the collector street plan should tie with the phasing of the Leigh Village site, such that proper street spacing exists when non-residential development comes on line. High traffic retail development should be phased to follow residential or office commercial development, or timed to occur after completion of the collector road network that provides an alternative access to NC 54 via George King Road.

Of significance to the economic vitality of the entire corridor is the need for a park-and-ride lot to be constructed at the Leigh Village site. This location has the potential to capture a substantial amount of traffic bound for the western end of the corridor and the UNC campus, and can become one of the region's major intermodal hubs once the light rail system comes on line. The park-and-ride lot must be built as a structured facility as part of the first phase of development at Leigh Village to help address the large unmet demand for park-and-ride spaces in the corridor from regional travel markets.

Phasing of Development

Transit-oriented development at Leigh Village is not likely to happen all at once. More likely, it will take many years to evolve into a proper TOD. A phased development plan would allow the infrastructure (park-and-ride, transit line, collector street network and other roadway improvements) to properly support the amount of future growth in the area, and to ensure the short-term development of the site is consistent with long-term plans for transit access as the development's centerpiece. The illustration at right depicts a possible phasing plan for the Leigh Village site to enable some development to move forward in the interim period prior to construction of the light rail segment planned to serve the area. As shown in the figure, a relatively small core mixed use area is developed initially, along with the structured parking that will eventually become necessary. This parking structure would serve a dual role of supporting the relocation of the park-and-ride lot currently at the Friday Center while also accommodating the needs of the emerging development. Following rail implementation, additional infill development occurs. Over time, as more phases are built, the structured parking continues to support the off-site parking needs for the TOD, enabling higher development intensities to attract private investment and generate increasing revenues from property values for Durham residents.

Each station should be master planned to lay out a development pattern with connected streets and appropriately scaled blocks. This will set the framework for the full build-out of the station while allowing flexibility in the intervening years. Prior to implementation of the light rail system, access to the sites will continue to be primarily by automobile and regular bus service, so parking must be provided to serve local businesses. However, once Bus Rapid Transit and eventually the light rail transit line is operational, interim parking areas can be fully developed to the intended densities. In the first phases of development, the recommended goal will be to achieve a minimum FAR of .65-75, which can be accomplished with surface parking. Buildings constructed during initial phases will conform to the design guidelines meeting heights and setbacks specified by district. In the interim some blocks will be utilized for parking. Once transit is in place these parking areas will be developed at densities appropriate to the proximity

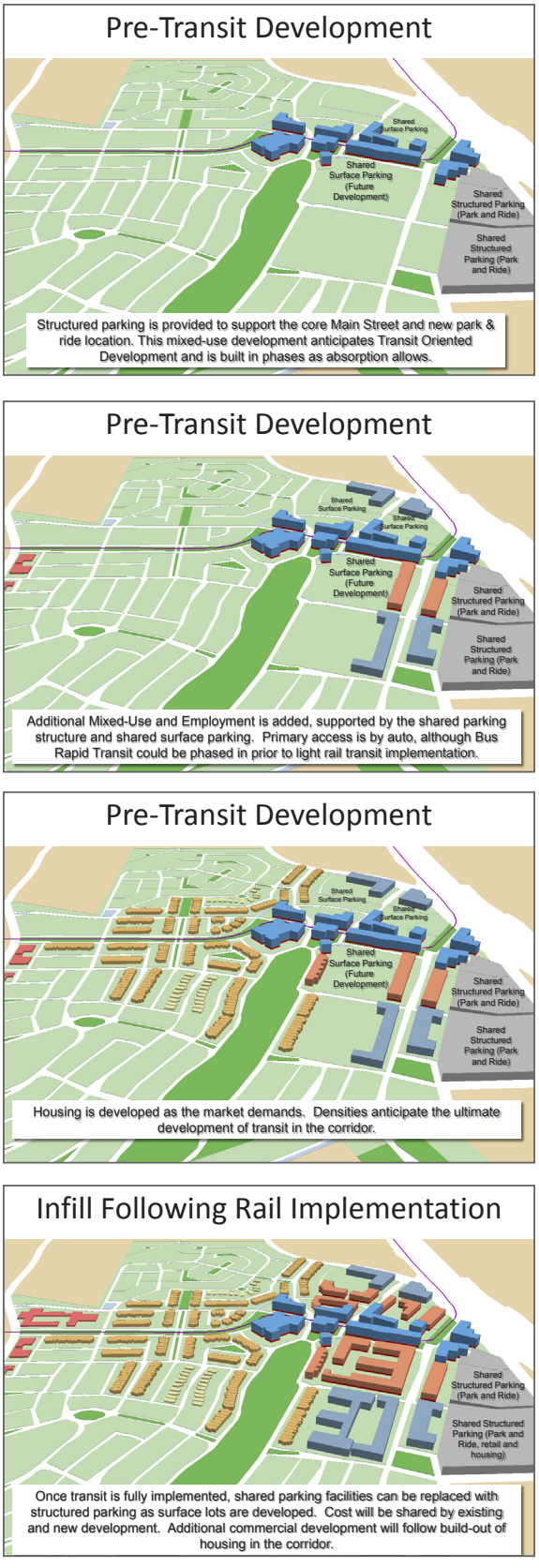

Figure 2-7: TOD Progression

to the station. Automobile access will continue to be accommodated with limited parking requirements using a mix of structured and on-street parking.

The use of Tax Increment Financing (TIF) is a potential funding mechanism for the structured parking garage that will provide needed park-and-ride access within the corridor. Although a relatively new funding source in North Carolina that has not yet achieved widespread application, a TIF district is designed to generate increasing tax revenues from rising property values. There are several approaches to creating a TIF, but in general a base property value level is established prior to investment in capital facilities or other infrastructure, and the increment of tax revenue from future revenue growth is returned to the area of the TIF to pay off debt for the initial infrastructure investment. This would enable the City, County or other authority to construct the parking garage up front and recoup its investment over time. A fuller discussion of this potential mechanism and a possible ownership structure is discussed in the implementation section at the end of the park-and-ride chapter.

There are a variety of funding sources that could be targeted for the parking garage, including possible financial assistance from the University of North Carolina-Chapel Hill as a major user of the facility, a fee-in-lieu program that enables development to pay into a parking fund instead of providing the minimum on-site parking allotment, a Local Improvement District (LID) or Municipal Services District (MSD), which assesses local property owners for public improvements like parking structures that benefit the land owners, and general obligation or revenue bonds issued by local governments.

Other Mixed Use Areas

Other mixed-use areas provide services for residential areas beyond the immediate vicinity of transit stations. While they are pedestrian-oriented, these retail-office-residential developments will also accommodate automobile access. They must be scaled to the neighborhoods they serve. Community scale developments may include lifestyle centers, which primarily consist of retail, with some office and residential uses. Smaller scale neighborhood centers include both retail and office development and provide more local services.

Redevelopment of the Falconbridge Shopping Center

The existing shopping center at the southwest quadrant of I-40 and NC 54 is a suburban-style development that provides both neighborhood retail and highway-oriented commercial uses that attract commuters using NC54. The recommended plan includes an extension of local bus service to this site, and anticipates that rising land values, age of buildings and changing real estate trends will lead to its eventual redevelopment within the planning horizon of 2035. With the most intense development identified for the core transit station areas, this location should not become a high density development due to potential traffic impacts. However, the location fills an important demand for the residential areas located to the south of NC 54, and could be effectively redesigned as a 'Lifestyle Center' to encourage walking access from those neighborhoods, as well as better access into the site by bus service. Redevelopment of this site can be addressed by the Durham Comprehensive Plan designation of general mixed-use. With redesign of the shopping center, it should be possible to create a new two-lane east-west access road that would provide a parallel connection between Farrington Road and Falconbridge Drive, which would be used primarily provide access into the shopping center from the south.

Unlike Celeste Circle, discussed below, which is likely to experience similar pressures for redevelopment, this commercial property is on a larger parcel under less diverse ownership, and is already serving as a focal point for services in the corridor.

Quadrangle Office Area east of I-40

The master plan does not recommend any changes to this employment center located immediately east of the corridor study limits. The area has capacity for additional office development, and it is in the early stages of its development. Indications from discussions with local real estate representatives and developers are that the NC 54 market is becoming saturated with offices uses, and the market is unlikely to add substantially more commercial office square footage for some time. Without a catalyst type of transportation investment on site, this combination of factors makes it unlikely to transition into a different type of development during the planning horizon. It will continue to draw workers from nearby residential areas as well as elsewhere in the Triangle region.

Celeste Circle

The Celeste Circle neighborhood is located on the north side of NC 54 to the west of Farrington Road and east of George King Road. Celeste Circle is comprised of about 50 single family homes, with an underlying future land use designation of commercial. A frontage road separates the homes from busy NC 54, providing a buffer from high speed traffic. The City of Durham collector street plan ties in to NC 54 immediately west of this neighborhood, providing additional access. The neighborhood's frontage along NC 54 likely means that in the future it is a candidate for change from residential to commercial development, particularly as NC 54 traffic volumes grow and development continues along the corridor to reduce available vacant parcels. During the public participation process, some residents of the neighborhood advocated for this change, while others preferred that the neighborhood remain residential.

The Master Plan recommends that the Celeste Circle neighborhood remain residential through the 2035 horizon. This recommendation requires a change in the Durham Comprehensive Plan to change the future land use to single family residential. The recommendation is consistent with the nodal development concept for the corridor. If Celeste Circle becomes commercial, it will most likely be in the form of automobile-oriented suburban development. Thus, to properly guide future development into districts where the majority of daily trips can be satisfied by walking, bicycling or using transit, it does not make sense to enable or encourage a linear commercial development pattern along this corridor. Celeste Circle is partially within the ½ mile buffer of the Leigh Village Station area and, with the collector road network providing strong connections to the proposed light rail station, it is conceivable that it could, in future, be oriented toward transit rather than NC 54, while remaining residential. Generally, within the NC 54/I-40 study corridor, areas located outside the ¼ and ½ mile areas of the planned LRT stations should not experience increases in development intensity until the station areas are approaching full build-out. Enabling such development to occur undermines the strength of the LRT investment to concentrate development activity at highly accessible locations, thus helping to reduce automobile traffic demand and VMT.

Land Use Blueprint

Figure 2-8 presents the recommended corridor land use plan. The plan leaves much of the study area as it is today – established residential neighborhoods and supporting retail and office uses – but focuses future growth in the corridor around planned light rail transit station areas. As shown in the figure, areas in various colors represent changes from existing land use, either filling in vacant parcels or redeveloping specific land areas. Individual parcels outside of planned station areas showing up as vacant are intended to build out at the current planned development intensity. This land use blueprint is intended to guide each of the local governments in modifying their adopted Comprehensive Plans and development regulations to implement the plan. gure, there are five conceptual land use categories defined for the land use blueprint:

- Mixed Use 1 – highest density core station area mixed use, with primarily retail and office uses
- Mixed Use 2 – retail on the ground floor with residential land uses above
- Residential 1 – mostly multi-family uses with neighborhood supporting uses (e.g., retail, schools, etc.) as appropriate
- Residential 2 – mostly single-family homes with neighborhood uses as appropriate
- Employment – may include office, institutional or health care facilities. This includes some mix of land uses and will be transit oriented to the maximum extent possible. Higher density workforce or student housing may be included in this category.

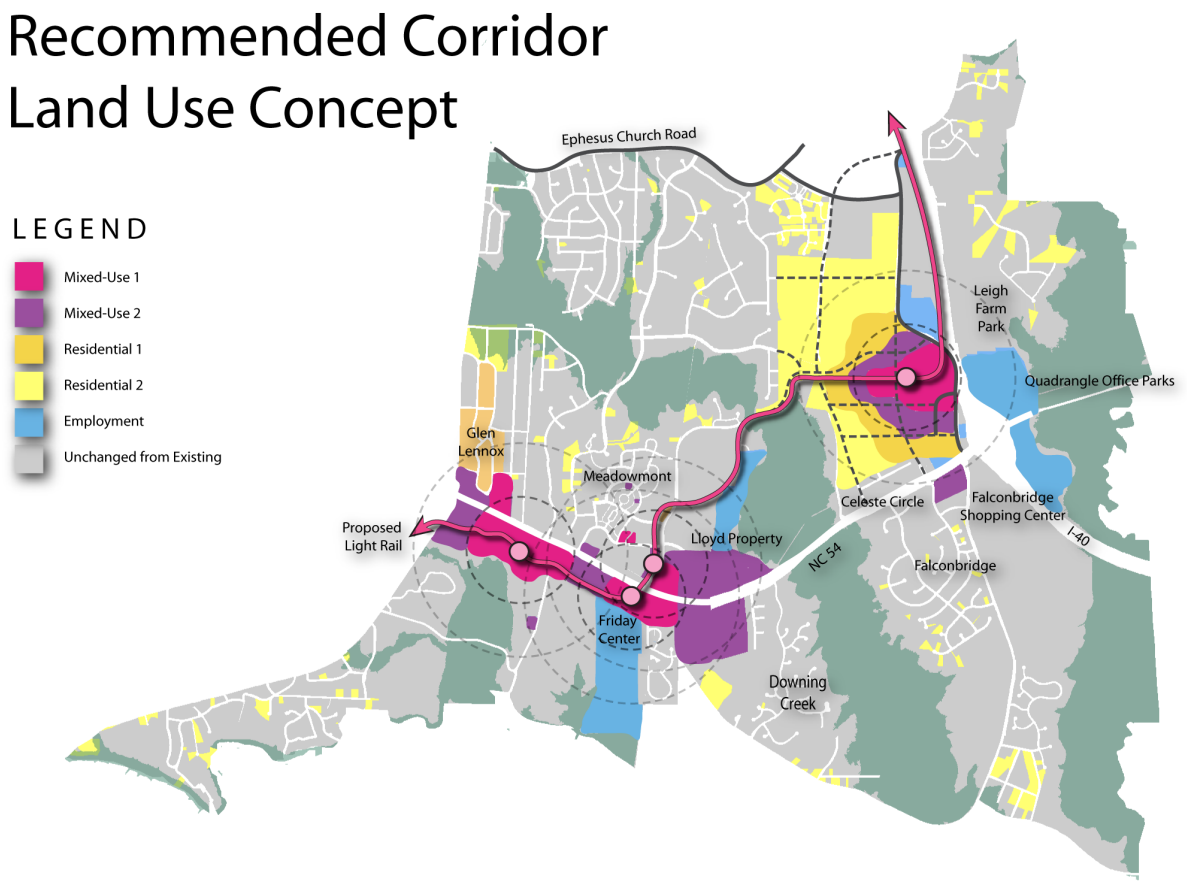

Figure 2-8: Recommended Corridor Land Use Concept

Table 2-1 shows the range of targeted development intensities associated with the land use blueprint shown in the figure. Local governments should establish minimum densities for the station areas (within ½ mile, or a 10-minute walk of the station itself), with a gradual reduction in development intensity outside the core first ¼ mile area.

The recommended target for development intensity is a range designed to allow for some policy variation and flexibility between the jurisdictions along the corridor for what is acceptable. These levels of intensity can be met through some combination of housing or employment. The upper limit of the range for Mixed Use 1 is 75 units per acre, which is only slightly higher than the City of Durham's existing suburban transit area designation allows. These target ranges are consistent with national research and TOD guidance from the Federal Transit Administration and guidelines developed by states and metropolitan regions elsewhere. From the experience of other regions with rail transit and TOD, the essential ingredient for financial success is sufficient development intensity in the immediate vicinity – the first ¼ mile – of the stations to support the ongoing operations of the system. For example, along the Ballston line in Arlington, VA range from 65 to 90 dwelling units per acre in the quarter mile core area, but the 2nd quarter mile drops substantially to about 20 units per acre, including a substantial amount of single family housing. While there is no one-size-fits-all approach, it is important to have a good jobs-to-housing balance through some combination of development intensity. The NC 54 Master Plan recommends that each of the station areas has a core employment focus to sustain the area as a destination, with supporting residential dropping down in density as one moves away from the core.

"The recommended target for development intensity in the station areas is a range designed to allow for some policy variation and flexibility between the jurisdictions along the corridor for what is acceptable."

The design guidelines included in Appendix B provide additional guidance on the station areas in terms of parking, internal circulation, multimodal connectivity and site layout.

Table 2-2 summarizes the expected population and employment growth in the study corridor, compared with the projections used for the adopted 2035 Long Range Transportation Plan. This projection reflects the analysis of development capacity and substantial input from key stakeholders, including land owners, developers and local government staff. The table shows that the recommended land use plan will exceed the population and employment projections assumed for the LRTP. However, from this analysis and discussion with UNC officials, in particular, this study indicates that the projections used in the LRTP substantially under-reported the likelihood of future development in Orange County. For instance, no change was assumed to occur at the Friday Center through 2035, and while no specific development plan is available, UNC officials have specifically informed the study team otherwise.

Table 2-1: Conceptual Land Uses

	Mixed Use 1	Mixed Use 2	Residential 1	Residential 2	Employment
No. of stories	3 – 8	2 – 4	2 – 4	1 – 3	4 – 12
Floor-to-area ratios (non-residential)	1.25 – 2.25	1.0 – 1.5	–	–	0.5 – 1.0
Dwelling Units per Acre	35 – 75	25 – 35	15 – 35	6 – 10	–
Employees per Acre	45 – 90	25 – 50	9 – 15	6 – 12	35 – 175

Table 2-2: Projected Population and Employment Growth for 2035

TOTAL CORRIDOR GROWTH				
	County	**Households**	**Population**	**Employment**
Base 2005	Durham	2,420	5,078	1,627
	Orange	1,862	4,097	1,606
LRTP 2035	Durham	6,118	14,340	10,325
	Orange	2,624	5,506	2,333
Recommended 2035	Durham	11,374	24,311	13,438
	Orange	4,686	10,086	7,344
INCREMENTAL GROWTH				
	County	**Households**	**Population**	**Employment**
Base 2005	Durham	2,420	5,078	1,627
	Orange	1,862	4,097	1,606
LRTP 2035	Durham	3,698	9,262	8,698
	Orange	762	1,409	727
Recommended 2035	Durham	8,954	19,233	11,811
	Orange	2,824	5,989	5,738

Land Use and Transportation Scenarios

The NC 54/I-40 Corridor Study is a scenario planning exercise to help imagine possible outcomes for the study area and properly plan for those outcomes. For the last few years, scenario planning has become an emerging part of the transportation planning practice nationwide, as whole regions and individual communities have engaged in a process of examining the "what ifs" associated with future land use and transportation pattern, and the influence of those patterns on transportation performance, economic growth and quality of life.

As it applies to the NC 54 study, scenario planning was employed to create and test the impacts of alternative future outcomes to define an overall vision for the corridor, assess policy trade-offs for integrated land use-transportation strategies, a comparison of various growth options, and to evaluate the impacts of growth on corridor mobility and accessibility. Each of the scenarios developed in this process helped guide the study team toward a recommendation of a "preferred" scenario to guide Corridor Master Plan ("blueprint").

NC 54 Scenario Descriptions

The following scenarios were developed to explore potential implications and strategies for growth and mobility in the study corridor. The scenarios were developed from planned land use and transportation projects, input from the steering committee, and guidance from the public at the first workshop.

Land Use and Transportation Scenarios

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NC 54 Scenario Descriptions

The following scenarios were developed to explore potential implications and strategies for growth and mobility in the study corridor. The scenarios were developed from planned land use and transportation projects, input from the steering committee, and guidance from the public at the first workshop.

Trend Scenario A – Historical Trend with minimal transportation improvements

This scenario assumes that the NC 54 corridor will continue to grow as in the past few decades with low density development in vacant land, minimal redevelopment, and transportation investments focused on widening the main corridors. The Trend Scenario A does not use the socioeconomic assumptions of the adopted Long Range Transportation Plan; rather it assumes that the vacant land will be developed from a historical trend perspective at roughly the minimum to mid-range densities and with land uses as specified in the future land use plans, resulting in mostly residential growth in the corridor. The transportation investments are minimal. In short, this scenario keeps the corridor essentially as it is today, with some minimal infill of vacant land at roughly the same densities as today. Figure 2-9 shows the Trend Scenario A concept.

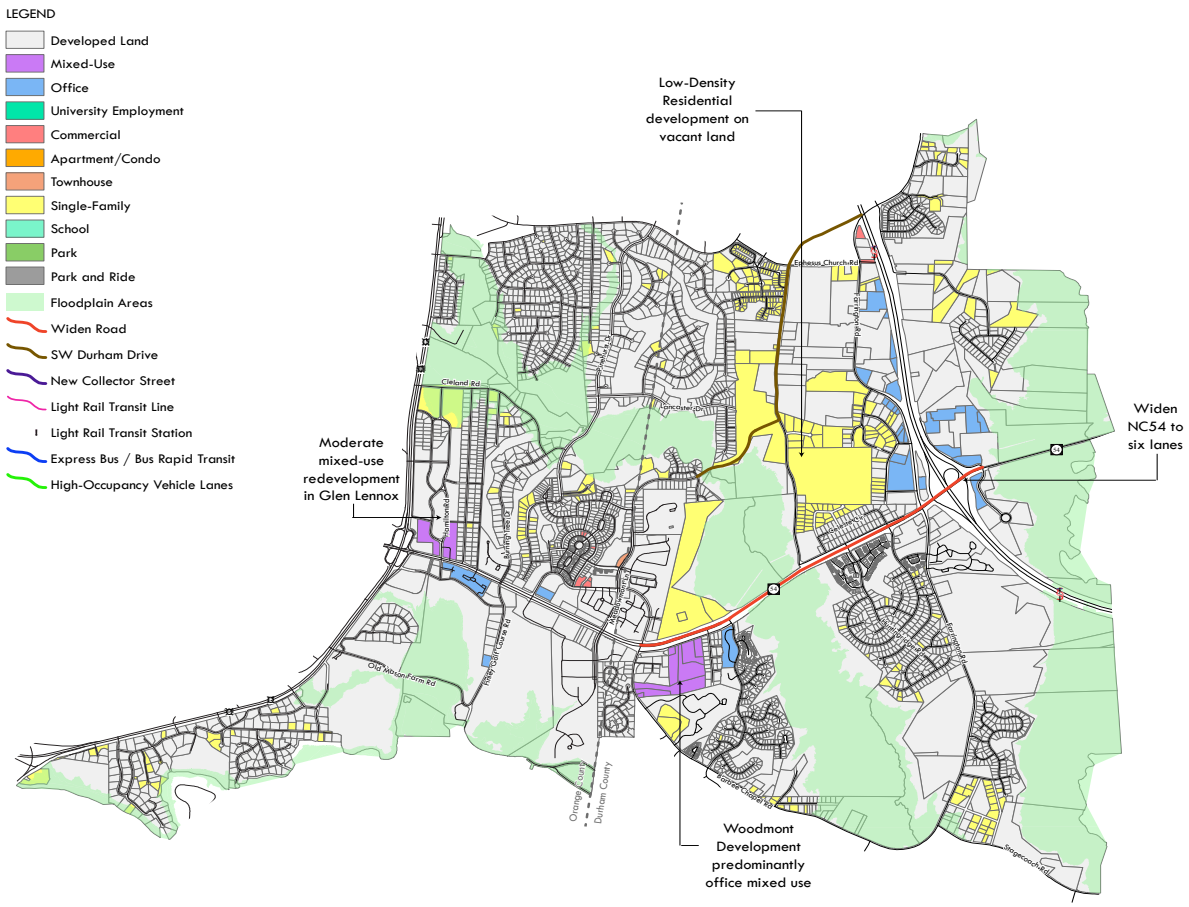

Figure 2-9: Trend Scenario A

Land Use Assumptions:

- Development will be limited to vacant parcels; no redevelopment will occur
- Existing vacant land in Durham County built to minimum densities according to Future Land Use Plan
  - Residential parcels have 1 to 12 dwelling units per acre
  - Employment/commercial parcels have 20 to 32 jobs per acre and 0.25 to 0.35 floor area ratio
- Existing vacant land in Chapel Hill built to minimum densities according to Future Land Use Plan

  Residential parcels have 1 to 15 dwelling units per acre

  Employment/commercial parcels have 13 to 48 jobs per acre and 0.18 to 0.60 floor area ratio
- Building heights are 1 to 3 stories

Orange County Growth		
	JOBS	HOUSEHOLDS
Existing	1,606	1,862
2035 Total LRTP	2,333	2,624
Trend	2,480 (106%)	2,524 (96%)

Durham County Growth		
	JOBS	HOUSEHOLDS
Existing	1,627	2,420
2035 Total LRTP	10,325	6,118
Trend	5,079 (49%)	5,229 (85%)

Transportation Assumptions:

- NC 54 expanded to 6 lanes
- No other transportation improvements
  - No collector streets built
  - No light rail system

Trend Scenario B – Historical Trend with more transportation investments

The land use assumptions in Trend Scenario B are identical to those in Trend Scenario A. In Trend Scenario B, the construction of the collector street system in the Durham County portion of the study area will provide increased capacity to address connectivity and traffic congestion problems. Figure 2-10 shows the Trend Scenario B concept.

Land Use Assumptions:

- These are the same as Trend Scenario A.

Transportation Assumptions:

- NC 54 expanded to 6 lanes
- Collector street system built
- No light rail

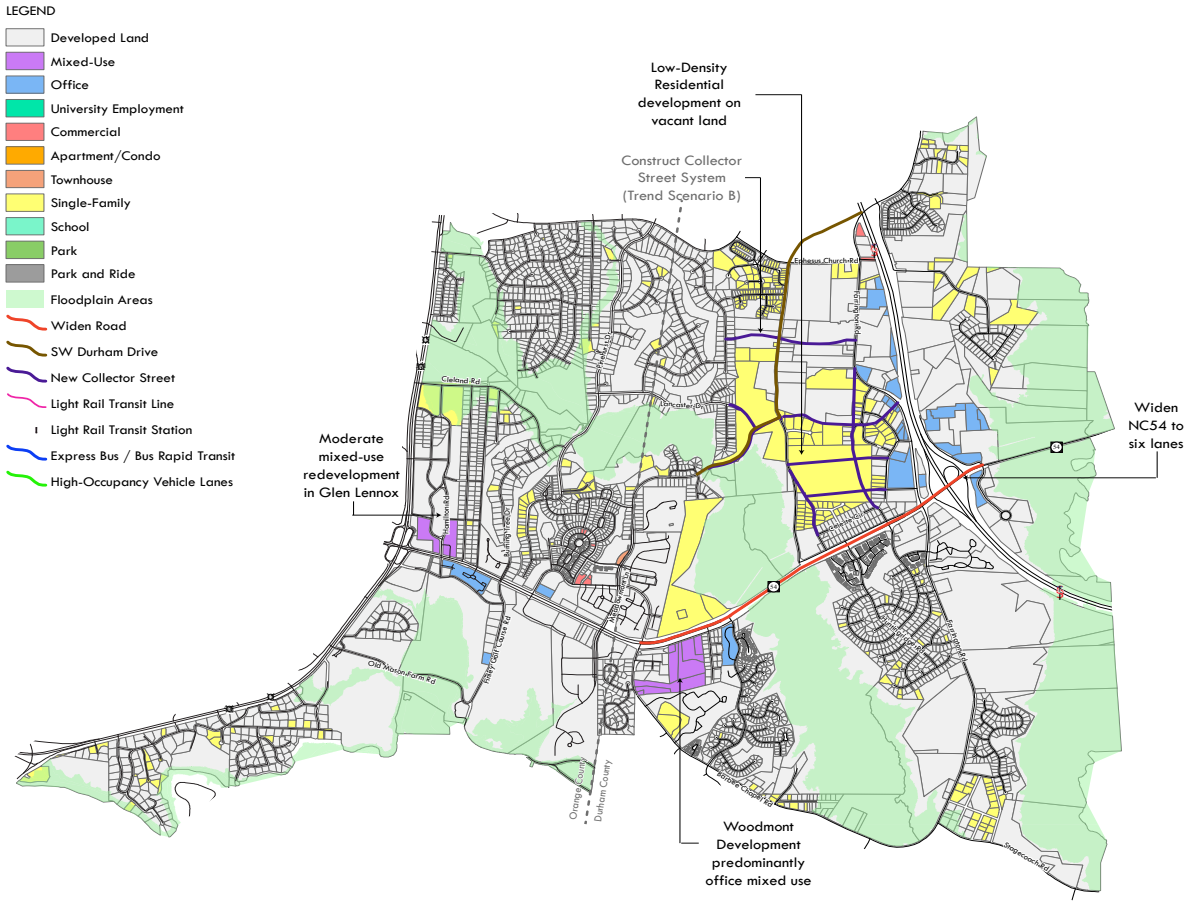

Figure 2-10: Trend Scenario B

Scenario 1 – LRTP Policy Scenario – Light Rail Transit Moderate Forecast

The DCHC MPO Long Range Transportation Plan identifies a number of policies that if followed will discontinue the historical patterns of development and transportation investments. In Scenario 1, the NC 54 corridor will grow and develop as indicated by the LRTP policies. The growth forecasted for the NC 54 corridor will be organized to minimally support the light rail transit system, which will be in place and operating by the study horizon year of 2035. The uses within the corridor will intensify to meet the forecasted growth in jobs and households as outlined in the LRTP. This MPO-adopted policy assumes substantially more growth in the Durham portion of the study area, and only moderate levels of growth in the Chapel Hill side of the study area. Figure 2-11 shows the Scenario 1 concept.

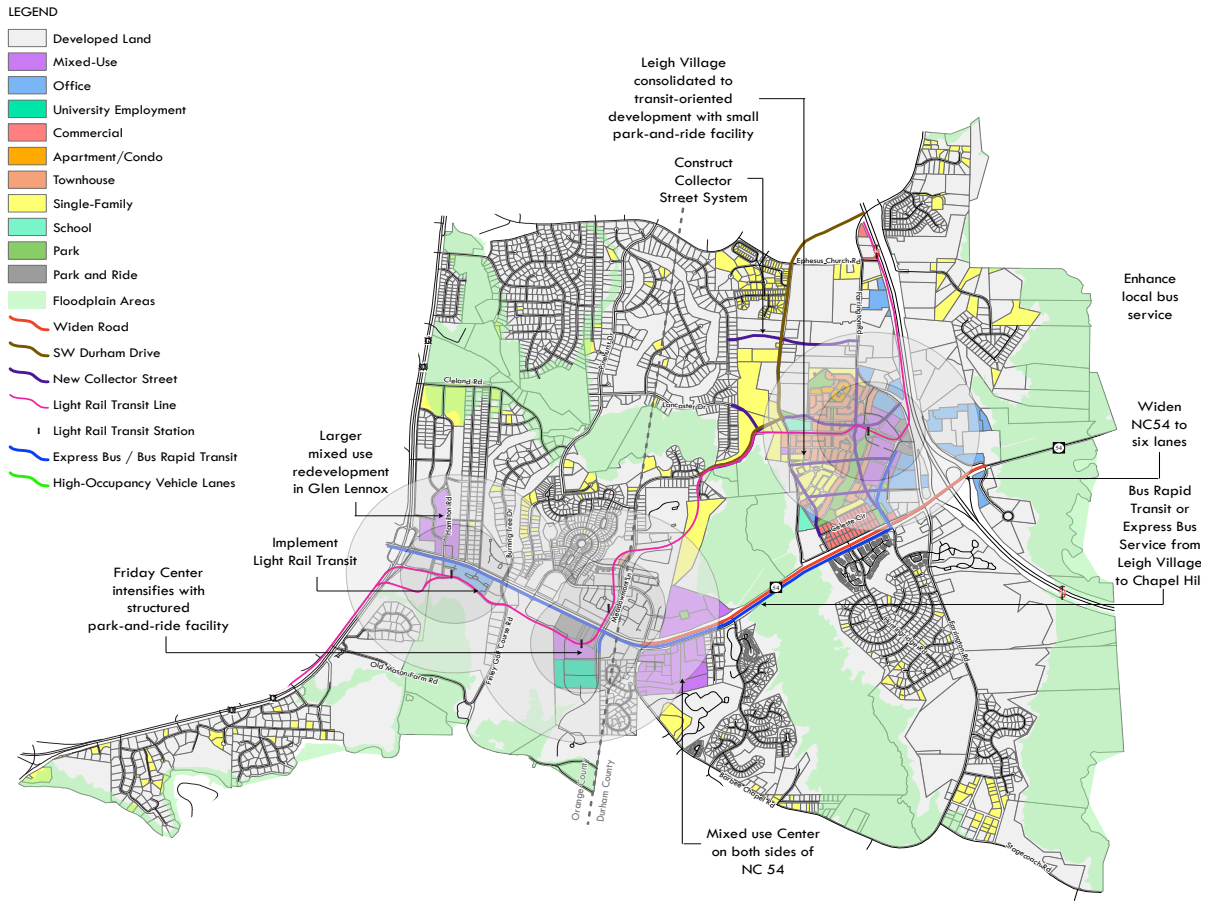

Figure 2-11: Scenario 1

Land Use Assumptions:

- Vacant land and redevelopment will occur to accommodate the forecasted growth
- Mostly residential buildout
- Development and redevelopment in Durham County:
  - Residential parcels have 6 to 20 dwelling units per acre
  - Employment/commercial parcels have 24 to 65 jobs per acre and 0.27 to 0.65 floor area ratio
- Development and redevelopment in Chapel Hill
  - Residential parcels have 2 to 25 dwelling units per acre
  - Employment/commercial parcels have 18 to 75 jobs per acre and 0.30 to 0.75 floor area ratio.
- Building heights are 1 to 3 stories, with up to 5 stories in the most intensely developed areas.
- Leigh Village will be built as illustrated with primarily horizontal mixed use
- Uses within the Friday Center may slightly intensify, providing higher employment growth in Chapel Hill than forecasted in the LRTP

Orange County Growth		
	JOBS	HOUSEHOLDS
Existing	1,606	1,862
2035 Total LRTP	2,333	2,624
Trend	4,450 (178%)	3,064 (117%)

Durham County Growth		
	JOBS	HOUSEHOLDS
Existing	1,627	2,420
2035 Total LRTP	10,325	6,118
Trend	10,920 (106%)	6,702 (100%)

Transportation Assumptions:

- NC 54 expanded to 6 lanes
- Collector street system built
- Light Rail system built and functioning
- Enhance local bus service as consistent with CHT and TTA planning documents
- Bus Rapid Transit service on NC 54 originating at Leigh Village to Chapel Hill and UNC
- Park-and-ride facility remains at Friday Center (may become bigger facility with structured parking instead of surface lots)

Scenario 2 – Transit Focused / High Growth

This scenario assumes that growth in the NC 54 corridor will exceed expectations in the adopted Long Range Transportation Plan. The light rail system will serve as a catalyst for population and job growth centered on station areas, with additional medical-related facilities supporting the UNC Health System. The corridor itself will be a destination for the region, a thriving district for UNC institutional, medical and academic prosperity. Transportation investments will be focused on making the light rail system a vital transportation asset, where ridership levels exceed expectations. Figure 2-12 shows the Scenario 2 concept.

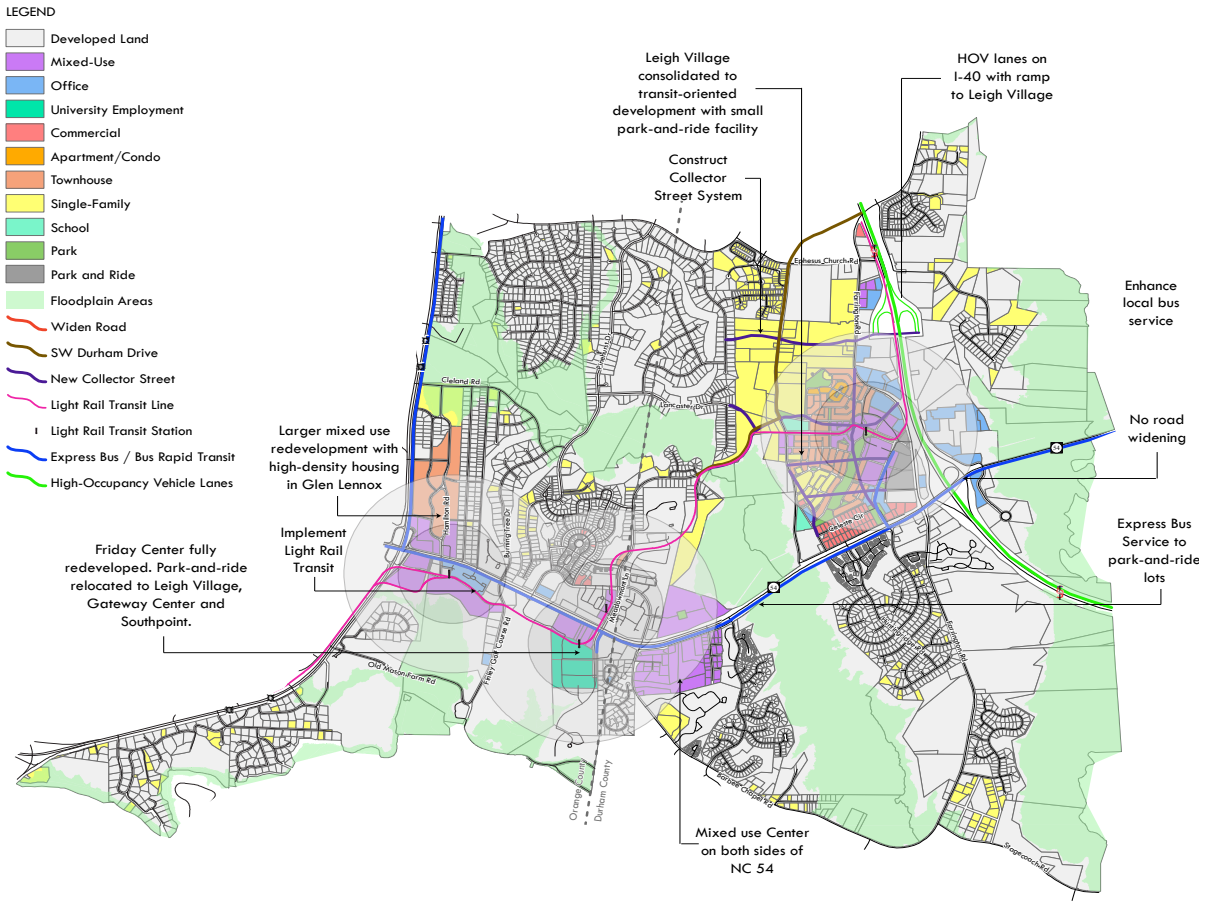

Figure 2-12: Scenario 2

Land Use Assumptions:

- Development and redevelopment will be centered around light rail transit stations to reflect the synergy between this type of catalyst investment and the regional access it provides
- Mixed use developments will be prevalent, with diverse housing, shopping, medical facilities, academic and institutional uses
  - Residential parcels have 9 to 60 dwelling units per acre
  - Employment/commercial parcels have 24 to 120 jobs per acre and 0.27 to 1.50 floor area ratio
- Building heights are 4 to 8 stories in the core transit hubs and high density complexes, with 1 to 4 stories in the outlying areas

Orange County Growth		
	JOBS	HOUSEHOLDS
Existing	1,606	1,862
2035 Total LRTP	2,333	2,624
Trend	6,964 (298%)	5,469 (208%)

Durham County Growth		
	JOBS	HOUSEHOLDS
Existing	1,627	2,420
2035 Total LRTP	10,325	6,118
Trend	14,300 (139%)	10,947 (179%)

- Leigh Village will become a key focal point of the corridor as a mixed use community hub of jobs and housing.
- Additional redevelopment will occur on parcels within the vicinity of Leigh Village
- The Friday Center will be fully redeveloped as an employment center with workforce housing nearby. This could result in an additional 2,500 jobs and 500 households by 2035.
- The Glen Lennox neighborhood will redevelop as a mixed use development featuring workforce housing.
- A mixed use area will emerge to the east of the Friday Center and Meadowmont, on both sides of NC 54, encompassing the Woodmont and Lloyd properties, respectively.
- Finley Golf Course will partially redevelop for workforce housing opportunities.

Transportation Assumptions:

- No lanes added to NC 54
- I-40 HOV lanes in effect
- Collector street system built
- Light Rail system built and functioning
- Remove Friday Center park-and-ride lot with parking reserved to support new development at the site
- Three new park-and-ride lots will be implemented
  - One at the Leigh Village/Farrington Road light rail transit station
  - One at the 'Gateway Center': the southwest quadrant of the I-40 & US 15-501 interchange north of the study area
  - One to the east of the study area, near the 751 interchange (Southpoint or Woodcroft, near car dealerships), and served by express bus service to Friday Center and UNC.
- Expand local bus service to serve the entire corridor with all day saturated local service with express buses in peaks
- Provide express bus service/ Bus Rapid Transit service to park-and-ride lots, with BRT along NC 54
- I-40 HOV flyover ramp connecting to the park-and-ride lot at Leigh Village, designed to avoid impacts to Leigh Farm Park.

Development of Land Use Data for Analysis

In creating the land use allocation for the scenarios and final recommended land use plan, the process began by developing prototypical place types for different land use categories, with each consisting of varying levels of intensity and mixes of use. These place types were created using Renaissance Planning Group's CorPlan land use modeling tool, which generates development potential based on the capacity of the land and the type of use, including required set-asides for utilities, open space, parking and other non-leasable components. The next step involved allocating the place types to parcels, starting with vacant lands in the corridor study area and those locations targeted for redevelopment. This set of assumptions provided the basis for development of the three scenarios, including the Trend. All work was done at the parcel level as the basic unit of geographic analysis. The parcels were then aligned with the traffic analysis zone (TAZ) layer and summarized. This identified the incremental allocation of new development beyond what was assumed for the TAZs in 2005 (base year). The incremental growth to 2035 was then added to the base year totals summarized by TAZ for use in the travel demand model.

That land use allocation process served as the basis for evaluating the jobs-housing balance by TAZ as a starting point to determine adjustments to the modeling process for internal capture and mode share.

The analysis of the transportation network included adjustments within the travel demand model structure to simulate the trip making characteristics of the corridor with the scenarios. Using research developed by the National Cooperative Highway Research Program (NCHRP)[1] walking adjustment percentages were created to be applied to the model to reflect the density, diversity and design of land use and transportation scenarios for the NC 54 corridor. Density, diversity and design were partitioned into three categories; Low, Moderate and High based on the socio-economic data, street width, and block size criteria identified in Table 2-3.

National research has shown that combinations of Density, Diversity and Design have a direct impact on trip generation and the trip making characteristics within a corridor. The travel demand model has limitations when testing land use and transportation scenarios with multimodal principles and is not sensitive enough to net out auto trips based on these factors. The model is designed to generate and distribute traffic based on the absolute number of people and jobs in the area. Table 2-4 on the following page identifies the adjustment percentages for walking trips developed for the corridor based on the existing characteristics.

Table 2-3: Density, Diversity & Design Criteria

DENSITY		DIVERSITY		DESIGN		
Dwelling units per acre		**Residential/Non-Residential Mix**			**Street**	**Blocks**
Low	less than 4	Low	greater than 80% residential	Low	greater than 80 feet	no blocks
Mod	4-20	Mod	40%-80% residential	Mod	40-80 feet	greater than 600 feet
High	greater than 20	High	less than 40% residential	High	less than 40 feet	less than 600 feet

1 Land Use Impacts of Transportation: A Guidebook. National Cooperative Highway Research Program (NCHRP) Report 423A, Parsons Brinckerhoff Quade and Douglas (1999). This report contains the results of research into the land use implications of transportation investments and decisions. as a Presented guidebook, it provides reference information on land use planning and its integration into the multimodal transportation planning process.

Guidance for Estimating the Indirect Effects of Proposed Transportation Projects. National Cooperative Highway Research Program (NCHRP) Report 403, Louis Berger Associates (1998). This report contains the results of research into the land use implications of transportation investments and decisions. Presented as a guidebook, it provides reference information on land use planning and its integration into the multimodal transportation planning process.

Table 2-4: Walking Trip Adjustments

Home Based Work (home to work) Walk Trip Percentages

		Density		
Diversity	Design	Low	Med	High
Low	Low	1%	1%	2%
	Med	1%	2%	2%
	High	2%	2%	3%
Med	Low	2%	2%	3%
	Med	2%	3%	4%
	High	3%	3%	4%
High	Low	2%	3%	4%
	Med	3%	4%	5%
	High	3%	4%	5%

Home Based Non-Work (home to shopping) Walk Trip Percentages

		Density		
Diversity	Design	Low	Med	High
Low	Low	3%	5%	8%
	Med	5%	8%	10%
	High	8%	10%	13%
Med	Low	8%	10%	16%
	Med	10%	13%	18%
	High	13%	16%	21%
High	Low	10%	16%	21%
	Med	13%	18%	24%
	High	16%	21%	26%

Non-Home Based (Work or Shopping to home) Walk Trip Percentages

		Density		
Diversity	Design	Low	Med	High
Low	Low	3%	6%	9%
	Med	6%	9%	12%
	High	9%	12%	14%
Med	Low	9%	12%	17%
	Med	12%	14%	20%
	High	14%	17%	23%
High	Low	12%	17%	23%
	Med	14%	20%	26%
	High	17%	23%	29%

The adjusted percentages were integrated directly into the modeling process after the trip generation step and before trip distribution. The productions (trip origins) and trip attractions (destinations) produced by the trip generation module were adjusted by trip purpose, as shown in Table X, resulting in traffic projections with the walking trips removed from the assignment to the network.

The results of this analysis step made the modeling more sensitive to the design characteristics of future development anticipated to occur in the corridor with the planned light rail transit investment. The analysis was included in the testing of each scenario and reflected in the estimates of mode share and traffic assignment.

Scenario Outcomes

In general, the analysis indicated that the historical Trend Scenario grossly understated the likely development potential of the corridor, especially given the significant University-owned properties and on-campus development constraints. In addition, there are substantial vacant and under-developed parcels along the corridor that would likely experience development pressure from rising market demand and planned transportation investments. Similarly, the LRTP Policy Scenario (Alternative 1) showed constrained employment growth in Chapel Hill, which appears to not account adequately for likely redevelopment on and around the Friday Center. Scenario 2, the most aggressive of the three alternatives, represents a likely market-based growth projection that reflects the dynamic nature of the corridor given its proximity in the region to major educational and employment areas, and is in line with the experience of areas with similar rail investments elsewhere in the country. In evaluating the impacts of the scenarios, regional growth eventually forces the need for major transportation investments in this corridor. Scenario 2 had the greatest increase in traffic and delays, but also had the highest share of non-auto travel. The analysis indicates about eight percent of total trips would be made by non-motorized modes (walking and bicycling) with the recommended master plan, so the potential exists to shift a substantial portion of trips from automobile travel into other modes. Refinements in the regional travel demand model are needed to more accurately reflect parking constraints on projected transit ridership and mode share; however, the results of this analysis entailed recommending a less intense scenario with most new development occurring within the designated transit station areas to increase the potential mode share for non-auto travel.

Implementation Plan

The land use element of this NC 54 Corridor Master Plan provides a detailed look at the potential development capacity in the study area. The recommended land use plan defines a strategy of focusing development in compact, mixed-use areas around planned transit stations to create greater proximity of jobs and housing, which will help reduce dependence on automobile travel, provide housing at a greater range of income levels, and protect the character of existing neighborhoods and the corridor's natural features. To support implementation of the recommended nodal development plan, the local governments in the corridor should take the following actions:

- Revise Comprehensive Plan policies and regulations, as necessary, to allow the highest density, mixed-use development within the core ¼ mile radius of the planned stations, and establish minimum densities or a minimum number of households/jobs in these centers. A target range of densities (minimum and maximum) has been suggested to enable variation and flexibility. The City of Durham should consider revising its transit station area definitions to create a category between suburban and downtown for the Leigh Village area, which would most logically fit between those two categories, enabling development to reach up to 75 dwelling units per acre. The land use mix in the core area should emphasize employment and commercial uses, with supporting residential.
- The policies should be revised as needed to promote a mix of uses and marginally lower development densities in the next ¼ mile from the core station area, with a shift toward higher density multi-family residential land uses and supporting office/retail land uses.
- Other modifications in the Comprehensive Plans should be to limit the amount of non-residential development occurring outside of the ½ mile area of the planned station areas, with noted exceptions at the Falconbridge Shopping Center, a small portion of the Glen Lennox neighborhood, and future development sites located immediately east of the Friday Center and Meadowmont. Each of these locations provides an opportunity to create a more compact, pedestrian-oriented development in the future. These sites are all recommended for increased transit service.
- In the Mixed Use 1 and 2 areas of the recommended master plan, inclusionary zoning policies should be established to require a minimum set-aside percentage of affordable workforce housing within these development nodes. A higher percentage should be considered in the core ¼ mile radius from the transit station. In general, affordable workforce housing refers to housing made available at rents for residents whose income is between 30 percent and 60 percent of Area Median Income (AMI); and home prices for residents whose incomes are between 60 percent and 100 percent of AMI. The term affordable workforce housing is used because the main goal is to make housing within the corridor affordable to those who live and work in the corridor, or at the institutions and commercial developments located adjacent to the corridor.
- A development phasing plan should be established that ties the most intense development in core station areas to the following transportation actions:
  - Construction of a parking structure (garage) in the Leigh Village area to accommodate at least 2,500 park-and-ride spaces for use by UNC-affiliated personnel, plus an additional 500 spaces for others. Incremental development may occur at various stages of the parking structure, such as dedicating the site for its development.
  - Construction of the "superstreet" intersection modifications to reduce potential delays from increasing traffic growth in the corridor.
  - Expansion of fixed route bus service at greater peak period service frequency and operation of an interim Bus Rapid Transit service along the corridor until the planned light rail system becomes operational.

  - Ultimate build-out of the planned station areas should be conditioned upon construction of the light rail line and stations, along with other necessary roadway improvements (i.e., direct access ramps to the Leigh Village park-and-ride from I-40 and reconstruction of the interchange) to maintain a minimum level of service standard. These are further defined elsewhere in the report.

- Land Development Regulations should be reviewed and updated, as necessary, for the proposed station areas and other mixed-use centers to enable smaller block sizes, reduced parking located behind buildings, on-street parking, and internal connectivity for pedestrians and cyclists. Regulations should require dedicated sites for transit stops and passenger waiting areas that are located proximate to building entrances with direct, safe and accessible pedestrian connections. Protected and secure bicycle parking should be provided. The Design Guidelines in the appendix of this report provides further guidance.
- A bi-annual (every two years) corridor monitoring program should be employed by the MPO and local governments to track development activity and transportation conditions in the corridor. This would help maintain a focus on study outcomes using benchmarks for mobility and development objectives that track performance and provide feedback on the effectiveness of the plan's recommended strategies. This could become part of an overall regional monitoring program that tracks development activity within defined centers and corridors, as is done in the Denver region, San Francisco Bay Area, Sacramento, Atlanta and other locations where transit investments are in place and more are planned.

Park-and-Ride Facility Recommendations

The recommendations for park-and-ride facilities for the NC 54 corridor are one part of the multi-pronged approach to provide mobility and accessibility for the corridor study area. Park-and-ride facilities are an important component of travel demand management. These recommendations go hand-in-hand with the transit recommendations, as success of the park-and-ride facilities is inextricably linked to frequent, reliable and convenient transit service. The roadway recommendations, especially in the Leigh Village development area, will provide the necessary access for these facilities. The land use decision-making recommendations will also influence the usage of the recommended park-and-ride facilities. The park-and-ride facilities will fill critical gaps in the transportation system further promoting alternatives to single-occupancy vehicles. The strategic timing of the park-and-ride facilities with growth and transit service will enable developers, transit agencies and local governments to participate in transportation solutions. All components are designed to work in tandem as one comprehensive mobility strategy to solve the unique challenges of this corridor and study area.

Park-and-Ride Travel Markets

As discussed previously, the areas of the Durham – Chapel Hill – Carrboro MPO and Research Triangle Park have fairly low density development patterns, and destinations are spread throughout the region, making effective and seamless transit service a challenge to implement. The NC 54 corridor study area is unique in that it has the low-density characteristics of the surrounding region, but is also in close proximity of the University of North Carolina at Chapel Hill campus and medical center, a major employment center generating a large volume of commuter trips evidenced by the strong directionality of traffic volumes in the peak periods. Constrained parking at the UNC campus and medical center further complicates the travel patterns within the NC 54 corridor.

The public has realized the need for and benefits of park-and-ride facilities and have advocated for more facilities within the region throughout the public process for this project and other regional planning projects, such as the Durham Area Transit Authority's (DATA) Short Range Transportation Plan.

The NC 54 corridor study area, because of its unique travel characteristics, needs a diverse and complimentary array of transportation options that serve different travel markets, including park-and-ride, which can reinforce regular fixed route transit service, as well as vanpool and carpool opportunities. Multiple park-and-ride facilities are needed to capture vehicle trips either at the trip's origin and provide express transit for the majority of the trip, or relatively close to the final destination and provide shuttles for the last leg of the trip. Facilities are needed to serve both distinct travel markets.

Regional Commuters

Traditionally, park-and-ride lots are used to intercept what would be single (or low) occupancy vehicle (SOV) trips near their trip origin and transfer to a higher-occupancy mode. Generally, if more than half of the trip is getting to the park-and-ride facility by SOV, commuters are likely to continue driving to reach their final destination. National research indicates that the majority of park-and-ride users live within five miles of the facility they utilize, and more than 80 percent come from within 10 miles[1]. These commuters make up one kind of travel market for future park-and-ride facilities in the study area.

1 TCRP Report 95, 2004. Page 3-31

Satellite Parking

The second type of travel market comes from the commuting demand and parking policies at UNC and downtown Chapel Hill. Parking restrictions and other limitations on parking availability make it necessary for many commuters to use satellite parking locations and take transit for the last leg of the trip to campus or downtown. The University's park-and-ride facilities function as peripheral or satellite parking facilities. All 1,647 spaces at the Friday Center are reserved for University permit holders. Chapel Hill Transit operates express and local bus service in both Chapel Hill and Carrboro; park-and-ride facilities have been implemented along most major road corridors that lead into Chapel Hill and the UNC campus and medical complex, as shown in Figure 3-1.

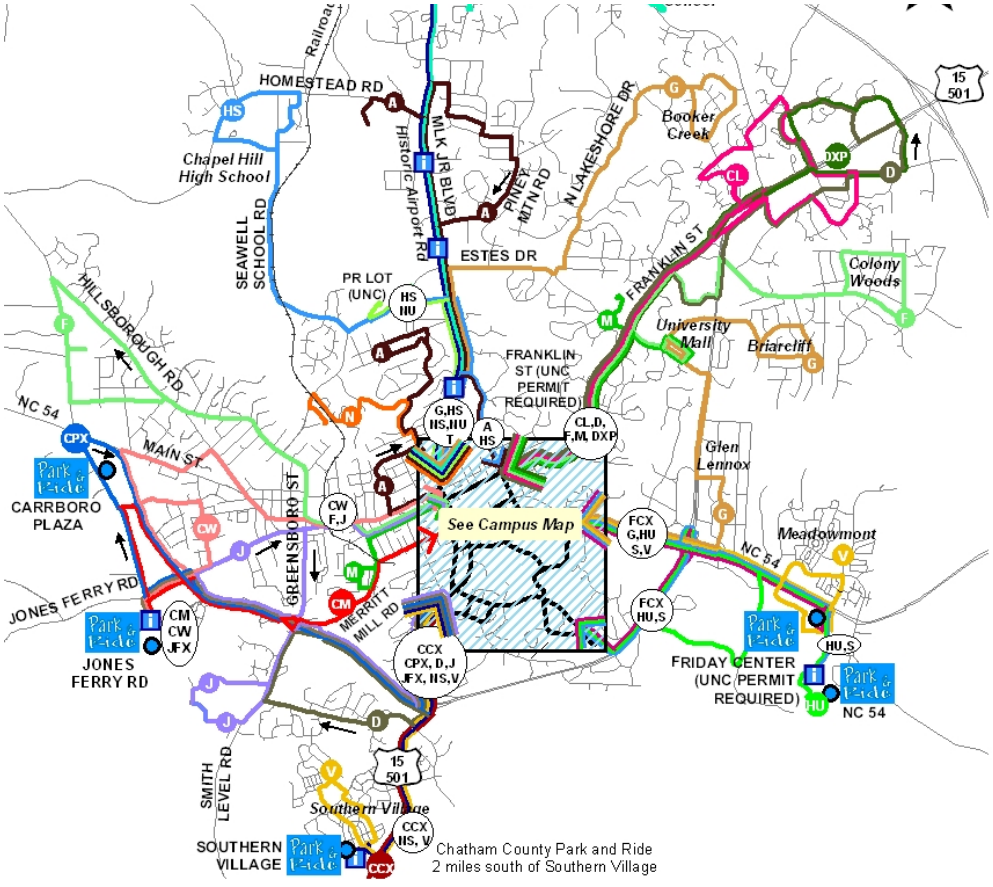

Figure 3-1: Park-and-Ride Facilities Served by Chapel Hill Transit

Source: Chapel Hill Transit

Due to parking restrictions in downtown Chapel Hill and UNC, Chapel Hill Transit offers service from park-and-ride facilities along every major road corridor into Chapel Hill and the campus.

Recommendations

Park-and-ride facilities to serve both travel markets are needed within the study area. The success of UNC's many "park-and-ride" lots demonstrates the dependence on satellite parking facilities like the Friday Center. Regional distribution data of UNC employees and students provide evidence of significant demand for satellite parking spaces to serve UNC commuters who live in southern Durham County and Wake County; about one quarter of all UNC employees and students reside within southern Durham County and Wake County. If all drive, this equates to about 17,000 daily trips, or 30 to 40 percent of the 2009 daily traffic volume on NC 54. However, the Friday Center supplies enough parking spaces for about 20 percent of this demand.

"Implementing strategically located park-and-ride facilities will decrease demand on the region's highway systems by moving more people in less vehicles. These facilities provide high-occupancy travel opportunities for residents of areas where densities are low and transit service in not frequent enough or available."

In addition to the satellite parking facilities, more traditional park-and-ride facilities will provide other options for commuters to reach their destinations. Commuters across the Triangle region, not just the UNC community, will benefit from park-and-ride facilities that are located within close proximity to home by saving money, reducing driving stress and saving time. Implementing strategically located park-and-ride facilities will decrease demand on the region's highway systems by moving more people in less vehicles. These facilities provide high-occupancy travel opportunities for residents of areas where densities are low and transit service in not frequent enough or available.

The following park-and-ride facility recommendations, shown in Figure 3-2, are strategically positioned to serve both the regional commuters who live nearby and want to take transit or carpool for the majority of their commute and the employees who cannot park at their final destination. The recommendations also strategically connect to all of the different types of available services for high-occupancy travel, including three different bus transit systems offering local and express service, the proposed light rail system to connect Chapel Hill with Durham and Raleigh, and the planned I-40 high-occupancy vehicle (HOV) lanes.

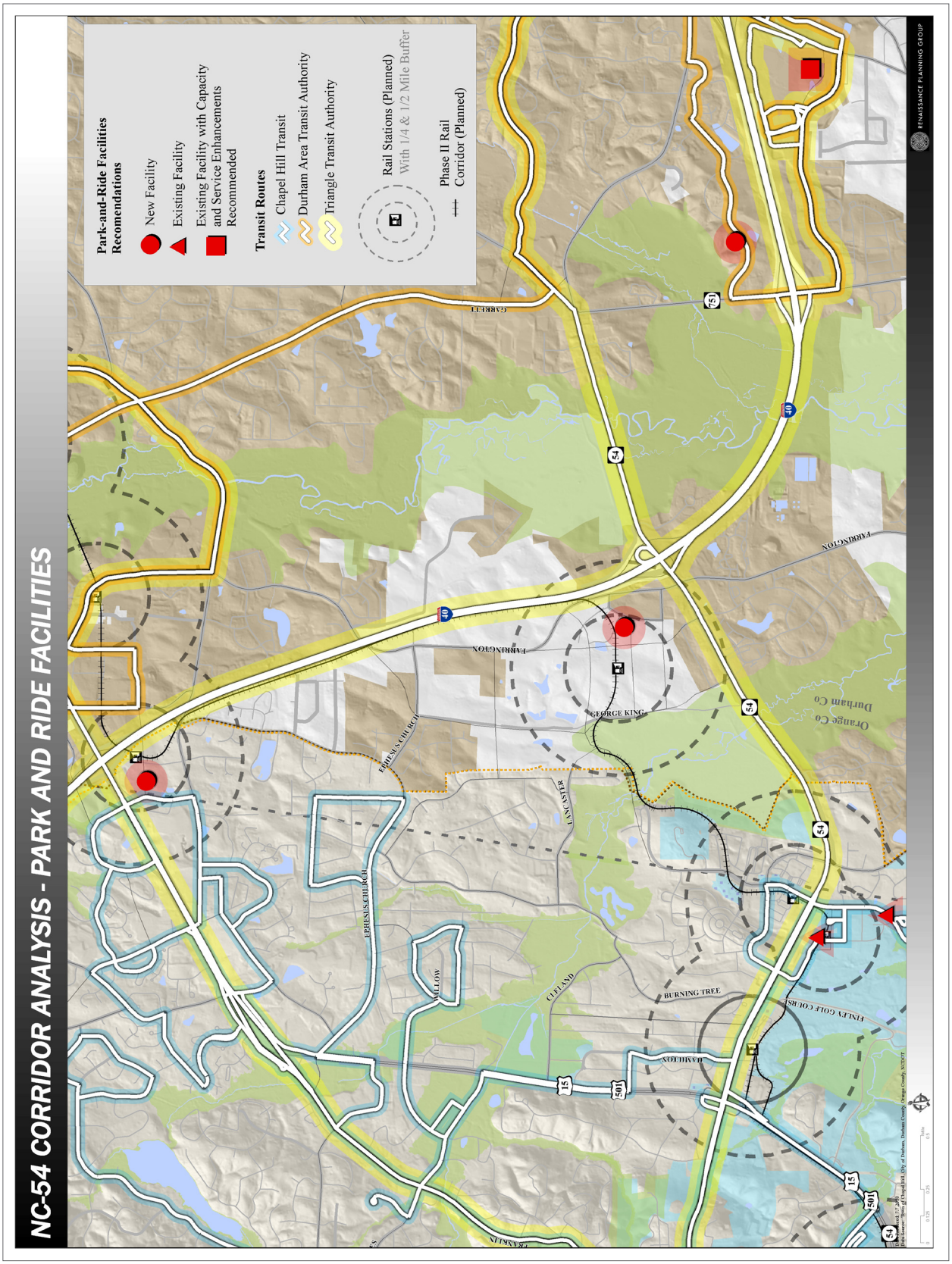

Figure 3-2: Park-and-Ride Facility Recommendations

Multiple park-and-ride facilities are needed to capture vehicle trips either at the trip's origin and provide express transit for the majority of the trip, or relatively close to the final destination and provide shuttles for the last leg of the trip.

Friday Center Park-and-Ride Facility

Within the NC 54 study area, the Friday Center is a successful park-and-ride lot for satellite parking with 1,647 total spaces. Within this complex, three different parking lots provide designated parking spaces for UNC parking permit-holders. The complex is served by four different CHT lines. The Friday Center park-and-ride facility generates a large amount of transit ridership for CHT. The four transit stops that serve the Friday Center park-and-ride facilities account for roughly five percent of the system's total daily boardings and alightings, and about 55 percent of the daily boardings and alightings within the NC 54 corridor study area[2]. The combination of close proximity to the university and medical campus, frequent and reliable transit service, guaranteed ride home policies, amenities for waiting passengers (bus shelters with benches and lighting), and the fact that the facility is owned and maintained by UNC has provided convenience, comfort and safety to UNC commuters and contributed to the massive success of this park-and-ride facility.

"Coupled with frequent and reliable transit service, the park-and-ride facility recommendations will provide commuters with multiple options that completely avoid driving in the NC 54 corridor. If successfully implemented, these recommendations will result in trip reductions within the study corridor."

Traffic generated by the Friday Center park-and-ride is an influential factor in the rush hour traffic patterns within the NC 54 study corridor. In the AM peak hour (7:30 to 8:30 AM), about 700 vehicles turn left from westbound NC 54 into Friday Center Drive, which is just as the Friday Center parking lot is filling up. About the same amount of traffic leaves the Friday Center to travel eastbound on NC 54 in the PM peak hour (5:00 to 6:00 PM).

The Friday Center lot, while very successful, is contributing to traffic congestion on NC 54 in the weekday peak hours because of its location. Many commuters access the facility from I-40 and pass through the Farrington Road intersection, contributing to the high volume of traffic at the already congested interchange area. Intercepting many of these auto trips prior to the NC 54/ I-40 interchange area would ease congestion at the interchange, while allowing UNC commuters to drive to a park-and-ride facility without the hassle of entering the NC 54 corridor.

As indicated in Chapter 2: Land Use Recommendations, substantial increases in development intensity are anticipated for the Friday Center area. When this happens, UNC may find that another location would be better suited to serve as a satellite parking facility.

As the corridor further develops, there will be opportunities to construct new park-and-ride facilities and enhance existing facilities. Coupled with frequent and reliable transit service, these facilities will provide commuters with multiple park-and-ride options that completely avoid driving in the NC 54 corridor. If successfully implemented, these recommendations will result in trip reductions within the study corridor. The locations discussed in the following sections will comprehensively serve the unique needs of all commuters within the region.

Southpoint Mall

Triangle Transit and DATA currently serve Southpoint Mall, which has approximately 50 designated spaces for park-and-ride. This facility will continue to be served by both transit agencies, and the mall will continue to be a key destination along Triangle Transit's regional "Core Service" route between Chapel Hill and the Regional Transit Center. Due to the lack of a major retail center in Chapel Hill and the high number of students who do not have vehicles/parking on campus, the travel market between UNC and Southpoint is and will continue to be strong, and should be strengthened by the additional development that is planned or may be expected to occur in the Southpoint area. This park-and-ride facility has the potential to reach a large portion of

2 Automated passenger counting data for the monthly average of March 2009 was obtained from Chapel Hill Transit.

the commuters in Wake County and southern Durham County, as well as serve the UNC market. Public citizens have advocated for a park-and-ride facility within this area. At the final public workshop several participants expressed the desire for a park-and-ride facility to be located east of the NC 54/ I-40 interchange, along the highway and out of the corridor.

The Southpoint Mall park-and-ride facility has the potential to provide regional bus service to commuters with connections to RTP, Raleigh and Cary. Additional development may be expected within the Southpoint area, which will contribute to the travel market for this park-and-ride facility.

"The Southpoint Mall park-and-ride facility has the potential to provide regional bus service to commuters with connections to RTP, Raleigh and Cary. It can also serve commuters who are traveling to UNC and downtown Chapel Hill."

The facility can also serve commuters who are traveling to UNC and downtown Chapel Hill as it is located east of the NC 54/ I-40 interchange and can intercept westbound trips that would otherwise go through the congested interchange area and Farrington Road intersection. Triangle Transit's recent service improvements will consolidate the routes that serve Southpoint and UNC to improve reliability and on-time performance.

Recommendations for this park-and-ride include increasing visibility of the facility, increasing transit frequency, and increasing capacity of the existing space allotment. Increasing visibility of the facility will increase usage by building awareness of the site. Research shows that the majority of park-and-ride patrons learn about their facility by seeing it or driving past it[3].

Increasing transit frequency to 15-minute headways or less is recommended at this facility. Currently, Triangle Transit buses stop at the Southpoint Mall park-and-ride every half-hour during morning and evening peaks. DATA buses service the facility every half-hour throughout the day. Commuters need frequent and reliable bus service if they are going to use a park-and-ride facility. With the visibility and transit service improvements, it is expected that more commuters will want to use the facility. Increasing the capacity of the facility with more spaces in conjunction with the other improvements is recommended.

NC 751 at Southpoint Auto Park Boulevard

Providing additional capacity at the Southpoint Mall may prove to be challenging as it will depend upon renegotiation with the mall ownership. The number of spaces may be limited. A longer-term facility off of Southpoint Auto Park Boulevard is recommended to provide the same benefits as the Southpoint Mall park-and-ride, but could be constructed and expanded to provide as many spaces as necessary. This facility should provide express transit service for regional commuters to RTP, Raleigh and Cary and could also provide satellite parking for UNC. Chapel Hill Transit could provide express service into downtown Chapel Hill and the UNC campus.

At the third and final public workshop, the study team presented the possibility of implementing a park-and-ride facility off of NC 751 near the car dealerships. The citizens in attendance had mixed opinions about this location. Several participants believed that this location would not logically serve Chapel Hill because it is too far away and out of the way for those who are traveling on I-40. Others supported it because it would relieve a portion of the traffic heading to the NC 54 corridor. Ultimately this park-and-ride facility is recommended, and negotiations with developers and land-owners for acquiring the property and right-of-way for the facility should proceed to ensure the feasibility of implementing the facility in the future.

3 TCRP Report 95, 2004. Page 3-34

US 15-501 & I-40 Interchange Area (Gateway Center)

A park-and-ride facility near the interchange of US 15-501 and I-40 has the potential to serve the travel markets for regional commuters and as a satellite parking facility for UNC and downtown Chapel Hill. This facility may be located somewhere within the Gateway Center if convenient, but the most highly-visible and easily-accessible location from I-40 and US 15-501 should be pursued.

Regional distribution data of UNC employees and students indicate that more than a quarter of the students and employees that are commuting to the UNC campus and hospital are coming from the area in and around downtown Durham and central Durham County. These commuters most likely use US 15-501 to commute to one of the park-and-ride facilities. To access the Friday Center facility, these commuters must go through the congested NC 54/ I-40 interchange. An easily-accessible and highly-visible park-and-ride facility at the interchange of I-40 and US 15-501 would intercept these trips prior to reaching the congested interchange. As recommended in the transit section of this report, this park-and-ride facility should be served by fast and direct transit service into UNC and downtown Chapel Hill.

"The Leigh Village park-and-ride has the potential to serve multiple purposes: as a satellite parking facility for commuters coming from southern Durham County, Wake County and areas to the east; as a park-and-ride facility for nearby residents to take the light rail to Durham and beyond; and as an off-site parking facility for the Leigh Village station area development."

The residential areas between NC-86 and I-40 and to the west are just a few minutes' drive away from this interchange. The primary travel market for this facility would be the northern Chapel Hill area. With enhancements to the DATA service, commuters who live within close proximity could have service into downtown Durham. It would also be a prime location for local residents to meet for carpools and vanpools, with its close proximity to I-40 and the HOV lanes.

A station for the preliminary proposed light rail transit system is planned at the southeast quadrant of the US 15-501 and I-40 interchange. Once the light rail system is implemented, this park-and-ride will provide a fast and direct connection into Duke University and downtown Durham. The specific location for the park-and-ride facility should be determined in conjunction with the planning process and alternatives analysis for the LRT system. The direct connection to the light rail system will capture many northern Chapel Hill commuters.

Leigh Village

A park-and-ride facility on the fringe of the Leigh Village station area will provide unique benefits. Commuters will be able to use the facility to access downtown Chapel Hill and UNC via bus rapid transit in the interim and light rail transit in the longer term. This facility has the potential to serve many of the commuters coming from westbound I-40 in southern Durham County, Wake County and areas to the east, acting as a satellite parking facility for commuters and providing an alternative to the existing facilities at the Friday Center. This location is approximately 3.5 miles away from the center of the UNC campus. Nearby residents can use it to take the light rail to Duke University and downtown Durham. The facility will also provide off-site parking for the Leigh Village station area development.

Because it will serve multiple purposes, the demand for this facility will be very high, and it is anticipated to generate a significant amount of trips. Just like the development of mixed use, office, residential and other land uses within the station area, this park-and-ride facility should be phased with transportation improvements. Each phase of facility construction will depend upon assessments of traffic impacts and the need for additional transit improvements. Phased transportation improvements will allow the station area and park-and-ride facility to develop concurrently with increases in multimodal transportation capacity. In the

short to mid-term, the transportation network will need bus rapid transit service and capacity improvements at Farrington Road (namely the continuous slip ramp and eastbound flyover ramp). Depending on timing relative to traffic volume growth on NC 54, a threshold of development will be reached such that new interchange access ramps will be required.

The key to implementing this particular park-and-ride facility will be to locate it outside of the Leigh Village community center. The Leigh Village station area should be a community hub with high-density mixed-use buildings and walkable streets. The large parking garages necessary to accommodate the high demand should be located away from the center, but no farther than 1/2 mile from the station if possible, to enable walk trips to the core commercial area.

Other Park-and-Ride Facilities

The study team also reviewed and presented a potential park-and-ride location on Farrington Road south of NC 54 at the water treatment plant. This location is not recommended for several reasons: it will further complicate traffic conditions at the already congested Farrington Road and NC 54 intersection; the water treatment plant has plans to expand which would only make this a temporary facility; and it would be duplicating the services of other recommended park-and-ride facilities.

Table 3-1 Park-and-Ride Recommendations

PARK AND RIDE					
Description	**Location**	**Jurisdiction**	**Phase**	***O&M Cost**	***Capital Cost**
Increase visibility and capacity at the Southpoint Mall park-and-ride facility. Increase transit frequency to 15-minute headways or less.	Southpoint Mall park-and-ride facility on the southwest quadrant of the I-40/ Fayetteville Rd interchange	Durham	Short Term (2012-2017)	$670,000	$1,170,000 (3 buses at $390,000 each)[4]
Construct NC 751 park-and-ride facility.	Along Southpoint Auto Park Blvd off of NC 751 just north of I-40	Durham	Short Term (2012-2017)	$50,000[5]	$625,000[6]
Construct highly visible structured park-and-ride facility with easy access from I-40 and US 15-501 near proposed light rail station.	At the I-40/ US 15-501 interchange with easy access to light rail station	Chapel Hill	Mid Term (2017-2022)	$50,000[5]	$30,000,000[7]
Implement a structured park-and-ride facility at the Leigh Village station area to be phased with transportation improvements.	Leigh Village light rail transit station area	Durham	Mid Term (2017-2022)	$400,000[8]	$40,000,000[8]

4 Operating and vehicle capital cost assumptions from Triangle Transit

5 On-going operating and maintenance costs are assumed to be $200 per space. Assumes ownership of facility.

6 Park-and-ride cost for construction of an open-air lot is assumed to be $2,500 per space (industry estimation standard). Planning level cost estimate assumes 250 spaces at this facility.

7 Park-and-ride cost for construction of a multi-level structure (attached or detached from other uses) is assumed to be $20,000 per space (industry estimation standard). Planning level cost estimate assumes 1,500 spaces at this facility.

8 Park-and-ride cost for construction of a multi-level structure (attached or detached from other uses) is assumed to be $20,000 per space (industry estimation standard). Planning level cost estimate assumes 2,000 spaces at this facility. Capacity at this facility should be implemented in a phased manner with transportation improvements. Detailed market analyses should be conducted to determine the appropriate capacity of the facility.

* Costs for park-and-ride facility improvements are based on 2010 dollars, and not adjusted for inflation to year of expenditure.

Analysis of Data

UNC provided data sets showing the regional distribution of UNC students and employees (of the university and hospital). As shown in Figures 3-3 and 3-4, most of the employees and students live within Chapel Hill and Durham. However, a significant amount of employees and especially students reside in Wake County in the areas in and around Cary and Raleigh. In addition to those who live in southern Durham County, most UNC employees and students who live in Wake County commute through the NC 54 corridor to get to the Chapel Hill main campus.

Figures 3-5 and 3-6 show the proportion of employees and students by approach corridor. Commuters from the two green areas (southern Durham County, northeastern Wake County, Raleigh area and middle Wake County) would likely use I-40 to NC 54 to commute in to Chapel Hill. Commuters from the dark red area (southwestern Wake County) would likely use NC 751 to NC 55 or NC 54 to commute in to UNC. Within the areas, there are about 4,200 UNC employees and 4,300 students who are going to and from Chapel Hill through the NC 54 study segment, which equates to almost 17,000 daily trips. Assuming that all of these commuting trips are made by single-occupancy vehicles, 17,000 vehicles equates to roughly 30 to 40 percent of the current daily traffic volume. This area represents 24 percent of all UNC employees and students, and 43 percent of all employees and students who live outside of a five mile radius from the UNC Bell Tower. The Friday Center park-and-ride facility's 1,640 park-and-ride spaces are comparable to about 20 percent of the "in" trips for these areas. The remaining 80 percent of the "in" trips are passing through the corridor, and a majority of these trips could be accommodated by providing more park-and-ride capacity coupled with better transit service to the campus and medical facilities.

The project team also examined the labor shed for Chapel Hill according to the US Census Bureau's "OnTheMap" Origin-Destination Database, a web-based mapping and reporting application that shows where people work and where workers live. Figure 3-7 shows the distribution of workers within the three census blocks of the UNC campus in Chapel Hill (as shown in the yellow and red boundary) by where they live. While many workers are located north and west of the UNC campus, there are a large number of workers who live in central Durham County and who most likely drive in to UNC using US 15-501 or NC 751 to NC 54. These commuters will be served by light rail in the future and would benefit from additional park-and-ride facilities.

The figures on the following pages show evidence of the regional dispersion of employees and students who are trying to commute in to UNC. The scarcity of parking makes it essential for longer-distance commuters to use a high-occupancy travel mode, either transit or ridesharing, to reach their final destination, while shorter trips can be made by biking or walking.

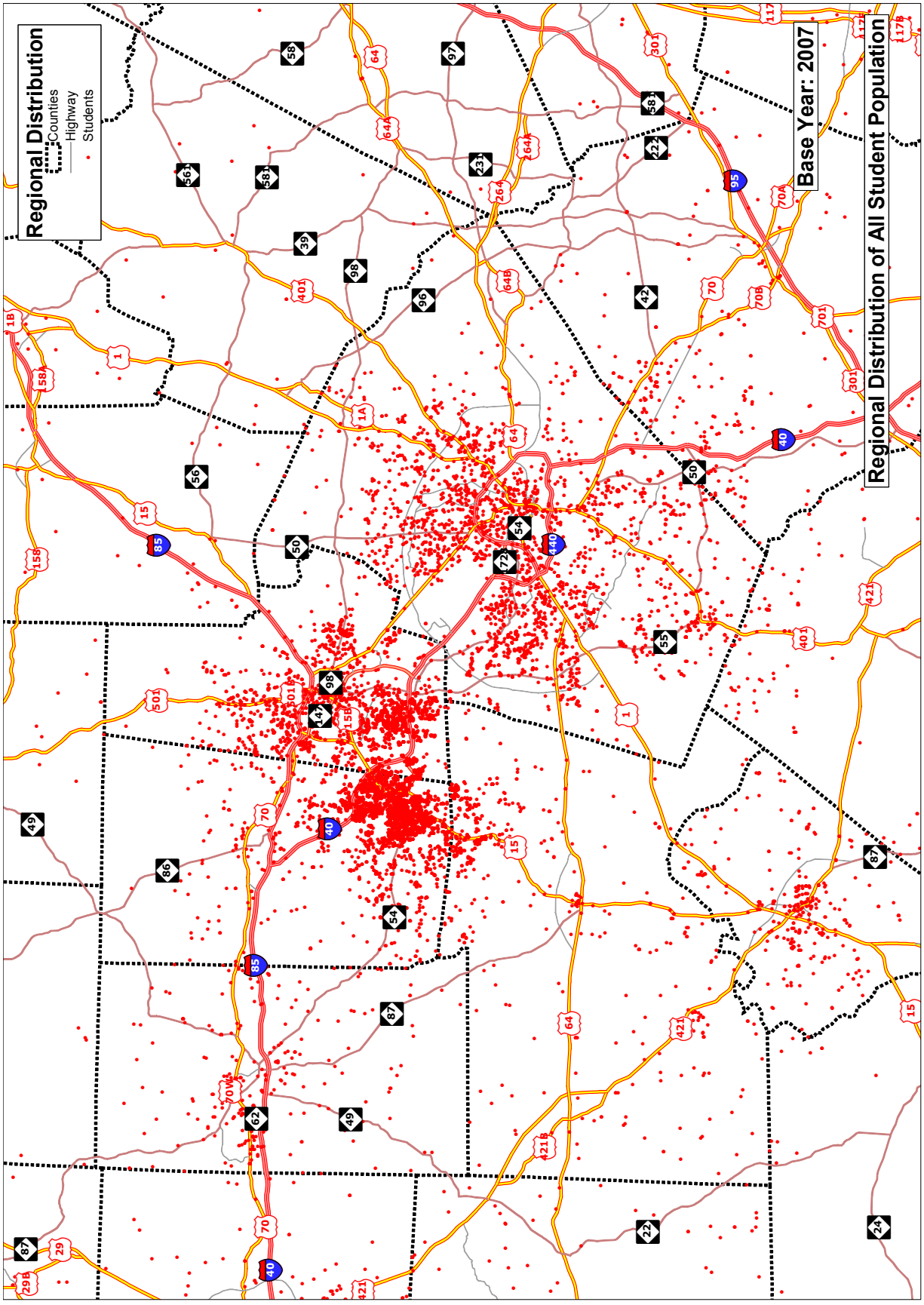

Figure 3-3: Regional Distribution of UNC Student Population

Source: University of North Carolina at Chapel Hill

Most UNC students live within Chapel Hill and Durham, although many reside in Wake County and commute through the NC 54 corridor.

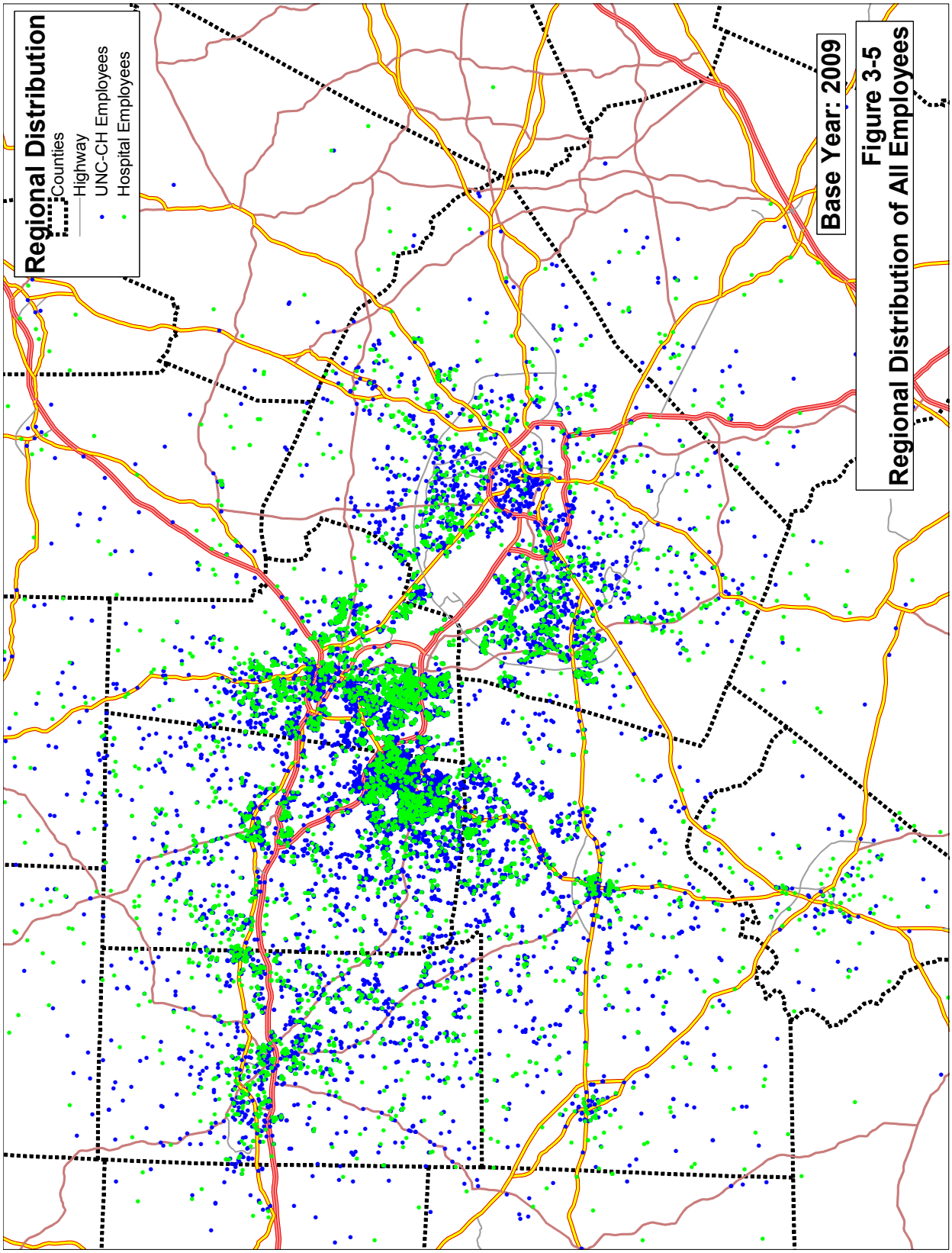

Figure 3-4: Regional Distribution of UNC Main Campus and Hospital Employees

Source: University of North Carolina at Chapel Hill

A significant amount of UNC employees reside in and around Cary and Raleigh, most likely commuting through the NC 54 corridor.

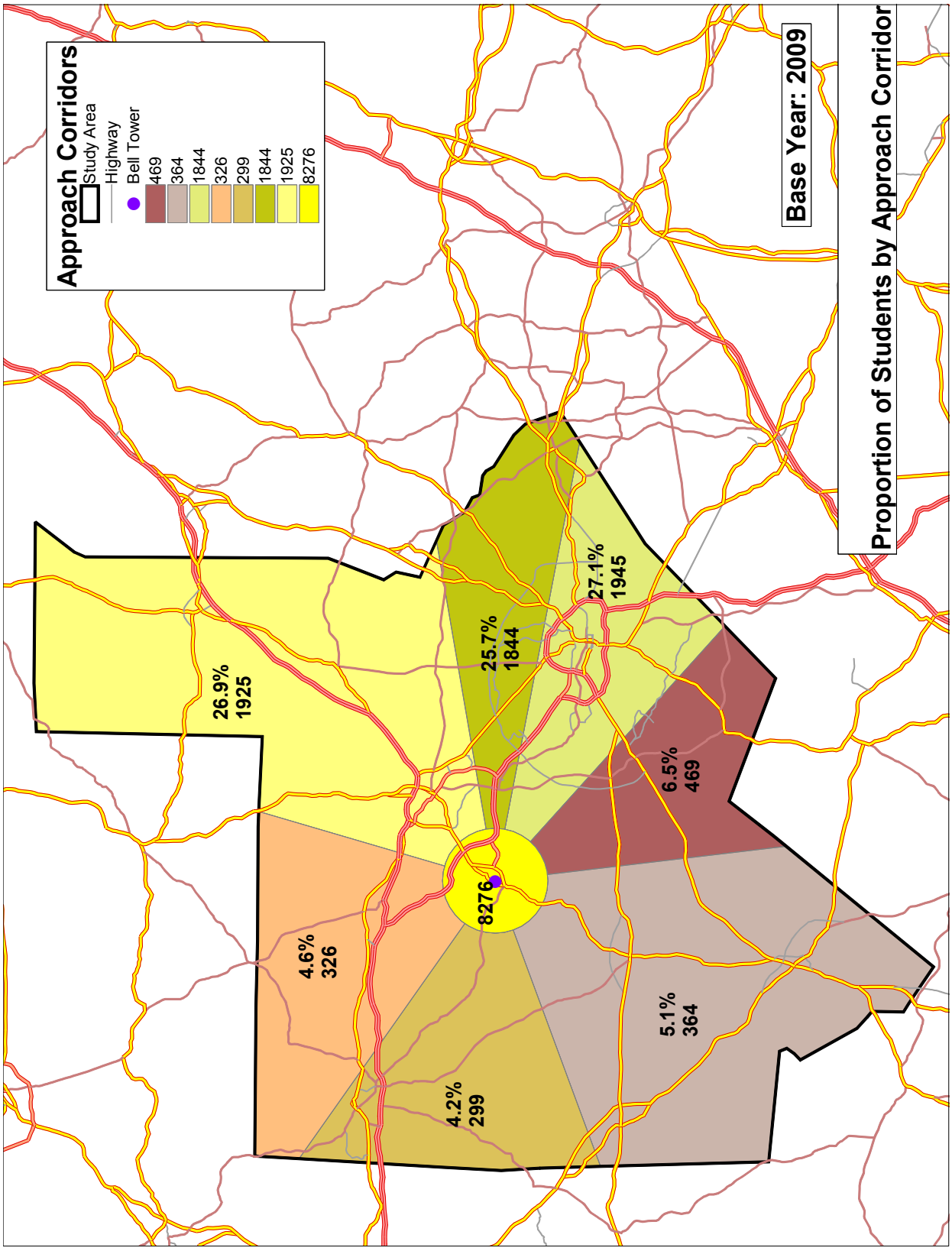

Figure 3-5: Proportion of UNC Students by Approach Corridor
Source: University of North Carolina at Chapel Hill.

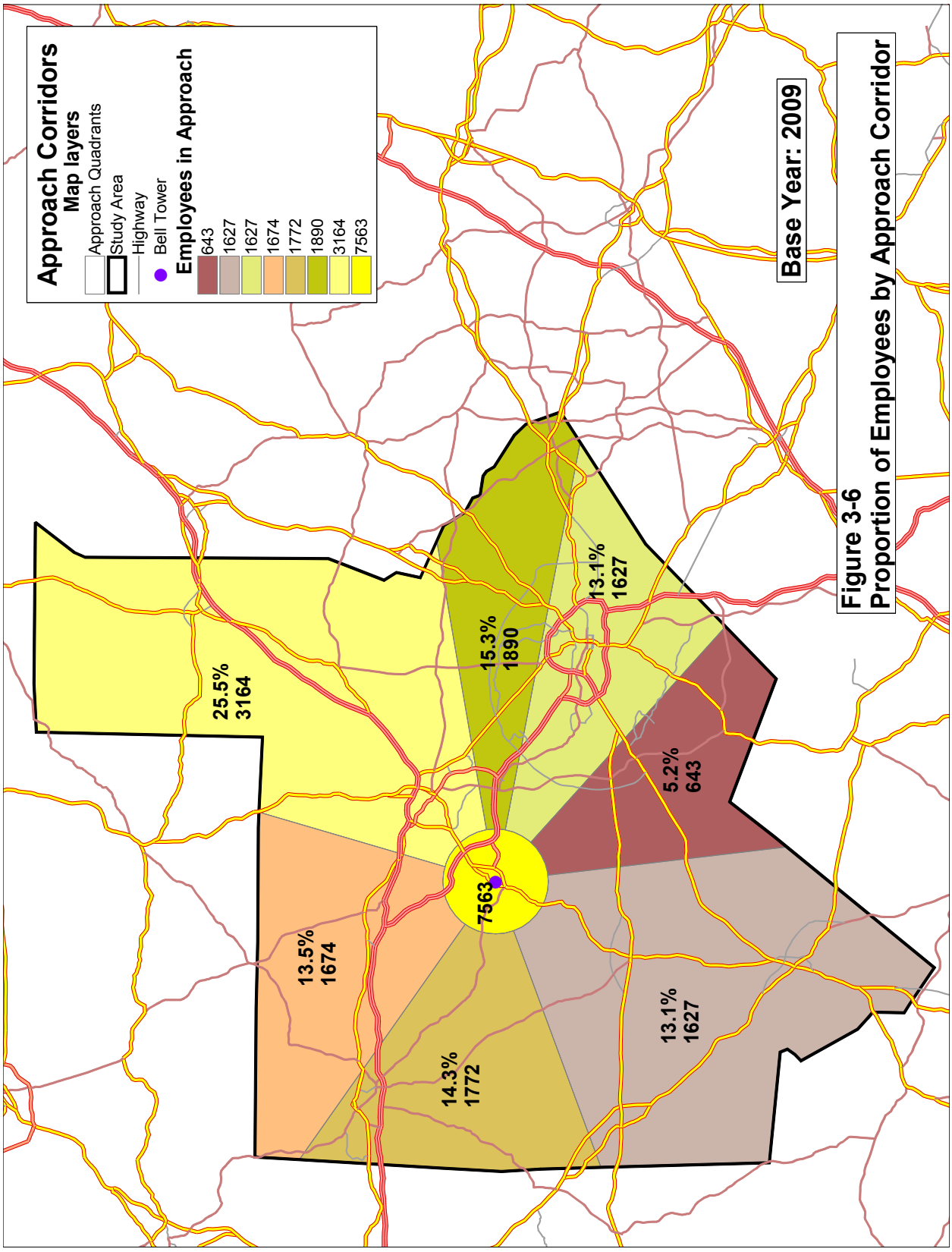

Figure 3-6: Proportion of UNC Main Campus and Hospital Employees by Approach Corridor

Source: University of North Carolina at Chapel Hill.

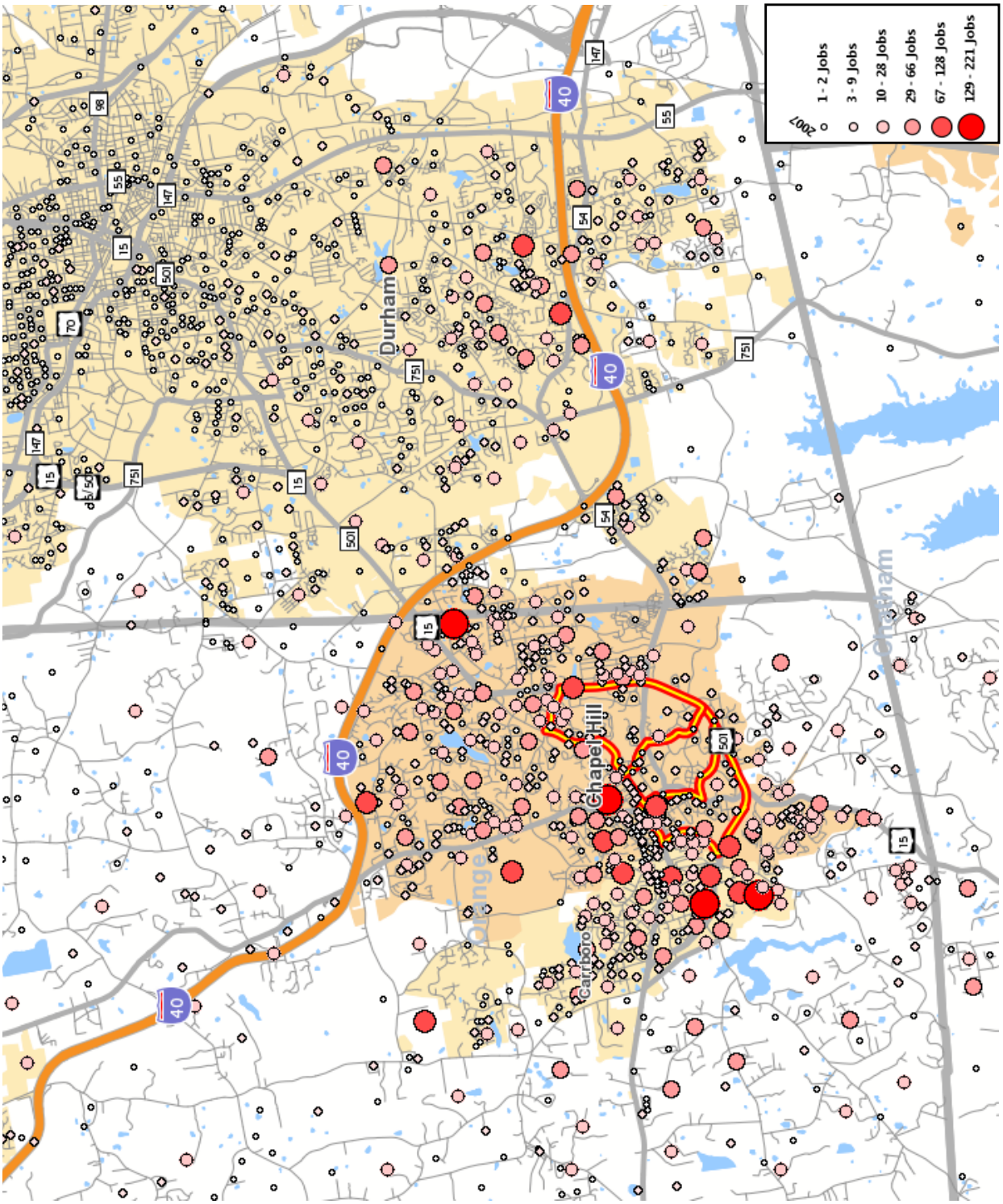

Figure 3-7: Labor Shed Report for 2007

While many workers within the selected three census blocks live north and west of the UNC campus, many others live in central Durham County and most likely drive to UNC using US 15-501 or NC 751 to NC 54. Source: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics Program.

Best Practices for Park-and-Ride Facilities

Ultimately, in order for park-and-ride facilities to be successful in intercepting single-occupancy trips, they must offer significant cost savings, time savings, or eliminate the stress of driving to work. Research and case studies from across the nation have demonstrated that several factors are related to the usage and success of regional commuter park-and-ride facilities. Applying these practices to the recommended park-and-ride facilities will enhance the usage of facilities and help attain the goals of reducing VMT and congestion. Ultimately, commuters desire convenience, cost savings and comfort during their daily commute, and a park-and-ride facility will be most successful if the transit or carpool services that access the facility provide a competitive alternative to driving alone.

Travel time is a critical consideration for travelers in choosing whether to use a park-and-ride facility. Commuters expect fast and direct service to their destination; otherwise they will not see a benefit in leaving their personal car behind. Facility utilization is strongly tied to the waiting time for service. Research indicates that demand for park-and-ride facilities with bus service sharply declines when headways are greater than 15 minutes, see Figure 3-8. A robust regional transit system is necessary to provide commuters with efficient transportation from the park-and-ride facility to their destination.

With the exception of satellite or peripheral parking facilities like the Friday Center, driving distance from home is another influential factor in whether a commuter will use a park-and-ride facility. Relative to the length of the overall trip, commuters tend not to use a facility that is too far away from home, especially if the facility is in the opposite direction from their place of work. Different studies have shown that commuters may drive up to 10 miles in the direction of travel to reach a park-and-ride facility, but rarely backtrack more than a mile[9].

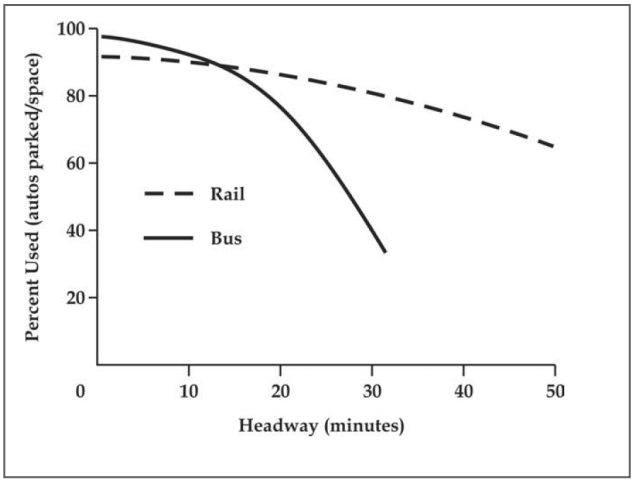

Figure 3-8: Effect of Transit Frequency on Park-and-Ride Utilization

Source: TRCP Report 95, 2004. Page 3-37

Usage and ridership levels of park-and-ride facilities with bus transit service are directly related to frequency of transit service. Usage sharply declines if commuters must wait more than 20 minutes for a bus.

However, if the time savings are significant, commuters will drive longer than 10 miles to reach a facility. It is expected that the facilities providing access to the light rail transit system will have a larger market sphere than those with just bus transit service. Strategically locating park-and-ride facilities can capture different residential markets.

The majority of park-and-ride patrons become aware of the facility by seeing it; this is especially true for facilities with bus service. Park-and-ride facilities should be highly visible, preferably from approach roads that serve as major commuting corridors[10]. The recommended park-and-ride facilities for the NC 54 study area are located just off of major roads like I-40, and US 15-501. Facilities must also be easily accessible from the major highways. More time spent driving to a facility translates to a decrease in the probability that the facility will be used.

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10 TCRP Report 95, 2004. Page 3-34

Generally, park-and-ride facilities located in severely congested corridors experience stronger demand, likely due to longer trip times and unpleasant driving conditions. Congestion is also an indicator of overall traffic volumes and thus greater market size[11]. The Leigh Village and US 15-501/I-40 facilities are expected to have greater demand due to their close proximity to the heavily traveled interstate. Facilities which give priority treatment to transit services or carpools after leaving the lot are especially successful in congested corridors. The close proximity of the Leigh Village to the proposed HOV lanes should ensure high demand at this facility. If possible, bus transit service should be given priority treatment at other facilities in the area.

Ownership, Construction and Maintenance

Assigning responsibility for ownership, construction and maintenance is a key element in planning for park-and-ride facilities. Controversial issues may arise throughout the planning and implementation processes, and it is important to note that the responsibility of the facilities should be clearly understood.

Usually it is the agency that most benefits from a park-and-ride facility that takes responsibility for it. For example, the Friday Center facility is owned and maintained by the University of North Carolina at Chapel Hill, and the UNC employees and commuting students are the target audience of the facility. Triangle Transit and Southpoint Mall have an agreement regarding the park-and-ride facility there: Triangle Transit leases spaces from the Mall, and the Mall is responsible for the maintenance of these spaces, as it is with the other parking spaces for the Mall.

The issue of responsibility can become controversial when several agencies are benefitting from a facility. Most of the recommended park-and-ride facilities, especially the Leigh Village facility, will have more than one target market. UNC will benefit from having another satellite parking facility, while Triangle Transit, Chapel Hill Transit, and DATA will have facilities from which to gather a 'critical mass' of riders, and NCDOT will benefit from decreased highway congestion due to the transit ridership and carpool opportunities. The issue of responsibility for the ownership, construction and maintenance of the facility must be clearly addressed early in the planning process.

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Leigh Village Park-and-ride Facility Development Strategy

This section presents a preliminary outline of a potential public-private partnership to develop the Leigh Village park-and-ride facility as an intermodal center and transit-oriented development site. With its strategic location along the NC 54 corridor providing access to I-40, parking for the UNC campus, and a future LRT station, the new facility will be an integral part of implementing mobility solutions through the NC 54/I-40 Corridor Master Plan.

Project Structure

The project would have the following basic components: (1) a parking structure to accommodate increasing park-and-ride needs as well as adjacent development, (2) a site reserved for the future LRT station, and (3) a number of privately owned sites for transit-oriented development. A potential strategy for the project envisions it taking place in three phases:

1. **Predevelopment.** In this phase land assembly is completed and planning of the entire project occurs. The assembled land would be re-subdivided as called for in the master plan and the necessary parcels for the parking structure and transit station area created. A tax increment financing (TIF) district and/or a municipal services district (MSD) could be created to provide a revenue stream to cover the initial costs of facility development and longer term infrastructure needs. While this is a relatively new concept in North Carolina that is not yet in widespread use as in some other states, this type of financing tool can be a very effective way to fund redevelopment or community improvement projects that would not otherwise occur without the assistance of a government entity. Following creation of a TIF or MSD, planning and construction of any new or expanded public utilities needed for future development would begin.

2. **Parking Structure**. A private developer (either the original land developer or another entity) could construct the parking structure, or if it is to be publicly owned then its parcel would be conveyed to a public entity, most likely the City of Durham. Depending on the master plan details, street right-of-way necessary for public access to the structure and transit station may need to be dedicated at this stage. The owner would obtain financing, oversee construction, and establish the operating structure of the facility. Blocks of parking spaces would be leased to major users such as UNC and Triangle Transit (if dedicated station parking is required), but some parking spaces would be reserved for use by future private development. Ownership of the parking structure is discussed in more detail below.

3. **Transit-Oriented Development.** This phase would take place as dictated by market demand and the timing of LRT service implementation. The private land developer(s) who assembled the project site would be in a position to sell building parcels adjacent to the parking structure and transit station to other builders, who would construct projects according to the requirements of the master plan prepared in the Predevelopment phase. Individual TOD projects would be able to acquire some or all of their required parking (as needed) from the block of reserved spaces in the structure. Construction of the LRT station also would take place in this phase. As development continues, the increase in local traffic volumes or other factors may require improvements to offsite transportation facilities, such as direct access ramps connecting the structure with I-40.

This is a simplified outline of a complex process that will have a series of steps and stakeholders, many of which are interdependent and subject to negotiation. The three phases above describe the basic critical path of the project.

Potential Roles

Table 3-2 following this section presents the three project phases and describes the potential roles of key stakeholders. In order to craft a workable partnership the objectives of these entities must be aligned, whether through their inherent interests or specific incentives built into the project structure.

- **Land Developer(s).** A single development entity is assumed to be engaged in land assembly in order to simplify the process. The land developer has the key role of producing a master plan for the entire project (with other stakeholder input) and delivering construction-ready sites first for the parking structure, later for the transit station, and finally for private development projects. The developer also could build and operate the parking structure, or sell those rights to another private entity. In the interim period before the private TOD begins to occur, the developer could participate in the project as the for-fee Development Manager of any publicly financed buildings such as the parking structure (if publicly owned), LRT station, or both. This would serve as a financial incentive to the developer for maintaining the partnership, and also allow the public entities to outsource construction and obtain the increased flexibility that can come from private contracting versus the traditional public procurement process.
- **City of Durham.** The City is envisioned as the key public entity in the project. It would review and approve the plans, provide public utilities to the area, create public-private financing vehicles such as the TIF district and/or MSD, and potentially own the parking structure. If the parking structure is publicly owned, the City would be responsible for obtaining financing, leasing spaces to other park-and-ride stakeholders, and potentially operating the structure. The City in this case also would hold in reserve the blocks of parking spaces for future conveyance to TOD projects. Ownership of the parking structure is discussed in more detail below.
- **Triangle Transit.** The transit agency will provide important input during the planning stage on the LRT station location and the internal site circulation needs for effective service provision. It may also lease park-and-ride spaces in the parking structure to serve the station. Depending on the desires and capacities of the stakeholders, Triangle Transit also could operate and maintain the parking structure on behalf of a public or private owner. The agency also will be responsible for purchasing the transit station parcel and constructing its facility.
- **University of North Carolina-Chapel Hill.** Coordination with UNC will be important in the initial stages of parking structure construction to ensure that the facility meets its needs and replacement parking for current users is provided effectively. Once the structure is complete, the university would lease a block of spaces from the structure's owner.
- **Builders.** Individual builders and developers would bid to purchase entitled parcels from the original land developer to construct TOD projects. These private transactions would be stimulated by the presence of the parking structure and future transit station, which will generate activity in the area and a captive audience for TOD. The builders also will benefit from the availability of parking capacity in the structure that can serve the TOD, reducing the cost burdens of providing on-site parking for their individual projects. The financial structure of the public-private partnership could potentially be crafted to assist development and/or provide incentives for higher density by discounting the conveyance price of the structured parking spaces below the current per-space cost of new parking construction.
- **MPO/NCDOT.** If major offsite transportation improvements are required as part of the area's development evolution, funding from the state and/or federal governments is likely to be required, as the costs will probably too high for private development projects to bear alone. The DCHC MPO and NCDOT will be key entities for identifying and prioritizing funds and implementing projects to maintain an adequate level of service for access to the facility.

While the roles and responsibilities of each stakeholder will depend on the ultimate structure of the public-private partnership, two core principles are to (1) clearly define the boundaries between the public and private realms, both physically and contractually; and (2) empower each stakeholder to act within the areas where it will be the most effective of the options available. Public-private partnerships rely on the ability to create "win-win" situations, so the process must be structured so that the benefits are mutual.

Ownership of Parking Structure

As noted in the discussion above, the parking structure at the Leigh Village park-and-ride facility could be either publicly or privately owned. The objectives, capacities, and constraints of the stakeholders, as well as conditions in the development and financing markets at the time of negotiations, will influence the course of action taken. While the precise details cannot be known at this time, some of the benefits of the two ownership structures can be compared in order to frame the issues that should be considered.

The list below presents a general overview of the benefits of public versus private ownership of the parking structure, written from the perspective of a public entity (most likely the City of Durham).

- Public ownership benefits:
  - Simplifies the structure of any public-private financing via TIF and/or MSD sources
  - Reduces the borrowing cost for construction through tax exempt financing or the stronger credit rating of a public borrower
  - May be required if bonds are to be issued, depending on state statutes and/or bond market underwriting requirements
  - Assures public control of the facility and more direct influence over operating and maintenance policies
  - Creates a long-term, revenue-producing public real estate asset
- Private ownership benefits:
  - Minimizes direct costs to public budgets
  - Creates a major project opportunity and financial incentive for the developer
  - Allows for greater efficiency and flexibility in construction and operation of the facility

As the project roles are established and the details crystallize, a detailed study of the pros and cons of different ownership, financing, and operational structures should be conducted. Credible project scenarios should be prepared and considered in the context of both short-term and long-term policy goals, project objectives, and implementation realities.

	Land Developer(s)		City of Durham (CoD)	Triangle Transit (TT)	UNC-CH	Builders	MPO/ NCDOT
1. Predevelopment	Land assembly Site planning & entitlements Re-subdivision of site		Assist with land assembly if needed Review & approve site plan and subdivision Create TIF district Create MSD Plan & construct utilities as needed	Provide input on LRT station location & planning	Provide input on replacement park & ride spaces during construction		
2. Parking Structure*	Build structure or sell parcel to public entity Dedicate land for public right-of-way Development manager for project		Could purchase structure parcel and build facility Could operate & maintain structure, including leasing out spaces Reserve some parking spaces for future TOD use	Lease spaces for transit parking Could operate structure for a private or public owner	Lease parking spaces for university and health care facility users		
3. Transit-Oriented Development	Sell parcel for transit station to TT Development manager for station construction Sell TOD building parcels to Builders		Review & approve TOD projects Convey reserved parking spaces to TOD projects as needed (if owner of structure)	Purchase parcel for station Construct, operate & maintain station		Purchase building parcels & construct TOD Obtain reserved parking spaces in structure as needed	Design & fund offsite road improvements as needed

Table 3-2: Potential Phases and Stakeholder Roles of Leigh Village Park-and-Ride Facility

** The parking structure could be privately or publicly owned. The shading indicates that these tasks could be performed either by the developer or the City of Durham, depending on the ownership structure of the facility.*

Transit Recommendations

The transit recommendations presented in this section are one component of a multipronged approach to providing mobility and accessibility in the NC 54 corridor. The transit mode recommendations are complementary to the other modes, and are strategically integrated with the other recommendations. Transit service expansion, coupled with better pedestrian infrastructure, will encourage residents within the corridor to use transit for daily trips. The recommended land use patterns and design guidelines will promote transit-supportive development. More park-and-ride options with more frequent and reliable transit service will encourage commuters to carpool or use transit for daily commutes. In all, the recommendations strategically work together to reduce demand and enhance mobility with greater transportation options and better performance of the transportation network.

Overview

The section of NC 54 between US 15-501 and roughly a mile east of I-40 is a significant transit corridor providing connections between local and regional origins and destinations. This corridor is increasingly playing a significant role in the delivery of transit service between Chapel Hill, Durham, and Raleigh. Regional transit routes connect with Chapel Hill's major destinations, like the University of North Carolina at Chapel Hill, by traveling through the study area. Residents of Raleigh and southern Durham access Chapel Hill primarily via NC 54, and likewise, residents of Chapel Hill and Carrboro use NC 54 to reach Raleigh, Durham, and other parts of the Triangle. Because of this dynamic, the future success of this corridor is significantly related to the success of transit services in the region. To meet future demand, transit services must evolve to meet new regional travel expectations. The right type of transit service targeting specific markets, at the right time during the corridor's evolution will encourage more transit use.

As the corridor develops, new travel dynamics will drive transit demand, requiring greater investments in transit services. The current system design will no longer be able to meet future needs. More trips will pass through the corridor, and the corridor itself will become a larger regional destination. The evolution of transit services that best match the travel dynamics of the corridor must meet regional travel needs for all types of transit services: regional express bus routes, park-and-ride facilities, bus rapid transit and expanded fixed route bus service, and light rail service. As the travel markets connecting to and through this corridor grow, transit use will dramatically benefit from a more cohesive, coordinated approach.

A critical step toward increasing transit usage and creating a positive impact on traffic conditions in this corridor is to create a seamless transit service between local and regional systems. If regional transit markets can be addressed, and new riders attracted to new transit infrastructure, more local residents will benefit from the same service dynamics. A system that effectively serves regional transit markets will increase transit use. Park-and-ride facilities, investment in more bus service, development of express services, and even the implementation of light rail will expand transit's share of the regional travel market. Further, such services can be measured by using three of the Transit Quality of Services factors developed by the Transportation Research Board: service coverage (in a regional and local context), service frequency (as viewed as opportunities of travel and travel options), and travel time (comparing transit to automobile, and comparing existing to future transit services).

Current Transit Services

Two types of transit systems and routes serve the study area: local feeder routes provided by Chapel Hill Transit (CHT) and regional express routes provided by Triangle Transit (TTA). Both systems provide efficient service, targeting specific transit markets. CHT focuses on serving two markets: 1) commuters coming into Chapel Hill, accessing park-and-ride lots and 2) local residents accessing either residential or commercial destinations within the town boundaries of Chapel Hill and Carrboro. Triangle Transit focuses on serving regional commuter markets by providing service between regional destinations such as Chapel Hill, Durham, Raleigh, Research Triangle Park and RDU Airport.

The City of Durham does offer transit services, but the route alignments do not extend to the western edge of the city limits along this corridor. Durham residents accessing destinations along or through this corridor either drive or use TTA.

From Chapel Hill Transit's perspective, the study area represents the southeastern-most portion of its service area. Routes stop at Meadowmont and the Friday Center, near the town's eastern municipal boundary, and do not extend into the eastern half of the study area. Daily boardings at each CHT bus stop within the study area are shown in Figure 4-2. While little market demand for additional service currently exists beyond this boundary, pressure for CHT to travel as far as the interchange of I-40 is growing. Ridership for CHT in the study area is significantly influenced by the Friday Center park-and-ride facility, which provides UNC employees and students with remote parking and shuttle access to campus. Additional ridership is generated by transit destinations like Meadowmont, where high densities and a mix of land uses exist. CHT provides efficient service for these two types of markets and it is well-positioned to expand its services and role as a transit provider.

"Together, Triangle Transit and Chapel Hill Transit provide service to regional commuters and local residents, targeting specific travel markets. As new growth occurs, greater investments in new types of transit services must meet regional needs and growing transportation demands."

Triangle Transit services do travel through and stop in the study area but with a primary destination of UNC main campus and downtown. Many users of the TTA service are commuting regionally into the Chapel Hill area. Very few users of the service are originating or terminating within the study area due to service design factors: transfers between CHT and TTA are not well facilitated along the study corridor, and the most convenient transfer point is at the CHT transfer point in downtown. Chapel Hill residents who wish to use the regional bus service usually first travel a CHT route to downtown before transferring to a TTA regional bus route. The accumulated travel time makes this option least desirable for Chapel Hill residents traveling outside of the town for employment purposes.

Both systems have established a service targeting specific markets, and structured routes around resource allocations and jurisdiction limitations. As both systems continue to expand to meet new expectations related to growth, new types of services must be defined to provide an attractive alternative to automobile use. As each system expands it should consider which emerging markets need service, how to attract such markets, and what level of service should be provided to meet expectations. For example, a significant number of commuters traveling to Chapel Hill, through the NC 54 corridor, are accessing the UNC main campus for variety of purposes. Once that transit market's travel characteristics and choice factors have been assessed, additional transit infrastructure can be implemented to appeal to its specific needs. For UNC commuters, it is mostly likely reliable and frequent transit service, safe and comfortable transfer amenities, and relatively fast and direct service to their final destination. Further, it might be identified that this transit market is more willing to use a specific type of transit from their point of origin more than others, such as light rail versus Triangle Transit's current express commuter service.

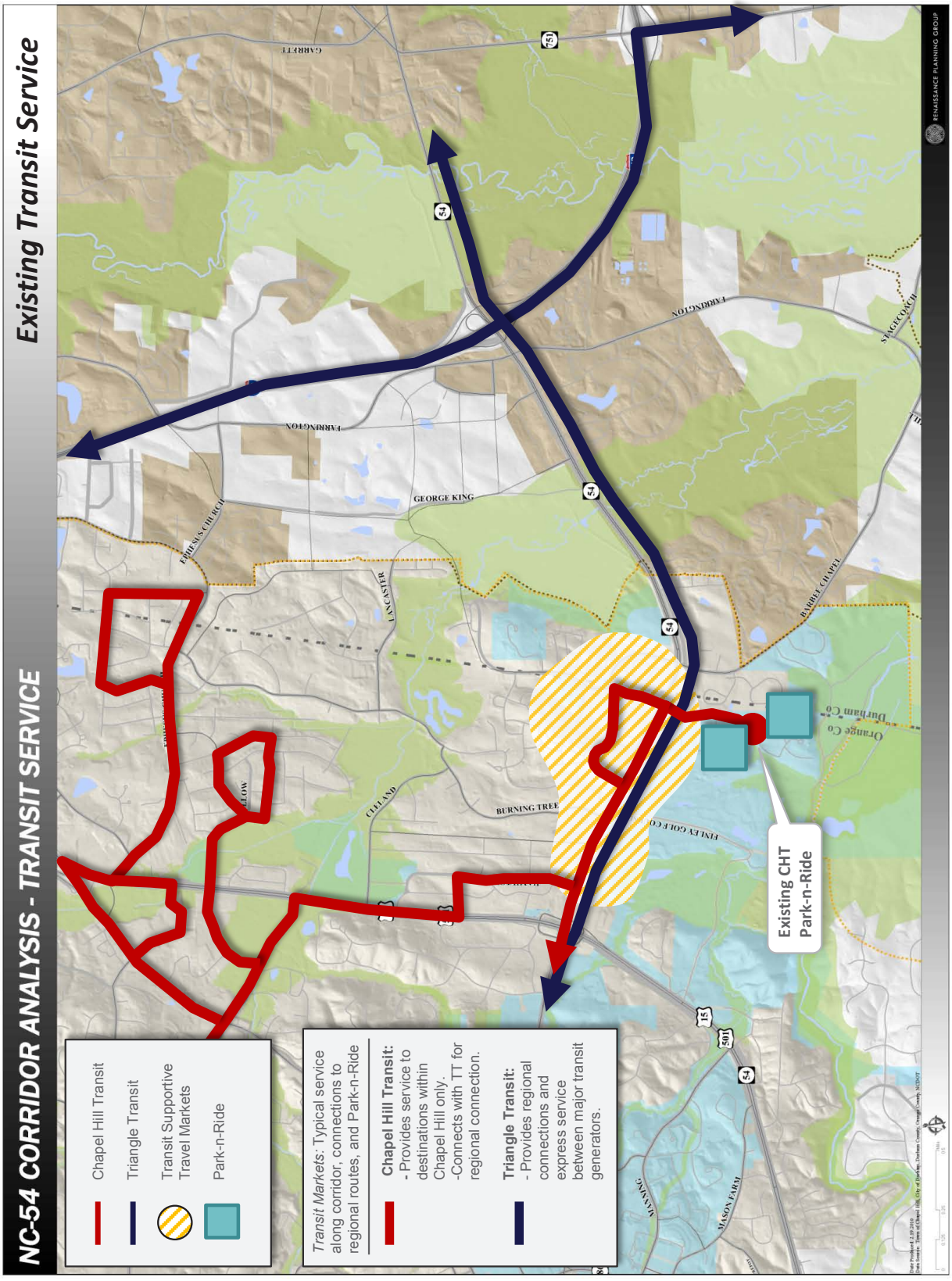


Figure 4-1: Existing Transit Service

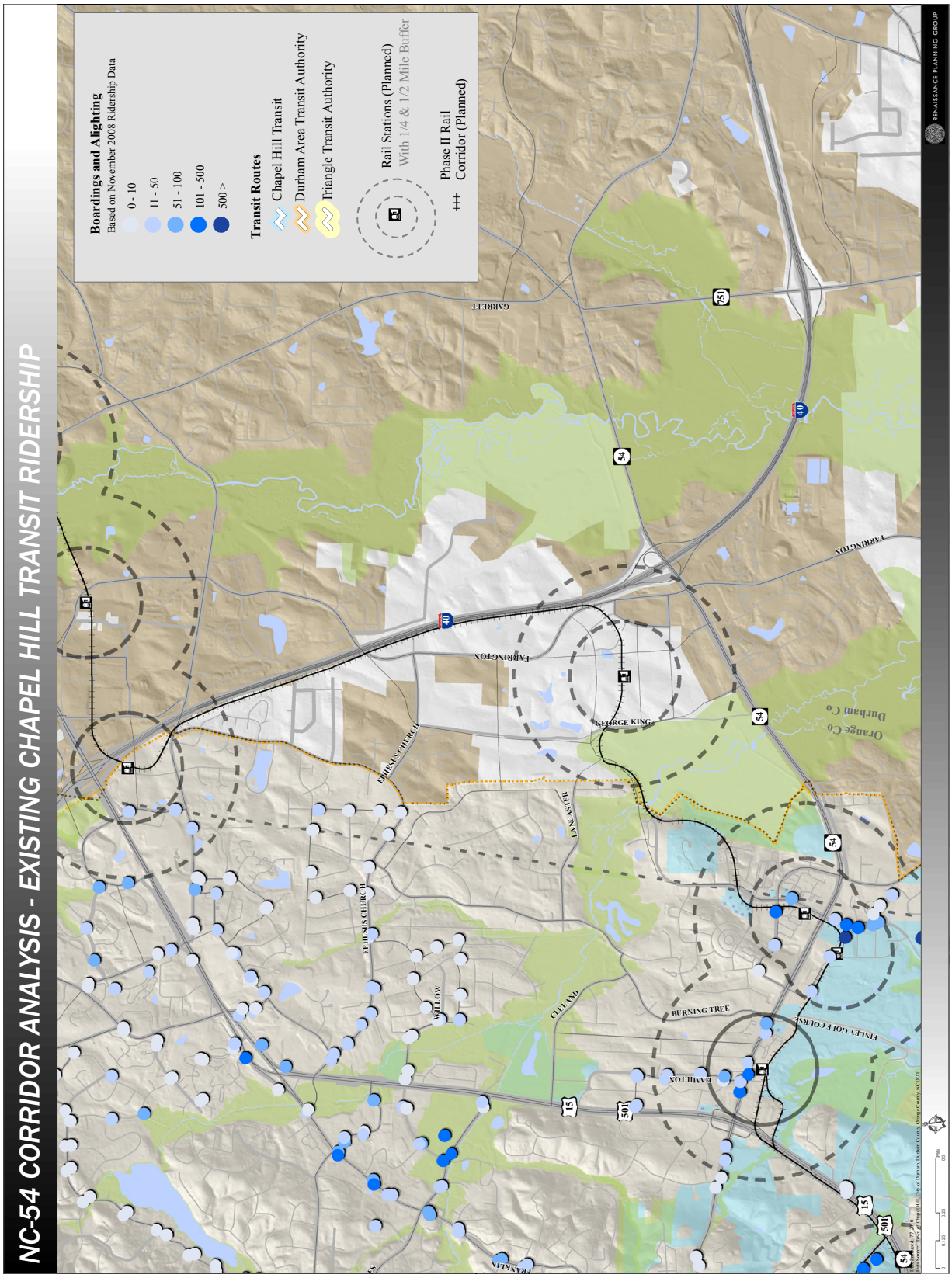


Figure 4-2: Chapel Hill Transit Daily Boardings by Bus Stop within the NC 54 Corridor

Short Term Improvements

The short term transit recommendations are based on the rate of land development along NC 54. As existing developed areas experience infill and minor new developments are created, the recommendations found in this section should be implemented. These recommendations target expansion of the existing CHT service area, providing more park-and-ride options, and improving the facilitation of transfers between various modes of travel. CHT should serve more of the municipal area as well as expand east to I-40 and NC 751. TTA and CHT should find new locations that create more opportunities for easy and convenient transfers. New park-and-ride locations will capture more commuters coming into the corridor from regional destinations. Recommendations presented in this section address the need for better local connectivity and better availability of regional transfers, creating a better foundation for future transit service expansion and implementation.

"CHT service expansions will provide greater local connectivity, create a base network for linking local transit with potential new modes, target local and regional markets, create opportunities to connect transit supportive nodes, and encourage transit ridership in lower density residential areas."

Expanding the System

Chapel Hill Transit connections along this corridor primarily provide service to UNC main campus and downtown Chapel Hill. Service coverage is limited to the eastern municipal boundary. There is high ridership from the Glen Lennox community on the western side of the study area, and transit provides connections to most major commercial destinations along the NC 54 corridor. To improve local access and to create a network that would support regional transit travel, it is recommended that Chapel Hill Transit expand services to the north and southeast of the study area. This expansion should connect NC 54 north to Ephesus Church Road, and provide connections to residential and commercial locations along Barbee Chapel Road and Farrington Road (south of NC 54). This expansion also provides new opportunities for park-and-ride facility development and connections, and the facilitation of transfers to Triangle Transit.

The route expansions will provide service to local commuters and park-and-ride regional commuters accessing downtown Chapel Hill. Service expansion north will provide greater local connectivity, and create a base network for linking local transit with the potential of new modes like light rail. The expansions target the local user market, as well as prepare for regional commuters. Expanding the transit routes eastward and looping around Barbee Chapel Road and Farrington Road will create the opportunity to connect transit supportive nodes outside of the Chapel Hill boundary and encourage more transit use in existing lower density residential areas. As more connections are created to local and regional destinations, more residents in low-density areas may find transit a viable form of transportation.

The new service expansion would improve service coverage and travel times. Expanding CHT's service coverage north and eastward will provide more residents with access to transit and potential regional connections. This connectivity will help reduce travel times as users transfer to TTA services at destinations along the corridor rather than in downtown Chapel Hill. Further, the expanded service will provide connections to new park-and-ride facilities, improving commuter travel options.

Transfer and Park-and-Ride Facilities

Triangle Transit and Chapel Hill Transit should seek to identify additional potential transfer locations, including transit-to-transit and park-and-ride. With the expansion of CHT's local service eastward, transfers between CHT and TTA at the commercial node near the I-40 interchange would serve as an ideal location for eastbound regional commuters, especially given the potential redevelopment of the Falconbridge Shopping Center to mixed use. New park-and-ride locations along NC 751 north of I-40, and additional parking allocations at Southpoint Mall will allow for more

commuters to access transit as a final and convenient component of their daily commutes into Chapel Hill. Both CHT and TTA could serve the locations. TTA should continue to serve Southpoint with increased frequency as increased park-and-ride demand may occur. CHT should provide express service to the NC 751 park-and-ride. Regional travel demand and Chapel Hill's parking restrictions reinforce the demand and success that would be generated from better transfers and park-and-ride facilities.

New transfer points between transit systems will provide better regional access for commuters traveling from Chapel Hill to regional destinations. In the study area, park-and-ride locations serve a dual purpose of providing the final segment of regional commuters' trips to their destinations, and they create familiarity with transit that encourages future transit use when more regional services are available. Park-and-ride facilities associated with this study area, and most of Chapel Hill, do not conform to the traditional use in which commuters access a facility within the first half of their total commute time. For this study area, park-and-ride facilities provide the final link to their destination, with commuters reaching the lots near the end of their trips. Park-and-ride facilities are typically the gateway to encouraging more complete use of a transit system. Commuters who begin to use a park-and-ride facility typically will consider using transit for their complete commute if such transit services are provided and meet their general travel needs. In both cases, the regional transit travel markets are improved.

"A new transfer facility between TTA and CHT will provide better regional access for commuters traveling from Chapel Hill to regional destinations. Given the potential redevelopment of the Falconbridge Shopping Center, the commercial node near the I-40 interchange would serve as an ideal location for eastbound commuters."

New transfer facilities will aid in reducing transit travel times. Strategically-located and well-served locations will reduce transfer dwell times, decreasing a transit commuter's overall travel time. Further, improved connectivity increases the sense of service coverage. Even though TTA already provides adequate regional service coverage, improved facilitation of transfers between transit systems, more general transfer options, and more park-and-ride options will increase the sense of service coverage. As a potential user's travel choices and ease of system use increases, the sense of any travel limitations or barriers decreases. This creates a better sense of transit service availability from the user perspective.

Express Service

To further provide seamless connections between the NC 751 park-and-ride location and downtown Chapel Hill, CHT should provide an express bus service between the two destinations, with limited stops along NC 54. The service would reduce transit commuter travel times and increase the incentive for transit use into Chapel Hill. A significant number of commuters would use the park-and-ride location to access employment in Chapel Hill, similar to the existing park-and-ride location south of Chapel Hill along US 15-501 at Old Lystra Road in Chatham County.

Creating an express service from the NC 751 park-and-ride location would further target regional commuters. The main objective of park-and-ride facilities are to create incentives for regional commuters to access their final destination by using transit for the final segment of their trip. Express service provides faster access to transit user destinations with less travel times than traditional fixed routes, and allows the transit entity to provide more frequent service.

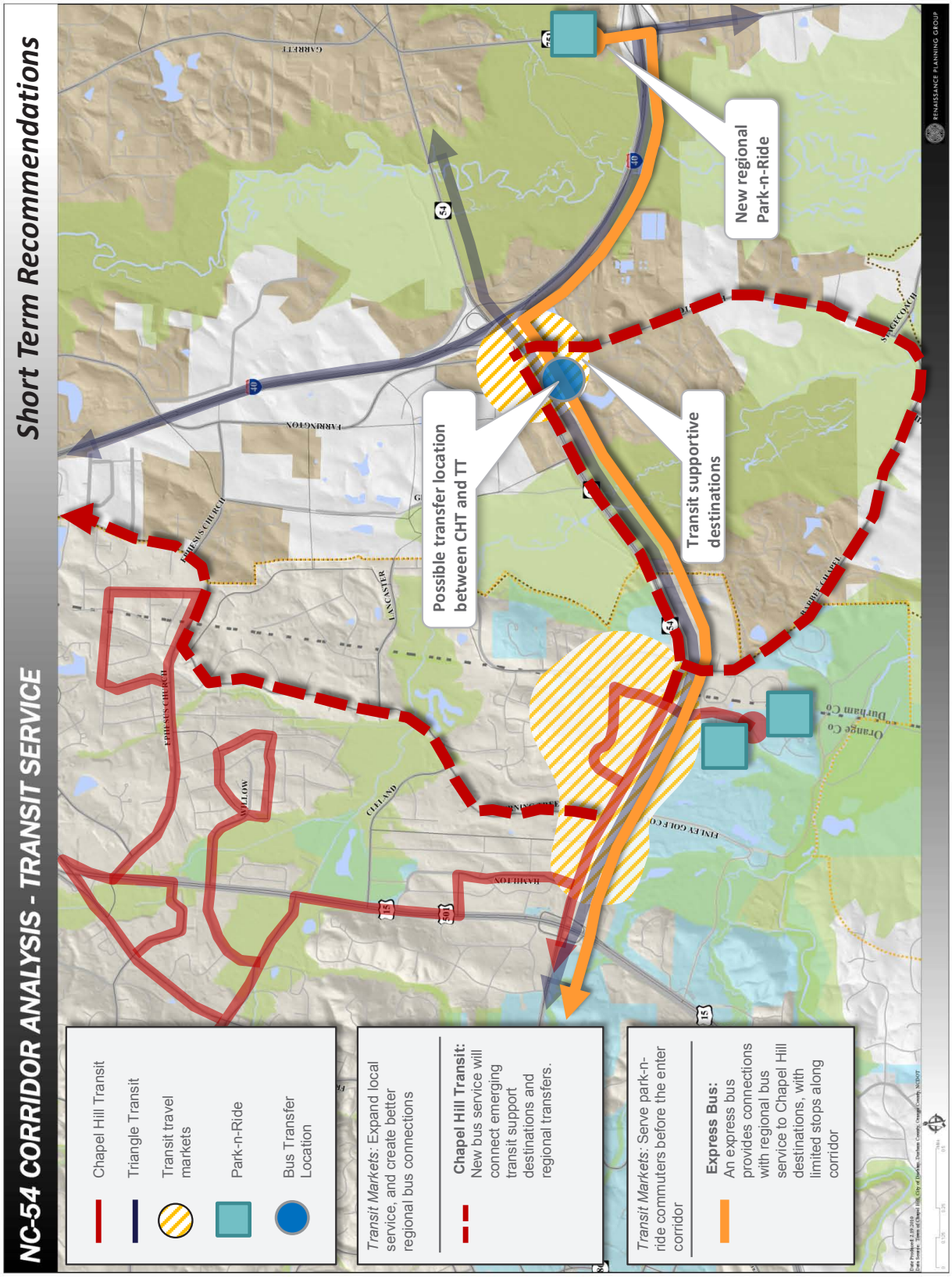


Figure 4-3: Short Term Recommendations

Long Term Improvements

Long term transit recommendations are based on the anticipated new transit-supportive development within the study area according to the future land use recommendations, including additional build-out along NC 54 in Chapel Hill and the creation of new destination nodes like Leigh Village in Durham. As new transit supportive nodes are created, the recommendations found in this section should be implemented to meet the needs of emerging transit markets. The recommendations include introducing new transit modes to attract more regional commuters. With these improvements, existing local service will continue the role of connecting local residents with regional services and providing final transit connections with transit supportive destinations. Recommendations presented in this section build upon the foundation established with the short term recommendations. The services identified provide fast and reliable transit service between regional facilities, such as park-and-ride locations, and direct service to regional destinations.

"Future land use recommendations will create strategically placed transit markets which can be easily and effectively served by local and regional transit systems. The land use and transit strategies work together to accomplish multimodal mobility for leisure and commute trips."

Expanding Service

Once transit supportive land uses like Leigh Village begin to develop, new bus service should be added north of NC 54, along Farrington Road through Leigh Village to Ephesus Church Road. The new service will provide greater local connectivity between new land development in western Durham and Chapel Hill, and to regional services provided by TTA. The new route will also provide local residents with connections to the planned light rail stations.

Expanding CHT's service coverage to the north will provide more residents access to transit and potential regional connections.

Bus Rapid Transit

Once new development in the eastern portion of the study area is established, new travel markets will need to be served by faster, more direct transit services. Traditional fixed-route service cannot continue to meet demand for more transit connections to new transit supportive land developments, including park-and-ride facilities and future light rail stations. To enhance these connections bus rapid transit (BRT) supported by signal priority should be implemented to provide faster access between transit facilities and primary transit supportive destinations. Such service is anticipated to provide roughly four percent of the commuting trips, and half of the overall transit trips. BRT should be provided in coordination with the development of the Leigh Village park-and-ride facility and station area, to serve the area before light rail is available . In addition, the BRT service would replace express service to existing park-and-ride facilities and provide direct service to other major transit-supportive locations along NC 54, such as 54 East and Meadowmont.

The implementation of BRT in conjunction with the development of Leigh Village will provide better transit service for regional commuters and park-and-ride users. The new service will improve service frequency and travel times. With BRT, transit users accessing transit supportive destinations and park-and-ride facilities will have faster service. Faster service will equate to the transit agency providing greater frequency as buses are able to move through traffic with limited delay.

Flex Route Service

Once BRT has been implemented, and as the light rail system begins to develop, segments of the existing transit routes for CHT should convert to a flex bus route service. This service should be provided to continue to meet demands from low density areas. As more transit

supportive land uses are developed, there is less of a need for transit routes to pass through low density communities. Resources will focus on higher density, more transit supportive areas, and roadway infrastructure will exist to allow for sufficient bus movement and physical access. As low density residents become accustomed to using transit, some sort of service should be provided to maintain coverage. The flex bus service will continue to provide residents the ability to access major transit-to-transit transfer locations, and regional services and destinations.

This type of service, which involves on-demand route deviation, expands the transit agency's service coverage, providing greater transit use incentives. Flex route service is most successful when major destinations or major points of access exist within a short distance, and parking is limited. Similar services exist in most metropolitan areas that have light rail service. Light rail services generate high demand, to the extent that even low density areas seek to access the system. Like many metropolitan areas with light rail (Portland, San Diego, Tacoma, and Dallas), the NC 54 flex route service would connect with LRT and BRT services.

"A light rail system will serve both local and regional transit markets, and both leisure and commuter transit users. Regional commuters will benefit the most from LRT because they are not currently served by an attractive and convenient regional transit service."

Light Rail Transit

The implementation of light rail transit (LRT) service will complete a comprehensive and coordinated regional transit service. Triangle Transit is currently conducting a study to identify the impact and alignment of a light rail transit system. The rail system will build upon previous recommendations, developing a regional transit backbone supported by subsystems of transit services and facilities. A light rail system provides regional transit services to and from the study area, allowing seamless access to major regional destinations. Regional transit users will have multiple transit travel options, increasing the attractiveness of transit commuting. The implementation of LRT will create a dramatic shift in the commuter mode choice across the entire region. Specifically for the NC 54 corridor, the service will provide an alternative to automobile travel with more transit service to residents of Chapel Hill, Durham and even Raleigh. Almost 9,000 boardings and alightings are anticipated for the rail stations located within the study area. Regional commuters will benefit the most from LRT because they are not currently served by an attractive and convenient regional transit service.

Within the study area, a light rail system will serve both local and regional transit markets, and both leisure and commuter transit users. With a comprehensive system, residents within the region will have multiple transit travel options to access destinations along NC 54. While the light rail service is designed for regional use, local residents can conveniently access destinations along NC 54 using traditional fixed-route bus service, bus rapid transit and light rail. For regional commuters, the light rail system provides new transit options for direct service from origin to final destination. For some commuters this will mean no longer accessing Chapel Hill via park-and-ride facilities. Some regional commuters might instead use their local transit service to access the light rail. Chapel Hill residents who commute to regional employment destinations will have a more comprehensive service that directly connects to regional destinations. Residents of Durham will have a more attractive transit mode option that will encourage more of the Durham commuters to access light rail stations locally either by transit services or a park-and-ride facility at the local LRT station. Thus, fewer automobiles will enter the NC 54 corridor during the peak commute times. Further, UNC and other regional commuters, from origins as far as Raleigh, now have a viable option to park locally and access the light rail station for the majority of their commute. Residents across the region will shift their commuting patterns from driving most of their commute to a park-and-ride location and then taking transit for the short last leg of the trip, to driving a short distance to a park-and-ride at (or using a local transit feeder route to) a nearby rail station and then accessing transit for majority of their commute. This new service will provide local residents with a more attractive regional transit option.

Table 4-1: Transit Recommendations

TRANSIT					
Description	**Location**	**Jurisdiction**	**Phase**	**O&M Cost**	**Capital Cost**
Expanded Local Bus Service with 30 minute frequency.	North along Burning Tree Dr & Pinehurst Dr from NC 54 to Ephesus Church Road	Chapel Hill	Short Term (2012-2017)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Expanded Local Bus Service with 30 minute frequency.	Southeast along Barbee Chapel Rd and returning north back to NC 54 along Farrington Rd	Durham	Short Term (2012-2017)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Express Bus along NC 54 from Route 751 Park-and-ride.	From NC 751 park-and-ride lot north of I-40 to downtown Chapel Hill alongNC 751 and NC 54	Durham & Chapel Hill	Short Term (2012-2017)	$1,355,400[6]	$700,000 (2 buses at $350,000 each)[2]
Expanded Local Bus Service with 30 minute frequency.	North of NC 54 along Farrington Rd & SW Durham Dr to US 15-501 (Durham-Chapel Hill Blvd)	Durham	Mid-Term (2017-2022)	$1,355,400[1]	$700,000 (2 buses at $350,000 each)[2]
Bus Rapid Transit - Phase 1. Five minute frequency with daily peak vehicle need of six buses.	From Meadowmont along NC 54 to downtown Chapel Hill	Chapel Hill	Mid-Term (2017-2022)	$11,566,080[3]	$3,400,000
Bus Rapid Transit - Phase 2. Five minute frequency with daily peak vehicle need of six buses.	From NC 751 park-and-ride lot north of I-40 along NC 54 towards Chapel Hill, aligning with Bus Rapid Transit - Phase 1	Durham	Long Term (2022-2035)	$11,566,080[3]	$3,400,000
Flex Route	General service north and south of study area along Barbee Chapel Rd, Pinehurst Dr, Farrington Rd, Ephesus Church Rd, serving the Falconbridge Community, Donwing Creek community, and Glen Lennox	Chapel Hill	Long Term (2022-2035)	$4,066,200[4]	$307,200 (4 buses at $76,800 each)[2]
Light Rail Transit (Preliminary Engineering and Design)	Durham to Chapel Hill	Durham & Chapel Hill	Long Term (2022-2035)	TBD[5]	$2,750,000)[2]

1 Operating cost for normal fixed route service with 30 minute frequency is based on Long Range Transportation Plan.
2 Source of vehicle cost is 2011 Transportation Improvement Program.
3 Bus Rapid Transit costs are based on the 2009 Long Range Transit Plan study conducted by the Town of Chapel Hill. They include the cost of roadway improvements.
4 Flex Route costs are based on the normal operations of a fixed route service. Flex service is essentially the same type of service, only different in the method of delivery.
5 Operating cost estimates for the light rail project cannot be provided. The project has a more complete analysis and cost estimate being conducted by Triangle Transit. The current cost for this project is limited to an estimate of preliminary engineering and design.
6 Operating cost for express bus service is based on the operations of a fixed route service, but at a higher frequency.

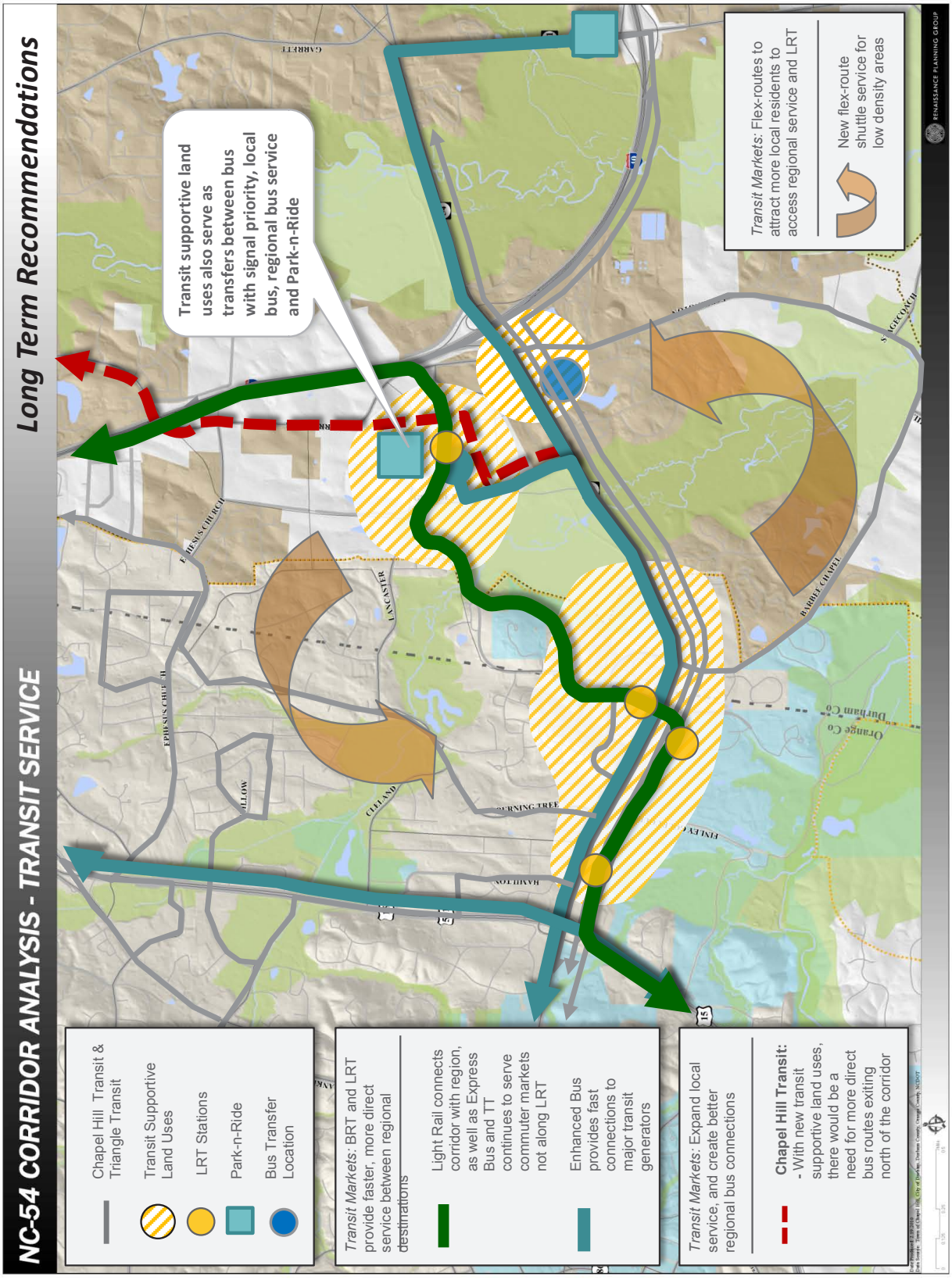


Figure 4-4: Long Term Recommendations

Transit Implementation

The NC 54 transit improvement projects are focused on the concept of growing the transit services from its core service delivery, to regional connections, matching the growth of land use along the corridor. The approach first addresses the need for transit to form a solid base of core services, such as fixed route bus service and express services, that satisfy the basic needs of local and some regional travelers. The system would then evolve its types of transit modes to match the land use growth and regional connectivity needs.. This implementation plan identifies the phasing of each recommended project, its association with anticipated growth, and potential funding that may be used to support financing. The transit improvements will coincide with the development of various key land uses, such as Leigh Village and East 54. It is anticipated that short term and some interim transit services would precede implementation of higher capacity transit improvements in the corridor, providing capacity that mitigates traffic congestion of new growth. Once the corridor has reached an envisioned build-out, the comprehensive transit infrastructure needs to be in place providing regional light rail connections that are supported by a local network of bus rapid transit (BRT) and fixed route services.

Phased Improvements

The corridor transit improvements will begin immediately and extend into the long term.

- The immediate and short term improvements will be implemented to satisfy the demand for transit service with existing development in the corridor. The immediate and short term improvements will include new routes connecting northern and western portions of the study area. The purpose is to provide immediate service needs.
- The mid-term service, which provides the core local transit infrastructure to support a light rail system, will be focused on express bus and high-capacity BRT that will serve the corridor through the forecasted major phases of population and employment growth. It will function as the precursor to the long term regional improvements. As new development occurs, the BRT will provide fast connections along the corridor.
- In the long term, the main focus of this implementation strategy is a light rail transit service in the corridor that would connect Durham and Chapel Hill at key locations. New land uses developed that are supported by the mid-term services would now serve as major points of rail access and transit-to-transit transfer.

Funding Opportunities

Section 5309 Grants

For Durham, Triangle Transit, and Chapel Hill, FTA Section 5309 Grants can continue to assist in financing bus and bus-related capital projects. These grants are typically 80 percent federal funds, with a 20 percent local match. Funding is available for the year appropriated plus two years (total of three years).

Eligible purposes include: acquisition of buses for fleet and service expansion, bus maintenance and administrative facilities, transfer facilities, bus malls, transportation centers, intermodal terminals, park-and-ride stations, acquisition of replacement vehicles, bus rebuilds, bus preventive maintenance, passenger amenities such as passenger shelters and bus stop signs, accessory and miscellaneous equipment such as mobile radio units, supervisory vehicles, fareboxes, computers, shop and garage equipment, and costs incurred in arranging innovative financing for eligible projects.

Section 5307 Grants

This program provides funds for planning, acquisition, construction, improvement, and associated capital maintenance items. These are typically defined as routine capital improvements and replacement projects, so they may have limited applicability for the projects identified for NC 54. Although, distribution of resources is on a formula basis, an increase is service delivery will provide a slight increase in these funds. With available federal funds, operating assistance for some transit entities is a 50 percent match. For the larger localities that exceed a 200,000 population, the funding for operating assistance is not available. Capital projects are funded with a maximum 80 percent federal contribution and a 20 percent local match.

Congestion Mitigation/Air Quality Program

CMAQ funds are allocated through the same regional formula process as the Surface Transportation Program, with 80 percent federal funds and a 20 percent state match. These funds are allocated to projects that demonstrate appreciable reductions in vehicle miles traveled or improvements in the effects of localized traffic congestion.

State and Local Taxes and User Charges

U.S. transit agencies draw extensively on local and state dedicated taxes and fees to support transit operations and capital. Because of tighter budgets at all levels of government, recently completed transit projects tend to rely more heavily on dedicated funding sources, as opposed to general funds from state or local governments. Perhaps the most common of these sources are local sales taxes that provide a dedicated revenue stream for transit capital and operating costs. The Chapel Hill, Durham, and Raleigh areas have been granted legislation that allows for the enactment of a 0.5 percent sales tax to fund future transit improvements. It is intended that the initial revenue of this tax would be used to fund the development of the light rail system. This source will provide significant funding for all major transit projects recommended in this study.

Developer Contributions

Improved transit facilities along the corridor will directly benefit the owners and tenants of new and existing housing, office, and retail development. With some of the proposed station and transit-way facilities directly serving developments, mechanisms by which owners of those developments may contribute to the construction and maintenance of transit amenities are being discussed. The potential for such contributions exists only in Chapel Hill.

The following is a list of numerous revenue mechanisms that could potentially be used at the local, regional, or state level to fund transit within the NC 54 corridor:

- Motor vehicle registration fee
- Corporate income tax
- Local property tax
- Surface parking fee
- Parking receipt tax

Pedestrian and Bicycle Recommendations

Overview

Pedestrians and bicyclists use the corridor for both recreational and transportation purposes, but the high-speed nature of the roadway, separated land use pattern and limited facilities conspire to curtail bicycle and pedestrian activity. Pedestrians and bicyclists are challenged by poor connectivity and lack comfortable places to walk or ride along the corridor. In general, with the exception of a short section of a shared-use path along NC 54 from Barbee Chapel Road to Burning Tree Drive/Finley Golf Course Road that connects to an unbuffered sidewalk to the west, there is a lack of facilities and signage for bicyclists and pedestrians to safely travel along or cross NC 54 to reach their destinations. This situation relegates most non-motorized travel to purely recreational in nature. Throughout this study, the public citizens and stakeholders have consistently advocated that walking and bicycling conditions must improve. Pedestrian and bicycling safety was brought up at all three public workshops and during the focus group sessions, and has been a significant issue since the beginning of the study.

Pedestrians and bicyclists are two of many competing modes of travel in the NC 54 corridor, and the recommendations for the travel market they comprise are a component of the multipronged approach to providing mobility along the corridor and within the study area. Providing better transportation network connectivity and safe access can help to provide alternate routes for local trips, and encourage pedestrian and bicycle activity. Providing pedestrian infrastructure, including sidewalks, multi-use paths, on-street bike lanes, pavement markings and design features at intersections will help to make the corridor safer for pedestrians and transit riders. The amount of existing and planned transit service to improve accessibility and mobility requires complementary pedestrian facilities for both ends of the trip. It is also important to encourage walking, biking, ridesharing and transit use to minimize the number of single-occupancy vehicle trips to the extent possible.

The following recommendations for pedestrian and bicycling infrastructure provide benefits to the transit network and make land development patterns more cohesive. Similarly, the recommendations for bus and light rail transit, the street grid, and changes land use patterns to create a more nodal urban form have a positive effect on walking and bicycling. Location-efficiency is key: pedestrian facilities must provide connections to local destinations and transit services to combat auto dependency, reduce traffic demand and improve neighborhood character and quality of life. The recommendations in this chapter are largely dependent on the land use, roadway and transit recommendations to achieve a comprehensive, interconnected and safe network for multimodal travel.

Recommendations

The overall goal of the pedestrian and bicycle facility recommendations for pedestrians and bicyclists is to provide a cohesive, connected network between destinations, neighborhoods and regional facilities to encourage walking and cycling as a viable means of everyday transportation. The recommendations are shown collectively in Figure 5-1 as a network of on-road and off-road facilities. The red paths designate roads which are suitable for on-street bicycle travel. On many of these roads, the right-of-way may be limited making a full-width bike lane infeasible; paved shoulders, signage and markings should be implemented to indicate bikes can and should share the road with autos. These roads should have buffered sidewalks for pedestrians, although ideally all roads would have sidewalks for safe pedestrian travel. The green paths designate areas where off-road facilities should accommodate bicycle and pedestrian travel. At the end of this chapter, Table 5-1 lists the specific projects and strategies shown in the figure and described below.

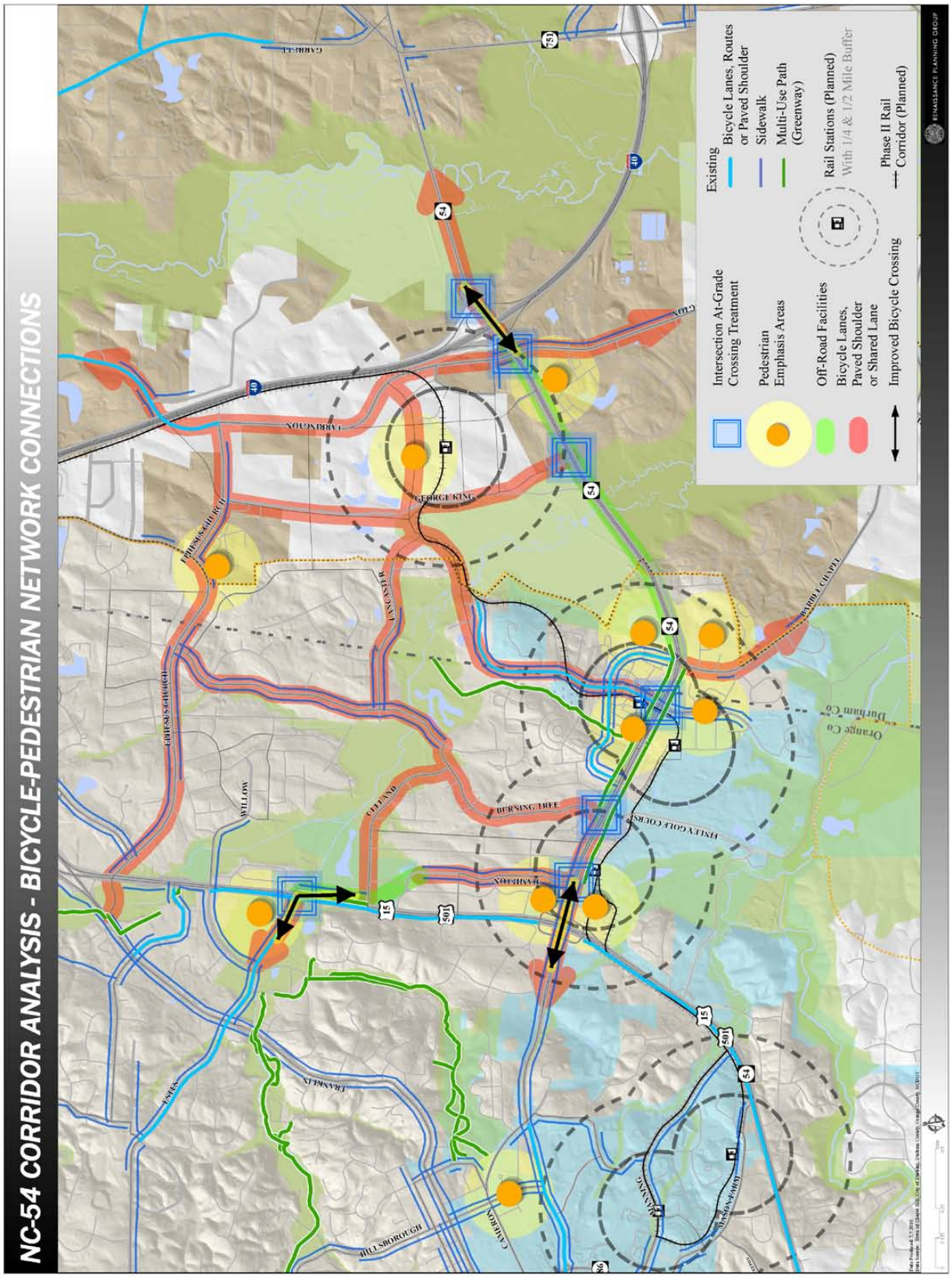


Figure 5-1: Bicycle and Pedestrian Network Recommendations

This map illustrates the recommended network for bicyclists and pedestrians with off-road paths and on-street facilities to connect destinations and neighborhoods within the study area.

Crosswalks and Pedestrian Signals at Signalized Intersections

Currently there are only two designated pedestrian crossing locations on NC 54 within the study area. All signalized intersections along the corridor should have adequate facilities for pedestrians to safely cross the street. Highly-visible marked crosswalks, activated pedestrian signals and adequate lighting will provide a safe convenient place for pedestrians to cross the street and to alert motorists of the presence of pedestrians: This will also help to slow down traffic during off-peak periods, which will also enhance pedestrian and bicycle safety.

"Highly-visible marked crosswalks, activated pedestrian signals and adequate lighting will provide a safe convenient place for pedestrians to cross the street and to alert motorists of the presence of pedestrians: This will also help to slow down traffic during off-peak periods, which will also enhance pedestrian and bicycle safety."

As the study area develops according to the recommended land use plan, the compact development will provide local destinations and encourage more residents and employees to make daily trips by walking. Crosswalks at primary superstreet intersections should be constructed as shown in Figure 5-2; this design meets ADA requirements and has been approved by NCDOT and has been implemented at other superstreet locations throughout North Carolina. Landscaping in the median refuge should be used to create a comfort barrier for pedestrians waiting in the middle of the intersection. To cross NC 54 at these locations, bicyclists should dismount and cross with pedestrians. At reverse superstreet locations, the signal phasing is not conducive to pedestrian crossings, and signage should be provided indicating pedestrians should cross at the adjacent intersection. The future roadway recommendations at other signalized intersections within the corridor are not safe for pedestrians, but are less than a quarter-mile away from the adjacent intersection with the exception of the I-40 interchange area.

At the unique design of the Farrington Road intersection, shown in Figure 5-3, crosswalks and pedestrian signals should be installed across the northern, southern and eastern legs of the intersection. Pedestrians cannot be accommodated across the western leg because of the constant conflicting traffic due to the signal phasing (westbound through traffic for the first phase and northbound left turns for the second phase).

Figure 5-2: Pedestrian & Bicyclist Crossing at Primary Superstreet Locations

At primary superstreet intersections, pedestrians can safely cross NC 54 with the directional crosswalk and refuge in the center of the intersection. Bicyclists can cross NC 54 by dismounting and crossing with pedestrians.

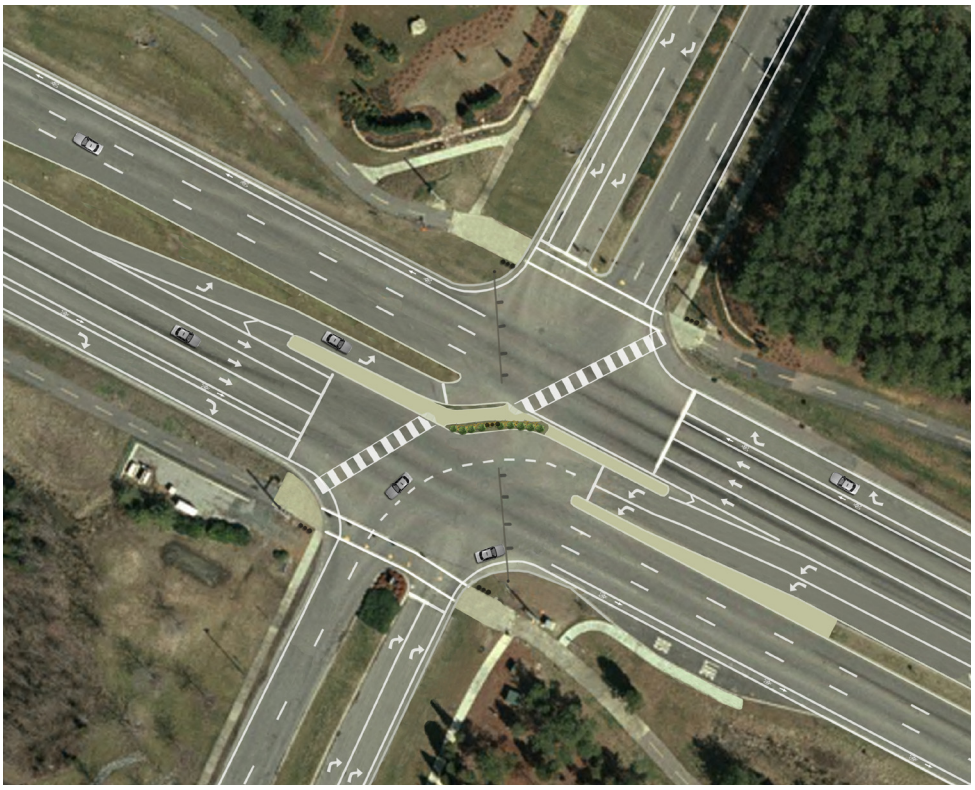
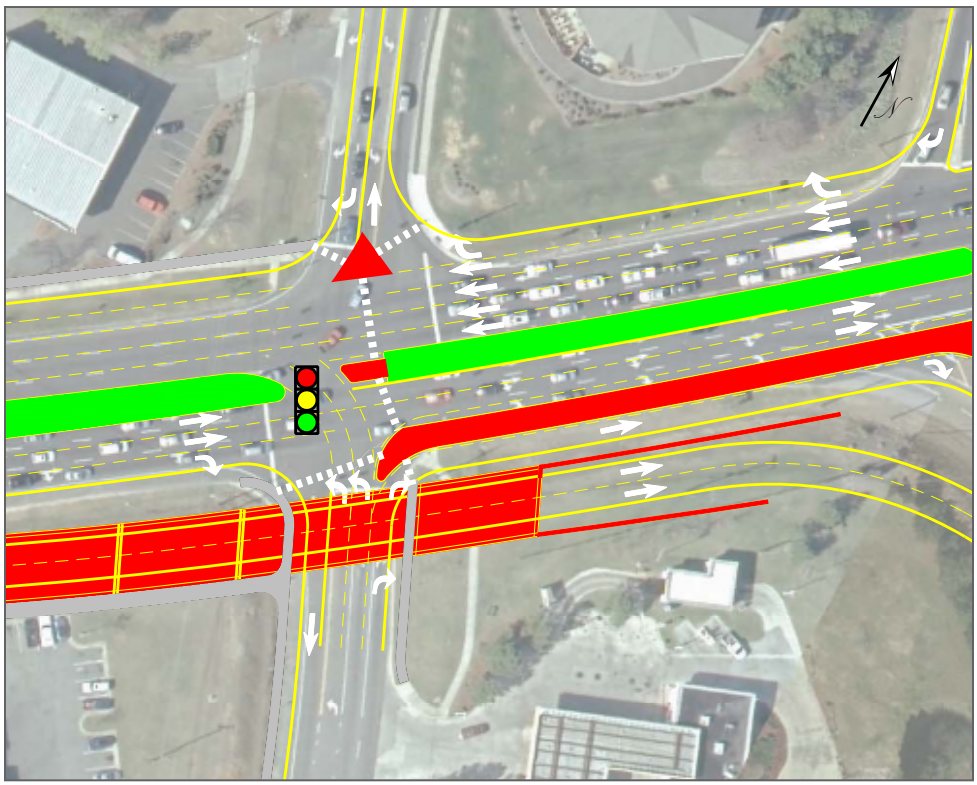


Figure 5-3: Schematic Drawing of Farrington Road Intersection

The recommendations for Farrington Road include conversion to a two-phase signal where eastbound and westbound through traffic goes on the first phase and northbound left turns on the second phase. Crosswalks and pedestrian signals should be installed on the northern, southern and eastern legs of the intersection, with signage for pedestrians to cross NC 54 on the eastern leg.



Sidewalks, Bike Lanes and Multi-Use Paths

Pedestrians and bicyclists should be accommodated in some fashion along all roads within the study area. An off-road shared-use path is generally preferred for high-speed roads like NC 54 , and a continuous off-road multi-use path on the north side of NC 54 is recommended from East Barbee Chapel Road to the I-40 interchange area to provide a dedicated space for pedestrians and bicyclists. This would complement and complete the existing shared-use path that currently runs from East Barbee Chapel Road west to Burning Tree Drive. Off road paths are typically 12 feet wide (10 feet is usually the minimum). Ideally a paved 15-foot wide shared use path is recommended and should be pursued. 15 feet is desired for multi-use paths with significant pedestrian activity, as it allows people who are walking together to comfortably Especially along NC 54, it is important to provide grassy or landscaped buffer between the off-road path and the road pavement to increase the safety of pedestrians and bicyclists.

"Pedestrians and bicyclists should be accommodated in some fashion along all roads within the study area. An off-road shared-use path is generally preferred for high-speed roads like NC 54.

Many of the connecting roads within the study are suitable for on-street bicycling because of their slower speeds and should be enhanced to provide a safe facility for on-road bicycling."

As part of the construction project to widen NC 54 to six lanes, the frontage roads that are Old State Highway 54 (Nelson Highway at Celeste Circle and Stancell Drive at Downing Creek) could be modified to provide proper support for bicyclists and pedestrians of various ages and experience levels with signage and pavement markings. Through the wetlands and around the waterfowl impoundment area, the off-road facility could be constructed as a boardwalk to minimize the amount of impervious surface area, or may require a short on-street paved shoulder connection across the bridge. On the south side of NC 54, a sidewalk is recommended from Huntingridge Road to the I-40 overpass.

Many of the connecting roads within the study area, as shown in Figure 1-1, are suitable for on-street bicycling because of their slower speeds and should be enhanced to provide a safe facility for on-road bicycling. While a 5-foot wide bicycle lane is recommended where possible, many times limited existing right-of-way makes a bike lane infeasible. In these cases, "share the road" signage and markings like sharrows, as depicted in Figure 5-4, should be implemented and will indicate that bicyclists can and should share the road with autos. Where possible, paved shoulders should also be implemented to provide more space for cyclists.

For NC 54, on-road cycling is limited to those who are very experienced and confident operating in mixed traffic situations; and even those riders find safety to be a serious impediment to riding along this roadway. However, west of Burning Tree Drive/ Finley Golf Course Road, the roadway is more conducive to on-road cycling because of lower speeds, and having designated facilities in place would make this section more attractive for potential riders. Therefore, a marked bike lane of a minimum five-foot width is recommended from Burning Tree Drive/ Finley Golf Course Road to west of the US 15-501 intersection to provide a more visible defined space for those cycling to and from the UNC main campus[1]. East of Burning Tree Drive/ Finley Golf Course Road, the shared-use off-road path provides a safe place for bicyclists of all experience levels.

For pedestrians, sidewalks or multi-use paths should be provided along all roads within the study area. The future land uses within the study area, notably the anticipated development in the mixed use station areas will increase the number of destinations for various trip purposes within the NC 54 corridor. Within these areas

1 A 5-foot wide bike lane could be achieved by restriping the travel lanes to 11-feet in width and making minor median modifications. The speed limit on NC 54 west of Burning Tree Drive/ Finley Golf Course Road is 35 mph; 11-foot wide lanes would provide adequate width

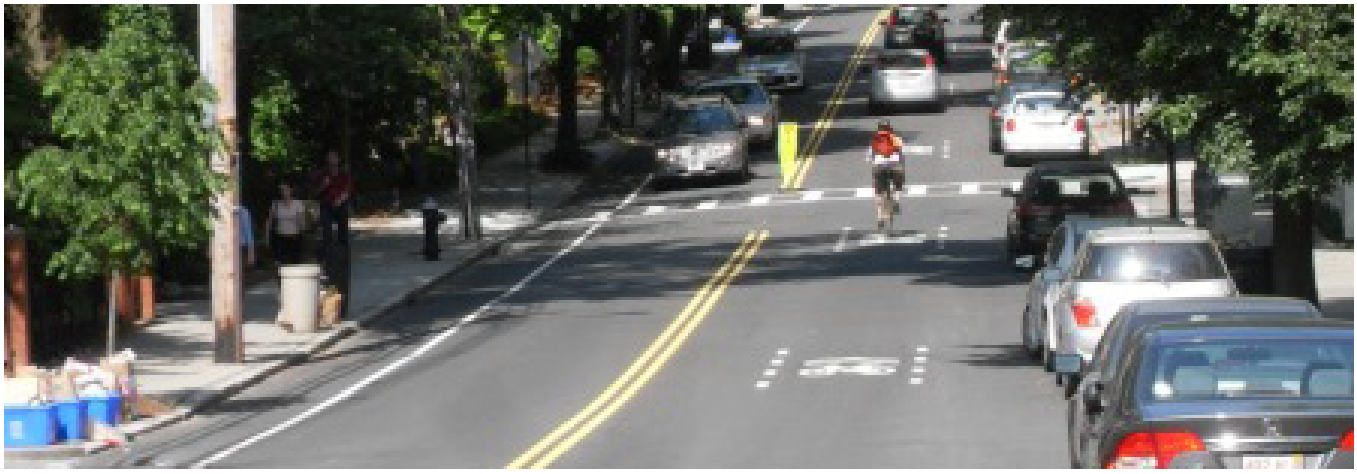


Figure 5-4: Example of a Sharrow

On-road markings like sharrows, like this one in Brookline, MA, will indicate that bicyclists can and should share the road with autos.

especially, sidewalks and marked crossing locations should be constructed on all roads to ensure pedestrian safety and provide connections between destinations in the development areas. Sidewalks should have a minimum two-foot buffer from the edge of pavement. Where possible the buffer space should be landscaped to separate the pedestrian environment from the high-speed traffic, increasing pedestrians' comfort and safety.

Connection of Greenways and Multi-Use Trails

The proposed bicycle and pedestrian network shown in Figure 5-1 will provide solid connections between neighborhoods, business centers, shopping areas, schools, parks and transit stations, and should be expanded and connect to larger regional trails in the area such as the American Tobacco Trail to the east and the trails in northern Chapel Hill to the west. Currently NCDOT is working with a consortium to acquire an easement to create a paved shoulder along Barbee Chapel Road that would provide a connection from NC 54 to the American Tobacco Trail, a rails-to-trails project spanning 22+ miles through the City of Durham and Durham, Chatham and Wake Counties. Other connections to existing regional trails will continue to extend the regional bicycling network, and provide more residents with a choice to use bicycling as a safe and practical mode of daily transportation.

"Greenway connections to larger regional trails such as the American Tobacco Trail will provide solid connections between neighborhoods, business centers, shopping areas, schools, parks and transit stations."

The neighborhoods of Glen Lennox and Meadowmont should have a direct connection to the University Mall for bicyclists and pedestrians. The existing trail that parallels US 15-501 just south of South Estes Drive should be utilized and tie into the network at Hamilton Road. The redevelopment of the Glen Lennox property could provide the opportunity to extend the existing trail south to NC 54 and connect to the off-road path to serve Meadowmont. This trail connection should be conditioned with the redevelopment of Glen Lennox. Crosswalks and enhanced pedestrian signals on all approaches of the intersection of Estes Drive and US 15-501 should be implemented.

Improvements at US 15-501 Ramps

Traffic accessing the US 15-501 ramps from or to NC 54 does not currently have to stop, which creates potential conflicts that discourages bicycle and pedestrian use. In particular, traffic using the 15-501 off-ramp to travel NC 54 eastbound is a potential threat to cyclists traveling down the hill from the UNC main campus. Traffic heading westbound on NC 54 to US 15-501 also has a free-flow right hand access to the ramp, which puts pedestrians and cyclists into a challenging situation. Significant upgrades at the US 15-501 ramps are necessary to safely accommodate bicyclists and pedestrians. Crosswalks should be implemented and the refuge islands should be expanded to provide pedestrians with a higher-visibility place to cross and a safe waiting place between the lanes. Activated flashers and warning signs will alert drivers to slow down and yield to pedestrians.

"Modifications to the US 15-501 interchange are necessary to provide safe facilities for bicyclists and pedestrians. The bridge supports can be modified to provide a wide sidewalk for pedestrians and an on-road bike lane."

Extending the solid marking designating the westbound exclusive right turn lane back about 500 feet as shown in Figure 5-5 will minimize weaving movements between the ramps, making an on-road bike lane for experienced cyclists safer. In other words, the westbound vehicles on NC 54 who wish to access the on-ramp for southbound US 15-501 will be directed to enter the exclusive right turn lane in advance of the northbound on-ramp. This improvement must be coupled with warning signs for traffic exiting US 15-501 to slow down and yield to cyclists.

Additionally, the abutment wall under the US 15-501 overpass should be modified to accommodate an 8-foot wide path on the back side of the bridge piers. The finished improvements will look similar to Figure 5-6. With the redevelopment of the Glen Lennox property, there is an opportunity to provide a shared-use path set back from the road that connects to the path under the bridge by dedicating the frontage of the property as an easement of a minimum 8-foot wide shared-use path in addition to a 6-foot wide sidewalk. The redevelopment of Glen Lennox will likely be higher density housing with a mix of uses near the street, so providing extra space for pedestrians and bicyclists will promote a more walkable space.

In the longer term, the 15-501 interchange will need to be upgraded to meet current design standards and accommodate anticipated traffic growth. At that time, it is imperative that this important gateway to the UNC main campus and the NC 54 corridor be designed to enable the safe access for pedestrians and cyclists of all abilities and experience levels.

Figure 5-5: Before and After Rendering of US 15-501 Ramp Improvements for Pedestrians and Bicyclists

Expanding the refuge islands and installing high-visibility crosswalks with warning signs and activated flashers will alert motorists to the presence of pedestrians.

Figure 5-6: Before and After Street View Rendering of Improvements at US 15-501 Interchange

Extending the solid markings for the westbound right turn lane further upstream in advance of the interchange area will reduce weaving movements, increasing safety for on-road bicyclists.

Improvements at NC 54 & I-40 Interchange

The sidewalk on the south side of NC 54 will lead to a 10-foot wide path across the overpass, which can be implemented during the construction of I-40 interchange improvements. The shared-use path should have a minimum width of 10 feet, but 15 feet is preferred if spacing permits. Signage at the Farrington Road and Leigh Farm Road/ Quadrangle Drive intersections should be installed indicating pedestrians must cross to the south side of the road. Marked crosswalks at the ramp should be visible to motorists.

A separate greenway bridge over I-40 for pedestrians and bicyclists, similar to the I-440 pedestrian bridge near Meredith College along the Reedy Creek Greenway shown in Figure 5-7, would provide the safest crossing and could connect to a regional greenway network. However, virtually no pedestrian destinations currently exist immediately east of I-40 and the Quadrangle office park. If and when this land develops, or if a regional greenway trail is implemented through this region, a separate bridge over the interstate should be designed for bicyclists and pedestrians. In the meantime, the proposed design for the NC 54/ I-40 interchange will provide a safe and dedicated space across the I-40 bridge for non-motorized travel modes.

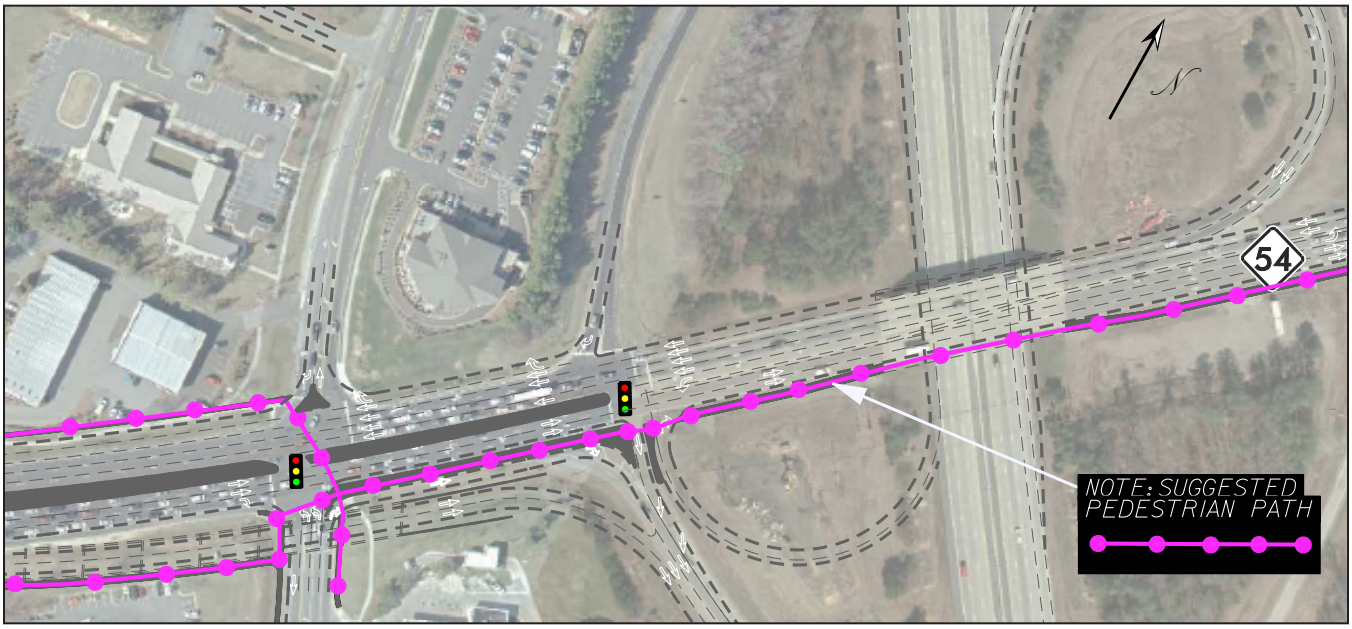


Figure 5-7: Travel Paths at NC 54/ I-40 Interchange

To travel over the I-40 overpass, pedestrians and bicyclists must cross to the southern side of the street at either Farrington Road or Leigh Farm Road/Quadrangle Drive. A 10-foot wide paved path is provided on the bridge.

Elevated Pedestrian Bridge at Light Rail Crossing

The planned light rail transit system will cross NC 54 above grade between the Friday Center and Meadowmont stations, see Figure 5-8. This bridge crossing can be designed to serve as a bridge for pedestrians and dismounted bicyclists and should be constructed as such to improve access across this high-speed, high-volume roadway. This overpass would complement the existing underpass located to the west, providing two grade-separated crossings that would enhance the utility of walking and bicycling along this corridor for transportation purposes.

Figure 5-8: Before and After Rendering of Light Rail Crossing with Accommodations for Pedestrians

The light rail bridge should be designed to accommodate pedestrians and bicyclists.

Table 5-1: Bicycle and Pedestrian Transportation Recommendations

PEDESTRIAN AND BICYCLE				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
Install crosswalks and pedestrian signals at signalized intersections with pedestrian refuge islands and street lighting for crossing NC 54.	Burning Tree Dr/ Finley Golf Course Rd & NC 54	Chapel Hill	Short Term (2012-2017)	$80,000
	W Barbee Chapel Rd & NC 54	Chapel Hill	Short Term (2012-2017)	
	Meadowmont Ln/ Friday Center Dr & NC 54	Chapel Hill	Short Term (2012-2017)	
	E Barbee Chapel Rd & NC 54	Chapel Hill	Short Term (2012-2017)	
	Huntingridge Rd & NC 54	Durham	Short Term (2012-2017)	
	Farrington Road (northern, southern and eastern approaches) & NC 54	Durham	Short Term (2012-2017)	
	Leigh Farm Rd/ Quadrangle Dr & NC 54	Durham	Short Term (2012-2017)	
Install crosswalks with pedestrian-activated flashers and expand refuge islands.	US 15-501 on/off ramps	Chapel Hill	Short Term (2012-2017)	$40,000
Extend the solid marking designating the westbound exclusive right turn lane for US 15-501 on–ramps to minimize weaving movements at interchange and increase safety for on-road bicyclists.	From SB US 15-501 on ramp to 500 feet to the east	Chapel Hill	Short Term (2012-2017)	$2,700,000
Provide a minimum 5-foot wide on-road bicycle lane by restriping travel lanes to be 11 feet wide and making minor median modifications.	NC 54 from Burning Tree Dr/ Finley Golf Course Rd to the west	Chapel Hill	Short Term (2012-2017)	
Modify sloped abutment wall to provide 8-foot wide sidewalk behind overpass structural piers.	NC 54 underneath US 15-501 overpass	Chapel Hill	Short Term (2012-2017)	
Pave road shoulders to accommodate bicyclists on select roads to provide connections to the American Tobacco Trail.	From NC 54 to the American Tobacco Trail via Barbee Chapel Rd, Farrington Rd, Stagecoach Rd, NC 751, and Massey Chapel Rd	Durham	Short Term (2012-2017)	$4,000,000

PEDESTRIAN AND BICYCLE				
Ensure adequate facilities for cyclists are available. Provide a 5-foot wide bicycle lane where possible, or provide "share the road" signage and a paved shoulder or sharrow markings for on-road bicycle travel. Many of the collector streets are designed with for low vehicular speeds with the intent for bicycles to share the travel lane. Fill in sidewalk gaps.	Farrington Road through the study area (Old Chapel Hill Rd to Stagecoach Rd)	Durham	Short Term (2012-2017)	Variable cost. Paving five-foot wide bike lanes on both sides of the roadway would cost approximately $1,200,000 per lane assuming medium duty pavement. Striping a bike lane without paving would cost approximately $5,000 per mile. Installing signage would
	Ephesus Church Rd from Farrington Rd to E Franklin St	Durham & Chapel Hill	Short Term (2012-2017)	
	George King Rd & Crossland Dr (proposed collector street) from Ephesus Church Rd to NC 54	Durham	Short Term (2012-2017)	
	SW Durham Dr from Ephesus Church Rd to NC 54	Durham & Chapel Hill	Short Term (2012-2017)	
	Lancaster Dr and E/W collector street from Farrington Rd to Pinehurst Dr	Durham & Chapel Hill	Short Term (2012-2017)	
	Pinehurst Dr from Ephesus Church Rd to Burning Tree Dr	Chapel Hill	Short Term (2012-2017)	
	Burning Tree Dr from Pinehurst Dr to NC 54	Chapel Hill	Short Term (2012-2017)	
	Hamilton Rd from NC 54 to Brandon Rd	Chapel HIll	Short Term (2012-2017)	
Construct an off-road shared-use path, with a boardwalk bridge as an alternative solution in environmentally sensitive areas. Path should have minimum 10-foot width; ideally 15 feet if possible.	Along north side of NC 54 from E Barbee Chapel Rd to Farrington Rd	Durham & Chapel Hill	Mid-Term (2017-2022)	The cost for these improvements is included in the roadway projects list under the item "Widen NC 54 to six lanes in the Durham section. Construct the multi-use path concurrent with th road project."
	Through the Glen Lennox property from Hamilton Rd at Brandon Rd to connect to S Estes Dr utilizing existing trail and along the NC 54 frontage to connect to the existing multi-use path at Burning Tree Dr	Chapel Hill	Mid-Term (2017-2022)	
Construct an off-road shared-use path on the south side of NC 54 with accompanying signage to cross. Path should have minimum 10-foot width; ideally 15 feet if possible.	NC 54 from Farrington Rd to I-40 overpass	Durham	Mid-Term (2017-2022)	
Construct sidewalk on south side of NC 54 to connect to I-40 overpass.	South side of NC 54 from Huntingridge Rd east to I-40 overpass	Durham	Mid-Term (2017-2022)	
Construct a 10-foot wide shared use path on south side of overpass.	NC 54 bridge over I-40	Durham	Mid-Term (2017-2022)	

PEDESTRIAN AND BICYCLE				
Implement crosswalks and landscaped median refuges at primary superstreet intersections.	Meadowmont Ln/ Friday Center Dr & NC 54	Chapel Hill	Mid-Term (2017-2022)	The cost for these improvements is included in the roadway projects list under the item "Construct EB NC 54 to EB I-40 flyover from Farrington Road to I-40 EB on-ramp."
	Huntingridge Rd & NC 54	Durham	Mid-Term (2017-2022)	
Adequately sign reverse superstreet intersections.	E Barbee Chapel Rd & NC 54	Chapel Hill	Mid-Term (2017-2022)	
	Falconbridge Rd & NC 54	Durham	Mid-Term (2017-2022)	
During construction of superstreet modifications, implement crosswalks and landscaped medians on the northern, southern and eastern approaches, and provide adequate signage for pedestrians to cross to south side to travel over I-40 bridge.	Farrington Rd & NC 54	Durham	Mid-Term (2017-2022)	
Design and construct light rail bridge over NC 54 to serve as an elevated pedestrian crossing.	Across NC 54 connecting Meadowmont and Friday Center	Chapel Hill	**Long Term (2022-2035)	TBD
Continue to make regional connections with greenways.	where possible	Durham & Chapel Hill	Long Term (2022-2035)	Variable cost

Implementation

As with roadway projects (see roadway implementation section), bicycle and pedestrian facilities and related roadway/intersection modifications should be incorporated into the MPO plans and priority lists (such as the Long Range Transportation Plan, Transportation Improvement Program, and Congestion Management Process) to ensure their eligibility for funding under various federal and state programs. The MPO has already identified a number of programs that can be used to fund bicycle and pedestrian projects, such as Transportation Enhancements, and routinely includes such projects in the Priority Lists and the Transportation Improvement Program. The MPO may consider increasing the amount of funds set aside from its federal and state funding allocations each year to provide an ongoing funding allocation for bicycle and pedestrian projects that would not get completed as part of widening, resurfacing, or other major roadway projects (the MPO currently sets aside a portion of Surface Transportation Program – Direct Allocation grant specifically for bicycle and pedestrian projects). The NCDOT Division of Bicycle and Pedestrian Transportation directly administers and manages the Bicycle and Pedestrian Planning Grant Initiative. This is primarily a pass-through program of federal funding sources to improve walking and bicycling conditions along state roadways. The state has a variety of funding sources from various departments that may be appropriate funding sources. These include NCDOT's High Hazard Elimination program, which addresses safety issues using federal funds, as well as the NC Recreational Trails Program and Parks and Recreation Trust Fund. Competition for these funds is typically very strong, and projects must compete for limited funding.

Several new federal programs, such as Safe Routes to Schools and the American Recovery and Reinvestment Act, have been created in recent years, and those communities with clearly identified and prioritized projects have benefitted significantly from those funds. A number of pilot programs have also been developed in the last several years, such as the Non-Motorized Transportation Pilot Program and the HUD-DOT-EPA Interagency Partnership for Sustainable Communities, which support community and regional efforts in planning and implementation of sustainability and livability initiatives. The Durham-Chapel Hill-Carrboro region has already shown its commitment to improving conditions for bicyclists and pedestrians through its planning, funding allocations, and education programs, and would be able to take advantage of future funding opportunities effectively. Additional funding sources that should be considered include the recreational trails programs (for the recommended shared use path along NC 54), transit funds such as Urbanized Area Formula Grants and Transit Enhancement funds for improving bicycle and pedestrian access to transit facilities and vehicles, and other non-traditional sources, such as public health, hazard mitigation, and economic development programs. Federal sources addressing livability and sustainability, as well as non-profit and foundation sources, are increasingly used as funding sources for both facilities and programs to support increased walking and bicycling. Examples include the Robert Wood Johnson Foundation.

Local governments should also consider including these projects in their capital improvements programs. As indicated in the table of recommendations, smaller projects that improve conditions and access for bicyclists and pedestrians, such as crosswalks, refuge islands, pedestrian signals and street lighting, may also be implemented using developer mitigation funds.

Roadway Recommendations

Overview

The roadway recommendations discussed in this chapter will provide enhanced mobility throughout the corridor and study area. These recommendations are just one part of the strategic plan to successfully promote growth and sustainably manage growing demands for transportation. The land use recommendations go hand-in-hand with the proposed transportation investments and achieve a network where residents and employees have mobility options for local and regional trips. The recommended roadway improvements are intended to better serve the areas of targeted growth, like the Leigh Village transit station area and the Friday Center as it redevelops into a larger employment center. The roadway network enhances capacity and increases safety for all modes of transportation, as it is coupled with improvements for park-and-ride facilities, transit service improvements, and facilities for bicyclists and pedestrians. The strategic investments in transportation and land uses will bring local governments, state agencies and private developers together to creatively participate in the funding and construction of the recommended improvements.

As part of the land use and transportation study process, the conditions along NC 54 within the study area were examined in an effort to identify short, mid, and long term strategies and improvements to mitigate congestion while providing for multimodal mobility options. An assessment of existing conditions was conducted relative to levels of service and safety concerns. In coordination with the land use scenarios development process, future traffic volumes, primarily along NC 54 and I-40, were examined and assessments made regarding levels of improvements necessary to accommodate those volumes. As the recommended scenario emerged, the study team developed concepts and strategies for the corridor, intersections, off-corridor connections, and interchange improvements necessary to accommodate the proposed growth. The identified strategies are meant to work in concert with the recommendations for other modes and the land use policies to achieve the vision of mobility and accessibility for all travel modes in the corridor. The following section describes the traffic conditions along NC 54 and the resulting recommended future roadway improvements, including concept level sketches illustrating the proposed improvements and project phasing.

While the I-40 corridor provides primarily high-speed freeway travel for regional and commuting trips, the NC 54 corridor serves many roles. It is a regional arterial for commuters, a gateway to the areas' cultural historical and recreational attractions, and a primary commercial/retail corridor. The NC 54 corridor also experiences demand from through traffic from southern Orange County and northern Chatham County to destinations in Durham and Wake Counties, including the Research Triangle Park.

Many commuters from mostly rural Chatham County and other areas in the Triangle use I-40 and NC 54 to access employment opportunities. Partly because of the constraints on development in Chapel Hill, growth is occurring throughout the region in previously rural or agricultural areas, and many commuters must use NC 54 to access jobs.

Review of Existing Conditions[1]

The NC 54 corridor is a major arterial providing access to southwest Durham County and the Town of Chapel Hill. It is characterized by heavy congestion and long queues, especially during the morning and evening commute hours, mainly because no other major east-west routes exist within the surrounding area. NC 54 draws commuting demand from a wide market area seeking access to the University of North Carolina at Chapel Hill and its medical center, as well as office, hotel and retail destinations located along NC 54 between I-40 and Fordham Boulevard (US 15-501). The historical and current patterns of development promote dependence on a personal automobile for mobility throughout the corridor.

Today, the NC 54 corridor serves approximately 45,000 vehicles per day (vpd) in regional and local trips. The majority (70 percent) of vehicles that use the corridor are passing through the study area, meaning that the trips originate at some point outside of the corridor (east of I-40 or west of US 15-501) and end at another point on the other side of the corridor. However, many of these trips are going to or from destinations in downtown Chapel Hill and UNC, most of which are located between one to two miles west of US 15-501. In fact, when the study area is expanded by two miles to the west and one mile to the east, the percentage of "through trips" drops from 70 to approximately 40 percent.

There are several different types of trips that the NC 54 corridor serves: long-distance regional trips, commuting trips to and from Chapel Hill, and local trips of residents within the corridor to destinations within the corridor. As discussed in the park-and-ride recommendations section, the regional commuting demand for UNC students and employees of the campus and hospital is currently 17,000 daily trips; if all of these trips are made by single-occupancy vehicles, this would equate to approximately 38 percent of the daily traffic volume on NC 54. At the segment level, the NC 54 corridor generally functions at LOS F, because of the high volumes on the corridor and the frequency of traffic signals in the Orange County portion and near the I-40 interchange. Queues for eastbound and westbound through traffic at intersections can stretch over 1,000 feet back from the intersection (over 25 cars or 0.2 miles). Eastbound traffic in the PM peak hour at Farrington Road can extend almost a half-mile back from the intersection. In the interchange area, traffic frequently backs up onto westbound I-40.

Because a large proportion of the long signal cycle length is allocated to the heavy eastbound and westbound through traffic, most of the signalized intersections along the corridor are operating at overall LOS D or better. The average side-street vehicle may wait minutes at the intersection, but the main through movements on NC 54 generally experience an average wait of 20 seconds or less at each intersection. Many of the intersections have very low side-street traffic, so it is acceptable to hold the green for the heavy mainline through movements to process the traffic as efficiently as possible.

Farrington Road and the I-40 ramps operate at overall LOS E or F. These intersections are by far the most congested in the study area. The intersections are also extremely close to each other; Farrington Road and the I-40 eastbound ramps are only about 300 feet apart. Seven lanes of traffic, heavy delays for all approaches and long queues make these intersections difficult for commuters during rush hours.

The demand in this corridor is exceptionally high, and commuters are using every available venue to get through the corridor to reach their final destination. The buses that serve the Friday Center are often at capacity with standing-room only during the peak hours. Commuters who drive are experiencing high delays because the corridor is operating at full capacity in the peak travel hours.

1 All existing traffic conditions and operational analyses are documented in the Community Profile (Appendix A), which assesses the existing conditions.

What does the future hold?

Regardless of any planning or policy decisions, the NC 54 corridor is going to continue to be a corridor of regional and statewide significance. It is going to continue to serve both regional commuting trips and local trips for residents within the corridor. UNC will continue to be a major destination for university students, faculty, staff members and hospital employees and patients. With the growth of the university and medical facilities, as well as other destinations for working, shopping, housing and recreation outside of the corridor, vehicular demand for the corridor will increase.

In the baseline "Trend" scenario, the growth in traffic volume is largely due to regional demand. If the land within the study area develops according to the assumptions in the Triangle Regional Travel Demand Model, the vehicular demand for the corridor will rise to approximately 70,000 vpd by 2035[2]. Examples of roads that carry 70,000 vpd are shown in Figure 6-1. This level of demand will require significant improvements to the I-40 interchange and corridor intersections to process vehicles without reaching 'grid-lock' conditions. If no improvements are made, travel conditions in the corridor will deteriorate. Wait times will increase significantly. For example, the average westbound vehicle currently waits about 40 seconds at Barbee Chapel Road in the AM peak hour. In the future this would increase to about four minutes. At Huntingridge Road, the westbound wait time could reach above nine minutes.

Regardless of any planning or policy decisions, the NC 54 corridor is going to continue to be a corridor of regional and statewide significance.

This level of demand will require significant improvements to the I-40 interchange and corridor intersections to move traffic without reaching 'grid-lock' conditions. If no improvements are made, travel conditions in the corridor will deteriorate.

As described in the land use section of this document, the land use recommendations proposed in this sub-area plan contain more density and thus more households and jobs within the study area than that currently shown in the LRTP. The proposed density, intensity and mix of uses, coupled with the recommended multimodal mobility strategies, are intended to create walkable nodes of development and encourage transportation options other than using a personal automobile for every trip. With the increased density, the percentage of regional (through) trips on the corridor will decline to less than half of the total trips. This does not infer that there will be less regional demand on the corridor. It means that the local demand will grow more rapidly than anticipated in the LRTP, with the same level of regional through traffic growth. In fact, with the land use recommendations proposed in this plan, it is projected that the corridor will reach the demand of 70,000 vpd by the 2020 to 2025[3] time frame instead of 2035 as projected in the LRTP scenario.

2 For more detailed explanations of the scenario planning process and modeling effort, please see Appendices B and C, respectively.

3 The scenario planning process assumes the proposed future land use plan is built to maximum density by 2035. In reality, the land may not be fully developed until after 2035 due to economic conditions.

Figure 6-1: North Carolina Highways Carrying 70,000 Vehicles per Day

These slides were provided by NCDOT as part of US 64 Corridor Study Presentation Materials

Regardless of the land use decisions, the vehicular demand will increase to a level where significant roadway and multimodal improvements are necessary. Throughout the study process, citizens and involved stakeholders have shown interest in improving transit service to accommodate the growing demand. Transit service is necessary to help the corridor function in the future, but it alone cannot solve the problem. To maintain a six-lane road (typical capacity threshold is about 50,000 vpd[4] – assuming traditional intersection designs), an additional 20,000 daily trips would need to be serviced by transit, roughly equating to a full busload (60 people) every minute during the AM and PM rush hour or a full articulated busload (100 people) every two minutes. It is important to note that the 70,000 vehicles per day projection already assumes that a robust transit system with light rail transit service and many local and express bus routes will serve the DCHC area. The complexity of the NC 54 corridor requires a multifaceted operational and policy level approach to plan for and accommodate the mobility needs of the proposed growth strategy.

Transit service is necessary to help the corridor function in the future, but it alone cannot solve the problem.

4 According to the FDOT Generalized Level of Service tables, a six-lane roadway will function at a failing level of service if the average daily traffic exceeds between 48,200 and 53,100 vehicles, depending on the spacing of traffic signals.

The Ultimate Solution

The recommended roadway solution for the NC 54 corridor includes several different improvements that work together to accommodate the demand of 70,000 vehicles per day. These improvements include a mix of widening, innovative intersection modifications, and eventually I-40 interchange access improvements. The 11x17 fold-out sheets found at the end of this section show the recommendations phased according to short (2012-2017), mid (2017-2022) and long term (2022-2035) improvements.

Widen NC 54 to Six Lanes

In the Durham portion of the study area, from East Barbee Chapel Road to the I-40 interchange, NC 54 is currently a four-lane road. Many local planning staff from the City of Durham and the MPO and many public citizens have recognized the need to expand the road to six lanes to increase the capacity of the road as needed for the future traffic volume demand. The future demand on the corridor will require that NC 54 be widened to six full through lanes east of Orange County, but that alone will not provide the needed road capacity.

The recommended roadway solution for the NC 54 corridor includes several different improvements that work together to accommodate the demand of 70,000 vehicles per day. These improvements include a mix of widening, innovative intersection modifications, and eventually I-40 interchange access improvements.

I-40 & NC 54 Interchange Improvements

The most problematic area of the NC 54 corridor is undoubtedly the interchange with I-40. Traffic volumes are highest on the east side of the corridor near this interchange and Farrington Road. The projected future volume for 2020 reaches upwards of 9,000 vehicles in one hour near Farrington Road in the PM peak, with an estimated daily volume of 75,000 vehicles per day. Several improvements working together will be necessary to allow the traffic to move through the interchange; most of these improvements are shown on the third sheet of the 2020 Phased Improvements.

The westbound I-40 loop off-ramp to westbound NC 54 is experiencing capacity deficiencies even today, and traffic from this ramp regularly backs up onto the interstate. The capacity of this ramp can be increased by modifying the ramp to two full lanes of traffic with two auxiliary exit lanes.

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Eliminating the signal at the I-40 eastbound off-ramp will also increase capacity of the interchange. Traffic exiting westbound I-40 will have an additional 300 feet before encountering a traffic signal, further preventing traffic from backing up onto the interstate. Currently, vehicles coming from eastbound I-40 who want to go eastbound on NC 54 must turn left at the off-ramp, conflicting with westbound traffic on NC 54. A partial cloverleaf for the I-40 eastbound off-ramp will bring these vehicles to the other side of NC 54, allowing them to merge onto NC 54 via a yield-controlled channelized right turn without conflicting with the westbound through traffic. The eastbound I-40 to westbound NC 54 traffic can operate with a channelized right turn that has its own dedicated lane from which vehicles must change lanes to go through at the Farrington Road intersection. A traffic signal will still be necessary at this location to stop the eastbound NC 54 traffic to let the left turns from westbound NC 54 onto the eastbound I-40 on-ramp, but the westbound through traffic on NC 54 will not be affected as it will see continuous green. A dedicated merge lane should not be necessary for vehicles using the new off-ramp, as the traffic signal will provide gaps in the eastbound NC 54 traffic.

The traffic on westbound NC 54 is expected to surpass the available capacity of the one westbound lane from the Leigh Farm Road/ Quadrangle Drive intersection over the I-40 overpass. Two lanes will be necessary in the future, and the bridge should be widened to accommodate four full-width westbound lanes (two from the I-40 westbound off-ramp and two from westbound NC 54) and three eastbound lanes (two through lanes and one left turn lane as configured currently).

Farrington Road Intersection Improvements

The close proximity of Farrington Road to the ramps is exacerbating the problems of congestion. Arguably the most problematic traffic movement in the corridor is traveling from eastbound I-40 to southbound Farrington Road. These vehicles have less than 300 feet to cross over three lanes in extremely congested situations. The traffic signal at the I-40 eastbound ramps stops the westbound through traffic in close proximity to the interchange, causing backups through the interchange and onto the interstate. The overall solution for this congested area includes reconfiguring the ramps and signalized intersections to provide additional roadway capacity and function more efficiently. These solutions will allow traffic on NC 54 to flow with fewer disruptions.

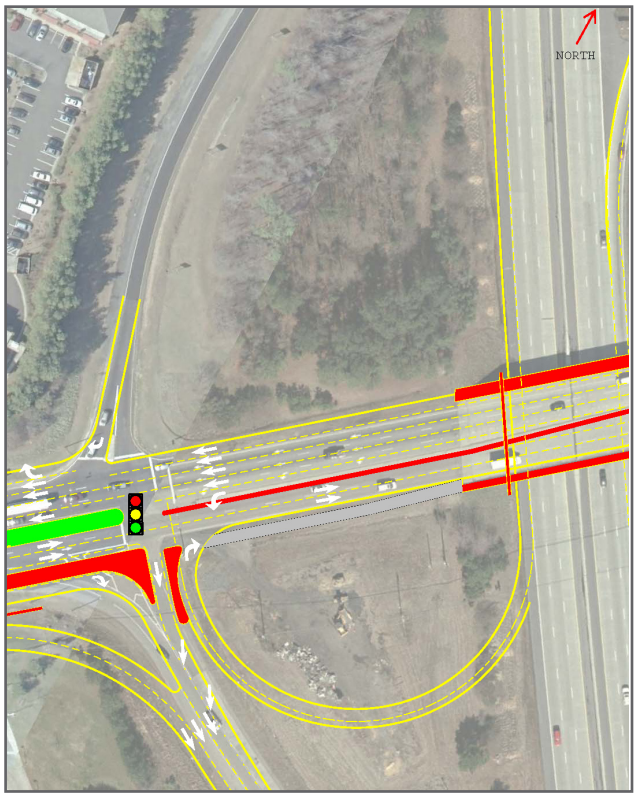


Figure 6-2: Partial cloverleaf for the I-40 eastbound off ramp.

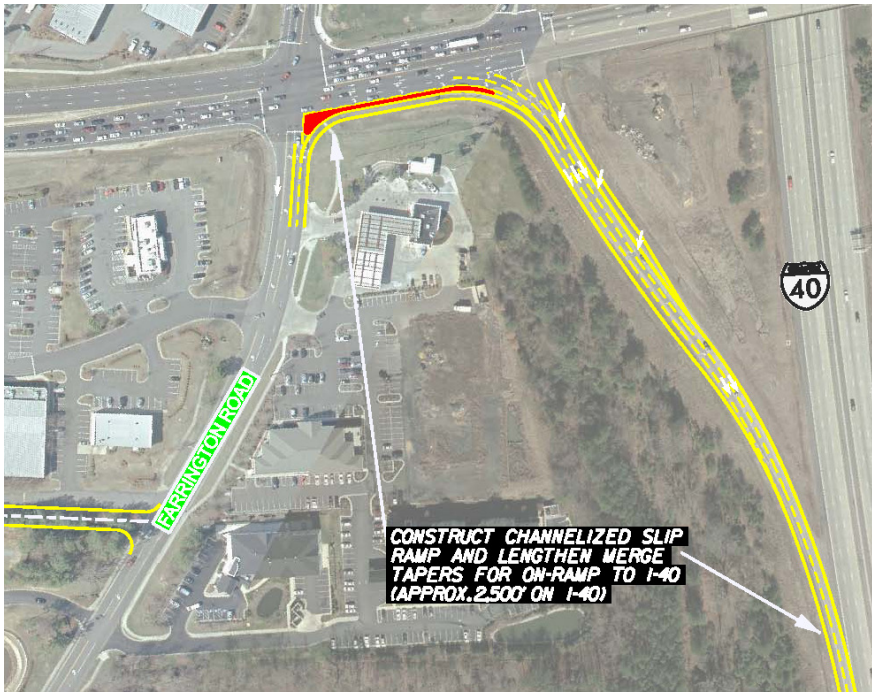
Current turning movement volumes indicate a large demand (approximately 720 vehicles in the AM peak hour and about 430 vehicles in the PM peak hour) to turn right from northbound Farrington Road onto eastbound NC 54, and the majority of those likely immediately turn right to access eastbound I-40. These vehicles currently experience heavy delays (over 10 minutes on average in the PM peak and even longer in the AM peak). Constructing a continuous slip ramp with a barrier for these vehicles will diminish the amount of time necessary for the northbound approach to process, thereby giving more green time to the east-west phase, and providing relief to the vehicles waiting at Farrington to access I-40. This continuous slip ramp should be constructed in advance of the other interchange improvements and is included in the list of short term (2012-2017) recommendations. Figure 6-3 shows a conceptual drawing of the continuous slip ramp.

"The close proximity of Farrington Road to the ramps is exacerbating the problems of congestion. Arguably the most problematic traffic movement in the corridor is traveling from eastbound I-40 to southbound Farrington Road. "

Especially in the morning and evening rush hours, many motorists are traveling eastbound on NC 54 to eastbound I-40. Approximately 2,200 vehicles in the AM peak hour and 2,300 vehicles in the PM peak hour are making this movement, as opposed to the 1,000 (AM peak hour) and 1,300 (PM peak hour) vehicles who continue to travel eastbound on NC 54. It is likely that more vehicles actually want to make this movement in the peak hour than the data indicates, but the congestion at Farrington Road is causing the peak demand to be spread out for longer than one hour. Essentially the traffic demand is exceeding the available capacity of the road network. A flyover ramp, as illustrated in Figure 6-4, will allow eastbound NC 54 traffic to access eastbound I-40

Figure 6-3: Continuous Slip Ramp for Direct Access to I-40 Eastbound On-Ramp from Farrington Road

The proposed slip ramp will allow vehicles on Farrington Road south of NC 54 to access the eastbound I-40 on-ramp without delay from the Farrington Road/ NC 54 traffic signal.



The traffic demand is exceeding the available capacity of the road network. A flyover ramp, will allow eastbound NC 54 traffic to access eastbound I-40 without being stopped by the Farrington Road signal.

without being stopped by the Farrington Road signal. Traffic projections and modeling indicate that the Farrington Road intersection will experience failing levels of service by year 2015 without this flyover ramp improvement. During construction of the flyover ramp, the Farrington Road intersection and continuous slip ramp should be modified so that the eastbound approach has one exclusive right turn lane and two through lanes, as illustrated in Figure 6-3. This is one solution that could work, however a preliminary engineering study should be performed to examine this and other options such as grade-separation at Farrington Road.

In addition to the continuous slip ramp and eastbound flyover ramp, the following recommendations will extend the green time for east-west through traffic at the signals, allowing more cars to pass through in each cycle. Vehicles will also be able to pass through multiple green signals before stopping at a red one. Maximizing the green time for the east-west through movements is accomplished by minimizing the number of conflicting signal phases for other movements. At a typical traffic signal, most of the green time is taken away from the through movement and given to the side streets and left turns. Reducing the number of phases at a signal gives more green time back to the major through movements. Signalized intersections function most efficiently with a two-phase signal, as demonstrated in Figure 6-5, although most intersections within the corridor currently operate with four or more phases.

In order to make these signals function as more efficient two-phase signals, selected turning movements will be prohibited and rerouted through the network of connector streets. The proposed configuration at Farrington Road can be seen in more detail in Figure 6-4 . The two signal phases would be: (1) east-west through traffic and right turns, and (2) northbound left turns and right turns. This configuration gives more green time to the westbound through traffic, reducing the potential for backups onto the interstate.

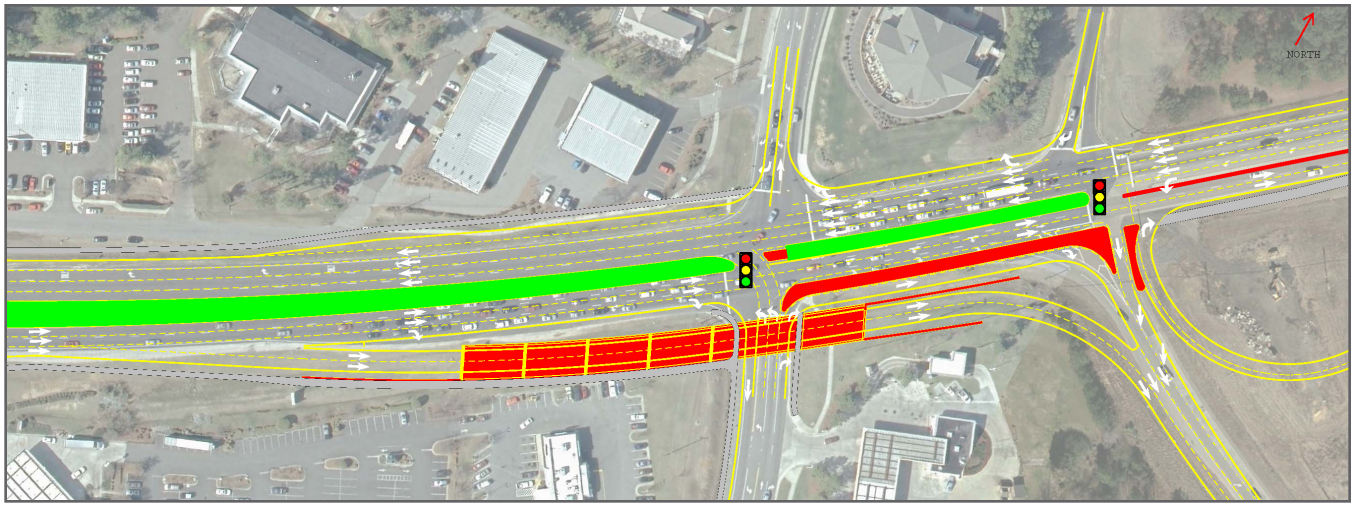


Figure 6-4: Detail of Proposed Configuration at Farrington Road and Flyover Ramp

The configuration at Farrington Road will allow the signal to operate with only two phases, minimizing delays for through traffic on NC 54.

Rerouting the side-street through traffic is necessary to attain the efficiency of a two-phase signal. Prohibiting westbound vehicles from turning left onto Farrington Road, will also eliminate the need for vehicles exiting eastbound I-40 to cut across three lanes of traffic. Instead, vehicles will continue on NC 54, turn right onto Falconbridge to a roundabout constructed as part of the Collector Street Plan, then re-emerge back onto eastbound NC 54 via a left turn from Falconbridgeto access their final destination.

The southbound right turn lane should be channelized with a dedicated merge lane to allow traffic from Farrington Road to easily access westbound NC 54. The planning level design provides a minimum of 600 feet for the receiving lane to merge, which meets the AASHTO criteria for lane transitions.

As part of the previously discussed partial cloverleaf recommendation for the I-40 & NC 54 interchange, the

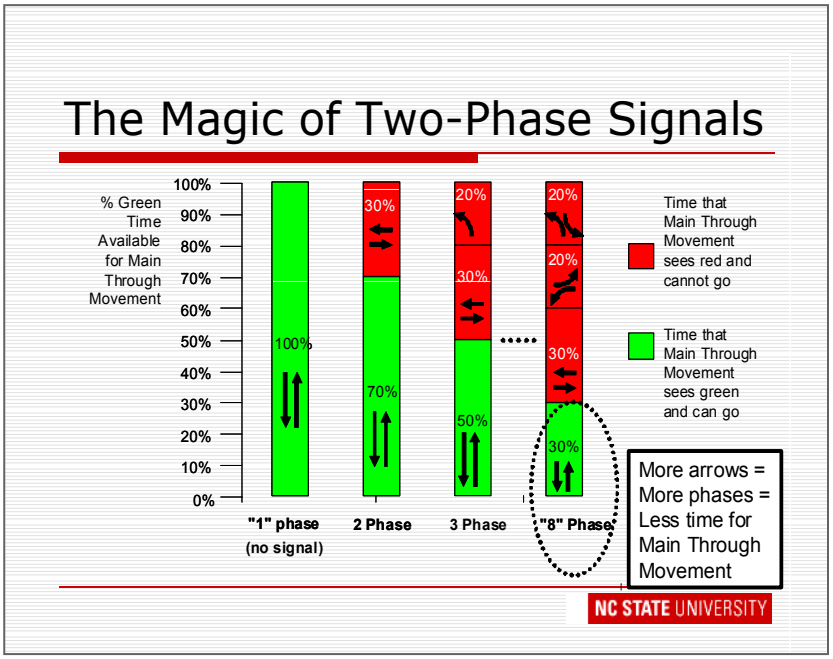


Figure 6-5: Efficiency of Two-Phase Signals

Source: Dr. Joseph Hummer, Professor of Civil Engineering, NC State University.

The most efficient traffic signals are those with least number of phases. A greater number of phases results in less green time for the main through traffic.

eastbound I-40 to westbound NC 54 traffic will now go through a channelized right turn with a dedicated lane to ensure that vehicles can merge with westbound traffic. That right-most lane will become a dedicated right turn lane at Farrington Road, and should be signed accordingly given the short distance between the off-ramp and Farrington Road. Similarly, the southbound right turn at Farrington should be channelized with a dedicated lane to merge with westbound traffic.

Superstreet Intersections

For most of the intersections along the study segment of NC 54, the same type of treatment is recommended as was explained for the Farrington Road intersection: decrease the number of phases to maximize the green time for the heavy east-west through movements. The 'superstreet' intersection configuration achieves the two-phase signal and best fits within the constrained roadway right-of-way

The superstreet concept refers to a reconfiguration of a traditional intersection. Simply, it is a method to safely and efficiently manage high traffic volumes at intersections with multiple approaches along a divided highway. The superstreet concept functions by redirecting through and left turning traffic from the side-street approach to turn right, proceed to a nearby U-turn and then return to its original course. At first, this may seem to be a complex solution to a very simple objective – to cross the intersection or to make a left turn. However, when designed correctly, it is actually a simple and safe solution for maximizing intersection and corridor travel capacity, thus reducing congestion. Two types of superstreet intersections are recommended for NC 54: the primary superstreet and the reverse superstreet.

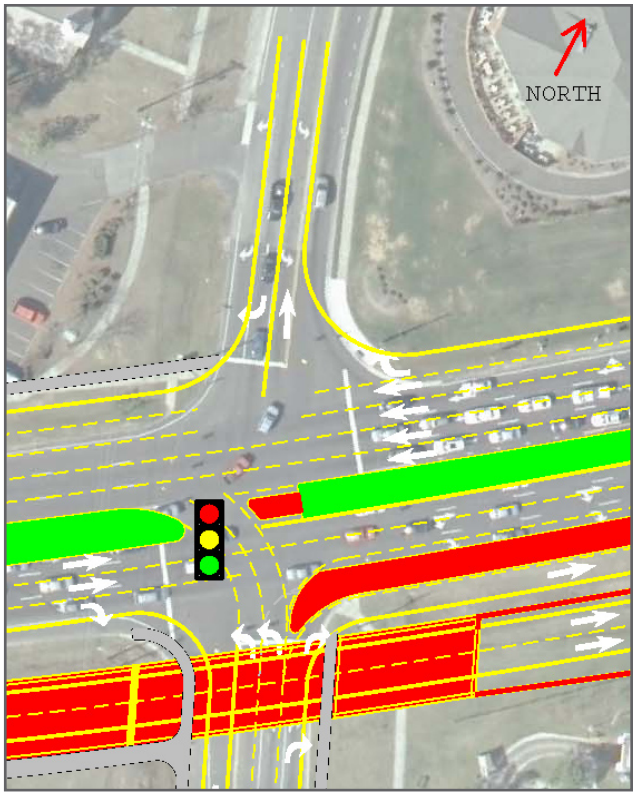


Figure 6-6: Farrington Road intersection configuration

The Primary Superstreet

The primary superstreet requires the through and left turning vehicles from the minor street approach to turn right, proceed to the downstream U-turn and then return in the opposite direction. The movements from the major street are unaffected as the main intersection still allows for all movements from the major street.

Figure 6-7 shows the primary superstreet configuration. A major benefit of this configuration is that the number of conflict points (opportunities for cars to collide) is minimized. The other major benefit is that signalization is simplified into two phases. The two signal phases first give a green light to the major street through traffic, followed by the second phase which gives the green light to the left turns from the major street at the same time as the right turns from the minor street. The two median U-turn locations would also be signalized and would operate similarly with only two phases; the first again being the through traffic and the second allowing the U-turn movement. The reduction in the number of movements that occur at each intersection allows the intersection to operate more efficiently and to give more of the green time (typically about 70% of the total cycle length) to the heavy through movements. Another benefit is the improved ability to coordinate the signals along the corridor, which reduces overall travel time.

The Reverse Superstreet

The reverse superstreet allows left-turns from the minor street directly onto the major street roadway. The benefits of this configuration over the Primary Superstreet concepts are that it can accommodate high left turn volumes from a minor street which may overwhelm the U-turn signal. Figure 6-8 illustrates the reverse superstreet concept.

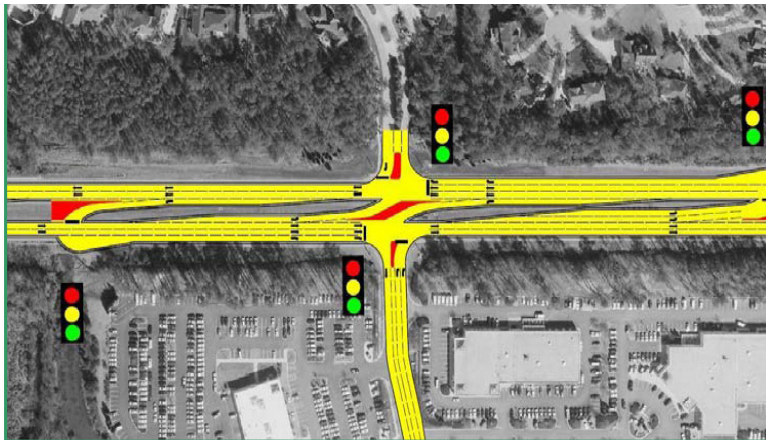


Figure 6-7: The Primary Superstreet Concept

Source: NCDOT, Intersection and Interchange Design Alternatives, US 64 Corridor Study
The primary superstreet concept achieves a two phase signal by directing all side-street traffic to turn right. Vehicles wishing to go through or turn left from the side-street proceed to the downstream u-turn and go straight thru the intersection or turn right.

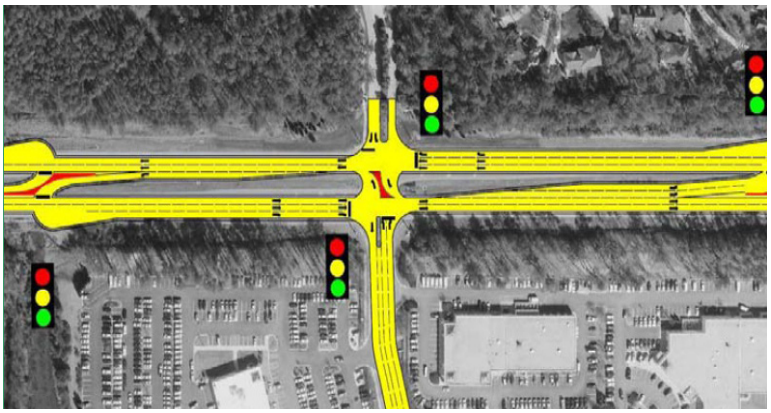


Figure 6-8: The Reverse Superstreet Concept

Source: NCDOT, Intersection and Interchange Design Alternatives, US 64 Corridor Study
The reverse superstreet prohibits left turns from the major road and allows direct left turns from the side-streets. In the NC 54 corridor the reverse superstreets are paired with primary superstreets to achieve adequate access to and from the side-streets.

Superstreet Safety

A superstreet intersection (both primary and reverse) reduces the number of "conflict points," meaning that there are fewer points for possible collisions (32 vs. 14). The most severe conflict points (side collisions or T-bones) are significantly reduced from 16 to 2.

Superstreets are actually safer for pedestrians than conventional intersections. There are fewer conflict points for pedestrians because of the simplified traffic flow. To cross the main street, pedestrians will cross one direction at a time, waiting in the median for the signal to change to finish crossing.

The superstreet concept is not new to North Carolina. Several localities have implemented superstreets on NC highways including:

- US 17 in Leland (Brunswick County)
- US 17 near the Pender County/ New Hanover County Line
- US 15-501 at Erwin Road/ Europa Drive in Chapel Hill
- US 1 near Vass (Moore County)
- US 74 west of Waynesville (Haywood County)

An unsignalized superstreet intersection has been already implemented within the corridor at Falconbridge Road. However, the high volumes of traffic in the future coupled with the construction of the collector street system are expected to necessitate a reconfiguration of the intersection to work in tandem with the adjacent intersections.

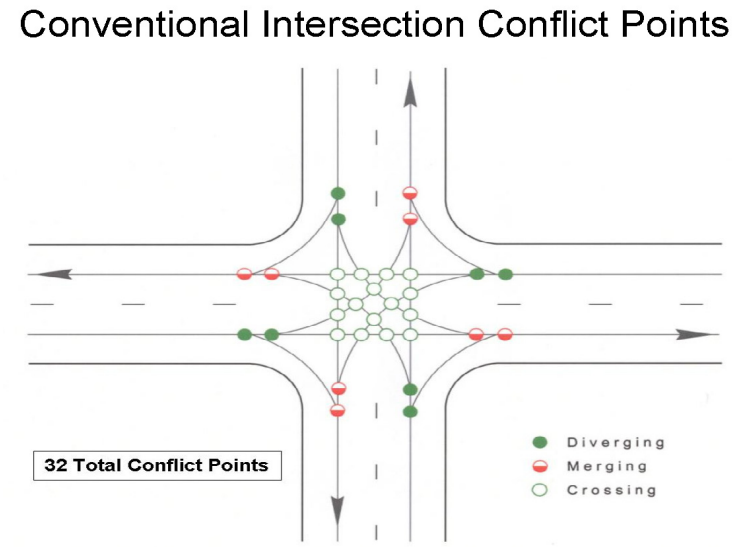


Figure 6-9: Conventional Intersection Conflict Points

Source: NCDOT

At a conventional intersection, there are 32 different ways that two vehicles can collide, referred to as conflict points.

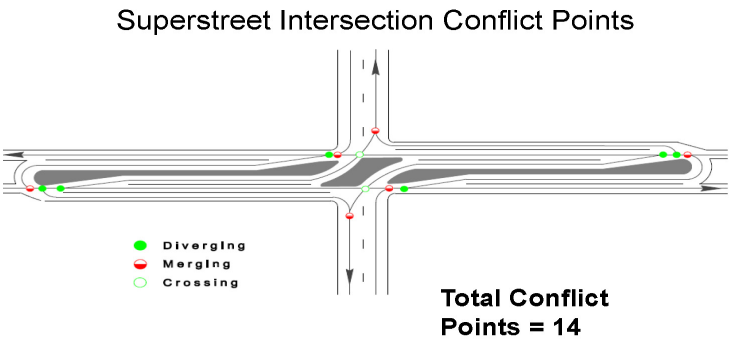


Figure 6-10: Superstreet Intersection Conflict Points

Source: NCDOT

At a superstreet intersection there are only 14 conflict points; indicating that there are less opportunities for collisions as compared to a conventional intersection.

US 17 in Leland (Brunswick County)

Figure 6-11: Superstreets on NC Highways

US 17 near the Pender County/ New Hanover County Line

US 15-501 at Erwin Road/ Europa Drive in Chapel hill, although this one doesn't seem to be working so well according to the public

US 1 near Vass (Moore County)

US 74 west of Waynesville (Haywood County)

Superstreets in the NC 54 Corridor

The superstreet recommendations are shown in the Mid-Term (2017-2022) Phased Improvements fold-out sheets. Providing a primary superstreet at one intersection and a reverse superstreet at the adjacent intersection has proven to be the most successful improvement for many of the signalized intersections along the NC 54 corridor. The primary superstreet provides excellent ingress for superstreets, and the reverse superstreet allows direct left turns from the side-street for egress, so when coupled together, vehicles have an easy way in and an easy way out, functioning similarly to a pair of one-way streets.

Huntingridge Road and the offset collector street Crossland Drive can function as a primary superstreet intersection, and Falconbridge Road can function as a reverse superstreet intersection. Since the Falconbridge Road intersection is the only one of these three cross-streets where southbound left turns will be permitted, two left turn lanes will be necessary at this location. As the Leigh Village area develops, a third left turn lane may be necessary.

East Barbee Chapel Road and Meadowmont Lane/ Friday Center Drive would also operate as a primary and reverse superstreet pair. The turning movement counts indicate a heavy northbound left demand at East Barbee Chapel and westbound left turn into the Friday Center in the AM peak hour, and in the PM peak hour a heavy movement in the reverse: a right turn out of the Friday Center and another right turn to go southbound on Barbee Chapel Road[5]. The northbound left turn at Barbee Chapel Road would need two left turn lanes, as would the westbound left turn from NC 54 onto Friday Center Drive. In the future, the northbound left turn at the intersection at Barbee Chapel Road may need to be reexamined for additional turning capacity. The land use and multimodal recommendations will likely slow the growth rate of the demand, however the projected turning movement counts indicate a high demand for the northbound left turn. The right-of-way for a triple left turn at East Barbee Chapel Road should be acquired and reserved for the future as a safeguard measure should this configuration be desired in the future. Free-flowing channelized right turn lanes for the northbound approach of Friday Center Drive and for the eastbound approach at Barbee Chapel Road should be implemented for the heavy movements in the PM peak hour.

The access road behind the shopping center can be upgraded to city standards and used as a strong connection between Falconbridge Road and Farrington Road.

For the primary and reverse superstreet pairing to work effectively, the two side-streets must have a strong connection and be well-signed so drivers are fully aware of the access restrictions and know what route to take to get onto the main road in their direction of travel. On the north side of NC 54, the collector streets as adopted in the Collector Street Plan will achieve this purpose, as does the extension of Barbee Chapel Road through the Meadowmont development.

On the south side of NC 54, connections become more difficult to anticipate. The extension of Marriott Way to Barbee Chapel Road could serve as a solid connection to and from Friday Center Drive; however the connection must be reconstructed to public street standards and carefully designed so as not to interfere with the northbound left turn lanes or queues on Barbee Chapel Road.

While indirect connections do exist between Huntingridge Road and Falconbridge Road, re-routing traffic through these residential streets may be controversial. Most of the land use within this area is residential; it is not anticipated that the 'cut-through' traffic would drastically intensify, especially since northbound left turns will still be permitted at Farrington Road.

5 The 2009 turning movement counts can be found in the Traffic Technical Appendix of the Community Profile in Appendix A.

The current connection (Farmington Drive) between Falconbridge Road and Farrington Road is located adjacent to a retirement living community, making an alternative connection desirable if possible. As indicated in the proposed future land use plan, the Farrington shopping center is likely to redevelop and when it does, the access road behind the shopping center can be upgraded to city standards and used as a strong connection between Falconbridge Road and Farrington Road. Other future connections within this area should be explored and constructed as opportunities arise through development proposals.

The superstreet configuration allows each direction of travel on the major street to be optimized and coordinated independently of the reverse direction. Coordinating all of the superstreet intersections within each jurisdiction will provide the best progression for both travel directions. Regularly conducting signal retiming efforts every few years ensure that the traffic patterns are most efficiently accommodated.

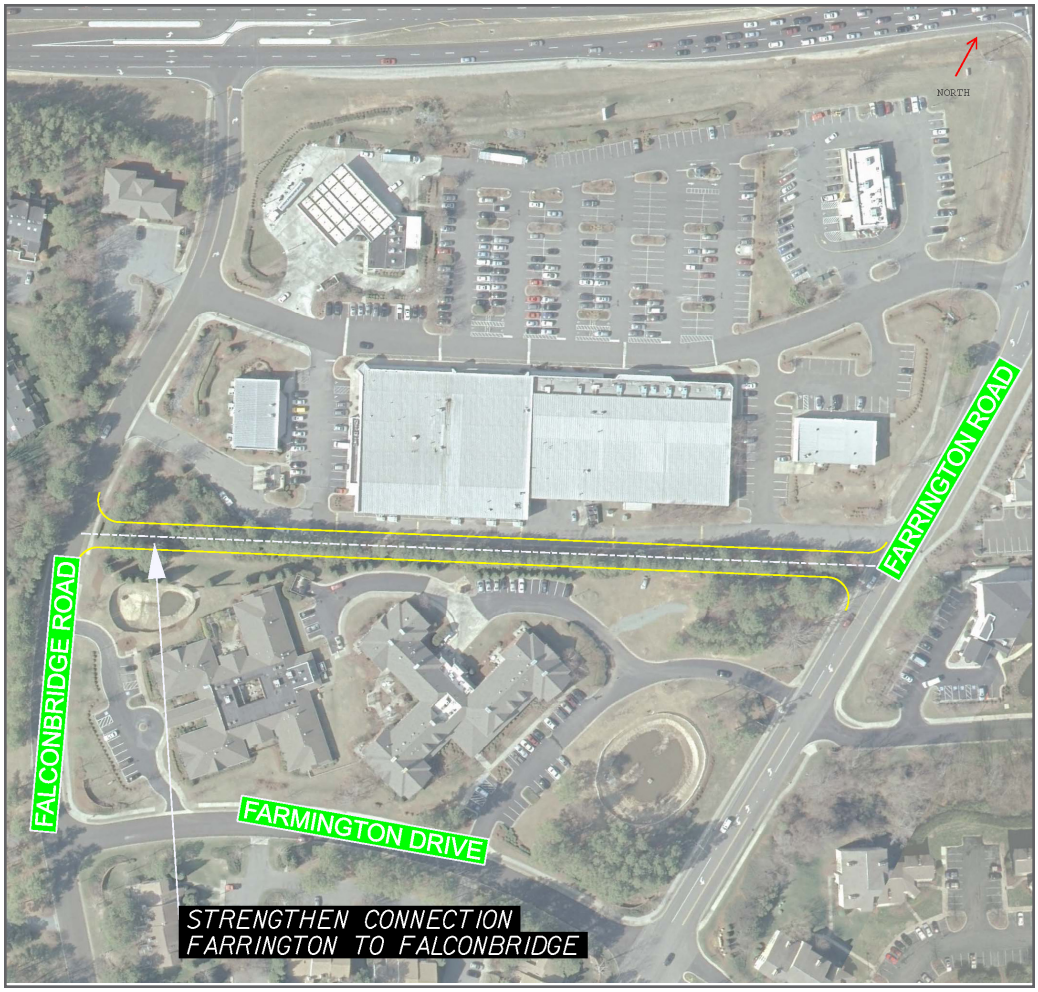


Figure 6-12: New access road connecting Falcon Bridge Road and Farrington Road

Operational Analysis

The following tables show a comparison between existing conditions, future volumes with no infrastructure improvements, and future volumes with the improvements described above[6]. As shown in Table 6-1, the overall intersection delays drop significantly at each intersection with the recommended improvements in the future. Table 6-2 shows the minutes of delay that eastbound and westbound traffic experience due to signalized intersections in the NC 54 corridor, which drop substantially with the recommended improvements.

Table 6-1: Overall Intersection Delay (seconds) & Level of Service

OVERALL INTERSECTION DELAY (SECONDS) AND LEVEL OF SERVICE												
Intersection	AM Peak Hour						PM Peak Hour					
	Existing (2009)		Future w/out Improvements (2020)		Future w/ Improvements (2020)		Existing (2009)		Future w/out Improvements (2020)		Future w/ Improvements (2020)	
NC 54 & I-40 Westbound Ramps	123	F	154	F	24	C	51	D	126	F	24	C
NC 54 & I-40 Eastbound Ramps	93	F	168	F	7	A	111	F	293	F	60	E
NC 54 & Farrington Road	172	F	294	F	94*	F*	162	F	383	F	153*	F*
NC 54 & East Barbee Chapel Road	48	D	168	F	31	C	32	C	98	F	13	B
NC 54 & Meadowmont Lane/ Friday Center Drive	73	E	82	F	40	D	64	E	138	F	12	B

**with 3 westbound lanes on NC 54. The addition of one more westbound through lane from the I-40 eastbound ramp to Falconbridge Road reduces delays to 29 seconds (LOS C) in the AM peak hour and 104 seconds (LOS F) in the PM peak hour.*

Table 6-2: Total Directional Delay (in minutes)

SCENARIO		EAST BOUND	WEST BOUND
AM PEAK HOUR	Existing (2009)	6	7
	Future w/out Improvements (2020)	10	29
	Future w/ Improvements (2020)	2	7
PM PEAK HOUR	Existing (2009)	8	3
	Future w/out Improvements (2020)	31	14
	Future w/ Improvements (2020)	7	5

6 The operational analyses are further documented in Appendix E: Synchro Traffic Analysis

Additional Improvements

As the Leigh Village station area develops, it will continue to generate more traffic and contribute to the increasing travel demand on the corridor. Once the traffic demand becomes greater than approximately 70,000 vpd, additional capacity improvements will be necessary. Improved access to I-40 to and from the Leigh Village station area and park-and-ride facility, via new interchange ramps, will relieve the NC 54/I-40 interchange and Farrington Road intersection .

Several direct access ramps from I-40 to the Leigh Village area are recommended, as shown in the Long Term (2022-2035) Phased Improvements fold-out sheets. The proposed design concept completely avoids impacting Leigh Farm Park to the east of I-40. The westbound I-40 off-ramp to Leigh Village meets the 50 mph design speed and would likely be designed for two lanes due to the length and volume demand. There will likely be some property impacts due to the loss of parking at the Harrington Bank parcel between Farrington Road and the I-40 eastbound off-ramp.

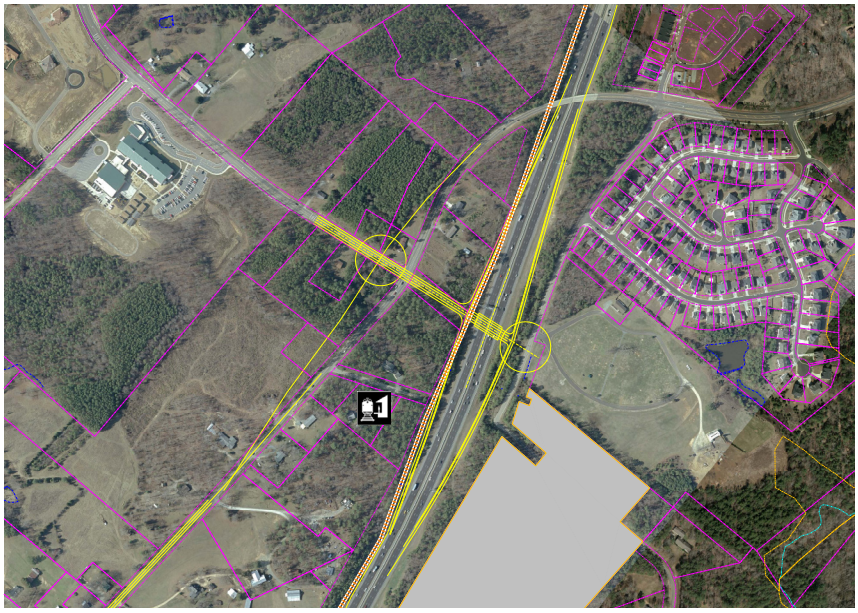
Another design for consideration during the preliminary engineering study in lieu of new access ramps to the Leigh Village station area and park-and-ride facility may be the tight diamond interchange shown in Figure 6-13. This interchange would provide direct access to and from both directions on I-40 without impacting Leigh Farm Park or the cemetery. While this location and configuration provide a relatively cost efficient and effective interchange opportunity that relieves traffic at the NC 54 interchange, this interchange location is not recommended due to its likely traffic impacts on the surrounding residential area and Creekside Elementary School.

In addition, the northbound left turn at Barbee Chapel Road and the southbound left turn from the collector street across from Farrington Road should be monitored as a triple left turn lanes may be necessary as traffic demand grows.

Figure 6-13: Alternative Solution: Tight Diamond Interchange at Ephesus Church Road

In lieu of the direct access ramps to Leigh Village, a tight diamond interchange could be further reviewed for feasibility at Ephesus Church Road.

*This alternative is **not recommended** due to potential traffic impacts on Creekside Elementary School and high traffic volumes using the planned collector road network, but it reflects the need for an additional connection from I-40 to serve Leigh Village as it develops.*



Short Term Improvements

In the short term there are several small and relatively inexpensive improvements that can be implemented as development proposals and other opportunities arise that represent incremental steps toward the installation of the longer term improvements.

Several of the signalized intersections will need channelized right turn lanes for future demand that will marginally benefit traffic in the short term, including the eastbound right turn at East Barbee Chapel Road and the northbound right turn with dedicated merge lane at Friday Center Drive. These channelized right turns should be constructed as shown in the Short Term (2012-2017) Phased Improvements fold-out sheets with consideration given to the future construction of the superstreet configuration.

Making connections on the south side of NC 54 will be extremely important in preparation for the superstreet configuration.

The northbound free flow channelized right turn at Friday Center Drive can be implemented as soon as funds are available. The northbound right turn should have a dedicated merge lane which will become an exclusive right turn lane onto southbound Barbee Chapel Road with a yield sign indicating vehicles must yield to southbound through traffic and westbound left turns.

The Farrington Road slip ramp for northbound vehicles on Farrington Road to directly access eastbound I-40 can be constructed as soon as funds are available. The collector street system as identified in the Collector Street Plan and shown in Figure 6-14 should also be constructed as soon as possible.

Making connections on the south side of NC 54 will be extremely important in preparation for the superstreet configuration. Extending Marriott Way and obtaining right-of-way/ constructing a connection behind the Falconbridge Shopping Center will be critical in ensuring the superstreet configurations function well. Other connections should be explored as opportunities arise. Local street connections that exist off of NC 54 will help to disperse the traffic and ease congestion on NC 54.

Many of the improvements for pedestrians and bicyclists as described in Chapter 5: Pedestrian and Bicycle Facility Recommendations should be constructed in the short term as soon as funds are available. The improvements at the US 15-501 interchange with NC 54 include modifying the abutment wall underneath the US 15-501 overpass to construct a sidewalk, improving the ramp intersections with larger 'pork-chop' channelization islands and crosswalks, widening under the bridge to accommodate a bike lane, and installing warning signs to alert drivers of the possible presence of pedestrians and bicyclists, especially as they approach the intersection from an off-ramp. Crosswalks and pedestrian signals should be installed as soon as possible at each approach on the intersections to make it safer for pedestrians to cross NC 54. A 5-foot wide bike lane is recommended on NC 54 west of Burning Tree Drive/ Finley Golf Course Drive and should be implemented through striping 11-foot wide travel lanes and minor median modifications or as widening opportunities arise with redevelopment of adjacent parcels or road resurfacing.

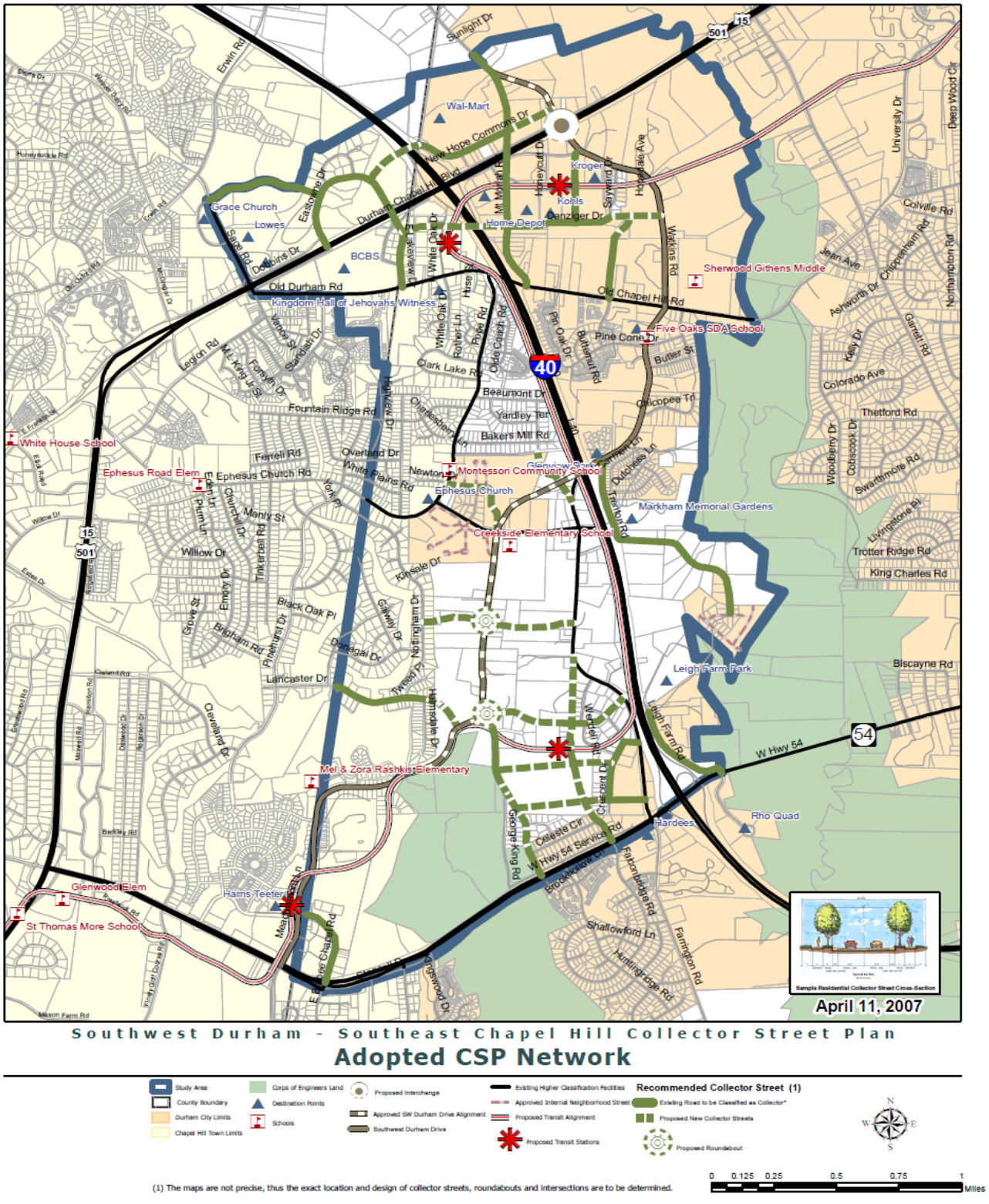


Figure 6-14: Adopted Collector Street Network

Source: Durham – Chapel Hill – Carrboro Metropolitan Planning Organization

The proposed and adopted collector street network within the study area should be constructed as soon as funds are available.

Roadway Recommendations by Implementation Phase

The following table shows the specific recommended roadway improvement projects according to timeframe. Construction projects for pedestrian and bicycle infrastructure are not included in this table, but are described in the Recommendations for Pedestrians and Bicyclists section and included in the complete project list at the end of this report.

Table 6-3: Roadway Transportation Recommendations

ROADWAY				
Description	**Location**	**Jurisdiction**	**Phase**	**Cost**
Construct channelized free flow lane for eastbound right turns into East Barbee Chapel Road	Along NC 54 at E Barbee Chapel Rd	Chapel Hill	Short Term (2012-2017)	$700,000
Construct northbound right turn channelization to free flow merge lane onto eastbound NC 54	Friday Center Dr	Chapel Hill	Short Term (2012-2017)	$900,000
Construct Farrington Road slip ramp for northbound traffic on Farrington Road to access eastbound I-40 directly. Modify on-ramp to allow for transition.	Farrington Rd	Durham	Short Term (2012-2017)	$3,300,000
Construct collector street system including turn lanes on NC 54.	As specified in the adopted Southwest Durham – Southeast Chapel Hill Collector Street Plan	Durham	Short Term (2012-2017 and beyond)	$31,400,000
Construct access road behind the Farrington Road shopping center for connection between Farrington Road and Falconbridge Road.	Between Farrington Rd and Falconbridge Rd	Durham	Short Term (2012-2017)	$400,000
Obtain Marriot Way, then upgrade to NCDOT standards and extend to Barbee Chapel Road.	Between Friday Center Dr and E Barbee Chapel Rd	Chapel Hill	Short Term (2012-2017)	$800,000
Construct other connections as opportunities arise through development proposals.	Through study area	Durham & Chapel Hill	Short to Long Term	Variable cost
Improve I-40 interchange to add new partial cloverleaf ramp for I-40 EB to NC54 EB, remove existing signal and install yield sign at the I-40 EB to NC54 WB ramp with addition of merge lane.	I-40 Interchange with NC 54	Durham	Mid-Term (2017-2022)	$1,100,000
Construct EB NC 54 to EB I-40 flyover from Farrington Road to I-40 EB on-ramp.	I-40 Interchange with NC 54	Durham	Mid-Term (2017-2022)	$10,800,000

ROADWAY				
Construct auxiliary lane widening for I-40 westbound offramp to match the two lane section of the ramp.	I-40 Interchange with NC 54	Durham	Mid-Term (2017-2022)	$1,100,000
Widen the bridge over I-40 to accommodate 4 lanes of westbound NC 54 laneage. In conjunction with this, widen the westbound approach to two lanes for 500 feet as needed for intersection capacity.	I-40 Interchange with NC54	Durham	Mid-Term (2017-2022)	$2,300,000
Reconstruct the Farrington Road intersection to only allow the northbound left turn through the intersection. Channelize for freeflow westbound right turn lane.	Farrington Rd	Durham	Mid-Term (2017-2022)	$3,700,000
Widen NC54 to six lanes in the Durham section. Construct the multiuse path concurrent with the road project.	Durham section of NC54	Durham	Mid-Term (2017-2022)	$18,700,000
Implement superstreet configurations at Falconbridge Rd, Huntingridge Rd, E Barbee Chapel Rd and Friday Center Dr intersections.	Falconbridge Rd, Huntingridge Rd, E Barbee Chapel Rd and Friday Center Dr	Durham	Mid-Term (2017-2022)	$3,800,000
Install triple southbound lefts at Falconbridge Road.	Falconbridge Rd	Durham	Long Term (2022-2035)	$400,000
Construct I-40 ramps into the northern development (Leigh Village) area	I-40 Interchange with NC54 and area to the north	Durham	Long Term (2022-2035)	$27,700,000
Monitor for potential need to grade separate key intersections through the corridor.	Corridorwide	Durham & Chapel Hill	Beyond 2035	Variable cost.

Tested Scenarios and Results

The NC 54 corridor study used a process of scenario planning to identify preliminary transportation strategies and complementary land use patterns. As part of this effort, several scenarios were developed based on the visioning consensus themes and ideas conveyed at the first public workshop, with the intent of providing three distinct pictures of what the NC 54 corridor and study area could look like in the future and how it would function in the year 2035. The preliminary scenarios, further detailed in Chapter 2: Land Use Recommendations, were broad approaches to mobility and urban form in the corridor and used as a tool to help the project team determine the vision and the preferred approach to guide future growth in the corridor.

The Collector Street Network

The trend scenario was tested with and without the construction of the adopted collector streets. The scenario testing results showed that the collector street network substantially relieves Farrington Road and other north-south collector roads north of NC 54. Although the collector street network does not attract much traffic away from NC 54, it does help improve traffic flow on NC 54.

Widening NC 54 to Six Lanes

Maintaining a four-lane section through the Durham portion of the NC 54 corridor reduces the amount of traffic the road can serve, but it does not eliminate the demand. In the scenario where NC 54 was maintained at four-lanes, traffic levels on the connecting roads like Barbee Chapel Road, Southwest Durham Drive, US 15-501 rose significantly, indicating that vehicles that couldn't access destinations within the study area because of congestion on NC 54 were crowding the other routes leading into the area.

Light Rail System, Enhanced Bus Service and Development Densities

The implementation of the light rail system and enhanced bus service will reduce traffic volumes on NC 54; however transit alone cannot solve the problem. With slightly increased development densities the delays and travel speeds remain comparable to the trend, but much higher densities, like those desired in the station areas to created successful transit-oriented mixed-used community hubs, create more local traffic and increase delays. Regardless of densities, the regional demand for the corridor will continue to rise because of its location, and roadway improvements will be necessary for the corridor to serve that demand. Leigh Village Park-and-Ride

Leigh Village Park-and-Ride

Constructing a park-and-ride facility within the Leigh Village area will help to reduce traffic volumes on NC 54. Commuters who currently use the Friday Center park-and-ride lot will use the park-and-ride lot that is closer to I-40 rather than driving halfway through the congested NC 54 corridor.

Providing Direct Access to Leigh Village from I-40

A full access interchange was tested along I-40 about one-quarter mile south of Ephesus Church Road with the intent to provide direct access for the Leigh Village park-and-ride facility and light rail station area. Traffic levels on Farrington Road between Ephesus Church Road and Wendell Road increased, but decreased or stayed the same on the other Farrington Road segments. The public advocated for the idea of providing direct access to Leigh Village from I-40, but unanimously indicated that such an interchange should not impact Leigh Farm Park.

HOV Lanes

The HOV lanes were tested on I-40 as new lanes, essentially making I-40 an eight lane freeway. This increased traffic volumes on I-40, but when tested with the interchange into Leigh Village did not impact the NC 54 interchange.

Conclusions

The roadway improvements described in the preceding sections will provide the necessary vehicular mobility given the projected growth in the study area and region. These improvements, in conjunction with the multimodal improvements and land use strategies result in a multifaceted approach to accommodating future jobs and households within this growing transit corridor.

It is important to note that the traffic volumes projected for year 2020 in the preferred scenario are similar to those projected for the LRTP scenario for year 2035, which are driven largely by regional demand outside of the study area. In other words, if the future unfolds similarly to the assumptions of the LRTP, the projected traffic demand for the NC 54 corridor will reach 70,000 vpd by 2035. If the future unfolds similarly to the preferred scenario, the demand will reach 70,000 vpd by 2020. Also, the travel demand modeling indicates that by coupling the land use development densities of the preferred scenario with direct access ramps from I-40 into the Leigh Village station area, the demand on the NC 54 corridor will be the same in 2035 as it would be in 2035 with the assumptions from the LRTP. Essentially, the direct access ramps, transit systems and transit-oriented development patterns will help manage and absorb the travel demand.

The coordinated housing and transportation investments will provide better mobility within the corridor while simultaneously putting people and jobs closer together to get maximum benefits from the transportation investments. Enabling higher density development within the station areas allows developers to contribute to transportation solutions so that needed investments have multiple funding sources and can be implemented more quickly.

If future growth and transportation investments occur similarly to the assumptions of the LRTP, the transportation investments outlined in this chapter will be needed by 2035 due to continued growth in regional traffic. The higher development densities of the preferred scenario accelerate the need for these transportation improvements. Yet, focusing the future growth into the planned light rail transit stations will bring the benefits of functional transit-oriented development. The coordinated housing and transportation investments will provide better mobility within the corridor while simultaneously putting people and jobs closer together to get maximum benefits from the transportation investments. Enabling higher density development within the station areas allows developers to contribute to transportation solutions so that needed investments have multiple funding sources and can be implemented more quickly.

The costs associated with the road improvements can be partially offset by the increase in tax revenue and other creative funding opportunities made possibly by the increased transit oriented density of the new development as described in the land use section of this document.

Implementation and Funding

The recommended roadway improvements range from minor geometric modifications, intersection reconstruction, construction of additional collector streets, and major interchange improvements. It is anticipated that many of the relatively minor improvements and also construction of the Collector Street Plan network will be implemented by the development community, while the larger scale improvements will require public funding sources and mechanisms.

Private Sector Funding

As development proposals are evaluated, the traffic impact analysis process will help to identify opportunities for developer sponsored improvements. These may include (among others to be determined), the intersection lane and channelization modifications, collector street construction, signalization modification and retiming, pedestrian facility improvements along their frontage or in close proximity, and potentially negotiated contributions toward the larger projects identified in this summary table. Significant segments of the multimodal network for local driving trips, walking, and wheeling will be constructed by the private sector as development occurs.

Public Funding Sources

The NC 54 Corridor Master Plan provides guidance to the Durham – Chapel Hill – Carrboro (DCHC) MPO for the development of project priorities for state and federal funding. Most of the public funding sources to carry out the transportation recommendations will be through the MPO funding process, with other minor projects undertaken through the local government capital improvement program funding or the MPO's Congestion Management Process.

MPO Related Funding

The primary funding mechanism for many of the transportation recommendations is expected to occur through the MPO's funding process, which requires inclusion of the projects in the adopted Long Range Transportation Plan and advanced through the Transportation Improvement Program (TIP). Following review of the plan by the MPO's Transportation Advisory Committee (TAC), NCDOT and each of the local policy boards, the TAC will need to determine which projects will be advanced into the 2040 update of the financially feasible DCHC LRTP based on the anticipated year of expenditure from available revenue sources. Priority projects will need to be advanced into the outer years of TIP, and then must compete for state funds through NCDOT's project prioritization criteria to receive state funding allocations. Specific funding sources, per the projected revenue forecasts, can be attached to the projects, depending on the type of project.

The MPO and localities can seek opportunities for earmark funding of the larger projects, such as the corridor widening and interchange improvement projects. Through this process federal dollars are earmarked for a specific project and the funding is then added to the MPO constrained project listing. Given the unique character and statewide importance of this corridor, the associated projects may be particularly competitive for earmark funding.

The MPO's Congestion Management Process is a good source of funding for small, lower cost projects, such as intersection modifications and signalization, that can be implemented relatively quickly. The CMP has a smaller amount of available funds, and these projects must compete against similar projects elsewhere in the MPO's planning area. CMP –eligible projects typically have a low construction cost threshold and right-of-way issues need to be resolved prior to funding.

State Enhancement Funding

Projects that are not initiated in the TIP process may be funded through competitive grant programs like the state transportation enhancement program, which requires a local match. The multimodal (sidewalks, multiuse paths, and pedestrian facilities) projects may be eligible for these funding grants, which would need to be included in the TIP if awarded.

Improvements that can be linked to safe pedestrian access to schools may be eligible for competitive Safe Routes To School funding. The localities can apply for this funding in coordination with the MPO. This may

be applicable to sidewalk improvements in proximity to Creekside Elementary School. This is a competitive grant-funded program based on federal money allocated to the state, and needs to be included in the TIP as well.

Local Capital Improvement Plans

The localities may seek to fund some of the projects through their respective Capital Improvement Plans . To accomplish this, the local governments will need to amend/ update their comprehensive plans to include the Corridor Study's recommendations, and then incorporate preferred projects into their Capital Improvements Program.

Competitive Grant Opportunities

Localities can apply for many grants for transportation projects, but if federal monies are awarded, the project must be included in the MPO's LRTP and TIP . Localities can use their HUD Community Development Block Grant (CDBG) funding for infrastructure, and many other federal grants including the newly available Sustainable Communities grants from HUD, EPA and USDOT (these include TIGER grants from USDOT and HUD Community Challenge grants). But again, any federal grants must have MPO backing .

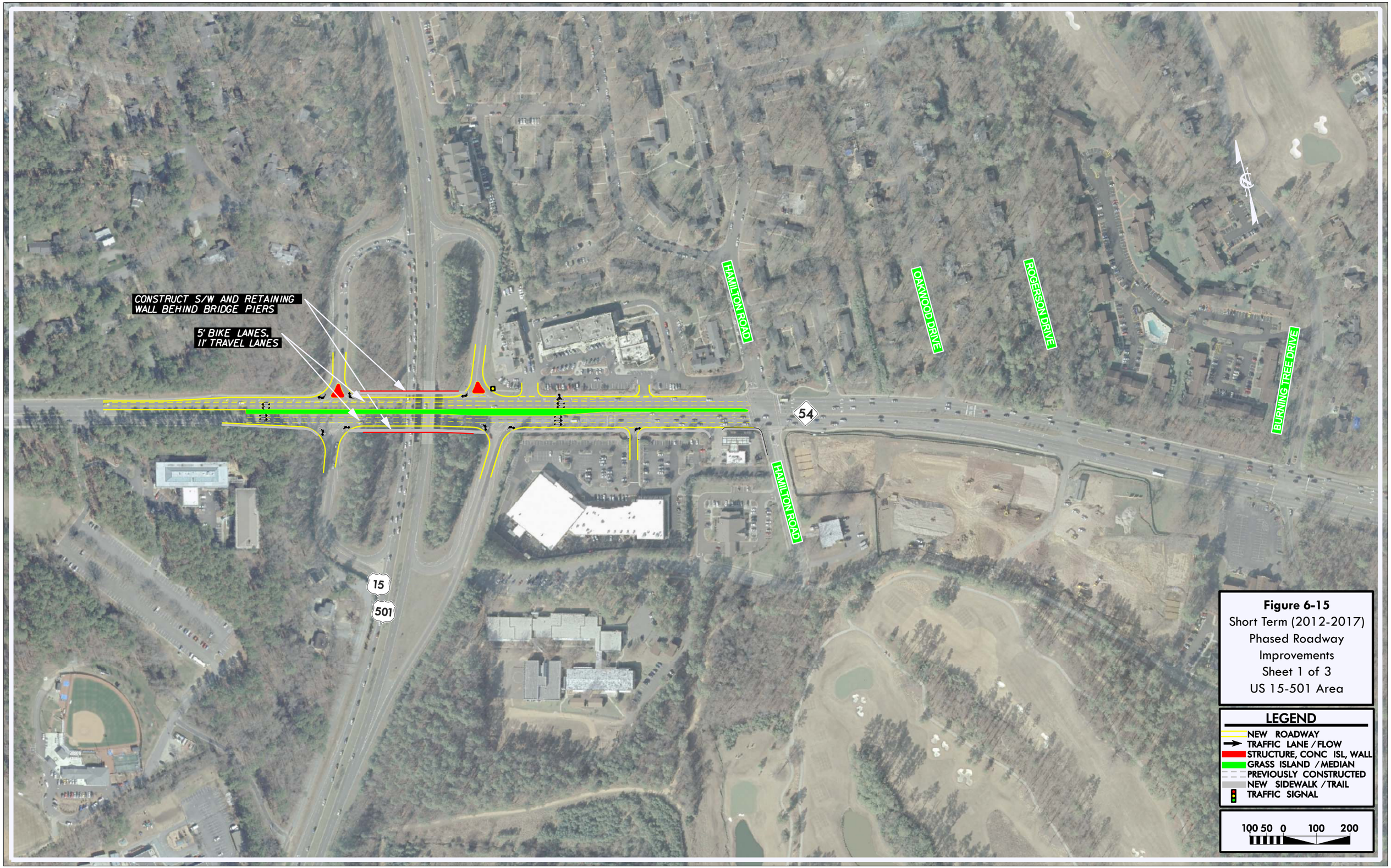
Small grant opportunities maybe found for specific bicycle and pedestrian projects through non-governmental, non-profit entities, including the Robert Wood Johnson Foundation grants (www.albd.org), and the Centers for Disease Control active living grant.

Innovative Finance Methods

The localities may choose to pursue innovative project finance alternatives such as:

- Tax Increment Financing (TIF) – this is a "value capture technique" whereby the locality re-coups the cost of infrastructure investment through the increased taxable value, and commercial revenue tax, or the affected area.
- Special taxing district – a method of applying an increased tax rate to a specified district with the intent on paying for necessary infrastructure investments
- Issuance of Bonds to pay for pre-specified transportation improvements (perhaps applicable to the improvements to the NC 54 corridor and interchange as a regionally significant roadway). TIF revenue is frequently allocated to pay off bonds, allowing for up-front investment with a steady revenue stream as taxable values grow.

Since legislative authority to allow the localities to create a revenue source to build a light rail system is under discussion, consideration could also be given to allow a portion of those proceeds to be used for transit-related infrastructure improvements around station areas. This could include enhancements to the transit 'customer delivery system' such as walking and wheeling improvements, street crossings, and commuter information systems.


CONSTRUCT S/W AND RETAINING WALL BEHIND BRIDGE PIERS
5' BIKE LANES, 11' TRAVEL LANES
HAMILTON ROAD
OAKWOOD DRIVE
ROGERSON DRIVE
BURNING TREE DRIVE
54
15
501
HAMILTON ROAD
Figure 6-15
Short Term (2012-2017) Phased Roadway Improvements
Sheet 1 of 3
US 15-501 Area
LEGEND
NEW ROADWAY
TRAFFIC LANE / FLOW
STRUCTURE, CONC ISL, WALL
GRASS ISLAND / MEDIAN
PREVIOUSLY CONSTRUCTED
NEW SIDEWALK / TRAIL
TRAFFIC SIGNAL
100 50 0 100 200

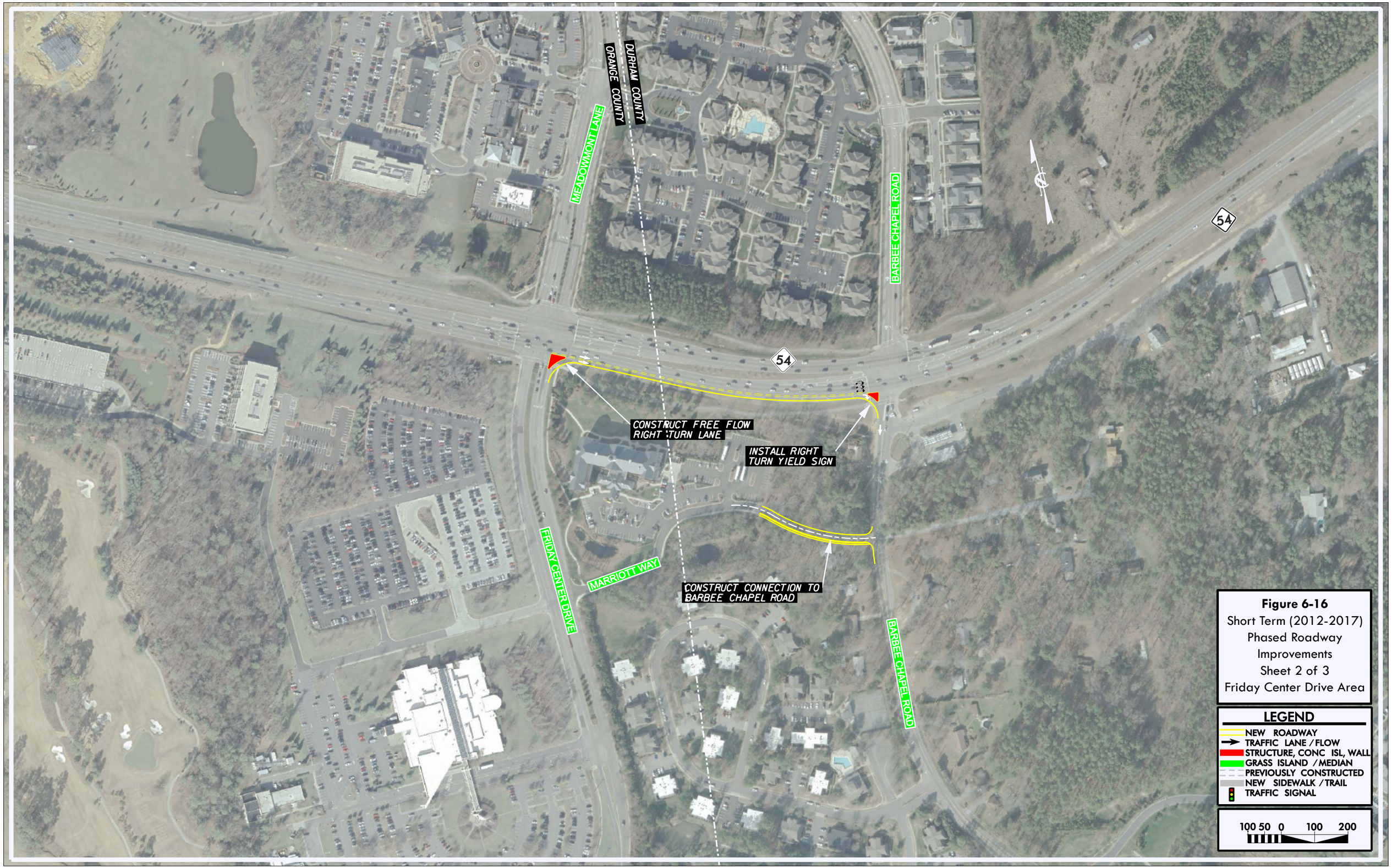


Figure 6-16
Short Term (2012-2017)
Phased Roadway
Improvements
Sheet 2 of 3
Friday Center Drive Area

CONSTRUCT COLLECTOR ROAD SYSTEM

CROSSLAND DRIVE

CELESTE CIRCLE

CRESCENT DRIVE

CLEORA DRIVE

FARRINGTON ROAD

54

CONSTRUCT TURN LANES ON NC 54

HUNTINGRIDGE DRIVE

FALCONBRIDGE ROAD

FARMINGTON DRIVE

FARRINGTON ROAD

STRENGTHEN CONNECTION FARRINGTON TO FALCONBRIDGE

CONSTRUCT CHANNELIZED SLIP RAMP AND LENGTHEN MERGE TAPERS FOR ON-RAMP TO I-40 (APPROX. 3,500' ON I-40)

INTERSTATE 40

Figure 6-17
Short Term (2012-2017)
Phased Roadway
Improvements
Sheet 3 of 3
Interchange Area

LEGEND

- NEW ROADWAY
- TRAFFIC LANE / FLOW
- STRUCTURE, CONC ISL, WALL
- GRASS ISLAND / MEDIAN
- PREVIOUSLY CONSTRUCTED
- NEW SIDEWALK / TRAIL
- TRAFFIC SIGNAL

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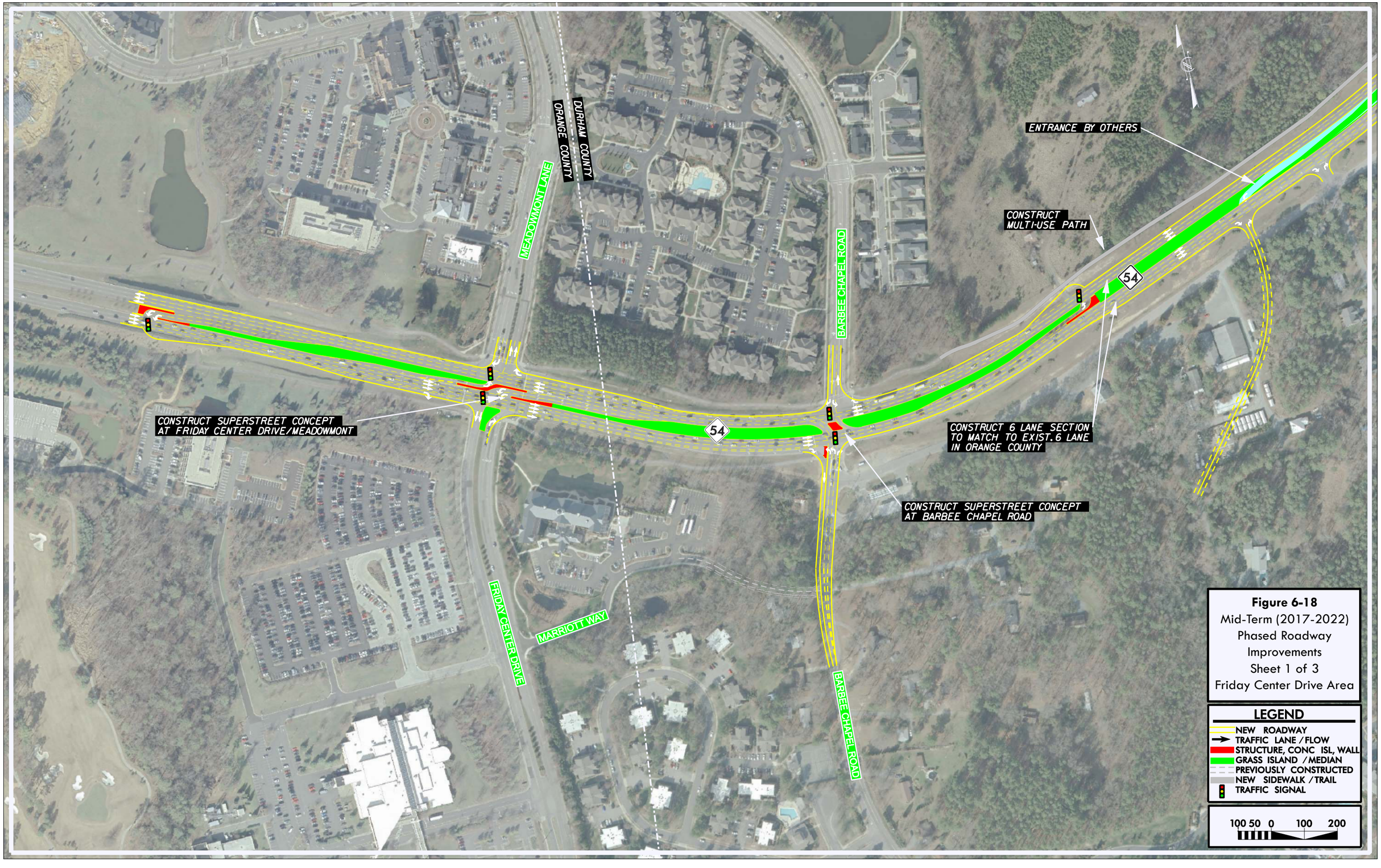


Figure 6-18
Mid-Term (2017-2022)
Phased Roadway
Improvements
Sheet 1 of 3
Friday Center Drive Area

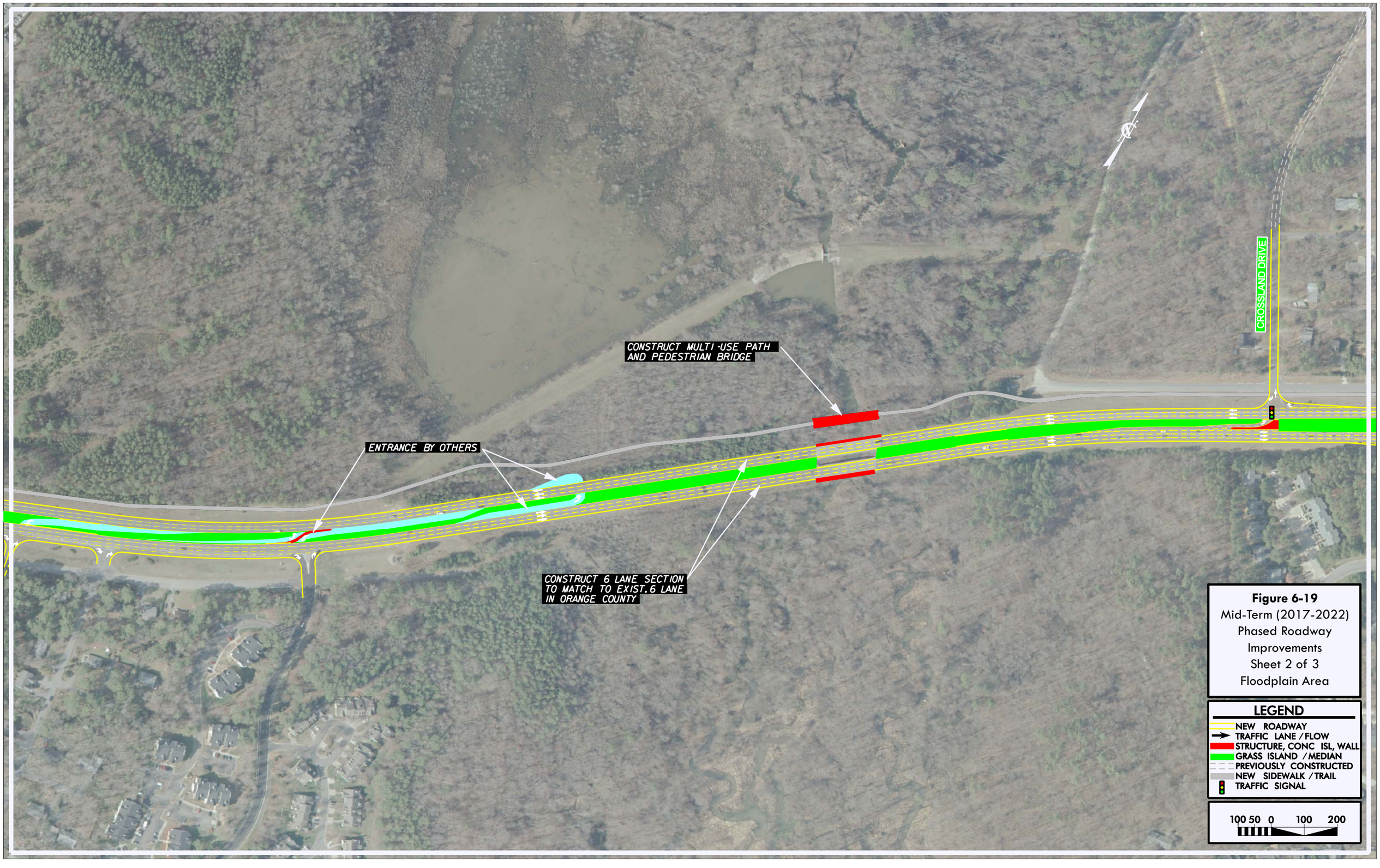


Figure 6-19
Mid-Term (2017-2022)
Phased Roadway
Improvements
Sheet 2 of 3
Floodplain Area

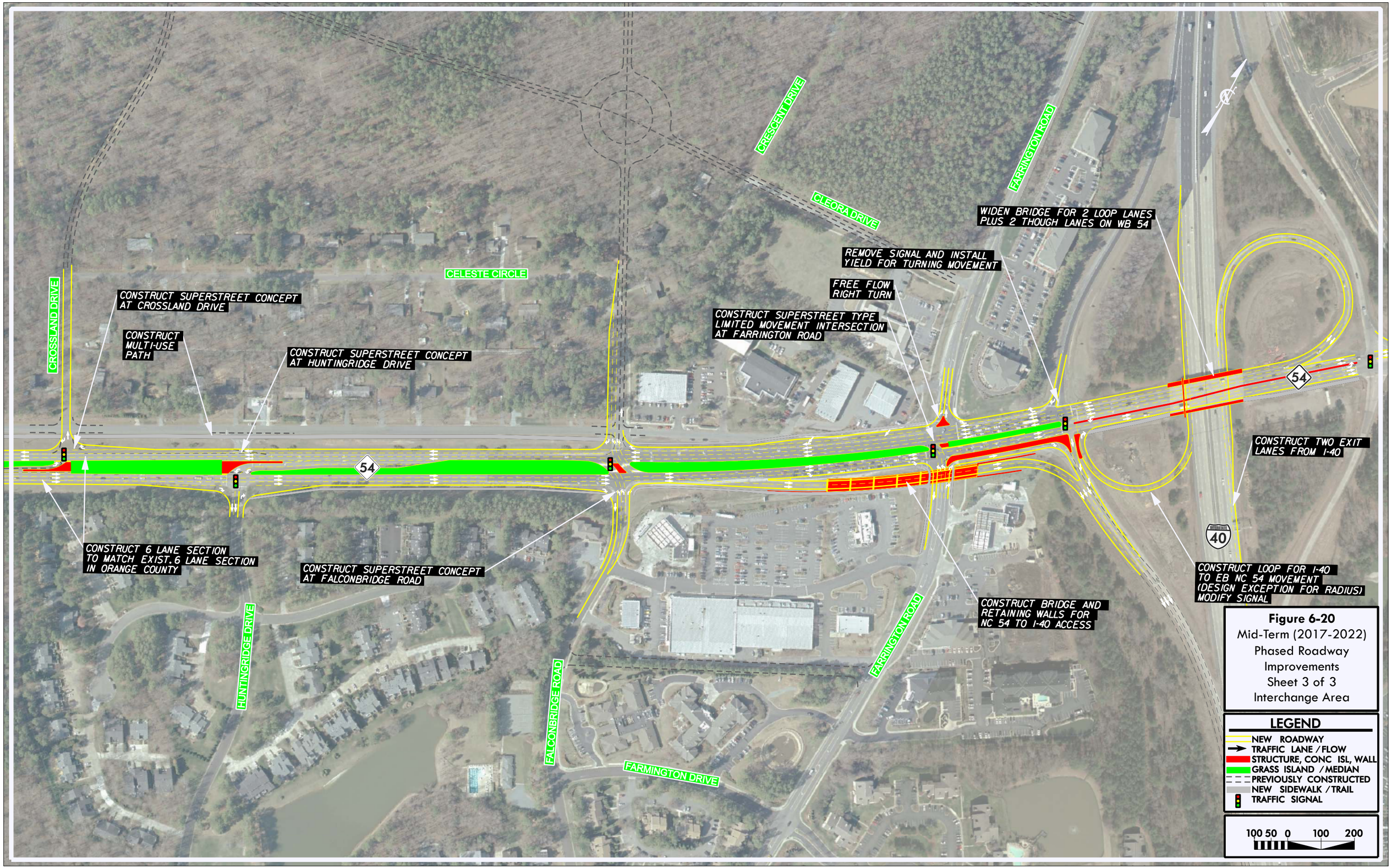


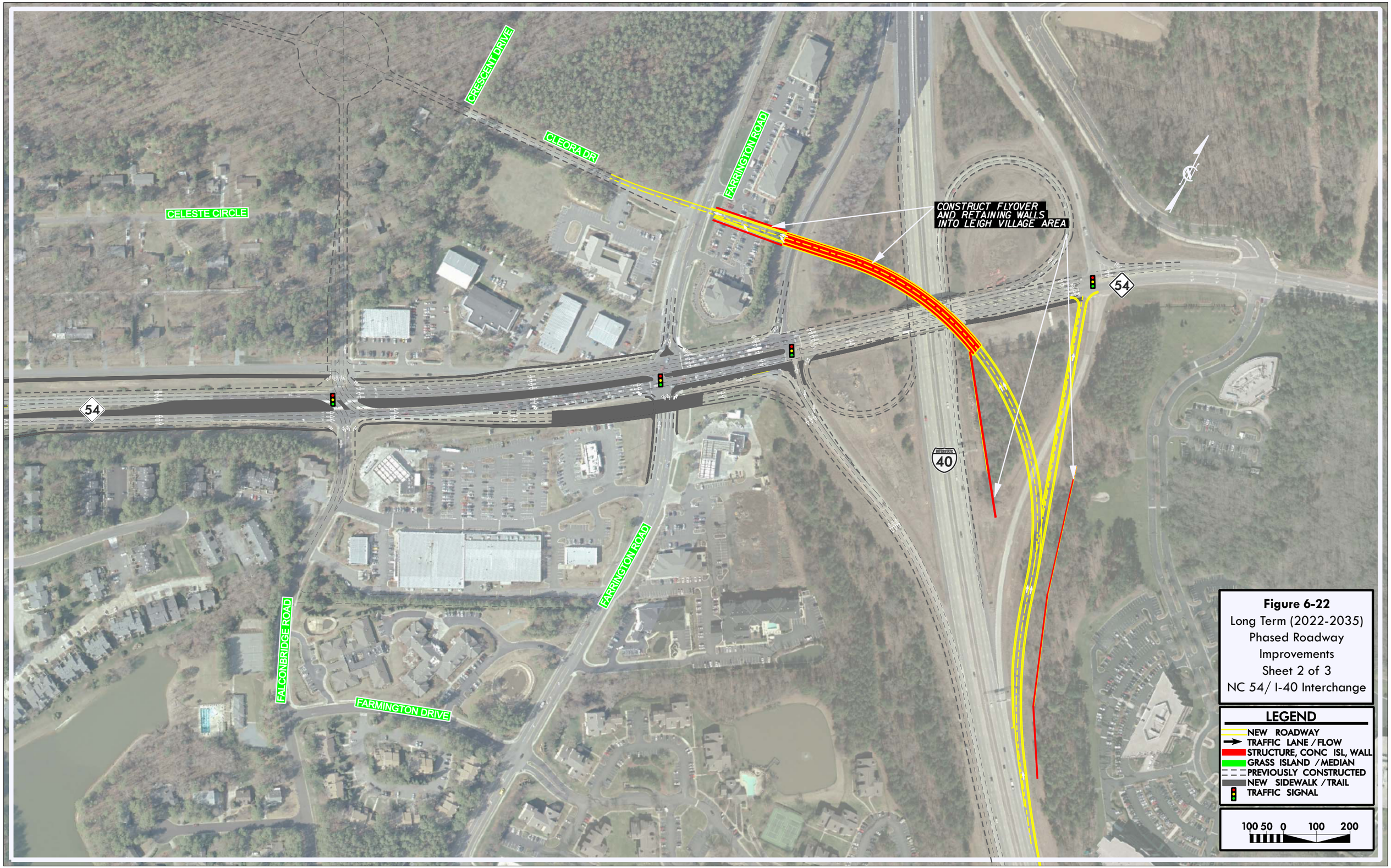
Figure 6-20
Mid-Term (2017-2022)
Phased Roadway
Improvements
Sheet 3 of 3
Interchange Area

LEGEND

- NEW ROADWAY
- TRAFFIC LANE / FLOW
- STRUCTURE, CONC ISL, WALL
- GRASS ISLAND / MEDIAN
- PREVIOUSLY CONSTRUCTED
- NEW SIDEWALK / TRAIL
- TRAFFIC SIGNAL

100 50 0 100 200

CROSSLAND DRIVE
CELESTE CIRCLE
CONSTRUCT 3RD TURN LANE
CRESCENT DRIVE
CLEORA DR
FARRINGTON ROAD
54
HUNTINGRIDGE DRIVE
FALCONBRIDGE ROAD
FARMINGTON DRIVE
FARRINGTON ROAD
40
Figure 6-21
Long Term (2022-2035)
Phased Roadway
Improvements
Sheet 1 of 3
Falconbridge Road
LEGEND
NEW ROADWAY
TRAFFIC LANE / FLOW
STRUCTURE, CONC ISL, WALL
GRASS ISLAND / MEDIAN
PREVIOUSLY CONSTRUCTED
NEW SIDEWALK / TRAIL
TRAFFIC SIGNAL
100 50 0 100 200


CRESCENT DRIVE
CLEORA DR
FARRINGTON ROAD
CELESTE CIRCLE
CONSTRUCT FLYOVER AND RETAINING WALLS INTO LEIGH VILLAGE AREA
54
54
40
FALCONBRIDGE ROAD
FARMINGTON ROAD
FARMINGTON DRIVE
Figure 6-22
Long Term (2022-2035)
Phased Roadway
Improvements
Sheet 2 of 3
NC 54/ I-40 Interchange
LEGEND
NEW ROADWAY
TRAFFIC LANE / FLOW
STRUCTURE, CONC ISL, WALL
GRASS ISLAND / MEDIAN
PREVIOUSLY CONSTRUCTED
NEW SIDEWALK / TRAIL
TRAFFIC SIGNAL
100 50 0 100 200

CREEKSIDE ELEMENTARY

LEIGH VILLAGE DEVELOPMENT AREA

EPHESUS CHURCH ROAD

FARRINGTON ROAD

CONSTRUCT LEIGH VILLAGE TO I-40 ACCESS

CONSTRUCT LEIGH VILLAGE TO I-40 ACCESS

LEIGH FARM PARK

TRENTON ROAD

TRENTON ROAD

CONSTRUCT LEIGH VILLAGE TO I-40 ACCESS.BRIDGE AND RETAINING WALLS

Figure 6-23
Long Term (2022-2035)
Phased Roadway
Improvements
Sheet 3 of 3
Leigh Village Ramps

LEGEND

- NEW ROADWAY
- TRAFFIC LANE / FLOW
- STRUCTURE, CONC ISL, WALL
- GRASS ISLAND / MEDIAN
- PREVIOUSLY CONSTRUCTED
- NEW SIDEWALK / TRAIL
- TRAFFIC SIGNAL

100 50 0 100 200

Summary and Conclusions

The NC 54/I-40 Corridor Study represents a year-long effort to explore, analyze, plan and build consensus for viable land use and mobility strategies that achieve an effective balance between competing regional and local travel needs in this regionally significant corridor that serves multiple jurisdictions. The goal has been to define a long term vision and strategic blueprint for mobility and livability that supports future development while maintaining a safe and efficient transportation network.

The outcome of this planning process is a master plan that provides a strategic set of recommendations intended to improve livability, personal mobility and access, while also serving regional and through traffic needs. It is important to set a proper context for this study. The Durham-Chapel Hill-Carrboro MPO identified the need for this study due to the high growth pressures facing this corridor, recognizing that its strategic location is fueling more intensive land development activity in the area, and a detailed transportation plan is needed to guide local and state agency decision-making. The corridor is essential not only to the University of North Carolina at Chapel Hill and its medical facility services, but to the Town of Chapel Hill and the City of Durham because of the regional and local accessibility it provides.

A multi-agency steering committee has guided the study's progress and recommendations quite effectively. This process also entailed a vigorous public participation program that included numerous meetings and a series of three well-attended public workshops held at key milestones in the plan's development. Numerous public comments shaped the direction and recommendations of this final report.

In general, this corridor is facing significant increases in traffic congestion from regional traffic demands, and lacks sufficient alternatives for parallel capacity. The corridor is largely constrained by environmentally sensitive lands, existing development and established neighborhoods. There are policies in place in Chapel Hill and on the University of North Carolina at Chapel Hill campus that restrict the amount of available parking, and encourage the use of transit in reaching destinations served by this corridor. Yet the heavy traffic, high-speeds and lack of multimodal facilities along the corridor create barriers that limit the usefulness of walking and bicycling for transportation. This also influences transit usage, as every rider is a pedestrian for at least a portion of their trip.

The analysis of growth and transportation indicates that substantial capacity improvements will be needed by 2035 with or without new development anticipated to occur in the corridor. The I-40 interchange at NC 54 is fast approaching its capacity, and the proximity of the Farrington Road intersection creates operational challenges that affect much of the corridor. Heavy through traffic volumes projected along the corridor require intersection modifications that will help reduce delay. While the planned light rail transit system will help when it becomes operational sometime around 2025, it will not eliminate congestion. Rather, the light rail network provides a sound basis to guide future growth into the planned station areas as part of a nodal development strategy that will help reduce trip lengths, lower vehicle miles traveled per capita, and provide for more location-efficient housing choices to increase the financial flexibility of those residents.

While the recommended land use plan increases growth in the corridor beyond the levels assumed for the adopted Long Range Transportation Plan, most of that additional growth is expected to occur in Orange County because the LRTP assumptions appear low relative to development potential and future plans on the part of the University of North Carolina at Chapel Hill.

The recommended transportation network is defined in phases timed with anticipated levels of future growth. A series of roadway intersection improvements to create a "superstreet" through increased operational efficiency will support anticipated growth through the year 2025. An elevated bypass from eastbound NC 54 to eastbound I-40 is also needed by 2025 to maintain a functioning intersection at Farrington Road and NC 54. Additional direct access ramps from I-40 into the proposed Leigh Village development will be necessary by 2035 to support anticipated traffic growth. These

ramps can be designed to avoid impacts to Leigh Farm Park and other sensitive neighborhoods. Geometric functional designs have been developed to guide these needed capacity improvements.

Much of the anticipated future growth will need to wait until the light rail system is operational. However, the plan calls for expanded park-and-ride opportunities, including a new parking structure immediately northwest of the I-40/NC 54 interchange to improve mobility and regional access into the corridor. Additional park-and-ride lots would serve other travel markets. Expanded local bus, Bus Rapid Transit, and commuter express routes are planned to meet the corridor's growing needs in the interim to light rail, and these services will complement the rail system when it is built.

A network of non-motorized transportation facilities, along with signage/markings for shared on-road use where appropriate, is needed to create a more accessible corridor and study area. This addresses travel along the NC 54 corridor by bicyclists and pedestrians, as well as crossing the corridor safely and efficiently. Elsewhere in the study area, the network provides additional connections between residential areas, commercial destinations and regional facilities, such as the American Tobacco Trail.

The appendix to this report contains a set of design guidelines that are intended to help local governments move forward with several of the land use and transportation recommendations. Implementation of this plan will take place in a number of ways.

Monitoring Program

Establishing benchmarks and targets is an effective way to measure progress toward plan implementation. The NC 54/I-40 Corridor Study is a multi-year, multi-phase effort aimed at improving overall mobility and accessibility, consistent with plans to create development focal points as places that become multipurpose destinations. Given the concerns of some residents and many stakeholders about traffic conditions and future development plans, it makes sense to take an approach in partnership with NCDOT and the local governments that addresses various aspects of this report to track progress toward achieving outcomes of this planning effort, not merely the programming and construction of capital projects. The recommended approach is for the MPO to prepare a biannual monitoring report every two years to document progress toward achieving the mobility goals outlined in this study. This report would document transportation system conditions over time using the performance measures defined in this report and expanded to address specific implementation activities and accomplishments. The report would fit within the MPO's established Congestion Management Process, and should include three main categories of reporting as related to the corridor study area:

- Local Government Mobility Strategy Actions (cities, counties, MPO)
  - Transportation Demand Management policies and programs
  - Transportation System Management (e.g., intersection improvements, Advanced Traffic System Management (ATMS) implementation)
- Collector street network connections
- Transit service changes/improvements
- Funding allocations/developer commitments
- Parking changes/strategies
- Land development activity in the corridor
  - Summary of approved development plans/ projects
  - Type and scale of land use

    - Development order agreements for transportation
    - Developer-financed mitigation
- Constructed developments
- Multimodal infrastructure
- Access management / circulation improvements
- City- or County-initiated land use actions
- Zoning changes/variances
- Land use changes
- Land Development Code revisions
- Transportation Characteristics/Patterns
- Duration of congestion (peak spreading)
- Transit ridership for routes serving the corridor
- Carpool and vanpool activity

The recommended process for the monitoring report is for the MPO to prepare the report every two years for review by the steering committee and Transportation Advisory Committee, and the partner agencies provide comments based on their review. The biannual report and related review comments are intended to be advisory, and provide an opportunity for the MPO and NCDOT to assess changes in conditions and determine whether additional measures may be needed or other strategies can be implemented. It is suggested that the MPO schedule a joint coordination meeting to address the report findings and agency review comments. This provides a basis for next steps and agreement on strategies for subsequent two-year reporting period. Important changes in the plan should be addressed through the Comprehensive Plans and land development codes in the local governments, the MPO 2040 LRTP and Congestion Management Process, not solely as a result of the biannual report.

NC 54/I-40
CORRIDOR STUDY

TRANSPORTATION-LAND USE MASTER PLAN

DRAFT

AUGUST 2010

Durham-Chapel Hill-Carrboro
Metropolitan Planning Organization

RENAISSANCE PLANNING GROUP

RENAISSANCE PLANNING GROUP

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Community Profile

RENAISSANCE PLANNING GROUP

Technical Memorandum

COMMUNITY PROFILE
Final Submittal

NC-54 / I-40 CORRIDOR STUDY
City of Durham & Town of Chapel Hill, NC

Prepared for:

Durham-Chapel Hill-Carrboro
Metropolitan Planning Organization

By:

RENAISSANCE PLANNING GROUP

December 16, 2009

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Existing Conditions Overview

The NC-54 corridor is major arterial providing access to southwest Durham County and the Town of Chapel Hill. It is characterized by heavy congestion, especially during the peak hours, mainly because no other major east-west routes exist within the surrounding area and it draws commuting demand from a wide market area seeking access to the University of North Carolina and its medical center, as well as office, hotel and retail destinations located along NC 54 between I-40 and Fordham Road.

There are multiple competing travel needs within the corridor. Nearby residents use the corridor for local trips and face congestion throughout much of the day. Residents from Durham County, Chatham County and areas served by I-40 commute to Chapel Hill, where the university and medical center are major regional employment centers. Transit service is heavily used within the corridor, and the Friday Center park-and-ride lot is a popular facility for commuters traveling to Chapel Hill. Pedestrians and bicyclists use the corridor for both recreational and limited transportation purposes, but the high-speed nature of the roadway, separated land use and limited facilities conspire to curtail bicycle and pedestrian activity. In addition, a passenger rail system has long been discussed and planned to serve this corridor as part of a larger regional system. Local and express buses serve the corridor, further exacerbating the issue of competing scales of travel. Local residents want more bus stops within the corridor for better accessibility to destination along the corridor; commuters want to minimize the number of stops to travel through the corridor quickly. It is the lack of alternate routes, both local and regional, that concentrates congestion on this corridor, and ultimately inhibits the mobility of all trips along the corridor.

The land use and urban form pattern generally solely accommodates the automobile as a means of transportation, as evidenced by low densities and large parking lots; however, this is not the case through the entire corridor. The Meadowmont development and portions of the corridor in Chapel Hill have features that provide for safe, if isolated pedestrian accessibility. Pedestrian mobility is especially challenging on the east side of the corridor in Durham County, although pedestrian and bicyclist safety is an issue throughout the corridor.

The area around the NC-54 corridor has poor connectivity with very little distributed networks. Because of the heavy traffic volume within the area, any connected street that provides an alternate route would likely face increasing levels of high-speed cut through traffic. Pedestrians and bicyclists also experience poor connectivity and lack comfortable places to walk or ride along the corridor. Transit connectivity is also challenging, as the Durham and Chapel Hill transit systems' services end at the city/town limits, creating gaps in service that do not match the needs of many existing and potential riders in the corridor. Triangle Transit does provide an overlap to connect these two systems, but the service has limitations.

The park-and-ride at the Friday Center has been a huge success in the corridor, serving the UNC main campus and UNC medical complex. Many people use the transit system to avoid driving and parking in downtown Chapel Hill or on the UNC campus; existing transit ridership along the NC 54 corridor exceeds 5,000 passengers per day and includes standing loads during the peak commuting periods. People living along the corridor without good transit service appear to drive

the short distance to the Friday Center to use transit to access the UNC campus, thus limiting the parking spaces available to longer distance commuters. While this strategy has been successful at displacing many commuter trips, the corridor remains one of the most congested corridors in the region, in part because even those who use transit must travel through the key choke point at I-40 and Farrington Road to reach the park-and-ride lot.

There are several areas of opportunity for the study area that could help the corridor to serve these multiple travel needs more effectively. Many people rely on the transit systems and the park-and-ride lots to access UNC main campus, UNC medical complex, the Town of Chapel Hill and other destinations along the corridor. Continuing to invest and provide services for transit and park-and-ride lots in the vicinity of I-40 could help mitigate automobile travel demand in the corridor. Providing better transportation network connectivity and safe access can also help to provide alternate routes for local trips, and encourage pedestrian and bicycle activity. Providing pedestrian infrastructure, including pavement markings and design features, at intersections will help to make the corridor safer for pedestrians and transit riders.

In planning for the planned future rail system, encouraging transit-oriented development near the planned transit stations will help to shorten trip lengths in the near future, and will provide the density and diversity of land uses to help attract federal funding while making the rail link more viable to capture trips when it is implemented. Planning transit-oriented development in nodes or station areas along the corridor can also support local transit, bicycling and walking trips in the near-term.

These challenges and opportunities will be further explored through a scenario planning process that envisions possible futures for the NC 54/I-40 corridor sub-area as a basis for establishing a transportation-land use blueprint to guide future investments and policies. This corridor profile establishes baseline conditions as a starting point for creating and evaluating the corridor scenarios.

Background

Introduction

The City of Durham and the Town of Chapel Hill are neighboring communities in the Central Piedmont area of North Carolina. The University of North Carolina resides within the Town of Chapel Hill, and is a major employment center and an area attraction for educational, social and recreational activities. Two major north-south routes exist between the Town of Chapel Hill and Durham County: US Route 15/501 and Interstate 40. NC Route 54 provides a critical link between Durham and Chapel Hill, as well as to major activity centers in southwest Durham County, the Research Triangle Park, Carrboro and beyond. Today it is characterized as a heavily congested arterial; the NC-54 and I-40 interchange has consistently ranked as the top congested location in the Triangle region.

The area is facing development pressure because of the demand for medical, commercial and residential land uses near complementary destinations like UNC and its growing medical complex. Environmental and development constraints limit east-west travel options, forcing a large amount of regional and local traffic to use NC 54. Inadequate capacity to meet this demand, as well as barriers and gaps for non-auto travel alternatives, conspire to create a serious congestion problem that threatens the economic vitality and community livability of one of the region's most economically important corridors. There is intense regional and multi-jurisdictional interest in the NC-54 corridor from daily commuters, the City of Durham, the Town of Chapel Hill, UNC, local businesses and residents, and the development community.

Purpose of the Study

The purpose of this study is to prepare a Transportation – Land Use Master Plan (aka "Blueprint") for the NC-54 and I-40 study area. The study area boundaries generally encompass NC-54 from US 15/501 in Chapel Hill to just east of I-40, and I-40 from the Farrington Road overpass to the NC-54 interchange, including adjacent neighborhoods and feeder and parallel roadway networks located north and south of this arterial corridor.

Through a comprehensive public involvement process and technical analyses, up to three feasible land use-transportation scenarios for the future will be indentified and evaluated to determine the best framework for well-planned growth and improved mobility within the study area. Each scenario will entail a distinct combination of land use and transportation strategies to address corridor issues and needs. The outcome of the study entails selection of a preferred scenario and detailed master plan blueprint to guide orderly growth and development that sustains economic vitality, increases personal mobility, protects environmental resources and enhances community livability into the future.

Recommendations for short-term and long range integrated land-use and multimodal transportation strategies will be developed, including recommendations for transportation improvements and land-use policies.

This technical memorandum summarizes the data and information compiled during the first two tasks of the study (Project Initiation and Corridor/Sub-Area Profile). The completion of these tasks required coordination with the Steering Committee, collection of traffic data, compiling an inventory of existing infrastructure, reviewing previous planning documents and studies, traffic analysis and modeling, assembling environmental data, and conducting a land development capacity analysis. This information and analyses are essential preparation for the next phases of the project.

History of the Communities

The area now incorporated as the City of Durham was home to the Eno and Occaneechi tribes before the Europeans arrived in the early 1700s. The Native Americans traced transportation routes through the area, including the Great Indian Trading Path. Early European settlers worked the land and built gristmills. After the Revolutionary War, large plantations were established, and in 1849, Dr. Barlett Durham provided land for a railroad station, leading to the success of the tobacco industry and others. Known for its medical education institutions, the City of Durham boasts Duke University and North Carolina Central University as its most prized assets.

The Town of Chapel Hill was created to serve the University of North Carolina, founded in 1793. The UNC Board of Trustees named a committee to lay out the town in 1798, and it consisted of 30 parcel and six streets. Until the 1940s the town remained a small relatively rural village. In 1952, the UNC Hospital opened (then called the North Carolina Memorial Hospital), and the partnership between UNC Hospitals and the School of Medicine began. Especially in the last 35 years, the University has continued to grow, and the UNC Medical Center has become the state's leading public medical facility. Because of the recent growth and change in the University, it has transformed into a thriving cosmopolitan university city. The UNC Medical Center is a statewide research and treatment center that is driving the growth in the study area more than any other single entity.

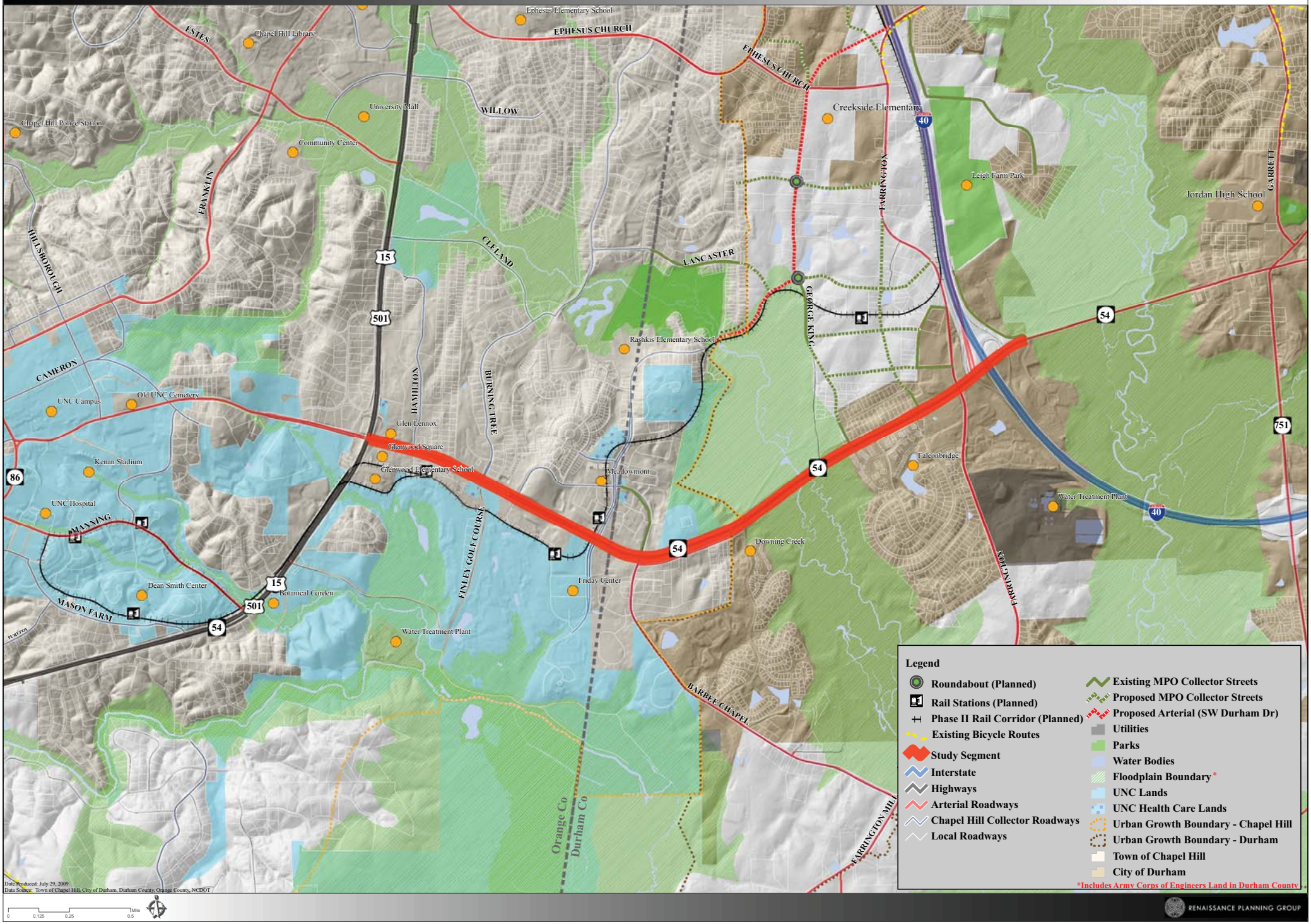
Regional Context

As shown in **Figure 1,** the NC-54 and I-40 corridors are significant components of the regional and local transportation network within the Triangle region. These two corridors serve the Chapel Hill and Durham communities, linking to major travel routes (US 15/501, US 70, and I-85) and the following nearby centers: Raleigh-Durham International Airport (12 miles east), Cary (20 miles southeast), Raleigh (30 miles southeast), Wake Forest (35 miles east), Apex (20 miles southeast), and Greensboro (50 miles west). While the I-40 corridor provides primarily high-speed freeway travel for regional and commuting trips, the NC-54 corridor serves many roles. It is a regional arterial for commuters, a gateway to the areas' cultural historical and recreational attractions, and a primary commercial/retail corridor. The NC 54 corridor also experiences demand from through traffic from southern Orange County and northern Chatham County to destinations in Durham and Wake Counties, including the Research Triangle Park.

Many commuters from mostly rural Chatham County and other areas in the Triangle use I-40 and NC-54 to access employment opportunities. Partly because of the constraints on development in Chapel Hill, growth is occurring throughout the region in previously rural or agricultural areas, and many commuters must use NC-54 to access jobs.

NC-54 CORRIDOR ANALYSIS - Study Area Basemap

Figure 1



What did the NC-54 corridor look like in the past, and how has it grown?

Environmental Constraints

The natural features of the area were the first influential factors in the development of the corridor. The rolling topography in the study area creates highly desirable views from residential properties. The settlement in this area was initially very low density residential homes on larger lots. In the 1970s through 1990s residential subdivisions were the predominant development patterns.

Steep slopes present very minimal constraints in the study area as most are evident on large parcels zoned for low density housing. Moderate slopes are attractive to development providing broad views over the surrounding landscape and require minimal earthwork. **Figure 2** shows the slope intensities within the study area.

Floodplains and wetlands are two of the primary limitations to development in the study area, as shown in **Figure 3**. At the same time they create a very attractive open space framework for development in the corridor and could provide a foil for dense development of unconstrained parcels. Most of the vacant constrained parcels are currently in public or quasi-public ownership, and thus should not create hazardous conditions for future development. The open space framework they create could become a major community asset.

The floodplain boundaries are protected areas within the study area, owned by the Army Corps of Engineers. Jordan Lake, a drinking water reservoir for Cary and Chatham County is another protected area to the south. Development pressures are present for the Jordan Lake area, where Durham's Board of County Commissioners has recently voted to move the protective buffer boundaries to make room for more development. Jordan Lake could soon become a drinking water source for Durham County residents too.

Figure 2 - Slope Map

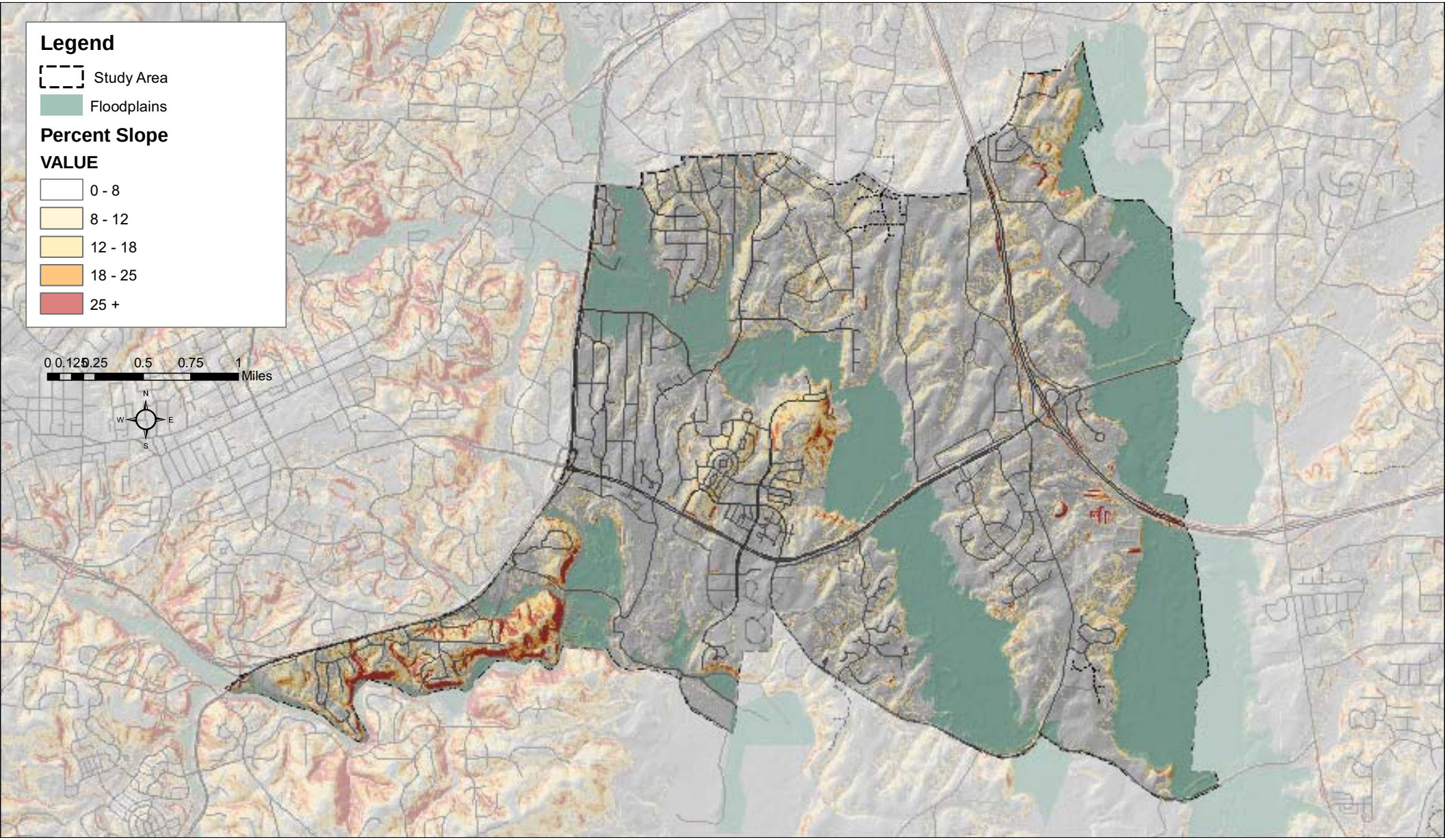
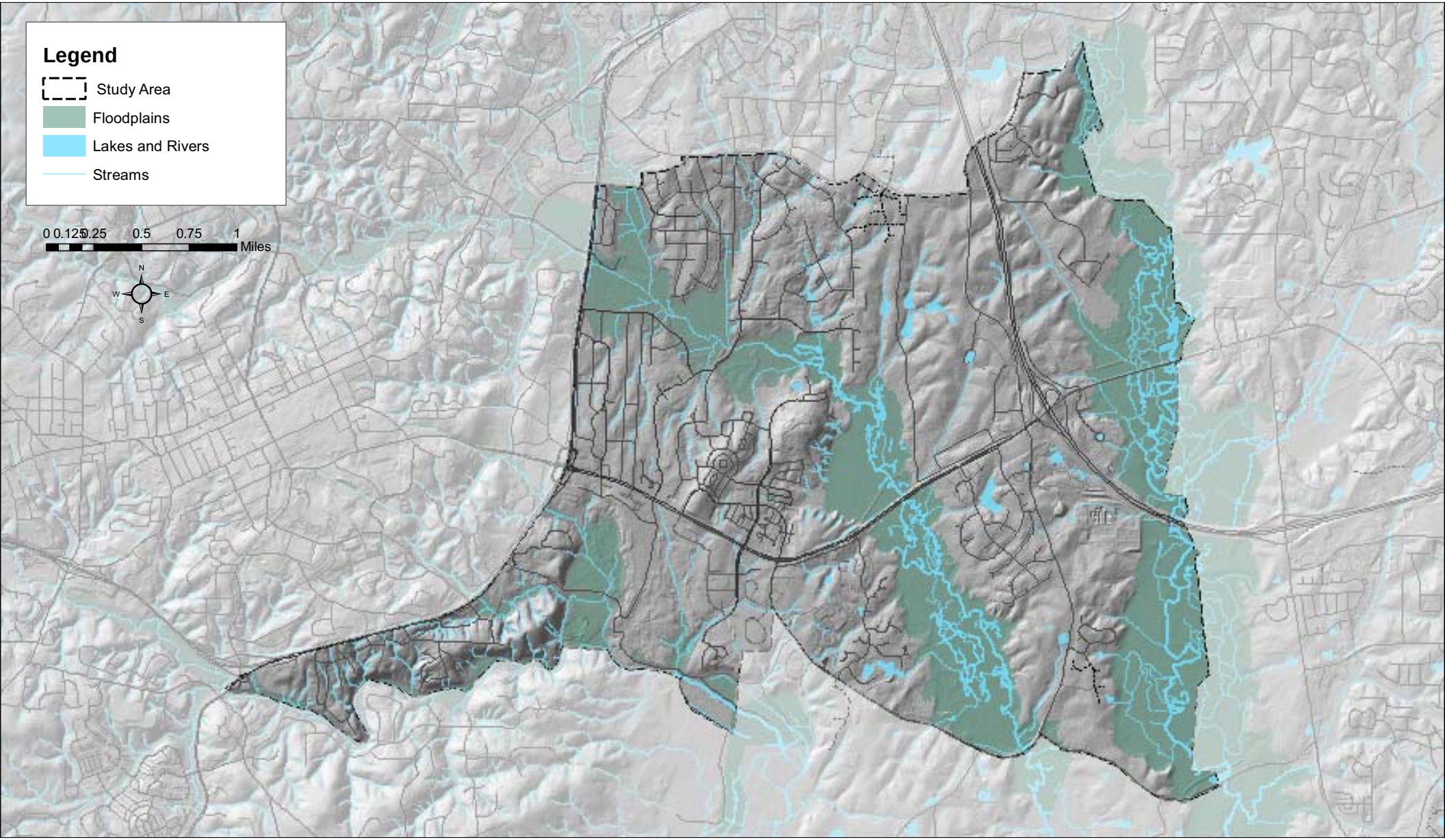


Figure 3 - Hydrography Map



Historical Development patterns

The corridor's main function has always been to provide a link from the Town of Chapel Hill and the University of North Carolina from Durham County and points east. The direct connection with I-40 encourages regional trips through the corridor, especially from the southeast.

The corridor initially developed to serve the regional traffic with highway strip commercial development and a few residential subdivisions. Many older homes still exist in the neighborhoods around Finley Golf Course.

Within the past few decades, development has grown especially around either ends of the corridor because of the interchanges with I-40 and US 15/501. Historically, this has been a prime location for regional employment centers and for interstate exit service land uses, the "drive-up" or "drive thru" developments. For example, the Quadrant and Carolina Point employment centers exist yards away from the I-40 interchange, and within a one-minute drive of the Bank of America, Hardee's fast food restaurant, Shell gas station, and Holiday Inn Express.

Development pressures have continued and more residential subdivisions have started to "fill in" in the middle of the corridor. Most of these residential communities are the sprawling unconnected subdivisions common in suburban and exurban areas built before the 1990s, built on the south side of the NC-54 corridor.

More recently, the Meadowmont development, a traditional neighborhood development, is an exception in the corridor, and may form the basis of a new trend. This development provides housing units for mixed incomes, has a walkable town center with retail and recreation, provides connectivity within the development and provides a safe paved path for bicyclists and pedestrians that connects to the existing sidewalk network. However, Meadowmont is still largely a "drive-to" activity center because of the barrier NC-54 represents in linking the bicycle and pedestrian network to other residential areas. The unsubmitted Leigh Village master plan could be a smaller, more compact version of the Meadowmont development. The 54 East project within the corridor is another example of the shifting trend in development patterns and is an example of transit-oriented development. This project is approved and nearing completion under construction in Chapel Hill. A vision plan with clear development guidelines for the corridor would further support this type of development.

Traffic Patterns[1]

The historical patterns of development have continued to encourage personal vehicle use on NC-54. The traffic demand has also intensified because no other east-west arterial exists within close proximity to distribute trips.

[1] Historical traffic data from NCDOT's AADT Traffic Maps

Over the past 10 years, the corridor has seen an increase in traffic of about 30 percent averaging a growth rate of about three percent per year. In 1997, the annual daily traffic (ADT) on NC-54 within the study area averaged about 35,000 vehicles per day. As of 2007, NC-54 services an average of 45,000 vehicles per day. The segments of I-40 within the study area have also seen a slightly higher rate of growth. In 1997 the I-40 ADT averaged 58,300 vehicles per day west of the NC-54 interchange. As of 2007 it was 83,000 vehicles per day, averaging about 40 percent growth in one decade. East of the NC 54 interchange, traffic on I-40 has grown from 82,400 to 108,000 in the past decade, averaging 30 percent growth in 10 years. The volume increase on I-40 was essentially enabled by a one-lane widening in each direction.

The areas with the greatest concentrations of recent growth have been those around Farrington Road and Barbee Chapel Road. These two roads have nearly doubled their daily traffic within the past decade (90-100% growth from 1997 to 2007). Whereas Chapel Hill had higher traffic volumes than Durham in the past, Durham now sees approximately the same volumes as Chapel Hill due to the increased growth around Farrington Road and Barbee Chapel Road.

How does the corridor function today?

Existing Traffic Conditions

To understand the existing traffic conditions, current data were collected from several sources. Turning movement counts (TMCs) were collected and compiled at 10 intersections along the NC-54 corridor.[2] Annual daily traffic (ADT) counts were also collected at 16 locations within the study area.[3] See **Figure 4** for a map of the data collection effort. Seasonal adjustment was not necessary for the ADT counts, as would be necessary for the beach and mountain areas to account for the high variation in traffic related to the tourist seasons.

The NC-54 corridor sees extremely heavy traffic and long queues during the morning and evening commute hours. Generally, the morning peak hour for the corridor is 7:30-8:30 AM, and the evening peak hour is 5:00-6:00 PM. The I-40 ramps and Farington Road intersections have a slightly later morning peak hour (7:45-8:45 AM for Farrington Road; 8:00-9:00 AM for I-40 ramps). The Leigh Farm Road/Quadrangle Drive intersection has a slightly earlier PM peak hour (4:15-5:15 PM), which may be due to the work hours of the large employment complex.

Queues for eastbound and westbound through traffic at intersection cans stretch over 1000 feet back from the intersection (over 25 cars or 0.2 miles). A field review revealed that the eastbound traffic in the PM peak hour at Farrington Road can stretch almost a half-mile back from the intersection. The modeled queue lengths of each intersection approach can be found in the Synchro printouts compiled in the Traffic Technical Appendix. Observations at this intersection have validated the model's outputs.

It is this heavy east-west traffic that prompts traffic signals to have long cycle lengths (150-200 seconds). A large proportion of the cycle time is allocated to the east and west through movements. Although the side-street traffic and left-turns must wait a long time, the east/west through traffic receives a low (good) level of service (LOS). As shown in **Table 1**, most of the signalized intersections along the corridor are operating at overall LOS D or better. While the average side-street vehicle may wait minutes at the intersection, the main through movements on NC-54 generally experience an average wait of 20 seconds or less.

[2] Turning movement counts for the intersections within the Town of Chapel Hill were conducted in September 2009 as part of the UNC data collection effort. Counts at the intersection of NC 54 with Farrington Road and the I-40 ramps were provided by the City of Durham. The intersection of NC 54 and Huntingridge Road was counted in October 2009 by Data Collection Group.

[3] Average annual daily traffic counts on I-40 were taken from NCDOT's 2008 AADT Traffic maps. AADTs for all other locations were collected in September 2009 by Data Collection Group.

Table 1 - Existing Traffic Conditions Intersection Level of Service

		AM Peak				PM Peak			
Intersection	Date	E/W Thru %	Overall Delay	Overall LOS	V/C Ratio	E/W Thru %	Overall Delay	Overall LOS	V/C Ratio
NC-54 & Hamilton Rd	9/22/09	80%	21.5	C	0.82	90%	17.0	B	0.75
NC-54 & Burning Tree Dr	9/22/09	91%	9.9	A	0.72	91%	13.4	B	0.77
NC-54 & W Barbee Chapel Rd	9/17/09	89%	9.7	A	0.66	87%	33.8	C	0.96
NC-54 & Meadowmont Ln	9/15/09	72%	52.7	D	0.80	70%	43.5	D	0.85
NC-54 & E Barbee Chapel Rd	9/17/09	80%	46.2	D	0.90	73%	22.0	C	0.81
NC-54 & Huntingridge Rd*	10/1/09	97%	57.2	E	0.96	97%	28.9	C	0.91
NC-54 & Farrington Rd	12/6/07	67%	277.7	F	1.54	68%	141.5	F	1.36
NC-54 & I-40 EB ramps	1/22/08	60%	67.6	E	1.12	57%	103.8	F	1.33
NC-54 & I-40 WB ramps	1/16/08	39%	88.1	F	1.01	42%	55.6	E	0.79
NC-54 & Leigh Farm Rd	1/14/09	72%	10.3	B	0.56	72%	23.4	C	0.66

*Synchro analysis indicates Huntingridge operates at LOS C in the AM peak, as it generally reflects lower delays in super-saturated conditions as compared to HCM.

Level of service is a general term that describes the overall operating conditions of an intersection as a measure of travel time. It is directly based on the amount of time vehicles are delayed at an intersection. Level of service "A" is the best condition (where the average vehicle waits 10 seconds or less at an intersection), and "F" is the worst (where the average vehicle waits 80 seconds or more at a signalized intersection, or 50 seconds or more at an unsignalized intersection). Generally, transportation engineers strive for LOS D or better in suburban environments. This standard changes as environments become more urban and transportation options increase. Level of service is one of several measures that should be considered in this increasingly complex and evolving corridor.

Farrington Road and the I-40 ramps operate at overall LOS E or F. These intersections are by far the most congested in the study area. The intersections are also extremely close to each other; Farrington Road and the I-40 eastbound ramps are only about 300 feet apart. Seven lanes of traffic, heavy delays for all approaches and long queues make these intersections difficult for commuters during rush hours. Analysis indicates that most of the movements at these intersections operate at LOS F, experiencing delays of over two minutes, up to six minutes of delay in the case of vehicles waiting at the northbound approach of Farrington to make a right turn in the PM peak hour. Arguably the most problematic traffic movement in the corridor is turning left at Farrington Road immediately after exiting the I-40 eastbound off ramp. These vehicles have less than 300 feet to cross over three lanes in extremely congested situations.

The volume-to-capacity ratio (V/C) is another standard measure of the operating conditions at an intersection. This ratio measures the amount of traffic at an intersection against the "available capacity" or the maximum total number of vehicles that the intersection could handle. Values above 1.0 indicate that the intersection is operating at or above capacity, that there is no more "room" for additional demand on the intersection. The intersections at Farrington Road and the I-40 Eastbound ramps have V/C ratios well above 1.0 in both AM and PM peak periods. This leads to a condition of "peak spreading," in which the excessive demand causes travelers to alter their arrival and departure times to reduce delay. With excessive demand, this merely expands

the peak beyond traditional rush hours, making congestion a lingering experience on typical weekdays.

Figures 5 and 6 show typical conditions around the Farrington Road intersection and I-40 interchange in the PM peak hour. These images are screenshots of the SimTraffic simulation model.

Several segments of the study area were analyzed using the Florida Department of Transportation's (FDOT) generalized level of service tables, which provide a solid planning level indication of the operation of roadways based upon several factors like number of lanes, medians, left turn lanes, frequency of signals and roadway classification among other factors. The thresholds for the different levels of service vary depending on the classifications and characteristics of the roadway. These tables, which are based on the Highway Capacity Manual, are provided in the Traffic Technical Appendix. The FDOT generalized tables establish basic planning level estimates for traffic conditions. In the future analysis, the NCLOS software will be utilized to determine more specific levels of service, volume-to-capacity ratios, and necessary road improvements for the projected future volumes.

Table 2 – Existing Traffic Conditions Segment Level of Service

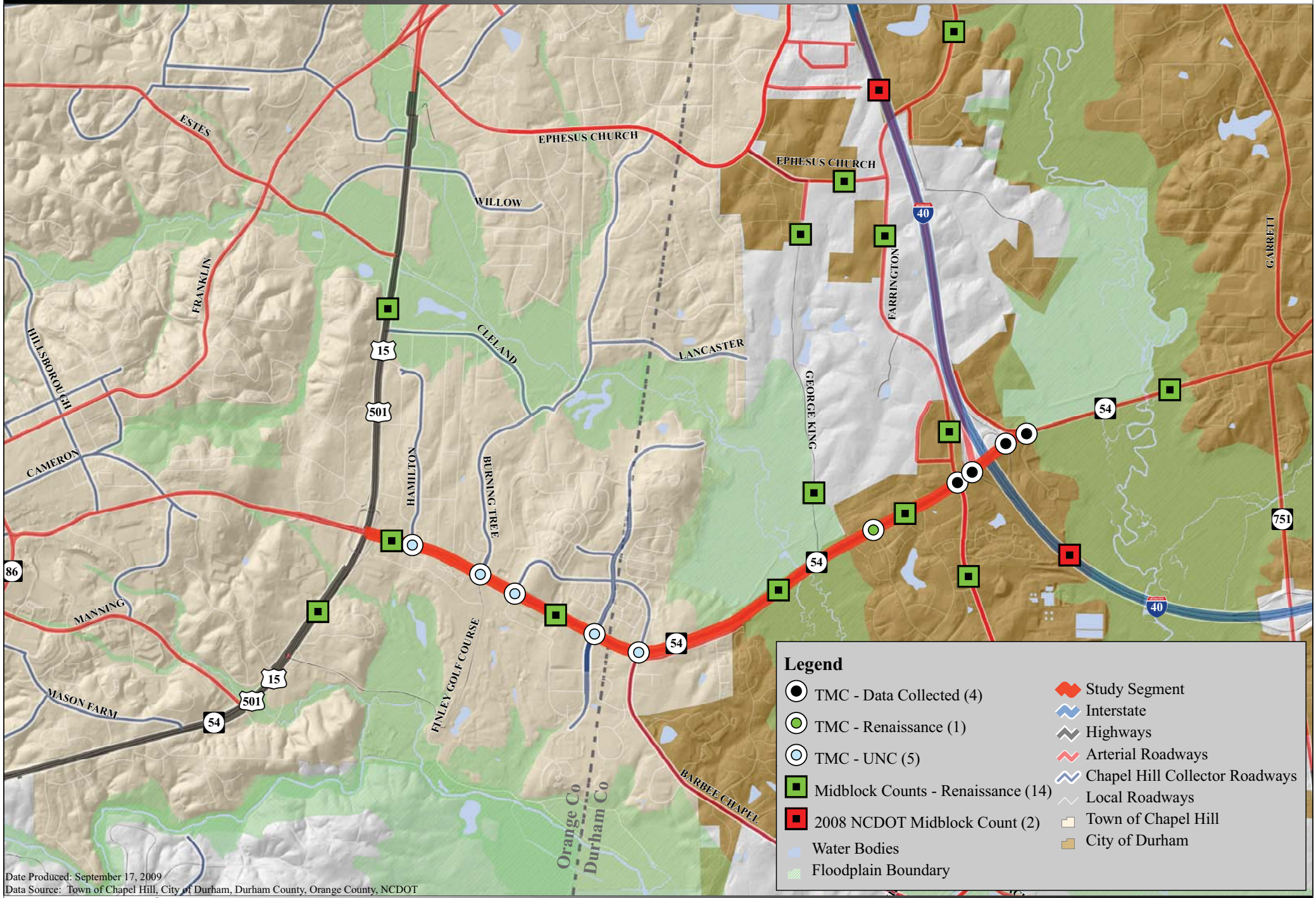
Roadway Name	Location	ADT 2009	LOS 2009
Fordham Blvd/US-501	S Estes Dr and Cleland Dr	38,900	F
Fordham Blvd/US-501	South of NC-54	52,500	F
NC-54	Hamilton Rd and Fordham Blvd US-501	50,000	F
NC-54	Medowmont Ln and W Barbee Chapel Rd	44,400	E
NC-54	Huntingridge Rd and Downing Creek Pkwy	44,400	F
NC-54	Falconridge Rd and Huntingridge Rd	44,300	F
NC-54	NC-751 and I-40	16,400	D
Farrington Rd	North/east of I-40 underpass	7,000	B
Farrington Rd	Ephesus Church Rd and Wendell Rd	10,700	C
Farrington Rd	North of NC-54	10,700	C
Farrington Rd	South of NC-54	7,300	B
Ephesus Church Rd	West of Farrington Rd	6,100	B
I-40	North of NC-54 interchange	78,000	C
I-40	South of NC-54 interchange	105,000	D
Barbee Chapel	South of NC-54	8,700	C
Burning Tree Dr	North of NC-54	1,700	A/B
George King Rd	South of Ephesus Church Rd	800	A/B
George King Rd	North of NC-54	200	A/B

The NC-54 corridor generally functions at LOS F, because of the high volumes on the corridor and the frequency of traffic signals in the Orange County portion and near the I-40 interchange, with a few exceptions. The segment near the Meadowmont development operates at LOS E for several reasons. The daily volume is about 6,000 vehicles less than the area around the US 15/501 interchange. This segment of the road has six travel lanes, whereas the portions in Durham County have only four travel lanes. The area east of Quadrangle Drive and the I-40 interchange operates at LOS D because the volume of traffic is significantly reduced by the I-40 interchange. Generally, the other road segments within the study area operate at an acceptable level of service, with the exception of US 15/501.

The existing conditions traffic analyses are graphically summarized in **Figure 7**.

NC-54 CORRIDOR ANALYSIS - Data Collection

Figure 4



Date Produced: September 17, 2009
Data Source: Town of Chapel Hill, City of Durham, Durham County, Orange County, NCDOT

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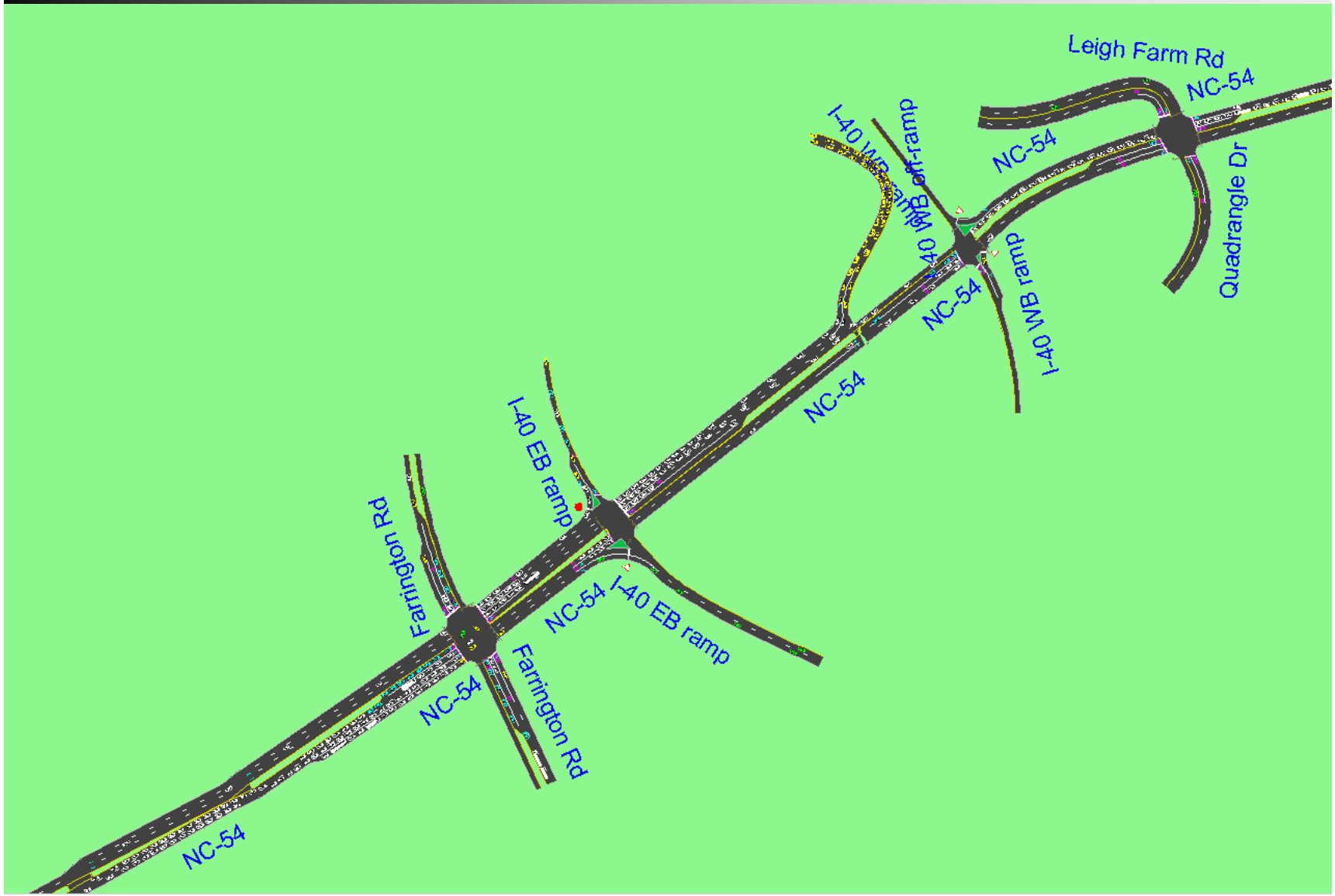
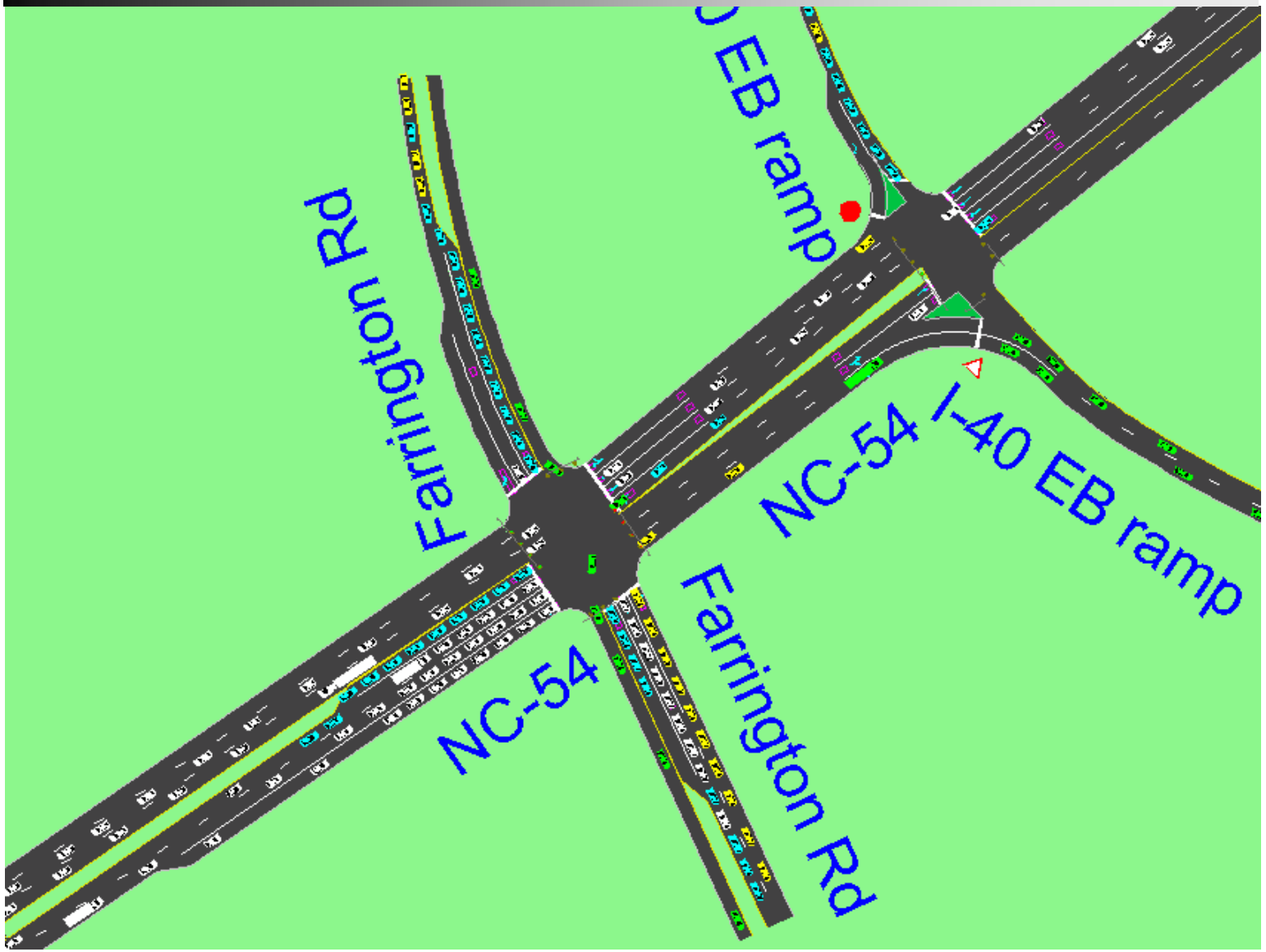
NC-54 CORRIDOR ANALYSIS – I-40 Interchange Existing Conditions

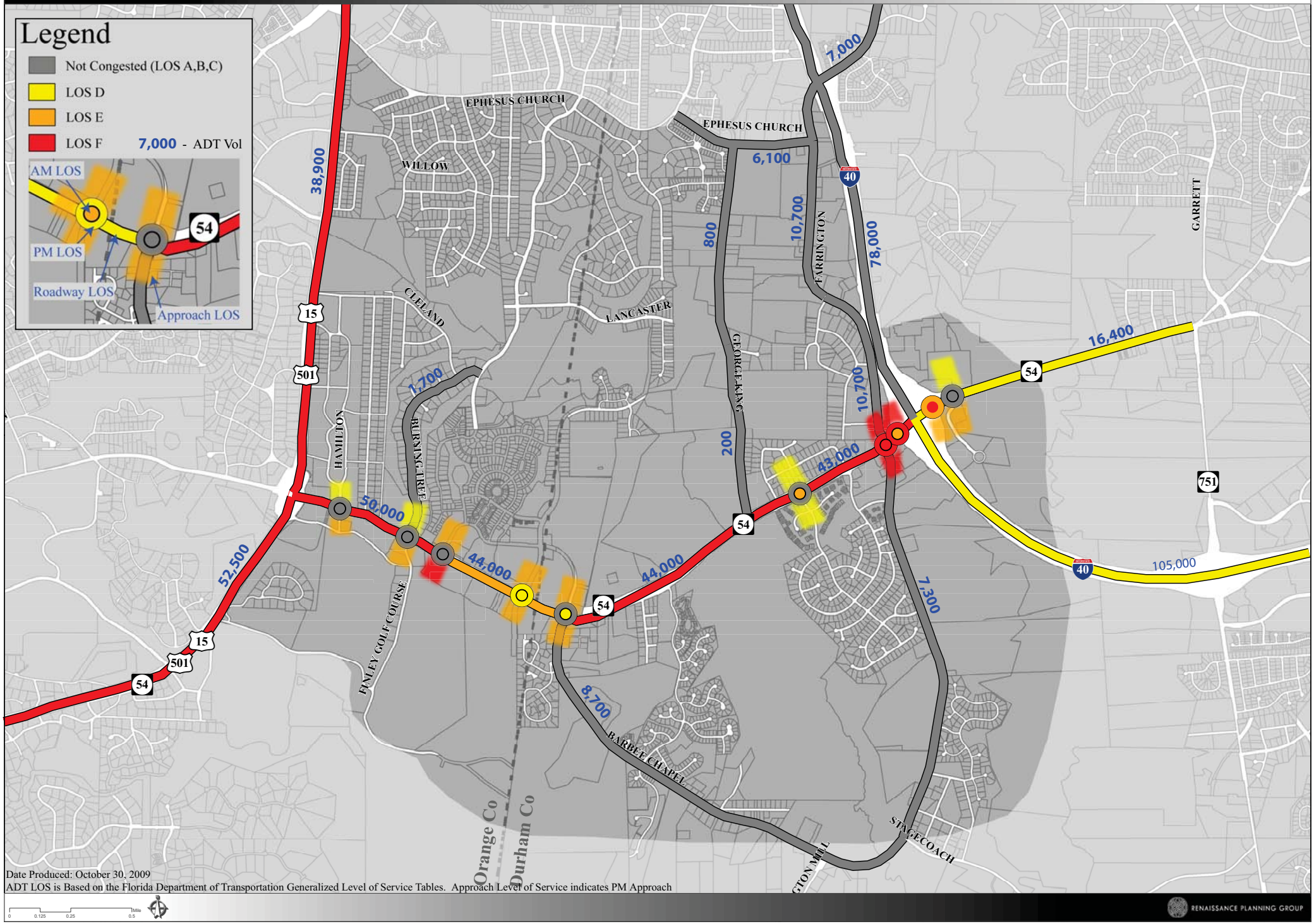


NC-54 CORRIDOR ANALYSIS – Farrington Road Existing Conditions



NC-54 CORRIDOR ANALYSIS - Existing Level of Service

Figure 7



Date Produced: October 30, 2009

ADT LOS is Based on the Florida Department of Transportation Generalized Level of Service Tables. Approach Level of Service indicates PM Approach

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Transit Use and Service

Because of the increasing congestion, severely constrained parking on the UNC campus and growing demand on the NC-54 corridor, transit use has grown as a viable means of transportation, especially for commuters from Durham to the Town of Chapel Hill and the University of North Carolina. Chapel Hill Transit and Triangle Transit offer multiple local and express bus routes through the corridor.

Triangle Transit operates three routes along the corridor, carrying about 900 passengers daily.[4] Route 550/500 is an express service connecting downtown Chapel Hill to downtown Raleigh. This route does not stop along the corridor, but does travel through the corridor every 30 minutes. Route 412/413 and Route 402/403 provide service to stops along the corridor. Both routes provide service every 30 minutes. Their schedules are staggered roughly 12 minutes so as to prevent simultaneous arrival of both routes. As a result, a Triangle Transit bus arrives roughly every 15 minutes. These two routes also serve the same general areas, connecting downtown Chapel Hill, Durham and the Triangle Transit Regional Transit Center at Slater Road in Durham's Imperial Center, adjacent to the Research Triangle Park. A majority of Triangle Transit service focuses on regional trips connecting Durham, Raleigh and UNC, providing a link between the local transit service providers operating in the Triangle region.

Chapel Hill Transit operates five routes along the corridor (Routes HU, G, S, V, and FCX). These services focus on providing local connections between destinations along the corridor to downtown Chapel Hill, where transit users can connect with other parts of Chapel Hill. Route G only serves the northwest portion of the study area, mainly the Glen Lennox residential area and Glen Lennox Shopping Center. This route provides service every 35 minutes in both directions during peak hours. Route S and V provide service to various stops connecting adjacent commercial and residential uses. During peak hours, Route S provides service every 10 to 15 minutes and Route V provides service every 30 minutes. Routes HU and FCX are express services, with stops made at the Friday Center Park-n-Ride lot and downtown. Both routes provide service every 10 minutes during the peak hours. Combined, these five routes serve about 5,000 passengers who board or alight at a stop within the corridor every day.[5] These figures represent the number of passenger-trips daily; a commuter using transit to and from the Town of Chapel Hill would account for two trips.

Although the surrounding area is served by three different transit agencies, gaps in transit service along the corridor exist and inhibit potential ridership. Most notably, the eastern end of the NC-54 corridor in Durham has no service. Chapel Hill Transit service ends at Barbee Chapel Road and the Friday Center park-and-ride lot; Triangle Transit only travels through the corridor; it does not stop within the corridor; and the Durham Area Transit Authority service ends east of I-40 at Route 751. Residents in the eastern portion of the corridor must drive to the Friday Center park-and-ride lot to access transit to the UNC campus or downtown Chapel Hill.

[4] Triangle Transit ridership data provided by Triangle Transit, dated September 2009
[5] Chapel Hill Transit ridership data provided by Chapel Hill Transit, dated September 2009

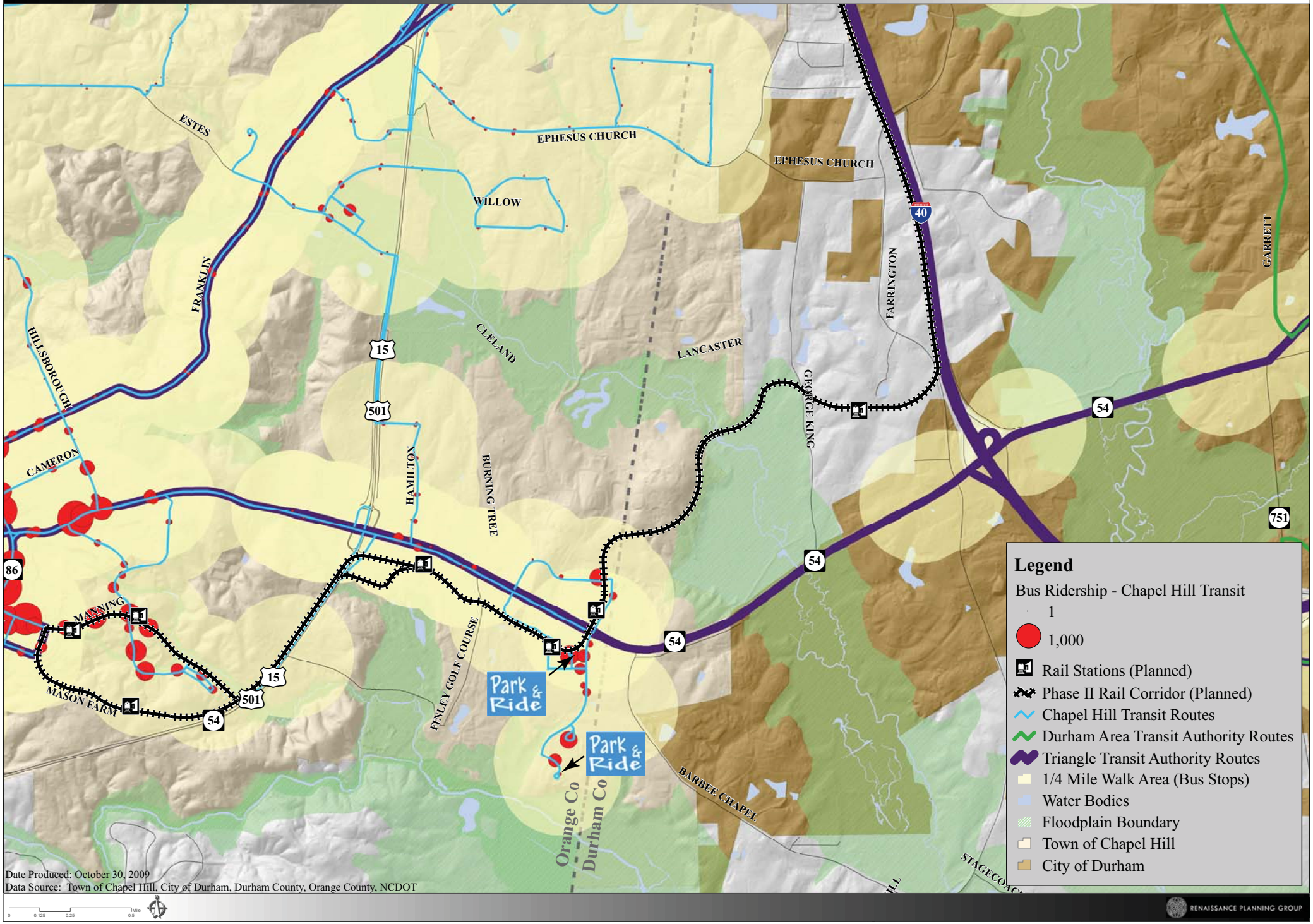
The success of the Friday Center park-and-ride lot is a testament to the demand for alternative modes of transportation. From field observations, many commuters use the Friday Center park-and-ride to commute in to the Town of Chapel Hill. In the PM peak, full bus loads of passengers depart at the Friday Center; many eastbound buses on the corridor are full, and westbound buses are empty. The park-and-ride lots are usually near capacity on any typical weekday.

Figure 8 shows several transit facilities within the western portion of the NC-54 corridor in the Town of Chapel Hill. **Figure 9** displays the existing transit service routes within the study area.

Figure 8 – Photos of Transit Service

NC-54 CORRIDOR ANALYSIS - Transit Facilities Map

Figure 9



Date Produced: October 30, 2009
Data Source: Town of Chapel Hill, City of Durham, Durham County, Orange County, NCDOT

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Pedestrian and Bicycle Use

From field observations, pedestrians and bicyclists rarely travel along NC-54, with the exception of recreational use along the shared use path serving the Meadowmont development to the western end of the corridor at Burning Tree Drive. The corridor lacks many crucial pedestrian features, compromising the safety of nearby residents who want to walk or bike to local shopping or other destinations along the corridor.

The Chapel Hill portion of the corridor has adequate pedestrian infrastructure (a wide multi-use path safely set back from the high-speed traffic). It was observed that this path is used mostly for exercise activities; it is not primarily used as a travel way for trips to or from a destination; however, Meadowmont and other neighborhood residents may use the multi-use paths for trips to work, school and nearby services. This multi-use path connects to the recently constructed Meadowmont development and provides a safe underpass below NC-54.

The Durham portion of the corridor lacks pedestrian infrastructure. Leigh Farm Road is the only intersection with crosswalks and pedestrian signals.

As the NC-54 corridor is a high-speed heavily-traveled congested arterial with four to seven lanes of traffic, it is not conducive to pedestrian or bicycle use. The surrounding development is geared towards automobiles: it is not dense enough to generate substantial numbers of pedestrian trips within the corridor traveling between land uses. Typically, development patterns where complementary origins and destinations are located within a ¼ mile encourage pedestrian activity.

Table 3 summarizes the pedestrian infrastructure and generalizes the condition of pedestrian safety.

There are no bicycle lanes or wide outside lanes to accommodate bicyclists within the corridor. The paved shoulders on NC 54 are only approximately 2-feet wide, whereas an adequate bicycle lane should be 4 to 5 feet in width. The narrow section through the wetland on the Durham side of the corridor is particularly dangerous for bicyclists with narrow lanes, no shoulders, and steep banks on either side. The many lanes and high-speed travel particularly discourage bicycling as a safe means of travel through the corridor. The speed differential is a major challenge for on-road cycling; even experienced cyclists are often uncomfortable riding in environments where the average speed is 20 or more miles per hour greater than the cycling speed. The lack of lower speed parallel or interconnecting streets reduces the viability of bicycling in the study area. Ephesus Church Road, with limited room for cyclists but offering lower speeds and fewer lanes of traffic, provides the only real continuous east-west option for bicyclists. Several bicycle commuters will travel routes that are five miles or 20 minutes out of their way to avoid NC 54. North-south links are similarly limited, meaning that potential cyclists likely opt to travel by car or transit for their transportation purposes instead.

Figures 10 and 11 show the pedestrian and bicycle facilities within the study area.

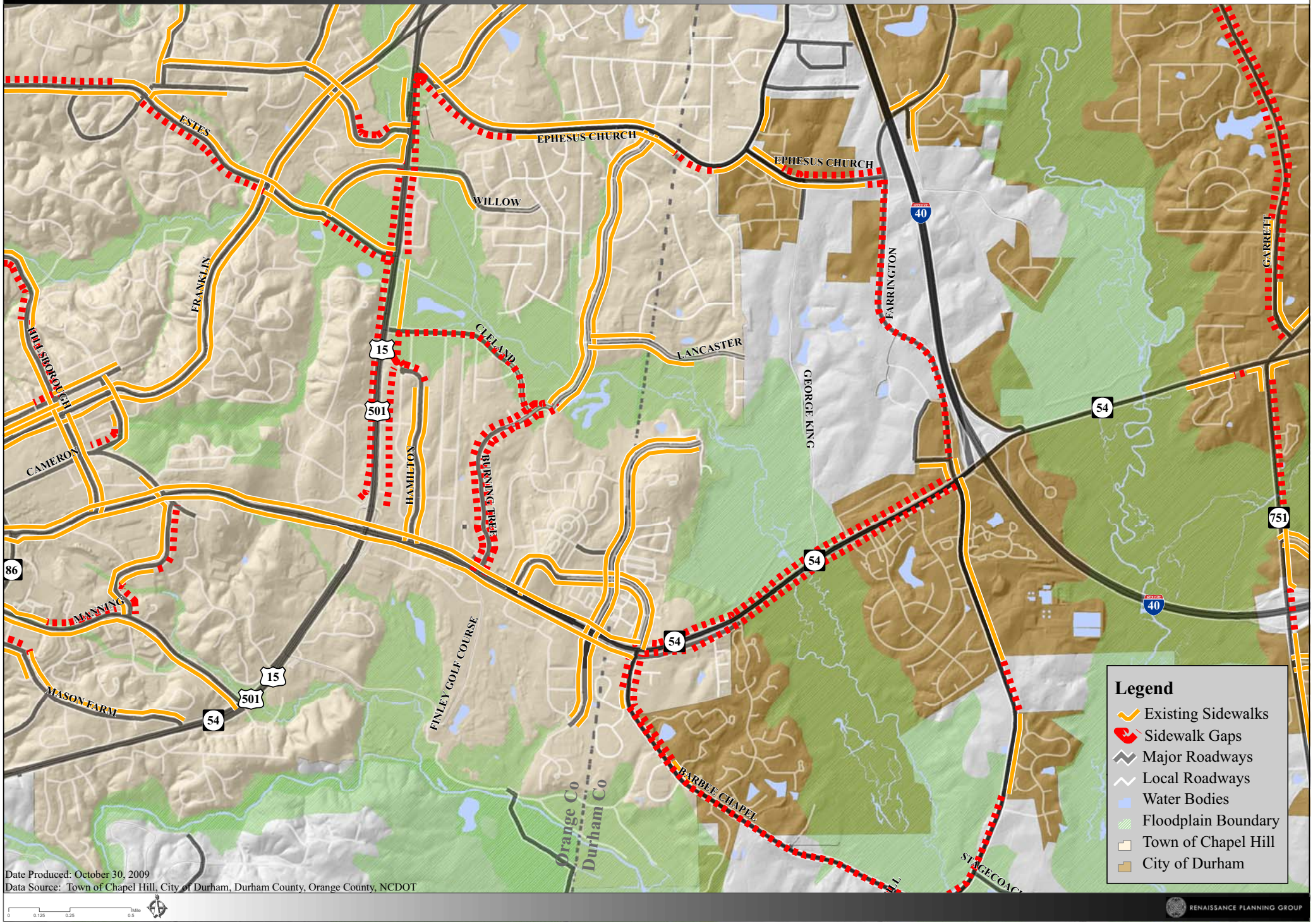
Several potential bicycle routes exist within the corridor. In particular, the multi-use path for pedestrians and bicyclists will be extended to the Town of Chapel Hill limits in the near term and further east in the longer term.

Table 3 – Current Pedestrian Infrastructure and Conditions

From	To	Condition	Notes
East	Leigh Farm Rd/ Quadrangle Dr	Challenging	No sidewalk - nowhere to safely cross
Leigh Farm Rd/ Quadrangle Dr intersection		Challenging	Curb ramps on only two corners; laterally striped crosswalks on only two legs; sidewalks only on Leigh Farm Rd approach
Leigh Farm Rd/ Quadrangle Dr	I-40 ramps	Challenging	No sidewalk - nowhere to safely cross - high speed, heavy traffic
I-40 interchange area		Challenging	No sidewalk - heavy high-speed traffic across up to 6 lanes -
I-40 ramps	Farrington Rd	Challenging	No Sidewalk - 7 lanes of extremely heavy traffic
Farrington Rd intersection		Challenging	There are sidewalks and curb ramps on less than half of the approaches - no crosswalks
Farrington Rd	Huntingridge Rd	Challenging	No sidewalks (except for 450 feet west of Farrington Rd intersection on north side only - many lanes of heavy, high-speed traffic - no crosswalks or ped features at intersections
Huntingridge Rd intersection		Challenging	No crosswalks, curb ramps or any ped features at all - many lanes of traffic
Huntingridge Rd	E Barbee Chapel Rd	Challenging	No sidewalks, road operates like heavily traveled high-speed freeway - wide lanes encorage high speed travel
E Barbee Chapel intersection		Moderate	Sidewalks on both sides of SB approach; Multi-use path on both sides of EB approach - lateral crosswalks across NB&SB approaches; curb ramps on half of approaches - no way to cross NC-54
E Barbee Chapel Rd	Meadowmont Ln	Well-accommodating	Multi-use paths on both sides of road - set back far from road ~ 40-60 feet
Meadowmont Ln intersection		Moderate	Sidewalks on all sides of approaches, curb ramps present, lateral crosswalks across NB&SB approaches - no way to cross NC 54; ~120 feet to cross
Meadowmont Ln	W Barbee Chapel Rd	Well-accommodating	Wide multi-use paths on both sides of the road - underpass to cross NC 54 - trail connects to Meadowmont development
W Barbee Chapel Rd intersection		Moderate	Sidewalks/multi-use paths on 7 of 8 approaches - curb ramps present, lateral crosswalks across NB&SB approaches - nothing across NC-54
W Barbee Chapel Rd	Finley Golf Course Dr/ Burning Tree	Well-accommodating	Wide multi-use paths on both sides of the road
Finley Golf Course Dr/ Burning Tree intersection		Moderate	Sidewalks/paved paths on 3 of 8 approaches - no crosswalks or other pedestrain features
Finley Golf Course Dr/ Burning Tree	Hamilton Rd	Well-accommodating	Sidewalks on both sides of street; no way to cross NC 54
Hamilton Rd intersection		Well-accommodating	Sidewalks on all approaches; lateral colored sidewalks across all legs, pedestrian signals - curp ramps - no median refuge
Hamilton Rd	US 15/501	Moderate	Sidewalks on both sides of the street - no setback - crosswalks across driveways/access points

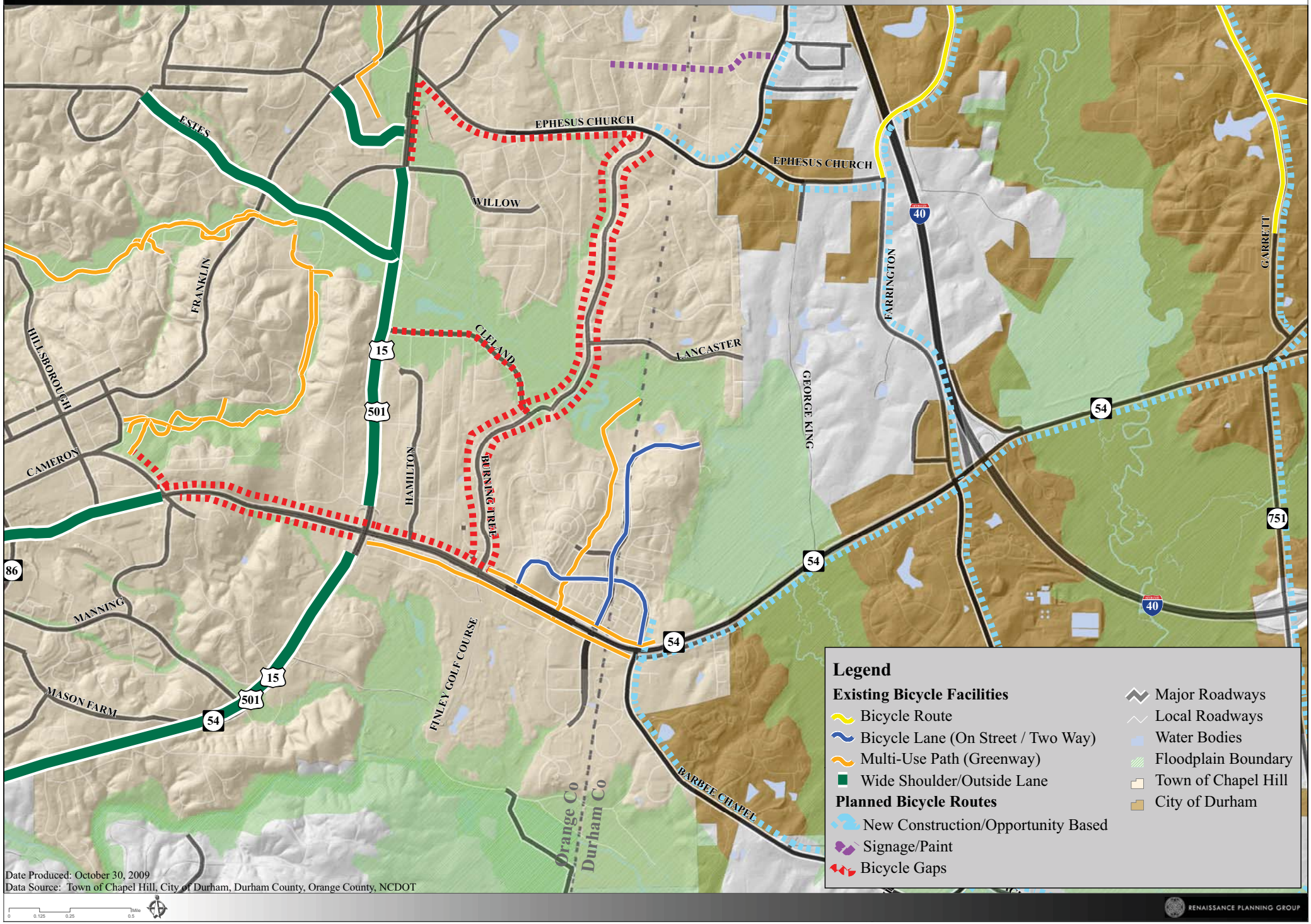
NC-54 CORRIDOR ANALYSIS - Pedestrian Facilities Map

Figure 10



NC-54 CORRIDOR ANALYSIS - Bicycle Facilities Map

Figure 11



Date Produced: October 30, 2009
Data Source: Town of Chapel Hill, City of Durham, Durham County, Orange County, NCDOT

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Crash History[6]

Within the past three years, 271 crashes have occurred within this corridor. Most of these (82%) have been within 600 feet of an intersection. About 60 percent were rear-end crashes, which are likely effects of congestion at traffic signals. Only one crash was a fatality, which occurred at the intersection of West Barbee Chapel Road in 2007.

Figure 12 displays the relative concentrations of crashes in the corridor within the past three years. The NCDOT Traffic Engineering Accident Analysis System reports total crash rates of 194 and 166 crashes per 100 million vehicle miles in the Orange and Durham County portions, respectively. As shown in **Table 4**, these rates are slightly lower than the 2005-2007 North Carolina average crash rates for state routes with similar characteristics. The first two lines of Table 4 show the crash rates within the NC 54 corridor; the bottom line is a basis for comparison.

Table 4 – Crash Rate Comparison

NC-54 STUDY AREA CRASH RATE COMPARISON WITH NORTH CAROLINA STATE AVERAGE

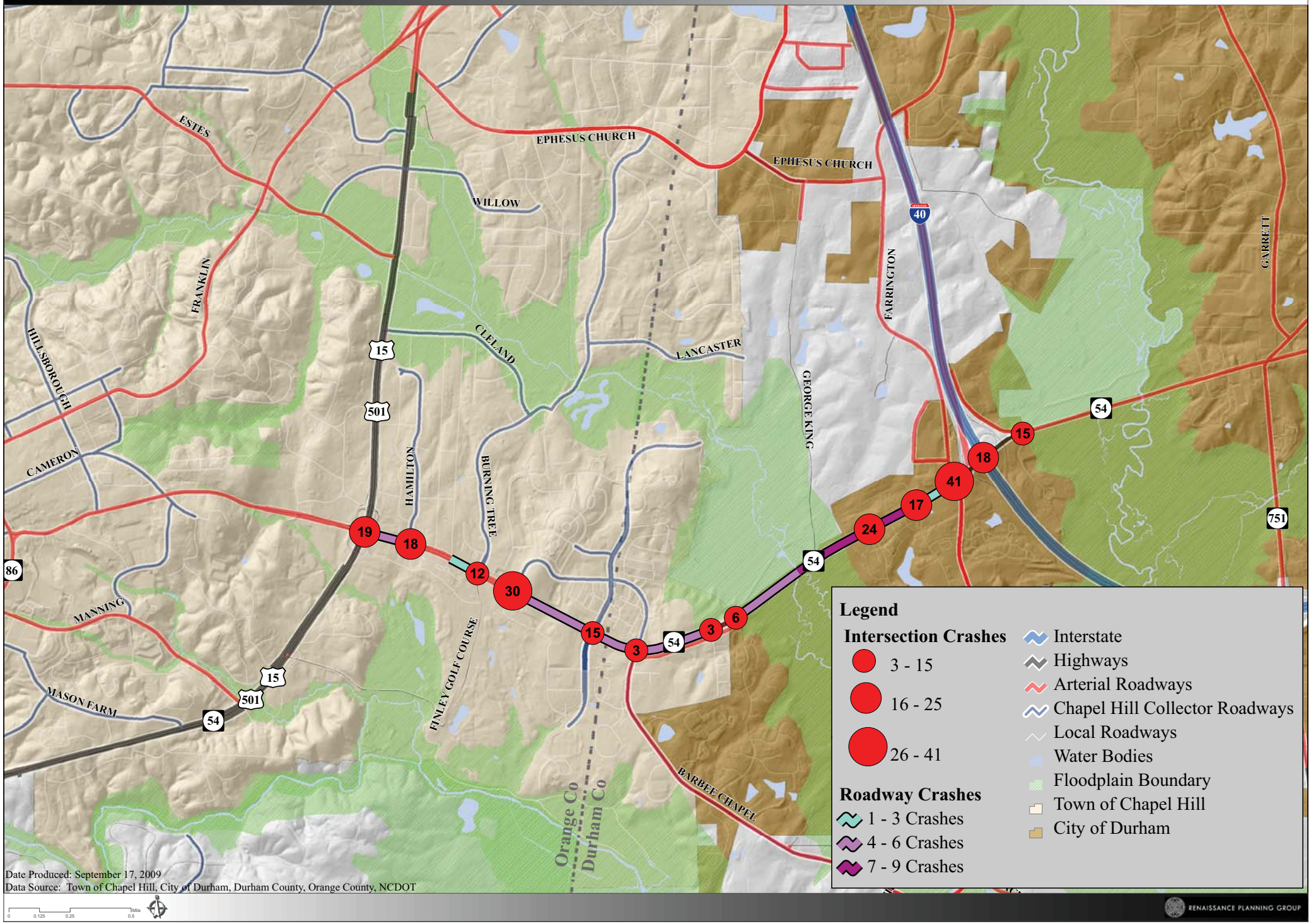
	Total	Fatal	Non-Fatal Injury	Night	Wet
NC-54 from US 15/501 to county line (Orange County)	194.13	1.70	42.57	35.76	32.35
NC-54 from county line to Leigh Farm Rd (Durham County)	166.32	0.00	37.08	31.78	25.43
NCDOT Standard Crash Rates - Urban North Carolina Route 4+ lanes divided with full access control (2005-2007)	219.30	0.87	62.23	47.67	38.31

The Farrington Road intersection has the greatest number of crashes in the corridor, with 41 crashes within the past three years. The intersection of NC 54 with West Barbee Chapel Road also has a disproportionately high number of crashes, with 30 in the past three years. Residents have noted that the intersection at Hamilton Road is also dangerous because of sight distance and driveways close to the intersection.

[6] Crash data was compiled for NC 54 from Fordham Blvd to Leigh Farm Rd/ Quadrangle Dr using NCDOT's Traffic Engineering Accident Analysis System. The generated reports provide crash data from July 2006 through June 2009 by county.

NC-54 CORRIDOR ANALYSIS - Crash Analysis (July 2006 - June 2009)

Figure 12



Date Produced: September 17, 2009
Data Source: Town of Chapel Hill, City of Durham, Durham County, Orange County, NCDOT

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What can we expect in the future?

Previous Studies

From a review of relevant planning documents, it is clear that the City of Durham, the Town of Chapel Hill, and the Durham – Chapel Hill – Carrboro MPO acknowledge that improvements must be made to the NC-54 corridor. Congestion within the area is a major problem.

The *DCHC MPO Long Range Transportation Plan for 2035* lists several specific roadway improvement projects within the study area including:

- Widening NC-54 from 4 to 6 lanes from I-40 to Barbee Chapel Road (2025)
- Constructing SW Durham Drive from Meadowmont Drive to I-40 (2025)
- Implementing I-40 HOV lanes from US 15/501 to the Wake County line (2035)

These major road improvements may continue to encourage auto traffic as it will provide additional roadway capacity for the anticipated population and job growth within the corridor and surrounding area.

In addition to the road improvements, there is a growing focus on transit and alternative transportation modes in many of the reviewed planning documents and studies. The community's need and desire for a light rail system was identified in 1995 with the *Triangle Fixed Guideway Study* (1995), which examined several alternatives for a transit system. This study refined a composite alternative and developed recommendations for a Regional Transit Plan. The *US 15-501 Major Investment Study* (1998-2001) ultimately resulted in the selection of a preliminary alignment for the fixed guideway. The DCHC MPO later modified the alignment, and all parties agree this rail system is necessary for the area. The MPO's Long Range Transportation Plan envisions completion of the rail system by 2025, subject to voter approval of a future funding source and federal funding commitments.

Recently, the *Chapel Hill Transit Master Plan* (2009) identified NC-54 between I-40 and Fordham Boulevard (US 15/501) as one of six main corridors for use by commuters to access the Chapel Hill-Carrboro community, and shows the proposed light rail guideway and Friday Center park-and-ride lot as instrumental in intercepting travelers entering Chapel Hill with enhanced bus service. The plan also generally recommends other transit-supportive concepts, such as improved local bus service for connectivity, connections to regional transit, transit-supportive development along the six "gateway" corridors, transit supportive land use policies, and parking policies.

Focus on alternative transportation investments throughout the area is evident in several other studies. The *I-40 HOV Study* (2000-2002) identified HOV lanes, rail and regional bus improvements and travel demand management (TDM) strategies to improve the vehicle-carrying capacity of I-40 in the Triangle region. The *Airport Rail Link Study* (2003) reaffirmed the need for a rail link between Triangle Transit Authority's rail system and the Raleigh-Durham Airport

(RDU). The *DCHC MPO LRTP* (2009) identifies a focus on transit station area development, as well as access management, complete streets and context-sensitive design. It also recommends enhanced bus service in Durham and Chapel Hill and regional bicycle facilities in the NC-54 study area.

The construction of collector routes is another common theme in several of the area's planning documents. The *DCHC Urban Thoroughfare Plan* (1991) proposed a minor highway extending from Barbee Chapel Road north to the Farrington Road bridge over I-40, identifying an early need for a more connected roadway network in that area. The *Collector Street Plan* (2006) continued to reinforce the community vision for a collector street system, and although the proposed alignment was controversial, created a collector street map including Southwest Durham Drive. After revisions to the maps, the approved collector street network was adopted in 2007. The *DCHC MPO LRTP* (2009) lists the construction of SW Durham Drive on its priority Road Projects List.

A review of several impact studies for developments within and near the corridor reveals that development pressure still exists for the corridor, despite the growing congestion. While the recent economic downturn may have slowed some development projects, it is likely that in the rebound, development along the corridor and surrounding area will continue. While this list may be incomplete, the following development projects have been proposed along the corridor:

- *751 Development* (2009)– Three development projects are located within the corridor's vicinity, near Barbee Chapel Road. These consist of approximately 200 total new residential units.

- *Leigh Village Traffic Impact Study* (2008) – This large mixed-use development would be located in the northwest quadrant of the I-40 interchange, consisting of approximately 2,000 residential units, a 76,000 s.f. hotel, 470,000 s.f. of general office space, 50,000 s.f. of medical office space, 200,000 s.f. of general commercial space, and a 52,000 s.f. grocery store. This study states that the Leigh Village site has been designated as a high density transit hub and includes a dedicated public transit corridor. The building of Leigh Village could stimulate a significant amount of additional development in the immediate area, especially if the development establishes access to NC 54.

- *Woodmont Traffic Impact Study* (2007) – The first phase of this development includes 90,000 s.f. of office space and 60 residential units. The development would be located south of NC-54 between Barbee Chapel Road and Little John Road.

- *Gateway Bank Traffic Impact Study* (2007) – At the intersection of NC-54 and Barbee Chapel Road, the construction of a 13,000 s.f. banking facility was proposed.

Existing and Future Land Uses

Predominant Existing Land Uses

The existing land uses in the corridor are mostly typical of a suburban environment. On the west end of the corridor near the US 15/501 interchange, strip malls front the road, and residential subdivisions with single-family homes and townhouses are located behind on the north side. The Finley Golf Course is located on the south side of the corridor behind the fronting businesses.

In the middle of the corridor, the Meadowmont development, an expansive mixed-use development is located on the north side. This development contains a range of housing options, and a "village center" with shops, restaurants and other uses for the residents. Churches and schools are also present north of the corridor. The Friday Center park-and-ride lot is located opposite the Meadowmont development on the south side, with a number of other large office complexes. Just east of the Friday Center is a residential subdivision with a variety of medium density housing.

The environmentally sensitive land on the Durham side of the corridor has prevented development within the floodplain areas, although development pressure continues. There is a large amount of environmentally sensitive land throughout the study area, 2,825 acres in total, or 49 percent of the land within the study area. The Army Corps of Engineers land accounts for 1,366 acres, approximately 50 percent of the total area of environmentally sensitive land.

Residential subdivisions are present to the east of the floodplains. Near the I-40 interchange, highway commercial and service uses are present, including hotels, banks, fast food restaurants, gas stations. Businesses front the corridor in strip development patterns. Large office complexes exist on either side of the road just east of I-40. The proposed Leigh Village mixed use development on the north side could provide housing, office space, commercial space, and a hotel and grocery store if developed. Leigh Farm Park is located further to the north.

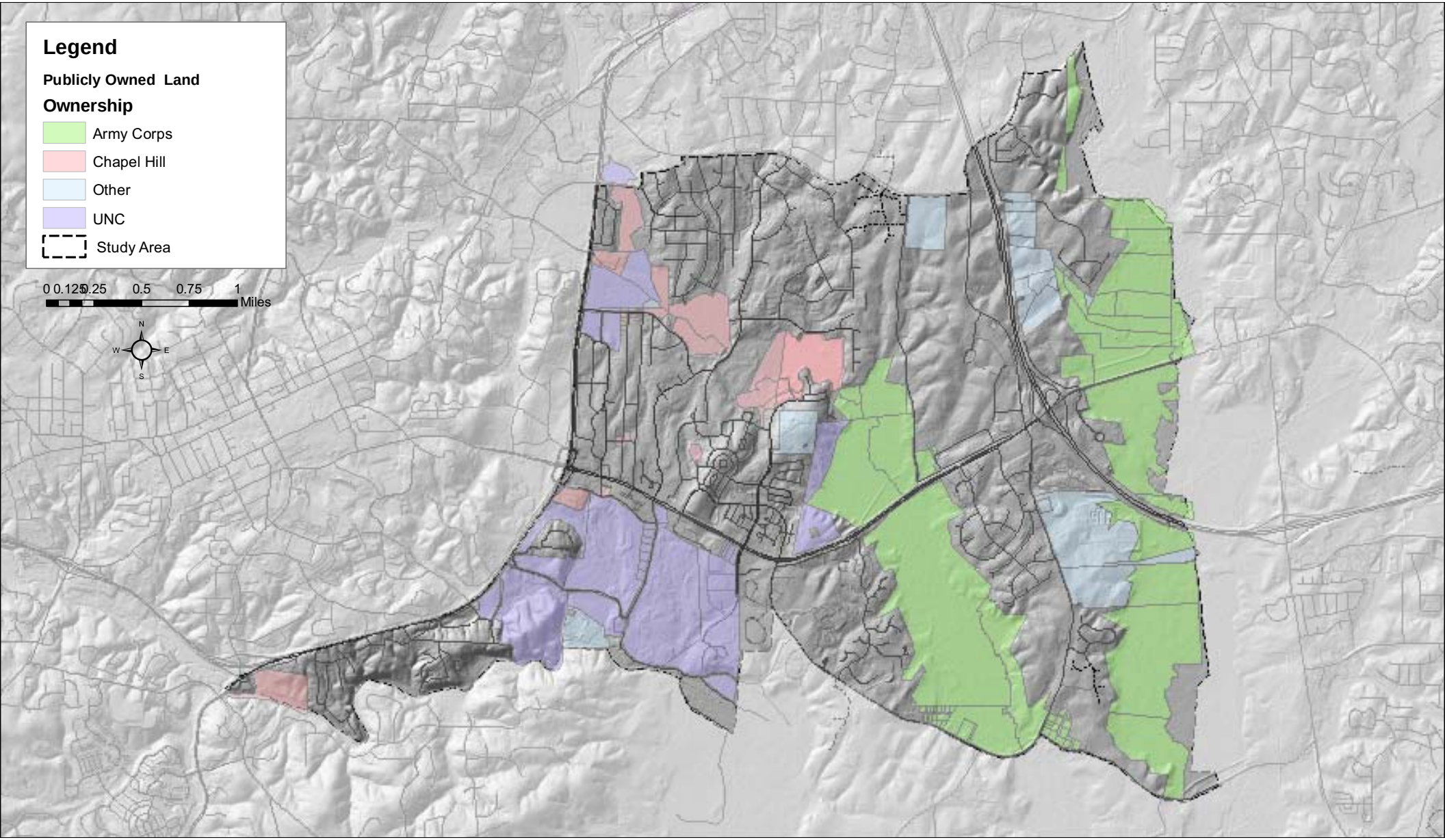
Predominant Land Ownership

In general, institutional uses account for a significant portion of the land uses within the corridor. The University of North Carolina owns approximately 750 acres within the study area, or about 13 percent. Other institutional uses include the Town of Chapel Hill, Chapel Hill/Carrboro School District and various other State and non-profit entities.

Patterns of Development

Almost half of the land in the corridor is in some form of public ownership. Much of this land is constrained by floodplain or wetlands, but a considerable portion is under University of North Carolina ownership. While publicly owned land is generally considered unlikely to be available for development in this instance it must be studied in more detail as the University has often proven to be an active developer. **Figure 13** shows the areas of publicly owned land within the study area.

Figure 13 - Publicly Owned Land



Non-public existing land uses within the corridor are dominated by single-family residential development which utilizes approximately 80 percent of the developed land. Non-residential uses, including industrial, commercial and office, accounts for approximately 10 percent of the land with the remainder in open space or recreational uses. Zoning on the remaining vacant land follows a similar pattern, although there is capacity for a much larger proportion of employment if the land develops at anticipated densities.

Development Pattern Prototypes for CorPlan Analysis

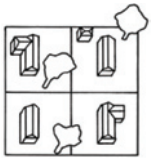
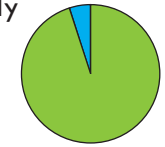
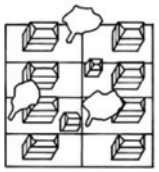
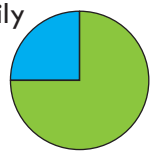
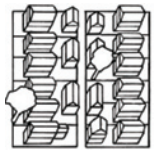
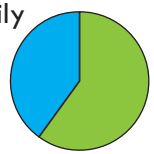
To analyze the effects of the land development patterns and uses, 12 prototypical development patterns were developed for the land use modeling and scenario planning analysis. Under the future scenarios, each parcel of vacant land and areas of potential can be designated as one of these 12 development patterns. Each type has a distinct combination of household units per acre and employees per acres, reflecting the land use characteristics of that development area, as shown in **Figures 14-17**.

Within the study area, neither county currently has future land use designations that fully support light rail transit. Each jurisdiction, however, has within its boundaries, zoning of sufficient intensity to create vibrant station areas. Increasing the zoning intensities in future station areas could promote transit supportive development to ensure the success of the rail service once implemented. In particular, the transit supportive village residential and mixed-use development patterns could help ensure the success of enhanced bus service and possible light rail service in the future.

Each future scenario will entail allocating some or all of the prototypical development patterns to the defined areas of potential change and vacant land, as explained in the following section. The CorPlan model, in conjunction with the regional demand model can then predict new transportation patterns and mode splits that evolve based on the different combinations and proximities of development types. In the future scenarios, areas within the study area can change development types to reflect the themes and predicted patterns of each scenario.

Figure 14 - Residential Development Patterns

RESIDENTIAL

	Land Use	Description	Density (dwellings)
RL	Residential Low 	Detached, single family houses. 1-3 story homes. Community spaces such as churches or small parks sometimes near or within subdivisions. Fixed route service is not viable at these low densities.	3 dwelling units/acre 95% single-family 5% multi-family R-2, R-3 
RM	Residential Medium 	Mixture of single family homes with multi-family and attached townhome dwellings. 1-3 story buildings. Community spaces sometimes within walking distance. This density begins to support bus service potential.	6 dwelling units/acre 75% single-family 25% multi-family R-3, R-4 
RH	Residential Medium-High 	Mixture of detached and attached housing types on small lots. Predominately townhomes and condominiums. 2-4 story buildings. Community spaces sometimes within walking distance. This density could support local fixed-route bus service.	10 dwelling units/acre 60% single-family 40% multi-family R-4, R-5 

Multi-family residential

Single-family residential

RL - Residential Low

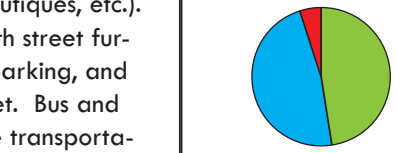
RM - Residential Medium

RH - Residential Medium-High

Figure 15 - Village Residential Development Patterns

VILLAGE RESIDENTIAL

	Land Use	Description	Density/ Intensity
VRL	Village Residential	Mostly attached housing types for single-family and multi-family dwellings. 2-4 story buildings. A few non-residential neighborhood uses within walking distance (coffee shops, boutiques, etc.). Walkable environment with street furniture, lighting, on-street parking, and buildings close to the street. Bus and light rail transit are viable transportation modes with these densities.	25 dwelling units/ acre 3 jobs/acre R-5, R-5-C
VRH	Village Residential High	Higher buildings with mostly multi-family apartments and condominiums. 4-6 story buildings in a walkable pedestrian-oriented environment with street furniture, lighting, on-street parking, and buildings close to the street. Neighborhood uses within walking distance. Bus and light rail transit are viable transportation modes with these densities.	50 dwelling units/ acre 8 jobs/acre R-6



VRL - Village Residential

VRH - Village Residential High

Non-residential

Multi-family residential

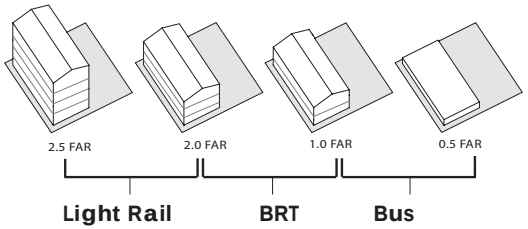
Single-family residential

Figure 16 - Employment Development Patterns

EMPLOYMENT

	Land Use	Description	Density / Intensity
EL	Employment Center Low	2-3 story office buildings with surface parking. Bus transit may be a commuting option for some employees. Neighboring buildings are also employment centers.	70 jobs/acre 0.65 Floor Area Ratio OI-2
EH	Employment Center High	3-4 story office buildings with structured or surface parking. Density is high enough to support bus transit and light rail as a viable option.	95 jobs/acre 0.85 Floor Area Ratio OI-2-C
HC	Hospital Campus	Major employment center generating local and regional transit and auto trips. 4-6 story buildings with structured parking. High density and intensity. Should be served by bus or light rail transit.	220 jobs/acre 2.0 Floor Area Ratio

Transit Densities



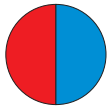
EL - Employment Center Low

EH - Employment Center High

HC - Hospital Campus

Figure 17 - Mixed Use & Commercial Development Patterns

MIXED-USE / COMMERCIAL

	Land Use	Description	Density / Intensity
VCL	Village Center Low	Mainly multi-family attached dwellings with some ground-level neighborhood uses. 2-3 story buildings with shared surface parking. Bus service is a viable means of transportation.	15 dwelling units/acre 20 jobs/acre 0.75 Floor Area Ratio R-4, R-5
VCH	Village Center High 	A mixture of residential and non-residential uses. Ground level restaurants, retail and service uses with residential above. Parking is structured and behind buildings.	25 dwelling units/acre 70 jobs/acre 1.25 Floor Area Ratio R-5, R-5-C
TC	Town Center	A vibrant mix of residential, commercial and employment. High densities support bus and light rail transit. Mix of uses encourages pedestrian activity.	50 dwelling units/acre 145 jobs/acre 1.75 Floor Area Ratio R-5, R-5-C
RC	Retail Center	Major shopping center. 1-2 story buildings with surface parking. May support bus transit.	35 jobs/acre 0.35 Floor Area Ratio CC

Non-residential

Multi-family residential

Single-family residential

VCL - Village Center Low

VCH - Village Center High

TC - Town Center

RC - Retail Center

Land Development Capacity Analysis

Population and Employment

The Triangle Travel Demand Model predicts the growth in population and jobs for the Triangle region by county. The model uses the latest planning assumptions as approved and adopted in documents such as the DCHC MPO 2035 Long Range Transportation Plan, the Durham Comprehensive Plan and the Orange County Comprehensive Plan. These planning assumptions are taken as input to the model in the form of land use forecasts (population, households, employment, etc) and transportation infrastructure (highway and transit). Different land uses exhibit different travel behaviors. The model forecasts traffic volumes on the roadways based on travel behavior of travelers in the region, including trip generation rates, origin destination patterns, modal split, and trip route choices. The model was calibrated and validated to represent these travel behaviors as accurately as possible.

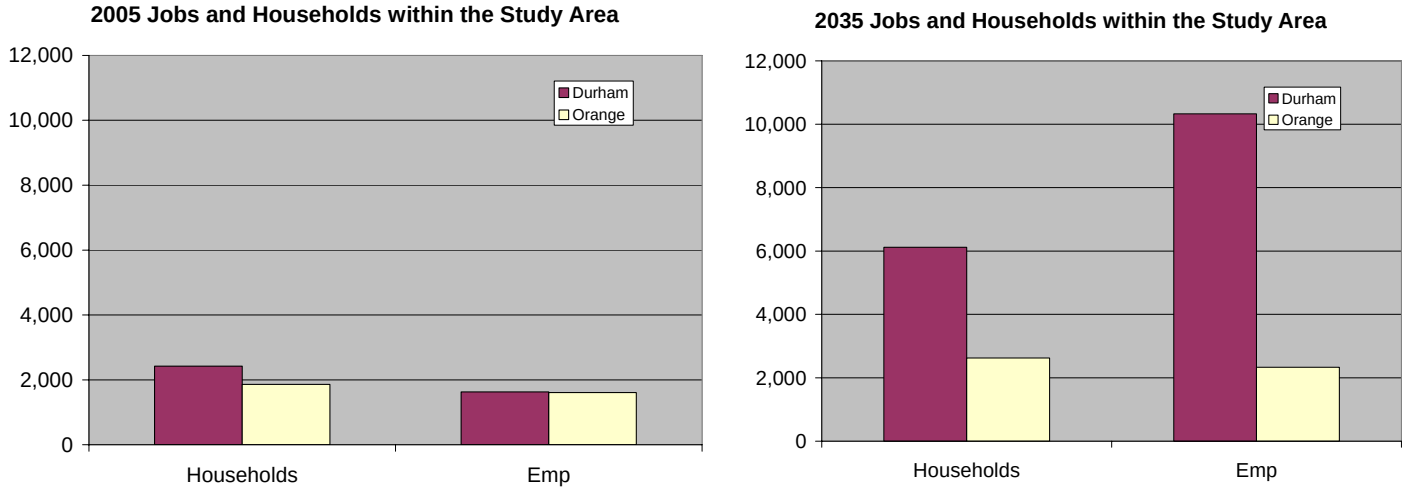
These predictions can be used to analyze whether the current zoning within the study area can accommodate the expected job and household growth. Forecasts are presented by county. The Town of Chapel Hill is included in the Orange County forecasts. Similarly, the City of Durham is included in the Durham County forecasts.

Currently there are 1,862 and 2,420 households and 1,606 and 1,627 jobs with the Orange and Durham County portions of the study area, respectively.

The Triangle Travel Demand Model predicts the Orange County portion of the study area will grow by 727 employees and 762 households from 2005 to 2035. Durham County will grow by 8,698 employees and 3,698 households in the same time.

By 2035, the study area will have a total of 8,742 households and 12,658 employees. **Figure 18** shows the comparison of jobs and population growth by county.

Figure 18 – 2005-2035 Job and Housing Growth



Vacant Buildable Land – Unconstrained Developable Land

To determine whether the expected growth in households and jobs can be accommodated within the study area, the amount of vacant land within the study area was calculated, and the portion within designated floodplain areas was subtracted from the total. Assuming that the remaining developable land would be developed at the densities specified in the Orange County Comprehensive Plan and Durham Future Land Use Plan, the number of jobs and households that would be accommodated at these densities was then calculated.

The portion of the study area within Orange County, including the study area within the Town of Chapel Hill limits, has about 330 acres of vacant land remaining of which about 225 (70%) is not constrained by floodplains. Assuming that development of the vacant parcels will occur within the densities specified in the Comprehensive Plan adopted in 2002, The current zoning classifications could accommodate up to 1,444 new jobs and 482 new households (approximately 1,109 people) within the Orange County portion of the study area. This area is expected to grow by 727 jobs and 762 households from 2005 to 2035. The vacant land under its current zoning appears to be somewhat inadequate to accommodate the forecast households and is more than sufficient for the forecast employment. Several developments under construction such as the 54 East project and recently constructed housing developments in the Meadowmont neighborhood were not counted as vacant land, although these areas may be able to absorb some of the forecast household growth. **Tables 5 and 6** show the employment and household capacities for Orange County within the study area.

In Orange County a significant portion of the remaining vacant land is under public ownership. This ownership is dominated by the University of North Carolina and UNC Endowment. Other owners include the Town of Chapel Hill, school district and public utilities. For the purposes of capacity, the UNC owned properties were included under their current zoning designations.

The portion of the study area within Durham County, including the study area within the City of Durham limits, has about 375 acres of vacant land in the study area, all of which is fully buildable. Under current future land use designations, this land could accommodate up to 3,475 new jobs and 3,125 new households (about 7,188 people) within the Durham County portion of the study area. This area is expected to grow by 12,658 jobs and 8,742 households from 2005 to 2035. The area falls short in land supply for the forecast households and employment. Full buildout of the study area would at current designations would only accommodate 36 percent of the forecast households and 27 percent of the forecast jobs. While there are several developments under construction that were not accounted for in the land capacity analysis, most jobs and households could not be accommodated with the current future land use designations. One alternative to accommodate the growth is infill development on underutilized land or redevelopment. **Tables 7 and 8** show the employment and household capacities on vacant land for Durham County within the study area. Development densities are from the Future Land Use Plan and are calculated on both the high and low end of each range, providing a minimum and maximum capacity depending on the individual site plans proposed for each parcel.

Table 5 – Employment Capacity in Orange County / Chapel Hill

Zoning Classification	Total Acres of Vacant Land	Acres not within Floodplain Boundaries	Dwelling Units per Acre	Square feet per Dwelling Unit	Total Dwelling Units	Floor Area Ratio	Total Square Footage	Square Feet per Employee	Total Number of Jobs
Community Commercial	2.87	2.87	-	-	-	0.35	43,741	600	73
Mixed Use, Low Density Residential	7,19	7.19	25	1500	119	0.76	238,162	400	595
Office & Institutional 2	41.19	26.99	-	-	-	0.264	310,335	400	776
TOTAL	**51.25**	**37.05**	**-**	**-**	**119**	**-**	**592,237**	**-**	**1,444**

Table 6 – Household Capacity in Orange County / Chapel Hill

Zoning Classification	Total Acres of Vacant Land	Acres not within Floodplain Boundaries	Dwelling Units per Acre	Total Dwelling Units
Residential 1	202.67	159.31	1	159
Residential 1A	13.01	9.76	2	20
Residential 2	0.76	0.50	3	2
Residential 3	53.94	12.33	5	62
High Density Residential	6.08	6.08	20	122
TOTAL	**276**	**188**		**363**

Table 7 – Employment Capacity on Vacant Land in Durham County

Future Land Use Classification	Total Acres of Vacant Land	Acres not within Floodplain Boundaries	Floor Area Ratio	Total Square Footage	Square Feet per Employee	Total Number of Jobs
Commercial	7.81	7.81	0.35	119,041	600	198
Office	60.18	60.18	0.50	1,310,755	400	3,277
TOTAL	**67.99**	**67.99**		**1,429,796**		**3,475**

Table 8 – Residential Capacity on Vacant Land in Durham County

Future Land Use Classification	Total Acres of Vacant Land	Acres not within Floodplain Boundaries	Maximum Capacity			Minimum Capacity		
			Dwelling Units per Acre	Total Dwelling Units	Total Popu-lation	Dwelling Units per Acre	Total Dwelling Units	Total Popu-lation
Medium-High Density Residential	109.90	109.90	20	2,198	5,055	8	879	2,022
Medium Density Residential	4.04	4.04	12	48	111	6	24	56
Low-Medium Density Residential	37.34	37.34	8	299	687	4	149	344
Low Density Residential	137.23	137.23	4	549	1,263	2	274	631
Very Low Density Residential	15.15	15.15	2	30	70	1	15	35
Rural Density Residential	1.71	1.71	0.5	1	2	0.2	0	1
TOTAL	**305.38**	**305.38**		**3,125**	**7,188**		**1,343**	**3,088**

Potential Redevelopment - Underutilized Commercial & Aging Multi-Family development

In addition to vacant land, areas of potential redevelopment could also accommodate future growth within the study area. Parcels of non-residential land and single-family residential parcels greater than five acres were identified as areas of potential redevelopment. Large lot residential uses are often displaced by more intensive transit-supportive development over time in areas with high expected growth rates, such as this study area. These large lot single-family

residential parcels were not used in determining capacity, but are flagged for consideration in the future scenarios.

Other parcels have been included as areas for potential change, as identified by the steering committee members based on their local knowledge of activities in the area. Several residential parcels, while usually not considered as having redevelopment potential, were included as areas of potential change because of the noted land assembly activities likely to expand the land capacity in the study area.

Both Orange and Durham Counties have capacity for redevelopment in the study area with great potential to emerge as significant employment or mixed-use sites. Many of these will be served by the proposed rail transit system which could help to support more intensive development. Over time this transit investment could expand potential redevelopment beyond the identified parcels. Often a major public infrastructure investment will first affect the most accessible land, but, over time, will also extend its impact to land beyond the immediate vicinity.

Committed and Constrained - Single-Family, Designated Open Space, Floodplain

One of the primary natural constraints in the study area is the extensive floodplains that dissect the landscape. Many of these are publicly owned and have no future development potential. Suburban style single-family developments are apparent in the upland strands. These subdivisions, with their cul-de-sac style development, are a constraint on street connectivity through the area.

Households, population and employment forecast, and jobs/housing balance

Households in the study area are anticipated to double over the forecast period with Durham County increasing by 150 percent and Orange by 50 percent At the same time employment will more than triple with the vast majority allocated to Durham County (increasing by 500%) and the smaller share to Orange County, again increasing by about 50 percent This is due in part to the discrepancies in zoning intensity between the jurisdictions, but is also due to the difference in the utilization of land in the study area. Under the current zoning and forecast Durham County will, essentially, build out all land in the corridor while Orange County will retain some potential for future development.

Conclusions of Capacity Analysis

Under current zoning the remaining vacant land in the study area will support all of the forecast housing and the majority of employment and land that is currently under development in Durham County will possibly fill the gap in employment. Infill of underutilized sites and some strategic redevelopment or rezoning in Durham County could prove adequate to close the employment gap, but without redevelopment, maximum capacity will be reached within the forecast horizon. **Figure 19** on the following page displays the land areas with low potential for change, areas of potential change, and vacant land within the study area.

NC-54 CORRIDOR ANALYSIS - Areas of Potential Change and Low Potential Change

Figure 19

Traffic Forecasts from Triangle Travel Demand Model

The land use and traffic analyses used the same assumptions from the Triangle Travel Demand Model, as indicated in **Table 9** below.

Table 9 – Triangle Travel Demand Model Assumptions

YEAR	HH	Pop	Ind	Ret	Hwy	Off	Ser	Total
2005	4,282	9,175	51	472	133	349	2,228	3,233
2035	8,742	19,846	322	1,359	591	4,581	5805	12,658
Increment	4,460	10,671	271	887	458	4,232	3,577	9,425
% Growth	104%	116%	532%	188%	344%	1,213%	161%	292%

The DCHC MPO travel demand model was employed to forecast annual daily traffic (ADT) volumes for the study area for the mid-term (year 2015) and long-term future (year 2035) to provide a preliminary idea of what traffic may look like in the next 25 years. The forecasted volumes and their corresponding levels of service are shown in **Table 10**. The model's base year is 2005. In some instances, the 2009 ADT is larger than the forecast 2015 ADT, where the actual growth rate has exceeded the expected growth rate. The travel demand model that forecasted these preliminary volumes does not include many of the collector streets proposed for construction in the future. As this corridor study moves forward, the development of alternative scenarios will dictate possible proposed land uses, densities and alterations to the roadway network. Any additional streets added to the travel demand model will relieve the existing streets to some degree, particularly Farrington Road, George King Road and others within the vicinity. The forecasts below reflect the current modeling tool available, and will change as the model is tweaked for each future scenario. For the future scenarios, a more in-depth analysis of historical traffic volumes and comparison of the base year volumes with the will inform a more comprehensive future

The forecast levels of service were determined with the planning level FDOT generalized LOS tables. The analysis for the refined future scenarios will include NCLOS for a detailed and comprehensive level of service and capacity analysis.

Table 10 – Forecast ADT and Future Levels of Service

Roadway Name	Location	ADT	Forecast ADT		LOS	Forecast LOS	
		2009	2015	2035	2009	2015	2035
Fordham Blvd/US-501	S Estes Dr and Cleland Dr	38,900	47,900	53,200	F	F	F
Fordham Blvd/US-501	South of NC-54	52,500	61,300	68,800	F	F	F
NC-54	Hamilton Rd and Fordham Blvd US-501	50,000	49,600	66,500	F	F	F
NC-54	Medowmont Ln and W Barbee Chapel Rd	44,400	55,100	83,100	E	F	F
NC-54	Huntingridge Rd and Downing Creek Pkwy	44,400	48,100	81,400	F	F	F
NC-54	Falconridge Rd and Huntingridge Rd	44,300	48,300	76,800	F	F	F
NC-54	NC-751 and I-40	16,400	15,800	30,300	D	D	C
Farrington Rd	North/east of I-40 underpass	7,000	9,700	28,400	B	C	F
Farrington Rd	Ephesus Church Rd and Wendell Rd	10,700	12,400	20,500	C	F	F
Farrington Rd	North of NC-54	10,700	14,800	26,300	C	F	F
Farrington Rd	South of NC-54	7,300	12,900	14,700	B	C	D
Ephesus Church Rd	West of Farrington Rd	6,100	5,800	5,300	B	B	B
I-40	North of NC-54 interchange	78,000	91,500	106,500	C	D	D
I-40 HOV lanes		-	-	15,400	-	-	C
I-40	South of NC-54 interchange	105,000	121,500	137,800	D	E	F
I-40 HOV lanes		-	-	23,800	-	-	E
SW Durham Dr	North of NC-54	-	-	8,500	-	-	B
Barbee Chapel	South of NC-54	8,700	15,200	16,300	C	F	F
Burning Tree Dr	North of NC-54	1,700	2,000	2,500	A/B	A/B	A/B
George King Rd	South of Ephesus Church Rd	800	-	-	A/B	-	-
George King Rd	North of NC-54	200	-	-	A/B	-	-

The roadway improvements within the study area from the DCHC MPO 2035 Long Range Transportation Plan were included in future analyses. By 2035, the portion of NC-54 from Barbee Chapel Road to the I-40 interchange is planned to be widened to 6 lanes, NC-54 east of the Leigh Farm Road/ Quadrangle Drive is planned to be widened to 4 lanes, and the I-40 HOV lanes will be constructed and in operation.

In general, traffic volumes along NC-54 are expected to grow at an annual rate around two percent per year (in the past 10 years traffic on this corridor has grown at a rate of about three percent per year). Currently, ADT volumes range from 44,300 to 50,000 vehicles per day on NC-54 between I-40 and US 15/501. In 2015, these volumes are projected to range from 48,100 to 55,100. In 2035, these volumes are projected to range from 66,500 to 83,100.

On I-40 the current daily volume of traffic north of the NC-54 interchange is 78,000. South of the NC-54 interchange, the volume is 105,000. By 2015, these volumes are expected to grow to 91,500 and 121,500, respectively. By 2035, the I-40 HOV lanes should be implemented, and the travel demand model projects that the ADT on this interstate will be 121,900 north of the NC-54 interchange, and 161,600 south of the NC-54 interchange. This equates to an annual growth of about 1.5 percent per year (in the past 10 years, traffic on I-40 has grown by about three percent per year enabled by the widening of the freeway from four to six lanes).

Farrington Road north of NC-54 is expected to have a very high growth rate of about 3.5 percent per year (in the past 10 years Farrington Road has grown by about seven percent per year). Within the next 26 years, the traffic on this road will more than double from 10,700 vehicles per day to 26,300 vehicles per day. Farrington Road south of NC-54 is expected to grow at a similar rate, about three percent per year.

Southwest Durham Drive is expected to be constructed by 2025, and in 2035 it is projected to carry about 8,500 vehicles per day.

The 'Trend' Scenario

Based on the review of past development patterns, projected growth and the focus areas identified in the adopted planning documents, the Trend Scenario can be characterized by:

- Continued development to accommodate the projected growth in population and employment along the corridor serviced primarily by personal auto transportation and bus transit.
- Development of land at the lower end of allowable zoning densities
- Consumption of most vacant land in the corridor following the same pattern of disconnected roadways
- Transportation improvements to the existing roadway, that will in turn encourage more auto traffic

Meadowmont, a recent development in the corridor, sets a pattern that conforms more closely to traditional neighborhood development and may set a trend for future development in the region. The development of Leigh Village may continue that trend, but it should be noted that there are no remaining large parcels in the study area that will accommodate such a complete mixed-use development without significant effort to assemble smaller parcels into a consolidated plan. In the absence of an overall plan for the corridor it is more likely that development will continue to be piecemeal efforts by individual developers resulting in similar patterns that already exist in the corridor. Thus it is anticipated that the available land under the Trend Scenario would be built at the lower end of densities allowable under current zoning. This will accommodate the current forecast, but in the process will consume all available vacant land in the study area. The result will most likely be a development pattern that is not supportive of the proposed transit system.

Resistance to changes by existing residents is a common occurrence in suburban areas such as this. The tendency is to conform to neighboring development patterns rather than risk the ire of local residents.

Land Use and Transportation Integration

The future land use of the vacant and redevelopable land within the study area can support the projected growth within the corridor. However, the transportation infrastructure will not be able to support the traffic growth if current transportation and development trends continue, as the roads and intersections are already operation at failing levels of service.

If land use and transportation trends do not change, the economic vitality of the corridor will decline. The congestion will drive away many prospective businesses, and new residents will be hesitant to relocate to an area where they must face heavy congestion everyday. This directly affects the ability of major employers, including the UNC medical center, to attract and retain employees, and create an environment that is supportive of its mission to provide quality health care for all North Carolinians. Increased congestion will also affect the environmental quality of

the area. As vehicles spend more time idling in traffic, the air quality will decline. Continuing to provide surface parking will increase surface runoff, attributing to a host of other environmental problems such as soil pollution and water quality issues, especially critical given the wetlands and floodplains in the area.

Future Scenarios

Given the development pressures, environmental constraints and established neighborhoods that exist within the NC-54 corridor, there are several possible alternate scenarios to the trend that could warrant further consideration and evaluation.

In planning for the continuation of transit service and the construction of the light rail system, channeling development towards future station areas to preserve the capacity of the corridor could be one possible scenario. The UNC Medical Center is already a huge force in the future of this corridor. The continued development of medical offices, complexes and workforce housing could have an effect on the corridor. If correctly channeled to future station areas, this development could help the future transit systems be very successful. Relocating the park-and-ride facilities off the corridor could streamline transit service through the corridor.

Prioritizing environmental stewardship and utilizing the corridor's natural features to connect and promote alternative transportation is another future concept worth noting. Using smaller scale development to encourage pedestrian trips, and preserving and enhancing a greenway system with off-road commuter bike trails and could transform the corridor's character.

Traffic Technical Appendix

Traffic Analysis Methodology

Turning Movement Count Data Sheets

Balanced Volume Network Sheets

Annual Daily Traffic Data Sheets

Synchro Model Outputs

FDOT Generalized Level of Service Tables

Historic Crash Reports

NCDOT 2005-2007 Crash Rates

Traffic Analysis Methodology

Traffic Analysis Methodology

Renaissance compiled turning movement counts from several different sources:

Intersection	Date	Source
NC-54 & Hamilton Rd	9/22/09	UNC Data Collection Effort
NC-54 & Burning Tree Dr	9/22/09	UNC Data Collection Effort
NC-54 & W Barbee Chapel Rd	9/17/09	UNC Data Collection Effort
NC-54 & Meadowmont Ln	9/15/09	UNC Data Collection Effort
NC-54 & E Barbee Chapel Rd	9/17/09	UNC Data Collection Effort
NC-54 & Huntingridge Rd	10/1/09	Renaissance Subconsultant
NC-54 & Farrington Rd	12/6/07	City of Durham
NC-54 & I-40 EB ramps	1/22/08	City of Durham
NC-54 & I-40 WB ramps	1/16/08	City of Durham
NC-54 & Leigh Farm Rd	1/14/09	City of Durham

Average daily traffic (ADT) counts were conducted at 16 locations within the study area; five of which counted ADT volumes on the NC 54 corridor:

ADT Count Location on NC 54	Date	Source
Between Hamilton Rd & Fordham Blvd	Sep. 22-23 2009	Renaissance Subconsultant
Between Meadowmont Ln & W Barbee Chapel Rd	Sep. 22-23 2009	Renaissance Subconsultant
Between Huntingridge Rd & Downing Creek Pkwy	Sep. 22-23 2009	Renaissance Subconsultant
Between Falconridge Rd & Huntingridge Rd	Sep. 22-23 2009	Renaissance Subconsultant
East of I-40	Sep 24 & Oct. 1 2009	Renaissance Subconsultant

Because the turning movement counts were compiled from several sources, the volumes did not balance across the corridor. Volumes between intersections differed by hundreds of vehicles. Ideally, the volumes could be slightly adjusted to balance exactly. However, adjusting volumes beyond 10-15% of the original count is unacceptable.

Using the collected ADT volumes as a guide, we adjusted the turning movement volumes to ensure that the volumes balanced on the Chapel Hill side of the corridor, particularly between East Barbee Chapel Road and Burning Tree Drive. We also adjusted volumes to balance between Farrington Road and the Leigh Farm Road/ Quadrangle Drive intersection.

The turning movement counts at the Farrington Road and I-40 ramps were surprisingly high (approximately 500 to 700 vehicles higher than the adjacent intersection at Leigh Farm Road). It would be against professional engineering judgment to adjust the volumes more than 20% from the original counts. This discrepancy occurs between the intersections of Farrington Road and Huntingridge Road. In the future conditions analysis, the volume projections will be balanced throughout the corridor.

To analyze the existing traffic conditions, we utilized Synchro Version 7 software with the existing coordinated signal timing plans. Within the Durham city limits, the four

traffic signals between Leigh Farm Road and Farrington Road change timing plans within the AM and PM peak hours.

The available turning movement count data indicates that the AM peak hour is between 7:45 and 8:45 AM at the Farrington Road intersection and between 8:00 and 9:00 AM at both I-40 ramp intersections. The time of day based coordinated signal timing plans currently implements two different signal timing plans within this peak time. From 7:00 AM to 8:30 AM a very high cycle length plan is implemented (200 second cycle length at Farrington Rd and I-40) and a different plan then runs at 8:30 with a 150 second cycle length.

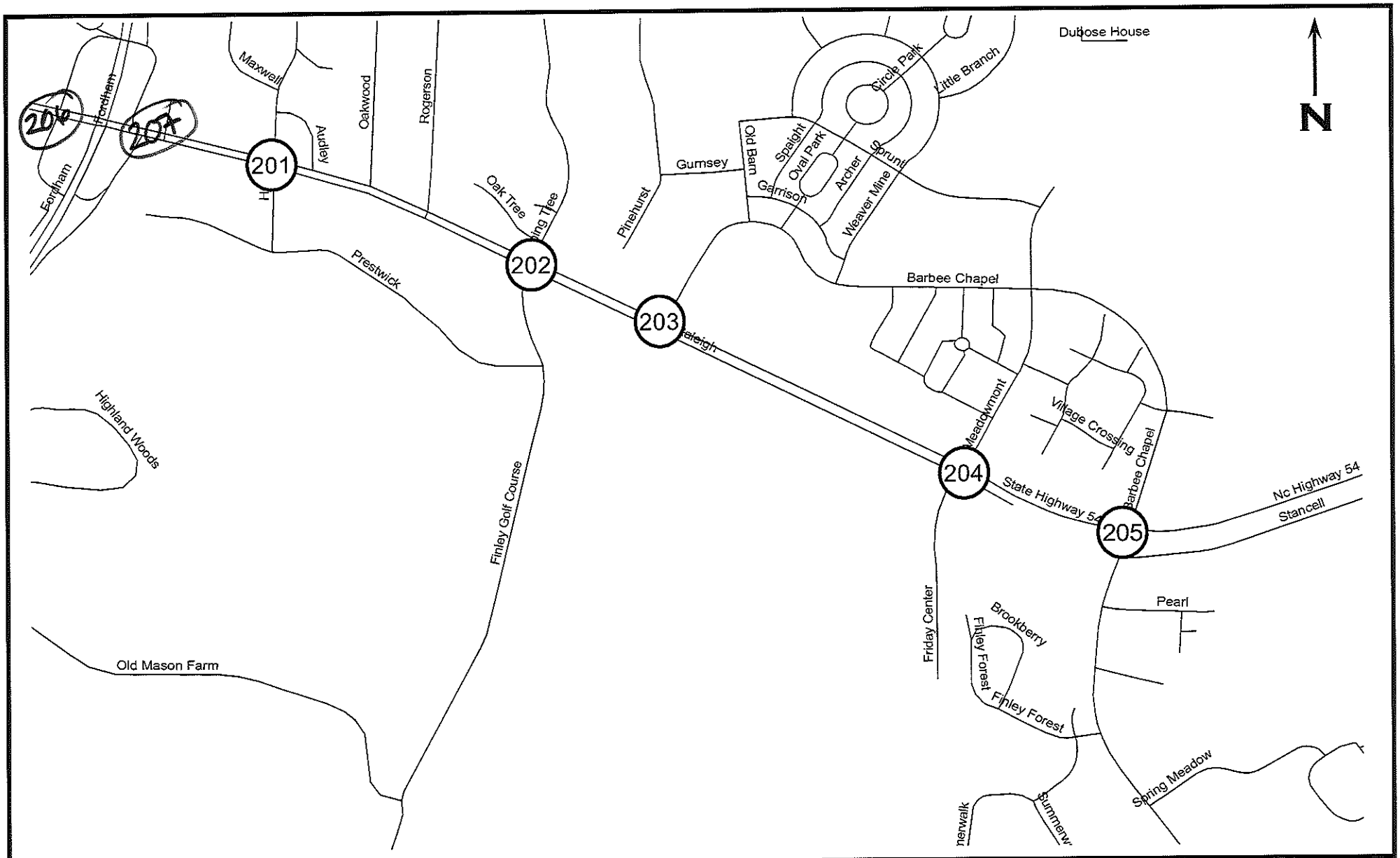
The available turning movement count data indicates that the PM peak hour is between 5:00 and 6:00 PM. The same timing plan coordination strategy occurs during the PM peak hour, with a 150 second cycle length plan implemented from 3:30 to 5:20 PM and then a 200 second cycle length plan starting at 5:20 PM.

After discussion, the NC 54 stakeholders and select steering committee members reached a decision to analyze existing conditions with a modification to how the peak hour traffic volumes are utilized. The peak hour volume entry would actually be the peak 15 minutes multiplied by four, and combined with a peak hour factor (PHF) of 1 as well as the higher cycle length timing plan (which operates during the heaviest traffic flow) the model would actually simulate the peak 15 minutes. The count data that is currently available does not specifically identify the peak 15 minutes; however, the peak 15 minutes can be calculated utilizing the related peak hour factor (PHF) data. This does assume that the peak 15 minutes is the same for each direction at each intersection and that the higher cycle length plan operates during the peak 15 minutes (which is reasonable as the higher volume would be the reason for a higher cycle length). The resulting Synchro model would then reflect the peak 15 minutes of the corridor.

As a test, this option was modeled in a mini Synchro model to include the I-40 interchange area and Farrington Road. The queuing in the area as reported by Synchro compared favorably to observed traffic conditions.

The turning movement counts, balanced volume network, and Synchro model outputs are included in the rest of the Traffic Technical Appendix. Electronic versions of the Synchro model have been included in the submission of the Community Profile document.

Turning Movement Count Data Sheets



○ Study Area Intersections

Figure 4-1c

Study Area Roadways and Intersections

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Page No : 1

Groups Printed- Vehicles

	Hamilton Road Southbound				NC 54 Westbound				Hamilton Road Northbound				NC 54 Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	3	1	6	1	14	355	0	23	5	0	12	0	1	247	15	12	36	659	695
07:15 AM	8	7	6	1	28	449	1	12	18	1	14	4	2	312	44	16	33	890	923
07:30 AM	11	8	8	1	31	586	4	18	54	4	39	4	5	380	105	13	36	1235	1271
07:45 AM	13	3	11	1	20	578	2	24	66	4	32	2	7	442	25	15	42	1203	1245
Total	35	19	31	4	93	1968	7	77	143	9	97	10	15	1381	189	56	147	3987	4134
08:00 AM	13	5	5	0	20	543	6	23	14	1	13	3	6	435	13	23	49	1074	1123
08:15 AM	11	3	9	1	11	499	7	15	13	5	15	1	9	414	9	18	35	1005	1040
08:30 AM	6	1	12	1	20	566	10	18	17	1	16	2	3	359	10	18	39	1021	1060
08:45 AM	10	1	10	1	15	632	9	18	8	0	7	0	4	365	0	17	36	1061	1097
Total	40	10	36	3	66	2240	32	74	52	7	51	6	22	1573	32	76	159	4161	4320
BREAK																			
11:00 AM	5	2	8	2	17	397	6	8	14	2	17	0	11	264	9	15	25	752	777
11:15 AM	8	0	5	0	21	343	4	18	16	1	15	3	9	236	6	11	32	664	696
11:30 AM	8	2	5	0	13	402	7	23	13	1	12	1	9	288	7	13	37	767	804
11:45 AM	12	4	4	2	23	461	11	15	15	0	17	3	13	242	7	10	30	809	839
Total	33	8	22	4	74	1603	28	64	58	4	61	7	42	1030	29	49	124	2992	3116
12:00 PM	7	4	2	1	25	396	9	14	28	1	22	3	11	269	4	9	27	778	805
12:15 PM	11	4	6	1	29	392	9	8	27	0	31	3	8	298	5	11	23	820	843
12:30 PM	4	2	7	0	26	390	6	10	26	1	28	2	9	307	12	12	24	818	842
12:45 PM	6	2	6	1	24	391	11	15	17	3	23	1	10	296	9	8	25	798	823
Total	28	12	21	3	104	1569	35	47	98	5	104	9	38	1170	30	40	99	3214	3313
BREAK																			
04:00 PM	11	4	6	2	18	331	8	6	28	2	17	1	9	426	15	15	24	875	899
04:15 PM	17	3	8	0	23	382	8	18	32	6	23	1	3	477	9	18	37	991	1028
04:30 PM	12	4	7	1	15	403	2	11	33	6	26	2	12	413	23	20	34	956	990
04:45 PM	14	4	7	0	21	439	13	12	29	8	22	2	15	493	8	12	26	1073	1099
Total	54	15	28	3	77	1555	31	47	122	22	88	6	39	1809	55	65	121	3895	4016
05:00 PM	14	3	11	1	26	462	5	8	29	3	20	1	15	473	10	16	26	1071	1097
05:15 PM	8	5	2	0	35	518	7	12	35	3	19	0	13	587	8	14	26	1240	1266
05:30 PM	13	6	13	3	25	458	9	9	30	5	29	0	15	564	14	16	28	1181	1209
05:45 PM	13	4	12	1	36	454	15	10	32	6	41	0	14	481	10	14	25	1118	1143
Total	48	18	38	5	122	1892	36	39	126	17	109	1	57	2105	42	60	105	4610	4715
Grand Total	238	82	176	22	536	10827	169	348	599	64	510	39	213	9068	377	346	755	22859	23614
Apprch %	48	16.5	35.5		4.6	93.9	1.5		51.1	5.5	43.5		2.2	93.9	3.9				
Total %	1	0.4	0.8		2.3	47.4	0.7		2.6	0.3	2.2		0.9	39.7	1.6		3.2	96.8	

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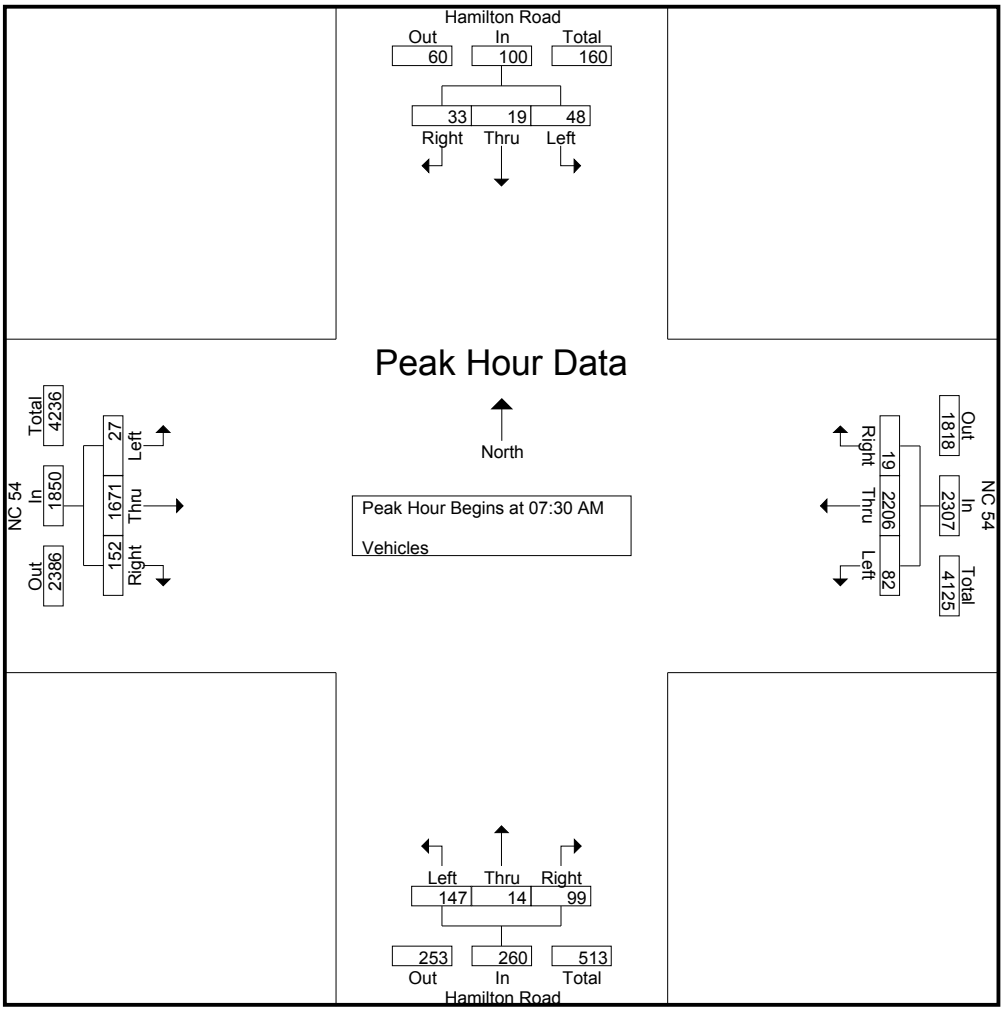
	Hamilton Road Southbound				NC 54 Westbound				Hamilton Road Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	11	8	8	27	31	586	4	621	54	4	39	97	5	380	105	490	1235
07:45 AM	13	3	11	27	20	578	2	600	66	4	32	102	7	442	25	474	1203
08:00 AM	13	5	5	23	20	543	6	569	14	1	13	28	6	435	13	454	1074
08:15 AM	11	3	9	23	11	499	7	517	13	5	15	33	9	414	9	432	1005
Total Volume	48	19	33	100	82	2206	19	2307	147	14	99	260	27	1671	152	1850	4517
% App. Total	48	19	33		3.6	95.6	0.8		56.5	5.4	38.1		1.5	90.3	8.2		
PHF	.923	.594	.750	.926	.661	.941	.679	.929	.557	.700	.635	.637	.750	.945	.362	.944	.914



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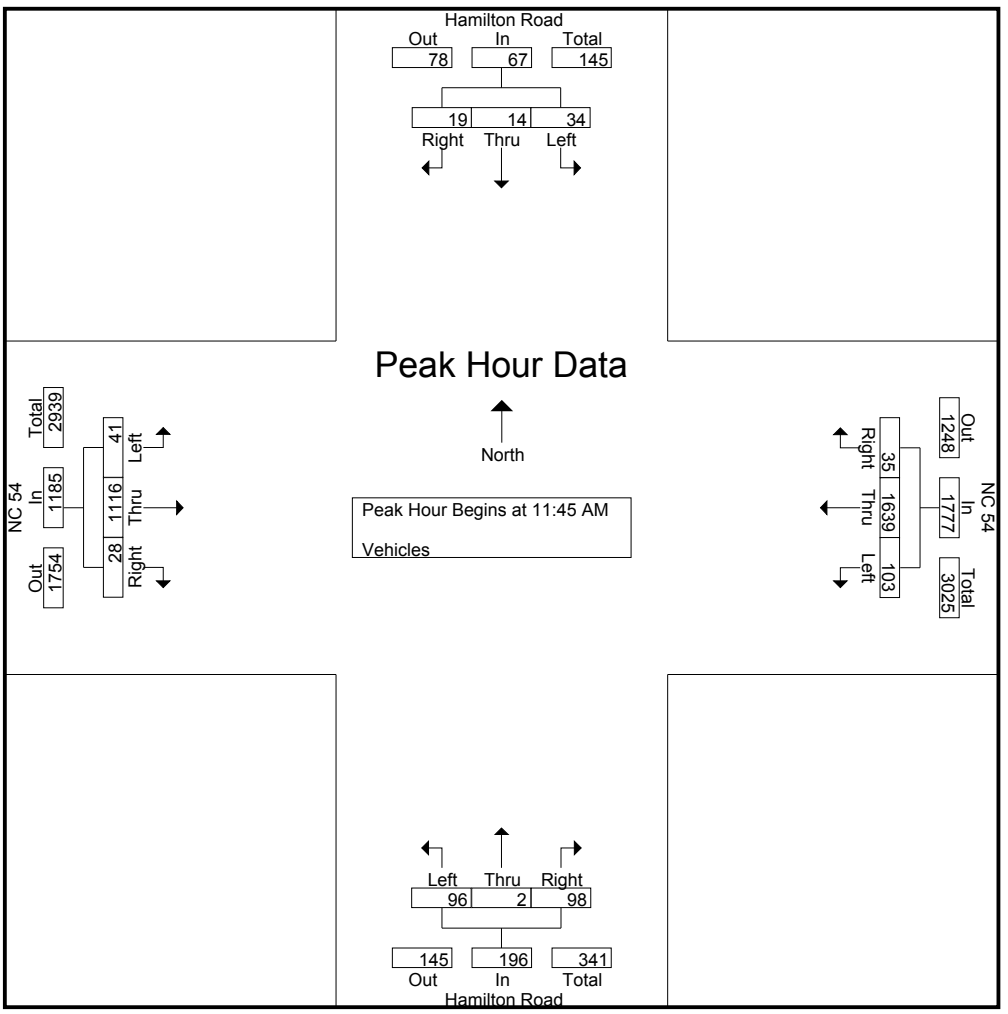
	Hamilton Road Southbound				NC 54 Westbound				Hamilton Road Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:45 AM																	
11:45 AM	12	4	4	20	23	461	11	495	15	0	17	32	13	242	7	262	809
12:00 PM	7	4	2	13	25	396	9	430	28	1	22	51	11	269	4	284	778
12:15 PM	11	4	6	21	29	392	9	430	27	0	31	58	8	298	5	311	820
12:30 PM	4	2	7	13	26	390	6	422	26	1	28	55	9	307	12	328	818
Total Volume	34	14	19	67	103	1639	35	1777	96	2	98	196	41	1116	28	1185	3225
% App. Total	50.7	20.9	28.4		5.8	92.2	2		49	1	50		3.5	94.2	2.4		
PHF	.708	.875	.679	.798	.888	.889	.795	.897	.857	.500	.790	.845	.788	.909	.583	.903	.983



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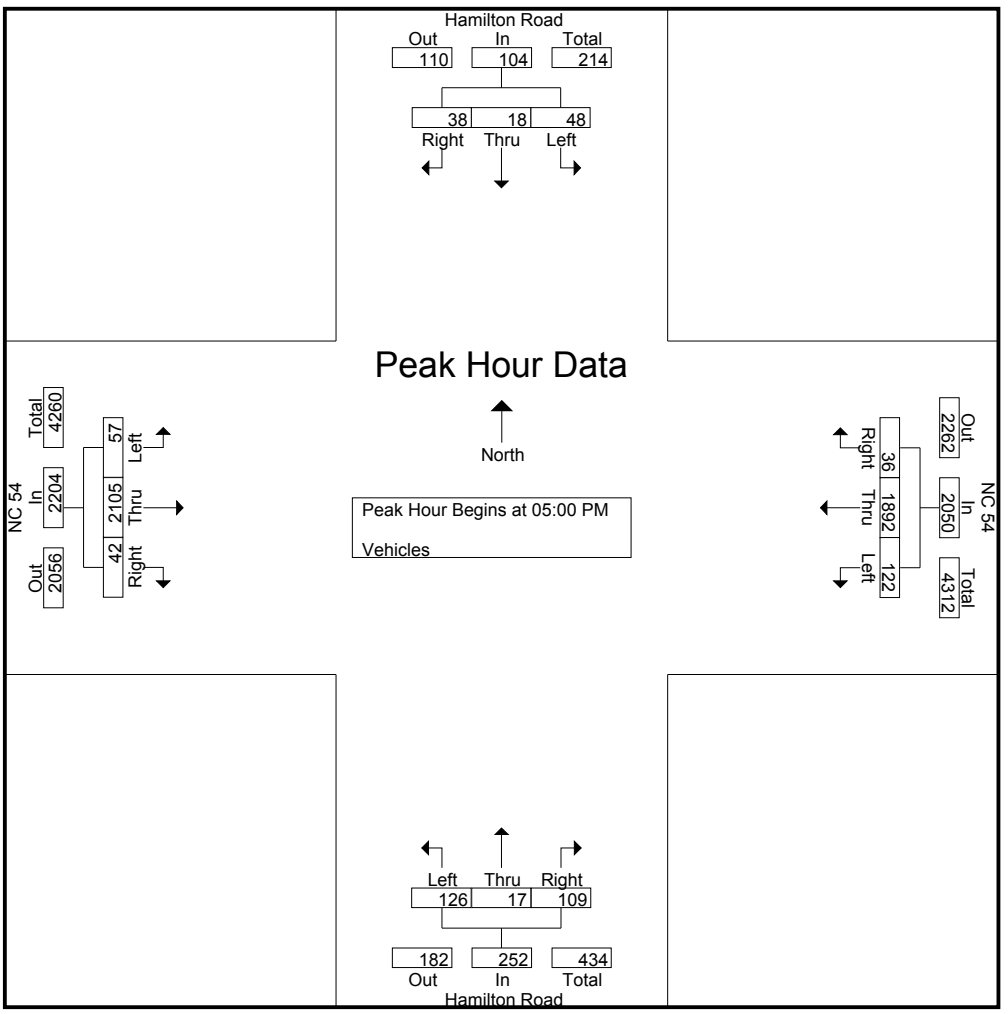
	Hamilton Road Southbound				NC 54 Westbound				Hamilton Road Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	14	3	11	28	26	462	5	493	29	3	20	52	15	473	10	498	1071
05:15 PM	8	5	2	15	35	518	7	560	35	3	19	57	13	587	8	608	1240
05:30 PM	13	6	13	32	25	458	9	492	30	5	29	64	15	564	14	593	1181
05:45 PM	13	4	12	29	36	454	15	505	32	6	41	79	14	481	10	505	1118
Total Volume	48	18	38	104	122	1892	36	2050	126	17	109	252	57	2105	42	2204	4610
% App. Total	46.2	17.3	36.5		6	92.3	1.8		50	6.7	43.3		2.6	95.5	1.9		
PHF	.857	.750	.731	.813	.847	.913	.600	.915	.900	.708	.665	.797	.950	.897	.750	.906	.929



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Groups Printed- All Vehicles

	Southbound				Westbound				Northbound				Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	1	0	10	327	0	14	3	0	4	0	2	259	7	10	24	614	638
07:15 AM	9	2	6	1	9	458	4	13	4	2	19	1	2	382	3	16	31	900	931
07:30 AM	7	1	11	0	13	565	6	21	1	1	41	0	1	392	10	14	35	1049	1084
07:45 AM	8	6	12	0	22	606	9	25	3	1	36	0	2	479	10	19	44	1194	1238
Total	24	10	30	1	54	1956	19	73	11	4	100	1	7	1512	30	59	134	3757	3891
08:00 AM	2	3	5	1	14	553	3	19	4	1	30	0	4	467	14	19	39	1100	1139
08:15 AM	6	4	9	0	28	477	5	16	1	0	17	0	7	425	16	19	35	995	1030
08:30 AM	8	1	10	0	21	493	3	17	4	1	18	1	7	384	11	18	36	961	997
08:45 AM	2	1	8	0	20	494	4	17	4	1	19	0	8	375	2	18	35	938	973
Total	18	9	32	1	83	2017	15	69	13	3	84	1	26	1651	43	74	145	3994	4139
BREAK																			
11:00 AM	3	1	1	1	3	288	2	7	8	4	12	1	3	272	10	13	22	607	629
11:15 AM	5	2	6	2	9	289	5	18	10	3	7	4	7	278	3	13	37	624	661
11:30 AM	7	3	4	2	6	303	5	13	8	0	18	2	8	274	3	15	32	639	671
11:45 AM	2	3	6	0	4	344	4	16	5	1	18	1	9	282	7	12	29	685	714
Total	17	9	17	5	22	1224	16	54	31	8	55	8	27	1106	23	53	120	2555	2675
12:00 PM	3	0	4	0	14	321	4	15	7	2	10	1	8	311	2	15	31	686	717
12:15 PM	6	1	2	1	13	313	5	7	10	0	23	1	4	323	16	12	21	716	737
12:30 PM	7	2	8	0	14	335	4	12	14	0	17	2	4	355	21	15	29	781	810
12:45 PM	4	2	5	1	14	274	7	16	10	1	11	3	14	302	3	7	27	647	674
Total	20	5	19	2	55	1243	20	50	41	3	61	7	30	1291	42	49	108	2830	2938
BREAK																			
04:00 PM	6	0	4	0	7	345	5	9	9	2	38	0	6	468	7	15	24	897	921
04:15 PM	9	4	8	1	4	298	5	15	9	1	14	0	5	492	8	14	30	857	887
04:30 PM	4	1	5	1	21	385	9	10	4	5	23	1	8	517	7	14	26	989	1015
04:45 PM	8	2	9	1	17	377	4	11	7	3	26	1	10	505	7	13	26	975	1001
Total	27	7	26	3	49	1405	23	45	29	11	101	2	29	1982	29	56	106	3718	3824
05:00 PM	8	2	14	1	41	454	8	7	15	2	42	1	11	525	5	13	22	1127	1149
05:15 PM	6	0	7	0	34	548	12	8	17	4	29	0	9	634	2	14	22	1302	1324
05:30 PM	6	3	4	0	23	553	7	8	6	1	34	0	9	609	2	14	22	1257	1279
05:45 PM	4	3	5	0	22	522	8	8	3	3	31	0	18	547	10	15	23	1176	1199
Total	24	8	30	1	120	2077	35	31	41	10	136	1	47	2315	19	56	89	4862	4951
06:00 PM	5	3	6	1	19	422	12	10	5	2	15	0	12	447	2	12	23	950	973
06:15 PM	4	1	3	0	9	461	4	6	0	1	10	0	4	414	1	11	17	912	929
Grand Total	139	52	163	14	411	10805	144	338	171	42	562	20	182	10718	189	370	742	23578	24320
Apprch %	39.3	14.7	46		3.6	95.1	1.3		22.1	5.4	72.5		1.6	96.7	1.7				
Total %	0.6	0.2	0.7		1.7	45.8	0.6		0.7	0.2	2.4		0.8	45.5	0.8		3.1	96.9	

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Start Date : 9/22/2009
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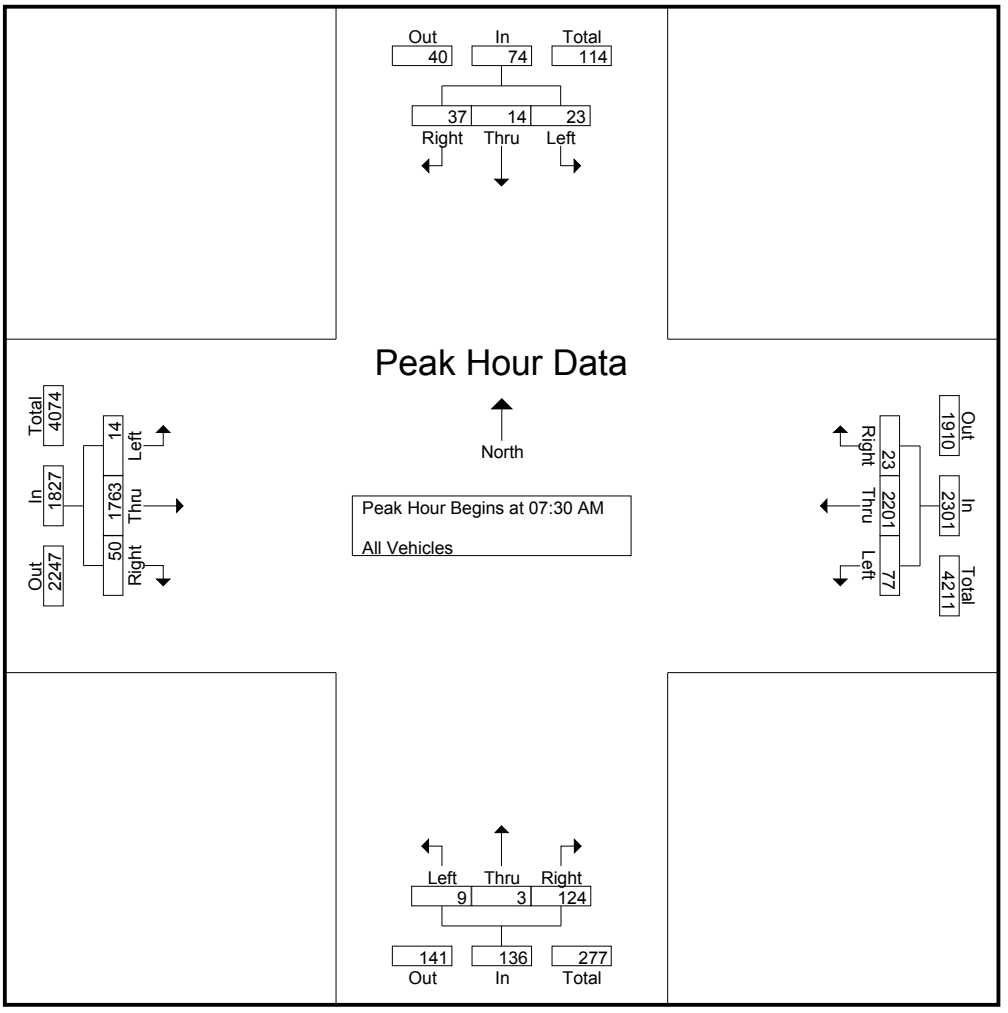
	Southbound				Westbound				Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	7	1	11	19	13	565	6	584	1	1	41	43	1	392	10	403	1049
07:45 AM	8	6	12	26	22	606	9	637	3	1	36	40	2	479	10	491	1194
08:00 AM	2	3	5	10	14	553	3	570	4	1	30	35	4	467	14	485	1100
08:15 AM	6	4	9	19	28	477	5	510	1	0	17	18	7	425	16	448	995
Total Volume	23	14	37	74	77	2201	23	2301	9	3	124	136	14	1763	50	1827	4338
% App. Total	31.1	18.9	50		3.3	95.7	1		6.6	2.2	91.2		0.8	96.5	2.7		
PHF	.719	.583	.771	.712	.688	.908	.639	.903	.563	.750	.756	.791	.500	.920	.781	.930	.908



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Start Date : 9/22/2009
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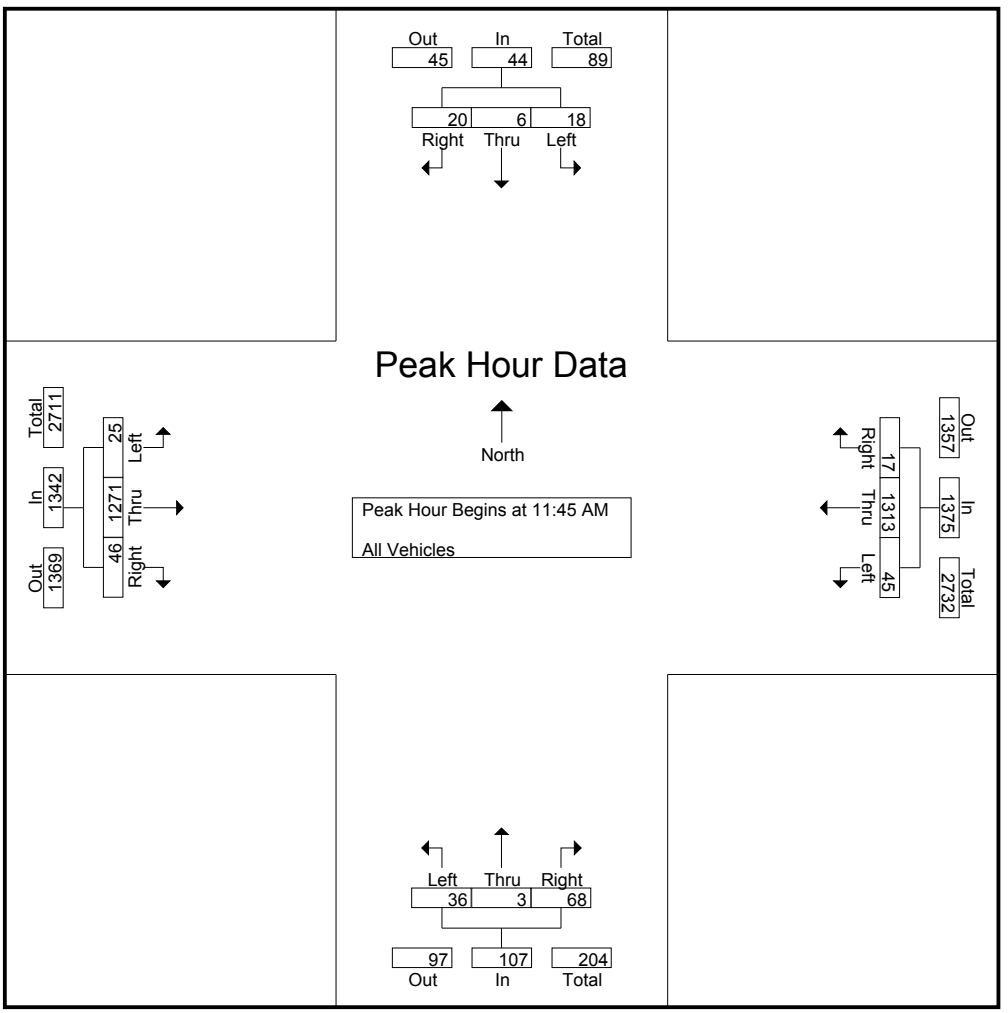
	Southbound				Westbound				Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:45 AM																	
11:45 AM	2	3	6	11	4	344	4	352	5	1	18	24	9	282	7	298	685
12:00 PM	3	0	4	7	14	321	4	339	7	2	10	19	8	311	2	321	686
12:15 PM	6	1	2	9	13	313	5	331	10	0	23	33	4	323	16	343	716
12:30 PM	7	2	8	17	14	335	4	353	14	0	17	31	4	355	21	380	781
Total Volume	18	6	20	44	45	1313	17	1375	36	3	68	107	25	1271	46	1342	2868
% App. Total	40.9	13.6	45.5		3.3	95.5	1.2		33.6	2.8	63.6		1.9	94.7	3.4		
PHF	.643	.500	.625	.647	.804	.954	.850	.974	.643	.375	.739	.811	.694	.895	.548	.883	.918



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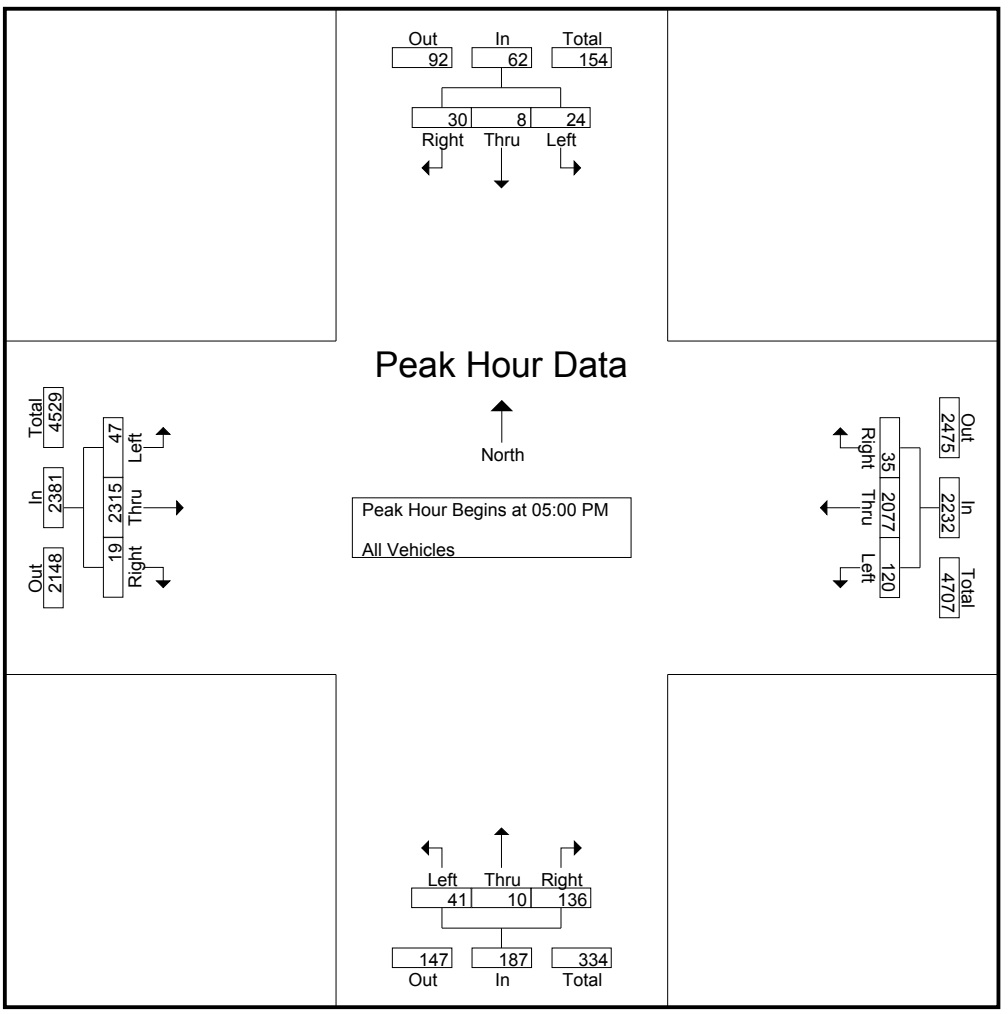
	Southbound				Westbound				Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	8	2	14	24	41	454	8	503	15	2	42	59	11	525	5	541	1127
05:15 PM	6	0	7	13	34	548	12	594	17	4	29	50	9	634	2	645	1302
05:30 PM	6	3	4	13	23	553	7	583	6	1	34	41	9	609	2	620	1257
05:45 PM	4	3	5	12	22	522	8	552	3	3	31	37	18	547	10	575	1176
Total Volume	24	8	30	62	120	2077	35	2232	41	10	136	187	47	2315	19	2381	4862
% App. Total	38.7	12.9	48.4		5.4	93.1	1.6		21.9	5.3	72.7		2	97.2	0.8		
PHF	.750	.667	.536	.646	.732	.939	.729	.939	.603	.625	.810	.792	.653	.913	.475	.923	.934



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File Name : 203
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Groups Printed- All Vehicles

	Barbee Chapel Road West Southbound				NC 54 Westbound				Driveway Northbound				NC 54 Eastbound						
Start Time	Left	Thru	Rght	Trks	Left	Thru	Rght	Trks	Left	Thru	Rght	Trks	Left	Thru	Rght	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	19	2	5	354	6	14	2	0	0	1	25	216	4	1	18	631	649
07:15 AM	1	1	24	0	14	444	4	10	0	0	2	0	25	303	18	0	10	836	846
07:30 AM	2	2	31	1	29	654	2	14	4	0	4	0	32	384	15	1	16	1159	1175
07:45 AM	3	6	29	2	28	652	4	16	3	0	0	1	33	449	28	3	22	1235	1257
Total	6	9	103	5	76	2104	16	54	9	0	6	2	115	1352	65	5	66	3861	3927
08:00 AM	1	0	32	0	47	479	2	14	2	0	3	0	38	464	18	1	15	1086	1101
08:15 AM	1	1	22	1	37	459	2	15	1	0	1	0	38	426	20	0	16	1008	1024
08:30 AM	0	5	34	3	40	674	3	19	5	0	2	0	36	305	11	0	22	1115	1137
08:45 AM	0	1	22	1	28	736	2	21	7	0	4	0	28	322	18	1	23	1168	1191
Total	2	7	110	5	152	2348	9	69	15	0	10	0	140	1517	67	2	76	4377	4453
BREAK																			
11:00 AM	2	1	18	1	5	290	3	10	9	1	4	0	18	259	7	5	16	617	633
11:15 AM	6	0	23	2	5	285	1	12	7	1	5	0	25	297	7	3	17	662	679
11:30 AM	4	2	35	3	1	372	6	10	8	3	5	0	26	257	5	2	15	724	739
11:45 AM	6	3	37	1	4	388	0	10	7	4	5	0	23	283	8	3	14	768	782
Total	18	6	113	7	15	1335	10	42	31	9	19	0	92	1096	27	13	62	2771	2833
12:00 PM	2	4	32	0	6	418	5	9	18	5	15	0	25	310	12	1	10	852	862
12:15 PM	0	3	50	2	12	526	2	5	9	3	12	0	26	290	14	2	9	947	956
12:30 PM	3	2	31	1	3	556	4	10	7	4	10	0	34	328	8	0	11	990	1001
12:45 PM	9	1	32	1	12	489	1	12	6	6	4	0	43	284	11	2	15	898	913
Total	14	10	145	4	33	1989	12	36	40	18	41	0	128	1212	45	5	45	3687	3732
BREAK																			
04:00 PM	7	1	34	4	2	422	4	6	7	0	11	0	25	475	3	0	10	991	1001
04:15 PM	2	0	21	1	4	410	0	8	9	0	9	0	33	524	6	0	9	1018	1027
04:30 PM	1	0	30	3	3	448	2	11	13	1	12	0	22	476	9	2	16	1017	1033
04:45 PM	4	1	41	1	2	445	1	6	24	1	14	0	30	540	4	2	9	1107	1116
Total	14	2	126	9	11	1725	7	31	53	2	46	0	110	2015	22	4	44	4133	4177
05:00 PM	2	0	43	2	1	497	6	12	32	4	31	0	47	521	8	0	14	1192	1206
05:15 PM	3	0	69	0	2	451	0	5	28	8	41	0	40	580	4	0	5	1226	1231
05:30 PM	3	1	52	0	2	439	7	8	29	6	33	0	37	582	7	1	9	1198	1207
05:45 PM	4	0	37	1	3	479	2	10	18	1	14	0	45	541	8	1	12	1152	1164
Total	12	1	201	3	8	1866	15	35	107	19	119	0	169	2224	27	2	40	4768	4808
06:00 PM	5	1	26	1	1	462	3	7	17	0	8	0	39	507	4	2	10	1073	1083
06:15 PM	0	0	35	1	2	453	1	7	12	2	7	0	26	404	1	0	8	943	951
Grand Total	71	36	859	35	298	12282	73	281	284	50	256	2	819	10327	258	33	351	25613	25964
Apprch %	7.3	3.7	88.9		2.4	97.1	0.6		48.1	8.5	43.4		7.2	90.6	2.3				
Total %	0.3	0.1	3.4		1.2	48	0.3		1.1	0.2	1		3.2	40.3	1		1.4	98.6	

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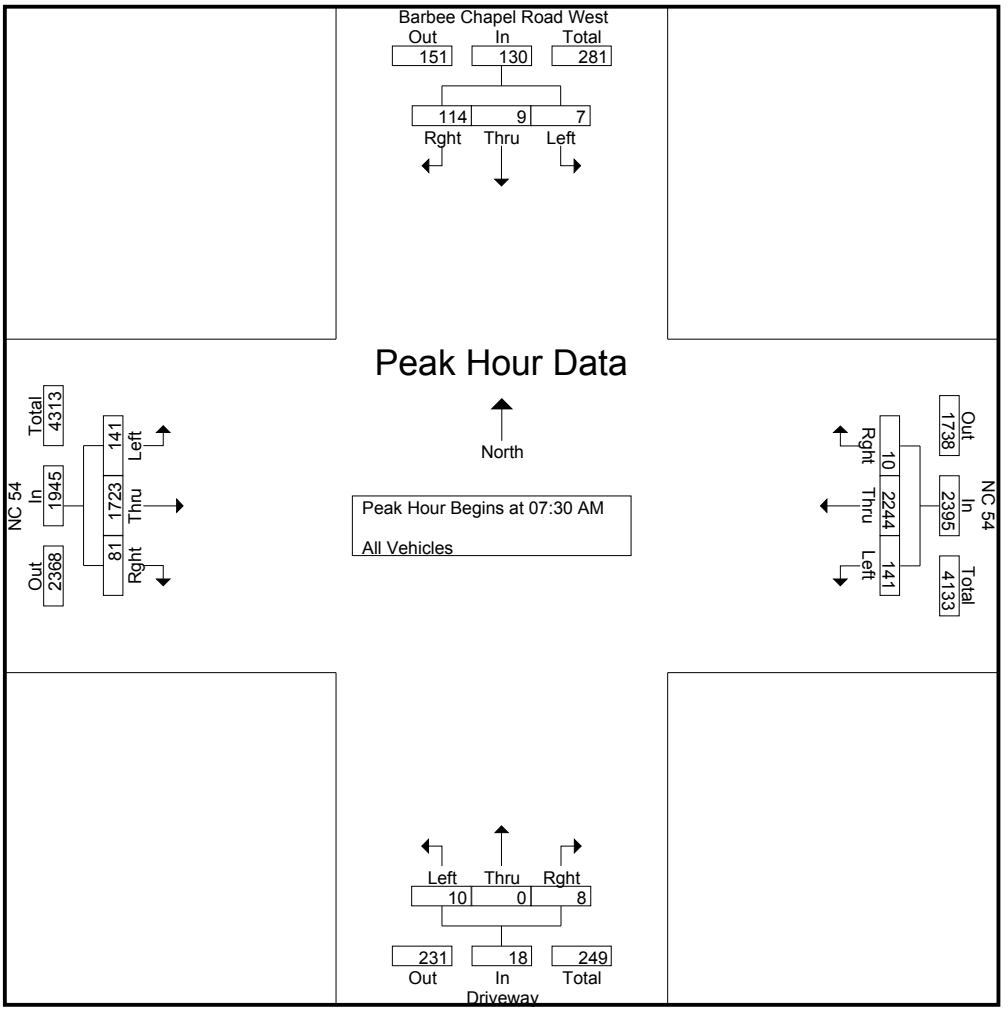
Start Date : 9/17/2009

	Barbee Chapel Road West Southbound				NC 54 Westbound				Driveway Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	2	2	31	35	29	654	2	685	4	0	4	8	32	384	15	431	1159
07:45 AM	3	6	29	38	28	652	4	684	3	0	0	3	33	449	28	510	1235
08:00 AM	1	0	32	33	47	479	2	528	2	0	3	5	38	464	18	520	1086
08:15 AM	1	1	22	24	37	459	2	498	1	0	1	2	38	426	20	484	1008
Total Volume	7	9	114	130	141	2244	10	2395	10	0	8	18	141	1723	81	1945	4488
% App. Total	5.4	6.9	87.7		5.9	93.7	0.4		55.6	0	44.4		7.2	88.6	4.2		
PHF	.583	.375	.891	.855	.750	.858	.625	.874	.625	.000	.500	.563	.928	.928	.723	.935	.909



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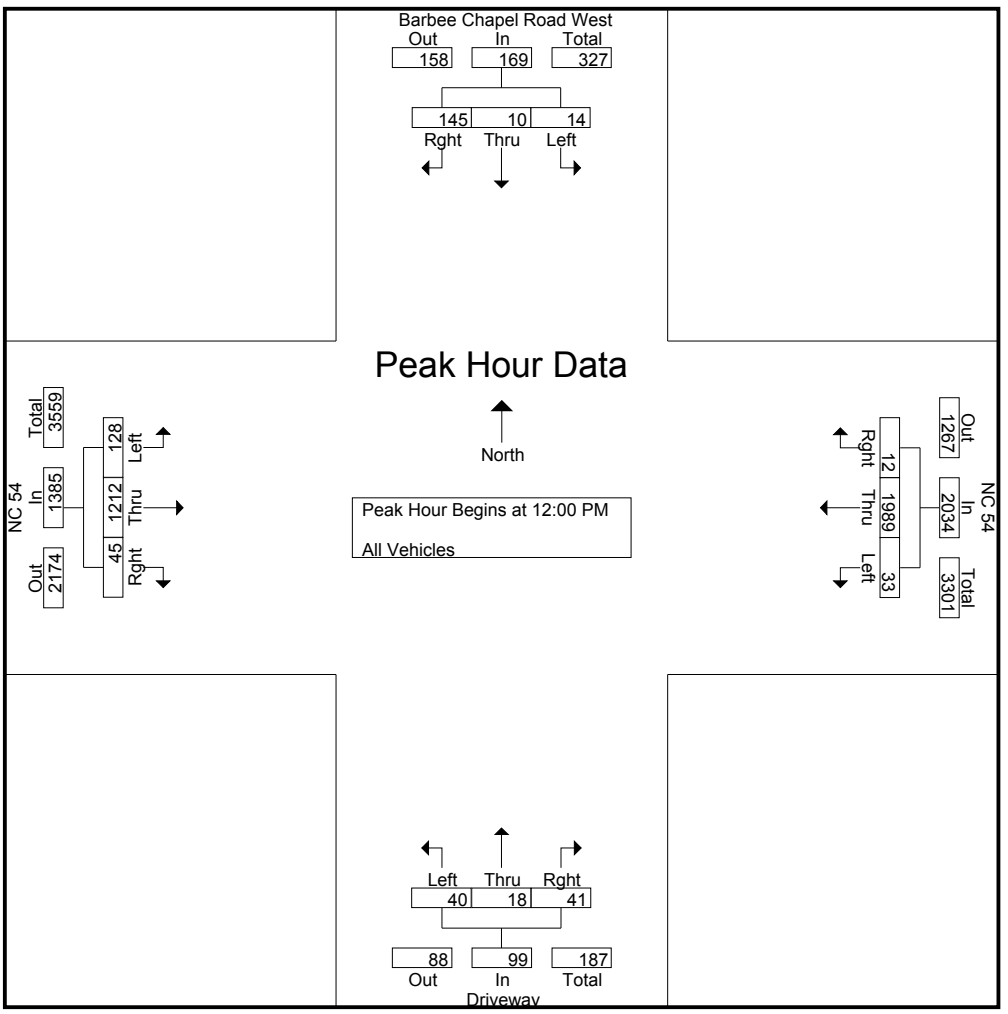
	Barbee Chapel Road West Southbound				NC 54 Westbound				Driveway Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	2	4	32	38	6	418	5	429	18	5	15	38	25	310	12	347	852
12:15 PM	0	3	50	53	12	526	2	540	9	3	12	24	26	290	14	330	947
12:30 PM	3	2	31	36	3	556	4	563	7	4	10	21	34	328	8	370	990
12:45 PM	9	1	32	42	12	489	1	502	6	6	4	16	43	284	11	338	898
Total Volume	14	10	145	169	33	1989	12	2034	40	18	41	99	128	1212	45	1385	3687
% App. Total	8.3	5.9	85.8		1.6	97.8	0.6		40.4	18.2	41.4		9.2	87.5	3.2		
PHF	.389	.625	.725	.797	.688	.894	.600	.903	.556	.750	.683	.651	.744	.924	.804	.936	.931



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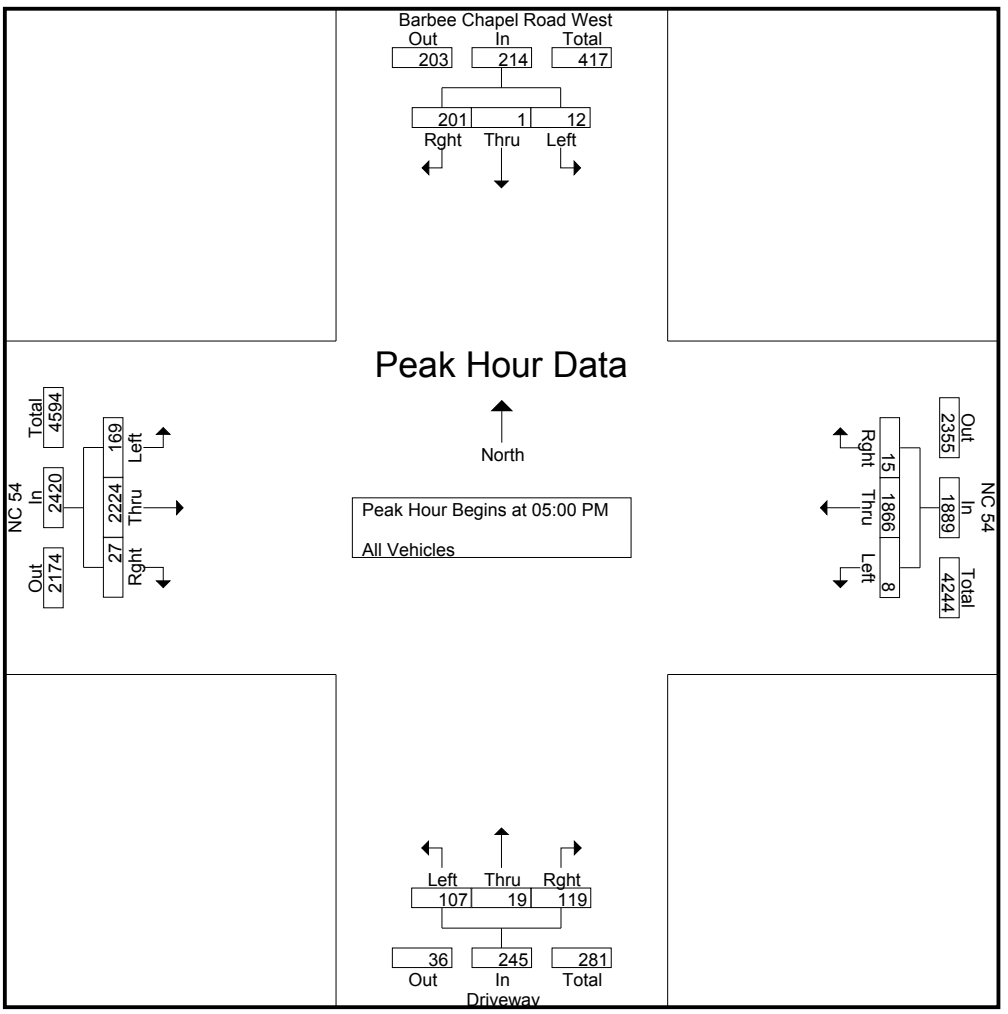
	Barbee Chapel Road West Southbound				NC 54 Westbound				Driveway Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	0	43	45	1	497	6	504	32	4	31	67	47	521	8	576	1192
05:15 PM	3	0	69	72	2	451	0	453	28	8	41	77	40	580	4	624	1226
05:30 PM	3	1	52	56	2	439	7	448	29	6	33	68	37	582	7	626	1198
05:45 PM	4	0	37	41	3	479	2	484	18	1	14	33	45	541	8	594	1152
Total Volume	12	1	201	214	8	1866	15	1889	107	19	119	245	169	2224	27	2420	4768
% App. Total	5.6	0.5	93.9		0.4	98.8	0.8		43.7	7.8	48.6		7	91.9	1.1		
PHF	.750	.250	.728	.743	.667	.939	.536	.937	.836	.594	.726	.795	.899	.955	.844	.966	.972



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Start Date : 9/15/2009
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Groups Printed- Vehicles

	Meadowmont Lane Southbound				NC 54 Westbound				Friday Center Drive Northbound				NC 54 Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	4	2	4	0	124	348	6	13	14	1	3	7	8	196	33	11	31	743	774
07:15 AM	8	11	6	1	176	535	15	20	9	1	6	4	10	281	22	6	31	1080	1111
07:30 AM	17	8	35	2	212	606	14	10	18	3	8	11	39	352	37	9	32	1349	1381
07:45 AM	38	17	38	1	173	567	17	16	15	3	6	5	30	392	25	15	37	1321	1358
Total	67	38	83	4	685	2056	52	59	56	8	23	27	87	1221	117	41	131	4493	4624
08:00 AM	17	11	22	4	149	575	38	18	26	4	6	8	23	368	57	11	41	1296	1337
08:15 AM	20	9	23	1	175	495	36	14	16	2	7	6	18	313	35	13	34	1149	1183
08:30 AM	20	10	27	4	137	500	34	9	29	2	7	7	19	308	40	23	43	1133	1176
08:45 AM	13	5	18	0	110	569	33	19	33	6	15	5	33	328	17	20	44	1180	1224
Total	70	35	90	9	571	2139	141	60	104	14	35	26	93	1317	149	67	162	4758	4920
BREAK																			
11:00 AM	35	2	25	4	24	299	20	7	17	4	18	1	26	254	16	11	23	740	763
11:15 AM	18	7	31	3	25	322	17	16	11	3	12	3	19	239	8	14	36	712	748
11:30 AM	28	3	28	2	22	381	17	13	18	6	17	4	16	268	7	15	34	811	845
11:45 AM	27	7	30	3	10	424	21	17	10	2	18	3	29	250	14	6	29	842	871
Total	108	19	114	12	81	1426	75	53	56	15	65	11	90	1011	45	46	122	3105	3227
12:00 PM	37	4	21	0	14	389	35	9	16	7	31	1	27	234	9	13	23	824	847
12:15 PM	49	4	35	0	20	478	21	9	10	6	27	2	25	307	12	20	31	994	1025
12:30 PM	46	6	47	1	17	479	28	9	15	11	34	1	49	266	13	9	20	1011	1031
12:45 PM	37	1	23	3	25	429	21	10	10	5	33	1	28	292	11	16	30	915	945
Total	169	15	126	4	76	1775	105	37	51	29	125	5	129	1099	45	58	104	3744	3848
BREAK																			
04:00 PM	37	1	38	3	19	297	12	5	34	5	121	5	32	396	23	14	27	1015	1042
04:15 PM	20	4	20	0	5	314	11	5	33	2	108	7	25	427	16	16	28	985	1013
04:30 PM	39	3	46	8	8	349	23	5	33	11	136	4	31	410	12	9	26	1101	1127
04:45 PM	38	2	28	0	12	362	23	5	22	5	137	7	34	466	15	9	21	1144	1165
Total	134	10	132	11	44	1322	69	20	122	23	502	23	122	1699	66	48	102	4245	4347
05:00 PM	53	1	46	2	14	389	15	4	40	7	155	3	41	524	25	17	26	1310	1336
05:15 PM	39	3	32	1	13	346	20	3	58	8	176	7	46	620	23	11	22	1384	1406
05:30 PM	38	1	36	0	20	370	25	5	38	8	150	12	36	514	33	14	31	1269	1300
05:45 PM	35	3	74	1	14	406	24	4	39	10	150	6	37	476	20	14	25	1288	1313
Total	165	8	188	4	61	1511	84	16	175	33	631	28	160	2134	101	56	104	5251	5355
06:00 PM	38	2	50	0	25	483	20	3	23	5	74	7	20	380	13	9	19	1133	1152
06:15 PM	48	0	27	2	16	462	20	2	13	5	61	6	24	371	13	18	28	1060	1088
Grand Total	799	127	810	46	1559	11174	566	250	600	132	1516	133	725	9232	549	343	772	27789	28561
Apprch %	46	7.3	46.7		11.7	84	4.3		26.7	5.9	67.4		6.9	87.9	5.2				
Total %	2.9	0.5	2.9		5.6	40.2	2		2.2	0.5	5.5		2.6	33.2	2		2.7	97.3	

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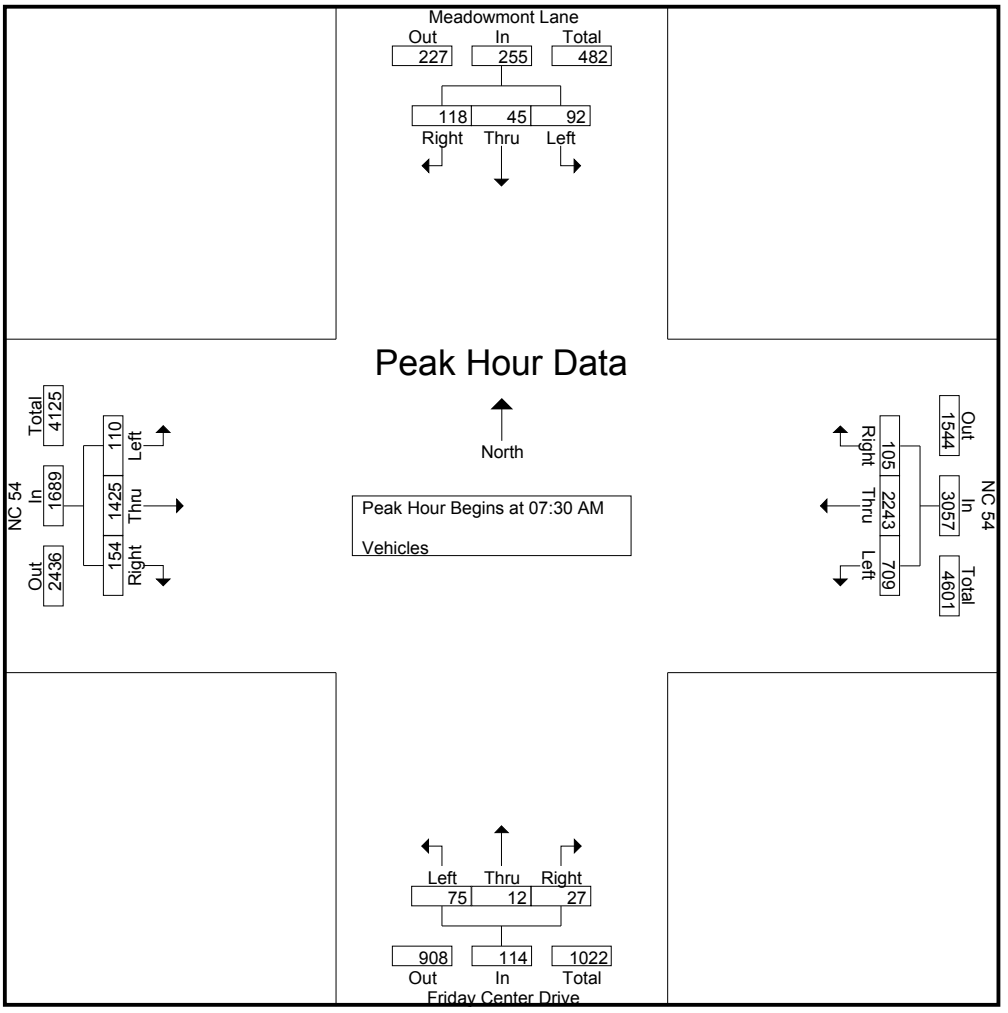
	Meadowmont Lane Southbound				NC 54 Westbound				Friday Center Drive Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	17	8	35	60	212	606	14	832	18	3	8	29	39	352	37	428	1349
07:45 AM	38	17	38	93	173	567	17	757	15	3	6	24	30	392	25	447	1321
08:00 AM	17	11	22	50	149	575	38	762	26	4	6	36	23	368	57	448	1296
08:15 AM	20	9	23	52	175	495	36	706	16	2	7	25	18	313	35	366	1149
Total Volume	92	45	118	255	709	2243	105	3057	75	12	27	114	110	1425	154	1689	5115
% App. Total	36.1	17.6	46.3		23.2	73.4	3.4		65.8	10.5	23.7		6.5	84.4	9.1		
PHF	.605	.662	.776	.685	.836	.925	.691	.919	.721	.750	.844	.792	.705	.909	.675	.943	.948



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Start Date : 9/15/2009
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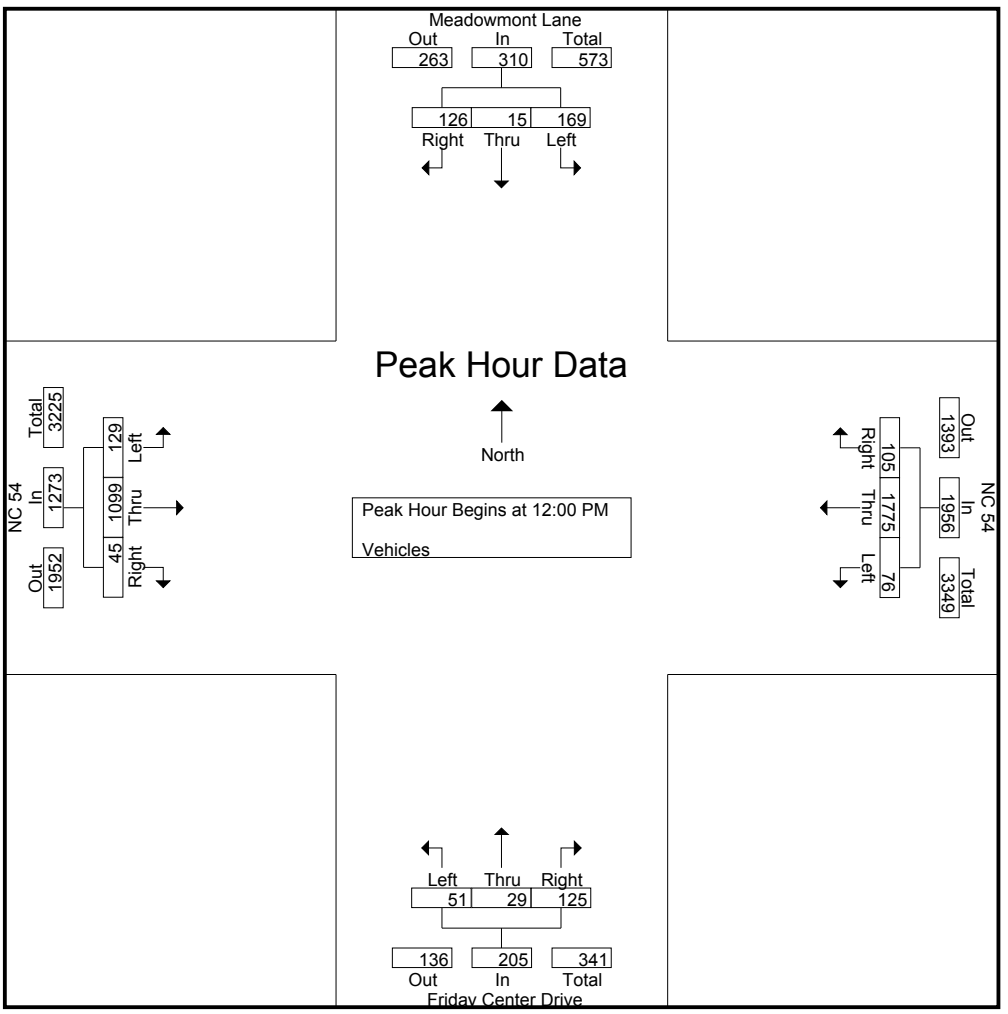
	Meadowmont Lane Southbound				NC 54 Westbound				Friday Center Drive Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	37	4	21	62	14	389	35	438	16	7	31	54	27	234	9	270	824
12:15 PM	49	4	35	88	20	478	21	519	10	6	27	43	25	307	12	344	994
12:30 PM	46	6	47	99	17	479	28	524	15	11	34	60	49	266	13	328	1011
12:45 PM	37	1	23	61	25	429	21	475	10	5	33	48	28	292	11	331	915
Total Volume	169	15	126	310	76	1775	105	1956	51	29	125	205	129	1099	45	1273	3744
% App. Total	54.5	4.8	40.6		3.9	90.7	5.4		24.9	14.1	61		10.1	86.3	3.5		
PHF	.862	.625	.670	.783	.760	.926	.750	.933	.797	.659	.919	.854	.658	.895	.865	.925	.926



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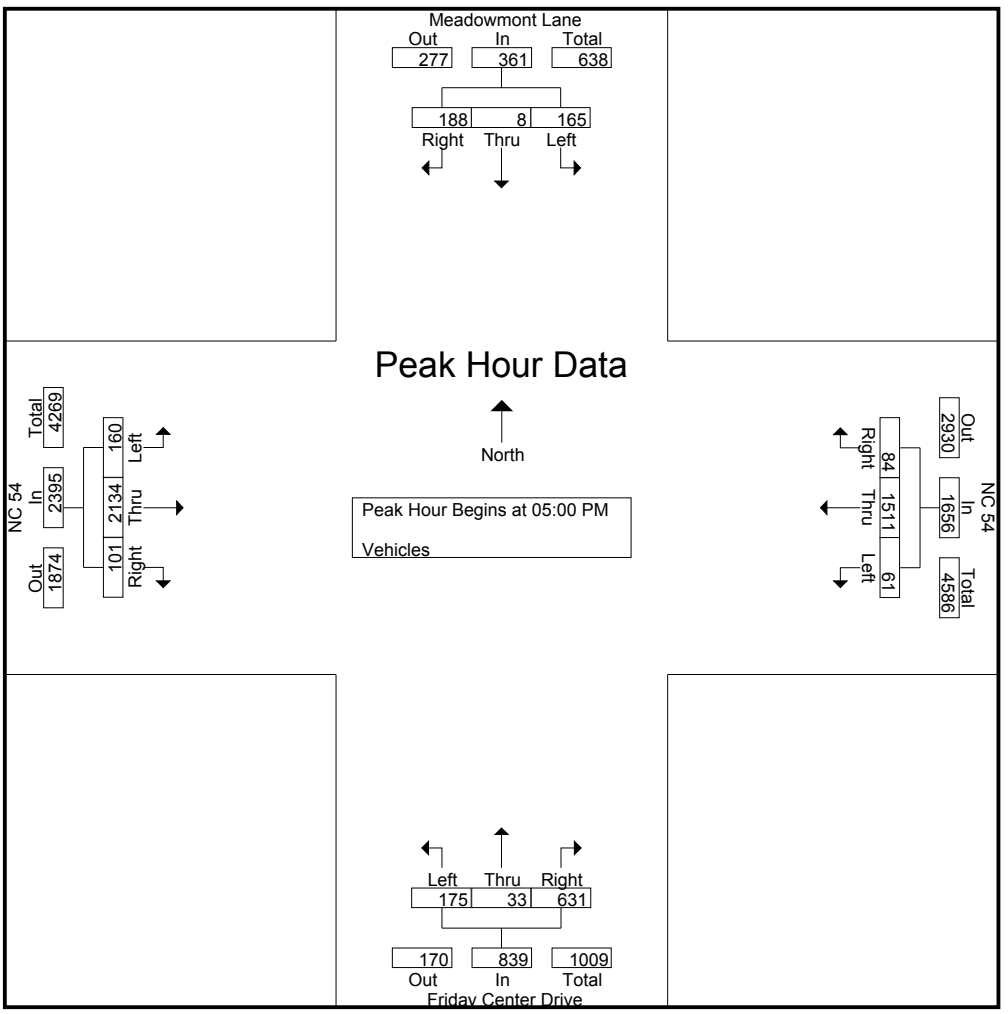
	Meadowmont Lane Southbound				NC 54 Westbound				Friday Center Drive Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	53	1	46	100	14	389	15	418	40	7	155	202	41	524	25	590	1310
05:15 PM	39	3	32	74	13	346	20	379	58	8	176	242	46	620	23	689	1384
05:30 PM	38	1	36	75	20	370	25	415	38	8	150	196	36	514	33	583	1269
05:45 PM	35	3	74	112	14	406	24	444	39	10	150	199	37	476	20	533	1288
Total Volume	165	8	188	361	61	1511	84	1656	175	33	631	839	160	2134	101	2395	5251
% App. Total	45.7	2.2	52.1		3.7	91.2	5.1		20.9	3.9	75.2		6.7	89.1	4.2		
PHF	.778	.667	.635	.806	.763	.930	.840	.932	.754	.825	.896	.867	.870	.860	.765	.869	.949



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Phone: (919) 829-0328; Fax: (919) 829-0329

File Name : 205
Site Code : 00000205
Start Date : 9/17/2009
Page No : 1

Groups Printed- Vehicles

	Barbee Chapel Rd East Southbound				NC 54 Westbound				Barbee Chapel Rd East Northbound				NC 54 Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	13	1	3	1	7	380	22	0	65	9	10	0	2	184	5	1	2	701	703
07:15 AM	20	1	0	0	5	527	31	2	95	12	6	1	0	257	14	3	6	968	974
07:30 AM	32	4	4	0	3	581	32	0	127	19	12	0	0	338	10	3	3	1162	1165
07:45 AM	32	2	4	0	2	614	23	1	158	15	4	1	1	415	26	3	5	1296	1301
Total	97	8	11	1	17	2102	108	3	445	55	32	2	3	1194	55	10	16	4127	4143
08:00 AM	22	2	2	0	4	622	44	2	139	16	15	0	1	359	22	1	3	1248	1251
08:15 AM	29	1	3	0	8	554	38	2	140	18	8	0	1	342	34	6	8	1176	1184
08:30 AM	16	7	3	0	3	494	48	1	113	25	18	0	0	281	21	1	2	1029	1031
08:45 AM	24	2	4	0	7	624	38	5	119	10	10	0	0	268	18	1	6	1124	1130
Total	91	12	12	0	22	2294	168	10	511	69	51	0	2	1250	95	9	19	4577	4596
BREAK																			
11:00 AM	21	7	4	0	3	232	26	2	24	10	9	0	2	226	25	7	9	589	598
11:15 AM	15	6	2	1	3	226	18	4	39	11	5	0	1	265	33	4	9	624	633
11:30 AM	26	10	2	1	6	233	26	2	34	6	9	0	0	241	23	3	6	616	622
11:45 AM	15	12	1	1	4	238	37	3	32	10	4	0	1	266	21	1	5	641	646
Total	77	35	9	3	16	929	107	11	129	37	27	0	4	998	102	15	29	2470	2499
12:00 PM	29	11	2	0	10	274	24	2	24	12	6	0	4	321	39	1	3	756	759
12:15 PM	26	14	3	0	12	245	30	1	40	14	11	0	4	265	41	2	3	705	708
12:30 PM	14	10	1	0	4	297	31	2	38	5	12	1	3	311	37	2	5	763	768
12:45 PM	14	7	3	0	6	268	24	1	34	4	13	1	2	256	36	1	3	667	670
Total	83	42	9	0	32	1084	109	6	136	35	42	2	13	1153	153	6	14	2891	2905
BREAK																			
04:00 PM	31	22	2	0	19	259	28	2	26	15	13	1	2	486	107	1	4	1010	1014
04:15 PM	16	7	2	0	11	287	33	0	43	11	8	0	1	540	108	5	5	1067	1072
04:30 PM	33	13	2	0	13	282	22	0	44	31	8	1	0	387	130	3	4	965	969
04:45 PM	40	21	4	0	24	336	46	0	33	7	6	0	0	555	146	1	1	1218	1219
Total	120	63	10	0	67	1164	129	2	146	64	35	2	3	1968	491	10	14	4260	4274
05:00 PM	25	26	2	0	29	365	40	1	42	12	8	0	1	525	148	0	1	1223	1224
05:15 PM	30	35	1	0	15	328	67	1	28	10	10	0	1	548	192	0	1	1265	1266
05:30 PM	25	21	3	0	23	408	54	1	38	16	5	0	0	593	189	2	3	1375	1378
05:45 PM	26	17	1	0	17	394	54	2	45	7	15	0	2	500	170	1	3	1248	1251
Total	106	99	7	0	84	1495	215	5	153	45	38	0	4	2166	699	3	8	5111	5119
06:00 PM	44	51	1	0	5	339	75	1	46	9	25	5	0	453	118	18	24	1166	1190
06:15 PM	16	17	2	0	12	306	46	0	53	9	33	0	1	383	87	0	0	965	965
Grand Total	634	327	61	4	255	9713	957	38	1619	323	283	11	30	9565	1800	71	124	25567	25691
Apprch %	62	32	6		2.3	88.9	8.8		72.8	14.5	12.7		0.3	83.9	15.8				
Total %	2.5	1.3	0.2		1	38	3.7		6.3	1.3	1.1		0.1	37.4	7		0.5	99.5	

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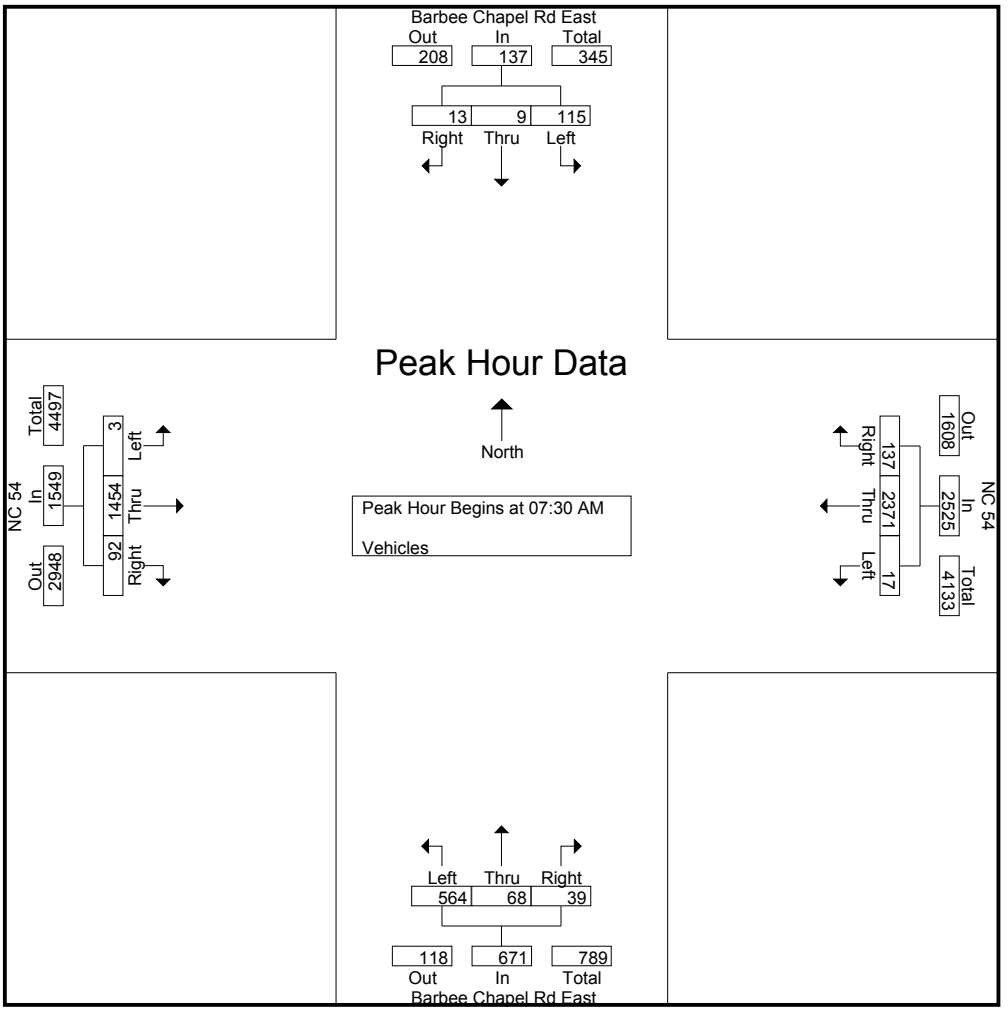
Start Date : 9/17/2009
Page No : 2

	Barbee Chapel Rd East Southbound				NC 54 Westbound				Barbee Chapel Rd East Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	32	4	4	40	3	581	32	616	127	19	12	158	0	338	10	348	1162
07:45 AM	32	2	4	38	2	614	23	639	158	15	4	177	1	415	26	442	1296
08:00 AM	22	2	2	26	4	622	44	670	139	16	15	170	1	359	22	382	1248
08:15 AM	29	1	3	33	8	554	38	600	140	18	8	166	1	342	34	377	1176
Total Volume	115	9	13	137	17	2371	137	2525	564	68	39	671	3	1454	92	1549	4882
% App. Total	83.9	6.6	9.5		0.7	93.9	5.4		84.1	10.1	5.8		0.2	93.9	5.9		
PHF	.898	.563	.813	.856	.531	.953	.778	.942	.892	.895	.650	.948	.750	.876	.676	.876	.942



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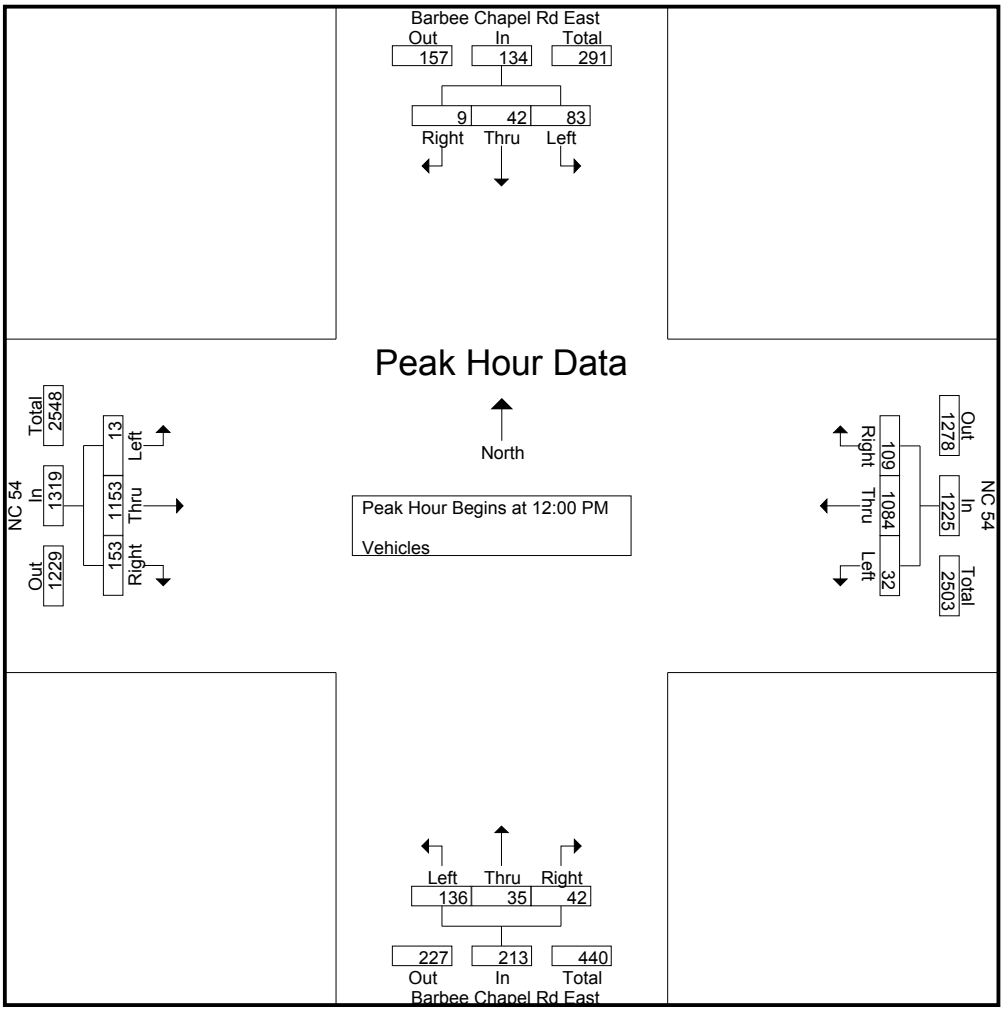
File Name : 205
Site Code : 00000205
Start Date : 9/17/2009
Page No : 3

	Barbee Chapel Rd East Southbound				NC 54 Westbound				Barbee Chapel Rd East Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	29	11	2	42	10	274	24	308	24	12	6	42	4	321	39	364	756
12:15 PM	26	14	3	43	12	245	30	287	40	14	11	65	4	265	41	310	705
12:30 PM	14	10	1	25	4	297	31	332	38	5	12	55	3	311	37	351	763
12:45 PM	14	7	3	24	6	268	24	298	34	4	13	51	2	256	36	294	667
Total Volume	83	42	9	134	32	1084	109	1225	136	35	42	213	13	1153	153	1319	2891
% App. Total	61.9	31.3	6.7		2.6	88.5	8.9		63.8	16.4	19.7		1	87.4	11.6		
PHF	.716	.750	.750	.779	.667	.912	.879	.922	.850	.625	.808	.819	.813	.898	.933	.906	.947



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File Name : 205
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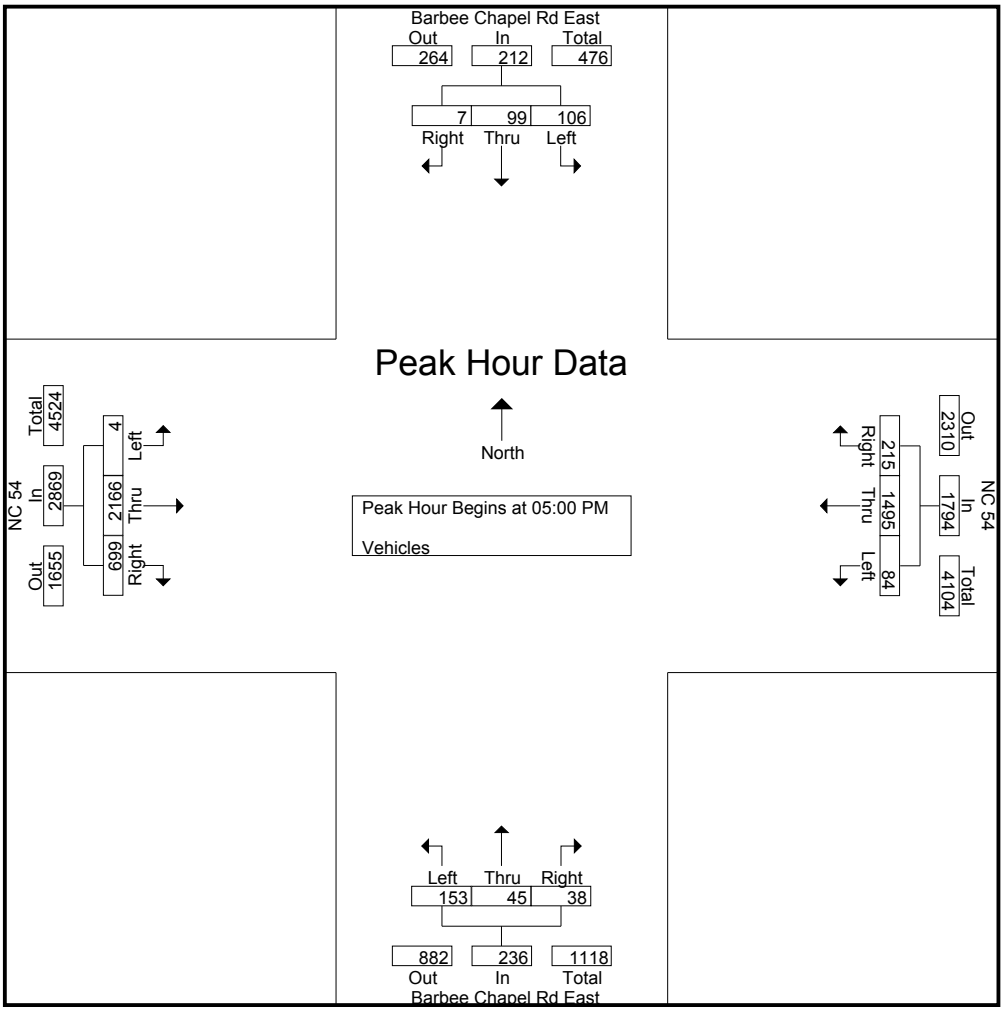
Start Date : 9/17/2009
Page No : 4

	Barbee Chapel Rd East Southbound				NC 54 Westbound				Barbee Chapel Rd East Northbound				NC 54 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 06:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	25	26	2	53	29	365	40	434	42	12	8	62	1	525	148	674	1223
05:15 PM	30	35	1	66	15	328	67	410	28	10	10	48	1	548	192	741	1265
05:30 PM	25	21	3	49	23	408	54	485	38	16	5	59	0	593	189	782	1375
05:45 PM	26	17	1	44	17	394	54	465	45	7	15	67	2	500	170	672	1248
Total Volume	106	99	7	212	84	1495	215	1794	153	45	38	236	4	2166	699	2869	5111
% App. Total	50	46.7	3.3		4.7	83.3	12		64.8	19.1	16.1		0.1	75.5	24.4		
PHF	.883	.707	.583	.803	.724	.916	.802	.925	.850	.703	.633	.881	.500	.913	.910	.917	.929



Data Collection Group

Laura Smith
DataCollectionGroup@hotmail.com

File Name : 54 & Huntingridge
Site Code : 42424242
Start Date : 10/1/2009
Page No : 1

Groups Printed- Cars - Heavy Trucks

	Service Road Connection From North					NC 54 From East					Huntingridge From South					NC 54 From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	3	0	0	0	3	2	402	1	0	405	6	0	6	0	12	1	228	3	0	232	652
07:15 AM	1	2	1	2	6	1	577	0	0	578	8	0	10	0	18	2	290	3	1	296	898
07:30 AM	2	1	3	0	6	2	633	3	0	638	12	1	13	0	26	3	417	1	0	421	1091
07:45 AM	8	0	4	0	12	1	615	0	0	616	5	0	7	0	12	6	488	3	0	497	1137
Total	14	3	8	2	27	6	2227	4	0	2237	31	1	36	0	68	12	1423	10	1	1446	3778
08:00 AM	7	0	1	0	8	7	533	0	0	540	19	1	7	0	27	1	390	3	0	394	969
08:15 AM	2	0	5	0	7	5	585	1	0	591	18	1	9	0	28	5	416	2	0	423	1049
08:30 AM	9	0	5	0	14	1	484	0	0	485	5	2	10	0	17	4	379	2	0	385	901
08:45 AM	5	0	3	0	8	5	613	0	0	618	13	0	7	0	20	3	356	3	0	362	1008
Total	23	0	14	0	37	18	2215	1	0	2234	55	4	33	0	92	13	1541	10	0	1564	3927
*** BREAK ***																					
04:00 PM	5	2	4	0	11	8	297	0	0	305	8	0	4	0	12	3	549	7	0	559	887
04:15 PM	2	0	1	0	3	12	381	0	0	393	8	0	2	0	10	3	546	8	0	557	963
04:30 PM	5	1	2	0	8	11	358	1	0	370	4	0	2	0	6	4	508	4	0	516	900
04:45 PM	4	1	2	0	7	9	426	0	0	435	4	0	0	0	4	2	411	2	0	415	861
Total	16	4	9	0	29	40	1462	1	0	1503	24	0	8	0	32	12	2014	21	0	2047	3611
05:00 PM	8	1	0	0	9	8	450	0	0	458	3	1	0	0	4	5	505	2	0	512	983
05:15 PM	8	2	2	0	12	8	453	0	0	461	4	0	5	0	9	2	505	4	0	511	993
05:30 PM	7	0	0	0	7	9	468	0	0	477	3	0	4	0	7	1	557	3	0	561	1052
05:45 PM	4	3	2	0	9	12	383	0	0	395	4	1	3	0	8	3	557	4	0	564	976
Total	27	6	4	0	37	37	1754	0	0	1791	14	2	12	0	28	11	2124	13	0	2148	4004
06:00 PM	9	2	2	0	13	14	445	0	0	459	8	1	1	0	10	6	525	7	0	538	1020
06:15 PM	4	1	4	0	9	8	395	1	0	404	2	0	3	0	5	6	560	0	0	566	984
Grand Total	93	16	41	2	152	123	8498	7	0	8628	134	8	93	0	235	60	8187	61	1	8309	17324
Apprch %	61.2	10.5	27	1.3		1.4	98.5	0.1	0		57	3.4	39.6	0		0.7	98.5	0.7	0		
Total %	0.5	0.1	0.2	0	0.9	0.7	49.1	0	0	49.8	0.8	0	0.5	0	1.4	0.3	47.3	0.4	0	48	
Cars	91	14	41	2	148	121	8384	6	0	8511	132	8	91	0	231	60	8078	58	1	8197	17087
% Cars	97.8	87.5	100	100	97.4	98.4	98.7	85.7	0	98.6	98.5	100	97.8	0	98.3	100	98.7	95.1	100	98.7	98.6
Heavy Trucks	2	2	0	0	4	2	114	1	0	117	2	0	2	0	4	0	109	3	0	112	237
% Heavy Trucks	2.2	12.5	0	0	2.6	1.6	1.3	14.3	0	1.4	1.5	0	2.2	0	1.7	0	1.3	4.9	0	1.3	1.4

Data Collection Group

Laura Smith
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File Name : 54 & Huntingridge
Site Code : 42424242
Start Date : 10/1/2009
Page No : 2

	Service Road Connection From North					NC 54 From East					Huntingridge From South					NC 54 From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	2	**1**	3	0	6	2	**633**	**3**	0	**638**	12	**1**	**13**	0	26	3	417	1	0	421	1091
07:45 AM	**8**	0	4	0	**12**	1	615	0	0	616	5	0	7	0	12	**6**	**488**	**3**	0	**497**	**1137**
08:00 AM	7	0	1	0	8	**7**	533	0	0	540	**19**	1	7	0	27	1	390	3	0	394	969
08:15 AM	2	0	**5**	0	7	5	585	1	0	591	18	1	9	0	**28**	5	416	2	0	423	1049
Total Volume	19	1	13	0	33	15	2366	4	0	2385	54	3	36	0	93	15	1711	9	0	1735	4246
% App. Total	57.6	3	39.4	0		0.6	99.2	0.2	0		58.1	3.2	38.7	0		0.9	98.6	0.5	0		
PHF	.594	.250	.650	.000	.688	.536	.934	.333	.000	.935	.711	.750	.692	.000	.830	.625	.877	.750	.000	.873	.934

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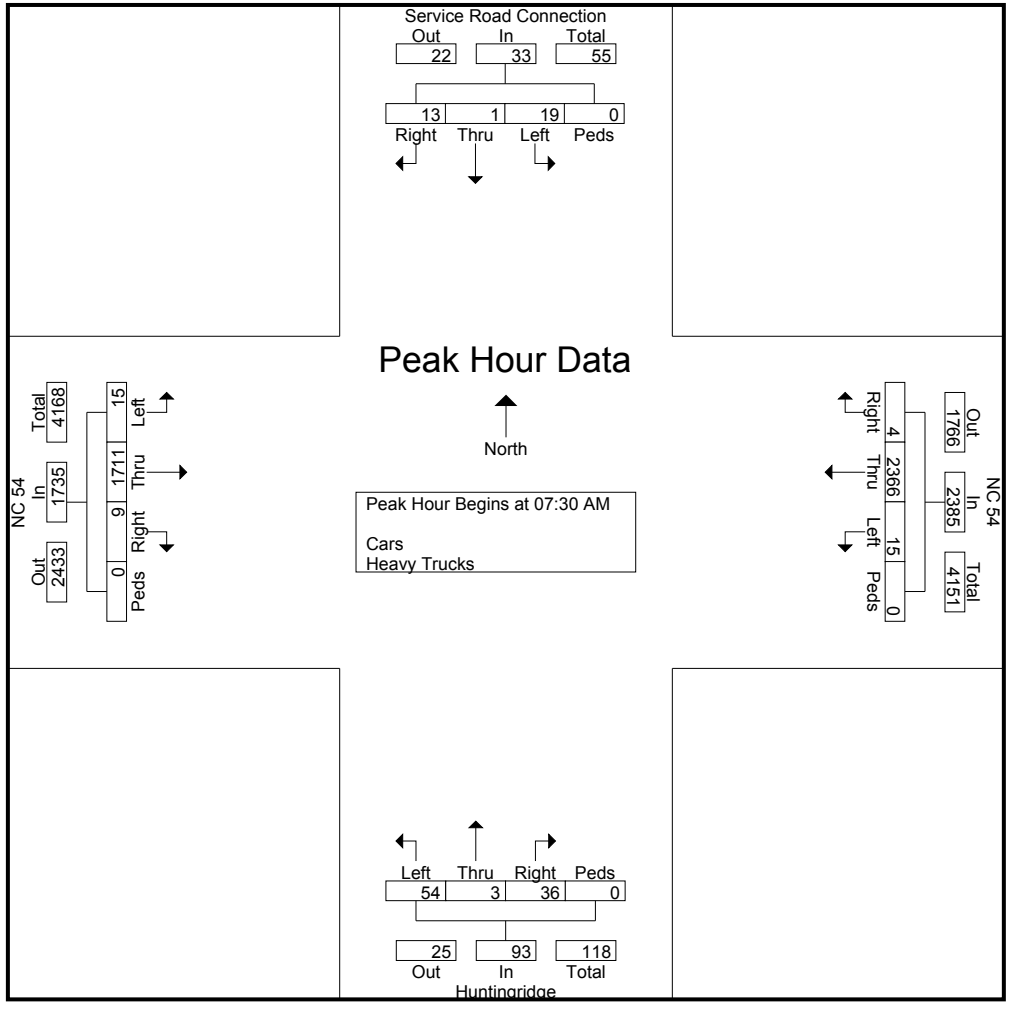
Site Code : 42424242
Start Date : 10/1/2009
Page No : 3



Data Collection Group

Laura Smith

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File Name : 54 & Huntingridge
Site Code : 42424242
Start Date : 10/1/2009
Page No : 4

	Service Road Connection From North					NC 54 From East					Huntingridge From South					NC 54 From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:15 PM																					
05:15 PM	8	2	**2**	0	12	8	453	0	0	461	4	0	**5**	0	9	2	505	4	0	511	993
05:30 PM	7	0	0	0	7	9	**468**	0	0	**477**	3	0	4	0	7	1	**557**	3	0	561	**1052**
05:45 PM	4	**3**	2	0	9	12	383	0	0	395	4	**1**	3	0	8	3	557	4	0	**564**	976
06:00 PM	**9**	2	2	0	**13**	**14**	445	0	0	459	**8**	1	1	0	**10**	**6**	525	**7**	0	538	1020
Total Volume	28	7	6	0	41	43	1749	0	0	1792	19	2	13	0	34	12	2144	18	0	2174	4041
% App. Total	68.3	17.1	14.6	0		2.4	97.6	0	0		55.9	5.9	38.2	0		0.6	98.6	0.8	0		
PHF	.778	.583	.750	.000	.788	.768	.934	.000	.000	.939	.594	.500	.650	.000	.850	.500	.962	.643	.000	.964	.960

Data Collection Group

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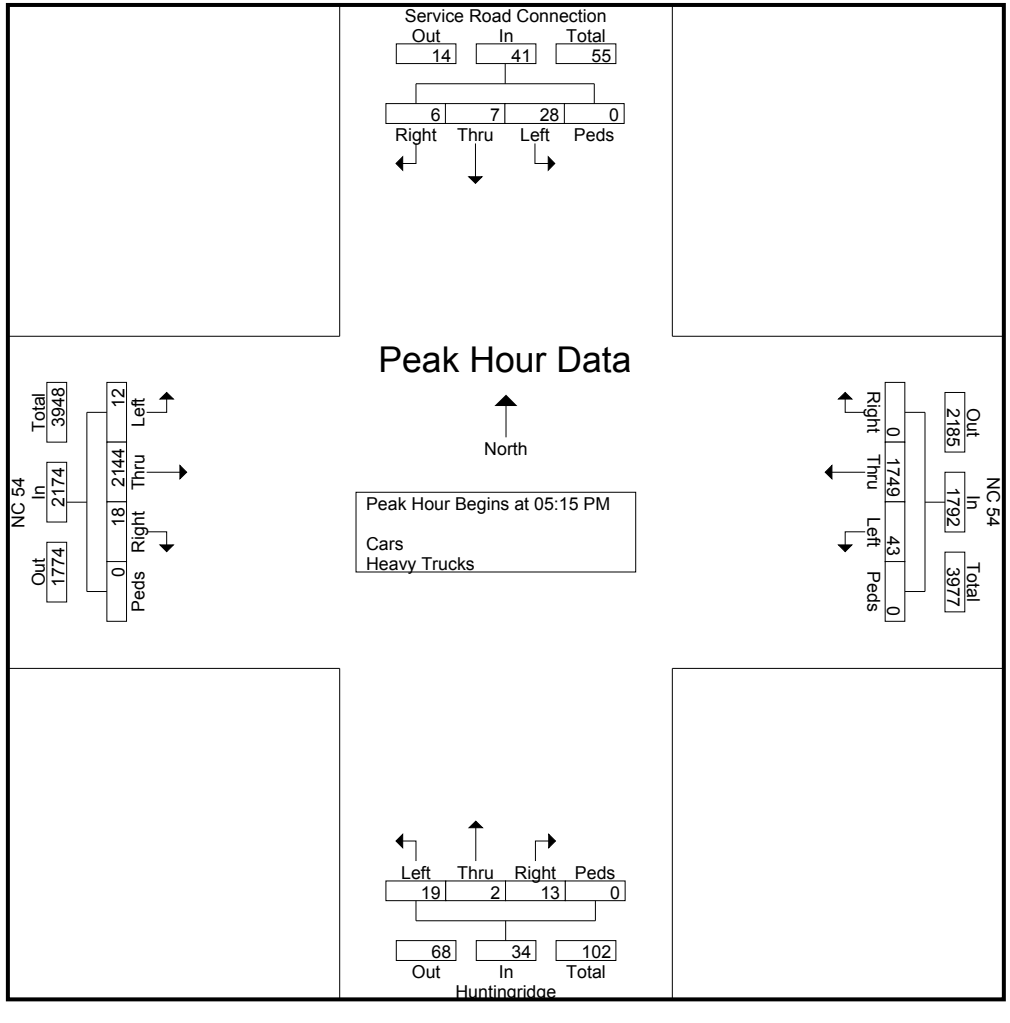
Site Code : 42424242
Start Date : 10/1/2009
Page No : 5



- Note that there was a rear end crash just east of the intersection. The incident closed the right most lane from approximately 4:55 to 5:03. After that, the vehicles were moved off the road.

- Note that there were large queues observed in the EB direction in the PM peak. Approaching Huntingridge, the EB queue (after the EB phase turned red) was regularly 200 - 300 vehicles from the start of the count at 4PM until 4:30PM. From 4:30P until the crash at 4:55P the queue was much smaller and cleared every cycle. For approximately 15 minutes after the crash cleared the road, the queue was 400 vehicles plus. From 5:30PM to about 5:40 PM and again from 6:05P to 6:15PM, the EB queue from downstream backed up into the Huntingride intersection. The EB queue approaching Huntingridge was regularly 200 - 300 vehicles until the end of the count at 6:30P.

LOCATION:	FARRINGTON ROAD	&	NC 54		COUNT BY:	KB
DATE:	12	/	6	/ 2007	WEATHER/ROAD:	DRY
AM peak:	7:45	-	8:45		PM peak:	5:00 - 6:00

A
|
(N)
|

	Phf	FARRINGTON ROAD			
AVG	*0.96*	**189**	**189**	**241**	697
PM	*0.96*	**152**	**258**	**238**	718
AM	*0.96*	**226**	**119**	**243**	675
		RT	TH	LT	

	AM	PM	AVG	
	0.87	*0.94*	*0.91*	*Phf*
RT	**328**	**387**	**358**	
TH	**2288**	**2201**	**2245**	
LT	**236**	**415**	**326**	
	2912	2961	2937	

NC 54

	2603	2507	2699	
LT	**168**	**168**	**168**	
TH	**2121**	**2290**	**1951**	
RT	**96**	**144**	**47**	
Phf	*0.90*	*0.95*	*0.85*	
	AVG	PM	AM	

LT	TH	RT		
402	**185**	**179**	**718**	*0.93* AM
817	**154**	**163**	**433**	*0.94* PM
610	**170**	**171**	**576**	*0.94* AVG
				Phf

(ENTER ALL DATA ON THIS SHEET)

NS street name	FARRINGTON ROAD
EW street name	NC 54

AM Peak		Time	7:45	thru	8:45
Dir		Volumes			
From	*Phf*	Right	Thru	Left	Total
North	*96*	226	119	243	588
East	*87*	328	2288	236	2852
South	*93*	718	179	185	1082
West	*85*	47	1951	168	2166

PM Peak		Time	5:00	thru	6:00
Dir		Volumes			
From	*Phf*	Right	Thru	Left	Total
North	*96*	152	258	238	648
East	*94*	387	2201	415	3003
South	*94*	433	163	154	750
West	*95*	144	2290	168	2602

Count by	KB		
Weather/road	DRY		
Date	12	6	2007
	mo	da	yr

LOCATION:	I-40 WB RAMP	&	NC 54	COUNT BY:	KB/DD
DATE:	1 / 22 / 2008	WEATHER/ROAD:	DRY		
AM peak:	8:00 - 9:00	PM peak:	5:00 - 6:00		

A
|
(N)
|

	Phf	I-40 WB RAMP			
AVG	*0.93*	**1764**	**0**	**0**	410
PM	*0.92*	**1771**	**0**	**0**	447
AM	*0.93*	**1757**	**0**	**0**	373

							AM	PM	AVG	
	NC 54						*0.94*	*0.94*	*0.94*	*Phf*
	2681	2637	2725			RT	**95**	**157**	**126**	
	284	**290**	**278**	LT		TH	**948**	**839**	**894**	
	748	**899**	**597**	TH		LT	**0**	**0**	**0**	
	0	**0**	**0**	RT			881	939	910	
Phf	*0.94*	*0.91*	*0.96*							
	AVG	PM	AM							

	LT	TH	RT		
0	**20**	**0**	**284**	*0.84*	AM
0	**27**	**0**	**40**	*0.84*	PM
0	**24**	**0**	**162**	*0.84*	AVG
				Phf	

(ENTER ALL DATA ON THIS SHEET)

NS street name	I-40 WB RAMP
EW street name	NC 54

AM Peak	Time	8:00	thru	9:00	
Dir	*A*	Volumes			
From	*Phf*	Right	Thru	Left	Total
North	*93*	1757	0	0	1757
East	*94*	95	948	0	1043
South	*84*	284	0	20	304
West	*96*	0	597	278	875

PM Peak	Time	5:00	thru	6:00	
Dir		Volumes			
From	*Phf*	Right	Thru	Left	Total
North	*92*	1771	0	0	1771
East	*94*	157	839	0	996
South	*84*	40	0	27	67
West	*91*	0	899	290	1189

Count by	KB/DD		
Weather/road	DRY		
Date	1	22	2008
	mo	da	yr

LOCATION:	I-40 EB RAMP	&	NC 54	COUNT BY:	DD/KB
DATE:	1 / 16 / 2008	WEATHER/ROAD:	DRY		
AM peak:	8:00 - 9:00	PM peak:	5:00 - 6:00		

A
|
(N)
|

	Phf	I-40 EB RAMP			
		RT	TH	LT	
AVG	*0.90*	**325**	**1**	**141**	0
PM	*0.93*	**285**	**0**	**120**	0
AM	*0.87*	**365**	**2**	**162**	0

	AM	PM	AVG	
	0.87	*0.98*	*0.93*	*Phf*
RT	**0**	**0**	**0**	
TH	**3430**	**2869**	**3150**	
LT	**13**	**369**	**191**	
	1179	1417	1298	

NC 54				
3475	3154	3795		
0	**0**	**0**	LT	
1157	**1297**	**1017**	TH	
2258	**2288**	**2227**	RT	
0.94	*0.94*	*0.93*		*Phf*
AVG	PM	AM		

	LT	TH	RT		
2242	**0**	**0**	**0**	*0.00*	AM
2657	**0**	**0**	**0**	*0.00*	PM
2450	**0**	**0**	**0**	*0.00*	AVG
				Phf	

(ENTER ALL DATA ON THIS SHEET)

NS street name	I-40 EB RAMP
EW street name	NC 54

AM Peak	Time	8:00	thru	9:00	
Dir	*A*	Volumes			
From	*Phf*	Right	Thru	Left	Total
North	*87*	365	2	162	529
East	*87*	0	3430	13	3443
South	*0*	0	0	0	0
West	*93*	2227	1017	0	3244

PM Peak	Time	5:00	thru	6:00	
Dir		Volumes			
From	*Phf*	Right	Thru	Left	Total
North	*93*	285	0	120	405
East	*98*	0	2869	369	3238
South	*0*	0	0	0	0
West	*94*	2288	1297	0	3585

Count by	DD/KB		
Weather/road	DRY		
Date	1	16	2008
	mo	da	yr

LOCATION:	LEIGH FARM RD/QUAD	&	NC 54		COUNT BY:	DD
DATE:	1	/	14	/ 9	WEATHER/ROAD:	DRY
AM peak:	7:30	-	8:30		PM peak:	4:15 - 5:15

LEIGH FARM RD/QUADRANGLE DR.

A
|
(N)
|

	Phf				
AVG	*0.56*	**55**	**0**	**22**	119
PM	*0.49*	**104**	**0**	**39**	8
AM	*0.63*	**5**	**0**	**5**	229
		RT	TH	LT	

	AM	PM	AVG	
	0.94	*0.90*	*0.92*	*Phf*
RT	**49**	**0**	**25**	
TH	**852**	**497**	**675**	
LT	**66**	**8**	**37**	
	459	921	690	

NC 54

	820	771	869
LT	**94**	**8**	**180**
TH	**636**	**821**	**450**
RT	**117**	**26**	**208**
Phf	*0.87*	*0.87*	*0.87*
	AVG	PM	AM

LT	TH	RT		
274	**12**	**0**	**4**	*0.67*	AM
34	**170**	**0**	**61**	*0.65*	PM
154	**91**	**0**	**33**	*0.66*	AVG
				Phf	

(ENTER ALL DATA ON THIS SHEET)

NS street name	LEIGH FARM RD/QUADRANGLE DR.
EW street name	NC 54

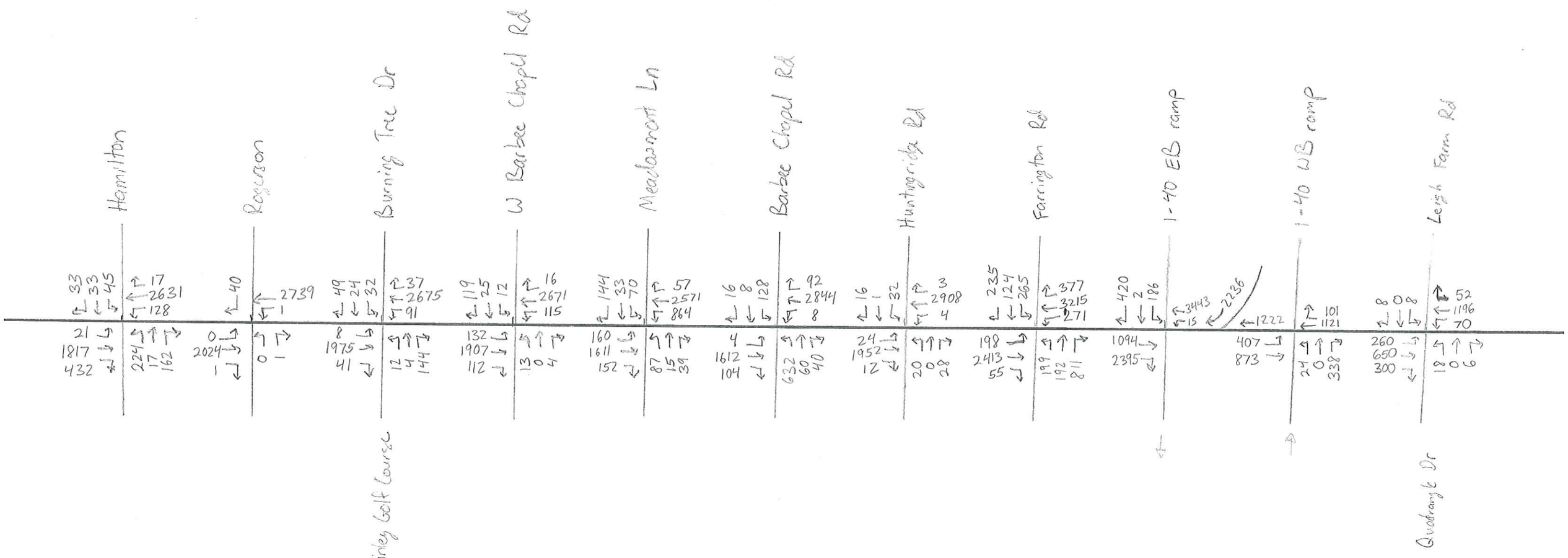
AM Peak	Time	7:30	thru	8:30	
Dir		Volumes			
From	*Phf*	Right	Thru	Left	Total
North	*63*	5	0	5	10
East	*94*	49	852	66	967
South	*67*	4	0	12	16
West	*87*	208	450	180	838

PM Peak	Time	4:15	thru	5:15	
Dir		Volumes			
From	*Phf*	Right	Thru	Left	Total
North	*49*	104	0	39	143
East	*90*	0	497	8	505
South	*65*	61	0	170	231
West	*87*	26	821	8	855

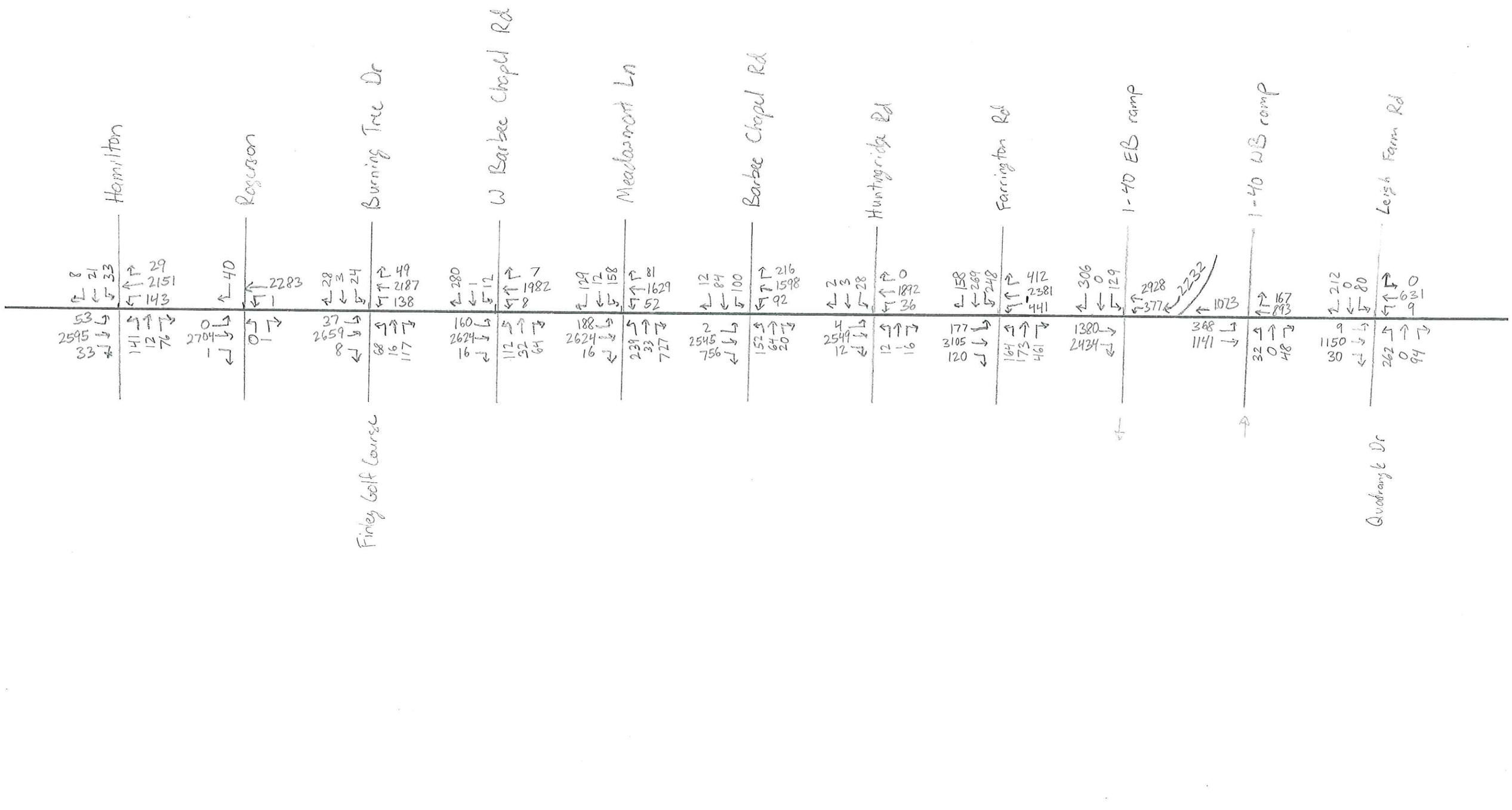
Count by	DD			
Weather/road	DRY			
Date	1	14	9	
	mo	da	yr	

Balanced Volume Network Sheets

AM Peak
Hourly Volumes
(Peak 15-min vol x 4)



PM Peak
Hourly Volumes
(Peak 15-min vol ×4)



Annual Daily Traffic Data Sheets

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 1
Station ID:
Fordham
b/w S Estes & Cleland
Latitude: 0' 0.000 Undefined

Start Time	22-Sep-09		23-Sep-09		24-Sep-09		25-Sep-09		26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	102	95	98	82	*	*	*	*	*	*	*	*	*	*	100	88
01:00	44	46	53	30	*	*	*	*	*	*	*	*	*	*	48	38
02:00	29	33	35	46	*	*	*	*	*	*	*	*	*	*	32	40
03:00	30	22	28	24	*	*	*	*	*	*	*	*	*	*	29	23
04:00	52	40	44	48	*	*	*	*	*	*	*	*	*	*	48	44
05:00	148	149	140	132	*	*	*	*	*	*	*	*	*	*	144	140
06:00	442	512	444	537	*	*	*	*	*	*	*	*	*	*	443	524
07:00	1202	1328	1210	1212	*	*	*	*	*	*	*	*	*	*	1206	1270
08:00	**1534**	**1362**	**1489**	**1362**	*	*	*	*	*	*	*	*	*	*	**1512**	**1362**
09:00	1295	1153	1213	1072	*	*	*	*	*	*	*	*	*	*	1254	1112
10:00	1274	1004	1170	1020	*	*	*	*	*	*	*	*	*	*	1222	1012
11:00	1284	1072	1332	1104	*	*	*	*	*	*	*	*	*	*	1308	1088
12:00 PM	1392	1248	1340	1267	*	*	*	*	*	*	*	*	*	*	1366	1258
01:00	1196	1322	1250	1364	*	*	*	*	*	*	*	*	*	*	1223	1343
02:00	1332	1230	1322	1352	*	*	*	*	*	*	*	*	*	*	1327	1291
03:00	1432	1400	1405	1346	*	*	*	*	*	*	*	*	*	*	1418	1373
04:00	1554	1444	1540	1368	*	*	*	*	*	*	*	*	*	*	1547	1406
05:00	**1744**	**1450**	**1803**	**1543**	*	*	*	*	*	*	*	*	*	*	**1774**	**1496**
06:00	1231	1394	1283	1327	*	*	*	*	*	*	*	*	*	*	1257	1360
07:00	916	1048	1009	1051	*	*	*	*	*	*	*	*	*	*	962	1050
08:00	700	724	628	790	*	*	*	*	*	*	*	*	*	*	664	757
09:00	441	542	402	644	*	*	*	*	*	*	*	*	*	*	422	593
10:00	247	306	276	332	*	*	*	*	*	*	*	*	*	*	262	319
11:00	152	175	174	166	*	*	*	*	*	*	*	*	*	*	163	170
Total	19773	19099	19688	19219	0	0	0	0	0	0	0	0	0	0	19731	19157
Day	38872		38907		0		0		0		0		0		38888	
AM Peak	08:00	08:00	08:00	08:00											08:00	08:00
Vol.	1534	1362	1489	1362											1512	1362
PM Peak	17:00	17:00	17:00	17:00											17:00	17:00
Vol.	1744	1450	1803	1543											1774	1496

Comb. Total	38872	38907	0	0	0	0	0	38888

ADT ADT 38,890 AADT 38,890

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 1111
Station ID:

Latitude: 0' 0.000 South

Start	30-Sep-09		01-Oct-09		02-Oct-09		03-Oct-09		04-Oct-09		05-Oct-09		06-Oct-09		Week Average	
Time	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2	Direction 1	Direction 2
12:00 AM	*	*	202	187	**196**	**182**	*	*	*	*	*	*	*	*	199	184
01:00	*	*	15	16	12	18	*	*	*	*	*	*	*	*	14	17
02:00	72	51	60	46	*	*	*	*	*	*	*	*	*	*	66	48
03:00	48	42	44	37	*	*	*	*	*	*	*	*	*	*	46	40
04:00	92	61	88	62	*	*	*	*	*	*	*	*	*	*	90	62
05:00	300	235	302	242	*	*	*	*	*	*	*	*	*	*	301	238
06:00	898	743	908	736	*	*	*	*	*	*	*	*	*	*	903	740
07:00	2121	1429	2118	1422	*	*	*	*	*	*	*	*	*	*	2120	1426
08:00	**2179**	**1757**	**2195**	**1780**	*	*	*	*	*	*	*	*	*	*	**2187**	**1768**
09:00	1661	1569	1638	1559	*	*	*	*	*	*	*	*	*	*	1650	1564
10:00	1461	1218	1452	1226	*	*	*	*	*	*	*	*	*	*	1456	1222
11:00	1603	1354	1610	1360	*	*	*	*	*	*	*	*	*	*	1606	1357
12:00 PM	1599	1563	1611	1564	*	*	*	*	*	*	*	*	*	*	1605	1564
01:00	1574	1670	1567	1655	*	*	*	*	*	*	*	*	*	*	1570	1662
02:00	1772	1755	1750	1730	*	*	*	*	*	*	*	*	*	*	1761	1742
03:00	2008	1664	1987	1650	*	*	*	*	*	*	*	*	*	*	1998	1657
04:00	2146	1776	2188	1804	*	*	*	*	*	*	*	*	*	*	2167	1790
05:00	**2289**	1866	**2316**	1876	*	*	*	*	*	*	*	*	*	*	**2302**	1871
06:00	1723	**2074**	1696	**2052**	*	*	*	*	*	*	*	*	*	*	1710	**2063**
07:00	1330	1447	1334	1434	*	*	*	*	*	*	*	*	*	*	1332	1440
08:00	814	1121	797	1122	*	*	*	*	*	*	*	*	*	*	806	1122
09:00	795	852	801	850	*	*	*	*	*	*	*	*	*	*	798	851
10:00	423	620	408	613	*	*	*	*	*	*	*	*	*	*	416	616
11:00	287	293	300	298	*	*	*	*	*	*	*	*	*	*	294	296
Total	27195	25160	27387	25321	208	200	0	0	0	0	0	0	0	0	27397	25340
Day	52355		52708		408		0		0		0		0		52737	
AM Peak	08:00	08:00	08:00	08:00	00:00	00:00									08:00	08:00
Vol.	2179	1757	2195	1780	196	182									2187	1768
PM Peak	17:00	18:00	17:00	18:00											17:00	18:00
Vol.	2289	2074	2316	2052											2302	2063

Comb. Total	52355	52708	408	0	0	0	0	52737

ADT ADT 52,532 AADT 52,532

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 33
Station ID:
NC 54
b/w Hamilton & Fordham
Latitude: 0' 0.000 Undefined

Start	22-Sep-09		23-Sep-09		24-Sep-09		25-Sep-09		26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
Time	EB	EB	EB	EB	EB	EB	EB	EB								
12:00 AM	104	0	109	0	*	*	*	*	*	*	*	*	*	*	106	0
01:00	34	0	43	0	*	*	*	*	*	*	*	*	*	*	38	0
02:00	22	0	25	0	*	*	*	*	*	*	*	*	*	*	24	0
03:00	25	0	16	0	*	*	*	*	*	*	*	*	*	*	20	0
04:00	50	0	46	0	*	*	*	*	*	*	*	*	*	*	48	0
05:00	172	0	161	0	*	*	*	*	*	*	*	*	*	*	166	0
06:00	514	0	454	0	*	*	*	*	*	*	*	*	*	*	484	0
07:00	1041	0	**1067**	0	*	*	*	*	*	*	*	*	*	*	**1054**	0
08:00	**1051**	0	1006	0	*	*	*	*	*	*	*	*	*	*	1028	0
09:00	682	0	712	0	*	*	*	*	*	*	*	*	*	*	697	0
10:00	628	0	546	0	*	*	*	*	*	*	*	*	*	*	587	0
11:00	648	0	638	0	*	*	*	*	*	*	*	*	*	*	643	0
12:00 PM	666	0	732	0	*	*	*	*	*	*	*	*	*	*	699	0
01:00	669	0	670	0	*	*	*	*	*	*	*	*	*	*	670	0
02:00	738	0	698	0	*	*	*	*	*	*	*	*	*	*	718	0
03:00	870	0	820	0	*	*	*	*	*	*	*	*	*	*	845	0
04:00	993	0	953	0	*	*	*	*	*	*	*	*	*	*	973	0
05:00	**1106**	0	**1028**	0	*	*	*	*	*	*	*	*	*	*	**1067**	0
06:00	756	0	826	0	*	*	*	*	*	*	*	*	*	*	791	0
07:00	542	0	630	0	*	*	*	*	*	*	*	*	*	*	586	0
08:00	421	0	444	0	*	*	*	*	*	*	*	*	*	*	432	0
09:00	346	0	300	0	*	*	*	*	*	*	*	*	*	*	323	0
10:00	179	0	185	0	*	*	*	*	*	*	*	*	*	*	182	0
11:00	123	0	33	0	*	*	*	*	*	*	*	*	*	*	78	0
Total	12380	0	12142	0	0	0	0	0	0	0	0	0	0	0	12259	0
Day	12380		12142		0		0		0		0		0		12259	
AM Peak	08:00		07:00												07:00	
Vol.	1051		1067												1054	
PM Peak	17:00		17:00												17:00	
Vol.	1106		1028												1067	

Comb. Total	12380	12142	0	0	0	0	0	12259

ADT ADT 12,261 AADT 12,261

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 32
Station ID:
NC 54
b/w Hamilton & Fordham
Latitude: 0' 0.000 Undefined

Start	22-Sep-09		23-Sep-09		24-Sep-09		25-Sep-09		26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
Time	EB	EB	EB	EB	EB	EB	EB	EB								
12:00 AM	0	152	0	136	*	*	*	*	*	*	*	*	*	*	0	144
01:00	0	62	0	80	*	*	*	*	*	*	*	*	*	*	0	71
02:00	0	45	0	47	*	*	*	*	*	*	*	*	*	*	0	46
03:00	0	19	0	22	*	*	*	*	*	*	*	*	*	*	0	20
04:00	0	48	0	50	*	*	*	*	*	*	*	*	*	*	0	49
05:00	0	118	0	120	*	*	*	*	*	*	*	*	*	*	0	119
06:00	0	362	0	352	*	*	*	*	*	*	*	*	*	*	0	357
07:00	0	**955**	0	**922**	*	*	*	*	*	*	*	*	*	*	0	**938**
08:00	0	901	0	888	*	*	*	*	*	*	*	*	*	*	0	894
09:00	0	628	0	718	*	*	*	*	*	*	*	*	*	*	0	673
10:00	0	616	0	579	*	*	*	*	*	*	*	*	*	*	0	598
11:00	0	678	0	700	*	*	*	*	*	*	*	*	*	*	0	689
12:00 PM	0	800	0	800	*	*	*	*	*	*	*	*	*	*	0	800
01:00	0	712	0	818	*	*	*	*	*	*	*	*	*	*	0	765
02:00	0	856	0	858	*	*	*	*	*	*	*	*	*	*	0	857
03:00	0	982	0	997	*	*	*	*	*	*	*	*	*	*	0	990
04:00	0	1189	0	1202	*	*	*	*	*	*	*	*	*	*	0	1196
05:00	0	**1362**	0	**1384**	*	*	*	*	*	*	*	*	*	*	0	**1373**
06:00	0	946	0	974	*	*	*	*	*	*	*	*	*	*	0	960
07:00	0	714	0	786	*	*	*	*	*	*	*	*	*	*	0	750
08:00	0	565	0	576	*	*	*	*	*	*	*	*	*	*	0	570
09:00	0	556	0	472	*	*	*	*	*	*	*	*	*	*	0	514
10:00	0	278	0	314	*	*	*	*	*	*	*	*	*	*	0	296
11:00	0	151	0	44	*	*	*	*	*	*	*	*	*	*	0	98
Total	0	13695	0	13839	0	0	0	0	0	0	0	0	0	0	0	13767
Day	13695		13839		0		0		0		0		0		13767	
AM Peak		07:00		07:00												07:00
Vol.		955		922												938
PM Peak		17:00		17:00												17:00
Vol.		1362		1384												1373

Comb. Total	13695	13839	0	0	0	0	0	13767

ADT ADT 13,767 AADT 13,767

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 31
Station ID:
NC 54
b/w Hamilton & Fordham
Latitude: 0' 0.000 Undefined

Start Time	22-Sep-09 WB	WB	23-Sep-09 WB	WB	24-Sep-09 WB	WB	25-Sep-09 WB	WB	26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
12:00 AM	82	0	90	0	*	*	*	*	*	*	*	*	*	*	86	0
01:00	44	0	54	0	*	*	*	*	*	*	*	*	*	*	49	0
02:00	36	0	31	0	*	*	*	*	*	*	*	*	*	*	34	0
03:00	24	0	22	0	*	*	*	*	*	*	*	*	*	*	23	0
04:00	58	0	42	0	*	*	*	*	*	*	*	*	*	*	50	0
05:00	198	0	193	0	*	*	*	*	*	*	*	*	*	*	196	0
06:00	582	0	576	0	*	*	*	*	*	*	*	*	*	*	579	0
07:00	1316	0	1346	0	*	*	*	*	*	*	*	*	*	*	1331	0
08:00	**1360**	0	**1391**	0	*	*	*	*	*	*	*	*	*	*	**1376**	0
09:00	1238	0	1191	0	*	*	*	*	*	*	*	*	*	*	1214	0
10:00	1078	0	1022	0	*	*	*	*	*	*	*	*	*	*	1050	0
11:00	1042	0	1046	0	*	*	*	*	*	*	*	*	*	*	1044	0
12:00 PM	1082	0	1066	0	*	*	*	*	*	*	*	*	*	*	1074	0
01:00	1040	0	1104	0	*	*	*	*	*	*	*	*	*	*	1072	0
02:00	1228	0	1156	0	*	*	*	*	*	*	*	*	*	*	1192	0
03:00	1094	0	1104	0	*	*	*	*	*	*	*	*	*	*	1099	0
04:00	1212	0	1300	0	*	*	*	*	*	*	*	*	*	*	1256	0
05:00	**1545**	0	**1493**	0	*	*	*	*	*	*	*	*	*	*	**1519**	0
06:00	1434	0	1413	0	*	*	*	*	*	*	*	*	*	*	1424	0
07:00	1004	0	970	0	*	*	*	*	*	*	*	*	*	*	987	0
08:00	675	0	714	0	*	*	*	*	*	*	*	*	*	*	694	0
09:00	528	0	610	0	*	*	*	*	*	*	*	*	*	*	569	0
10:00	366	0	365	0	*	*	*	*	*	*	*	*	*	*	366	0
11:00	220	0	43	0	*	*	*	*	*	*	*	*	*	*	132	0
Total	18486	0	18342	0	0	0	0	0	0	0	0	0	0	0	18416	0
Day	18486		18342		0		0		0		0		0		18416	
AM Peak	08:00		08:00												08:00	
Vol.	1360		1391												1376	
PM Peak	17:00		17:00												17:00	
Vol.	1545		1493												1519	

Comb. Total	18486	18342	0	0	0	0	0	18416

ADT ADT 18,414 AADT 18,414

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 32
Station ID:
NC 54
b/w Hamilton & Fordham
Latitude: 0' 0.000 Undefined

Start	22-Sep-09		23-Sep-09		24-Sep-09		25-Sep-09		26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
Time	WB	WB	WB	WB	WB	WB	WB	WB								
12:00 AM	21	0	9	0	*	*	*	*	*	*	*	*	*	*	15	0
01:00	8	0	3	0	*	*	*	*	*	*	*	*	*	*	6	0
02:00	6	0	4	0	*	*	*	*	*	*	*	*	*	*	5	0
03:00	1	0	2	0	*	*	*	*	*	*	*	*	*	*	2	0
04:00	7	0	9	0	*	*	*	*	*	*	*	*	*	*	8	0
05:00	46	0	63	0	*	*	*	*	*	*	*	*	*	*	54	0
06:00	260	0	260	0	*	*	*	*	*	*	*	*	*	*	260	0
07:00	578	0	582	0	*	*	*	*	*	*	*	*	*	*	580	0
08:00	**663**	0	**664**	0	*	*	*	*	*	*	*	*	*	*	**664**	0
09:00	494	0	442	0	*	*	*	*	*	*	*	*	*	*	468	0
10:00	302	0	296	0	*	*	*	*	*	*	*	*	*	*	299	0
11:00	261	0	278	0	*	*	*	*	*	*	*	*	*	*	270	0
12:00 PM	280	0	292	0	*	*	*	*	*	*	*	*	*	*	286	0
01:00	298	0	264	0	*	*	*	*	*	*	*	*	*	*	281	0
02:00	258	0	284	0	*	*	*	*	*	*	*	*	*	*	271	0
03:00	260	0	270	0	*	*	*	*	*	*	*	*	*	*	265	0
04:00	291	0	321	0	*	*	*	*	*	*	*	*	*	*	306	0
05:00	**464**	0	**439**	0	*	*	*	*	*	*	*	*	*	*	**452**	0
06:00	461	0	436	0	*	*	*	*	*	*	*	*	*	*	448	0
07:00	264	0	244	0	*	*	*	*	*	*	*	*	*	*	254	0
08:00	158	0	162	0	*	*	*	*	*	*	*	*	*	*	160	0
09:00	113	0	154	0	*	*	*	*	*	*	*	*	*	*	134	0
10:00	70	0	87	0	*	*	*	*	*	*	*	*	*	*	78	0
11:00	40	0	9	0	*	*	*	*	*	*	*	*	*	*	24	0
Total	5604	0	5574	0	0	0	0	0	0	0	0	0	0	0	5590	0
Day	5604		5574		0		0		0		0		0		5590	
AM Peak	08:00		08:00												08:00	
Vol.	663		664												664	
PM Peak	17:00		17:00												17:00	
Vol.	464		439												452	

Comb. Total	5604	5574	0	0	0	0	0	5590

ADT ADT 5,589 AADT 5,589

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 42
Station ID:
NC 54
b/w Meadowmont & W Barbee Chapel
Latitude: 0' 0.000 Undefined

Start	22-Sep-09		23-Sep-09		24-Sep-09		25-Sep-09		26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
Time	EB	EB	EB	EB	EB	EB	EB	EB								
12:00 AM	172	0	161	0	*	*	*	*	*	*	*	*	*	*	166	0
01:00	60	0	84	0	*	*	*	*	*	*	*	*	*	*	72	0
02:00	43	0	44	0	*	*	*	*	*	*	*	*	*	*	44	0
03:00	27	0	25	0	*	*	*	*	*	*	*	*	*	*	26	0
04:00	56	0	58	0	*	*	*	*	*	*	*	*	*	*	57	0
05:00	167	0	160	0	*	*	*	*	*	*	*	*	*	*	164	0
06:00	480	0	436	0	*	*	*	*	*	*	*	*	*	*	458	0
07:00	1040	0	1070	0	*	*	*	*	*	*	*	*	*	*	1055	0
08:00	**1115**	0	**1092**	0	*	*	*	*	*	*	*	*	*	*	**1104**	0
09:00	794	0	932	0	*	*	*	*	*	*	*	*	*	*	863	0
10:00	720	0	777	0	*	*	*	*	*	*	*	*	*	*	748	0
11:00	766	0	832	0	*	*	*	*	*	*	*	*	*	*	799	0
12:00 PM	888	0	948	0	*	*	*	*	*	*	*	*	*	*	918	0
01:00	835	0	900	0	*	*	*	*	*	*	*	*	*	*	868	0
02:00	893	0	936	0	*	*	*	*	*	*	*	*	*	*	914	0
03:00	1185	0	1198	0	*	*	*	*	*	*	*	*	*	*	1192	0
04:00	1372	0	1343	0	*	*	*	*	*	*	*	*	*	*	1358	0
05:00	**1522**	0	**1596**	0	*	*	*	*	*	*	*	*	*	*	**1559**	0
06:00	1064	0	1137	0	*	*	*	*	*	*	*	*	*	*	1100	0
07:00	804	0	908	0	*	*	*	*	*	*	*	*	*	*	856	0
08:00	644	0	628	0	*	*	*	*	*	*	*	*	*	*	636	0
09:00	568	0	526	0	*	*	*	*	*	*	*	*	*	*	547	0
10:00	316	0	356	0	*	*	*	*	*	*	*	*	*	*	336	0
11:00	176	0	120	0	*	*	*	*	*	*	*	*	*	*	148	0
Total	15707	0	16267	0	0	0	0	0	0	0	0	0	0	0	15988	0
Day	15707		16267		0		0		0		0		0		15988	
AM Peak	08:00		08:00												08:00	
Vol.	1115		1092												1104	
PM Peak	17:00		17:00												17:00	
Vol.	1522		1596												1559	

Comb. Total	15707	16267	0	0	0	0	0	15988

ADT ADT 15,987 AADT 15,987

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 41
Station ID:
NC 54
b/w Meadowmont & W Barbee Chapel
Latitude: 0' 0.000 Undefined

Start Time	22-Sep-09 EB		23-Sep-09 EB		24-Sep-09 EB		25-Sep-09 EB		26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
12:00 AM	29	0	46	0	*	*	*	*	*	*	*	*	*	*	38	0
01:00	12	0	14	0	*	*	*	*	*	*	*	*	*	*	13	0
02:00	12	0	11	0	*	*	*	*	*	*	*	*	*	*	12	0
03:00	4	0	5	0	*	*	*	*	*	*	*	*	*	*	4	0
04:00	16	0	10	0	*	*	*	*	*	*	*	*	*	*	13	0
05:00	30	0	40	0	*	*	*	*	*	*	*	*	*	*	35	0
06:00	148	0	162	0	*	*	*	*	*	*	*	*	*	*	155	0
07:00	356	0	364	0	*	*	*	*	*	*	*	*	*	*	360	0
08:00	**370**	0	**396**	0	*	*	*	*	*	*	*	*	*	*	**383**	0
09:00	262	0	276	0	*	*	*	*	*	*	*	*	*	*	269	0
10:00	216	0	273	0	*	*	*	*	*	*	*	*	*	*	244	0
11:00	267	0	302	0	*	*	*	*	*	*	*	*	*	*	284	0
12:00 PM	326	0	312	0	*	*	*	*	*	*	*	*	*	*	319	0
01:00	301	0	307	0	*	*	*	*	*	*	*	*	*	*	304	0
02:00	325	0	340	0	*	*	*	*	*	*	*	*	*	*	332	0
03:00	464	0	475	0	*	*	*	*	*	*	*	*	*	*	470	0
04:00	586	0	589	0	*	*	*	*	*	*	*	*	*	*	588	0
05:00	**705**	0	**744**	0	*	*	*	*	*	*	*	*	*	*	**724**	0
06:00	463	0	436	0	*	*	*	*	*	*	*	*	*	*	450	0
07:00	328	0	289	0	*	*	*	*	*	*	*	*	*	*	308	0
08:00	237	0	220	0	*	*	*	*	*	*	*	*	*	*	228	0
09:00	198	0	208	0	*	*	*	*	*	*	*	*	*	*	203	0
10:00	90	0	104	0	*	*	*	*	*	*	*	*	*	*	97	0
11:00	51	0	43	0	*	*	*	*	*	*	*	*	*	*	47	0
Total	5796	0	5966	0	0	0	0	0	0	0	0	0	0	0	5880	0
Day	5796		5966		0		0		0		0		0		5880	
AM Peak	08:00		08:00												08:00	
Vol.	370		396												383	
PM Peak	17:00		17:00												17:00	
Vol.	705		744												724	

Comb. Total	5796	5966	0	0	0	0	0	5880

ADT ADT 5,881 AADT 5,881

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: llyon 44
Station ID: SN:023247
NC 54
b/w Meadowmont & W Barbee Chapel
Latitude: 0' 0.000 Undefined

Start	22-Sep-09		23-Sep-09		24-Sep-09		25-Sep-09		26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
Time	WB	WB	WB	WB	WB	WB	WB	WB								
12:00 AM	18	0	14	0	*	*	*	*	*	*	*	*	*	*	16	0
01:00	4	0	8	0	*	*	*	*	*	*	*	*	*	*	6	0
02:00	6	0	6	0	*	*	*	*	*	*	*	*	*	*	6	0
03:00	0	0	3	0	*	*	*	*	*	*	*	*	*	*	2	0
04:00	12	0	12	0	*	*	*	*	*	*	*	*	*	*	12	0
05:00	50	0	74	0	*	*	*	*	*	*	*	*	*	*	62	0
06:00	308	0	326	0	*	*	*	*	*	*	*	*	*	*	317	0
07:00	597	0	618	0	*	*	*	*	*	*	*	*	*	*	608	0
08:00	**740**	0	**736**	0	*	*	*	*	*	*	*	*	*	*	**738**	0
09:00	615	0	570	0	*	*	*	*	*	*	*	*	*	*	592	0
10:00	411	0	444	0	*	*	*	*	*	*	*	*	*	*	428	0
11:00	366	0	395	0	*	*	*	*	*	*	*	*	*	*	380	0
12:00 PM	400	0	404	0	*	*	*	*	*	*	*	*	*	*	402	0
01:00	446	0	443	0	*	*	*	*	*	*	*	*	*	*	444	0
02:00	416	0	396	0	*	*	*	*	*	*	*	*	*	*	406	0
03:00	402	0	423	0	*	*	*	*	*	*	*	*	*	*	412	0
04:00	428	0	496	0	*	*	*	*	*	*	*	*	*	*	462	0
05:00	**634**	0	**616**	0	*	*	*	*	*	*	*	*	*	*	**625**	0
06:00	598	0	549	0	*	*	*	*	*	*	*	*	*	*	574	0
07:00	346	0	324	0	*	*	*	*	*	*	*	*	*	*	335	0
08:00	205	0	225	0	*	*	*	*	*	*	*	*	*	*	215	0
09:00	144	0	182	0	*	*	*	*	*	*	*	*	*	*	163	0
10:00	95	0	112	0	*	*	*	*	*	*	*	*	*	*	104	0
11:00	45	0	54	**4**	*	*	*	*	*	*	*	*	*	*	50	**2**
Total	7286	0	7430	4	0	0	0	0	0	0	0	0	0	0	7359	2
Day	7286		7434		0		0		0		0		0		7361	
AM Peak	08:00		08:00												08:00	
Vol.	740		736												738	
PM Peak	17:00		17:00	23:00											17:00	23:00
Vol.	634		616	4											625	2

Comb. Total	7286	7434	0	0	0	0	0	7361

ADT ADT 7,360 AADT 7,360

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 43
Station ID:
NC 54
b/w Meadowmont & W Barbee Chapel
Latitude: 0' 0.000 Undefined

Start Time	22-Sep-09 WB	WB	23-Sep-09 WB	WB	24-Sep-09 WB	WB	25-Sep-09 WB	WB	26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
12:00 AM	80	0	68	0	*	*	*	*	*	*	*	*	*	*	74	0
01:00	36	0	40	0	*	*	*	*	*	*	*	*	*	*	38	0
02:00	32	0	24	0	*	*	*	*	*	*	*	*	*	*	28	0
03:00	32	0	18	0	*	*	*	*	*	*	*	*	*	*	25	0
04:00	58	0	50	0	*	*	*	*	*	*	*	*	*	*	54	0
05:00	192	0	172	0	*	*	*	*	*	*	*	*	*	*	182	0
06:00	633	0	621	0	*	*	*	*	*	*	*	*	*	*	627	0
07:00	1274	0	1306	0	*	*	*	*	*	*	*	*	*	*	1290	0
08:00	**1330**	0	**1318**	0	*	*	*	*	*	*	*	*	*	*	**1324**	0
09:00	1060	0	1014	0	*	*	*	*	*	*	*	*	*	*	1037	0
10:00	819	0	789	0	*	*	*	*	*	*	*	*	*	*	804	0
11:00	822	0	813	0	*	*	*	*	*	*	*	*	*	*	818	0
12:00 PM	800	0	822	0	*	*	*	*	*	*	*	*	*	*	811	0
01:00	844	0	880	0	*	*	*	*	*	*	*	*	*	*	862	0
02:00	899	0	854	0	*	*	*	*	*	*	*	*	*	*	876	0
03:00	844	0	896	0	*	*	*	*	*	*	*	*	*	*	870	0
04:00	900	0	993	0	*	*	*	*	*	*	*	*	*	*	946	0
05:00	**1176**	0	**1140**	0	*	*	*	*	*	*	*	*	*	*	**1158**	0
06:00	1104	0	1104	0	*	*	*	*	*	*	*	*	*	*	1104	0
07:00	790	0	734	0	*	*	*	*	*	*	*	*	*	*	762	0
08:00	525	0	564	0	*	*	*	*	*	*	*	*	*	*	544	0
09:00	452	0	510	0	*	*	*	*	*	*	*	*	*	*	481	0
10:00	291	0	287	0	*	*	*	*	*	*	*	*	*	*	289	0
11:00	190	0	150	0	*	*	*	*	*	*	*	*	*	*	170	0
Total	15183	0	15167	0	0	0	0	0	0	0	0	0	0	0	15174	0
Day	15183		15167		0		0		0		0		0		15174	
AM Peak	08:00		08:00												08:00	
Vol.	1330		1318												1324	
PM Peak	17:00		17:00												17:00	
Vol.	1176		1140												1158	

Comb. Total	15183	15167	0	0	0	0	0	15174

ADT ADT 15,175 AADT 15,175

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 51
Station ID:
NC 54
bw Huntingridge & Downing Creek
Latitude: 0' 0.000 Undefined

Start	22-Sep-09		23-Sep-09		24-Sep-09		25-Sep-09		26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	204	87	180	82	*	*	*	*	*	*	*	*	*	*	192	84
01:00	78	44	90	40	*	*	*	*	*	*	*	*	*	*	84	42
02:00	51	41	45	32	*	*	*	*	*	*	*	*	*	*	48	36
03:00	31	30	24	25	*	*	*	*	*	*	*	*	*	*	28	28
04:00	62	72	60	70	*	*	*	*	*	*	*	*	*	*	61	71
05:00	196	331	186	310	*	*	*	*	*	*	*	*	*	*	191	320
06:00	580	1264	542	1293	*	*	*	*	*	*	*	*	*	*	561	1278
07:00	1380	**2318**	1414	**2401**	*	*	*	*	*	*	*	*	*	*	1397	**2360**
08:00	**1452**	2173	**1506**	2130	*	*	*	*	*	*	*	*	*	*	**1479**	2152
09:00	1046	1542	1150	1514	*	*	*	*	*	*	*	*	*	*	1098	1528
10:00	956	1164	980	1168	*	*	*	*	*	*	*	*	*	*	968	1166
11:00	1094	1070	1134	1093	*	*	*	*	*	*	*	*	*	*	1114	1082
12:00 PM	1258	1175	1308	1144	*	*	*	*	*	*	*	*	*	*	1283	1160
01:00	1142	1176	1224	1247	*	*	*	*	*	*	*	*	*	*	1183	1212
02:00	1192	1178	1268	1094	*	*	*	*	*	*	*	*	*	*	1230	1136
03:00	1791	1206	1790	1218	*	*	*	*	*	*	*	*	*	*	1790	1212
04:00	2084	1240	1942	1370	*	*	*	*	*	*	*	*	*	*	2013	1305
05:00	**2167**	**1736**	**2424**	**1738**	*	*	*	*	*	*	*	*	*	*	**2296**	**1737**
06:00	1518	1672	1541	1555	*	*	*	*	*	*	*	*	*	*	1530	1614
07:00	1079	982	1254	985	*	*	*	*	*	*	*	*	*	*	1166	984
08:00	888	708	856	776	*	*	*	*	*	*	*	*	*	*	872	742
09:00	736	600	687	646	*	*	*	*	*	*	*	*	*	*	712	623
10:00	368	384	404	399	*	*	*	*	*	*	*	*	*	*	386	392
11:00	198	225	238	232	*	*	*	*	*	*	*	*	*	*	218	228
Total	21551	22418	22247	22562	0	0	0	0	0	0	0	0	0	0	21900	22492
Day	43969		44809		0		0		0		0		0		44392	
AM Peak	08:00	07:00	08:00	07:00											08:00	07:00
Vol.	1452	2318	1506	2401											1479	2360
PM Peak	17:00	17:00	17:00	17:00											17:00	17:00
Vol.	2167	1736	2424	1738											2296	1737

Comb. Total	43969	44809	0	0	0	0	0	44392

ADT ADT 44,389 AADT 44,389

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 62
Station ID:
NC 54
b/w Falconridge & Huntingridge
Latitude: 0' 0.000 Undefined

Start Time	22-Sep-09 WB	WB	23-Sep-09 WB	WB	24-Sep-09 WB	WB	25-Sep-09 WB	WB	26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
12:00 AM	94	0	84	0	*	*	*	*	*	*	*	*	*	*	89	0
01:00	44	0	43	0	*	*	*	*	*	*	*	*	*	*	44	0
02:00	41	0	32	0	*	*	*	*	*	*	*	*	*	*	36	0
03:00	31	0	24	0	*	*	*	*	*	*	*	*	*	*	28	0
04:00	72	0	69	0	*	*	*	*	*	*	*	*	*	*	70	0
05:00	322	0	302	0	*	*	*	*	*	*	*	*	*	*	312	0
06:00	1260	0	1284	0	*	*	*	*	*	*	*	*	*	*	1272	0
07:00	**2280**	0	**2309**	0	*	*	*	*	*	*	*	*	*	*	**2294**	0
08:00	2086	0	2086	0	*	*	*	*	*	*	*	*	*	*	2086	0
09:00	1522	0	1466	0	*	*	*	*	*	*	*	*	*	*	1494	0
10:00	1142	0	1128	0	*	*	*	*	*	*	*	*	*	*	1135	0
11:00	1071	0	1076	0	*	*	*	*	*	*	*	*	*	*	1074	0
12:00 PM	1136	0	1130	0	*	*	*	*	*	*	*	*	*	*	1133	0
01:00	1164	0	1218	0	*	*	*	*	*	*	*	*	*	*	1191	0
02:00	1153	0	1104	0	*	*	*	*	*	*	*	*	*	*	1128	0
03:00	1188	0	1181	0	*	*	*	*	*	*	*	*	*	*	1184	0
04:00	1242	0	1330	0	*	*	*	*	*	*	*	*	*	*	1286	0
05:00	**1734**	0	**1718**	0	*	*	*	*	*	*	*	*	*	*	**1726**	0
06:00	1683	0	1550	0	*	*	*	*	*	*	*	*	*	*	1616	0
07:00	998	0	978	0	*	*	*	*	*	*	*	*	*	*	988	0
08:00	718	0	779	0	*	*	*	*	*	*	*	*	*	*	748	0
09:00	608	0	644	0	*	*	*	*	*	*	*	*	*	*	626	0
10:00	382	0	396	0	*	*	*	*	*	*	*	*	*	*	389	0
11:00	225	0	236	0	*	*	*	*	*	*	*	*	*	*	230	0
Total	22196	0	22167	0	0	0	0	0	0	0	0	0	0	0	22179	0
Day	22196		22167		0		0		0		0		0		22179	
AM Peak	07:00		07:00												07:00	
Vol.	2280		2309												2294	
PM Peak	17:00		17:00												17:00	
Vol.	1734		1718												1726	

Comb. Total	22196	22167	0	0	0	0	0	22179

ADT ADT 22,182 AADT 22,182

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 61
Station ID:
NC 54
bw Falconridge & Huntingridge
Latitude: 0' 0.000 Undefined

Start	22-Sep-09		23-Sep-09		24-Sep-09		25-Sep-09		26-Sep-09		27-Sep-09		28-Sep-09		Week Average	
Time	EB	EB	EB	EB	EB	EB	EB	EB								
12:00 AM	208	0	178	0	*	*	*	*	*	*	*	*	*	*	193	0
01:00	79	0	100	0	*	*	*	*	*	*	*	*	*	*	90	0
02:00	53	0	45	0	*	*	*	*	*	*	*	*	*	*	49	0
03:00	31	0	24	0	*	*	*	*	*	*	*	*	*	*	28	0
04:00	58	0	62	0	*	*	*	*	*	*	*	*	*	*	60	0
05:00	192	0	184	0	*	*	*	*	*	*	*	*	*	*	188	0
06:00	562	0	528	0	*	*	*	*	*	*	*	*	*	*	545	0
07:00	1365	0	1374	0	*	*	*	*	*	*	*	*	*	*	1370	0
08:00	**1548**	0	**1636**	0	*	*	*	*	*	*	*	*	*	*	**1592**	0
09:00	1109	0	1200	0	*	*	*	*	*	*	*	*	*	*	1154	0
10:00	986	0	1006	0	*	*	*	*	*	*	*	*	*	*	996	0
11:00	1106	0	1140	0	*	*	*	*	*	*	*	*	*	*	1123	0
12:00 PM	1283	0	1334	0	*	*	*	*	*	*	*	*	*	*	1308	0
01:00	1148	0	1222	0	*	*	*	*	*	*	*	*	*	*	1185	0
02:00	1224	0	1252	0	*	*	*	*	*	*	*	*	*	*	1238	0
03:00	1750	0	1772	0	*	*	*	*	*	*	*	*	*	*	1761	0
04:00	**2133**	0	1945	0	*	*	*	*	*	*	*	*	*	*	2039	0
05:00	2106	0	**2242**	0	*	*	*	*	*	*	*	*	*	*	**2174**	0
06:00	1630	0	1650	0	*	*	*	*	*	*	*	*	*	*	1640	0
07:00	1088	0	1210	0	*	*	*	*	*	*	*	*	*	*	1149	0
08:00	900	0	913	0	*	*	*	*	*	*	*	*	*	*	906	0
09:00	734	0	686	0	*	*	*	*	*	*	*	*	*	*	710	0
10:00	387	0	414	0	*	*	*	*	*	*	*	*	*	*	400	0
11:00	219	0	240	0	*	*	*	*	*	*	*	*	*	*	230	0
Total	21899	0	22357	0	0	0	0	0	0	0	0	0	0	0	22128	0
Day	21899		22357		0		0		0		0		0		22128	
AM Peak	08:00		08:00												08:00	
Vol.	1548		1636												1592	
PM Peak	16:00		17:00												17:00	
Vol.	2133		2242												2174	

Comb. Total	21899	22357	0	0	0	0	0	22128

ADT ADT 22,128 AADT 22,128

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 2222
Station ID:
NC54
E of I-40
Latitude: 0' 0.000 Undefined

Start Time	01-Oct-09		02-Oct-09		03-Oct-09		04-Oct-09		05-Oct-09		06-Oct-09		07-Oct-09		Week Average	
	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	*	*	**28**	**40**	*	*	*	*	*	*	*	*	*	*	28	40
01:00	18	28	*	*	*	*	*	*	*	*	*	*	*	*	18	28
02:00	12	15	*	*	*	*	*	*	*	*	*	*	*	*	12	15
03:00	10	10	*	*	*	*	*	*	*	*	*	*	*	*	10	10
04:00	28	10	*	*	*	*	*	*	*	*	*	*	*	*	28	10
05:00	103	35	*	*	*	*	*	*	*	*	*	*	*	*	103	35
06:00	356	122	*	*	*	*	*	*	*	*	*	*	*	*	356	122
07:00	**868**	306	*	*	*	*	*	*	*	*	*	*	*	*	**868**	306
08:00	846	**408**	*	*	*	*	*	*	*	*	*	*	*	*	846	**408**
09:00	528	360	*	*	*	*	*	*	*	*	*	*	*	*	528	360
10:00	444	298	*	*	*	*	*	*	*	*	*	*	*	*	444	298
11:00	387	379	*	*	*	*	*	*	*	*	*	*	*	*	387	379
12:00 PM	496	524	*	*	*	*	*	*	*	*	*	*	*	*	496	524
01:00	544	442	*	*	*	*	*	*	*	*	*	*	*	*	544	442
02:00	528	452	*	*	*	*	*	*	*	*	*	*	*	*	528	452
03:00	437	609	*	*	*	*	*	*	*	*	*	*	*	*	437	609
04:00	536	807	*	*	*	*	*	*	*	*	*	*	*	*	536	807
05:00	**601**	**913**	*	*	*	*	*	*	*	*	*	*	*	*	**601**	**913**
06:00	600	713	*	*	*	*	*	*	*	*	*	*	*	*	600	713
07:00	340	515	*	*	*	*	*	*	*	*	*	*	*	*	340	515
08:00	217	365	*	*	*	*	*	*	*	*	*	*	*	*	217	365
09:00	154	264	*	*	*	*	*	*	*	*	*	*	*	*	154	264
10:00	124	168	*	*	*	*	*	*	*	*	*	*	*	*	124	168
11:00	71	107	*	*	*	*	*	*	*	*	*	*	*	*	71	107
Total	8248	7850	28	40	0	0	0	0	0	0	0	0	0	0	8276	7890
Day	16098		68		0		0		0		0		0		16166	
AM Peak	07:00	08:00	00:00	00:00											07:00	08:00
Vol.	868	408	28	40											868	408
PM Peak	17:00	17:00													17:00	17:00
Vol.	601	913													601	913

Comb. Total	16098	68	0	0	0	0	0	16166

ADT ADT 16,098 AADT 16,098

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 6666
Station ID:
NC54
E of I-40
Latitude: 0' 0.000 Undefined

Start Time	24-Sep-09		25-Sep-09		26-Sep-09		27-Sep-09		28-Sep-09		29-Sep-09		30-Sep-09		Week Average	
	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	*	*	**41**	**61**	*	*	*	*	*	*	*	*	*	*	41	61
01:00	*	*	22	33	*	*	*	*	*	*	*	*	*	*	22	33
02:00	*	*	6	16	*	*	*	*	*	*	*	*	*	*	6	16
03:00	11	7	*	*	*	*	*	*	*	*	*	*	*	*	11	7
04:00	26	12	*	*	*	*	*	*	*	*	*	*	*	*	26	12
05:00	98	37	*	*	*	*	*	*	*	*	*	*	*	*	98	37
06:00	378	113	*	*	*	*	*	*	*	*	*	*	*	*	378	113
07:00	871	310	*	*	*	*	*	*	*	*	*	*	*	*	871	310
08:00	**909**	417	*	*	*	*	*	*	*	*	*	*	*	*	**909**	417
09:00	538	337	*	*	*	*	*	*	*	*	*	*	*	*	538	337
10:00	376	308	*	*	*	*	*	*	*	*	*	*	*	*	376	308
11:00	413	**423**	*	*	*	*	*	*	*	*	*	*	*	*	413	**423**
12:00 PM	506	554	*	*	*	*	*	*	*	*	*	*	*	*	506	554
01:00	559	465	*	*	*	*	*	*	*	*	*	*	*	*	559	465
02:00	458	474	*	*	*	*	*	*	*	*	*	*	*	*	458	474
03:00	434	564	*	*	*	*	*	*	*	*	*	*	*	*	434	564
04:00	498	802	*	*	*	*	*	*	*	*	*	*	*	*	498	802
05:00	**610**	**986**	*	*	*	*	*	*	*	*	*	*	*	*	**610**	**986**
06:00	572	770	*	*	*	*	*	*	*	*	*	*	*	*	572	770
07:00	378	503	*	*	*	*	*	*	*	*	*	*	*	*	378	503
08:00	277	373	*	*	*	*	*	*	*	*	*	*	*	*	277	373
09:00	192	316	*	*	*	*	*	*	*	*	*	*	*	*	192	316
10:00	149	165	*	*	*	*	*	*	*	*	*	*	*	*	149	165
11:00	83	127	*	*	*	*	*	*	*	*	*	*	*	*	83	127
Total	8336	8063	69	110	0	0	0	0	0	0	0	0	0	0	8405	8173
Day	16399		179		0		0		0		0		0		16578	
AM Peak	08:00	11:00	00:00	00:00											08:00	11:00
Vol.	909	423	41	61											909	423
PM Peak	17:00	17:00													17:00	17:00
Vol.	610	986													610	986

Comb. Total	16399	179	0	0	0	0	0	16578

ADT ADT 16,399 AADT 16,399

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 10
Station ID:
Farrington
NE of I40 Underpass
Latitude: 0' 0.000 Undefined

Start Time	16-Sep-09		17-Sep-09		18-Sep-09		19-Sep-09		20-Sep-09		21-Sep-09		22-Sep-09		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	12	10	4	14	*	*	*	*	*	*	*	*	*	*	8	12
01:00	4	8	5	2	*	*	*	*	*	*	*	*	*	*	4	5
02:00	2	0	0	6	*	*	*	*	*	*	*	*	*	*	1	3
03:00	4	3	6	8	*	*	*	*	*	*	*	*	*	*	5	6
04:00	3	7	2	9	*	*	*	*	*	*	*	*	*	*	2	8
05:00	19	30	20	20	*	*	*	*	*	*	*	*	*	*	20	25
06:00	94	133	90	132	*	*	*	*	*	*	*	*	*	*	92	132
07:00	265	311	280	258	*	*	*	*	*	*	*	*	*	*	272	284
08:00	**320**	**336**	**310**	**327**	*	*	*	*	*	*	*	*	*	*	**315**	**332**
09:00	187	162	212	163	*	*	*	*	*	*	*	*	*	*	200	162
10:00	143	134	126	138	*	*	*	*	*	*	*	*	*	*	134	136
11:00	150	166	152	173	*	*	*	*	*	*	*	*	*	*	151	170
12:00 PM	226	242	202	192	*	*	*	*	*	*	*	*	*	*	214	217
01:00	198	238	160	184	*	*	*	*	*	*	*	*	*	*	179	211
02:00	212	217	236	234	*	*	*	*	*	*	*	*	*	*	224	226
03:00	254	234	277	301	*	*	*	*	*	*	*	*	*	*	266	268
04:00	316	286	301	287	*	*	*	*	*	*	*	*	*	*	308	286
05:00	**340**	**394**	**316**	**386**	*	*	*	*	*	*	*	*	*	*	**328**	**390**
06:00	257	266	234	279	*	*	*	*	*	*	*	*	*	*	246	272
07:00	144	180	145	201	*	*	*	*	*	*	*	*	*	*	144	190
08:00	85	131	111	133	*	*	*	*	*	*	*	*	*	*	98	132
09:00	71	97	81	125	*	*	*	*	*	*	*	*	*	*	76	111
10:00	45	56	40	67	*	*	*	*	*	*	*	*	*	*	42	62
11:00	21	28	31	23	*	*	*	*	*	*	*	*	*	*	26	26
Total	3372	3669	3341	3662	0	0	0	0	0	0	0	0	0	0	3355	3666
Day	7041		7003		0		0		0		0		0		7021	
AM Peak	08:00	08:00	08:00	08:00											08:00	08:00
Vol.	320	336	310	327											315	332
PM Peak	17:00	17:00	17:00	17:00											17:00	17:00
Vol.	340	394	316	386											328	390

Comb. Total	7041	7003	0	0	0	0	0	7021

ADT ADT 7,022 AADT 7,022

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 11
Station ID:
Farrington
bw Ephesus Church & Wendell
Latitude: 0' 0.000 Undefined

Start Time	16-Sep-09		17-Sep-09		18-Sep-09		19-Sep-09		20-Sep-09		21-Sep-09		22-Sep-09		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	30	14	*	*	*	*	*	*	*	*	*	*	*	*	30	14
01:00	8	9	*	*	*	*	*	*	*	*	*	*	*	*	8	9
02:00	3	7	*	*	*	*	*	*	*	*	*	*	*	*	3	7
03:00	2	7	*	*	*	*	*	*	*	*	*	*	*	*	2	7
04:00	16	21	*	*	*	*	*	*	*	*	*	*	*	*	16	21
05:00	29	34	*	*	*	*	*	*	*	*	*	*	*	*	29	34
06:00	116	199	*	*	*	*	*	*	*	*	*	*	*	*	116	199
07:00	358	430	*	*	*	*	*	*	*	*	*	*	*	*	358	430
08:00	**504**	**528**	*	*	*	*	*	*	*	*	*	*	*	*	**504**	**528**
09:00	271	321	*	*	*	*	*	*	*	*	*	*	*	*	271	321
10:00	214	213	*	*	*	*	*	*	*	*	*	*	*	*	214	213
11:00	260	281	*	*	*	*	*	*	*	*	*	*	*	*	260	281
12:00 PM	304	317	*	*	*	*	*	*	*	*	*	*	*	*	304	317
01:00	294	352	*	*	*	*	*	*	*	*	*	*	*	*	294	352
02:00	294	303	*	*	*	*	*	*	*	*	*	*	*	*	294	303
03:00	485	421	*	*	*	*	*	*	*	*	*	*	*	*	485	421
04:00	476	427	*	*	*	*	*	*	*	*	*	*	*	*	476	427
05:00	**548**	**581**	*	*	*	*	*	*	*	*	*	*	*	*	**548**	**581**
06:00	394	363	*	*	*	*	*	*	*	*	*	*	*	*	394	363
07:00	281	219	*	*	*	*	*	*	*	*	*	*	*	*	281	219
08:00	190	133	*	*	*	*	*	*	*	*	*	*	*	*	190	133
09:00	124	106	*	*	*	*	*	*	*	*	*	*	*	*	124	106
10:00	108	80	*	*	*	*	*	*	*	*	*	*	*	*	108	80
11:00	53	38	*	*	*	*	*	*	*	*	*	*	*	*	53	38
Total	5362	5404	0	0	0	0	0	0	0	0	0	0	0	0	5362	5404
Day	10766		0		0		0		0		0		0		10766	
AM Peak	08:00	08:00													08:00	08:00
Vol.	504	528													504	528
PM Peak	17:00	17:00													17:00	17:00
Vol.	548	581													548	581

Comb. Total	10766	0	0	0	0	0	0	10766

ADT ADT 10,766 AADT 10,766

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 3333
Station ID:
Farrington
bw Ephesus Church & Wendell
Latitude: 0' 0.000 Undefined

Start	24-Sep-09		25-Sep-09		26-Sep-09		27-Sep-09		28-Sep-09		29-Sep-09		30-Sep-09		Week Average	
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	**25**	**11**	*	*	*	*	*	*	*	*	*	*	25	11
01:00	12	7	*	*	*	*	*	*	*	*	*	*	*	*	12	7
02:00	5	4	*	*	*	*	*	*	*	*	*	*	*	*	5	4
03:00	6	2	*	*	*	*	*	*	*	*	*	*	*	*	6	2
04:00	6	11	*	*	*	*	*	*	*	*	*	*	*	*	6	11
05:00	21	35	*	*	*	*	*	*	*	*	*	*	*	*	21	35
06:00	116	177	*	*	*	*	*	*	*	*	*	*	*	*	116	177
07:00	360	410	*	*	*	*	*	*	*	*	*	*	*	*	360	410
08:00	**495**	**525**	*	*	*	*	*	*	*	*	*	*	*	*	**495**	**525**
09:00	246	318	*	*	*	*	*	*	*	*	*	*	*	*	246	318
10:00	240	231	*	*	*	*	*	*	*	*	*	*	*	*	240	231
11:00	250	301	*	*	*	*	*	*	*	*	*	*	*	*	250	301
12:00 PM	324	311	*	*	*	*	*	*	*	*	*	*	*	*	324	311
01:00	301	293	*	*	*	*	*	*	*	*	*	*	*	*	301	293
02:00	298	305	*	*	*	*	*	*	*	*	*	*	*	*	298	305
03:00	444	463	*	*	*	*	*	*	*	*	*	*	*	*	444	463
04:00	458	432	*	*	*	*	*	*	*	*	*	*	*	*	458	432
05:00	**579**	**487**	*	*	*	*	*	*	*	*	*	*	*	*	**579**	**487**
06:00	354	404	*	*	*	*	*	*	*	*	*	*	*	*	354	404
07:00	263	271	*	*	*	*	*	*	*	*	*	*	*	*	263	271
08:00	158	156	*	*	*	*	*	*	*	*	*	*	*	*	158	156
09:00	148	118	*	*	*	*	*	*	*	*	*	*	*	*	148	118
10:00	110	84	*	*	*	*	*	*	*	*	*	*	*	*	110	84
11:00	52	42	*	*	*	*	*	*	*	*	*	*	*	*	52	42
Total	5246	5387	25	11	0	0	0	0	0	0	0	0	0	0	5271	5398
Day	10633		36		0		0		0		0		0		10669	
AM Peak	08:00	08:00	00:00	00:00											08:00	08:00
Vol.	495	525	25	11											495	525
PM Peak	17:00	17:00													17:00	17:00
Vol.	579	487													579	487

Comb. Total	10633	36	0	0	0	0	0	10669

ADT ADT 10,633 AADT 10,633

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 3333
Station ID:
Farrington
N of NC 54 (N of Cleora)
Latitude: 0' 0.000 Undefined

Start Time	01-Oct-09		02-Oct-09		03-Oct-09		04-Oct-09		05-Oct-09		06-Oct-09		07-Oct-09		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	37	22	*	*	*	*	*	*	*	*	*	*	*	*	37	22
01:00	9	11	*	*	*	*	*	*	*	*	*	*	*	*	9	11
02:00	5	6	*	*	*	*	*	*	*	*	*	*	*	*	5	6
03:00	9	4	*	*	*	*	*	*	*	*	*	*	*	*	9	4
04:00	5	18	*	*	*	*	*	*	*	*	*	*	*	*	5	18
05:00	20	39	*	*	*	*	*	*	*	*	*	*	*	*	20	39
06:00	114	180	*	*	*	*	*	*	*	*	*	*	*	*	114	180
07:00	384	419	*	*	*	*	*	*	*	*	*	*	*	*	384	419
08:00	**466**	**523**	*	*	*	*	*	*	*	*	*	*	*	*	**466**	**523**
09:00	240	340	*	*	*	*	*	*	*	*	*	*	*	*	240	340
10:00	238	250	*	*	*	*	*	*	*	*	*	*	*	*	238	250
11:00	228	240	*	*	*	*	*	*	*	*	*	*	*	*	228	240
12:00 PM	289	321	*	*	*	*	*	*	*	*	*	*	*	*	289	321
01:00	313	319	*	*	*	*	*	*	*	*	*	*	*	*	313	319
02:00	302	331	*	*	*	*	*	*	*	*	*	*	*	*	302	331
03:00	454	472	*	*	*	*	*	*	*	*	*	*	*	*	454	472
04:00	455	445	*	*	*	*	*	*	*	*	*	*	*	*	455	445
05:00	**488**	**527**	*	*	*	*	*	*	*	*	*	*	*	*	**488**	**527**
06:00	414	352	*	*	*	*	*	*	*	*	*	*	*	*	414	352
07:00	262	257	*	*	*	*	*	*	*	*	*	*	*	*	262	257
08:00	172	162	*	*	*	*	*	*	*	*	*	*	*	*	172	162
09:00	138	118	*	*	*	*	*	*	*	*	*	*	*	*	138	118
10:00	99	73	*	*	*	*	*	*	*	*	*	*	*	*	99	73
11:00	54	44	*	*	*	*	*	*	*	*	*	*	*	*	54	44
Total	5195	5473	0	0	0	0	0	0	0	0	0	0	0	0	5195	5473
Day	10668		0		0		0		0		0		0		10668	
AM Peak	08:00	08:00													08:00	08:00
Vol.	466	523													466	523
PM Peak	17:00	17:00													17:00	17:00
Vol.	488	527													488	527

Comb. Total	10668	0	0	0	0	0	0	10668

ADT ADT 10,668 AADT 10,668

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 13
Station ID:
Farrington Rd
S of NC54 (just N of Dunbrook)
Latitude: 0' 0.000 Undefined

Start	16-Sep-09		17-Sep-09		18-Sep-09		19-Sep-09		20-Sep-09		21-Sep-09		22-Sep-09		Week Average	
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 AM	13	8	9	5	*	*	*	*	*	*	*	*	*	*	11	6
01:00	10	6	6	4	*	*	*	*	*	*	*	*	*	*	8	5
02:00	4	0	10	2	*	*	*	*	*	*	*	*	*	*	7	1
03:00	2	8	4	13	*	*	*	*	*	*	*	*	*	*	3	10
04:00	4	13	4	10	*	*	*	*	*	*	*	*	*	*	4	12
05:00	23	35	20	52	*	*	*	*	*	*	*	*	*	*	22	44
06:00	55	143	60	194	*	*	*	*	*	*	*	*	*	*	58	168
07:00	156	**447**	119	**555**	*	*	*	*	*	*	*	*	*	*	138	**501**
08:00	**194**	410	**237**	479	*	*	*	*	*	*	*	*	*	*	**216**	444
09:00	149	235	166	326	*	*	*	*	*	*	*	*	*	*	158	280
10:00	136	200	132	246	*	*	*	*	*	*	*	*	*	*	134	223
11:00	160	232	164	216	*	*	*	*	*	*	*	*	*	*	162	224
12:00 PM	201	215	191	243	*	*	*	*	*	*	*	*	*	*	196	229
01:00	198	216	166	218	*	*	*	*	*	*	*	*	*	*	182	217
02:00	252	242	197	263	*	*	*	*	*	*	*	*	*	*	224	252
03:00	255	254	244	225	*	*	*	*	*	*	*	*	*	*	250	240
04:00	311	253	304	**268**	*	*	*	*	*	*	*	*	*	*	308	260
05:00	**393**	**286**	**412**	249	*	*	*	*	*	*	*	*	*	*	**402**	**268**
06:00	286	224	262	244	*	*	*	*	*	*	*	*	*	*	274	234
07:00	171	143	158	128	*	*	*	*	*	*	*	*	*	*	164	136
08:00	133	117	135	85	*	*	*	*	*	*	*	*	*	*	134	101
09:00	97	82	109	71	*	*	*	*	*	*	*	*	*	*	103	76
10:00	75	41	69	50	*	*	*	*	*	*	*	*	*	*	72	46
11:00	21	27	28	38	*	*	*	*	*	*	*	*	*	*	24	32
Total	3299	3837	3206	4184	0	0	0	0	0	0	0	0	0	0	3254	4009
Day	7136		7390		0		0		0		0		0		7263	
AM Peak	08:00	07:00	08:00	07:00											08:00	07:00
Vol.	194	447	237	555											216	501
PM Peak	17:00	17:00	17:00	16:00											17:00	17:00
Vol.	393	286	412	268											402	268

Comb. Total	7136	7390	0	0	0	0	0	7263

ADT ADT 7,263 AADT 7,263

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: 14
Station ID:
Ephesus Church Rd
Just W of Farrington
Latitude: 0' 0.000 Undefined

Start Time	16-Sep-09		17-Sep-09		18-Sep-09		19-Sep-09		20-Sep-09		21-Sep-09		22-Sep-09		Week Average	
	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	5	3	3	0	*	*	*	*	*	*	*	*	*	*	4	2
01:00	4	1	1	0	*	*	*	*	*	*	*	*	*	*	2	0
02:00	6	12	2	7	*	*	*	*	*	*	*	*	*	*	4	10
03:00	16	20	14	18	*	*	*	*	*	*	*	*	*	*	15	19
04:00	61	72	50	60	*	*	*	*	*	*	*	*	*	*	56	66
05:00	214	178	199	175	*	*	*	*	*	*	*	*	*	*	206	176
06:00	**414**	**402**	**424**	**410**	*	*	*	*	*	*	*	*	*	*	**419**	**406**
07:00	135	157	142	190	*	*	*	*	*	*	*	*	*	*	138	174
08:00	101	121	118	132	*	*	*	*	*	*	*	*	*	*	110	126
09:00	138	142	128	146	*	*	*	*	*	*	*	*	*	*	133	144
10:00	160	152	108	135	*	*	*	*	*	*	*	*	*	*	134	144
11:00	273	271	123	177	*	*	*	*	*	*	*	*	*	*	198	224
12:00 PM	180	222	167	233	*	*	*	*	*	*	*	*	*	*	174	228
01:00	168	258	284	388	*	*	*	*	*	*	*	*	*	*	226	323
02:00	214	264	250	355	*	*	*	*	*	*	*	*	*	*	232	310
03:00	**273**	**355**	**296**	**418**	*	*	*	*	*	*	*	*	*	*	**284**	**386**
04:00	184	186	226	226	*	*	*	*	*	*	*	*	*	*	205	206
05:00	106	96	128	160	*	*	*	*	*	*	*	*	*	*	117	128
06:00	89	69	90	82	*	*	*	*	*	*	*	*	*	*	90	76
07:00	62	39	68	44	*	*	*	*	*	*	*	*	*	*	65	42
08:00	59	31	52	23	*	*	*	*	*	*	*	*	*	*	56	27
09:00	21	18	14	13	*	*	*	*	*	*	*	*	*	*	18	16
10:00	15	5	16	8	*	*	*	*	*	*	*	*	*	*	16	6
11:00	2	1	6	5	*	*	*	*	*	*	*	*	*	*	4	3
Total	2900	3075	2909	3405	0	0	0	0	0	0	0	0	0	0	2906	3242
Day	5975		6314		0		0		0		0		0		6148	
AM Peak	06:00	06:00	06:00	06:00											06:00	06:00
Vol.	414	402	424	410											419	406
PM Peak	15:00	15:00	15:00	15:00											15:00	15:00
Vol.	273	355	296	418											284	386

Comb. Total	5975	6314	0	0	0	0	0	6148

ADT ADT 6,144 AADT 6,144

Data Collection Group

757-478-6761
DataCollectionGroup@hotmail.com

Site Code: ax FLEX HS 15
Station ID: SN:023113
George King
Just S of Ephesus Church
Latitude: 0' 0.000 Undefined

Start Time	16-Sep-09		17-Sep-09		18-Sep-09		19-Sep-09		20-Sep-09		21-Sep-09		22-Sep-09		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
01:00	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
02:00	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
03:00	1	1	0	0	*	*	*	*	*	*	*	*	*	*	0	0
04:00	2	1	0	0	*	*	*	*	*	*	*	*	*	*	1	0
05:00	0	1	2	1	*	*	*	*	*	*	*	*	*	*	1	1
06:00	8	12	12	10	*	*	*	*	*	*	*	*	*	*	10	11
07:00	28	20	27	25	*	*	*	*	*	*	*	*	*	*	28	22
08:00	**57**	**42**	**37**	**48**	*	*	*	*	*	*	*	*	*	*	**47**	**45**
09:00	20	32	18	38	*	*	*	*	*	*	*	*	*	*	19	35
10:00	30	19	28	18	*	*	*	*	*	*	*	*	*	*	29	18
11:00	18	28	37	33	*	*	*	*	*	*	*	*	*	*	28	30
12:00 PM	30	32	24	18	*	*	*	*	*	*	*	*	*	*	27	25
01:00	**66**	18	24	10	*	*	*	*	*	*	*	*	*	*	45	14
02:00	34	39	28	20	*	*	*	*	*	*	*	*	*	*	31	30
03:00	42	35	**86**	20	*	*	*	*	*	*	*	*	*	*	**64**	28
04:00	22	37	22	22	*	*	*	*	*	*	*	*	*	*	22	30
05:00	38	**42**	29	**26**	*	*	*	*	*	*	*	*	*	*	34	**34**
06:00	18	22	18	21	*	*	*	*	*	*	*	*	*	*	18	22
07:00	10	12	5	9	*	*	*	*	*	*	*	*	*	*	8	10
08:00	11	20	10	19	*	*	*	*	*	*	*	*	*	*	10	20
09:00	4	12	4	11	*	*	*	*	*	*	*	*	*	*	4	12
10:00	1	5	3	5	*	*	*	*	*	*	*	*	*	*	2	5
11:00	2	4	0	3	*	*	*	*	*	*	*	*	*	*	1	4
Total	442	434	414	357	0	0	0	0	0	0	0	0	0	0	429	396
Day	876		771		0		0		0		0		0		825	
AM Peak	08:00	08:00	08:00	08:00											08:00	08:00
Vol.	57	42	37	48											47	45
PM Peak	13:00	17:00	15:00	17:00											15:00	17:00
Vol.	66	42	86	26											64	34

Comb. Total	876	771	0	0	0	0	0	825

ADT ADT 824 AADT 824

Data Collection Group

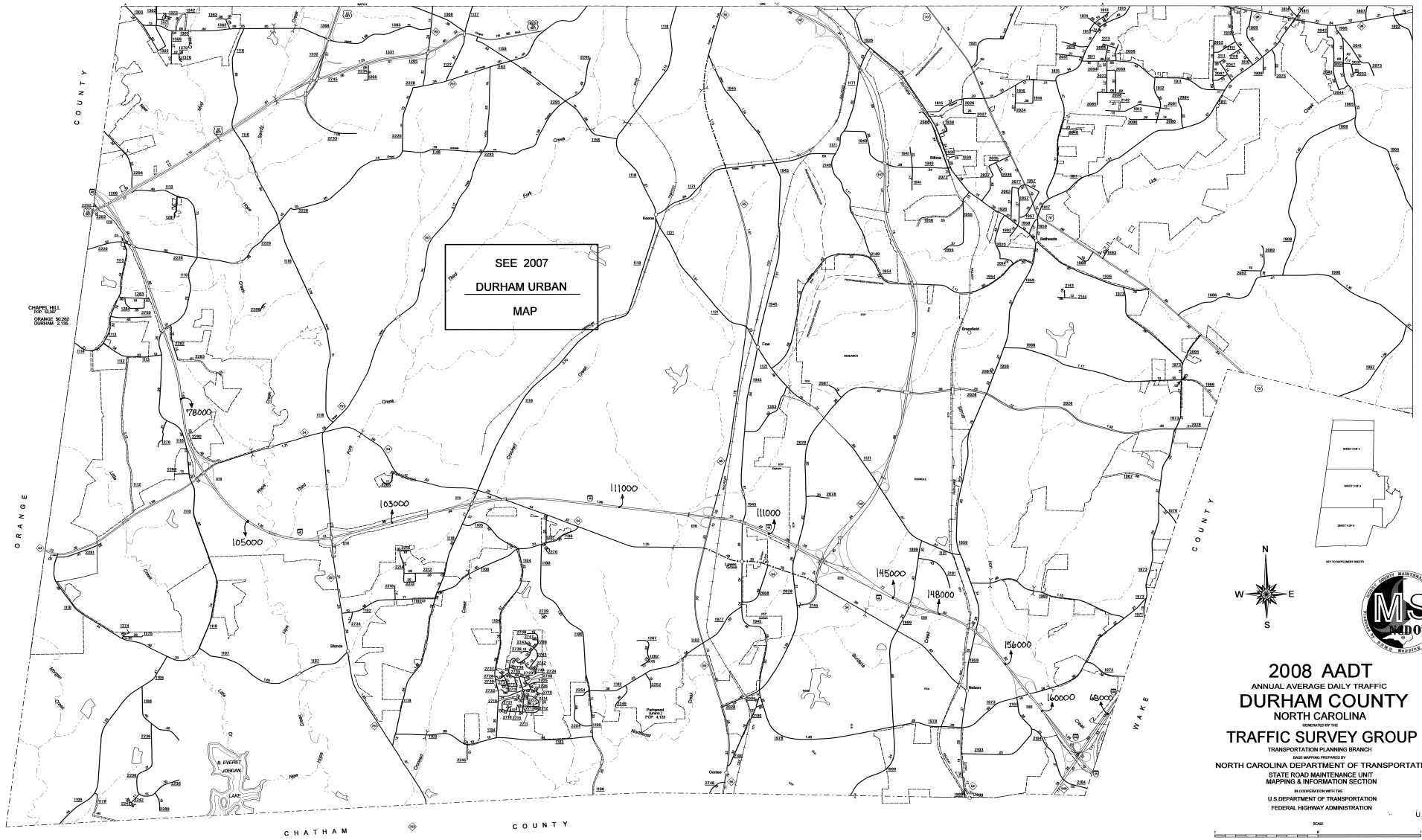
757-478-6761
DataCollectionGroup@hotmail.com

Site Code: rthfork 16
Station ID:
George King
Just N of NC54
Latitude: 0' 0.000 Undefined

Start	16-Sep-09		17-Sep-09		18-Sep-09		19-Sep-09		20-Sep-09		21-Sep-09		22-Sep-09		Week Average	
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
01:00	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
02:00	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
03:00	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
04:00	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
05:00	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
06:00	1	1	3	0	*	*	*	*	*	*	*	*	*	*	2	0
07:00	3	4	3	5	*	*	*	*	*	*	*	*	*	*	3	4
08:00	**8**	9	**12**	**7**	*	*	*	*	*	*	*	*	*	*	**10**	**8**
09:00	7	6	2	4	*	*	*	*	*	*	*	*	*	*	4	5
10:00	6	**12**	2	2	*	*	*	*	*	*	*	*	*	*	4	7
11:00	6	6	2	6	*	*	*	*	*	*	*	*	*	*	4	6
12:00 PM	**10**	5	5	3	*	*	*	*	*	*	*	*	*	*	**8**	4
01:00	8	**12**	3	2	*	*	*	*	*	*	*	*	*	*	6	7
02:00	10	10	2	1	*	*	*	*	*	*	*	*	*	*	6	6
03:00	8	9	**8**	**7**	*	*	*	*	*	*	*	*	*	*	8	**8**
04:00	7	5	7	7	*	*	*	*	*	*	*	*	*	*	7	6
05:00	9	5	5	5	*	*	*	*	*	*	*	*	*	*	7	5
06:00	1	7	3	4	*	*	*	*	*	*	*	*	*	*	2	6
07:00	1	1	2	2	*	*	*	*	*	*	*	*	*	*	2	2
08:00	5	2	1	1	*	*	*	*	*	*	*	*	*	*	3	2
09:00	1	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
10:00	0	0	0	0	*	*	*	*	*	*	*	*	*	*	0	0
11:00	0	0	1	1	*	*	*	*	*	*	*	*	*	*	0	0
Total	91	94	61	57	0	0	0	0	0	0	0	0	0	0	76	76
Day	185		118		0		0		0		0		0		152	
AM Peak	08:00	10:00	08:00	08:00											08:00	08:00
Vol.	8	12	12	7											10	8
PM Peak	12:00	13:00	15:00	15:00											12:00	15:00
Vol.	10	12	8	7											8	8

Comb. Total	185	118	0	0	0	0	0	152

ADT ADT 152 AADT 152



2008 AADT

ANNUAL AVERAGE DAILY TRAFFIC

DURHAM COUNTY

NORTH CAROLINA

GENERATED BY THE

TRAFFIC SURVEY GROUP

TRANSPORTATION PLANNING BRANCH

BASE MAPPING PREPARED BY

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE ROAD MAINTENANCE UNIT

MAPPING & INFORMATION SECTION

IN COOPERATION WITH THE

U.S.DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

097

SCALE

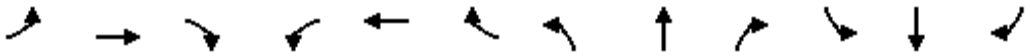
0 MILE

SHEET 4 OF 4

Traffic Survey Group, 1547 Mail Service Center, Raleigh, N.C. 27699-1547

DIVISION 5 DISTRICT 2 DURHAM COUNTY NORTH CAROLINA 063

Synchro Model Outputs



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	1952	12	4	2908	3	20	0	28	32	1	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-3%			-2%			3%	
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3504	1567	1796	3592		1787	1599		1743	1576	
Flt Permitted	0.05	1.00	1.00	0.06	1.00		1.00	1.00		0.74	1.00	
Satd. Flow (perm)	100	3504	1567	120	3592		1881	1599		1356	1576	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	1952	12	4	2908	3	20	0	28	32	1	16
RTOR Reduction (vph)	0	0	1	0	0	0	0	27	0	0	15	0
Lane Group Flow (vph)	24	1952	11	4	2911	0	20	1	0	32	2	0
Turn Type	pm+pt		Perm	pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	76.6	73.6	73.6	72.8	71.7		5.5	3.3		11.1	6.1	
Effective Green, g (s)	76.6	73.6	73.6	72.8	71.7		5.5	3.3		11.1	6.1	
Actuated g/C Ratio	0.77	0.74	0.74	0.73	0.72		0.06	0.03		0.11	0.06	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	126	2579	1153	106	2575		101	53		170	96	
v/s Ratio Prot	c0.01	0.56		0.00	c0.81		0.00	0.00		c0.01	0.00	
v/s Ratio Perm	0.14		0.01	0.03			0.01			c0.01		
v/c Ratio	0.19	0.76	0.01	0.04	1.13		0.20	0.02		0.19	0.02	
Uniform Delay, d1	43.8	7.9	3.5	16.7	14.1		44.6	46.8		40.5	44.1	
Progression Factor	1.00	1.00	1.00	1.38	2.15		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	2.1	0.0	0.0	59.3		1.0	0.1		0.5	0.1	
Delay (s)	44.6	10.0	3.5	23.1	89.7		45.5	46.9		41.0	44.2	
Level of Service	D	A	A	C	F		D	D		D	D	
Approach Delay (s)		10.4			89.6			46.3			42.1	
Approach LOS		B			F			D			D	

Intersection Summary			
HCM Average Control Delay	57.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	199	192	811	265	124	235	198	2413	55	271	3215	377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			1%			0%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1778	1872	1591	1761	1853	1575	1761	5043		1770	5005	
Flt Permitted	0.56	1.00	1.00	0.21	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1052	1872	1591	390	1853	1575	1761	5043		1770	5005	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	199	192	811	265	124	235	198	2413	55	271	3215	377
RTOR Reduction (vph)	0	0	232	0	0	95	0	1	0	0	7	0
Lane Group Flow (vph)	199	192	579	265	124	140	198	2467	0	271	3585	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot			Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	23.0	14.0	14.0	33.0	19.0	19.0	14.0	114.0		34.0	134.0	
Effective Green, g (s)	23.0	14.0	14.0	33.0	19.0	19.0	14.0	114.0		34.0	134.0	
Actuated g/C Ratio	0.12	0.07	0.07	0.16	0.10	0.10	0.07	0.57		0.17	0.67	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	154	131	111	160	176	150	123	2875		301	3353	
v/s Ratio Prot	0.06	0.10		c0.12	0.07		c0.11	0.49		0.15	c0.72	
v/s Ratio Perm	0.09		c0.36	0.16		0.09						
v/c Ratio	1.29	1.47	5.22	1.66	0.70	0.93	1.61	0.86		0.90	1.07	
Uniform Delay, d1	87.6	93.0	93.0	79.5	87.8	89.9	93.0	36.2		81.3	33.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.07	1.17		0.78	0.71	
Incremental Delay, d2	171.2	246.3	1918.9	321.4	21.1	57.5	305.0	3.2		14.2	33.4	
Delay (s)	258.8	339.3	2011.9	400.9	108.8	147.4	404.2	45.5		77.5	56.9	
Level of Service	F	F	F	F	F	F	F	D		E	E	
Approach Delay (s)		1454.5			247.4			72.1			58.4	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM Average Control Delay	277.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.54		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	127.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	186	2	420	0	0	0	0	1094	2395	15	3443	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%			-1%	
Total Lost time (s)		6.0	6.0					6.5	6.5	6.5	6.5	
Lane Util. Factor		1.00	1.00					0.91	0.91	1.00	0.91	
Frt		1.00	0.85					0.92	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1766	1575					3124	1441	1778	5111	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1766	1575					3124	1441	1778	5111	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	186	2	420	0	0	0	0	1094	2395	15	3443	0
RTOR Reduction (vph)	0	0	2	0	0	0	0	88	368	0	0	0
Lane Group Flow (vph)	0	188	418	0	0	0	0	2204	829	15	3443	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		6						4		3	8	
Permitted Phases	6		6						4			
Actuated Green, G (s)		39.0	39.0					127.9	127.9	14.1	148.5	
Effective Green, g (s)		39.0	39.0					127.9	127.9	14.1	148.5	
Actuated g/C Ratio		0.20	0.20					0.64	0.64	0.07	0.74	
Clearance Time (s)		6.0	6.0					6.5	6.5	6.5	6.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		344	307					1998	922	125	3795	
v/s Ratio Prot								c0.71		0.01	c0.67	
v/s Ratio Perm		0.11	c0.27						0.58			
v/c Ratio		0.55	1.36					1.12dr	0.90	0.12	0.91	
Uniform Delay, d1		72.5	80.5					36.0	30.6	87.1	20.3	
Progression Factor		1.00	1.00					1.15	3.48	0.65	0.54	
Incremental Delay, d2		6.1	182.9					47.3	1.5	0.2	4.1	
Delay (s)		78.7	263.4					88.7	107.8	57.1	15.1	
Level of Service		E	F					F	F	E	B	
Approach Delay (s)		206.3			0.0			95.2			15.3	
Approach LOS		F			A			F			B	

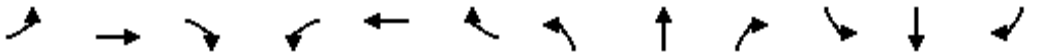
Intersection Summary			
HCM Average Control Delay	67.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	128.4%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Volume (vph)	24	0	338	0	0	407	873	0	0	1121	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%		0%			-3%			3%	
Total Lost time (s)		6.5	6.5			6.0	6.5			6.5	6.5
Lane Util. Factor		1.00	1.00			1.00	0.95			1.00	1.00
Frt		1.00	0.85			1.00	1.00			1.00	0.85
Flt Protected		0.95	1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)		1752	1567			1796	3592			1835	1560
Flt Permitted		0.95	1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)		1752	1567			1796	3592			1835	1560
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	24	0	338	0	0	407	873	0	0	1121	101
RTOR Reduction (vph)	0	0	223	0	0	0	0	0	0	0	18
Lane Group Flow (vph)	0	24	115	0	0	407	873	0	0	1121	83
Turn Type	Perm		Perm			Prot					Perm
Protected Phases		2				7	4			8	
Permitted Phases	2		2								8
Actuated Green, G (s)		28.5	28.5			29.0	158.5			123.5	123.5
Effective Green, g (s)		28.5	28.5			29.0	158.5			123.5	123.5
Actuated g/C Ratio		0.14	0.14			0.14	0.79			0.62	0.62
Clearance Time (s)		6.5	6.5			6.0	6.5			6.5	6.5
Vehicle Extension (s)		3.0	3.0			3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		250	223			260	2847			1133	963
v/s Ratio Prot						c0.23	0.24			c0.61	
v/s Ratio Perm		0.01	c0.07								0.05
v/c Ratio		0.10	0.52			1.57	0.31			0.99	0.09
Uniform Delay, d1		74.6	79.4			85.5	5.7			37.6	15.5
Progression Factor		1.00	1.00			1.08	0.96			1.08	0.68
Incremental Delay, d2		0.8	8.3			262.1	0.1			22.3	0.2
Delay (s)		75.3	87.7			354.6	5.6			63.0	10.7
Level of Service		E	F			F	A			E	B
Approach Delay (s)		86.8		0.0			116.6			58.7	
Approach LOS		F		A			F			E	

Intersection Summary			
HCM Average Control Delay	88.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	149.2%	ICU Level of Service	H
Analysis Period (min)	15		

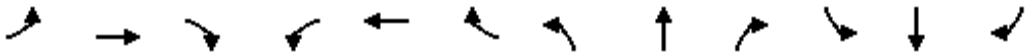
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	650	300	70	1196	52	11	0	6	8	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-4%			4%			5%			-2%	
Total Lost time (s)	5.5	6.7		6.5	6.7			6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.95		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	3439		1734	3447			1725	1544		1787	1599
Flt Permitted	0.16	1.00		0.30	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	297	3439		550	3447			1816	1544		1881	1599
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	260	650	300	70	1196	52	11	0	6	8	0	8
RTOR Reduction (vph)	0	28	0	0	2	0	0	0	6	0	0	8
Lane Group Flow (vph)	260	922	0	70	1246	0	0	11	0	0	8	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	84.0	74.1		65.8	62.4			2.8	2.8		2.8	2.8
Effective Green, g (s)	84.0	74.1		65.8	62.4			2.8	2.8		2.8	2.8
Actuated g/C Ratio	0.84	0.74		0.66	0.62			0.03	0.03		0.03	0.03
Clearance Time (s)	5.5	6.7		6.5	6.7			6.5	6.5		6.5	6.5
Vehicle Extension (s)	1.0	2.0		1.0	2.0			1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	492	2548		402	2151			51	43		53	45
v/s Ratio Prot	c0.09	0.27		0.01	c0.36							
v/s Ratio Perm	0.36			0.11				c0.01	0.00		0.00	0.00
v/c Ratio	0.53	0.36		0.17	0.58			0.22	0.00		0.15	0.00
Uniform Delay, d1	6.9	4.6		6.7	11.1			47.5	47.2		47.4	47.2
Progression Factor	3.07	0.75		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.4		0.1	1.1			0.8	0.0		0.5	0.0
Delay (s)	21.5	3.8		6.8	12.2			48.3	47.3		47.9	47.3
Level of Service	C	A		A	B			D	D		D	D
Approach Delay (s)		7.6			11.9			47.9			47.6	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.7
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

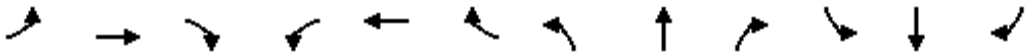
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	1817	432	128	2631	17	224	17	162	45	33	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-4%			2%			-2%	
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.96		1.00	1.00		1.00	0.94		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.96	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.86		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1718	4624		1787	5131		1718	1472		1708	1723	
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00		0.46	1.00	
Satd. Flow (perm)	1718	4624		1787	5131		1237	1472		820	1723	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	21	1817	432	128	2631	17	224	17	162	45	33	33
RTOR Reduction (vph)	0	26	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	21	2223	0	128	2648	0	224	179	0	45	66	0
Confl. Peds. (#/hr)	4		43	43		4			38	38		
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	4%	4%	4%	3%	3%	3%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	5.2	81.5		17.8	94.1		29.7	29.7		29.7	29.7	
Effective Green, g (s)	9.2	85.5		21.8	98.1		33.7	33.7		33.7	33.7	
Actuated g/C Ratio	0.06	0.57		0.15	0.65		0.22	0.22		0.22	0.22	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	105	2636		260	3356		278	331		184	387	
v/s Ratio Prot	0.01	c0.48		0.07	c0.52			0.12			0.04	
v/s Ratio Perm							c0.18			0.05		
v/c Ratio	0.20	0.84		0.49	0.79		0.81	0.54		0.24	0.17	
Uniform Delay, d1	66.9	26.7		59.0	18.5		55.1	51.3		47.7	46.9	
Progression Factor	1.00	1.00		0.70	0.22		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	3.5		1.1	1.5		15.5	1.8		0.7	0.2	
Delay (s)	67.8	30.2		42.2	5.4		70.6	53.1		48.4	47.1	
Level of Service	E	C		D	A		E	D		D	D	
Approach Delay (s)		30.6			7.1			62.8			47.6	
Approach LOS		C			A			E			D	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

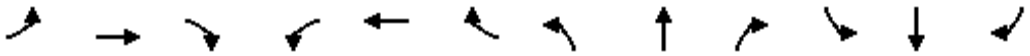
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	1975	41	91	2675	37	12	4	144	32	24	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	11	12	12	12	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.88			0.94	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.98	
Satd. Flow (prot)	1736	4970		1752	4856			1640			1603	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.53	
Satd. Flow (perm)	1736	4970		1752	4856			1583			855	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	1975	41	91	2675	37	12	4	144	32	24	49
RTOR Reduction (vph)	0	1	0	0	0	0	0	128	0	0	24	0
Lane Group Flow (vph)	8	2015	0	91	2712	0	0	32	0	0	81	0
Confl. Peds. (#/hr)	9		5	5		9	4		1	1		4
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	3.8	104.6		13.5	114.3			13.9			13.9	
Effective Green, g (s)	6.8	107.6		16.5	117.3			16.9			16.9	
Actuated g/C Ratio	0.05	0.72		0.11	0.78			0.11			0.11	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	79	3565		193	3797			178			96	
v/s Ratio Prot	0.00	c0.41		0.05	c0.56							
v/s Ratio Perm								0.02			c0.09	
v/c Ratio	0.10	0.57		0.47	0.71			0.18			0.84	
Uniform Delay, d1	68.7	10.1		62.7	8.1			60.3			65.3	
Progression Factor	0.70	0.30		1.24	0.54			1.00			1.00	
Incremental Delay, d2	0.5	0.6		1.3	0.8			0.5			45.7	
Delay (s)	48.4	3.6		79.0	5.2			60.8			111.0	
Level of Service	D	A		E	A			E			F	
Approach Delay (s)		3.8			7.6			60.8			111.0	
Approach LOS		A			A			E			F	

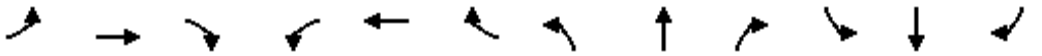
Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	132	1907	112	115	2671	16	13	0	4	12	25	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	5136	1487	1769	5085	1531	1716	1538		1752	1596	
Flt Permitted	0.03	1.00	1.00	0.09	1.00	1.00	0.30	1.00		0.76	1.00	
Satd. Flow (perm)	66	5136	1487	165	5085	1531	547	1538		1393	1596	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	132	1907	112	115	2671	16	13	0	4	12	25	119
RTOR Reduction (vph)	0	0	26	0	0	3	0	4	0	0	109	0
Lane Group Flow (vph)	132	1907	86	115	2671	13	13	0	0	12	35	0
Confl. Peds. (#/hr)	4		15	15		4	1					1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	3%	3%	3%
Turn Type	pm+pt		Perm	pm+pt		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	121.9	110.6	110.6	117.7	108.5	108.5	9.2	9.2		9.2	9.2	
Effective Green, g (s)	129.9	114.6	114.6	125.7	112.5	112.5	13.2	13.2		13.2	13.2	
Actuated g/C Ratio	0.87	0.76	0.76	0.84	0.75	0.75	0.09	0.09		0.09	0.09	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	233	3924	1136	279	3814	1148	48	135		123	140	
v/s Ratio Prot	c0.06	0.37		0.04	c0.53			0.00			0.02	
v/s Ratio Perm	0.44		0.06	0.31		0.01	c0.02			0.01		
v/c Ratio	0.57	0.49	0.08	0.41	0.70	0.01	0.27	0.00		0.10	0.25	
Uniform Delay, d1	41.0	6.6	4.4	4.5	9.9	4.7	63.9	62.4		62.9	63.8	
Progression Factor	0.85	1.20	2.61	4.48	0.46	0.04	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7	0.4	0.1	0.6	0.7	0.0	3.0	0.0		0.3	1.0	
Delay (s)	37.7	8.3	11.7	21.0	5.2	0.2	66.9	62.4		63.3	64.8	
Level of Service	D	A	B	C	A	A	E	E		E	E	
Approach Delay (s)		10.3			5.8			65.9			64.6	
Approach LOS		B			A			E			E	

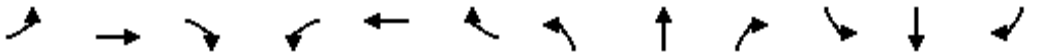
Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	1611	152	864	2571	57	87	15	39	70	33	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	12	12	12	12	12	12	12
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.91	0.95	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	5036	1444	3433	5085	1565	1417	1367	1268	3400	1845	1568
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	5036	1444	3433	5085	1565	1417	1367	1268	3400	1845	1568
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	1611	152	864	2571	57	87	15	39	70	33	144
RTOR Reduction (vph)	0	0	52	0	0	11	0	2	25	0	0	114
Lane Group Flow (vph)	160	1611	100	864	2571	46	53	51	10	70	33	30
Confl. Peds. (#/hr)	1		3	3		1	4		1	1		4
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	21%	21%	21%	3%	3%	3%
Turn Type	Prot		pm+ov	Prot		pm+ov	Split		pt+ov	Split		pt+ov
Protected Phases	5	2	4	1	6	3	4	4	4 1	3	3	3 5
Permitted Phases			2			6						
Actuated Green, G (s)	12.4	77.1	88.3	22.0	86.7	95.4	11.2	11.2	33.2	8.7	8.7	21.1
Effective Green, g (s)	17.4	81.1	98.3	27.0	90.7	105.4	16.2	16.2	43.2	13.7	13.7	31.1
Actuated g/C Ratio	0.12	0.54	0.66	0.18	0.60	0.70	0.11	0.11	0.29	0.09	0.09	0.21
Clearance Time (s)	8.0	7.0	8.0	8.0	7.0	8.0	8.0	8.0		8.0	8.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	394	2723	975	618	3075	1100	153	148	365	311	169	325
v/s Ratio Prot	0.05	c0.32	0.01	c0.25	c0.51	0.00	0.04	c0.04	0.01	c0.02	0.02	0.02
v/s Ratio Perm			0.06			0.03						
v/c Ratio	0.41	0.59	0.10	1.40	0.84	0.04	0.35	0.35	0.03	0.23	0.20	0.09
Uniform Delay, d1	61.5	23.3	9.5	61.5	23.7	6.8	62.0	62.0	38.3	63.2	63.1	48.0
Progression Factor	0.95	1.22	3.94	0.74	0.37	0.41	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.8	0.0	182.2	0.9	0.0	1.4	1.4	0.0	0.4	0.6	0.1
Delay (s)	59.0	29.3	37.7	227.7	9.7	2.8	63.4	63.4	38.4	63.6	63.6	48.2
Level of Service	E	C	D	F	A	A	E	E	D	E	E	D
Approach Delay (s)		32.4			63.6			57.2			54.6	
Approach LOS		C			E			E			D	

Intersection Summary			
HCM Average Control Delay	52.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

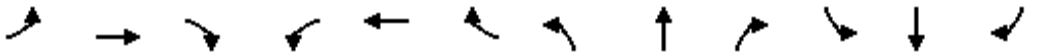
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	1612	104	8	2844	92	632	60	40	128	8	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.2	3.0	3.0	2.8	3.2	3.2		2.8	2.8	
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.95	0.95		0.95	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96		0.95	0.97	
Satd. Flow (prot)	1770	4471	1556	1770	5085	1553	1681	1676		1681	1647	
Flt Permitted	0.05	1.00	1.00	0.06	1.00	1.00	0.95	0.96		0.95	0.97	
Satd. Flow (perm)	90	4471	1556	117	5085	1553	1681	1676		1681	1647	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	1612	104	8	2844	92	632	60	40	128	8	16
RTOR Reduction (vph)	0	0	24	0	0	25	0	3	0	0	7	0
Lane Group Flow (vph)	4	1612	80	8	2844	67	367	362	0	77	68	0
Confl. Peds. (#/hr)	1		1	1		1	6		7	7		6
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	Split			Split		
Protected Phases	5	2	4	1	6	3	4	4		3	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	80.2	78.8	107.1	80.0	78.6	92.1	28.3	28.3		13.5	13.5	
Effective Green, g (s)	88.6	82.6	115.1	88.0	82.4	100.5	32.3	32.3		17.7	17.7	
Actuated g/C Ratio	0.59	0.55	0.77	0.59	0.55	0.67	0.22	0.22		0.12	0.12	
Clearance Time (s)	7.2	6.8	7.2	7.0	6.8	7.0	7.2	7.2		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	116	2462	1194	128	2793	1041	362	361		198	194	
v/s Ratio Prot	0.00	0.36	0.01	c0.00	c0.56	0.01	c0.22	0.22		c0.05	0.04	
v/s Ratio Perm	0.02		0.04	0.03		0.04						
v/c Ratio	0.03	0.65	0.07	0.06	1.02	0.06	1.01	1.00		0.39	0.35	
Uniform Delay, d1	33.4	23.7	4.3	17.6	33.8	8.5	58.8	58.8		61.2	60.9	
Progression Factor	0.11	0.18	0.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.1	0.0	0.2	21.8	0.0	50.8	48.0		1.3	1.1	
Delay (s)	3.8	5.5	0.0	17.8	55.6	8.6	109.7	106.8		62.4	62.0	
Level of Service	A	A	A	B	E	A	F	F		E	E	
Approach Delay (s)		5.2			54.0			108.3			62.2	
Approach LOS		A			D			F			E	

Intersection Summary			
HCM Average Control Delay	46.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	2549	12	36	1892	0	12	1	16	28	3	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-3%			-2%			3%	
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.86		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3504	1567	1796	3592		1787	1616		1743	1725	
Flt Permitted	0.07	1.00	1.00	0.05	1.00		1.00	1.00		0.75	1.00	
Satd. Flow (perm)	132	3504	1567	102	3592		1881	1616		1369	1725	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	2549	12	36	1892	0	12	1	16	28	3	2
RTOR Reduction (vph)	0	0	1	0	0	0	0	16	0	0	2	0
Lane Group Flow (vph)	4	2549	11	36	1892	0	12	1	0	28	3	0
Turn Type	pm+pt		Perm	pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	71.5	70.4	70.4	79.1	74.2		4.1	2.8		11.3	6.4	
Effective Green, g (s)	71.5	70.4	70.4	79.1	74.2		4.1	2.8		11.3	6.4	
Actuated g/C Ratio	0.72	0.70	0.70	0.79	0.74		0.04	0.03		0.11	0.06	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	112	2467	1103	164	2665		76	45		173	110	
v/s Ratio Prot	0.00	c0.73		c0.01	0.53		0.00	0.00		c0.01	0.00	
v/s Ratio Perm	0.03		0.01	0.16			0.00			c0.01		
v/c Ratio	0.04	1.03	0.01	0.22	0.71		0.16	0.03		0.16	0.03	
Uniform Delay, d1	15.7	14.8	4.4	42.3	7.0		45.3	47.3		40.2	43.9	
Progression Factor	1.00	1.00	1.00	1.32	1.36		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	27.4	0.0	0.3	0.8		1.0	0.3		0.4	0.1	
Delay (s)	15.8	42.2	4.4	56.1	10.3		46.2	47.6		40.6	44.0	
Level of Service	B	D	A	E	B		D	D		D	D	
Approach Delay (s)		41.9			11.2			47.0			41.1	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	164	173	461	248	269	158	177	3105	120	441	2381	412
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			1%			0%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1778	1872	1591	1761	1853	1575	1761	5032		1770	4973	
Flt Permitted	0.29	1.00	1.00	0.21	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	535	1872	1591	390	1853	1575	1761	5032		1770	4973	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	164	173	461	248	269	158	177	3105	120	441	2381	412
RTOR Reduction (vph)	0	0	231	0	0	63	0	2	0	0	12	0
Lane Group Flow (vph)	164	173	230	248	269	95	177	3223	0	441	2781	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot			Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	23.0	14.0	14.0	33.0	19.0	19.0	14.0	114.0		34.0	134.0	
Effective Green, g (s)	23.0	14.0	14.0	33.0	19.0	19.0	14.0	114.0		34.0	134.0	
Actuated g/C Ratio	0.12	0.07	0.07	0.16	0.10	0.10	0.07	0.57		0.17	0.67	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	117	131	111	160	176	150	123	2868		301	3332	
v/s Ratio Prot	0.06	0.09		c0.11	c0.15		c0.10	c0.64		c0.25	0.56	
v/s Ratio Perm	0.10		c0.14	0.15		0.06						
v/c Ratio	1.40	1.32	2.08	1.55	1.53	0.63	1.44	1.12		1.47	0.83	
Uniform Delay, d1	86.7	93.0	93.0	79.5	90.5	87.1	93.0	43.0		83.0	24.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.91		0.97	0.82	
Incremental Delay, d2	224.1	187.8	513.4	275.9	264.4	18.5	227.8	59.5		219.8	1.6	
Delay (s)	310.8	280.8	606.4	355.4	354.9	105.6	316.9	98.8		300.0	21.9	
Level of Service	F	F	F	F	F	F	F	F		F	C	
Approach Delay (s)		475.0			296.7			110.2			59.8	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	141.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	130.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	129	0	306	0	0	0	0	1380	2434	377	2928	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			0%			-1%	
Total Lost time (s)		6.0	6.0					6.5	6.5	6.5	6.5	
Lane Util. Factor		1.00	1.00					0.91	0.91	1.00	0.91	
Frt		1.00	0.85					0.93	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1761	1575					3152	1441	1778	5111	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1761	1575					3152	1441	1778	5111	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	129	0	306	0	0	0	0	1380	2434	377	2928	0
RTOR Reduction (vph)	0	0	4	0	0	0	0	79	280	0	0	0
Lane Group Flow (vph)	0	129	302	0	0	0	0	2518	937	377	2928	0
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		6						4		3	8	
Permitted Phases	6		6						4			
Actuated Green, G (s)		39.0	39.0					118.5	118.5	23.5	148.5	
Effective Green, g (s)		39.0	39.0					118.5	118.5	23.5	148.5	
Actuated g/C Ratio		0.20	0.20					0.59	0.59	0.12	0.74	
Clearance Time (s)		6.0	6.0					6.5	6.5	6.5	6.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		343	307					1868	854	209	3795	
v/s Ratio Prot								c0.80		c0.21	0.57	
v/s Ratio Perm		0.07	c0.19						0.65			
v/c Ratio		0.38	0.98					1.35	1.10	1.80	0.77	
Uniform Delay, d1		69.9	80.2					40.8	40.8	88.2	15.5	
Progression Factor		1.00	1.00					0.23	0.84	0.83	0.72	
Incremental Delay, d2		3.1	47.4					156.8	46.0	376.7	1.6	
Delay (s)		73.1	127.6					166.2	80.1	449.8	12.8	
Level of Service		E	F					F	F	F	B	
Approach Delay (s)		111.4			0.0			138.7			62.6	
Approach LOS		F			A			F			E	

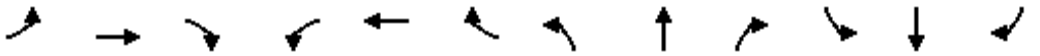
Intersection Summary			
HCM Average Control Delay	103.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	144.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL2	NBL	NBR	SEL	SER	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											
Volume (vph)	32	0	48	0	0	368	1141	0	0	893	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%		0%			-3%			3%	
Total Lost time (s)		6.5	6.5			6.5	6.0			6.5	6.5
Lane Util. Factor		1.00	1.00			1.00	0.95			1.00	1.00
Frt		1.00	0.85			1.00	1.00			1.00	0.85
Flt Protected		0.95	1.00			0.95	1.00			1.00	1.00
Satd. Flow (prot)		1752	1567			1796	3592			1835	1560
Flt Permitted		0.95	1.00			0.95	1.00			1.00	1.00
Satd. Flow (perm)		1752	1567			1796	3592			1835	1560
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	0	48	0	0	368	1141	0	0	893	167
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	0	0	37
Lane Group Flow (vph)	0	32	7	0	0	368	1141	0	0	893	130
Turn Type	Perm		Perm			Prot					Perm
Protected Phases		2				7	4			8	
Permitted Phases	2		2								8
Actuated Green, G (s)		28.5	28.5			28.5	159.0			123.5	123.5
Effective Green, g (s)		28.5	28.5			28.5	159.0			123.5	123.5
Actuated g/C Ratio		0.14	0.14			0.14	0.80			0.62	0.62
Clearance Time (s)		6.5	6.5			6.5	6.0			6.5	6.5
Vehicle Extension (s)		3.0	3.0			3.0	3.0			3.0	3.0
Lane Grp Cap (vph)		250	223			256	2856			1133	963
v/s Ratio Prot						c0.20	0.32			c0.49	
v/s Ratio Perm		0.02	0.00								0.08
v/c Ratio		0.13	0.03			1.44	0.40			0.79	0.13
Uniform Delay, d1		74.9	73.9			85.8	6.2			28.5	16.0
Progression Factor		1.00	1.00			0.99	0.53			1.00	1.11
Incremental Delay, d2		1.1	0.3			198.9	0.0			5.2	0.3
Delay (s)		76.0	74.1			284.0	3.3			33.8	17.9
Level of Service		E	E			F	A			C	B
Approach Delay (s)		74.8		0.0			71.7			31.3	
Approach LOS		E		A			E			C	

Intersection Summary			
HCM Average Control Delay	55.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	200.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	141.2%	ICU Level of Service	H
Analysis Period (min)	15		

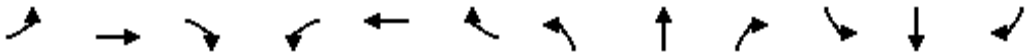
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	1150	30	9	631	0	262	0	94	80	0	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-4%			4%			5%			-2%	
Total Lost time (s)	5.5	6.7		6.5	6.7			6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	3596		1734	3468			1725	1544		1787	1599
Flt Permitted	0.40	1.00		0.17	1.00			0.70	1.00		0.42	1.00
Satd. Flow (perm)	754	3596		309	3468			1280	1544		798	1599
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	9	1150	30	9	631	0	262	0	94	80	0	212
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	72	0	0	163
Lane Group Flow (vph)	9	1178	0	9	631	0	0	262	22	0	80	49
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	57.6	56.7		58.2	57.5			22.9	22.9		22.9	22.9
Effective Green, g (s)	57.6	56.7		58.2	57.5			22.9	22.9		22.9	22.9
Actuated g/C Ratio	0.58	0.57		0.58	0.57			0.23	0.23		0.23	0.23
Clearance Time (s)	5.5	6.7		6.5	6.7			6.5	6.5		6.5	6.5
Vehicle Extension (s)	1.0	2.0		1.0	2.0			1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	444	2039		190	1994			293	354		183	366
v/s Ratio Prot	0.00	c0.33		c0.00	0.18							
v/s Ratio Perm	0.01			0.03				c0.20	0.01		0.10	0.03
v/c Ratio	0.02	0.58		0.05	0.32			0.89	0.06		0.44	0.13
Uniform Delay, d1	9.1	13.9		10.2	11.0			37.4	30.1		33.0	30.7
Progression Factor	1.09	1.25		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	1.1		0.0	0.4			26.7	0.0		0.6	0.1
Delay (s)	9.9	18.5		10.3	11.5			64.1	30.2		33.6	30.7
Level of Service	A	B		B	B			E	C		C	C
Approach Delay (s)		18.5			11.4			55.1			31.5	
Approach LOS		B			B			E			C	

Intersection Summary			
HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

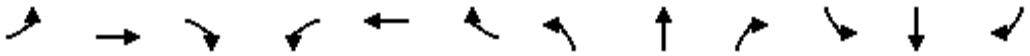
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	53	2595	33	143	2151	29	141	12	76	33	21	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-4%			2%			-2%	
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.94		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.96	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.87		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	4965		1805	5174		1769	1531		1659	1752	
Flt Permitted	0.95	1.00		0.95	1.00		0.74	1.00		0.60	1.00	
Satd. Flow (perm)	1735	4965		1805	5174		1375	1531		1052	1752	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	53	2595	33	143	2151	29	141	12	76	33	21	8
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	53	2627	0	143	2179	0	141	88	0	33	29	0
Confl. Peds. (#/hr)	4		43	43		4			38	38		
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	1%	1%	1%	5%	5%	5%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	8.7	93.9		14.4	99.6		20.7	20.7		20.7	20.7	
Effective Green, g (s)	12.7	97.9		18.4	103.6		24.7	24.7		24.7	24.7	
Actuated g/C Ratio	0.08	0.65		0.12	0.69		0.16	0.16		0.16	0.16	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	147	3240		221	3574		226	252		173	288	
v/s Ratio Prot	0.03	c0.53		0.08	c0.42			0.06			0.02	
v/s Ratio Perm							c0.10			0.03		
v/c Ratio	0.36	0.81		0.65	0.61		0.62	0.35		0.19	0.10	
Uniform Delay, d1	64.8	19.2		62.7	12.4		58.3	55.5		54.0	53.2	
Progression Factor	1.00	1.00		0.61	0.18		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	2.3		5.4	0.7		5.3	0.8		0.5	0.2	
Delay (s)	66.3	21.5		43.8	2.9		63.6	56.4		54.6	53.4	
Level of Service	E	C		D	A		E	E		D	D	
Approach Delay (s)		22.4			5.4			60.8			54.0	
Approach LOS		C			A			E			D	

Intersection Summary			
HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

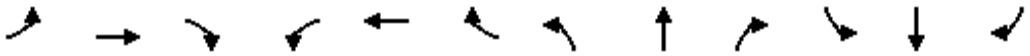
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	2659	8	138	2187	49	68	16	117	24	3	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	11	12	12	12	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.92			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1770	5083		1787	4945			1687			1568	
Flt Permitted	0.95	1.00		0.95	1.00			0.87			0.73	
Satd. Flow (perm)	1770	5083		1787	4945			1494			1174	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	37	2659	8	138	2187	49	68	16	117	24	3	28
RTOR Reduction (vph)	0	0	0	0	1	0	0	36	0	0	23	0
Lane Group Flow (vph)	37	2667	0	138	2235	0	0	165	0	0	32	0
Confl. Peds. (#/hr)	9		5	5		9	4		1	1		4
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	17.6	95.7		15.0	93.1			21.3			21.3	
Effective Green, g (s)	20.6	98.7		18.0	96.1			24.3			24.3	
Actuated g/C Ratio	0.14	0.66		0.12	0.64			0.16			0.16	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	243	3345		214	3168			242			190	
v/s Ratio Prot	0.02	c0.52		0.08	c0.45							
v/s Ratio Perm								c0.11			0.03	
v/c Ratio	0.15	0.80		0.64	0.71			0.68			0.17	
Uniform Delay, d1	57.0	18.5		63.0	17.7			59.2			54.1	
Progression Factor	0.75	0.42		1.37	0.36			1.00			1.00	
Incremental Delay, d2	0.2	1.5		4.8	1.0			7.7			0.4	
Delay (s)	42.9	9.2		91.0	7.4			66.9			54.5	
Level of Service	D	A		F	A			E			D	
Approach Delay (s)		9.7			12.2			66.9			54.5	
Approach LOS		A			B			E			D	

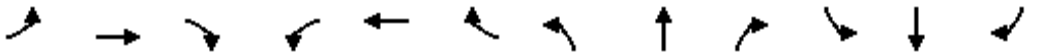
Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	2624	16	8	1982	7	112	32	64	12	1	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	5136	1487	1770	5085	1531	1786	1693		1787	1578	
Flt Permitted	0.06	1.00	1.00	0.04	1.00	1.00	0.15	1.00		0.59	1.00	
Satd. Flow (perm)	120	5136	1487	75	5085	1531	289	1693		1107	1578	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	2624	16	8	1982	7	112	32	64	12	1	280
RTOR Reduction (vph)	0	0	3	0	0	2	0	48	0	0	147	0
Lane Group Flow (vph)	160	2624	13	8	1982	5	112	48	0	12	134	0
Confl. Peds. (#/hr)	4		15	15		4	1					1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	pm+pt		Perm	pm+pt		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	114.0	105.8	105.8	96.0	94.8	94.8	22.0	22.0		22.0	22.0	
Effective Green, g (s)	118.0	109.8	109.8	104.0	98.8	98.8	26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.79	0.73	0.73	0.69	0.66	0.66	0.17	0.17		0.17	0.17	
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	274	3760	1088	111	3349	1008	50	293		192	274	
v/s Ratio Prot	c0.06	c0.51		0.00	0.39			0.03			0.08	
v/s Ratio Perm	0.40		0.01	0.05		0.00	c0.39			0.01		
v/c Ratio	0.58	0.70	0.01	0.07	0.59	0.00	2.24	0.16		0.06	0.49	
Uniform Delay, d1	27.4	11.0	5.4	10.8	14.3	8.8	62.0	52.8		51.8	56.0	
Progression Factor	1.90	0.44	0.80	1.24	2.00	1.66	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.7	0.0	0.2	0.6	0.0	616.8	0.3		0.1	1.4	
Delay (s)	53.9	5.5	4.3	13.5	29.3	14.5	678.8	53.0		52.0	57.4	
Level of Service	D	A	A	B	C	B	F	D		D	E	
Approach Delay (s)		8.3			29.1			390.0			57.1	
Approach LOS		A			C			F			E	

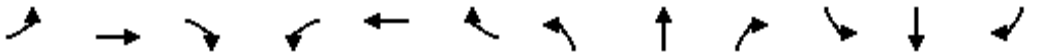
Intersection Summary			
HCM Average Control Delay	33.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	188	2418	94	52	1629	81	239	33	727	158	12	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	10	12	12	12	12	12	12	12	12	12
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.91	0.95	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1462	3467	5136	1582	1665	1442	1490	3467	1881	1599
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1462	3467	5136	1582	1665	1442	1490	3467	1881	1599
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	188	2418	94	52	1629	81	239	33	727	158	12	129
RTOR Reduction (vph)	0	0	25	0	0	33	0	141	42	0	0	59
Lane Group Flow (vph)	188	2418	69	52	1629	48	215	258	343	158	12	70
Confl. Peds. (#/hr)	1		3	3		1	4		1	1		4
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Split		pt+ov	Split		pt+ov
Protected Phases	5	2	4	1	6	3	4	4	4 1	3	3	3 5
Permitted Phases			2			6						
Actuated Green, G (s)	11.6	64.2	91.8	15.0	67.6	79.8	27.6	27.6	42.6	12.2	12.2	23.8
Effective Green, g (s)	16.6	68.2	101.8	20.0	71.6	89.8	32.6	32.6	52.6	17.2	17.2	33.8
Actuated g/C Ratio	0.11	0.45	0.68	0.13	0.48	0.60	0.22	0.22	0.35	0.11	0.11	0.23
Clearance Time (s)	8.0	7.0	8.0	8.0	7.0	8.0	8.0	8.0		8.0	8.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	380	2312	1021	462	2452	947	362	313	522	398	216	360
v/s Ratio Prot	0.05	c0.48	0.01	0.01	c0.32	0.01	0.13	c0.18	0.23	c0.05	0.01	0.04
v/s Ratio Perm			0.03			0.02						
v/c Ratio	0.49	1.05	0.07	0.11	0.66	0.05	0.59	0.82	0.66	0.40	0.06	0.19
Uniform Delay, d1	62.8	40.9	8.1	57.2	30.0	12.5	52.8	56.0	41.1	61.6	59.2	47.1
Progression Factor	1.01	0.56	0.26	0.76	0.64	0.68	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	29.9	0.0	0.1	1.3	0.0	2.6	16.0	3.0	0.7	0.1	0.3
Delay (s)	63.9	52.9	2.1	43.3	20.4	8.4	55.4	72.0	44.1	62.2	59.3	47.3
Level of Service	E	D	A	D	C	A	E	E	D	E	E	D
Approach Delay (s)		51.9			20.5			57.6			55.7	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM Average Control Delay	43.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

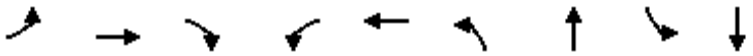
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	2545	756	92	1598	216	152	64	20	100	84	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.2	3.0	3.0	2.8	3.2	3.2		2.8	2.8	
Lane Util. Factor	1.00	*0.80	1.00	1.00	0.91	1.00	0.95	0.95		0.95	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1770	4471	1553	1770	5085	1552	1681	1692		1681	1726	
Flt Permitted	0.12	1.00	1.00	0.05	1.00	1.00	0.95	0.99		0.95	1.00	
Satd. Flow (perm)	218	4471	1553	85	5085	1552	1681	1692		1681	1726	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	2545	756	92	1598	216	152	64	20	100	84	12
RTOR Reduction (vph)	0	0	142	0	0	55	0	5	0	0	3	0
Lane Group Flow (vph)	2	2545	614	92	1598	161	117	114	0	90	103	0
Confl. Peds. (#/hr)	1		1	1		1	6		7	7		6
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	Split			Split		
Protected Phases	5	2	4	1	6	3	4	4		3	3	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	82.1	80.7	97.7	97.1	88.5	103.4	17.0	17.0		14.9	14.9	
Effective Green, g (s)	90.5	84.5	105.7	101.1	92.3	111.8	21.0	21.0		19.1	19.1	
Actuated g/C Ratio	0.60	0.56	0.70	0.67	0.62	0.75	0.14	0.14		0.13	0.13	
Clearance Time (s)	7.2	6.8	7.2	7.0	6.8	7.0	7.2	7.2		7.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	189	2519	1094	208	3129	1157	235	237		214	220	
v/s Ratio Prot	0.00	c0.57	c0.08	c0.04	0.31	0.02	0.07	0.07		0.05	c0.06	
v/s Ratio Perm	0.01		0.32	0.26		0.09						
v/c Ratio	0.01	1.01	0.56	0.44	0.51	0.14	0.50	0.48		0.42	0.47	
Uniform Delay, d1	12.8	32.8	10.8	35.3	16.2	5.4	59.6	59.5		60.3	60.7	
Progression Factor	0.37	0.38	0.16	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	12.9	0.2	1.5	0.6	0.1	1.7	1.5		1.3	1.6	
Delay (s)	4.7	25.4	1.9	36.8	16.8	5.5	61.3	61.0		61.7	62.3	
Level of Service	A	C	A	D	B	A	E	E		E	E	
Approach Delay (s)		20.0			16.5			61.1			62.0	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM Average Control Delay	22.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	1952	12	4	2911	20	28	32	17
v/c Ratio	0.14	0.67	0.01	0.02	1.00	0.14	0.07	0.18	0.12
Control Delay	7.1	8.7	4.3	4.2	30.1	39.7	0.3	39.2	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	8.7	4.3	4.2	30.1	39.7	0.3	39.2	22.6
Queue Length 50th (ft)	2	317	1	1	~2303	12	0	18	1
Queue Length 95th (ft)	9	604	8	m1	m#2276	32	0	44	22
Internal Link Dist (ft)		1117			1054		270		268
Turn Bay Length (ft)	100		80	100					
Base Capacity (vph)	269	2900	1298	287	2905	221	626	237	359
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.67	0.01	0.01	1.00	0.09	0.04	0.14	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	SWL	SWT
Lane Group Flow (vph)	199	192	811	265	124	235	198	2468	271	3592
v/c Ratio	1.29	1.47	2.36	1.66	0.70	0.96	1.61	0.86	0.90	1.07
Control Delay	229.5	302.2	642.2	363.8	109.0	94.9	357.4	45.9	79.3	57.4
Queue Delay	0.0	0.0	58.3	0.0	0.0	0.0	0.0	48.4	66.7	22.9
Total Delay	229.5	302.2	700.5	363.8	109.0	94.9	357.4	94.3	146.0	80.4
Queue Length 50th (ft)	~317	~344	~1433	~452	162	181	~371	1098	348	~1906
Queue Length 95th (ft)	#416	#530	#1702	#658	#256	#375	#563	1232	m384	m#1806
Internal Link Dist (ft)		273			318			512		308
Turn Bay Length (ft)	150			190		125	175			
Base Capacity (vph)	154	131	343	160	176	245	123	2877	301	3360
Starvation Cap Reductn	0	0	0	0	0	0	0	0	64	158
Spillback Cap Reductn	0	0	31	0	0	0	0	643	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.29	1.47	2.60	1.66	0.70	0.96	1.61	1.10	1.14	1.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Group Flow (vph)	188	420	2292	1197	15	3443
v/c Ratio	0.55	1.36	1.12dr	0.92	0.10	0.91
Control Delay	79.3	236.3	69.2	17.9	53.1	15.4
Queue Delay	0.0	0.0	75.1	122.4	0.0	10.7
Total Delay	79.3	236.3	144.3	140.2	53.1	26.1
Queue Length 50th (ft)	226	~724	~1928	1373	16	786
Queue Length 95th (ft)	322	#963	m#1427	m1174	m22	806
Internal Link Dist (ft)	289		308			531
Turn Bay Length (ft)		75			300	
Base Capacity (vph)	344	309	2124	1295	209	3795
Starvation Cap Reductn	0	0	290	357	0	397
Spillback Cap Reductn	0	0	0	0	0	202
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	1.36	1.25	1.28	0.07	1.01

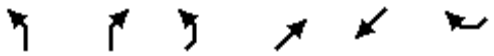
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.



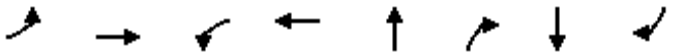
Lane Group	NBL	NBR	NEL	NET	SWT	SWR
Lane Group Flow (vph)	24	338	407	873	1121	101
v/c Ratio	0.10	0.76	1.57	0.31	0.99	0.10
Control Delay	75.9	31.4	313.7	5.6	62.0	5.9
Queue Delay	0.0	0.0	0.0	0.0	122.8	0.0
Total Delay	75.9	31.4	313.7	5.6	184.8	5.9
Queue Length 50th (ft)	28	101	~769	111	1410	27
Queue Length 95th (ft)	62	235	m#755	m107	#1741	32
Internal Link Dist (ft)	289			235	424	
Turn Bay Length (ft)		75	300			
Base Capacity (vph)	250	446	260	2847	1133	981
Starvation Cap Reductn	0	0	0	0	267	0
Spillback Cap Reductn	0	0	0	0	55	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.76	1.57	0.31	1.29	0.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

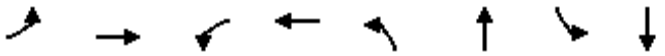
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	260	950	70	1248	11	6	8	8
v/c Ratio	0.51	0.34	0.16	0.55	0.09	0.05	0.06	0.07
Control Delay	11.7	2.9	3.7	10.7	45.2	27.0	44.6	25.8
Queue Delay	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	11.7	3.0	3.7	11.0	45.2	27.0	44.6	25.8
Queue Length 50th (ft)	49	56	4	128	7	0	5	0
Queue Length 95th (ft)	138	151	15	311	25	13	20	15
Internal Link Dist (ft)		424		395	263		384	
Turn Bay Length (ft)	140		75					
Base Capacity (vph)	507	2795	436	2288	490	421	508	438
Starvation Cap Reductn	0	716	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	401	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.46	0.16	0.66	0.02	0.01	0.02	0.02

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	2249	128	2648	224	179	45	66
v/c Ratio	0.15	0.82	0.57	0.77	0.81	0.54	0.24	0.17
Control Delay	66.2	27.7	50.8	5.4	76.3	57.0	49.6	46.4
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	66.2	27.7	50.8	5.5	76.3	57.0	49.6	46.4
Queue Length 50th (ft)	20	627	125	104	205	153	36	52
Queue Length 95th (ft)	49	720	m176	245	306	230	74	93
Internal Link Dist (ft)		815		844		425		418
Turn Bay Length (ft)	200		200				100	
Base Capacity (vph)	218	2745	226	3450	313	373	207	436
Starvation Cap Reductn	0	0	0	90	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.82	0.57	0.79	0.72	0.48	0.22	0.15

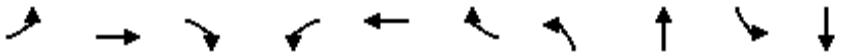
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	8	2016	91	2712	160	105
v/c Ratio	0.06	0.57	0.47	0.69	0.52	0.88
Control Delay	42.8	3.9	82.9	5.4	17.8	100.8
Queue Delay	0.0	0.1	0.0	0.1	0.0	0.0
Total Delay	42.8	4.0	82.9	5.6	17.8	100.8
Queue Length 50th (ft)	8	119	76	791	14	77
Queue Length 95th (ft)	m12	143	m110	47	83	#159
Internal Link Dist (ft)		590		780	552	391
Turn Bay Length (ft)	200		100			
Base Capacity (vph)	255	3568	245	3954	471	215
Starvation Cap Reductn	0	374	0	317	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.63	0.37	0.75	0.34	0.49

Intersection Summary

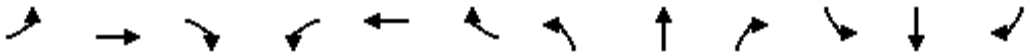
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	132	1907	112	115	2671	16	13	4	12	144
v/c Ratio	0.57	0.49	0.10	0.41	0.70	0.01	0.27	0.01	0.10	0.58
Control Delay	36.0	9.2	3.4	25.5	5.7	0.2	75.8	0.0	62.2	25.1
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	9.2	3.4	25.5	5.8	0.2	75.8	0.0	62.2	25.1
Queue Length 50th (ft)	89	219	5	19	12	0	12	0	11	23
Queue Length 95th (ft)	168	312	36	m50	1026	m0	35	0	32	92
Internal Link Dist (ft)		780			1850			353		751
Turn Bay Length (ft)	250		250	250		250				
Base Capacity (vph)	310	3924	1162	379	3814	1151	99	438	251	385
Starvation Cap Reductn	0	220	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	144	0	0	0	0	3
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.51	0.10	0.30	0.73	0.01	0.13	0.01	0.05	0.38

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



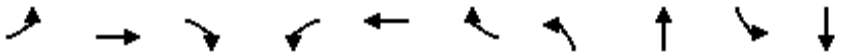
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	160	1611	152	864	2571	57	53	53	35	70	33	144
v/c Ratio	0.41	0.59	0.15	1.40	0.84	0.05	0.35	0.36	0.09	0.23	0.20	0.33
Control Delay	60.8	30.2	5.6	217.7	10.7	1.4	67.3	65.3	7.6	64.6	65.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.8	30.2	5.6	217.7	10.7	1.4	67.3	65.3	7.6	64.6	65.3	6.3
Queue Length 50th (ft)	71	514	22	~586	378	2	51	51	0	33	31	0
Queue Length 95th (ft)	102	663	69	m#613	m500	m3	97	100	22	58	66	43
Internal Link Dist (ft)		1850			997			1154			643	
Turn Bay Length (ft)	250		250	250		250	400			225		
Base Capacity (vph)	476	2724	1018	618	3076	1186	283	275	504	499	271	552
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.59	0.15	1.40	0.84	0.05	0.19	0.19	0.07	0.14	0.12	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

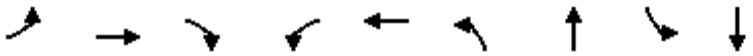


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	1612	104	8	2844	92	367	365	77	75
v/c Ratio	0.02	0.61	0.08	0.04	0.95	0.08	1.01	1.00	0.39	0.37
Control Delay	1.5	4.7	0.1	12.1	37.5	2.2	107.5	104.5	66.7	59.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.5	4.7	0.1	12.1	37.5	2.2	107.5	104.5	66.7	59.5
Queue Length 50th (ft)	0	37	0	3	870	4	378	372	75	65
Queue Length 95th (ft)	m0	42	0	11	#1222	24	#656	#650	129	120
Internal Link Dist (ft)		997			1950			1178		694
Turn Bay Length (ft)	275		275	325		300	250			
Base Capacity (vph)	245	2629	1268	258	2989	1185	362	364	271	273
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.61	0.08	0.03	0.95	0.08	1.01	1.00	0.28	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	2549	12	36	1892	12	17	28	5
v/c Ratio	0.02	0.90	0.01	0.20	0.63	0.09	0.15	0.18	0.03
Control Delay	3.8	19.7	5.6	9.1	8.4	40.7	23.9	40.1	35.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	19.7	5.6	9.1	8.4	40.7	23.9	40.1	35.0
Queue Length 50th (ft)	0	669	1	4	465	7	1	17	2
Queue Length 95th (ft)	3	#1135	8	m9	m782	22	22	40	14
Internal Link Dist (ft)		1117			1054		270		268
Turn Bay Length (ft)	100		80	100					
Base Capacity (vph)	292	2817	1261	276	3024	208	368	220	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.90	0.01	0.13	0.63	0.06	0.05	0.13	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	SWL	SWT
Lane Group Flow (vph)	164	173	461	248	269	158	177	3225	441	2793
v/c Ratio	1.40	1.32	1.35	1.55	1.53	0.74	1.44	1.12	1.47	0.84
Control Delay	275.1	251.1	200.4	321.7	316.7	69.3	283.0	96.6	270.2	21.9
Queue Delay	0.0	0.0	260.2	418.3	0.0	0.0	0.0	33.0	180.9	2.0
Total Delay	275.1	251.1	460.5	740.0	316.7	69.3	283.0	129.6	451.1	23.9
Queue Length 50th (ft)	~235	~293	~473	~405	~493	116	~313	~1779	~807	129
Queue Length 95th (ft)	#409	#472	#717	#607	#700	#224	m#399	#1808	m#1029	m131
Internal Link Dist (ft)		273			318			512		308
Turn Bay Length (ft)	150			190		125	175			
Base Capacity (vph)	117	131	342	160	176	213	123	2869	301	3344
Starvation Cap Reductn	0	0	0	0	0	0	0	0	65	389
Spillback Cap Reductn	0	0	103	96	0	0	0	178	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.40	1.32	1.93	3.88	1.53	0.74	1.44	1.20	1.87	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	SET	SER	NET	NER	SWL	SWT
Lane Group Flow (vph)	129	306	2597	1217	377	2928
v/c Ratio	0.38	0.98	1.33	1.07	1.80	0.77
Control Delay	73.7	123.3	166.3	50.8	414.0	12.9
Queue Delay	0.0	0.0	2.2	77.5	0.0	1.6
Total Delay	73.7	123.3	168.4	128.2	414.0	14.6
Queue Length 50th (ft)	150	402	~2357	~490	~751	651
Queue Length 95th (ft)	225	#621	m#1794	m159	#982	649
Internal Link Dist (ft)	289		308			531
Turn Bay Length (ft)		75			300	
Base Capacity (vph)	343	311	1948	1133	209	3795
Starvation Cap Reductn	0	0	7	162	0	645
Spillback Cap Reductn	0	0	0	0	0	613
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.98	1.34	1.25	1.80	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
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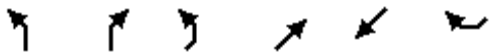
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



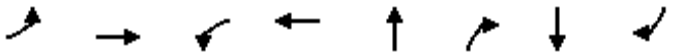
Lane Group	NBL	NBR	NEL	NET	SWT	SWR
Lane Group Flow (vph)	32	48	368	1141	893	167
v/c Ratio	0.13	0.18	1.44	0.40	0.79	0.17
Control Delay	76.6	18.1	252.8	3.3	34.6	7.6
Queue Delay	0.0	0.0	0.0	0.7	3.4	0.0
Total Delay	76.6	18.1	252.8	4.0	38.0	7.6
Queue Length 50th (ft)	37	0	~664	95	832	45
Queue Length 95th (ft)	76	45	m#496	m76	966	m83
Internal Link Dist (ft)	289			235	424	
Turn Bay Length (ft)		75	300			
Base Capacity (vph)	250	265	256	2856	1133	1000
Starvation Cap Reductn	0	0	0	1244	155	0
Spillback Cap Reductn	0	1	0	141	12	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.18	1.44	0.71	0.91	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

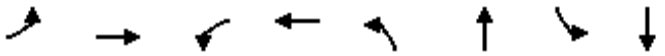
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	9	1180	9	631	262	94	80	212
v/c Ratio	0.02	0.53	0.04	0.29	0.89	0.22	0.44	0.40
Control Delay	8.2	15.7	8.3	10.5	68.6	7.5	39.6	6.5
Queue Delay	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.1
Total Delay	8.2	15.9	8.3	10.6	68.6	7.5	39.6	6.6
Queue Length 50th (ft)	3	362	2	90	159	0	43	0
Queue Length 95th (ft)	m8	573	8	165	#276	38	87	54
Internal Link Dist (ft)		424		395	263		384	
Turn Bay Length (ft)	140		75					
Base Capacity (vph)	530	2228	244	2147	346	486	215	586
Starvation Cap Reductn	0	320	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	440	0	0	0	27
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.62	0.04	0.37	0.76	0.19	0.37	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	53	2628	143	2180	141	88	33	29
v/c Ratio	0.32	0.80	0.70	0.60	0.62	0.35	0.19	0.10
Control Delay	67.8	21.5	55.2	3.1	69.6	57.8	54.1	51.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.8	21.5	55.2	3.1	69.6	57.8	54.1	51.1
Queue Length 50th (ft)	49	635	134	65	130	77	28	24
Queue Length 95th (ft)	94	817	#225	135	195	127	59	52
Internal Link Dist (ft)		815		844		425		418
Turn Bay Length (ft)	200		200				100	
Base Capacity (vph)	199	3287	205	3622	348	388	266	444
Starvation Cap Reductn	0	0	0	141	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.80	0.70	0.63	0.41	0.23	0.12	0.07

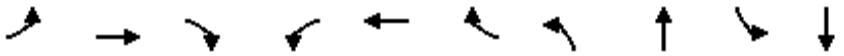
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	37	2667	138	2236	201	55
v/c Ratio	0.14	0.80	0.64	0.70	0.72	0.26
Control Delay	41.0	9.8	95.9	8.1	60.7	31.6
Queue Delay	0.0	0.9	0.0	0.0	0.0	0.0
Total Delay	41.0	10.7	95.9	8.1	60.7	31.6
Queue Length 50th (ft)	33	587	142	179	150	23
Queue Length 95th (ft)	m44	454	m#223	m227	227	63
Internal Link Dist (ft)		590		780	552	391
Turn Bay Length (ft)	200		100			
Base Capacity (vph)	295	3348	215	3211	372	288
Starvation Cap Reductn	0	368	0	2	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.89	0.64	0.70	0.54	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



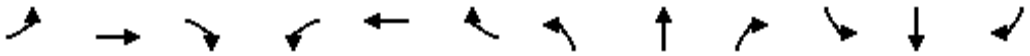
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	160	2624	16	8	1982	7	112	96	12	281
v/c Ratio	0.58	0.66	0.01	0.05	0.59	0.01	2.24	0.28	0.06	0.67
Control Delay	45.3	4.4	2.4	5.8	30.4	9.4	644.0	26.0	53.0	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	4.5	2.4	5.8	30.4	9.4	644.0	26.0	53.0	29.3
Queue Length 50th (ft)	99	100	0	1	650	2	~176	32	10	94
Queue Length 95th (ft)	m146	201	m1	m2	695	m5	#308	88	30	201
Internal Link Dist (ft)		780			1850			353		751
Turn Bay Length (ft)	250		250	250		250				
Base Capacity (vph)	339	3952	1147	284	3349	1011	50	341	192	421
Starvation Cap Reductn	0	109	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.68	0.01	0.03	0.59	0.01	2.24	0.28	0.06	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



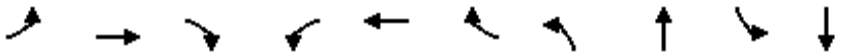
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	188	2418	94	52	1629	81	215	399	385	158	12	129
v/c Ratio	0.50	1.04	0.09	0.11	0.66	0.08	0.59	0.88	0.68	0.40	0.06	0.31
Control Delay	66.8	54.1	0.7	43.9	20.9	1.7	60.3	51.5	30.7	64.2	58.3	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.8	54.1	0.7	43.9	20.9	1.7	60.3	51.5	30.7	64.2	58.3	13.0
Queue Length 50th (ft)	81	~986	2	23	474	16	196	240	204	75	11	26
Queue Length 95th (ft)	123	#1075	m4	46	110	2	301	#467	300	110	32	64
Internal Link Dist (ft)		1850			997			1154			643	
Turn Bay Length (ft)	250		250	250		250	400			225		
Base Capacity (vph)	389	2314	1014	462	2455	1019	369	459	570	508	276	472
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	1.04	0.09	0.11	0.66	0.08	0.58	0.87	0.68	0.31	0.04	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	2	2545	756	92	1598	216	117	119	90	106
v/c Ratio	0.01	1.01	0.61	0.44	0.48	0.17	0.50	0.49	0.42	0.48
Control Delay	4.0	28.9	1.1	28.2	15.4	1.1	66.1	62.6	65.8	65.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	28.9	1.1	28.2	15.4	1.1	66.1	62.6	65.8	65.0
Queue Length 50th (ft)	0	~265	0	33	254	0	112	108	87	100
Queue Length 95th (ft)	m0	m#1230	m2	98	447	25	178	174	143	161
Internal Link Dist (ft)		997			1950			1178		694
Turn Bay Length (ft)	275		275	325		300	250			
Base Capacity (vph)	321	2516	1268	249	3322	1307	289	296	271	282
Starvation Cap Reductn	0	0	15	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	1.01	0.60	0.37	0.48	0.17	0.40	0.40	0.33	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

FDOT Generalized Level of Service Tables

TABLE 1

Generalized **Annual Average Daily** Volumes for Florida's **Urbanized Areas**[1]

9/4/09

STATE SIGNALIZED ARTERIALS

Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	9,600	15,400	16,500	***
4	Divided	29,300	35,500	36,700	***
6	Divided	45,000	53,700	55,300	***
8	Divided	60,800	71,800	73,800	***

Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	10,500	15,200	16,200
4	Divided	**	25,000	33,200	35,100
6	Divided	**	39,000	50,300	53,100
8	Divided	**	53,100	67,300	70,900

Class III/IV (more than 4.5 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	5,100	11,900	14,900
4	Divided	**	12,600	28,200	31,900
6	Divided	**	19,700	43,700	48,200
8	Divided	**	27,000	59,500	64,700

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Major City/County Roadways	- 10%
Other Signalized Roadways	- 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 15%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6.

FREEWAYS

Lanes	B	C	D	E
4	43,500	59,800	73,600	79,400
6	65,300	90,500	110,300	122,700
8	87,000	120,100	146,500	166,000
10	108,700	151,700	184,000	209,200
12	149,300	202,100	238,600	252,500

Freeway Adjustments

Auxiliary Lanes	Ramp Metering	Oversaturated Conditions*
+ 20,000	+ 5%	-10% of E

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	7,800	15,600	22,200	27,900
4	Divided	34,300	49,600	64,300	72,800
6	Divided	51,500	74,400	96,400	109,400

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane

Coverage	B	C	D	E
0-49%	**	3,200	12,100	>12,100
50-84%	2,400	3,700	>3,700	***
85-100%	6,300	>6,300	***	***

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	5,000	14,400
50-84%	**	**	11,300	18,800
85-100%	**	11,400	18,800	>18,800

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	>5	≥4	≥3	≥2
85-100%	>4	≥3	≥2	≥1

[1] Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. Although presented as daily volumes, they actually represent peak hour direction conditions with applicable K and D factors applied. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* For oversaturated conditions during peak hour, subtract 10% from the LOS E (capacity volumes). This number becomes the new maximum service volume for LOS D, and LOS E cannot be achieved.

** Cannot be achieved using table input value defaults.

*** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

TABLE 1
(continued)

Generalized **Annual Average Daily** Volumes for Florida's
Urbanized Areas

9/4/09

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities								
				State Arterials						Class II		
	Freeways	Highways		Class I		Class II		Class III		Bicycle	Pedestrian	Bus
ROADWAY CHARACTERISTICS												
Area type (l,o)	l	l	l	l	l	l	l	l	l	l	l	l
Number of through lanes	4-12	2	4-6	2	4-8	2	4-8	2	4-8	4	4	
Posted speed (mph)	65	50	50	45	50	45	45	35	35	45	45	
Free flow speed (mph)	70	55	55	50	55	50	50	40	40	50	50	
Aux, meter, or accel/decel ≥1500 (n,y)	n											
Median (n, nr, r)		n	r	n	r	n	r	n	r	r	r	
Terrain (l,r)	l	l	l									
% no passing zone		80										
Exclusive left turn lanes /[impact](n, y)		[n]	y	y	y	y	y	y	y	y	y	
Exclusive right turn lanes (n, y)				n	n	n	n	n	n	n	n	
Paved shoulder/bicycle lane (n, y)										n, 50%,y	n	
Outside lane width										t	t	
Pavement condition										t		
Sidewalk (n, y)											n, 50%,y	n,y
Sidewalk/roadway separation (a, t, w)											t	
Sidewalk protective barrier (n, y)											n	
Obstacle to bus stop (n, y)												n
Facility length (mi)	4	5	5	2	2	2	2	2	2	2	2	2
Number of segments	4											
TRAFFIC CHARACTERISTICS												
Planning analysis hour factor (K)	0.092	0.094	0.094	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	
Peak hour factor (PHF)	0.95	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	
Base saturation flow rate (pcphpl)		1700	2100	1950	1950	1950	1950	1950	1950	1950	1950	
Heavy vehicle percent	4.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5	1.5	2.0	2.0	
Local adjustment factor	.98	1.0	.98									
% left turns				12	12	12	12	12	12	12	12	
% right turns				12	12	12	12	12	12	12	12	
Bus span of service												15
CONTROL CHARACTERISTICS												
Number of signals				2	2	6	6	10	10	6	6	
Arrival type (1-6)				3	3	4	4	4	4	4	4	
Signal type (a, s, p)				a	a	s	s	s	s	s	s	
Cycle length (C)				120	120	120	120	120	120	120	120	
Effective green ratio (g/C)				0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highway Segments		State & Non-State Signalized Arterials			Bicycle	Pedestrian	Bus
		Two-Lane	Multilane	Class I	Class II	Class III			
	Density	%ffs	Density	ats	ats	ats	Score	Score	Buses per hr.
B	≤17	≥0.833	≤18	> 34 mph	> 28 mph	> 24 mph	≤2.5	≤2.5	≥4
C	≤24	>0.750	≤26	> 27 mph	> 22 mph	> 18 mph	≤3.5	≤3.5	≥3
D	≤31	>0.667	≤35	> 21 mph	> 17 mph	> 14 mph	≤4.5	≤4.5	≥2
E	≤39	>0.583	≤41	> 16 mph	> 13 mph	> 10 mph	≤5.5	≤5.5	≥1

% ffs = Percent free flow speed ats = Average travel speed

TABLE 2

Generalized **Annual Average Daily** Volumes for Florida's **Areas Transitioning into Urbanized Areas** OR **Areas Over 5,000 Not In Urbanized Areas**[1]

9/4/09

STATE SIGNALIZED ARTERIALS

Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	8,900	14,100	15,200	***
4	Divided	26,900	32,100	33,800	***
6	Divided	41,500	48,600	51,000	***

Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	9,400	13,700	14,700
4	Divided	**	22,700	30,000	31,700
6	Divided	**	35,700	45,400	47,800

Class III (more than 4.5 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	4,700	10,700	13,400
4	Divided	**	11,500	25,500	28,900
6	Divided	**	18,000	39,800	43,900

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Major City/County Roadways	- 10%
Other Signalized Roadways	- 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 15%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6.

FREEWAYS

Lanes	B	C	D	E
4	42,600	57,600	68,700	73,600
6	63,900	86,600	103,300	113,700
8	85,200	115,600	137,600	153,700
10	106,400	145,600	172,400	192,800

Freeway Adjustments

Auxiliary Lanes	Ramp Metering
+ 20,000	+5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	8,000	15,100	21,100	26,800
4	Divided	31,400	45,400	58,800	66,600
6	Divided	47,200	68,100	88,200	100,000

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	2,800	7,300	>7,300
50-84%	2,200	3,400	13,100	>13,100
85-100%	4,100	>4,100	***	***

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	5,000	14,400
50-84%	**	**	11,300	18,800
85-100%	**	11,400	18,800	>18,800

[1] Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. Although presented as daily volumes, they actually represent peak hour direction conditions with applicable K and D factors applied. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

** Cannot be achieved using table input value defaults.

*** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

TABLE 2
(continued)

Generalized **Annual Average Daily** Volumes for Florida's
Areas Transitioning Into Urbanized Areas OR Areas over 5,000 Not in Urbanized Areas

9/4/09

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities							
				State Arterials						Class II	
	Freeways	Highways		Class I		Class II		Class III		Bicycle	Pedestrian
ROADWAY CHARACATERISTICS											
Number of through lanes	4-10	2	4-6	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	45	45	35	35	45	45
Free flow speed (mph)	75	55	55	50	55	50	50	40	40	50	50
Aux, meter, or accel/decel ≥1500 (n,y)	n	n	n								
Median (n, nr, r)		n	r	n	r	n	r	n	r	r	r
Terrain (l, r)	l	l	l								
% no passing zone		60									
Exclusive left turn lanes/[impact] (n, y)		[n]	y	y	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n	n	n
Paved shoulder/bicycle lane (n, y)										n,50%,y	n
Outside lane width										t	t
Pavement condition										t	
Sidewalk (n, y)											n,50%,y
Sidewalk/roadway separation (a, t, w)											t
Sidewalk protective barrier (n, y)											n
Facility length (m)	8	5	5	2	2	2	2	2	2	2	2
Number of segments	4										
TRAFFIC CHARACTERISTICS											
Planning analysis hour factor (K)	0.094	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Peak hour factor (PHF)	0.950	0.910	0.910	0.910	0.910	0.910	0.910	0.910	0.910	0.910	0.910
Base capacity (pcphpl)		1700	2100	1950	1950	1950	1950	1950	1950	1950	1950
Heavy vehicle percent	9.0	4.0	4.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0
Local adjustment factor	0.950	1.00	.950								
% left turns				12	12	12	12	12	12	12	12
% right turns				12	12	12	12	12	12	12	12
CONTROL CHARACTERISTICS											
Number of Signals				2	2	6	6	10	10	6	6
Arrival type (1-6)				3	3	4	4	4	4	4	4
Signal type (a, s, p)				a	a	s	s	s	s	s	s
Cycle length (C)				120	120	120	120	120	120	120	120
Effective green ratio (g/C)				0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highway Segments		State & Non-State Two-Way Arterials			Bicycle	Pedestrian
		Two-Lane	Multilane	Class I	Class II	Class III		
	Density	%ffs	Density	ats	ats	ats	Score	Score
B	≤17	≥0.833	≤18	> 34 mph	> 28 mph	> 24 mph	≤2.5	≤2.5
C	≤24	>0.750	≤26	> 27 mph	> 22 mph	> 18 mph	≤3.5	≤3.5
D	≤31	>0.667	≤35	> 21 mph	> 17 mph	> 14 mph	≤4.5	≤4.5
E	≤39	>0.583	≤41	> 16 mph	> 13 mph	> 10 mph	≤5.5	≤5.5

% ffs = Percent free flow speed ats = Average travel speed

TABLE 3

Generalized **Annual Average Daily** Volumes for Florida's
Rural Undeveloped Areas and Cities OR
Developed Areas Less than 5,000 Population[1]

9/4/09

Rural Undeveloped Areas

FREEWAYS

Lanes	B	C	D	E
4	37,100	50,800	59,900	63,700
6	56,500	76,400	89,900	98,300
8	75,100	101,100	119,900	132,900

Freeway Adjustments

Auxiliary Lanes
+18,000

UNINTERRUPTED FLOW TWO-LANE HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	4,500	8,100	13,800	27,600

Passing Lane Adjustment

Alter LOS B-D volumes in proportion to passing lane length to the highway segment length.

UNINTERRUPTED FLOW MULTILANE HIGHWAYS

Lanes	Median	B	C	D	E
4	Divided	26,300	41,100	52,100	59,100
6	Divided	39,400	61,700	78,000	88,600

ISOLATED STATE SIGNALIZED INTERSECTIONS

Lanes	B	C	D	E
2	**	4,700	10,400	12,300
4	**	10,300	23,200	25,500
6	**	15,800	36,000	38,500

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	**	**	7,800
50-84%	**	**	**	14,000
85-100%	**	4,200	>4,200	***

[1] Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. Although presented as daily volumes, they actually represent peak hour direction conditions with applicable K and D factors applied. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model and Pedestrian LOS Model, respectively for the automobile/truck, bicycle, and pedestrian modes.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

** Cannot be achieved using table input value defaults.

*** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:

Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

Cities or Rural Developed Areas Less Than 5000

FREEWAYS

Lanes	B	C	D	E
4	37,100	49,900	59,400	63,700
6	54,800	74,600	89,000	98,300
8	73,300	100,200	118,700	132,700

Freeway Adjustments

Auxiliary Lanes
+18,000

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	7,800	14,200	20,000	25,600
4	Divided	23,800	37,200	48,000	54,600
6	Divided	35,600	55,800	72,000	82,000

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

STATE SIGNALIZED ARTERIALS

Lanes	Median	B	C	D	E
2	Undivided	**	9,800	13,000	13,900
4	Divided	**	23,300	28,000	29,900
6	Divided	**	36,400	42,400	45,000

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Major City/County Roadways - 10%
Other Signalized Roadways - 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Turn Lanes	Exclusive Right Turn Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 15%

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	2,800	7,300	>7,300
50-84%	2,200	3,400	13,100	>13,100
85-100%	4,100	>4,100	***	***

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	5,000	14,400
50-84%	**	**	11,300	18,800
85-100%	**	11,400	18,800	>18,800

TABLE 3
(continued)

Generalized **Annual Average Daily** Volumes for Florida's
Rural Undeveloped Areas and Cities OR Developed Areas Less than 5,000 Population

9/4/09

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities					
	Freeways	Highways				Isolated Signalized Intersections	Arterials Class I		Bicycle Class I		Pedestrian Class I
ROADWAY CHARACTERISTICS											
Area type (ru, rd)	ru/rd	ru	ru	rd	rd	ru	rd	rd	ru	rd	rd
Number of through lanes	4-8	2	4-6	2	4-6	2-6	2	4-6	2	2	2
Posted speed (mph)	70	55	65	50	55		45	45	55	45	45
Free flow speed (mph)	75	60	70	55	60		50	50	60	50	50
Aux, meter, or accel/decel ≥1500 (n,y)	n										
Median (n, nr, r)		n	r	n	r	n	n	r	n	n	n
Terrain (l,r)	l	l	l	l	l						
% no passing zone		20		60							
Exclusive left turn lanes/[impact] (n, y)		[n]	y	[n]	y	y	y	y	[n]	y	y
Exclusive right turn lanes (n, y)											
Paved shoulder/bicycle lane (n, y)									n,50%,y	n,50%,y	n,50%,y
Outside lane width											
Pavement condition											
Sidewalk (n, y)											
Sidewalk/roadway separation (a, t, w)											
Sidewalk protective barrier (n, y)											
Obstacle to bus stop (n, y)											
Facility length (mi)	14	10	10	5	5		2	2	4	2	2
Number of segments	4										
TRAFFIC CHARACTERISTICS											
Planning analysis hour factor (K)	.103	.098	.098	.100	.100	.098	.097	.097	.098	.097	.097
Directional distribution factor (D)	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55
Peak hour factor (PHF)	.950	.880	.880	.895	.895	.88	.895	.895	.88	.895	.895
Base saturation flow rate (pcphpl)		1700	2300	1700	2200	1950	1950	1950	1950	1950	1950
Heavy vehicle percent	9.0	5.0	9.0	4.0	4.0	5.0	3.0	3.0	6.0	3.0	3.0
Local adjustment factor	.90	1.00	.86	1.00	.93						
% left turns						12	12	12		12	12
% right turns						12	12	12	12	12	12
CONTROL CHARACTERISTICS											
Number of signals							4	4	2	4	4
Arrival type (1-6)						3	3	3	3	3	3
Signal type (a, s, p)						a	s	s	a	s	s
Cycle length (C)						60	90	90	60	90	90
Effective green ratio (g/C)						.44	.44	.44	.44	.44	.44

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highway Segments				Isolated Intersections	Arterials	Bicycle	Pedestrian
	Density	Two-Lane ru %tsf	Two-Lane rd %ffs	Multilane ru ats	Multilane rd ats	Other (Control delay) ats	Major City/Co. ats	Score	Score
B	≤17	≤50	≥0.833	≤14	≤14	≤10 sec	> 34 mph	≤2.5	≤2.5
C	≤24	≤65	>0.750	≤22	≤22	≤15 sec	> 27 mph	≤3.5	≤3.5
D	≤31	≤80	>0.667	≤29	≤29	≤20 sec	> 21 mph	≤4.5	≤4.5
E	≤39	>80	>0.583	≤34	≤34	≤40 sec	> 16 mph	≤5.5	≤5.5

% tsf = Percent time spent following % ffs = Percent free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

TABLE 4

Generalized **Peak Hour Two-Way** Volumes for Florida's **Urbanized Areas**[1]

9/4/09

STATE SIGNALIZED ARTERIALS

Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	930	1,500	1,600	***
4	Divided	2,840	3,440	3,560	***
6	Divided	4,370	5,200	5,360	***
8	Divided	5,900	6,970	7,160	***

Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	1,020	1,480	1,570
4	Divided	**	2,420	3,220	3,400
6	Divided	**	3,790	4,880	5,150
8	Divided	**	5,150	6,530	6,880

Class III/IV (more than 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	500	1,150	1,440
4	Divided	**	1,220	2,730	3,100
6	Divided	**	1,910	4,240	4,680
8	Divided	**	2,620	5,770	6,280

FREEWAYS

Lanes	B	C	D	E
4	4,000	5,500	6,770	7,300
6	6,000	8,320	10,150	11,290
8	8,000	11,050	13,480	15,270
10	10,000	13,960	16,930	19,250
12	13,730	18,600	21,950	23,230

Freeway Adjustments

Auxiliary Lanes	Ramp Metering	Oversaturated Conditions*
+ 1,800	+ 5%	-10% of E

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	730	1,460	2,080	2,620
4	Divided	3,220	4,660	6,040	6,840
6	Divided	4,840	6,990	9,060	10,280

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Major City/County Roadways	- 10%
Other Signalized Roadways	- 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 15%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6.

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	310	1,180	>1,180
50-84%	240	360	>360	***
85-100%	620	>620	***	***

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	480	1,390
50-84%	**	**	1,100	1,820
85-100%	**	1,100	1,820	>1,820

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	>5	≥4	≥3	≥2
85-100%	>4	≥3	≥2	≥1

[1] Values shown are presented as hourly two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated. Although presented as peak hour two-way volumes, they actually represent peak hour peak direction conditions with an applicable D factor applied. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* For oversaturated conditions during peak hour, subtract 10% from the LOS E (capacity volumes). This number becomes the new maximum service volume for LOS D, and LOS E cannot be achieved.

** Cannot be achieved using table input value defaults.

*** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

TABLE 4
(continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's

Urbanized Areas

9/4/09

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities								
				State Arterials						Class II		
	Freeways	Highways		Class I		Class II		Class III		Bicycle	Pedestrian	Bus
ROADWAY CHARACTERISTICS												
Area type (l,o)	l	l	l	l	l	l	l	l	l	l	l	l
Number of through lanes	4-12	2	4-6	2	4-8	2	4-8	2	4-8	4	4	
Posted speed (mph)	65	50	50	45	50	45	45	35	35	45	45	
Free flow speed (mph)	70	55	55	50	55	50	50	40	40	50	50	
Aux, meter, or accel/decel ≥1500 (n,y)	n											
Median (n, nr, r)		n	r	n	r	n	r	n	r	r	r	
Terrain (l,r)	l	l	l									
% no passing zone		80										
Exclusive left turn lanes /[impact](n, y)		[n]	y	y	y	y	y	y	y	y	y	
Exclusive right turn lanes (n, y)				n	n	n	n	n	n	n	n	
Paved shoulder/bicycle lane (n, y)										n, 50%,y	n	
Outside lane width										t	t	
Pavement condition										t		
Sidewalk (n, y)											n, 50%,y	n,y
Sidewalk/roadway separation (a, t, w)											t	
Sidewalk protective barrier (n, y)											n	
Obstacle to bus stop (n, y)												n
Facility length (mi)	4	5	5	2	2	2	2	2	2	2	2	2
Number of segments	4											
TRAFFIC CHARACTERISTICS												
Planning analysis hour factor (K)	0.092	0.094	0.094	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	
Peak hour factor (PHF)	0.95	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	
Base saturation flow rate (pcphpl)		1700	2100	1950	1950	1950	1950	1950	1950	1950	1950	
Heavy vehicle percent	4.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5	1.5	2.0	2.0	
Local adjustment factor	.98	1.0	.98									
% left turns				12	12	12	12	12	12	12	12	
% right turns				12	12	12	12	12	12	12	12	
Bus span of service												15
CONTROL CHARACTERISTICS												
Number of signals				2	2	6	6	10	10	6	6	
Arrival type (1-6)				3	3	4	4	4	4	4	4	
Signal type (a, s, p)				a	a	s	s	s	s	s	s	
Cycle length (C)				120	120	120	120	120	120	120	120	
Effective green ratio (g/C)				0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highway Segments		State & Non-State Signalized Arterials			Bicycle	Pedestrian	Bus
		Two-Lane	Multilane	Class I	Class II	Class III			
	Density	%ffs	Density	ats	ats	ats	Score	Score	Buses per hr.
B	≤17	≥0.833	≤18	> 34 mph	> 28 mph	> 24 mph	≤2.5	≤2.5	≥4
C	≤24	>0.750	≤26	> 27 mph	> 22 mph	> 18 mph	≤3.5	≤3.5	≥3
D	≤31	>0.667	≤35	> 21 mph	> 17 mph	> 14 mph	≤4.5	≤4.5	≥2
E	≤39	>0.583	≤41	> 16 mph	> 13 mph	> 10 mph	≤5.5	≤5.5	≥1

% ffs = Percent free flow speed ats = Average travel speed

TABLE 5

Generalized **Peak Hour Two-Way** Volumes for Florida's **Areas Transitioning into Urbanized Areas** OR **Areas Over 5,000 Not In Urbanized Areas**[1]

9/4/09

STATE SIGNALIZED ARTERIALS

Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	860	1,370	1,480	***
4	Divided	2,600	3,110	3,280	***
6	Divided	4,020	4,710	4,950	***

Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	910	1,330	1,420
4	Divided	**	2,200	2,910	3,080
6	Divided	**	3,460	4,400	4,640

Class III/IV(more than 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
2	Undivided	**	460	1,040	1,300
4	Divided	**	1,110	2,480	2,800
6	Divided	**	1,750	3,860	4,260

Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Major City/County Roadways	- 10%
Other Signalized Roadways	- 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 15%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6.

FREEWAYS

Lanes	B	C	D	E
4	4,000	5,410	6,460	6,920
6	6,000	8,140	9,710	10,690
8	8,000	10,870	12,930	14,450
10	10,000	13,690	16,200	18,120

Freeway Adjustments

Auxiliary Lanes	Ramp Metering
+ 1,800	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	770	1,460	2,040	2,590
4	Divided	3,040	4,400	5,700	6,460
6	Divided	4,570	6,600	8,550	9,700

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	270	710	>710
50-84%	220	330	1,270	>1,270
85-100%	400	>400	***	***

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	480	1,390
50-84%	**	**	1,100	1,820
85-100%	**	1,100	1,820	>1,820

[1] Values shown are presented as hourly two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated. Although presented as peak hour two-way volumes, they actually represent peak hour direction conditions with an applicable D factor applied. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

** Cannot be achieved using table input value defaults.

*** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

TABLE 5
(continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's
Areas Transitioning Into Urbanized Areas OR Areas over 5,000 Not in Urbanized Areas

9/4/09

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities							
				State Arterials						Class II	
	Freeways	Highways		Class I		Class II		Class III		Bicycle	Pedestrian
ROADWAY CHARACATERISTICS											
Number of through lanes	4-10	2	4-6	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	45	45	35	35	45	45
Free flow speed (mph)	75	55	55	50	55	50	50	40	40	50	50
Aux, meter, or accel/decel ≥1500 (n,y)	n	n	n								
Median (n, nr, r)		n	r	n	r	n	r	n	r	r	r
Terrain (l, r)	l	l	l								
% no passing zone		60									
Exclusive left turn lanes/[impact] (n, y)		[n]	y	y	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n	n	n
Paved shoulder/bicycle lane (n, y)										n,50%,y	n
Outside lane width										t	t
Pavement condition										t	
Sidewalk (n, y)											n,50%,y
Sidewalk/roadway separation (a, t, w)											t
Sidewalk protective barrier (n, y)											n
Facility length (m)	8	5	5	2	2	2	2	2	2	2	2
Number of segments	4										
TRAFFIC CHARACTERISTICS											
Planning analysis hour factor (K)	0.094	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Peak hour factor (PHF)	0.950	0.910	0.910	0.910	0.910	0.910	0.910	0.910	0.910	0.910	0.910
Base capacity (pcphpl)		1700	2100	1950	1950	1950	1950	1950	1950	1950	1950
Heavy vehicle percent	9.0	4.0	4.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0
Local adjustment factor	0.950	1.00	.950								
% left turns				12	12	12	12	12	12	12	12
% right turns				12	12	12	12	12	12	12	12
CONTROL CHARACTERISTICS											
Number of Signals				2	2	6	6	10	10	6	6
Arrival type (1-6)				3	3	4	4	4	4	4	4
Signal type (a, s, p)				a	a	s	s	s	s	s	s
Cycle length (C)				120	120	120	120	120	120	120	120
Effective green ratio (g/C)				0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highway Segments		State & Non-State Two-Way Arterials			Bicycle	Pedestrian
		Two-Lane	Multilane	Class I	Class II	Class III		
	Density	%ffs	Density	ats	ats	ats	Score	Score
B	≤17	≥0.833	≤18	> 34 mph	> 28 mph	> 24 mph	<2.5	<2.5
C	≤24	>0.750	≤26	> 27 mph	> 22 mph	> 18 mph	≤3.5	≤3.5
D	≤31	>0.667	≤35	> 21 mph	> 17 mph	> 14 mph	≤4.5	≤4.5
E	≤39	>0.583	≤41	> 16 mph	> 13 mph	> 10 mph	≤5.5	≤5.5

% ffs = Percent free flow speed ats = Average travel speed

TABLE 6

Generalized **Peak Hour Two-Way** Volumes for Florida's
Rural Undeveloped Areas and Cities OR
Developed Areas Less Than 5,000 Population[1]

9/4/09

Rural Undeveloped Areas

FREEWAYS

Lanes	B	C	D	E
4	3,820	5,230	6,170	6,560
6	5,820	7,870	9,260	10,120
8	7,730	10,410	12,350	13,690

Freeway Adjustments

Auxiliary Lanes +1,800

UNINTERRUPTED FLOW TWO-LANE HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	440	790	1,350	2,700

Passing Lane Adjustment

Alter LOS B-D volumes in proportion to passing lane length to the highway segment length.

UNINTERRUPTED FLOW MULTILANE HIGHWAYS

Lanes	Median	B	C	D	E
4	Divided	2,570	4,020	5,100	5,790
6	Divided	3,860	6,040	7,640	8,680

ISOLATED STATE SIGNALIZED INTERSECTIONS

Lanes	B	C	D	E
2	**	460	1,020	1,200
4	**	1,000	2,280	2,500
6	**	1,550	3,530	3,770

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	**	**	770
50-84%	**	**	**	1,370
85-100%	**	410	>410	***

[1] Values shown are presented as hourly two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated. Although presented as peak hour two-way volume, they actually represent peak hour direction conditions with an applicable D factor applied. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model and Pedestrian LOS Model, respectively for the automobile/truck, bicycle, and pedestrian modes.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

** Cannot be achieved using table input value defaults.

*** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:

Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

Cities or Rural Developed Areas Less Than 5000

FREEWAYS

Lanes	B	C	D	E
4	3,820	5,140	6,110	6,560
6	5,640	7,690	9,170	10,120
8	7,550	10,320	12,220	13,670

Freeway Adjustments

Auxiliary lanes +1,800

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	770	1,420	2,000	2,550
4	Divided	2,370	3,710	4,790	5,460
6	Divided	3,550	5,570	7,190	8,190

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

STATE SIGNALIZED ARTERIALS

Lanes	Median	B	C	D	E
2	Undivided	**	950	1,260	1,350
4	Divided	**	2,260	2,710	2,900
6	Divided	**	3,530	4,110	4,370

Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Major City/County Roadways - 10%
Other Signalized Roadways - 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Turn Lanes	Exclusive Right Turn Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 15%

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	270	710	>710
50-84%	220	330	1,270	>1,270
85-100%	400	>400	***	***

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	480	1,390
50-84%	**	**	1,100	1,820
85-100%	**	1,100	1,820	>1,820

TABLE 6
(continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's
Rural Undeveloped Areas and Cities OR Developed Areas Less than 5,000 Population

9/4/09

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities					
	Freeways	Highways				Isolated Signalized Intersections	Arterials Class I		Bicycle Class I		Pedestrian Class I
ROADWAY CHARACTERISTICS											
Area type (ru, rd)	ru/rd	ru	ru	rd	rd	ru	rd	rd	ru	rd	rd
Number of through lanes	4-8	2	4-6	2	4-6	2-6	2	4-6	2	2	2
Posted speed (mph)	70	55	65	50	55		45	45	55	45	45
Free flow speed (mph)	75	60	70	55	60		50	50	60	50	50
Aux, meter, or accel/decel ≥1500 (n,y)	n										
Median (n, nr, r)		n	r	n	r	n	n	r	n	n	n
Terrain (l,r)	l	l	l	l	l						
% no passing zone		20		60							
Exclusive left turn lanes/[impact] (n, y)		[n]	y	[n]	y	y	y	y	[n]	y	y
Exclusive right turn lanes (n, y)											
Paved shoulder/bicycle lane (n, y)									n,50%,y	n,50%,y	n,50%,y
Outside lane width											
Pavement condition											
Sidewalk (n, y)											
Sidewalk/roadway separation (a, t, w)											
Sidewalk protective barrier (n, y)											
Obstacle to bus stop (n, y)											
Facility length (mi)	14	10	10	5	5		2	2	4	2	2
Number of segments	4										
TRAFFIC CHARACTERISTICS											
Planning analysis hour factor (K)	.103	.098	.098	.100	.100	.098	.097	.097	.098	.097	.097
Directional distribution factor (D)	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55
Peak hour factor (PHF)	.950	.880	.880	.895	.895	.88	.895	.895	.88	.895	.895
Base saturation flow rate (pcphpl)		1700	2300	1700	2200	1950	1950	1950	1950	1950	1950
Heavy vehicle percent	9.0	5.0	9.0	4.0	4.0	5.0	3.0	3.0	6.0	3.0	3.0
Local adjustment factor	.90	1.00	.86	1.00	.93						
% left turns						12	12	12		12	12
% right turns						12	12	12	12	12	12
CONTROL CHARACTERISTICS											
Number of signals							4	4	2	4	4
Arrival type (1-6)						3	3	3	3	3	3
Signal type (a, s, p)						a	s	s	a	s	s
Cycle length (C)						60	90	90	60	90	90
Effective green ratio (g/C)						.44	.44	.44	.44	.44	.44

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highway Segments				Isolated Intersections	Arterials	Bicycle	Pedestrian
		Two-Lane ru	Two-Lane rd	Multilane ru	Multilane rd	Other (Control delay)	Major City/Co.		
	Density	%tsf	%ffs	ats	ats	ats	ats	Score	Score
B	≤17	≤50	≥0.833	≤14	≤14	≤10 sec	> 34 mph	≤2.5	≤2.5
C	≤24	≤65	>0.750	≤22	≤22	≤15 sec	> 27 mph	≤3.5	≤3.5
D	≤31	≤80	>0.667	≤29	≤29	≤20 sec	> 21 mph	≤4.5	≤4.5
E	≤39	>80	>0.583	≤34	≤34	≤40 sec	> 16 mph	≤5.5	≤5.5

% tsf = Percent time spent following % ffs = Percent free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

TABLE 7

Generalized **Peak Hour Directional** Volumes for Florida's **Urbanized Areas**[1]

9/4/09

STATE SIGNALIZED ARTERIALS

Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Median	B	C	D	E
1	Undivided	510	820	880	***
2	Divided	1,560	1,890	1,960	***
3	Divided	2,400	2,860	2,940	***
4	Divided	3,240	3,830	3,940	***

Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
1	Undivided	**	560	810	860
2	Divided	**	1,330	1,770	1,870
3	Divided	**	2,080	2,680	2,830
4	Divided	**	2,830	3,590	3,780

Class III/IV (more than 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
1	Undivided	**	270	630	790
2	Divided	**	670	1,500	1,700
3	Divided	**	1,050	2,330	2,570
4	Divided	**	1,440	3,170	3,450

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Major City/County Roadways	- 10%
Other Signalized Roadways	- 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 15%

One-Way Facility Adjustment

Multiply the corresponding volumes in this table by 1.20.

FREEWAYS

Lanes	B	C	D	E
2	2,200	3,020	3,720	4,020
3	3,300	4,580	5,580	6,200
4	4,400	6,080	7,420	8,400
5	5,500	7,680	9,320	10,580
6	7,560	10,220	12,080	12,780

Freeway Adjustments

Auxiliary Lanes	Ramp Metering	Oversaturated Conditions*
+ 1,000	+ 5%	-10% of E

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
1	Undivided	400	800	1,140	1,440
2	Divided	1,770	2,560	3,320	3,760
3	Divided	2,660	3,840	4,980	5,650

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane

Coverage	B	C	D	E
0-49%	**	170	650	>650
50-84%	130	200	>200	***
85-100%	340	>340	***	***

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	270	770
50-84%	**	100	600	1000
85-100%	**	610	1000	>1000

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	>5	≥4	≥3	≥2
85-100%	>4	≥3	≥2	≥1

[1] Values shown are presented as hourly directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. To convert to annual average daily traffic volumes, these volumes must be divided by appropriate D and K factors. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* For oversaturated conditions during peak hour, subtract 10% from the LOS E (capacity volumes). This number becomes the new maximum service volume for LOS D, and LOS E cannot be achieved.

** Cannot be achieved using table input value defaults.

*** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

TABLE 7
(continued)

Generalized **Peak Hour Directional** Volumes for Florida's

Urbanized Areas

9/4/09

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities								
				State Arterials						Class II		
	Freeways	Highways		Class I		Class II		Class III		Bicycle	Pedestrian	Bus
ROADWAY CHARACTERISTICS												
Area type (l,o)	l	l	l	l	l	l	l	l	l	l	l	l
Number of through lanes	2-6	1	2-3	1	2-4	1	2-4	1	2-4	2	2	
Posted speed (mph)	65	50	50	45	50	45	45	35	35	45	45	
Free flow speed (mph)	70	55	55	50	55	50	50	40	40	50	50	
Aux, meter, or accel/decel ≥1500 (n,y)	n											
Median (n, nr, r)		n	r	n	r	n	r	n	r	r	r	
Terrain (l,r)	l	l	l									
% no passing zone		80										
Exclusive left turn lanes /[impact](n, y)		[n]	y	y	y	y	y	y	y	y	y	
Exclusive right turn lanes (n, y)				n	n	n	n	n	n	n	n	
Paved shoulder/bicycle lane (n, y)										n, 50%,y	n	
Outside lane width										t	t	
Pavement condition										t		
Sidewalk (n, y)											n, 50%,y	n,y
Sidewalk/roadway separation (a, t, w)											t	
Sidewalk protective barrier (n, y)											n	
Obstacle to bus stop (n, y)												n
Facility length (mi)	4	5	5	2	2	2	2	2	2	2	2	2
Number of segments	4											
TRAFFIC CHARACTERISTICS												
Planning analysis hour factor (K)	0.092	0.094	0.094	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	
Peak hour factor (PHF)	0.95	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	0.925	
Base saturation flow rate (pcphpl)		1700	2100	1950	1950	1950	1950	1950	1950	1950	1950	
Heavy vehicle percent	4.0	2.0	2.0	2.0	2.0	2.0	2.0	1.5	1.5	2.0	2.0	
Local adjustment factor	.98	1.0	.98									
% left turns				12	12	12	12	12	12	12	12	
% right turns				12	12	12	12	12	12	12	12	
Bus span of service												15
CONTROL CHARACTERISTICS												
Number of signals				2	2	6	6	10	10	6	6	
Arrival type (1-6)				3	3	4	4	4	4	4	4	
Signal type (a, s, p)				a	a	s	s	s	s	s	s	
Cycle length (C)				120	120	120	120	120	120	120	120	
Effective green ratio (g/C)				0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highway Segments		State & Non-State Signalized Arterials			Bicycle	Pedestrian	Bus
		Two-Lane	Multilane	Class I	Class II	Class III			
	Density	%ffs	Density	ats	ats	ats	Score	Score	Buses per hr.
B	≤17	≥0.833	≤18	> 34 mph	> 28 mph	> 24 mph	≤2.5	≤2.5	≥4
C	≤24	>0.750	≤26	> 27 mph	> 22 mph	> 18 mph	≤3.5	≤3.5	≥3
D	≤31	>0.667	≤35	> 21 mph	> 17 mph	> 14 mph	≤4.5	≤4.5	≥2
E	≤39	>0.583	≤41	> 16 mph	> 13 mph	> 10 mph	≤5.5	≤5.5	≥1

% ffs = Percent free flow speed ats = Average travel speed

TABLE 8

Generalized **Peak Hour Directional** Volumes for Florida's **Areas Transitioning into Urbanized Areas** OR **Areas Over 5,000 Not In Urbanized Areas**[1]

9/4/09

STATE SIGNALIZED ARTERIALS

Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Median	B	C	D	E
1	Undivided	470	750	800	***
2	Divided	1,430	1,710	1,800	***
3	Divided	2,210	2,590	2,720	***

Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
1	Undivided	**	500	730	780
2	Divided	**	1,210	1,600	1,690
3	Divided	**	1,900	2,420	2,550

Class III (more than 4.50 signalized intersections per mile)

Lanes	Median	B	C	D	E
1	Undivided	**	250	570	710
2	Divided	**	610	1,360	1,540
3	Divided	**	960	2,120	2,340

FREEWAYS

Lanes	B	C	D	E
2	2,200	2,980	3,560	3,800
3	3,300	4,480	5,340	5,880
4	4,400	5,980	7,120	7,940
5	5,500	7,520	8,920	9,960

Freeway Adjustments

Auxiliary Lanes	Ramp Metering
+ 1,000	+5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
1	Undivided	420	800	1,120	1,420
2	Divided	1,670	2,420	3,130	3,550
3	Divided	2,510	3,630	4,700	5,330

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Major City/County Roadways	- 10%
Other Signalized Roadways	- 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 15%

One-Way Facility Adjustment

Multiply the corresponding volumes in this table by 1.20.

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	150	390	>390
50-84%	120	180	700	>700
85-100%	220	>220	**	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	270	770
50-84%	**	**	600	1,000
85-100%	**	610	1,000	>1,000

[1] Values shown are presented as hourly directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. To convert to annual average daily traffic volumes, these volumes must be divided by appropriate D and K factors. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

** Cannot be achieved using table input value defaults.

*** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

TABLE 8
(continued)

Generalized **Peak Hour Directional** Volumes for Florida's

Areas Transitioning Into Urbanized Areas OR Areas over 5,000 Not in Urbanized Areas

9/4/09

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities							
				State Arterials						Class II	
	Freeways	Highways		Class I		Class II		Class III		Bicycle	Pedestrian
ROADWAY CHARACATERISTICS											
Number of through lanes	2-5	1	2-3	1	2-3	1	2-3	1	2-3	2	2
Posted speed (mph)	70	50	50	45	50	45	45	35	35	45	45
Free flow speed (mph)	75	55	55	50	55	50	50	40	40	50	50
Aux, meter, or accel/decel ≥1500 (n,y)	n	n	n								
Median (n, nr, r)		n	r	n	r	n	r	n	r	r	r
Terrain (l, r)	l	l	l								
% no passing zone		60									
Exclusive left turn lanes/[impact] (n, y)		[n]	y	y	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n	n	n
Paved shoulder/bicycle lane (n, y)										n,50%,y	n
Outside lane width										t	t
Pavement condition										t	
Sidewalk (n, y)											n,50%,y
Sidewalk/roadway separation (a, t, w)											t
Sidewalk protective barrier (n, y)											n
Facility length (m)	8	5	5	2	2	2	2	2	2	2	2
Number of segments	4										
TRAFFIC CHARACTERISTICS											
Planning analysis hour factor (K)	0.094	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Peak hour factor (PHF)	0.950	0.910	0.910	0.910	0.910	0.910	0.910	0.910	0.910	0.910	0.910
Base capacity (pcphpl)		1700	2100	1950	1950	1950	1950	1950	1950	1950	1950
Heavy vehicle percent	9.0	4.0	4.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0
Local adjustment factor	0.950	1.00	.950								
% left turns				12	12	12	12	12	12	12	12
% right turns				12	12	12	12	12	12	12	12
CONTROL CHARACTERISTICS											
Number of Signals				2	2	6	6	10	10	6	6
Arrival type (1-6)				3	3	4	4	4	4	4	4
Signal type (a, s, p)				a	a	s	s	s	s	s	s
Cycle length (C)				120	120	120	120	120	120	120	120
Effective green ratio (g/C)				0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highway Segments		State & Non-State Two-Way Arterials			Bicycle	Pedestrian
		Two-Lane	Multilane	Class I	Class II	Class III		
	Density	%ffs	Density	ats	ats	ats	Score	Score
B	≤17	≥0.833	≤18	> 34 mph	> 28 mph	> 24 mph	≤2.5	≤2.5
C	≤24	>0.750	≤26	> 27 mph	> 22 mph	> 18 mph	≤3.5	≤3.5
D	≤31	>0.667	≤35	> 21 mph	> 17 mph	> 14 mph	≤4.5	≤4.5
E	≤39	>0.583	≤41	> 16 mph	> 13 mph	> 10 mph	≤5.5	≤5.5

% ffs = Percent free flow speed ats = Average travel speed

TABLE 9

Generalized **Peak Hour Directional** Volumes for Florida's **Rural Undeveloped Areas and Cities** OR **Developed Areas Less Than 5,000 Population**[1]

9/4/09

Rural Undeveloped Areas

FREEWAYS

Lanes	B	C	D	E
2	2,100	2,880	3,400	3,600
3	3,200	4,320	5,100	5,560
4	4,260	5,720	6,800	7,520

Freeway Adjustments

Auxiliary Lanes +1,000

UNINTERRUPTED FLOW TWO-LANE HIGHWAYS

Lanes	Median	B	C	D	E
1	Undivided	240	430	740	1,480

Passing Lane Adjustment

Alter LOS B-D volumes in proportion to passing lane length to the highway segment length..

UNINTERRUPTED FLOW MULTILANE HIGHWAYS

Lanes	Median	B	C	D	E
2	Divided	1,410	2,210	2,800	3,180
3	Divided	2,120	3,320	4,200	4,770

ISOLATED STATE SIGNALIZED INTERSECTIONS

Lanes	B	C	D	E
1	**	260	560	660
2	**	560	1,260	1,380
3	**	860	1,940	2,080

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	**	**	420
50-84%	**	**	**	760
85-100%	**	230	>230	***

[1] Values shown are presented as hourly directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. To convert to annual average daily traffic volumes, these volumes must be divided by appropriate D and K factors. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model and Pedestrian LOS Model, respectively for the automobile/truck, bicycle, and pedestrian modes.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

** Cannot be achieved using table input value defaults.

*** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:

Florida Department of Transportation
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450

Cities or Rural Developed Areas Less Than 5000

FREEWAYS

Lanes	B	C	D	E
2	2,100	2,820	3,360	3,600
3	3,100	4,220	5,040	5,560
4	4,160	5,680	6,720	7,520

Freeway Adjustments

Auxiliary Lanes +1,000

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
1	Undivided	420	780	1,100	1,400
2	Divided	1,300	2,040	2,630	3,000
3	Divided	1,950	3,060	3,950	4,500

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

STATE SIGNALIZED ARTERIALS

Lanes	Median	B	C	D	E
1	Undivided	**	520	690	740
2	Divided	**	1,240	1,490	1,590
3	Divided	**	1,940	2,260	2,400

Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Major City/County Roadways - 10%
Other Signalized Roadways - 35%

State & Non-State Signalized Roadway Adjustments

(Alter corresponding volume by the indicated percent.)

Divided/Undivided & Turn Lane Adjustments

Lanes	Median	Exclusive Left Turn Lanes	Exclusive Right Turn Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 15%

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	B	C	D	E
0-49%	**	150	390	>390
50-84%	120	180	700	>700
85-100%	210	>210	***	***

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	**	**	270	770
50-84%	**	**	600	1000
85-100%	**	610	1000	>1000

TABLE 9
(continued)

Generalized **Peak Hour Directional** Volumes for Florida's
Rural Undeveloped Areas and Cities OR Developed Areas Less than 5,000 Population

9/4/09

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities					
	Freeways	Highways				Isolated Signalized Intersections	Arterials Class I		Bicycle Class I		Pedestrian Class I
ROADWAY CHARACTERISTICS											
Area type (ru, rd)	ru/rd	ru	ru	rd	rd	ru	rd	rd	ru	rd	rd
Number of through lanes	2-4	1	2-3	1	2-3	1-3	1	2-3	1	1	1
Posted speed (mph)	70	55	65	50	55		45	45	55	45	45
Free flow speed (mph)	75	60	70	55	60		50	50	60	50	50
Aux, meter, or accel/decel ≥1500 (n,y)	n										
Median (n, nr, r)		n	r	n	r	n	n	r	n	n	n
Terrain (l,r)	l	l	l	l	l						
% no passing zone		20		60							
Exclusive left turn lanes/[impact] (n, y)		[n]	y	[n]	y	y	y	y	[n]	y	y
Exclusive right turn lanes (n, y)											
Paved shoulder/bicycle lane (n, y)									n,50%,y	n,50%,y	n,50%,y
Outside lane width											
Pavement condition											
Sidewalk (n, y)											
Sidewalk/roadway separation (a, t, w)											
Sidewalk protective barrier (n, y)											
Obstacle to bus stop (n, y)											
Facility length (mi)	14	10	10	5	5		2	2	4	2	2
Number of segments	4										
TRAFFIC CHARACTERISTICS											
Planning analysis hour factor (K)	.103	.098	.098	.100	.100	.098	.097	.097	.098	.097	.097
Directional distribution factor (D)	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55
Peak hour factor (PHF)	.950	.880	.880	.895	.895	.88	.895	.895	.88	.895	.895
Base saturation flow rate (pcphpl)		1700	2300	1700	2200	1950	1950	1950	1950	1950	1950
Heavy vehicle percent	9.0	5.0	9.0	4.0	4.0	5.0	3.0	3.0	6.0	3.0	3.0
Local adjustment factor	.90	1.00	.86	1.00	.93						
% left turns						12	12	12		12	12
% right turns						12	12	12	12	12	12
CONTROL CHARACTERISTICS											
Number of signals							4	4	2	4	4
Arrival type (1-6)						3	3	3	3	3	3
Signal type (a, s, p)						a	s	s	a	s	s
Cycle length (C)						60	90	90	60	90	90
Effective green ratio (g/C)						.44	.44	.44	.44	.44	.44

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highway Segments				Isolated Intersections	Arterials	Bicycle	Pedestrian
		Two-Lane ru	Two-Lane rd	Multilane ru	Multilane rd	Other (Control delay)	Major City/Co.		
	Density	%tsf	%ffs	ats	ats	ats	ats	Score	Score
B	≤17	≤50	≥0.833	≤14	≤14	≤10 sec	> 34 mph	≤2.5	≤2.5
C	≤24	≤65	>0.750	≤22	≤22	≤15 sec	> 27 mph	≤3.5	≤3.5
D	≤31	≤80	>0.667	≤29	≤29	≤20 sec	> 21 mph	≤4.5	≤4.5
E	≤39	>80	>0.583	≤34	≤34	≤40 sec	> 16 mph	≤5.5	≤5.5

% tsf = Percent time spent following % ffs = Percent free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

Historic Crash Reports

North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Study Criteria Summary

County: DURHAM **City:** All and Rural
Date: 07/01/2006 **to** 06/30/2009 **Study:** LTNC54FORDHAMTOLEIGHFARMDURHAM
Location: NC 54 from Fordham Blvd to Leigh Farm/Quadrangle, Durham Co portion

Report Details

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
1	**102197595**	0.000	02/28/2008 13:57	SIDESWIPE, SAME DIRECTION	$ 2400	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:** 0	**Speed:** 5 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**										
Unit	**2 :** 1	**Alchl/Drgs:** 0	**Speed:** 5 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:** 5	**Obj Strk:**										
2	**101792063**	0.100	08/22/2006 19:35	REAR END, SLOW OR STOP	$ 1850	0	0	0	0	2	2	3	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:** 0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 11	**Obj Strk:**										
Unit	**2 :** 1	**Alchl/Drgs:** 0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**										
3	**101996915**	0.121	03/29/2007 16:45	REAR END, SLOW OR STOP	$ 1000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:** 0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:** 11	**Obj Strk:**										
Unit	**2 :** 1	**Alchl/Drgs:** 0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:** 1	**Obj Strk:**										
4	**101976936**	0.128	03/02/2007 07:54	REAR END, SLOW OR STOP	$ 1100	0	0	0	1	2	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:** 0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 11	**Obj Strk:**										
Unit	**2 :** 4	**Alchl/Drgs:** 0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 1	**Obj Strk:**										
5	**102157589**	0.210	01/18/2008 16:30	REAR END, SLOW OR STOP	$ 3600	0	0	0	1	1	1	1	1	0	0	
Unit	**1 :** 5	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 11	**Obj Strk:**										
Unit	**2 :** 1	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 11	**Obj Strk:**										
6	**102455941**	0.330	11/25/2008 19:25	REAR END, SLOW OR STOP	$ 7500	0	0	0	0	1	5	2	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:** 0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**										
Unit	**2 :** 1	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**										
7	**101836288**	0.360	09/20/2006 17:28	REAR END, SLOW OR STOP	$ 9500	0	0	0	2	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**										
Unit	**2 :** 1	**Alchl/Drgs:** 0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 11	**Obj Strk:**										
Unit	**3 :** 1	**Alchl/Drgs:** 0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 11	**Obj Strk:**										
Unit	**4 :** 1	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**										

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
8	**101898348**	0.365	01/25/2007 08:12	REAR END, SLOW OR STOP	$ 600	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
9	**102306091**	0.414	04/16/2008 07:27	REAR END, SLOW OR STOP	$ 1400	0	0	0	1	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
10	**102111667**	0.457	08/13/2007 23:34	OVERTURN/ROLLOVER	$ 10000	0	0	2	2	1	5	1	4	0	0	
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 50 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
11	**102070964**	0.469	09/14/2007 17:19	REAR END, SLOW OR STOP	$ 5000	0	0	0	0	2	1	3	1	0	0	
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
12	**102370756**	0.532	08/14/2008 17:08	REAR END, SLOW OR STOP	$ 3000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**3 :** 4	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
13	**102415992**	0.570	10/07/2008 19:20	REAR END, SLOW OR STOP	$ 6800	0	0	0	1	1	5	1	1	2	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**3 :** 2	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**4 :** 5	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
14	**102513020**	0.570	02/06/2009 18:29	RAN OFF ROAD - LEFT	$ 15000	0	0	0	0	1	6	1	3	0	0	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
15	**102160407**	0.584	10/09/2007 14:11	RAN OFF ROAD - LEFT	$ 7500	0	0	0	0	1	1	1	5	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 56 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			5			**Obj Strk:**			33	
16	**102115704**	0.589	11/26/2007 17:00	REAR END, SLOW OR STOP	$ 900	0	0	0	0	2	2	2	1	0	0	
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
17	**101836521**	0.608	10/31/2006 17:55	REAR END, SLOW OR STOP	$ 2500	0	0	0	0	1	5	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	7	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
18	**101843864**	0.627	11/14/2006 01:09	ANIMAL	$ 2000	0	0	0	0	1	5	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**	17			
19	**101994640**	0.665	06/13/2007 14:39	SIDESWIPE, SAME DIRECTION	$ 1200	0	0	0	0	2	1	3	1	0	0	
Unit	**1 :** 3	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			5			**Obj Strk:**				
20	**102093759**	0.710	10/25/2007 09:49	REAR END, SLOW OR STOP	$ 1500	0	0	0	0	2	1	2	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** SW	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** SW	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
21	**101903082**	0.820	11/30/2006 00:05	REAR END, SLOW OR STOP	$ 10300	0	0	0	0	1	5	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**3 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
22	**102191257**	0.820	02/22/2008 16:19	REAR END, SLOW OR STOP	$ 7000	0	0	0	0	3	1	2	1	0	0	2
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
23	**102493834**	0.900	01/13/2009 18:05	REAR END, SLOW OR STOP	$ 5000	0	0	0	2	1	5	2	3	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 55 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 55 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
24	**101839491**	1.000	11/06/2006 14:41	REAR END, SLOW OR STOP	$ 9000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
25	**102086537**	1.060	10/08/2007 07:03	RAN OFF ROAD - LEFT	$ 16150	0	0	1	0	1	1	1	3	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**	37			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 60 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**	64			

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
26	**102259559**	1.070	04/22/2008 17:32	REAR END, SLOW OR STOP	$ 1650	0	0	0	1	2	1	3	1	0	0	
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
27	**102453929**	1.070	11/24/2008 20:09	REAR END, SLOW OR STOP	$ 6000	0	0	0	0	2	4	3	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
28	**102479123**	1.110	12/16/2008 16:23	REAR END, SLOW OR STOP	$ 3000	0	0	0	0	2	1	3	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			5		**Obj Strk:**					
29	**102584393**	1.115	05/06/2009 17:05	REAR END, SLOW OR STOP	$ 8000	0	0	0	0	1	1	2	3	0	0	
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 55 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 55 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
30	**101928601**	1.120	03/07/2007 16:41	REAR END, SLOW OR STOP	$ 10000	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
31	**102084762**	1.182	10/04/2007 06:42	RAN OFF ROAD - RIGHT	$ 10000	0	0	0	0	1	4	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**		59			
32	**101818590**	1.196	10/06/2006 17:31	REAR END, SLOW OR STOP	$ 1100	0	0	0	3	2	2	2	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
33	**102567801**	1.199	04/14/2009 16:37	REAR END, SLOW OR STOP	$ 6000	0	0	0	1	2	1	2	3	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 55 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 55 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 55 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
34	**101994629**	1.201	03/07/2007 17:16	REAR END, SLOW OR STOP	$ 500	0	0	0	0	1	1	1	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 10	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
35	**101822620**	1.210	10/12/2006 15:41	ANGLE	$ 3000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
36	**101890574**	1.210	10/18/2006 18:11	ANGLE	$ 2000	0	0	0	0	1	4	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
37	**101865583**	1.210	12/12/2006 17:54	LEFT TURN, DIFFERENT ROADWAYS	$ 12000	0	0	0	0	1	5	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
38	**101876286**	1.210	12/28/2006 08:22	ANGLE	$ 3500	0	0	0	1	1	1	1	1	0	3	1
Unit	**1 :** 10	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
39	**101919359**	1.210	02/26/2007 16:13	ANGLE	$ 8000	0	0	1	1	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
40	**101988000**	1.210	06/04/2007 17:38	REAR END, SLOW OR STOP	$ 2900	0	0	0	2	1	1	1	3	0	0	2
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 8 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
41	**102067228**	1.210	09/19/2007 16:34	REAR END, SLOW OR STOP	$ 3500	0	0	0	0	1	1	2	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
42	**102099881**	1.210	11/02/2007 16:02	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	1	1	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
43	**102246237**	1.210	04/10/2008 15:50	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** NE		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
44	**102362865**	1.210	07/24/2008 11:06	SIDESWIPE, SAME DIRECTION	$ 2000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 : 4**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
45	**102358118**	1.210	07/29/2008 16:33	REAR END, SLOW OR STOP	$ 900	0	0	0	0	1	1	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 40 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
46	**102619305**	1.210	06/04/2009 16:08	REAR END, SLOW OR STOP	$ 15000	0	0	1	1	2	1	3	1	1	3	1
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
47	**102621654**	1.210	06/24/2009 14:36	REAR END, SLOW OR STOP	$ 4500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 : 4**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**3 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
48	**101854200**	1.213	11/29/2006 15:24	REAR END, SLOW OR STOP	$ 2500	0	0	0	0	1	1	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 30 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 30 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**3 : 4**	**Alchl/Drgs:**	7	**Speed:** 30 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
49	**102100113**	1.219	11/02/2007 18:32	REAR END, SLOW OR STOP	$ 3000	0	0	0	2	1	1	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 4**	**Alchl/Drgs:**	0	**Speed:** 20 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
50	**102403304**	1.219	08/14/2008 17:00	REAR END, SLOW OR STOP	$ 1600	0	0	0	0	1	1	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 40 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 : 5**	**Alchl/Drgs:**	0	**Speed:** 40 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
51	**101971859**	1.221	05/10/2007 16:46	REAR END, SLOW OR STOP	$ 5500	0	0	0	0	1	1	1	1	0	0	
Unit	**1 : 4**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** NE		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** NE		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			

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North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
52	**101987973**	1.248	06/05/2007 09:34	REAR END, SLOW OR STOP	$ 3500	0	0	0	0	1	1	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
53	**102585502**	1.248	05/07/2009 15:27	REAR END, SLOW OR STOP	$ 1300	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
54	**102100114**	1.260	11/03/2007 19:22	REAR END, SLOW OR STOP	$ 5500	0	0	0	0	1	4	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**3 :** 4	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
55	**102647494**	1.267	02/07/2009 13:08	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 3	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
56	**101773406**	1.310	07/26/2006 08:49	REAR END, SLOW OR STOP	$ 1100	0	0	0	0	1	1	2	1	0	0	
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
57	**102183990**	1.310	02/15/2008 16:27	REAR END, SLOW OR STOP	$ 5500	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
58	**102154283**	1.320	01/15/2008 17:21	REAR END, SLOW OR STOP	$ 13500	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**		64	
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
59	**101785501**	1.340	07/15/2006 23:31	BACKING UP	$ 1500	0	0	0	0	1	5	1	1	0		2
Unit	**1 :** 2	**Alchl/Drgs:**	7	**Speed:** 0 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				2			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**				10			**Obj Strk:**			
60	**101773409**	1.340	07/26/2006 09:56	REAR END, SLOW OR STOP	$ 2600	0	0	0	0	1	1	2	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**3 : 1**	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
61	**102017626**	1.340	07/17/2007 16:30	REAR END, SLOW OR STOP	$ 7000	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 : 4**	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
62	**102529566**	1.364	02/13/2009 15:15	REAR END, SLOW OR STOP	$ 4400	0	0	0	0	1	1	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 : 2**	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**3 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**4 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
63	**102420407**	1.370	10/13/2008 17:21	REAR END, SLOW OR STOP	$ 1500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 : 4**	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 : 4**	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
64	**101825390**	1.399	10/17/2006 17:14	REAR END, SLOW OR STOP	$ 4000	0	0	0	1	2	1	3	1	0	0	2
Unit	**1 : 2**	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
65	**102621750**	1.402	06/28/2009 00:09	RAN OFF ROAD - RIGHT	$ 3000	0	0	0	0	1	5	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 50 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**		33	
66	**101787017**	1.420	07/21/2006 12:50	RAN OFF ROAD - LEFT	$ 4500	0	0	0	1	1	1	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
67	**102264637**	1.421	04/25/2008 07:40	REAR END, SLOW OR STOP	$ 900	0	0	0	0	1	1	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
68	**102605688**	1.432	06/03/2009 17:39	REAR END, SLOW OR STOP	$ 6000	0	0	0	0	1	1	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			

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69	**101821229**	1.440	10/11/2006 16:53	HEAD ON	$ 6000	0	0	0	1	1	1	1	2	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 5	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**4 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
70	**101961994**	1.440	04/25/2007 17:07	REAR END, SLOW OR STOP	$ 0	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
71	**102004923**	1.440	06/28/2007 16:10	RIGHT TURN, DIFFERENT ROADWAYS	$ 7000	0	0	0	1	1	1	2	1	0	1	1
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				7			**Obj Strk:**			
72	**102101874**	1.440	11/06/2007 07:44	REAR END, SLOW OR STOP	$ 4000	0	0	0	0	1	1	2	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
73	**102141972**	1.440	12/30/2007 19:42	REAR END, SLOW OR STOP	$ 3000	0	0	0	0	2	5	3	1	0	0	
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
74	**102402614**	1.440	08/19/2008 17:25	ANGLE	$ 3000	0	0	1	1	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				8			**Obj Strk:**			
75	**102379601**	1.440	08/20/2008 18:47	REAR END, SLOW OR STOP	$ 900	0	0	0	0	2	1	3	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	7	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
76	**102468730**	1.440	12/05/2008 16:51	REAR END, SLOW OR STOP	$ 10000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**4 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
77	**102558347**	1.440	03/31/2009 08:22	BACKING UP	$ 2000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**		8		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		10		**Obj Strk:**						
78	**102472592**	1.450	12/15/2008 18:40	REAR END, SLOW OR STOP	$ 3500	0	0	0	0	1	5	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		1		**Obj Strk:**						
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
79	**102586679**	1.450	05/08/2009 19:42	SIDESWIPE, SAME DIRECTION	$ 1300	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 3	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 2 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		5		**Obj Strk:**						
80	**102576140**	1.460	04/22/2009 15:50	REAR END, SLOW OR STOP	$ 2400	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		1		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		11		**Obj Strk:**						
81	**102398049**	1.520	09/18/2008 20:02	SIDESWIPE, SAME DIRECTION	$ 1400	0	0	0	0	1	2	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		5		**Obj Strk:**						
82	**102438859**	1.540	11/05/2008 17:07	REAR END, SLOW OR STOP	$ 1050	0	0	0	2	1	1	1	1	0	0	
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**3 :** 2	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
83	**102527141**	1.540	02/19/2009 13:01	RAN OFF ROAD - RIGHT	$ 5500	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**		5		**Obj Strk:**						
84	**101763518**	1.570	07/12/2006 08:25	REAR END, SLOW OR STOP	$ 5500	0	0	0	0	1	1	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
85	**101968730**	1.570	05/07/2007 16:52	REAR END, SLOW OR STOP	$ 4000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
86	**102139429**	1.570	12/22/2007 15:57	REAR END, SLOW OR STOP	$ 20000	0	0	1	1	1	1	2	1	0	0	
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**3 :** 4	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
87	**102159990**	1.570	01/21/2008 02:54	RAN OFF ROAD - LEFT	$ 6000	0	0	0	0	1	5	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	1	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**		33	
88	**102424401**	1.570	10/14/2008 18:50	REAR END, SLOW OR STOP	$ 1500	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
89	**102548378**	1.570	03/20/2009 16:03	REAR END, SLOW OR STOP	$ 3700	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
90	**102565511**	1.570	04/07/2009 17:11	SIDESWIPE, SAME DIRECTION	$ 2000	0	0	0	0	1	1	2	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
91	**101818596**	1.582	10/06/2006 07:26	REAR END, SLOW OR STOP	$ 1550	0	0	0	0	2	1	3	1	0	3	1
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
92	**101851168**	1.582	11/25/2006 16:24	REAR END, SLOW OR STOP	$ 2500	0	0	0	3	1	1	1	1	0	0	
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
93	**102135837**	1.601	12/17/2007 09:45	SIDESWIPE, SAME DIRECTION	$ 5000	0	0	0	0	1	1	1	1	0	0	2
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
94	**101765224**	1.620	07/14/2006 12:29	ANGLE	$ 2000	0	0	0	0	1	1	1	1	0	0	2
Unit	**1 :** 14	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
95	**101807668**	1.620	08/14/2006 13:33	SIDESWIPE, SAME DIRECTION	$ 1500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	5	**Obj Strk:**						
96	**101844586**	1.620	09/30/2006 12:04	ANGLE	$ 10000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	15 MPH	**Dir:**	N	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:**	25 MPH	**Dir:**	N	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
97	**101842590**	1.620	11/10/2006 22:35	HEAD ON	$ 6000	0	0	0	2	1	4	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	20 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	7	**Obj Strk:**						
98	**101898580**	1.620	11/28/2006 19:01	ANGLE	$ 3000	0	0	0	0	1	5	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	7	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	9	**Obj Strk:**						
99	**101899455**	1.620	11/28/2006 20:20	OTHER COLLISION WITH VEHICLE	$ 31000	0	0	0	1	1	5	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	S	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	E	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	N	**Veh Mnvr/Ped Actn:**	1	**Obj Strk:**			18			
100	**101910294**	1.620	02/13/2007 23:59	REAR END, SLOW OR STOP	$ 3000	0	0	0	0	2	5	3	1	0	0	2
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	11	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
101	**101987569**	1.620	03/18/2007 09:08	ANGLE	$ 2000	0	0	0	1	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	E	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	35 MPH	**Dir:**	S	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
102	**101942149**	1.620	03/25/2007 17:15	ANGLE	$ 1000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	20 MPH	**Dir:**	S	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	15 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
103	**101960126**	1.620	04/23/2007 14:28	SIDESWIPE, SAME DIRECTION	$ 4500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 3	**Alchl/Drgs:**	0	**Speed:**	45 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
104	**102012166**	1.620	07/05/2007 11:52	REAR END, SLOW OR STOP	$ 500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 : 4**	**Alchl/Drgs:**	0	**Speed:** 5 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	7	**Speed:** 5 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
105	**102035524**	1.620	08/09/2007 10:03	ANGLE	$ 4000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 10 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 4**	**Alchl/Drgs:**	0	**Speed:** 10 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				7			**Obj Strk:**			
106	**102052841**	1.620	08/31/2007 18:39	REAR END, SLOW OR STOP	$ 820	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 : 4**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 20 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
107	**102125799**	1.620	12/05/2007 17:28	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	2	1	1	0	3	1
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 5 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 35 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
108	**102236920**	1.620	04/02/2008 19:28	SIDESWIPE, SAME DIRECTION	$ 1000	0	0	0	0	1	2	1	1	0	3	1
Unit	**1 : 4**	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** S		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 4**	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** S		**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
109	**102278545**	1.620	04/24/2008 14:06	REAR END, SLOW OR STOP	$ 600	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 5 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
110	**102265805**	1.620	04/28/2008 07:56	REAR END, SLOW OR STOP	$ 1200	0	0	0	0	2	1	3	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** S		**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** S		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
111	**102273208**	1.620	05/02/2008 11:01	ANIMAL	$ 1000	0	0	0	0	1	1	1	1	0	0	2
Unit	**1 : 4**	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**		17	
112	**102288608**	1.620	05/15/2008 10:14	REAR END, SLOW OR STOP	$ 11000	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** NE		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 12**	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** NE		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			

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113	**102317214**	1.620	06/11/2008 14:31	REAR END, SLOW OR STOP	$ 20000	0	0	1	1	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
114	**102384309**	1.620	09/02/2008 07:31	ANGLE	$ 5500	0	0	1	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** SE	**Veh Mnvr/Ped Actn:**			8		**Obj Strk:**					
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** SW	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
115	**102398560**	1.620	09/20/2008 23:55	PARKED MOTOR VEHICL	$ 2500	0	0	0	0	1	5	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**		20			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**		20			
Unit	**3 :** 32	**Alchl/Drgs:**	7	**Speed:** 0 MPH	**Dir:**	**Veh Mnvr/Ped Actn:**					**Obj Strk:**		20			
116	**102415993**	1.620	10/08/2008 19:09	REAR END, SLOW OR STOP	$ 2500	0	0	0	0	2	2	3	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
117	**102424416**	1.620	10/10/2008 14:49	LEFT TURN, DIFFERENT ROADWAYS	$ 4000	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			8		**Obj Strk:**					
118	**102497734**	1.620	01/17/2009 05:21	REAR END, SLOW OR STOP	$ 14000	0	0	0	0	1	4	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
119	**102501684**	1.620	01/25/2009 14:00	REAR END, SLOW OR STOP	$ 3000	0	0	0	0	1	1	2	1	0	3	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
120	**102517882**	1.620	02/12/2009 19:16	REAR END, SLOW OR STOP	$ 3000	0	0	0	1	1	4	1	1	0	3	1
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
121	**102537483**	1.620	02/27/2009 18:27	REAR END, SLOW OR STOP	$ 2400	0	0	0	0	2	3	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
Unit	**2 :** 5	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
122	**102602686**	1.620	06/02/2009 21:49	ANGLE	$ 6000	0	0	0	0	1	4	1	1	0	3	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH **Dir:** S		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
123	**102493725**	1.624	01/13/2009 07:46	REAR END, SLOW OR STOP	$ 13500	0	0	1	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 35 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**4 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH **Dir:** E		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
124	**102468739**	1.670	12/11/2008 14:42	REAR END, SLOW OR STOP	$ 1000	0	0	0	0	2	1	3	1	0	3	1
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 45 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				8			**Obj Strk:**			
125	**101878308**	1.720	01/04/2007 16:09	REAR END, SLOW OR STOP	$ 10000	0	0	0	0	1	1	2	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH **Dir:** N		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** N		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
126	**102110623**	1.761	11/14/2007 19:12	REAR END, SLOW OR STOP	$ 3000	0	0	0	0	1	4	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
127	**102000183**	1.766	04/01/2007 11:42	REAR END, SLOW OR STOP	$ 600	0	0	0	0	1	1	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH **Dir:** N		**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH **Dir:** N		**Veh Mnvr/Ped Actn:**				9			**Obj Strk:**			
128	**101814625**	1.770	08/23/2006 18:42	REAR END, SLOW OR STOP	$ 1500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 15 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
129	**101871727**	1.770	10/30/2006 13:51	REAR END, SLOW OR STOP	$ 3000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 0 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH **Dir:** W		**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
130	**101866128**	1.770	12/08/2006 20:12	ANGLE	$ 25000	0	0	0	0	1	4	2	1	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	2	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
131	**101893105**	1.770	01/24/2007 11:30	SIDESWIPE, SAME DIRECTION	$ 1200	0	0	0	0	1	1	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 50 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 11	**Alchl/Drgs:**	0	**Speed:** 55 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
132	**101952770**	1.770	04/12/2007 08:23	ANGLE	$ 2000	0	0	0	0	1	1	2	1	0	3	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
133	**101998775**	1.770	06/20/2007 08:23	REAR END, SLOW OR STOP	$ 3500	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
134	**102031322**	1.770	08/02/2007 16:52	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	7	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			5			**Obj Strk:**				
135	**102047611**	1.770	08/19/2007 18:54	ANGLE	$ 2000	0	0	0	0	1	1	1	2	0	1	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			7			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			7			**Obj Strk:**				
136	**102400609**	1.770	08/29/2008 14:33	REAR END, SLOW OR STOP	$ 1200	0	0	0	0	1	1	1	1	0	0	2
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
137	**102391073**	1.770	09/11/2008 17:53	REAR END, SLOW OR STOP	$ 3300	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
138	**102443257**	1.770	11/12/2008 17:47	REAR END, SLOW OR STOP	$ 5000	0	0	0	0	1	4	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			5			**Obj Strk:**				

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
139	**102527149**	1.770	02/23/2009 08:50	SIDESWIPE, SAME DIRECTION	$ 2000	0	0	0	0	1	1	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		5		**Obj Strk:**						
140	**102578781**	1.770	04/25/2009 11:41	SIDESWIPE, SAME DIRECTION	$ 1800	0	0	0	0	1	1	1	3	0	3	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		5		**Obj Strk:**						
141	**102590892**	1.770	05/15/2009 07:23	ANGLE	$ 5000	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 3	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**		7		**Obj Strk:**						
142	**102452065**	1.808	11/18/2008 18:48	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	5	1	2	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		1		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		11		**Obj Strk:**						
143	**102343366**	1.940	07/08/2008 16:09	REAR END, SLOW OR STOP	$ 1500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		1		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		1		**Obj Strk:**						
Unit	**3 :** 1	**Alchl/Drgs:**	7	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
144	**102570045**	1.940	04/16/2009 11:25	SIDESWIPE, SAME DIRECTION	$ 200	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		3		**Obj Strk:**						
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**		5		**Obj Strk:**						
145	**102215427**	1.946	01/15/2008 17:05	SIDESWIPE, SAME DIRECTION	$ 3000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
146	**101843859**	1.950	11/13/2006 13:10	LEFT TURN, SAME ROADWAY	$ 1500	0	0	0	0	1	1	1	7	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** SW	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**		8		**Obj Strk:**						
147	**101847229**	1.950	11/16/2006 09:06	REAR END, SLOW OR STOP	$ 2500	0	0	0	0	2	1	3	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		11		**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**		4		**Obj Strk:**						

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
148	**101856759**	1.950	11/30/2006 08:07	ANGLE	$ 4500	0	0	0	1	1	1	1	3	0	3	1
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
149	**101856027**	1.950	12/01/2006 14:09	REAR END, SLOW OR STOP	$ 3500	0	0	0	0	2	1	2	3	0	3	1
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
150	**102026885**	1.950	07/30/2007 11:41	REAR END, SLOW OR STOP	$ 1100	0	0	0	0	1	1	1	7	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
151	**102073216**	1.950	09/26/2007 15:27	REAR END, SLOW OR STOP	$ 1000	0	0	0	0	1	1	1	7	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
152	**102215787**	1.950	03/16/2008 17:49	REAR END, SLOW OR STOP	$ 5000	0	0	0	0	1	1	1	7	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
153	**102331050**	1.950	06/23/2008 17:07	ANGLE	$ 14000	0	0	0	2	1	1	1	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** NW	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
154	**102349730**	1.950	07/12/2008 18:05	ANGLE	$ 5000	0	0	0	0	1	1	1	3	0		1
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
155	**102459628**	1.950	12/03/2008 12:55	REAR END, SLOW OR STOP	$ 5000	0	0	0	4	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
156	**102509850**	1.950	02/03/2009 18:29	ANGLE	$ 1700	0	0	0	0	1	2	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				

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North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
157	**102616431**	1.950	06/18/2009 08:29	LEFT TURN, SAME ROADWAY	$ 19000	0	0	0	2	1	1	2	3	0	3	1

Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	45	MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	45	MPH	**Dir:**	E	**Veh Mnvr/Ped Actn:**	8	**Obj Strk:**					

Legend for Report Details:

Acc No - Accident Number
Injuries: F - Fatal, A - Class A, B - Class B, C - Class C
Condition: R - Road Surface, L - Ambient Light, W - Weather
Rd Ch - Road Character
Rd Ci - Roadway Contributing Circumstances
Trfc Ctl - Traffic Control: Dv - Device, Op - Operating
Alchl/Drgs - Alcohol Drugs Suspected
Veh Mnvr/Ped Actn - Vehicle Maneuver/Pedestrian Action
Obj Strk - Object Struck

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Summary Statistics

High Level Crash Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	157	100.00
Fatal Crashes	0	0.00
Non-Fatal Injury Crashes	35	22.29
Total Injury Crashes	35	22.29
Property Damage Only Crashes	122	77.71
Night Crashes	30	19.11
Wet Crashes	24	15.29
Alcohol/Drugs Involvement Crashes	2	1.27

Crash Severity Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	157	100.00
Fatal Crashes	0	0.00
Class A Crashes	0	0.00
Class B Crashes	9	5.73
Class C Crashes	26	16.56
Property Damage Only Crashes	122	77.71

Vehicle Exposure Statistics

Annual ADT = 43500

Total Length = 1.98 (Miles) 3.187 (Kilometers)

Total Vehicle Exposure = 94.4 (MVMT) 151.92 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	166.32	103.34
Fatal Crash Rate	0.00	0.00
Non Fatal Crash Rate	37.08	23.04
Night Crash Rate	31.78	19.75
Wet Crash Rate	25.42	15.80
EPDO Rate	440.69	273.83

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Miscellaneous Statistics

Severity Index =	2.65
EPDO Crash Index =	416.00
Estimated Property Damage Total = $	728670.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
ANGLE	21	13.38
ANIMAL	2	1.27
BACKING UP	2	1.27
HEAD ON	2	1.27
LEFT TURN, DIFFERENT ROADWAYS	2	1.27
LEFT TURN, SAME ROADWAY	2	1.27
OTHER COLLISION WITH VEHICLE	1	0.64
OVERTURN/ROLLOVER	1	0.64
PARKED MOTOR VEHICLE	1	0.64
RAN OFF ROAD - LEFT	5	3.18
RAN OFF ROAD - RIGHT	3	1.91
REAR END, SLOW OR STOP	99	63.06
RIGHT TURN, DIFFERENT ROADWAYS	1	0.64
SIDESWIPE, SAME DIRECTION	15	9.55

Injury Summary

Injury Type	Number of Injuries	Percent of Total
Fatal Injuries	0	0.00
Class A Injuries	0	0.00
Class B Injuries	10	17.24
Class C Injuries	48	82.76
Total Non-Fatal Injuries	58	100.00
Total Injuries	58	100.00

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Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	11	7.01
Feb	13	8.28
Mar	9	5.73
Apr	16	10.19
May	8	5.10
Jun	13	8.28
Jul	13	8.28
Aug	13	8.28
Sep	9	5.73
Oct	17	10.83
Nov	22	14.01
Dec	13	8.28

Daily Summary

Day	Number of Crashes	Percent of Total
Mon	20	12.74
Tue	31	19.75
Wed	30	19.11
Thu	32	20.38
Fri	26	16.56
Sat	10	6.37
Sun	8	5.10

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Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	2	1.27
0100-0159	1	0.64
0200-0259	1	0.64
0300-0359	0	0.00
0400-0459	0	0.00
0500-0559	1	0.64
0600-0659	1	0.64
0700-0759	10	6.37
0800-0859	10	6.37
0900-0959	6	3.82
1000-1059	2	1.27
1100-1159	8	5.10
1200-1259	4	2.55
1300-1359	6	3.82
1400-1459	12	7.64
1500-1559	8	5.10
1600-1659	23	14.65
1700-1759	27	17.20
1800-1859	14	8.92
1900-1959	11	7.01
2000-2059	4	2.55
2100-2159	1	0.64
2200-2259	1	0.64
2300-2359	4	2.55

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Light and Road Conditions Summary

Condition	Dry	Wet	Other	Total
Day	102	16	0	118
Dark	27	3	0	30
Other	4	5	0	9
Total	133	24	0	157

Object Struck Summary

Object Type	Times Struck	Percent of Total
ANIMAL	2	15.38
EMBANKMENT	1	7.69
MOVABLE OBJECT	1	7.69
OFFICIAL HIGHWAY SIGN NON-BREAKAWAY	1	7.69
OTHER FIXED OBJECT	2	15.38
PARKED MOTOR VEHICLE	3	23.08
TREE	3	23.08

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
LIGHT TRUCK (MINI-VAN, PANEL)	5	1.46
PASSENGER CAR	237	69.30
PICKUP	23	6.73
SINGLE UNIT TRUCK (2-AXLE, 6-TIRE)	2	0.58
SINGLE UNIT TRUCK (3 OR MORE AXLES)	1	0.29
SPORT UTILITY	54	15.79
TRACTOR/SEMI-TRAILER	1	0.29
TRUCK/TRAILER	1	0.29
UNKNOWN	1	0.29
VAN	17	4.97

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Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
2006	34	0	10	24
2007	47	0	9	38
2008	47	0	10	37
2009	29	0	6	23
Total	157	0	35	122

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2006	0	16
2007	0	16
2008	0	17
2009	0	9
Total	0	58

Miscellaneous Totals

Year	Property Damage	EPDO Index
2006	$ 183500	108.00
2007	$ 193570	113.60
2008	$ 192900	121.00
2009	$ 158700	73.40
Total	$ 728670	416.00

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
2006	2	0	17	1	8	1	5
2007	0	1	32	3	6	4	1
2008	1	0	34	1	4	5	2
2009	1	0	16	3	3	5	1
Total	4	1	99	8	21	15	9

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Strip Diagram

Features	Milepost	Crash IDs
CL-ORANGE	0.000	102197595
	0.010	
	0.020	
	0.030	
	0.040	
	0.050	
	0.060	
	0.070	
	0.080	
	0.090	
	0.100	101792063
	0.110	
	0.120	101996915
SR 1110 | BARBEE CHAPEL	0.130	101976936
	0.140	
	0.150	
	0.160	
	0.170	
	0.180	
	0.190	
	0.200	
	0.210	102157589
	0.220	
	0.230	
	0.240	
	0.250	
	0.260	
	0.270	
	0.280	
	0.290	
	0.300	
	0.310	
	0.320	
	0.330	102455941
	0.340	
	0.350	
	0.360	101836288
	0.370	101898348
	0.380	
	0.390	
	0.400	
	0.410	102306091

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Features	Milepost	Crash IDs
	0.420	
	0.430	
	0.440	
	0.450	
LITTLE JOHN	0.460	102111667
	0.470	102070964
	0.480	
	0.490	
	0.500	
	0.510	
	0.520	
	0.530	102370756
ML-CHAPEL HILL | ML-DURHAM	0.540	
	0.550	
	0.560	
DOWNING CREEK	0.570	102415992 | 102513020
	0.580	102160407
	0.590	102115704
	0.600	
	0.610	101836521
	0.620	
	0.630	101843864
	0.640	
	0.650	
	0.660	
	0.670	101994640
	0.680	
	0.690	
	0.700	
	0.710	102093759
	0.720	
	0.730	
	0.740	
	0.750	
	0.760	
	0.770	
	0.780	
	0.790	
	0.800	
	0.810	
	0.820	101903082 | 102191257
	0.830	
	0.840	

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Features	Milepost	Crash IDs
	0.850	
	0.860	
	0.870	
Structure:310319 | Structure:310320	0.880	
	0.890	
	0.900	102493834
	0.910	
	0.920	
	0.930	
	0.940	
	0.950	
	0.960	
	0.970	
	0.980	
	0.990	
	1.000	101839491
	1.010	
	1.020	
	1.030	
	1.040	
	1.050	
	1.060	102086537
	1.070	102259559 | 102453929
	1.080	
	1.090	
	1.100	
	1.110	102479123
	1.120	102584393 | 101928601
	1.130	
	1.140	
	1.150	
	1.160	
	1.170	
	1.180	102084762
	1.190	
	1.200	101818590 | 102567801 | 101994629
HUNTING RIDGE | HUNTINGTON RIDGE |	1.210	101822620 | 101890574 | 101865583 | 101876286 |
HUNTINGBRIDGE		101919359 | 101988000 | 102067228 | 102099881 |
		102246237 | 102362865 | 102358118 | 102619305 |
		102621654 | 101854200
	1.220	102100113 | 102403304 | 101971859
	1.230	
	1.240	

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Features	Milepost	Crash IDs
	1.250	101987973 | 102585502
	1.260	102100114
	1.270	102647494
	1.280	
	1.290	
	1.300	
	1.310	101773406 | 102183990
	1.320	102154283
	1.330	
	1.340	101785501 | 101773409 | 102017626
	1.350	
	1.360	102529566
	1.370	102420407
	1.380	
	1.390	
	1.400	101825390 | 102621750
	1.410	
	1.420	101787017 | 102264637
	1.430	102605688
CELESTE | FALCON RIDGE | FALCONBRIDGE	1.440	101821229 | 101961994 | 102004923 | 102101874 |
| FARMINGTON | GEORGE KING		102141972 | 102402614 | 102379601 | 102468730 |
		102558347
	1.450	102472592 | 102586679
	1.460	102576140
	1.470	
	1.480	
	1.490	
	1.500	
	1.510	
	1.520	102398049
	1.530	
	1.540	102438859 | 102527141
	1.550	
	1.560	
	1.570	101763518 | 101968730 | 102139429 | 102159990 |
		102424401 | 102548378 | 102565511
	1.580	101818596 | 101851168
	1.590	
	1.600	102135837
	1.610	
SR 1110 | FARRINGTON | WATKINS	1.620	101765224 | 101807668 | 101844586 | 101842590 |

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Features	Milepost	Crash IDs
		101898580 | 101899455 | 101910294 | 101987569 |
		101942149 | 101960126 | 102012166 | 102035524 |
		102052841 | 102125799 | 102236920 | 102278545 |
		102265805 | 102273208 | 102288608 | 102317214 |
		102384309 | 102398560 | 102415993 | 102424416 |
		102497734 | 102501684 | 102517882 | 102537483 |
		102602686 | 102493725
	1.630	
	1.640	
	1.650	
	1.660	
	1.670	102468739
	1.680	
	1.690	
	1.700	
	1.710	
	1.720	101878308
	1.730	
	1.740	
	1.750	
	1.760	102110623
I 40 | Structure:310314	1.770	102000183 | 101814625 | 101871727 | 101866128 |
		101893105 | 101952770 | 101998775 | 102031322 |
		102047611 | 102400609 | 102391073 | 102443257 |
		102527149 | 102578781 | 102590892
	1.780	
	1.790	
	1.800	
	1.810	102452065
	1.820	
	1.830	
	1.840	
	1.850	
	1.860	
	1.870	
	1.880	
	1.890	
	1.900	
	1.910	
	1.920	
	1.930	
	1.940	102343366 | 102570045
SR 2290 | LEIGH FARM | QUADRANGLE	1.950	102215427 | 101843859 | 101847229 | 101856759 |

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Features	Milepost	Crash IDs
		101856027 | 102026885 | 102073216 | 102215787 | 102331050 | 102349730 | 102459628 | 102509850 | 102616431
	1.960	
	1.970	
	1.980	

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Study Criteria

Study Name	Log No.	PH No.	TIP No.	K/A Cf.	B/C Cf.	ADT	ADT Route
LTNC54FORDHAMTOLEIGHFARMDURHAM				76.8	8.4	43500	30000054

Request Date	Courier Service	Phone No.	Ext.	Fax No.
08/13/2009				

County			Municipality					
Name	Code	Div.	Name	Code	Y-Line Ft.	Begin Date	End Date	Years
DURHAM	31	5	All and Rural		150	07/01/2006	06/30/2009	3.00

Location Text	Requestor
NC 54 from Fordham Blvd to Leigh Farm/Quadrangle, Durham Co portion	Leta Huntsinger

Fiche Roads

Name	Code
NC 54	30000054

Strip Road

Name	Code	Begin MP	End MP	Miles	Kilometers
NC 54	30000054	0.000	1.980	1.980	3.187

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North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Study Criteria Summary

County: ORANGE **City:** All and Rural
Date: 07/01/2006 **to** 06/30/2009 **Study:** LTNC54FORDHAMTOLEIGHFARMORANGE
Location: NC 54 from Fordham Blvd to Leigh Farm/Quadrangle, Orange Co portion

Report Details

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
1	**102418626**	15.581	10/01/2008 14:13	REAR END, SLOW OR STOP	$ 1900	0	0	0	0	1	1	1	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	20 MPH	**Dir:**	S	**Veh Mnvr/Ped Actn:**	1	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	20 MPH	**Dir:**	S	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
2	**102353888**	15.598	06/23/2008 10:36	REAR END, SLOW OR STOP	$ 10100	0	0	0	0	1	1	2	6	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	0 MPH	**Dir:**	S	**Veh Mnvr/Ped Actn:**	1	**Obj Strk:**						
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:**	10 MPH	**Dir:**	S	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
3	**101773778**	15.600	07/04/2006 17:48	REAR END, SLOW OR STOP	$ 2500	0	0	0	0	1	1	1	7	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:**	5 MPH	**Dir:**	SE	**Veh Mnvr/Ped Actn:**	7	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	5 MPH	**Dir:**	SE	**Veh Mnvr/Ped Actn:**	7	**Obj Strk:**						
4	**101834129**	15.600	09/17/2006 17:25	REAR END, SLOW OR STOP	$ 2200	0	0	0	0	1	1	1	5	0		
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:**	10 MPH	**Dir:**	N	**Veh Mnvr/Ped Actn:**	11	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	10 MPH	**Dir:**	N	**Veh Mnvr/Ped Actn:**	11	**Obj Strk:**						
5	**101908771**	15.600	12/09/2006 19:07	LEFT TURN, SAME ROADWAY	$ 9500	0	0	0	0	1	4	1	1	0		
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	5 MPH	**Dir:**	N	**Veh Mnvr/Ped Actn:**	8	**Obj Strk:**						
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:**	20 MPH	**Dir:**	W	**Veh Mnvr/Ped Actn:**	4	**Obj Strk:**						
6	**101926800**	15.600	12/25/2006 06:26	REAR END, SLOW OR STOP	$ 100	0	0	0	1	2	1	3	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	5 MPH	**Dir:**	S	**Veh Mnvr/Ped Actn:**	12	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	5 MPH	**Dir:**	S	**Veh Mnvr/Ped Actn:**	11	**Obj Strk:**						
7	**101975773**	15.600	03/04/2007 16:23	REAR END, SLOW OR STOP	$ 500	0	0	0	1	1	1	1	1	0	1	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:**	10 MPH	**Dir:**	N	**Veh Mnvr/Ped Actn:**	12	**Obj Strk:**						
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:**	0 MPH	**Dir:**	N	**Veh Mnvr/Ped Actn:**	1	**Obj Strk:**						
8	**102090402**	15.600	07/15/2007 14:30	REAR END, TURN	$ 1300	0	0	0	0	1	1	1	6	0	3	1
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:**	0 MPH	**Dir:**	S	**Veh Mnvr/Ped Actn:**	1	**Obj Strk:**						

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North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 3 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				7			**Obj Strk:**			
9	**102186237**	15.600	11/08/2007 21:44	ANIMAL	$ 2000	0	0	0	0	1	5	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 50 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**		17	
10	**102410021**	15.600	09/19/2008 18:38	SIDESWIPE, SAME DIRECTION	$ 5600	0	0	0	0	1	1	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
11	**102499726**	15.600	12/12/2008 15:50	REAR END, SLOW OR STOP	$ 2600	0	0	0	0	1	1	1	6	0	1	1
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** SE	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 55 MPH	**Dir:** SE	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
12	**102514282**	15.600	01/11/2009 12:41	REAR END, SLOW OR STOP	$ 3000	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 : 4**	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 : 4**	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
13	**102530261**	15.600	02/04/2009 12:52	SIDESWIPE, SAME DIRECTION	$ 1500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
14	**102549281**	15.600	03/05/2009 18:21	REAR END, SLOW OR STOP	$ 1800	0	0	0	0	1	4	1	5	0	0	3
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** SE	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 : 4**	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** SE	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
15	**102613146**	15.605	06/04/2009 17:11	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	2	1	2	1	0	2	1
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
16	**101884845**	15.609	11/12/2006 20:39	REAR END, SLOW OR STOP	$ 6000	0	0	0	0	1	5	1	7	0	1	1
Unit	**1 : 2**	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
17	**102266881**	15.628	02/20/2008 16:59	SIDESWIPE, SAME DIRECTION	$ 1100	0	0	0	0	1	1	1	1	0	0	
Unit	**1 : 1**	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 : 1**	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			

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North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
18	**101901941**	15.638	12/01/2006 02:37	RAN OFF ROAD - RIGHT	$ 2050	0	0	0	0	2	4	2	1	0		2
Unit	**1 :** 1	**Alchl/Drgs:**	1	**Speed:** 50 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**		64	
19	**102135142**	15.650	09/10/2007 12:46	REAR END, SLOW OR STOP	$ 2500	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
20	**102403094**	15.695	09/06/2008 07:26	SIDESWIPE, SAME DIRECTION	$ 2200	0	0	0	0	3	1	3	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**		39	
21	**102173055**	15.700	10/25/2007 19:06	SIDESWIPE, SAME DIRECTION	$ 2000	0	0	0	0	2	1	3	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
22	**102487705**	15.700	12/11/2008 18:03	REAR END, SLOW OR STOP	$ 6000	0	0	0	0	2	4	9	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
23	**102191793**	15.738	11/14/2007 08:13	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	1	1	1	12	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
24	**102191790**	15.743	11/14/2007 08:13	REAR END, SLOW OR STOP	$ 5500	0	0	0	1	1	1	1	1	0		
Unit	**1 :** 20	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
25	**102626866**	15.743	06/20/2009 02:56	REAR END, SLOW OR STOP	$ 4000	0	0	0	0	1	4	1	1	0		
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 32	**Alchl/Drgs:**	7	**Speed:** 55 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
26	**102516059**	15.781	11/18/2008 15:46	REAR END, SLOW OR STOP	$ 3000	0	0	0	0	1	1	1	1	0		
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
27	**102598166**	15.781	05/13/2009 12:13	REAR END, SLOW OR STOP	$ 2800	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
28	**102553850**	15.785	03/11/2009 15:12	REAR END, SLOW OR STOP	$ 7500	0	0	1	0	1	1	2	1	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 5	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
29	**102460865**	15.791	11/11/2008 15:17	REAR END, SLOW OR STOP	$ 1500	0	0	0	0	1	1	2	1	0		
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11			**Obj Strk:**				
30	**101865325**	15.800	10/24/2006 18:27	LEFT TURN, SAME ROADWAY	$ 3000	0	0	0	0	1	1	1	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** SW	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
31	**102119489**	15.800	08/23/2007 20:21	REAR END, SLOW OR STOP	$ 1200	0	0	0	0	1	5	1	1	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
32	**102219063**	15.800	12/09/2007 02:00	PEDESTRIAN	$ 0	0	0	1	0	1	4	1	1	0	3	1
Unit	**1 :** 32	**Alchl/Drgs:**	7	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**		14		
Unit	**2 :** 24	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:**	**Veh Mnvr/Ped Actn:**						**Obj Strk:**		14		
33	**102214826**	15.800	12/12/2007 09:45	OTHER COLLISION WITH VEHICLE	$ 1500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** NW	**Veh Mnvr/Ped Actn:**			9			**Obj Strk:**				
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
34	**102419928**	15.800	10/06/2008 15:23	RIGHT TURN, SAME ROADWAY	$ 1250	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** SE	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
35	**101848864**	15.802	10/06/2006 12:19	REAR END, SLOW OR STOP	$ 3900	0	0	0	0	2	1	3	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
36	**101859973**	15.803	10/18/2006 18:13	REAR END, SLOW OR STOP	$ 3150	0	0	0	3	1	1	1	1	0	3	1
Unit	**1 :** 9	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
37	**102171712**	15.803	10/24/2007 13:05	ANGLE	$ 3000	0	0	0	1	2	1	3	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
38	**102235215**	15.804	01/07/2008 09:02	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 10	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
39	**102140963**	15.809	09/15/2007 11:25	REAR END, SLOW OR STOP	$ 3500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			5		**Obj Strk:**					
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
40	**101781635**	15.814	07/10/2006 16:45	FIXED OBJECT	$ 1100	0	0	1	0	1	1	1	1	0		2
Unit	**1 :** 20	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			8		**Obj Strk:**					
41	**102547738**	15.814	03/03/2009 08:33	SIDESWIPE, SAME DIRECTION	$ 3000	0	0	0	0	4	1	1	1	0	0	2
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			5		**Obj Strk:**					
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
42	**102599029**	15.819	05/15/2009 17:28	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
43	**102604299**	15.838	05/21/2009 07:56	LEFT TURN, SAME ROADWAY	$ 1700	0	0	0	2	7	1	2	5	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** SW	**Veh Mnvr/Ped Actn:**			8		**Obj Strk:**					
44	**102561995**	15.880	03/28/2009 13:04	REAR END, SLOW OR STOP	$ 7800	0	0	0	1	1	1	2	3	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
45	**102575705**	15.895	04/09/2009 15:45	REAR END, SLOW OR STOP	$ 2500	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
46	**102329129**	15.931	05/09/2008 14:29	SIDESWIPE, SAME DIRECTION	$ 1000	0	0	0	0	1	1	1	3	0	0	
Unit	**1 :** 10	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
47	**102587223**	16.073	04/30/2009 11:29	REAR END, SLOW OR STOP	$ 10500	0	0	0	0	1	1	2	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
48	**102513652**	16.080	01/09/2009 08:04	REAR END, SLOW OR STOP	$ 2100	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
49	**102207198**	16.128	12/03/2007 07:19	REAR END, SLOW OR STOP	$ 2200	0	0	0	0	2	1	1	4	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 :** 3	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
50	**101781003**	16.130	07/09/2006 17:39	RAN OFF ROAD - RIGHT	$ 3000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				7			**Obj Strk:**		37	
51	**101880965**	16.130	11/08/2006 22:11	REAR END, SLOW OR STOP	$ 4000	0	0	0	0	2	4	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
52	**101975213**	16.130	03/03/2007 12:57	RIGHT TURN, DIFFERENT ROADWAYS	$ 3350	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**				7			**Obj Strk:**		37	
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
53	**102011976**	16.130	04/15/2007 22:01	BACKING UP	$ 1200	0	0	0	0	2	4	3	4	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				10			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			

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North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
54	**102278967**	16.130	03/08/2008 15:56	REAR END, SLOW OR STOP	$ 1500	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			12		**Obj Strk:**					
55	**102300542**	16.130	04/08/2008 14:10	RIGHT TURN, DIFFERENT ROADWAYS	$ 24000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			7		**Obj Strk:**					
56	**102323064**	16.130	05/11/2008 11:27	RIGHT TURN, SAME ROADWAY	$ 2500	0	0	0	0	2	1	3	3	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			7		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
57	**102362352**	16.130	07/07/2008 12:17	LEFT TURN, DIFFERENT ROADWAYS	$ 2500	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			8		**Obj Strk:**					
Unit	**2 :** 3	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
58	**102615334**	16.130	06/07/2009 03:50	REAR END, SLOW OR STOP	$ 14000	0	0	0	1	1	4	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
59	**101885542**	16.158	11/13/2006 16:53	REAR END, SLOW OR STOP	$ 1000	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
60	**101835337**	16.282	09/19/2006 21:22	REAR END, SLOW OR STOP	$ 8000	0	0	0	0	1	4	1	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
61	**102366013**	16.316	07/11/2008 10:35	REAR END, SLOW OR STOP	$ 1500	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
62	**102560488**	16.316	03/26/2009 18:42	REAR END, SLOW OR STOP	$ 6500	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 50 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					

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63	**102088007**	16.317	07/13/2007 11:20	REAR END, SLOW OR STOP	$ 6500	0	0	0	1	1	1	2	2	0	0	
Unit	**1 :** 5	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
64	**101780625**	16.320	07/08/2006 12:42	PEDALCYCLIST	$ 1000	0	1	0	0	1	1	1	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**				8			**Obj Strk:**		15	
Unit	**2 :** 23	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:**	**Veh Mnvr/Ped Actn:**							**Obj Strk:**			
65	**101854285**	16.320	10/10/2006 20:06	LEFT TURN, SAME ROADWAY	$ 5600	0	0	0	0	1	4	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** SW	**Veh Mnvr/Ped Actn:**				8			**Obj Strk:**			
Unit	**2 :** 3	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
66	**101885557**	16.320	11/13/2006 17:18	ANGLE	$ 2000	0	0	0	0	1	2	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
67	**101889573**	16.320	11/17/2006 07:49	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	1	1	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
68	**101891499**	16.320	12/11/2006 09:33	SIDESWIPE, SAME DIRECTION	$ 2000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 11	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
69	**102033513**	16.320	05/07/2007 07:41	LEFT TURN, DIFFERENT ROADWAYS	$ 30250	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				8			**Obj Strk:**			
Unit	**2 :** 5	**Alchl/Drgs:**	0	**Speed:** 50 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
70	**102032922**	16.320	05/07/2007 07:54	REAR END, SLOW OR STOP	$ 900	0	0	0	1	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
71	**102038814**	16.320	05/14/2007 07:14	ANGLE	$ 4000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
72	**102051501**	16.320	05/28/2007 16:43	ANGLE	$ 4000	0	0	0	0	1	1	1	4	0	3	1
Unit	**1 :** 3	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			7			**Obj Strk:**				
73	**102055325**	16.320	06/01/2007 07:37	HEAD ON	$ 1100	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** NW	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
74	**102059147**	16.320	06/05/2007 18:56	ANGLE	$ 20000	0	0	0	2	1	1	1	5	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 3	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
Unit	**3 :** 4	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
75	**102061250**	16.320	06/08/2007 15:22	ANGLE	$ 14000	0	0	0	1	1	1	1	5	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
76	**102076718**	16.320	06/28/2007 09:22	REAR END, SLOW OR STOP	$ 2000	0	0	0	1	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1			**Obj Strk:**				
77	**102144085**	16.320	09/19/2007 06:22	LEFT TURN, SAME ROADWAY	$ 5000	1	0	0	1	1	3	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			16			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			16			**Obj Strk:**				
78	**102205161**	16.320	11/30/2007 18:39	LEFT TURN, SAME ROADWAY	$ 15000	0	0	0	1	1	1	1	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
79	**102213959**	16.320	12/11/2007 13:49	RIGHT TURN, DIFFERENT ROADWAYS	$ 1000	0	0	0	0	1	1	1		0		
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** SW	**Veh Mnvr/Ped Actn:**			7			**Obj Strk:**				
80	**102243214**	16.320	01/18/2008 18:03	LEFT TURN, SAME ROADWAY	$ 4800	0	0	0	0	1	5	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4			**Obj Strk:**				
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			8			**Obj Strk:**				

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
81	**102475586**	16.320	12/05/2008 15:51	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	1	1	1	0		
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
82	**102542718**	16.320	02/25/2009 08:27	REAR END, SLOW OR STOP	$ 5050	0	0	0	0	1	1	2	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
83	**102547742**	16.320	03/03/2009 11:30	RAN OFF ROAD - RIGHT	$ 6000	0	0	0	0	1	1	1	3	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 20 MPH	**Dir:** SW	**Veh Mnvr/Ped Actn:**				8			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 40 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**	64		
84	**102586049**	16.320	05/02/2009 10:59	SIDESWIPE, SAME DIRECTION	$ 800	0	0	0	1	1	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				5			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				12			**Obj Strk:**			
85	**101907426**	16.322	12/08/2006 09:54	REAR END, SLOW OR STOP	$ 2500	0	0	0	0	1	1	1	5	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
86	**101898731**	16.325	11/27/2006 13:30	REAR END, SLOW OR STOP	$ 2550	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
87	**101945888**	16.329	01/26/2007 17:04	REAR END, SLOW OR STOP	$ 1600	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			
88	**102543343**	16.339	02/28/2009 15:36	OTHER COLLISION WITH VEHICLE	$ 2500	0	0	0	0	2	1	3	5	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				11			**Obj Strk:**			
Unit	**3 :** 32	**Alchl/Drgs:**	7	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				16			**Obj Strk:**			
89	**102126276**	16.344	08/31/2007 17:04	REAR END, SLOW OR STOP	$ 6800	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				1			**Obj Strk:**			
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 10 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**				4			**Obj Strk:**			

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Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries F	A	B	C	Condition R	L	W	Road Ch	Ci	Trfc Ctl Dv	Op
90	**102560496**	16.377	03/26/2009 18:22	REAR END, SLOW OR STOP	$ 5000	0	0	0	0	1	1	2	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
91	**102023786**	16.420	04/27/2007 18:07	SIDESWIPE, SAME DIRECTION	$ 2200	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 3	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			5		**Obj Strk:**					
92	**102493472**	16.420	12/18/2008 07:59	REAR END, SLOW OR STOP	$ 3300	0	0	0	0	1	1	1	1	0	0	
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
93	**102522011**	16.420	01/22/2009 04:28	RAN OFF ROAD - RIGHT	$ 5600	0	0	0	0	1	5	1	1	0	0	2
Unit	**1 :** 4	**Alchl/Drgs:**	1	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**		33			
94	**102581519**	16.434	04/24/2009 07:37	REAR END, SLOW OR STOP	$ 10200	0	0	2	0	1	1	2	1	0		
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 50 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
95	**102407522**	16.641	09/12/2008 16:09	REAR END, SLOW OR STOP	$ 1800	0	0	0	1	1	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
96	**102260739**	16.647	02/12/2008 16:42	REAR END, SLOW OR STOP	$ 4500	0	0	0	0	2	1	3	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
97	**102278068**	16.648	03/07/2008 12:22	REAR END, SLOW OR STOP	$ 4000	0	0	0	0	2	1	3	1	0	1	1
Unit	**1 :** 2	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** SE	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** SE	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
98	**102412708**	16.648	09/22/2008 17:49	REAR END, SLOW OR STOP	$ 5800	0	0	0	1	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					

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99	**101953606**	16.650	02/05/2007 18:08	REAR END, SLOW OR STOP	$ 1600	0	0	0	0	1	4	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			13		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:**			13		**Obj Strk:**					
100	**102011986**	16.650	04/15/2007 09:02	REAR END, SLOW OR STOP	$ 3500	0	0	0	0	2	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 2	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
101	**102022971**	16.650	04/26/2007 15:47	REAR END, SLOW OR STOP	$ 2000	0	0	0	0	1	1	2	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 15 MPH	**Dir:** NE	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
102	**102085654**	16.650	07/10/2007 17:49	REAR END, SLOW OR STOP	$ 5000	0	0	0	0	2	1	3	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			11		**Obj Strk:**					
103	**102421034**	16.650	10/07/2008 02:00	ANGLE	$ 8500	0	0	1	0	1	4	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	1	**Speed:** 35 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
104	**102460673**	16.650	11/08/2008 15:58	REAR END, SLOW OR STOP	$ 4650	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**3 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**4 :** 1	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
105	**102510639**	16.650	01/08/2009 17:33	SIDESWIPE, SAME DIRECTION	$ 1200	0	0	0	0	1	5	1	1	0	3	1
Unit	**1 :** 4	**Alchl/Drgs:**	0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
Unit	**2 :** 3	**Alchl/Drgs:**	0	**Speed:** 5 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			5		**Obj Strk:**					
106	**102419623**	16.652	10/03/2008 15:44	REAR END, SLOW OR STOP	$ 10000	0	0	0	0	1	1	1	1	0	3	1
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**2 :** 3	**Alchl/Drgs:**	0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			1		**Obj Strk:**					
Unit	**3 :** 10	**Alchl/Drgs:**	0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					
107	**102486618**	16.659	12/10/2008 17:10	REAR END, SLOW OR STOP	$ 13400	0	0	0	0	2	4	2	1	0		3
Unit	**1 :** 1	**Alchl/Drgs:**	0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:**			4		**Obj Strk:**					

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Unit 2 : 5	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
Unit 3 : 4	**Alchl/Drgs:** 0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
Unit 4 : 1	**Alchl/Drgs:** 0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
108	**102575699**	16.659	04/17/2009 14:20	REAR END, SLOW OR STOP	$ 8000	0	0	0	0	1	1	1	1	0	0	
Unit 1 : 1	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
Unit 2 : 5	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
109	**101974745**	16.688	03/02/2007 19:11	REAR END, SLOW OR STOP	$ 2500	0	0	0	0	1	5	1	1	0	0	
Unit 1 : 1	**Alchl/Drgs:** 0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 11	**Obj Strk:**											
Unit 2 : 32	**Alchl/Drgs:** 7	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 11	**Obj Strk:**											
Unit 3 : 32	**Alchl/Drgs:** 7	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
110	**101961763**	16.710	02/16/2007 16:14	REAR END, SLOW OR STOP	$ 1150	0	0	0	2	1	1	1	1	0	0	
Unit 1 : 1	**Alchl/Drgs:** 0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 1	**Obj Strk:**											
Unit 2 : 1	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
111	**102278076**	16.710	03/07/2008 16:26	REAR END, SLOW OR STOP	$ 7000	0	0	0	0	2	1	3	1	1	0	
Unit 1 : 4	**Alchl/Drgs:** 0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
Unit 2 : 1	**Alchl/Drgs:** 0	**Speed:** 20 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 11	**Obj Strk:**											
112	**102453472**	16.710	11/03/2008 07:32	ANIMAL	$ 1000	0	0	0	0	1	1	2	3	0		
Unit 1 : 4	**Alchl/Drgs:** 0	**Speed:** 40 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:** 17											
113	**102580579**	16.710	04/23/2009 08:30	REAR END, SLOW OR STOP	$ 8000	0	0	0	2	1	1	1	3	0	13	1
Unit 1 : 1	**Alchl/Drgs:** 0	**Speed:** 35 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
Unit 2 : 1	**Alchl/Drgs:** 0	**Speed:** 0 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 1	**Obj Strk:**											
114	**102580155**	16.710	04/23/2009 09:34	SIDESWIPE, SAME DIRECTION	$ 9000	0	0	0	0	1	1	1	1	0		
Unit 1 : 2	**Alchl/Drgs:** 0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 7	**Obj Strk:**											
Unit 2 : 4	**Alchl/Drgs:** 0	**Speed:** 25 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
Unit 3 : 1	**Alchl/Drgs:** 0	**Speed:** 30 MPH	**Dir:** E	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											

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North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op

Legend for Report Details:

Acc No - Accident Number
Injuries: F - Fatal, A - Class A, B - Class B, C - Class C
Condition: R - Road Surface, L - Ambient Light, W - Weather
Rd Ch - Road Character
Rd Ci - Roadway Contributing Circumstances
Trfc Ctl - Traffic Control: Dv - Device, Op - Operating
Alchl/Drgs - Alcohol Drugs Suspected
Veh Mnvr/Ped Actn - Vehicle Maneuver/Pedestrian Action
Obj Strk - Object Struck

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Summary Statistics

High Level Crash Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	114	100.00
Fatal Crashes	1	0.88
Non-Fatal Injury Crashes	25	21.93
Total Injury Crashes	26	22.81
Property Damage Only Crashes	88	77.19
Night Crashes	21	18.42
Wet Crashes	19	16.67
Alcohol/Drugs Involvement Crashes	3	2.63

Crash Severity Summary

Crash Type	Number of Crashes	Percent of Total
Total Crashes	114	100.00
Fatal Crashes	1	0.88
Class A Crashes	1	0.88
Class B Crashes	5	4.39
Class C Crashes	19	16.67
Property Damage Only Crashes	88	77.19

Vehicle Exposure Statistics

Annual ADT = 47000

Total Length = 1.14 (Miles) 1.835 (Kilometers)

Total Vehicle Exposure = 58.72 (MVMT) 94.51 (MVKMT)

Crash Rate	Crashes Per 100 Million Vehicle Miles	Crashes Per 100 Million Vehicle Kilometers
Total Crash Rate	194.13	120.63
Fatal Crash Rate	1.70	1.06
Non Fatal Crash Rate	42.57	26.45
Night Crash Rate	35.76	22.22
Wet Crash Rate	32.35	20.10
EPDO Rate	754.72	468.96

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Miscellaneous Statistics

Severity Index =	3.89
EPDO Crash Index =	443.20
Estimated Property Damage Total = $	504050.00

Accident Type Summary

Accident Type	Number of Crashes	Percent of Total
ANGLE	7	6.14
ANIMAL	2	1.75
BACKING UP	1	0.88
FIXED OBJECT	1	0.88
HEAD ON	1	0.88
LEFT TURN, DIFFERENT ROADWAYS	2	1.75
LEFT TURN, SAME ROADWAY	7	6.14
OTHER COLLISION WITH VEHICLE	2	1.75
PEDALCYCLIST	1	0.88
PEDESTRIAN	1	0.88
RAN OFF ROAD - RIGHT	4	3.51
REAR END, SLOW OR STOP	67	58.77
REAR END, TURN	1	0.88
RIGHT TURN, DIFFERENT ROADWAYS	3	2.63
RIGHT TURN, SAME ROADWAY	2	1.75
SIDESWIPE, SAME DIRECTION	12	10.53

Injury Summary

Injury Type	Number of Injuries	Percent of Total
Fatal Injuries	1	2.94
Class A Injuries	1	2.94
Class B Injuries	6	17.65
Class C Injuries	26	76.47
Total Non-Fatal Injuries	33	97.06
Total Injuries	34	100.00

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Monthly Summary

Month	Number of Crashes	Percent of Total
Jan	7	6.14
Feb	7	6.14
Mar	13	11.40
Apr	11	9.65
May	10	8.77
Jun	8	7.02
Jul	9	7.89
Aug	2	1.75
Sep	9	7.89
Oct	10	8.77
Nov	14	12.28
Dec	14	12.28

Daily Summary

Day	Number of Crashes	Percent of Total
Mon	19	16.67
Tue	14	12.28
Wed	14	12.28
Thu	18	15.79
Fri	27	23.68
Sat	11	9.65
Sun	11	9.65

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Hourly Summary

Hour	Number of Crashes	Percent of Total
0000-0059	0	0.00
0100-0159	0	0.00
0200-0259	4	3.51
0300-0359	1	0.88
0400-0459	1	0.88
0500-0559	0	0.00
0600-0659	2	1.75
0700-0759	11	9.65
0800-0859	6	5.26
0900-0959	7	6.14
1000-1059	3	2.63
1100-1159	5	4.39
1200-1259	9	7.89
1300-1359	4	3.51
1400-1459	5	4.39
1500-1559	13	11.40
1600-1659	9	7.89
1700-1759	12	10.53
1800-1859	12	10.53
1900-1959	3	2.63
2000-2059	3	2.63
2100-2159	2	1.75
2200-2259	2	1.75
2300-2359	0	0.00

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Light and Road Conditions Summary

Condition	Dry	Wet	Other	Total
Day	75	14	2	91
Dark	16	5	0	21
Other	2	0	0	2
Total	93	19	2	114

Object Struck Summary

Object Type	Times Struck	Percent of Total
ANIMAL	2	18.18
OFFICIAL HIGHWAY SIGN NON-BREAKAWAY	2	18.18
OTHER FIXED OBJECT	2	18.18
OVERHEAD SIGN SUPPORT	1	9.09
PEDALCYCLIST	1	9.09
PEDESTRIAN	2	18.18
TREE	1	9.09

Vehicle Type Summary

Vehicle Type	Number Involved	Percent of Total
LIGHT TRUCK (MINI-VAN, PANEL)	8	3.42
MOTORCYCLE	2	0.85
OTHER BUS	1	0.43
PASSENGER CAR	152	64.96
PEDALCYCLE	1	0.43
PEDESTRIAN	1	0.43
PICKUP	17	7.26
SINGLE UNIT TRUCK (2-AXLE, 6-TIRE)	3	1.28
SINGLE UNIT TRUCK (3 OR MORE AXLES)	1	0.43
SPORT UTILITY	37	15.81
UNKNOWN	5	2.14
VAN	6	2.56

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Yearly Totals Summary

Accident Totals

Year	Total Accidents	Fatal Accidents	Injury Accidents	Property Damage Only Accidents
2006	21	0	4	17
2007	36	1	11	24
2008	30	0	3	27
2009	27	0	7	20
Total	114	1	25	88

Injury Totals

Year	Fatal Injuries	Class A, B, or C Injuries
2006	0	6
2007	1	14
2008	0	3
2009	0	10
Total	1	33

Miscellaneous Totals

Year	Property Damage	EPDO Index
2006	$ 67150	119.00
2007	$ 161850	193.20
2008	$ 141000	52.20
2009	$ 134050	78.80
Total	$ 504050	443.20

Type of Accident Totals

Year	Left Turn	Right Turn	Rear End	Run Off Road & Fixed Object	Angle	Side Swipe	Other
2006	3	0	12	3	1	1	1
2007	3	2	19	0	5	2	5
2008	2	3	19	0	1	4	1
2009	1	0	18	2	0	5	1
Total	9	5	68	5	7	12	8

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Strip Diagram

Features	Milepost	Crash IDs
	15.570	
	15.580	102418626
	15.590	
US 15 | US 501 | SR 2048 | FORDHAM |	15.600	102353888 | 101773778 | 101834129 | 101908771 |
RALEIGH | Structure:670045		101926800 | 101975773 | 102090402 | 102186237 |
		102410021 | 102499726 | 102514282 | 102530261 |
		102549281 | 102613146
	15.610	101884845
	15.620	
	15.630	102266881
	15.640	101901941
	15.650	102135142
	15.660	
	15.670	
	15.680	
	15.690	102403094
	15.700	102173055 | 102487705
	15.710	
	15.720	
	15.730	
	15.740	102191793 | 102191790 | 102626866
	15.750	
	15.760	
	15.770	
	15.780	102516059 | 102598166 | 102553850
	15.790	102460865
HAMILTON	15.800	101865325 | 102119489 | 102219063 | 102214826 |
		102419928 | 101848864 | 101859973 | 102171712 |
		102235215
	15.810	102140963 | 101781635 | 102547738
	15.820	102599029
	15.830	
	15.840	102604299
	15.850	
	15.860	
	15.870	
AUDLEY	15.880	102561995
	15.890	
	15.900	102575705

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Features	Milepost	Crash IDs
	15.910	
	15.920	
	15.930	102329129
	15.940	
OAKWOOD	15.950	
	15.960	
	15.970	
	15.980	
	15.990	
	16.000	
ROGERSON	16.010	
	16.020	
	16.030	
	16.040	
	16.050	
	16.060	
	16.070	102587223
	16.080	102513652
	16.090	
	16.100	
	16.110	
	16.120	
SR 1900 | BURNINGTREE | FINLEY GOLF	16.130	102207198 | 101781003 | 101880965 | 101975213 |
COURSE		102011976 | 102278967 | 102300542 | 102323064 |
		102362352 | 102615334
	16.140	
	16.150	
	16.160	101885542
	16.170	
	16.180	
	16.190	
	16.200	
	16.210	
	16.220	
	16.230	
	16.240	
	16.250	
	16.260	
	16.270	
	16.280	101835337
	16.290	
	16.300	
	16.310	
BARBEE CHAPEL	16.320	102366013 | 102560488 | 102088007 | 101780625 |

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Features	Milepost	Crash IDs
		101854285 | 101885557 | 101889573 | 101891499 |
		102033513 | 102032922 | 102038814 | 102051501 |
		102055325 | 102059147 | 102061250 | 102076718 |
		102144085 | 102205161 | 102213959 | 102243214 |
		102475586 | 102542718 | 102547742 | 102586049 |
		101907426
	16.330	101898731 | 101945888
	16.340	102543343 | 102126276
	16.350	
	16.360	
	16.370	
	16.380	102560496
	16.390	
	16.400	
	16.410	
	16.420	102023786 | 102493472 | 102522011
	16.430	102581519
	16.440	
	16.450	
	16.460	
	16.470	
	16.480	
	16.490	
	16.500	
	16.510	
	16.520	
	16.530	
	16.540	
	16.550	
	16.560	
	16.570	
	16.580	
	16.590	
	16.600	
	16.610	
	16.620	
	16.630	
	16.640	102407522
FRIDAY	16.650	102260739 | 102278068 | 102412708 | 101953606 |
		102011986 | 102022971 | 102085654 | 102421034 |
		102460673 | 102510639 | 102419623
	16.660	102486618 | 102575699
	16.670	

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Features	Milepost	Crash IDs
	16.680	
	16.690	101974745
	16.700	
CL-DURHAM	16.710	101961763 | 102278076 | 102453472 | 102580579 | 102580155

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Study Criteria

Study Name	Log No.	PH No.	TIP No.	K/A Cf.	B/C Cf.	ADT	ADT Route
LTNC54FORDHAMTOLEIGHFARMORANGE				76.8	8.4	47000	30000054

Request Date	Courier Service	Phone No.	Ext.	Fax No.
08/13/2009				

County			Municipality					
Name	Code	Div.	Name	Code	Y-Line Ft.	Begin Date	End Date	Years
ORANGE	67	7	All and Rural		150	07/01/2006	06/30/2009	3.00

Location Text	Requestor
NC 54 from Fordham Blvd to Leigh Farm/Quadrangle, Orange Co portion	Leta Huntsinger

Fiche Roads

Name	Code
NC 54	30000054
RALEIGH	50025238

Strip Road

Name	Code	Begin MP	End MP	Miles	Kilometers
NC 54	30000054	15.570	16.710	1.140	1.835

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NCDOT 2005-2007 Crash Rates

STANDARD

North Carolina Department of Transportation
Traffic Engineering and Safety Systems Branch
Traffic Safety Systems Management Unit
2005-2007 Three Year Crash Rates

RURAL STATE HIGHWAYS

ITEMS	INTER-STATE	UNITED STATES	NORTH CAROLINA	PRIMARY	SECONDARY ROAD	TOTAL RURAL
TOTAL CRASHES	26,047	57,025	59,949	143,021	144,092	287,113
FATAL CRASHES	225	638	709	1,572	1,566	3,138
NON-FATAL INJURY CRASHES	7,131	20,693	22,535	50,359	50,970	101,329
NIGHT CRASHES	7,795	17,714	20,143	45,652	57,221	102,873
WET CRASHES	5,995	10,608	9,104	25,707	21,516	47,223
PERCENT FATAL CRASHES	0.86%	1.12%	1.18%	1.10%	1.09%	1.09%
PERCENT NON-FATAL INJURY CRASHES	27.38%	36.29%	37.59%	35.21%	35.37%	35.29%
PERCENT NIGHT CRASHES	29.93%	31.06%	33.60%	31.92%	39.71%	35.83%
PERCENT WET CRASHES	23.02%	18.60%	15.19%	17.97%	14.93%	16.45%
MILES OF ROAD	822	4,183	6,966	11,971	60,032	72,003
AVERAGE DAILY TRAFFIC	42,000	9,800	4,700	9,100	600	2,000
TRAVEL (100MVM) (1)	378.04	451.15	357.58	1,186.76	413.54	1,600.30
TOTAL CRASH RATE (2)	68.90	126.40	167.65	120.51	348.44	179.41
FATAL CRASH RATE (2)	0.60	1.41	1.98	1.32	3.79	1.96
NON-FATAL INJURY CRASH RATE (2)	18.86	45.87	63.02	42.43	123.25	63.32
NIGHT CRASH RATE (2)	20.62	39.26	56.33	38.47	138.37	64.28
WET CRASH RATE (2)	15.86	23.51	25.46	21.66	52.03	29.51
SEVERITY INDEX (3)	4.53	5.90	6.31	5.82	6.20	6.01

URBAN STATE HIGHWAYS

ITEMS	INTER-STATE	UNITED STATES	NORTH CAROLINA	PRIMARY	SECONDARY ROAD	NON-SYSTEM	TOTAL URBAN
TOTAL CRASHES	26,795	90,900	54,802	172,497	104,417	111,703	388,617
FATAL CRASHES	125	306	204	635	287	254	1,176
NON-FATAL INJURY CRASHES	7,697	29,561	17,826	55,084	32,666	35,047	122,797
NIGHT CRASHES	6,589	18,711	11,189	36,489	23,241	25,413	85,143
WET CRASHES	5,512	14,654	8,389	28,555	16,142	16,908	61,605
PERCENT FATAL CRASHES	0.47%	0.34%	0.37%	0.37%	0.27%	0.23%	0.30%
PERCENT NON-FATAL INJURY CRASHES	28.73%	32.52%	32.53%	31.93%	31.28%	31.37%	31.60%
PERCENT NIGHT CRASHES	24.59%	20.58%	20.42%	21.15%	22.26%	22.75%	21.91%
PERCENT WET CRASHES	20.57%	16.12%	15.31%	16.55%	15.46%	15.14%	15.85%
MILES OF ROAD	277	1,372	1,196	2,845	4,846	24,431	32,122
AVERAGE DAILY TRAFFIC	80,800	19,000	12,300	22,200	4,900	1,000	3,500
TRAVEL (100MVM) (1)	245.08	285.48	160.48	691.03	258.32	267.52	1,216.87
TOTAL CRASH RATE (2)	109.33	318.41	341.50	249.62	404.22	417.55	319.36
FATAL CRASH RATE (2)	0.51	1.07	1.27	0.92	1.11	0.95	0.97
NON-FATAL INJURY CRASH RATE (2)	31.41	103.55	111.08	79.71	126.46	131.01	100.91
NIGHT CRASH RATE (2)	26.89	65.54	69.72	52.80	89.97	95.00	69.97
WET CRASH RATE (2)	22.49	51.33	52.28	41.32	62.49	63.20	50.63
SEVERITY INDEX (3)	3.95	4.19	4.27	4.17	4.11	3.99	4.10

ALL STATE HIGHWAYS

ITEMS	INTER-STATE	UNITED STATES	NORTH CAROLINA	PRIMARY	SECONDARY ROAD	NON-SYSTEM	TOTAL System
TOTAL CRASHES	52,842	147,925	114,751	315,518	248,509	111,703	675,730
FATAL CRASHES	350	944	913	2,207	1,853	254	4,314
NON-FATAL INJURY CRASHES	14,828	50,254	40,361	105,443	83,636	35,047	224,126
NIGHT CRASHES	14,384	36,425	31,332	82,141	80,462	25,413	188,016
WET CRASHES	11,507	25,262	17,493	54,262	37,658	16,908	108,828
PERCENT FATAL CRASHES	0.66%	0.64%	0.80%	0.70%	0.75%	0.23%	0.64%
PERCENT NON-FATAL INJURY CRASHES	28.06%	33.97%	35.17%	33.42%	33.66%	31.37%	33.17%
PERCENT NIGHT CRASHES	27.22%	24.62%	27.30%	26.03%	32.38%	22.75%	27.82%
PERCENT WET CRASHES	21.78%	17.08%	15.24%	17.20%	15.15%	15.14%	16.11%
MILES OF ROAD	1,099	5,555	8,162	14,816	64,878	24,431	104,125
AVERAGE DAILY TRAFFIC	51,800	12,100	5,800	11,600	900	1,000	2,500
TRAVEL (100MVM) (1)	623.12	736.63	518.05	1,877.79	671.85	267.52	2,817.17
TOTAL CRASH RATE (2)	84.80	200.81	221.50	168.03	369.89	417.55	239.86
FATAL CRASH RATE (2)	0.56	1.28	1.76	1.18	2.76	0.95	1.53
NON-FATAL INJURY CRASH RATE (2)	23.80	68.22	77.91	56.15	124.49	131.01	79.56
NIGHT CRASH RATE (2)	23.08	49.45	60.48	43.74	119.76	95.00	66.74
WET CRASH RATE (2)	18.47	34.29	33.77	28.90	56.05	63.20	38.63
SEVERITY INDEX (3)	4.21	4.84	5.30	4.89	5.35	3.99	4.87

(1) ESTIMATED VALUE
(2) ACCIDENT RATES ARE IN ACCIDENTS PER 100 MILLION VEHICLE MILES OF TRAVEL
(3) SEVERITY INDEX =(76.8*(F+A) + 8.4*(B+C) + PDO)/ TOTAL CRASHES

2005-2007 Three Year Crash Rates
By Road System, Type and Control
Crash Rate per 100 Million Vehicle Miles Traveled

RURAL INTERSTATE ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED						
3 LANES UNDIVIDED						
4 OR MORE LANES UNDIVIDED						
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS						
PARTIAL CONTROL ACCESS						
FULL CONTROL ACCESS	**822**	**68.90**	**0.60**	**18.86**	**20.62**	**15.86**
TOTAL	**822**	**68.90**	**0.60**	**18.86**	**20.62**	**15.86**

URBAN INTERSTATE ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED						
3 LANES UNDIVIDED						
4 OR MORE LANES UNDIVIDED						
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS						
PARTIAL CONTROL ACCESS						
FULL CONTROL ACCESS	**277**	**109.33**	**0.51**	**31.41**	**26.89**	**22.49**
TOTAL	**277**	**109.33**	**0.51**	**31.41**	**26.89**	**22.49**

ALL INTERSTATE ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED						
3 LANES UNDIVIDED						
4 OR MORE LANES UNDIVIDED						
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS						
PARTIAL CONTROL ACCESS						
FULL CONTROL ACCESS	**1,099**	**84.80**	**0.56**	**23.80**	**23.08**	**18.47**
TOTAL	**1,099**	**84.80**	**0.56**	**23.80**	**23.08**	**18.47**

NOTE: INCLUDES ONLY ROUTE SEGMENTS WITH COMPUTERIZED TRAFFIC VOLUMES

2005-2007 Three Year Crash Rates
By Road System, Type and Control
Crash Rate per 100 Million Vehicle Miles Traveled

RURAL UNITED STATES ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	2,573	159.45	2.06	61.26	51.69	26.61
2 LANES CONT. LEFT TURN LANE*	13	182.91	0.00	70.91	55.01	25.85
3 LANES UNDIVIDED*	17	150.20	4.93	66.33	43.30	27.41
4 OR MORE LANES UNDIVIDED	76	158.80	2.13	56.75	46.77	34.02
4+ LANES CONT. LEFT TURN LANE	177	174.64	1.54	65.76	43.38	30.07
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	598	122.30	1.09	43.45	35.39	21.27
PARTIAL CONTROL ACCESS	304	87.29	1.06	31.01	27.85	17.21
FULL CONTROL ACCESS	425	75.44	0.69	21.92	26.26	20.88
TOTAL	4,183	126.40	1.41	45.87	39.26	23.51

URBAN UNITED STATES ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	512	305.79	1.10	101.41	60.56	47.42
2 LANES CONT. LEFT TURN LANE*	10	769.47	1.81	236.90	164.56	115.74
3 LANES UNDIVIDED*	5	704.50	1.63	242.99	141.88	114.16
4 OR MORE LANES UNDIVIDED	114	468.47	1.21	159.10	82.39	72.39
4+ LANES CONT. LEFT TURN LANE	261	375.75	1.32	127.20	72.88	58.95
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	224	359.45	1.06	114.46	77.81	56.05
PARTIAL CONTROL ACCESS	135	239.68	1.16	73.67	53.55	42.05
FULL CONTROL ACCESS	111	186.90	0.59	56.88	43.34	35.39
TOTAL	1,372	318.41	1.07	103.55	65.54	51.33

ALL UNITED STATES ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	3,085	193.09	1.84	70.49	53.73	31.39
2 LANES CONT. LEFT TURN LANE*	23	431.00	0.76	141.12	101.34	48.95
3 LANES UNDIVIDED*	22	289.64	4.10	110.77	68.10	49.23
4 OR MORE LANES UNDIVIDED	190	361.83	1.53	123.86	70.12	59.17
4+ LANES CONT. LEFT TURN LANE	438	307.87	1.40	106.47	62.92	49.20
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	822	216.15	1.08	71.55	52.18	35.04
PARTIAL CONTROL ACCESS	439	152.65	1.10	49.31	38.88	27.86
FULL CONTROL ACCESS	536	113.81	0.66	33.95	32.14	25.88
TOTAL	5,555	200.81	1.28	68.22	49.45	34.29

NOTE: INCLUDES ONLY ROUTE SEGMENTS WITH COMPUTERIZED TRAFFIC VOLUMES
* RATES ARE NOT STATISTICALLY SIGNIFICANT

2005-2007 Three Year Crash Rates
By Road System, Type and Control
Crash Rate per 100 Million Vehicle Miles Traveled

RURAL NORTH CAROLINA ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	6,587	175.41	2.14	66.12	60.38	26.41
2 LANES CONT. LEFT TURN LANE*	15	190.73	1.08	76.51	58.19	28.56
3 LANES UNDIVIDED*	18	252.90	3.12	103.81	61.66	39.03
4 OR MORE LANES UNDIVIDED*	42	221.49	1.28	77.38	57.34	32.62
4+ LANES CONT. LEFT TURN LANE	97	154.57	2.12	61.04	43.89	24.88
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	147	129.76	1.01	46.44	38.38	19.87
PARTIAL CONTROL ACCESS*	23	133.47	1.12	46.60	39.52	22.74
FULL CONTROL ACCESS	37	21.96	0.20	6.25	4.33	6.75
TOTAL	6,966	167.65	1.98	63.02	56.33	25.46

URBAN NORTH CAROLINA ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	823	303.18	1.12	97.95	62.72	45.48
2 LANES CONT. LEFT TURN LANE*	5	194.36	0.00	63.22	18.73	32.78
3 LANES UNDIVIDED*	7	423.02	1.98	137.38	90.93	66.22
4 OR MORE LANES UNDIVIDED	109	426.12	1.49	144.46	78.34	64.41
4+ LANES CONT. LEFT TURN LANE	117	325.12	1.47	108.72	64.83	48.90
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	100	443.05	1.48	142.08	94.79	69.85
PARTIAL CONTROL ACCESS	23	285.32	1.04	90.01	59.25	45.53
FULL CONTROL ACCESS	12	219.30	0.87	62.23	47.67	38.31
TOTAL	1,196	341.50	1.27	111.08	69.72	52.28

ALL NORTH CAROLINA ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	7,410	200.46	1.94	72.36	60.84	30.15
2 LANES CONT. LEFT TURN LANE*	20	191.41	0.88	74.02	50.81	29.35
3 LANES UNDIVIDED*	25	327.96	2.62	118.63	74.58	51.03
4 OR MORE LANES UNDIVIDED	151	385.15	1.45	131.03	74.14	58.05
4+ LANES CONT. LEFT TURN LANE	214	258.65	1.73	90.14	56.67	39.54
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	247	301.97	1.27	99.01	69.39	47.34
PARTIAL CONTROL ACCESS	46	230.96	1.07	74.47	52.19	37.37
FULL CONTROL ACCESS	49	94.49	0.45	26.82	20.26	18.35
TOTAL	8,162	221.50	1.76	77.91	60.48	33.77

NOTE: INCLUDES ONLY ROUTE SEGMENTS WITH COMPUTERIZED TRAFFIC VOLUMES
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2005-2007 Three Year Crash Rates
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RURAL PRIMARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	9,160	169.86	2.11	64.43	57.36	26.48
2 LANES CONT. LEFT TURN LANE*	28	187.23	0.59	74.00	56.76	27.34
3 LANES UNDIVIDED*	35	192.57	4.19	81.79	50.88	32.20
4 OR MORE LANES UNDIVIDED	118	177.76	1.87	62.99	49.97	33.59
4+ LANES CONT. LEFT TURN LANE	274	167.71	1.74	64.13	43.56	28.28
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	745	123.63	1.08	43.99	35.93	21.02
PARTIAL CONTROL ACCESS	327	91.46	1.06	32.42	28.91	17.71
FULL CONTROL ACCESS	1,284	69.17	0.61	19.18	21.35	16.62
TOTAL	11,971	120.51	1.32	42.43	38.47	21.66

URBAN PRIMARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	1,335	304.22	1.12	99.32	61.87	46.25
2 LANES CONT. LEFT TURN LANE*	15	609.26	1.30	188.52	123.94	92.63
3 LANES UNDIVIDED*	12	529.24	1.85	177.23	110.16	84.31
4 OR MORE LANES UNDIVIDED	223	448.30	1.35	152.13	80.46	68.59
4+ LANES CONT. LEFT TURN LANE	378	360.77	1.37	121.73	70.50	55.97
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	324	383.60	1.18	122.44	82.72	60.04
PARTIAL CONTROL ACCESS	158	248.44	1.14	76.81	54.64	42.71
FULL CONTROL ACCESS	400	123.84	0.53	36.07	29.91	24.85
TOTAL	2,845	249.62	0.92	79.71	52.80	41.32

ALL PRIMARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	10,495	197.82	1.90	71.69	58.30	30.59
2 LANES CONT. LEFT TURN LANE*	43	319.32	0.82	109.84	77.79	47.78
3 LANES UNDIVIDED*	47	308.22	3.38	114.58	71.24	50.10
4 OR MORE LANES UNDIVIDED	341	371.79	1.50	126.92	71.84	58.69
4+ LANES CONT. LEFT TURN LANE	652	292.45	1.50	101.35	60.96	46.17
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	1,069	235.57	1.12	77.77	56.07	37.82
PARTIAL CONTROL ACCESS	485	163.38	1.10	52.75	40.70	29.16
FULL CONTROL ACCESS	1,684	90.16	0.58	25.67	24.64	19.78
TOTAL	14,816	168.03	1.18	56.15	43.74	28.90

NOTE: INCLUDES ONLY ROUTE SEGMENTS WITH COMPUTERIZED TRAFFIC VOLUMES
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2005-2007 Three Year Crash Rates
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RURAL SECONDARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	59,887	354.02	3.93	125.75	142.23	52.64
2 LANES CONT. LEFT TURN LANE*	11	155.50	1.32	52.71	30.31	31.63
3 LANES UNDIVIDED*	4	262.13	0.00	93.02	46.51	50.74
4 OR MORE LANES UNDIVIDED*	44	442.93	1.99	136.68	113.93	74.41
4+ LANES CONT. LEFT TURN LANE*	21	438.83	1.65	149.90	122.56	72.15
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	56	139.90	0.27	40.43	35.85	22.10
PARTIAL CONTROL ACCESS*	3	70.20	0.00	22.24	25.02	16.68
FULL CONTROL ACCESS*	6	53.74	0.38	9.02	13.53	9.77
TOTAL	60,032	348.44	3.79	123.25	138.37	52.03

URBAN SECONDARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	4,267	413.78	1.31	130.38	96.90	62.26
2 LANES CONT. LEFT TURN LANE*	19	419.53	0.52	133.75	83.59	66.35
3 LANES UNDIVIDED*	24	482.35	1.09	130.10	78.64	67.41
4 OR MORE LANES UNDIVIDED	240	479.50	1.11	148.38	95.05	75.81
4+ LANES CONT. LEFT TURN LANE	150	501.90	1.04	154.29	103.27	81.57
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	94	277.85	0.60	87.38	59.06	45.78
PARTIAL CONTROL ACCESS	38	130.52	0.07	44.66	35.57	20.19
FULL CONTROL ACCESS*	14	108.44	0.42	33.03	31.58	24.72
TOTAL	4,846	404.22	1.11	126.46	89.97	62.49

ALL SECONDARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	64,154	370.48	3.21	127.03	129.75	55.29
2 LANES CONT. LEFT TURN LANE*	30	344.57	0.75	110.74	68.47	56.49
3 LANES UNDIVIDED*	28	464.97	1.00	127.17	76.10	66.09
4 OR MORE LANES UNDIVIDED	284	475.60	1.20	147.13	97.07	75.66
4+ LANES CONT. LEFT TURN LANE	171	496.05	1.10	153.89	105.05	80.70
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	150	237.93	0.51	73.80	52.34	38.93
PARTIAL CONTROL ACCESS	41	124.72	0.07	42.51	34.55	19.85
FULL CONTROL ACCESS	20	88.97	0.40	24.48	25.15	19.40
TOTAL	64,878	369.89	2.76	124.49	119.76	56.05

NOTE: INCLUDES ONLY ROUTE SEGMENTS WITH COMPUTERIZED TRAFFIC VOLUMES
* RATES ARE NOT STATISTICALLY SIGNIFICANT

STANDARD

North Carolina Department of Transportation
Traffic Engineering and Safety Systems Branch
Traffic Safety Systems Management Unit
2005-2007 Three Year Truck Crash Rates

RURAL STATE HIGHWAYS

ITEMS	INTER-STATE	UNITED STATES	NORTH CAROLINA	PRIMARY	SECONDARY ROAD	TOTAL RURAL
TOTAL CRASHES	3,484	2,802	1,932	8,218	1,898	10,116
FATAL CRASHES	58	97	67	222	32	254
NON-FATAL INJURY CRASHES	957	1,023	755	2,735	625	3,360
NIGHT CRASHES	1,044	624	386	2,054	370	2,424
WET CRASHES	563	420	286	1,269	237	1,506
PERCENT FATAL CRASHES	1.66%	3.46%	3.47%	2.70%	1.69%	2.51%
PERCENT NON-FATAL INJURY CRASHES	27.47%	36.51%	39.08%	33.28%	32.93%	33.21%
PERCENT NIGHT CRASHES	29.97%	22.27%	19.98%	24.99%	19.49%	23.96%
PERCENT WET CRASHES	16.16%	14.99%	14.80%	15.44%	12.49%	14.89%
MILES OF ROAD	822	4,183	6,966	11,971	60,032	72,003
AVERAGE DAILY TRAFFIC	42,000	9,800	4,700	9,100	600	2,000
TRAVEL (100MVM) (1)	378.04	451.15	357.58	1,186.76	413.54	1,600.30
TOTAL CRASH RATE (2)	9.22	6.21	5.40	6.92	4.59	6.32
FATAL CRASH RATE (2)	0.15	0.22	0.19	0.19	0.08	0.16
NON-FATAL INJURY CRASH RATE (2)	2.53	2.27	2.11	2.30	1.51	2.10
NIGHT CRASH RATE (2)	2.76	1.38	1.08	1.73	0.89	1.51
WET CRASH RATE (2)	1.49	0.93	0.80	1.07	0.57	0.94
SEVERITY INDEX (3)	5.22	8.49	8.80	7.17	6.65	7.07

URBAN STATE HIGHWAYS

ITEMS	INTER-STATE	UNITED STATES	NORTH CAROLINA	PRIMARY	SECONDARY ROAD	NON-SYSTEM	TOTAL URBAN
TOTAL CRASHES	2,903	3,287	1,554	7,744	2,160	2,744	12,648
FATAL CRASHES	29	22	11	62	7	7	76
NON-FATAL INJURY CRASHES	852	842	374	2,068	434	467	2,969
NIGHT CRASHES	713	497	197	1,407	252	332	1,991
WET CRASHES	486	444	203	1,133	264	334	1,731
PERCENT FATAL CRASHES	1.00%	0.67%	0.71%	0.80%	0.32%	0.25%	0.60%
PERCENT NON-FATAL INJURY CRASHES	29.35%	25.62%	24.07%	26.70%	20.09%	17.03%	23.48%
PERCENT NIGHT CRASHES	24.56%	15.12%	12.68%	18.17%	11.67%	12.12%	15.75%
PERCENT WET CRASHES	16.74%	13.51%	13.06%	14.63%	12.22%	12.19%	13.69%
MILES OF ROAD	277	1,372	1,196	2,845	4,846	24,431	32,122
AVERAGE DAILY TRAFFIC	80,800	19,000	12,300	22,200	4,900	1,000	3,500
TRAVEL (100MVM) (1)	245.08	285.48	160.48	691.03	258.32	267.52	1,216.87
TOTAL CRASH RATE (2)	11.85	11.51	9.68	11.21	8.36	10.26	10.39
FATAL CRASH RATE (2)	0.12	0.08	0.07	0.09	0.03	0.03	0.06
NON-FATAL INJURY CRASH RATE (2)	3.48	2.95	2.33	2.99	1.68	1.75	2.44
NIGHT CRASH RATE (2)	2.91	1.74	1.23	2.04	0.98	1.24	1.64
WET CRASH RATE (2)	1.98	1.56	1.26	1.64	1.02	1.25	1.42
SEVERITY INDEX (3)	4.52	4.22	4.32	4.36	3.57	2.91	3.94

ALL STATE HIGHWAYS

ITEMS	INTER-STATE	UNITED STATES	NORTH CAROLINA	PRIMARY	SECONDARY ROAD	NON-SYSTEM	TOTAL System
TOTAL CRASHES	6,387	6,089	3,486	15,962	4,058	2,744	22,764
FATAL CRASHES	87	119	78	284	39	7	330
NON-FATAL INJURY CRASHES	1,809	1,865	1,129	4,803	1,059	467	6,329
NIGHT CRASHES	1,757	1,121	583	3,461	622	332	4,415
WET CRASHES	1,049	864	489	2,402	501	334	3,237
PERCENT FATAL CRASHES	1.36%	1.95%	2.24%	1.78%	0.96%	0.25%	1.45%
PERCENT NON-FATAL INJURY CRASHES	28.32%	30.63%	32.39%	30.09%	26.10%	17.03%	27.80%
PERCENT NIGHT CRASHES	27.51%	18.41%	16.72%	21.68%	15.33%	12.12%	19.40%
PERCENT WET CRASHES	16.42%	14.19%	14.03%	15.05%	12.35%	12.19%	14.22%
MILES OF ROAD	1,099	5,555	8,162	14,816	64,878	24,431	104,125
AVERAGE DAILY TRAFFIC	51,800	12,100	5,800	11,600	900	1,000	2,500
TRAVEL (100MVM) (1)	623.12	736.63	518.05	1,877.79	671.85	267.52	2,817.17
TOTAL CRASH RATE (2)	10.25	8.27	6.73	8.50	6.04	10.26	8.08
FATAL CRASH RATE (2)	0.14	0.16	0.15	0.15	0.06	0.03	0.12
NON-FATAL INJURY CRASH RATE (2)	2.90	2.53	2.18	2.56	1.58	1.75	2.25
NIGHT CRASH RATE (2)	2.82	1.52	1.13	1.84	0.93	1.24	1.57
WET CRASH RATE (2)	1.68	1.17	0.94	1.28	0.75	1.25	1.15
SEVERITY INDEX (3)	4.87	6.14	6.75	5.74	5.21	2.91	5.31

(1) ESTIMATED VALUE
(2) ACCIDENT RATES ARE IN ACCIDENTS PER 100 MILLION VEHICLE MILES OF TRAVEL
(3) SEVERITY INDEX =(76.8*(F+A) + 8.4*(B+C) + PDO)/ TOTAL CRASHES

2005-2007 Three Year Truck Crash Rates
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RURAL INTERSTATE ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED						
3 LANES UNDIVIDED						
4 OR MORE LANES UNDIVIDED						
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS						
PARTIAL CONTROL ACCESS						
FULL CONTROL ACCESS	**822**	**9.22**	**0.15**	**2.53**	**2.76**	**1.49**
TOTAL	**822**	**9.22**	**0.15**	**2.53**	**2.76**	**1.49**

URBAN INTERSTATE ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED						
3 LANES UNDIVIDED						
4 OR MORE LANES UNDIVIDED						
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS						
PARTIAL CONTROL ACCESS						
FULL CONTROL ACCESS	**277**	**11.85**	**0.12**	**3.48**	**2.91**	**1.98**
TOTAL	**277**	**11.85**	**0.12**	**3.48**	**2.91**	**1.98**

ALL INTERSTATE ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED						
3 LANES UNDIVIDED						
4 OR MORE LANES UNDIVIDED						
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS						
PARTIAL CONTROL ACCESS						
FULL CONTROL ACCESS	**1,099**	**10.25**	**0.14**	**2.90**	**2.82**	**1.68**
TOTAL	**1,099**	**10.25**	**0.14**	**2.90**	**2.82**	**1.68**

NOTE: INCLUDES ONLY ROUTE SEGMENTS WITH COMPUTERIZED TRAFFIC VOLUMES

2005-2007 Three Year Truck Crash Rates
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RURAL UNITED STATES ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	2,573	7.10	0.36	2.76	1.42	1.00
2 LANES CONT. LEFT TURN LANE*	13	7.95	0.00	1.33	0.66	1.33
3 LANES UNDIVIDED*	17	5.48	0.00	2.19	1.64	1.10
4 OR MORE LANES UNDIVIDED	76	8.04	0.37	2.31	1.57	0.83
4+ LANES CONT. LEFT TURN LANE	177	7.62	0.23	2.66	1.71	1.18
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	598	6.39	0.16	2.41	1.37	1.05
PARTIAL CONTROL ACCESS	304	5.19	0.07	1.95	1.17	0.74
FULL CONTROL ACCESS	425	4.35	0.09	1.32	1.33	0.72
TOTAL	4,183	6.21	0.22	2.27	1.38	0.93

URBAN UNITED STATES ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	512	10.51	0.08	2.68	1.44	1.42
2 LANES CONT. LEFT TURN LANE*	10	20.80	0.00	4.52	2.71	2.71
3 LANES UNDIVIDED*	5	26.09	0.00	8.15	6.52	3.26
4 OR MORE LANES UNDIVIDED	114	12.43	0.00	2.48	1.12	1.41
4+ LANES CONT. LEFT TURN LANE	261	10.95	0.05	3.00	1.37	1.51
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	224	13.70	0.10	3.45	2.20	1.77
PARTIAL CONTROL ACCESS	135	10.86	0.17	2.72	1.78	1.56
FULL CONTROL ACCESS	111	9.84	0.02	2.75	1.99	1.45
TOTAL	1,372	11.51	0.08	2.95	1.74	1.56

ALL UNITED STATES ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	3,085	7.89	0.30	2.74	1.43	1.09
2 LANES CONT. LEFT TURN LANE*	23	13.39	0.00	2.68	1.53	1.91
3 LANES UNDIVIDED*	22	10.67	0.00	3.69	2.87	1.64
4 OR MORE LANES UNDIVIDED	190	10.92	0.13	2.42	1.27	1.21
4+ LANES CONT. LEFT TURN LANE	438	9.83	0.11	2.88	1.49	1.40
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	822	9.28	0.14	2.82	1.70	1.33
PARTIAL CONTROL ACCESS	439	7.62	0.12	2.28	1.43	1.09
FULL CONTROL ACCESS	536	6.24	0.07	1.81	1.56	0.97
TOTAL	5,555	8.27	0.16	2.53	1.52	1.17

NOTE: INCLUDES ONLY ROUTE SEGMENTS WITH COMPUTERIZED TRAFFIC VOLUMES
* RATES ARE NOT STATISTICALLY SIGNIFICANT

2005-2007 Three Year Truck Crash Rates
By Road System, Type and Control
Crash Rate per 100 Million Vehicle Miles Traveled

RURAL NORTH CAROLINA ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	6,587	5.69	0.21	2.26	1.14	0.83
2 LANES CONT. LEFT TURN LANE*	15	3.77	0.00	1.62	1.08	0.54
3 LANES UNDIVIDED*	18	7.81	0.00	2.34	0.78	1.56
4 OR MORE LANES UNDIVIDED*	42	5.97	0.21	1.92	1.49	0.43
4+ LANES CONT. LEFT TURN LANE	97	4.30	0.06	1.25	0.56	0.75
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	147	4.80	0.13	1.85	1.01	0.93
PARTIAL CONTROL ACCESS*	23	3.73	0.00	1.86	1.12	0.56
FULL CONTROL ACCESS	37	0.60	0.00	0.10	0.20	0.10
TOTAL	6,966	5.40	0.19	2.11	1.08	0.80

URBAN NORTH CAROLINA ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	823	8.96	0.08	2.30	1.22	1.14
2 LANES CONT. LEFT TURN LANE*	5	2.34	0.00	2.34	2.34	0.00
3 LANES UNDIVIDED*	7	14.83	0.00	2.97	0.99	2.97
4 OR MORE LANES UNDIVIDED	109	12.27	0.00	2.72	1.55	1.60
4+ LANES CONT. LEFT TURN LANE	117	8.36	0.08	1.87	0.96	1.31
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	100	11.66	0.11	2.60	1.19	1.37
PARTIAL CONTROL ACCESS	23	9.87	0.00	2.60	1.66	1.25
FULL CONTROL ACCESS	12	5.89	0.00	1.56	0.87	0.87
TOTAL	1,196	9.68	0.07	2.33	1.23	1.26

ALL NORTH CAROLINA ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	7,410	6.33	0.18	2.26	1.15	0.89
2 LANES CONT. LEFT TURN LANE*	20	3.50	0.00	1.75	1.31	0.44
3 LANES UNDIVIDED*	25	10.90	0.00	2.62	0.87	2.18
4 OR MORE LANES UNDIVIDED	151	11.01	0.04	2.56	1.54	1.37
4+ LANES CONT. LEFT TURN LANE	214	6.78	0.07	1.63	0.80	1.09
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	247	8.57	0.12	2.26	1.11	1.17
PARTIAL CONTROL ACCESS	46	7.67	0.00	2.34	1.47	1.00
FULL CONTROL ACCESS	49	2.55	0.00	0.64	0.45	0.38
TOTAL	8,162	6.73	0.15	2.18	1.13	0.94

NOTE: INCLUDES ONLY ROUTE SEGMENTS WITH COMPUTERIZED TRAFFIC VOLUMES
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2005-2007 Three Year Truck Crash Rates
By Road System, Type and Control
Crash Rate per 100 Million Vehicle Miles Traveled

RURAL PRIMARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	9,160	6.18	0.26	2.43	1.23	0.88
2 LANES CONT. LEFT TURN LANE*	28	5.65	0.00	1.49	0.89	0.89
3 LANES UNDIVIDED*	35	6.44	0.00	2.25	1.29	1.29
4 OR MORE LANES UNDIVIDED	118	7.41	0.32	2.19	1.55	0.71
4+ LANES CONT. LEFT TURN LANE	274	6.48	0.17	2.17	1.31	1.03
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	745	6.10	0.16	2.31	1.31	1.03
PARTIAL CONTROL ACCESS	327	5.06	0.07	1.94	1.16	0.73
FULL CONTROL ACCESS	1,284	8.12	0.14	2.25	2.44	1.31
TOTAL	11,971	6.92	0.19	2.30	1.73	1.07

URBAN PRIMARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	1,335	9.57	0.08	2.45	1.31	1.25
2 LANES CONT. LEFT TURN LANE*	15	15.66	0.00	3.91	2.61	1.96
3 LANES UNDIVIDED*	12	19.08	0.00	4.92	3.08	3.08
4 OR MORE LANES UNDIVIDED	223	12.36	0.00	2.59	1.32	1.50
4+ LANES CONT. LEFT TURN LANE	378	10.18	0.06	2.66	1.25	1.45
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	324	13.11	0.10	3.20	1.91	1.66
PARTIAL CONTROL ACCESS	158	10.67	0.14	2.69	1.76	1.50
FULL CONTROL ACCESS	400	11.41	0.10	3.32	2.72	1.88
TOTAL	2,845	11.21	0.09	2.99	2.04	1.64

ALL PRIMARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	10,495	6.89	0.23	2.43	1.25	0.96
2 LANES CONT. LEFT TURN LANE*	43	8.78	0.00	2.25	1.43	1.23
3 LANES UNDIVIDED*	47	10.78	0.00	3.17	1.90	1.90
4 OR MORE LANES UNDIVIDED	341	10.96	0.09	2.48	1.39	1.28
4+ LANES CONT. LEFT TURN LANE	652	8.87	0.10	2.49	1.27	1.30
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	1,069	9.12	0.13	2.69	1.57	1.30
PARTIAL CONTROL ACCESS	485	7.63	0.10	2.28	1.43	1.08
FULL CONTROL ACCESS	1,684	9.38	0.12	2.66	2.55	1.53
TOTAL	14,816	8.50	0.15	2.56	1.84	1.28

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2005-2007 Three Year Truck Crash Rates
By Road System, Type and Control
Crash Rate per 100 Million Vehicle Miles Traveled

RURAL SECONDARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	59,887	4.63	0.08	1.54	0.91	0.58
2 LANES CONT. LEFT TURN LANE*	11	1.32	0.00	0.00	0.00	0.00
3 LANES UNDIVIDED*	4	0.00	0.00	0.00	0.00	0.00
4 OR MORE LANES UNDIVIDED*	44	7.95	0.00	1.99	1.10	0.88
4+ LANES CONT. LEFT TURN LANE*	21	4.94	0.00	0.99	0.33	0.00
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	56	2.29	0.00	0.54	0.54	0.13
PARTIAL CONTROL ACCESS*	3	0.70	0.00	0.70	0.00	0.70
FULL CONTROL ACCESS*	6	2.25	0.00	0.75	0.75	0.75
TOTAL	60,032	4.59	0.08	1.51	0.89	0.57

URBAN SECONDARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	4,267	9.47	0.03	1.95	1.07	1.13
2 LANES CONT. LEFT TURN LANE*	19	5.22	0.00	1.04	0.52	0.00
3 LANES UNDIVIDED*	24	6.16	0.00	1.81	0.72	0.36
4 OR MORE LANES UNDIVIDED	240	8.61	0.03	1.59	0.98	1.32
4+ LANES CONT. LEFT TURN LANE	150	8.48	0.07	1.58	0.98	1.04
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	94	5.43	0.00	1.15	0.82	0.55
PARTIAL CONTROL ACCESS	38	2.74	0.00	0.59	0.52	0.22
FULL CONTROL ACCESS*	14	0.62	0.00	0.00	0.21	0.00
TOTAL	4,846	8.36	0.03	1.68	0.98	1.02

ALL SECONDARY ROUTES

ROAD TYPE	SYSTEM MILES	TOTAL	FATAL	NON-FATAL INJURY	NIGHT	WET
2 LANES UNDIVIDED	64,154	5.96	0.07	1.65	0.95	0.73
2 LANES CONT. LEFT TURN LANE*	30	4.12	0.00	0.75	0.37	0.00
3 LANES UNDIVIDED*	28	5.67	0.00	1.67	0.67	0.33
4 OR MORE LANES UNDIVIDED	284	8.54	0.02	1.63	0.99	1.27
4+ LANES CONT. LEFT TURN LANE	171	8.15	0.06	1.53	0.92	0.95
4 OR MORE LANES DIVIDED WITH						
NO CONTROL ACCESS	150	4.52	0.00	0.98	0.74	0.43
PARTIAL CONTROL ACCESS	41	2.54	0.00	0.60	0.47	0.27
FULL CONTROL ACCESS	20	1.20	0.00	0.27	0.40	0.27
TOTAL	64,878	6.04	0.06	1.58	0.93	0.75

NOTE: INCLUDES ONLY ROUTE SEGMENTS WITH COMPUTERIZED TRAFFIC VOLUMES
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APPENDIX B

Design Guidelines

NC-54/I-40 Corridor
DESIGN GUIDELINES

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Introduction

Purpose

These Design Guidelines are intended to provide land development principles and standards for Transit-Oriented Development (TOD) in the NC-54/I-40 corridor. The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC-MPO) Long Range Transportation Plan (LRTP) identifies four future light-rail station areas in the NC-54/I-40 corridor study area. These Design Guidelines make recommendations and describe best practices for placing making that supports, and is supported by, transit. TOD planning typically is oriented around core station area planning within a 1/4 mile radius from the station, and outer areas between 1/4 mile and 1/2 mile radius of a station.

Transit oriented design improves mobility and leverages public investment in transit systems using pedestrian and transit-friendly development patterns. These development patterns encourage compatible mix of residential, commercial, and other land uses, facilitate employment opportunities convenient to transit, enhance connectivity to transit stations and surrounding land uses, and promote land use density and intensity in designated transit corridors that is appropriate for and in scale to each community type.

The Design Guidelines are intended help implement preferences expressed for transit-oriented design rather than the auto-oriented land development patterns prevalent in the region today. Through the project planning process it was determined that transit-oriented design is a better choice for reducing urban sprawl, preserving the economic viability of existing communities, protecting rural lands, providing travel alternatives, and promoting transit ridership.

The Design Guidelines are intended to facilitate the implementation of these transit-oriented design principles by local governments, the development community, regional agencies, business owners, and community residents. Specific development and performance standards are noted to assist communities with the creation of transit-oriented districts. These specific standards provide guidance with land development activities, encourage redevelopment, and offer clear direction for the creation and review of transit-oriented projects.

The Design Guidelines begins with sections that address what is and why TOD is important. Factors such as density, diversity and design are explained, followed by an introduction of two scales of TOD station area types appropriate to the NC-54/I-40 study area context. The final Community Form section provides more specific design detail and considerations relevant to achieving high quality, vibrant, diverse and enjoyable future station areas.

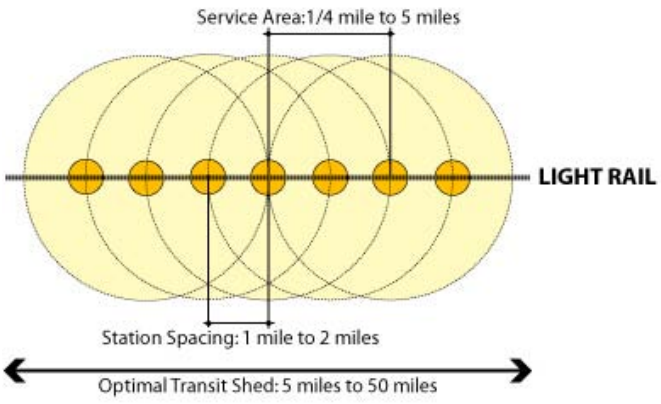
What is and Why TOD

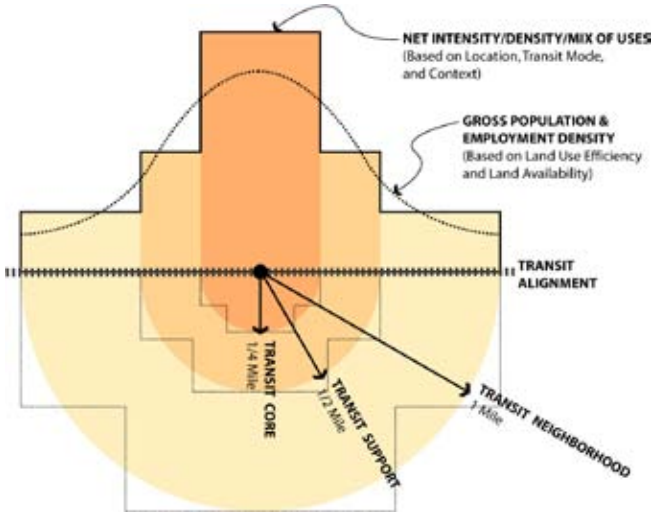
TODs are moderate to high density, mixed use, and walkable developments designed to maximize access to transit. TODs are defined generally as the area encompassing a radius of one-fourth to one-half mile around a transit station, a distance most pedestrians are willing to walk. This form of development optimizes transit, walking and biking as the preferred mode of transportation by locating a wide range of uses in close proximity to one another and adjacent to the transit station. They incorporate features such as interconnected street networks, bicycle and pedestrian facilities, and street-oriented site design to encourage comfortable and convenient access to surrounding properties within the transit station area. TODs consume less land and increase accessibility through proximity, and provide a host of other community benefits including opportunities for:

- Creating more housing choices to meet growing market demand for higher density, 24-hour live, work and recreate centers that appeal to changing demographics.
- Increasing transportation choices and reducing household costs for auto ownership and operation.
- Reducing parking requirements and thereby reducing development costs for the private sector.
- Encouraging more healthy lifestyles whereby walking and biking become part of everyday travel patterns.
- Reducing total number of vehicular trips and trip lengths thereby reducing area-wide vehicle miles traveled (VMT) and associated green house gas emissions.
- Reducing incentives for sprawling development patterns and helping preserve more open space and natural resources.
- Encouraging redevelopment opportunities around station areas and helping revitalize aging commercial centers.

TOD's create strong jobs to housing balances, decrease dependence on single occupant auto trips and reduce parking requirements, all resulting in reductions to area-wide vehicle miles traveled (VMT) which supports energy conservation. Public transit combined with reduced private automobile usage reduces the consumption of fossil fuels and potential emission of greenhouse gases, balanced distribution of jobs and housing. The added convenience, accessibility, and amenity resulting from close proximity to a diversity of uses results in travel cost and time savings for residents and employees. Access to transit and other modes of transportation results in increased mobility, especially for the transportation disadvantaged population, and reduced household costs for auto ownership and operation. Transit provides access to a larger employment pool resulting in higher productivity for businesses. Decreased dependence on private automobiles reduces parking requirements and enhances development opportunities.

For local governments, TODs can serve as a funding mechanism for transit/transportation plans and multi-modal transportation improvements by leveraging public-private partnerships. By optimizing transit ridership through appropriate land use strategies, TODs facilitate the implementation of transit, especially rail transit. TOD reduces the incentive for sprawling development patterns resulting in less land consumption and preservation of natural resources. Public transit combined with reduced private automobile usage reduces the consumption of fossil fuels and emission of greenhouse gases.





Density, Diversity, Design

Density, diversity, and design are necessary priorities in transit oriented design. The careful integration and balance of these factors is crucial to multi-modal, pedestrian-friendly development. Density allows for proximity between uses, a prerequisite for walkability. Diversity, multiple uses serving multiple needs, provides a wide range of services and opportunities within walking distance. Design creates the network for movement and provides access to nearby destinations within an attractive and desirable pedestrian environment. In sum, density generates the demand for transit ridership but not necessarily the incentive to shift to transit. Creating a walkable environment through diversity and design encourages the shift.

Density

More compact and efficient land use patterns allows for greater proximity between uses. Higher densities allow for multiple destinations to be located within close proximity to one another, thereby adding convenience, time and cost savings. Higher density/intensity developments also provide wider housing choices and often support housing affordability. Businesses located in TODs can optimize the use of land and building space while at the same time increase accessibility to their clients and workforce, thereby resulting in more efficient operating costs. Mixed use, compact developments create opportunities to live, work and shop in close proximity and ultimately promote greater transportation choices. Creating more compact, efficient land use patterns can jointly benefit both the transportation disadvantaged populations through increasing accessibility and the general population through reduced household costs for auto ownership and operation.

Most people will choose to walk if a destination is within a quarter of a mile and will not walk if the destination is more than a half-mile away. Because of the importance of walk access to transit ridership, this influence of distance on whether or not to walk defines the market area around a transit station. The primary market area is within a quarter mile and the secondary area within a half mile of the station. Because the station market area is fixed, density directly influences the number of person trips generated and potential transit ridership. Higher capacity transit systems, such as light rail transit, require higher densities to generate enough ridership to help pay the higher costs.

Density and Transit
Density is expressed in terms of floor area ratio (FAR), which is the total building area divided by the total lot area. Bus transit is supported with FARs of at least 0.5 and preferably over 1.0. Light rail transit is supported with FARs of 2.0 or greater.

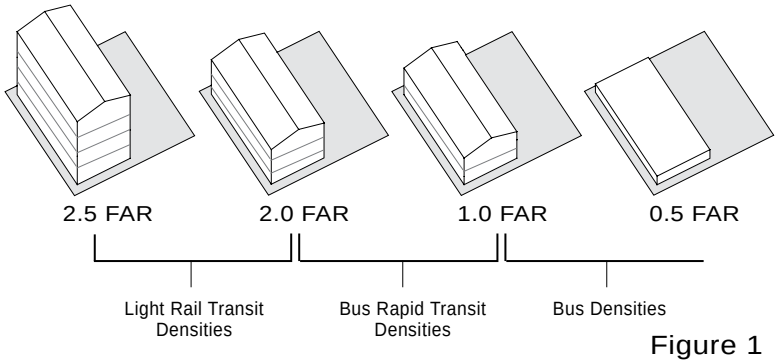


Figure 1

Diversity

While density generates the demand for transit ridership, it does not, by itself, result in a shift from auto to walking trips and higher ridership. Other factors influence mode shift, including the frequency and convenience of transit service provided and the convenience of being able to walk to destinations within the station area.

Land use diversity encourages walking because it creates opportunities for local trips. Few trips are made between similar land uses – seldom does one travel from their home to another home, for example. Rather, trips are made between different yet complementary uses, like a trip from home to work or from work to lunch. A greater diversity of land uses in the station's market area creates more opportunities for short trips, which are more likely to be made by walking. Fostering the walkability of the station area ultimately encourages people to leave their cars behind and use transit.

Design

While density creates the demand for and diversity creates the opportunity to walk, design makes it possible and pleasurable to walk. Paths are needed to walk, and more paths will promote more walking. To create an interconnected and dense path network, the layout of the network design must lead the design process as it is very difficult to achieve the desired results if it is incrementally or as an afterthought. The grid network creates relatively direct connections among buildings, parking is tucked behind buildings and separated from paths so that walking is not made through parking lots, and traffic is spread over several streets to minimize the conflict between walking and autos.

There are added benefits to creating a path network. Once established, the network controls the location, spacing and size of buildings. More streets will disperse traffic, making it possible to bring buildings and entrances up to the street. Smaller blocks will reduce the scale and massing of buildings making the place seem less overwhelming, even though overall densities are the same or higher. Smaller buildings allow for greater diversity in closer proximity. In essence, the path network creates a framework for development, resulting in a place that seems to "hang together."

Well-organized and scaled places encourage people to enjoy the surroundings, thereby increasing street life and encouraging even more walking. Other design factors can promote street life. As illustrated by the contrast in the images below, clearly defining travel paths as public spaces with uniform scale and street walls, providing plenty of windows that connect private and public spaces and encouraging a variety of design features within the overall framework combine to create a positive experience for walkers and others out on the street.

If is difficult to create a well-connected, well-defined internal path network through the typical site planning and development review process because the process focuses on the site, not how the site connects to and relates with adjacent sites. A path network plan along with building/path design specifications are needed so that site plans and reviews can react to the network rather than the other way around. The purpose of these Design Guidelines is to provide such needed specifications. Floor area ratios and dwelling units per acre (density), land use mixes (diversity) and maximum block lengths and other design details are defined for each transit station area type. Path network plans, based on the Design Guidelines, are the next step for each of the proposed station areas. These TOD Design Guidelines provide instructions to local governments and land developers in the region on how to ensure proper density, diversity and design in transit station areas.

Defining Edges

POORLY DEFINED EDGES AND CIRCULATION ◄----------► CLEARLY DEFINED EDGES AND CIRCULATION

Station Area Planning

Planning around station areas involves several factors that influence the design and scale of TOD. This includes the specific transit technology (commuter rail, heavy rail, light rail or bus rapid transit), transit facility design, station location and surrounding community context, and existing or desired levels of activity. These guidelines are for TOD that are oriented around future light rail. The primary goal of TOD is to maximize pedestrian access to the transit station by locating a critical mass of development located within the one-fourth to one-half mile station area. Since every transit trip starts as a walking trip, this equates to locating as many "front doors" as close as possible to a transit stop. The more density, intensity and mixture of uses programmed for TODs, the higher level of activity and the greater number of origins and destinations that can be accessed by transit and walking trips. In designing for TOD it is important to consider the density, diversity and design of the building forms, creating quality street networks and walking environments is also a key design element.

Two TOD scales and types were identified as appropriate for the NC-54/I-40 study area context, based on research conducted for the "A Framework for Transit Oriented Development in Florida", Developed by the Florida Department of Transportation and the Department of Community Affairs (Renaissance Planning Group, Draft, June, 2010). These types are Community Center and Neighborhood Center and are described in further detail below.

Community Center Station Area

Community centers function as local centers for economic and community activity including urban and town centers served by a variety of primary and secondary transit services. Residential densities are usually lower than residential densities in regional centers, but the mixture of uses is more balanced between residential and employment uses. Intensity of development in community centers tends to be focused within walking distance of the transit station or stop. The development patterns in community centers range from urban to suburban with moderate block sizes, lot coverage, and intensity/density. Parking is typically structured closer to the transit station or stop.

Neighborhood Center Station Area

Neighborhood centers are mostly residential areas that are served by a primary transit service. Non-residential uses within neighborhood centers are limited to local-serving retail and services. Residential densities in neighborhood centers tend to be low and largely focused in a limited area around the transit station or stop. Neighborhood centers are found within older urbanized areas and newer suburban developments. Open space is usually abundant in neighborhood centers and parking is mostly in surface lots.

Station Area Master Plans

Station area master plans should be developed to assure overall conformity with the target densities and uses necessary to support the transit investment. Core areas (first ¼ mile from stations) will be jobs rich with densities at the upper spectrum of the density ranges while transition areas (second ¼ mile from stations) will be housing rich at the lower range of densities. Four conceptual station areas are identified for the study area and are described and identified on the following page.

1. Glen Lennox Area – Neighborhood Center

Because of limited land around this station the overall densities will conform to those of Neighborhood Centers. While there is some potential for additional land becoming available over time it is unlikely to expand beyond Neighborhood Center densities.

2. Friday Center – Community Center

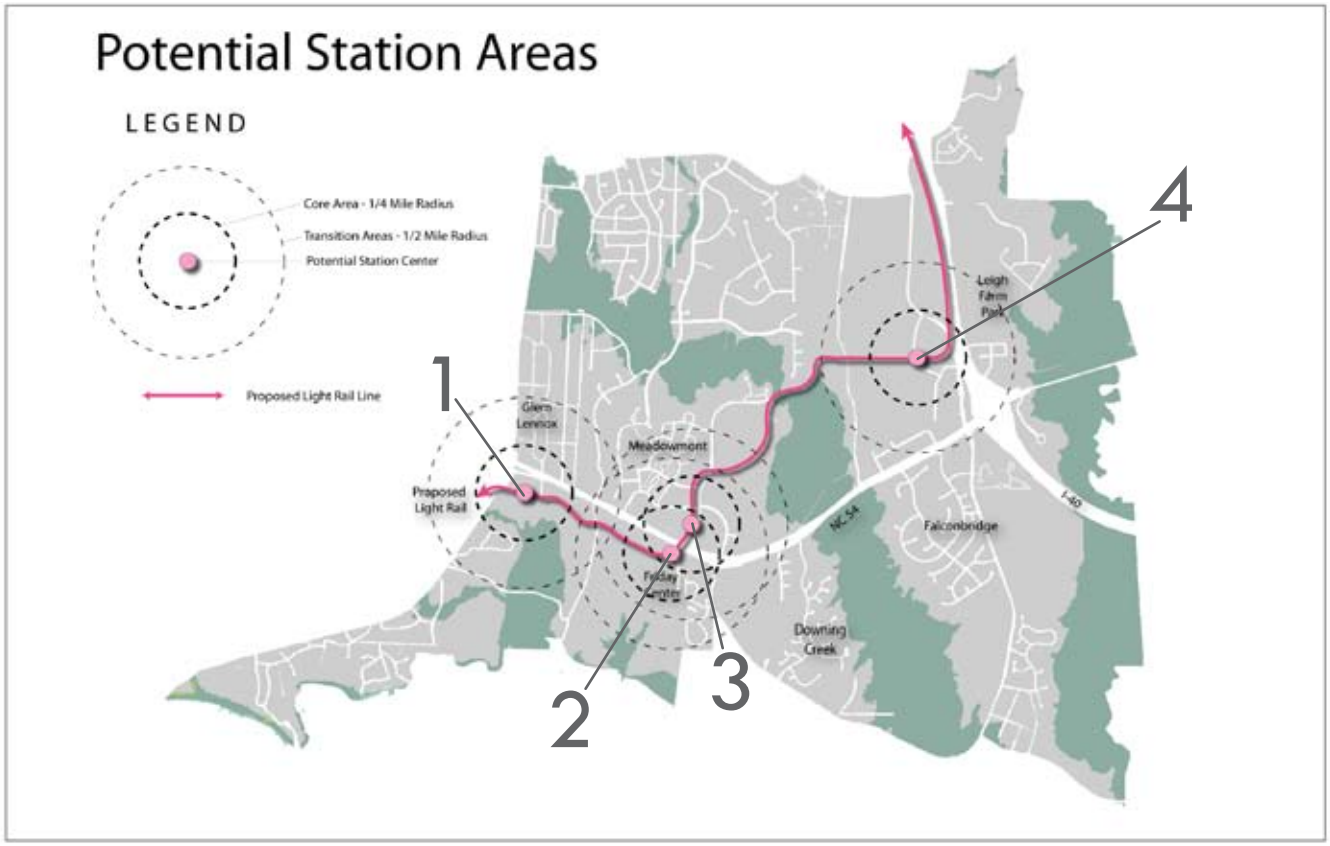
Given the scale of potential redevelopment on the Friday Center site and surrounding land with redevelopment potential for housing this site is a candidate for a Community Center. It is highly accessible by other forms of transit on NC 54 and will support an extensive employment opportunity.

3. Meadowmont – Neighborhood Center

This relatively recent development is unlikely to experience significant change in the foreseeable future, but the vacant land near the proposed rail station could develop at relatively high density. Overall densities are likely to achieve those of a Neighborhood Center.

4. Leigh Village – Community Center

Most of the land in the Leigh Village area is either vacant or aging large lot residential developments. With the extent of developable land in the vicinity it is likely that Leigh Village can achieve Community Center densities and influence additional vacant land in the vicinity. With the park and ride facility it should attain the higher end of the Community Center densities.



1. Glen Lennox Area – Neighborhood Center; 2. Friday Center – Community Center; 3. Meadowmont – Neighborhood Center; 4. Leigh Village – Community Center

Station Area Type Characteristics

The station area indicators and variables described for the community and neighborhood centers identify the physical attributes, functional characteristics and design character within approximately one-half mile radius around a transit station. The target density and intensity of specific site level developments could vary based on the size and location of the developments within the larger station area. These densities and intensities represent the targets within a one-quarter mile radius, however it is to be expected that the densities are likely to be highest immediately adjacent to the station. This variation in density and intensity as well as the design of streets and other public spaces should be addressed through a detailed station area planning.

The measures summarized for the two scales of station types address the target intensities, densities and mixture of uses most desirable within each station area. Gross density targets are established for the station area as a whole, while net density, intensity, and mixture of uses are used to describe building development at the site level within a station area. Development standards in station areas are described for a range of indicators and variables broadly classified into the following categories:

- Gross density - Population density (persons per square mile) and employment density (employment per square mile)
- Intensity, density, and mixture of uses – Residential and non-residential mixture of uses, residential density, total Floor Area Ratio (FAR), non-residential Floor Area Ratio (FAR), and jobs to housing ratio
- Street network and building design - grid density, block size, building height, lot coverage, street frontage
- Parking – residential parking, non-residential parking, park-and-ride

	STATION AREA TYPES	
GROSS DENSITY INDICATORS	**COMMUNITY CENTER**	**NEIGHBORHOOD CENTER**
Population Density - Persons per Square Mile	45,000-60,000	10,000-20,000
Employment Density - Employees per Square Mile	25,000-35,000	5,000-10,000
Average Jobs/Housing Ratio (Jobs : Dwelling Units)	3:1	1:1
NET INTENSITY, AND MIX OF USES		
Average Residential Density (Dwelling Units Per Acre)	30-40	10-20
Average Total Floor Area Ratio (FAR)	1.0-4.0	0.75-2.0
Average Non-Residential (FAR)	0.75-2.0	0.35-1
Mix of Uses - % Residential / % Non-Residential	50% / 50%	70% / 30%
STREET NETWORK AND BUILDING DESIGN		
Grid Density - Blocks per square mile for vehicular, Bicycle, and Pedestrian Street Network	> 250	>175
Average Block Size (in Feet)	200'x400'	200' x 600'
Average Building Height (in Floors)	>4	>2
Minimum Lot Coverage	70%	60%
Minimum Street Frontage	70%	60%
PARKING		
Maximum Residential Parking - Space per Dwelling Unit	1.25	1.5
Maximum Retail Parking - Spaces per 1000 square feet	2.5	3
Maximum Office Parking - Spaces per 1000 square feet	1.5	2

Achieving Station Area Targets

Achieving the physical and functional variables summarized for each station area will require master planning for each to calibrate it to account for existing intensity, density and mixtures of uses, land availability (vacant or redevelopment), public infrastructure and open spaces, etc. The target gross density indicators guide the degree and direction of calibration that will be required.

The variables and ranges contained within this framework are consistent with the Federal Transit Administration's (FTA) standards for assessing land uses that are supportive of major transit capital investment. Proposed transit projects that exhibit land use characteristics within the ranges described in the place type tables would likely receive a favorable land use rating by FTA's standards.

Calibrating to Local Conditions

The placetypes described in this guidebook represent prototypical conditions. Therefore, when applied to existing conditions across Florida communities, the station area level guidance requires calibration to the local context. This calibration process should be iterative in nature and should follow the following steps:

Existing Conditions Assessment

The existing conditions assessment entails evaluation of the proposed station area to assess existing population and employment density, productions and attractions/ activity centers, and land development (availability, assembly, and use). This assessment provides the baseline for determining how transit-ready existing conditions may already be, or how much change is required within the station area to achieve more transit supportive conditions as defined by the range of station area placetypes.

Placetype Selection

In addition to the existing conditions assessment, selecting the desired station area placetype should also be driven by a local visioning process or other means whereby the future development potential/desires are defined. This combination of existing conditions and future development visioning is essential to aligning community goals with station area design.

Placetype Calibration

Once a specific station area placetype is identified for a given area, the prototypical design variables need to be calibrated to the existing conditions. This calibration process is essentially a design analysis process that considers the variables of building design, street network design, and parking to generate gross and net density and intensity targets. Building design considerations such as building height and lot coverage are critical place based factors that can heavily influence the ultimate amount of future development within the station area.

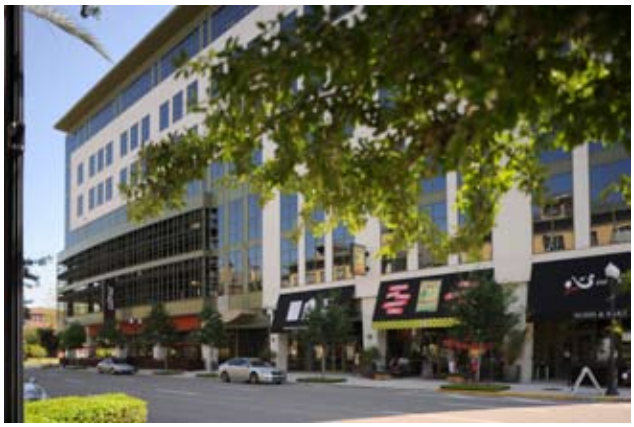
Community Center - Illustrative Examples

The Community Center station areas are characterized by vertical mixed use, with generally a higher percentage of employment than residential, and numerous amenities to attract pedestrians. Parking ratios are kept as low as possible in this center type, with access primarily directly from transit, walking trips from adjacent community and the park and ride facility. Within this station area, the core zones are the most intensive and the outer 1/2 mile is less intensive. The employment mix includes office and service, restaurants and other retail businesses as well as residential. The examples shown here illustrate some building types and development patterns that are appropriate to reach the desired built form and intensity for Community Center Station Areas.

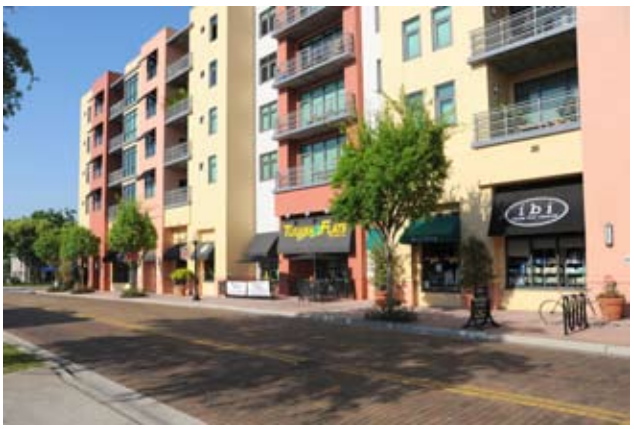
Example: Office/Institutional, 5 stories, FAR approximately 0.5-1.0, shared structured and surface parking. Approximately 35-175 employees per acre.

Example: Retail / Office Mixed, 3 stories, FAR approximately 1.0, 100% street frontage, store front, shared surface parking, on-street parking. Approximately 80 employees per acre.

Example: Retail / Residential, 9 stories, FAR approximately 4.0, 100% street frontage, no-onsite parking. Approximately 25 employees per acre, 130 units per acre.



Example: Retail / Office Mixed , 5 story, FAR approximately 2.0, 100% street frontage, store front, private structured parking, on-street parking. Approximately 175 employees per acre.

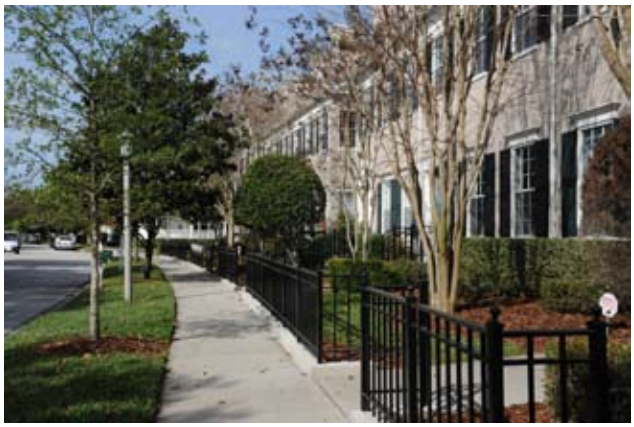


Example: Retail / Residential, 5 stories, FAR approximately 2.0, 100% street frontage, storefronts, private structured parking. Approximately 32 employees per acre, 50 units per acre.

Neighborhood Center - Illustrative Examples

The Neighborhood Center station areas are also mixed use places, but are characterized by a higher residential mix than employment. They have a local-serving mixed-use and relatively dense housing stock. These include townhouses, apartment/condo and small lot single-family residences. The street network is connected with relatively small blocks. This retains the ease of walking through the district. The examples shown here illustrate some building types and development patterns that are appropriate to reach the desired built form and intensity for Neighborhood Center station areas.

Example: Retail / Residential, 3 stories, FAR approximately 1.5, 100% street frontage, arcade store front, shared surface and on-site parking. Approximately 25 employees per acre and 25 units per acre.



Example: Residential Townhouse Condominium, FAR approximately .7, shared surface parking, on-street parking. Approximately 18 units per acre.

Example: Residential Townhouse Condominium, FAR approximately 1.75, shared surface parking, on-street parking. Approximately 50 units per acre.

Example: Residential Single Family, FAR approximately .7, Residential porch/yard, alley loaded garage and on-street parking. Approximately 4-8 units per acre.

Example: Residential Townhouse Condominium, FAR approximately 1.0, shared surface parking, on-street parking. Approximately 25 units per acre.

Community Form

The following Communtiy Form section outlines design principles and best practices for creating walkable, enjoyable mixed-use TOD. These guidelines are intended to provide a reference manual, or 'playbook', to help localities and developers achieve quality and vibrant TOD development. The design details and considerations for new development to consider include vertical and horizontal mixed use, connectivity and access, street types and multimodal features, building form, lighting, landscaping, open space and parking.

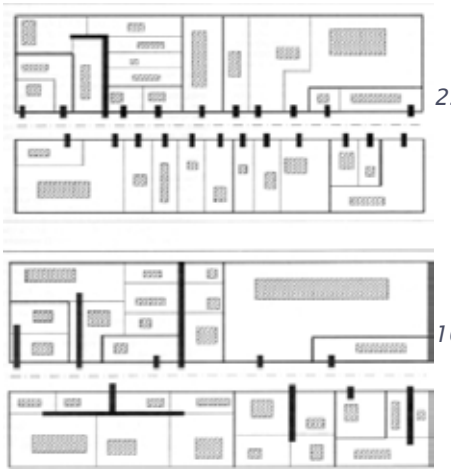
Mixture of Uses

Creating a walkable environment typically includes providing a careful balance of jobs, housing, restaurants and shopping within a compact, walkable area. In vertically mixed-use buildings, uses that attract pedestrians, such as retail or service uses, should be encouraged on the ground floor with office and residential uses above. Additionally, to be successful, development should incorporate both a vertical (multiple floors) and horizontal (adjacent buildings) mixture of uses. Mixed use development should include an interconnected street network that enhances mobility for pedestrians and cyclists, and allows users to park once and walk between several uses; and provide a balance between activities that occur between the daytime, evening, and weekend hours, fostering a busier, safer, and more exciting environment 24 hours a day.

Access Management

Access management is a comprehensive approach for controlling the location, spacing, design and operation of entrances, street intersections, median openings, and traffic signals. Each of these access points (entrances) creates conflict points where vehicles have to stop or slow down, disrupting the flow of traffic. As the number of conflict points increase, so does traffic congestion and traffic crashes affecting the traffic carrying capacity of the road. Access management should be used to minimize unnecessary driveway connections and to encourage shared and cross-access between adjacent parcels. When applied, access management can reduce the number of full access points and include median separators, thus helping to create a refuge for pedestrian crossings at mid-block locations. Managing access, therefore, seeks to limit and separate entrances, intersections, median openings, and traffic signals in order to maintain and improve the flow of traffic and enhance public safety. The benefits include:

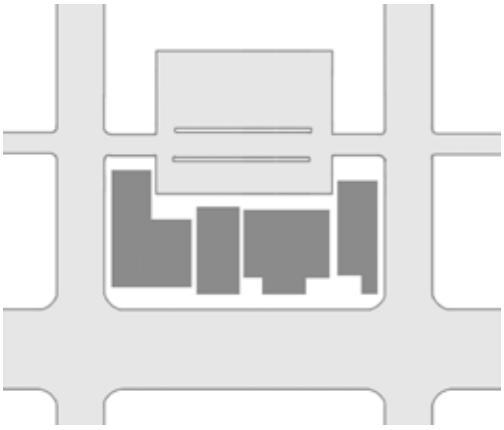
- Less traffic congestion.
- Lower fuel consumption and air pollution.
- Fewer and less severe traffic crashes.
- More efficient movement of people and goods that promotes economic development by expanding the market area and labor market for businesses.
- Preserving highway traffic carrying capacity to avoid having to widen them or build new ones.



Top: 23 entrances, 28 parcels

Bottom: 10 entrances, 29 parcels

Discouraged: separate driveways & parking in front



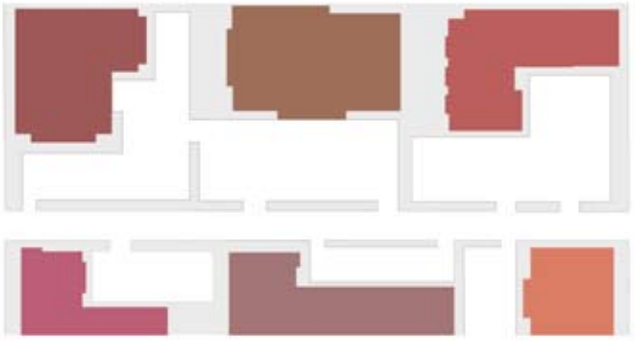
Encouraged: shared access & parking/ access in rear

Connectivity and Block Size

Connectivity

Interconnected transportation networks can provide advantages such as enhanced vehicular and pedestrian access, reduced traffic congestion, and enable emergency vehicles to respond in a more timely manner. Well-connected areas promote pedestrian activity and encourage walking in place of driving for local trips.

encouraged



discouraged

Block Size

Smaller scaled blocks help promote walkability and mixed-use development by:

- Creating an increased sense of location and direction
- Decreasing and breaking down the distance between intersections and destinations
- Promoting a diversity of building types within closer proximity
- Providing increased visibility for businesses and offices

Recommended block sizes range from 200' - 800' in length, with the average length recommended at 400'.

encouraged

discouraged

Streets Types

Streets and corridors provide the framework for Transit Oriented Development. Effective street design is critical to the success of a mixed-use activity center. Streets must provide an efficient and interconnected network for vehicles, bicycles, and pedestrians. Street function and appearance must be in balance with the built environment and create a pleasant and safe experience for travelers and residents with homes and/or businesses facing the street.

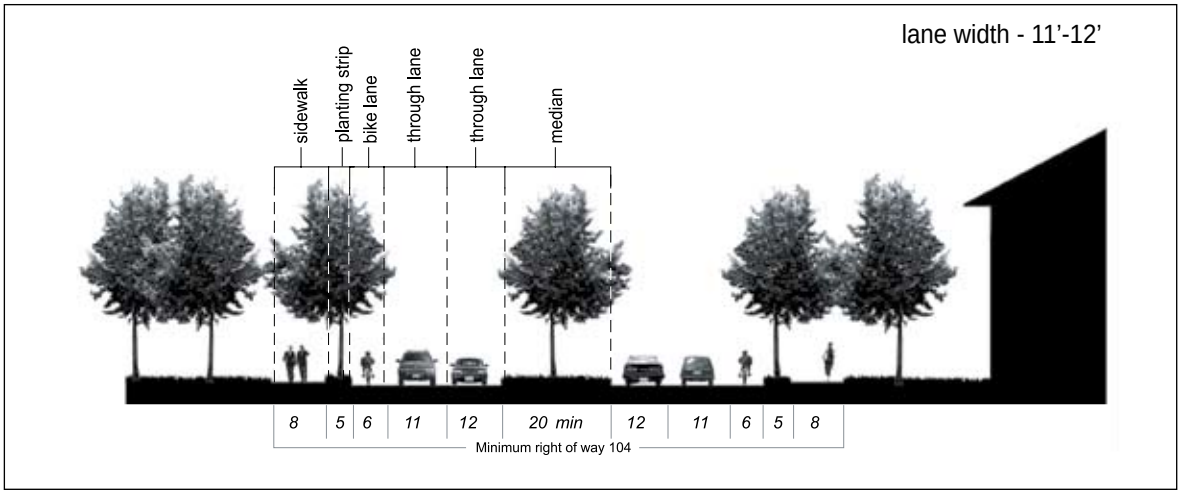
To ensure a lively street setting, street networks must avoid concentrating travel on a few large roads. A more diverse roadway fabric provides multiple routes of access and evenly distributes activity to create a more energized urban environment. The dispersal of vehicle loads allows streets to be narrower and treated at a human scale. Streetscape elements provide a softened appearance and enhance the quality and appeal for pedestrians. On-street parking and street trees help define a comfortable pedestrian realm buffered from vehicular traffic. Narrow road widths naturally reduce travel speeds and give greater spatial enclosure to the street environment. Enclosure allows the streetscape to be experienced as an 'urban room,' a space that attracts pedestrians and jump-starts activity.

Boulevard

A boulevard provides multi-lane access to commercial and mixed use buildings. Medians separate slower traffic at the edge of the designated right-of-way. Center lanes allow through traffic. Boulevards allow for a variety of uses, frontage types, sidewalks, and pedestrian activity. Planting strips and trees provide shade, scale, and aesthetic quality.

Recommended Standards

Lanes with marked bike path
Maximum of 4 travel lanes
Planting Strips - 5 - 11'
Sidewalks - 8' on each side
Design Speed - 40-45 mph (maximum)
Posted Speed - 40 mph
Requires a 104' Right-of-Way (ROW)
Drainage - curb and gutter

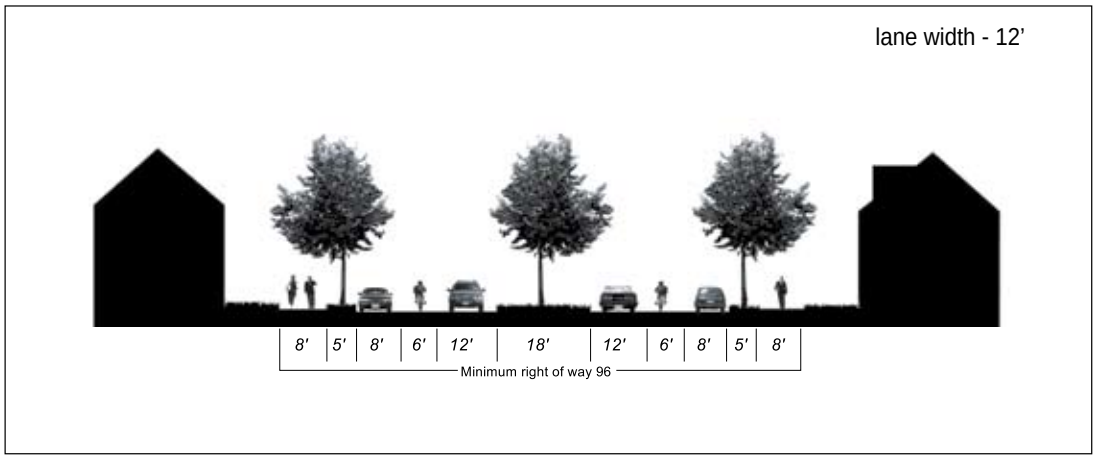


Avenue

An avenue provides short distance medium speed connections between neighborhoods and core areas, often terminating at prominent buildings or plazas. Avenues may also circulate around squares and neighborhood parks. Planting strips and on-street parking separate the pedestrian realm from vehicular traffic.

Recommended Standards

Lanes with marked bike path
Maximum of 4 travel lanes
Planting Strips - 5 - 7'
Sidewalks - 8' on each side
Design Speed - 30 mph (maximum)
Posted Speed - 25-30 mph
Requires a 96' Right-of-Way (ROW)
Drainage - curb and gutter

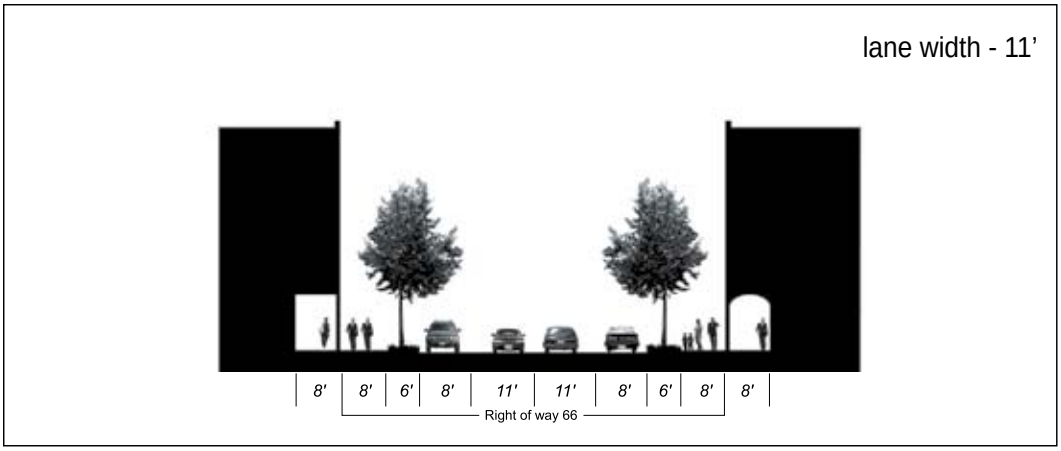


Main

A main street provides low-speed access to high-density mixed use commercial and residential areas. A main street may serve as a focal point a mixed-use center. Narrow street width creates spatial enclosure and sidewalk bulb-outs allow short pedestrian crossing distances. Planting strips are replaced with planting wells.

Recommended Standards

Lanes with striped parking
Maximum of 2 travel lanes
Planting Wells - 6'
Sidewalks - 8' on each side
(w/ 8'-10' arcade)
Design Speed - 25 mph (maximum)
Posted Speed - 20-25 mph
Requires a 66' Right-of-Way (ROW)
Drainage - curb and gutter

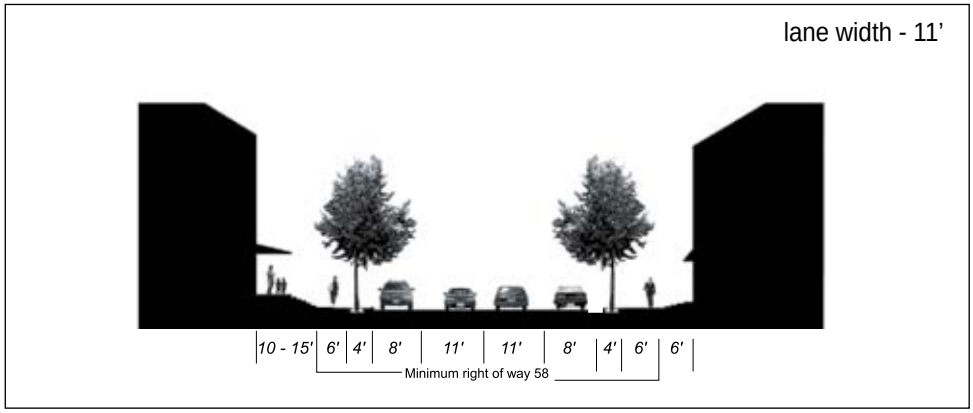


Local

A local street provides low-speed access from main streets and avenues to commercial and residential areas. Narrow street width creates spatial enclosure. Stoop and dooryard fronts allow setbacks, buffering residential units from vehicular traffic. Planting wells may contain street trees.

Recommended Standards

Lanes with striped parking
Maximum of 2 travel lanes
Planting Strips - 4'
Sidewalks - 6' on each side
Design Speed - 25-30 mph (maximum)
Posted Speed - 25 mph
Requires a 58' Right-of-Way (ROW)
Drainage - curb and gutter

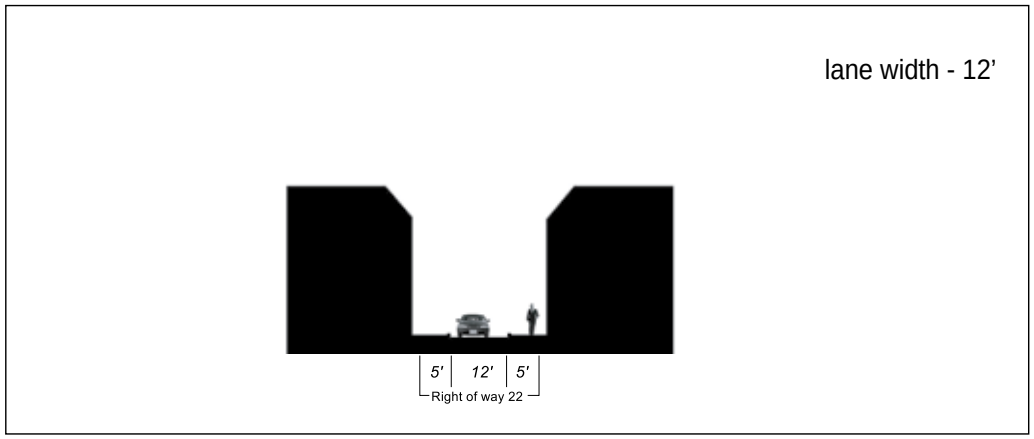


Alley

An alley provides property access, but is not intended to accommodate through traffic. Alleys often allow access to interior parking. Utilities may be located in alleyways to provide service connections to rear elevations.

Recommended Standards

Single lane with no parking
Maximum of 1 travel lane
Planting Strips - n/a
Sidewalks 5' on each side
Design Speed -10-15 mph (maximum)
Posted Speed -10 mph
Requires a 20'-22' Right-of-Way (ROW)
Drainage - n/a)



Complete Streets and Multimodal Features

In addition to the importance of density, diversity and design of the building forms for TODs, creating quality street networks and walking environments is also a key design element. Implementing the design principles of "complete streets" can help create strong streetscapes that support safe and comfortable pedestrian activity. Complete streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and transit riders of all ages and abilities must be able to safely move along and across a complete street. More information on Complete Streets is available from the National Complete Streets Coalition, www.completestreets.org. Designing TODs with strong walking environments and access to multiple destinations within close proximity to one another helps maximize transit ridership potential.

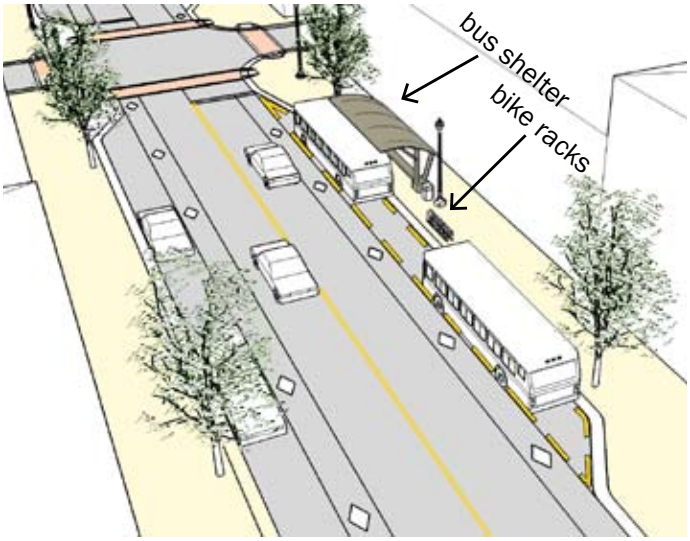
Multimodal Infrastructure

Design buildings, streetscape, with multimodal infrastructure interconnect to produce a high-quality, pedestrian-oriented environment. Narrow streets help to calm traffic and reduce pedestrian crossing distances. Bicycle lanes, on-street parking, transit easements, and streetscaping elements such as landscaping and light posts, help provide a comforting barrier between vehicle traffic and sidewalk activity. With buildings fronting directly onto the sidewalk and parking relegated to the rear, pedestrians have direct access to shops, dining, services, entertainment, or other daily activities. Bus shelters and sidewalk furniture allow for passengers to comfortably wait or pedestrians to rest and relax. Bicycle parking located near transit stops and building entrances provides convenient transfer access to cyclists. The remainder of this section on Complete Streets and Multimodal Features describes in greater detail different elements and features to be considered in design and development.

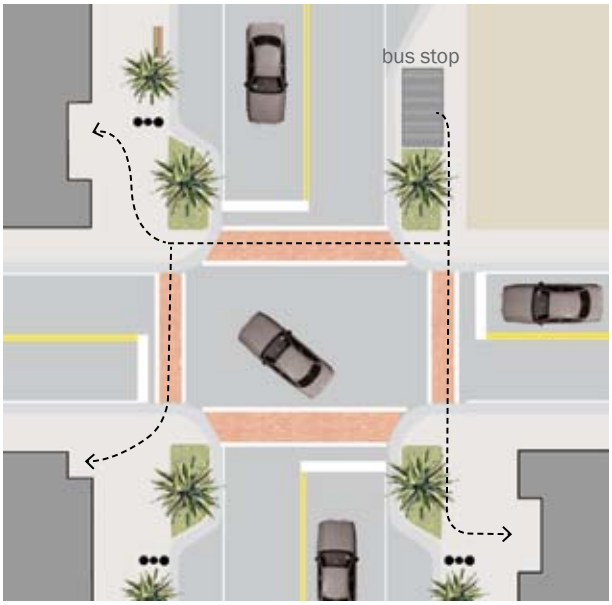
Transit Facilities

Transit stops should be accessible to pedestrians, located at the core of compact developments and surrounded by a good mix of land uses. Transit shelters should provide a safe environment that is integrated with the streetscape and surrounding activities. Transit stops should include at least one shelter, bench, and trash receptacle, as well as bicycle parking, lighting, and transit system information. Bus bays allow buses to safely load and unload passengers without disturbing the flow of traffic. Bus bays may be preferable in special circumstances, such as where multiple buses will transfer or where long dwell times are expected.

All transit users are pedestrians for some portion of their trip both at the origin and destination. Providing direct sidewalk connections from transit stops to origins and destinations is vital to ensure convenience for transit users.



Bus bays, shelters make for safer, convenient and inviting transit stops



Sidewalk connectivity linking transit stops to destinations ensures convenience and use of transit facilities

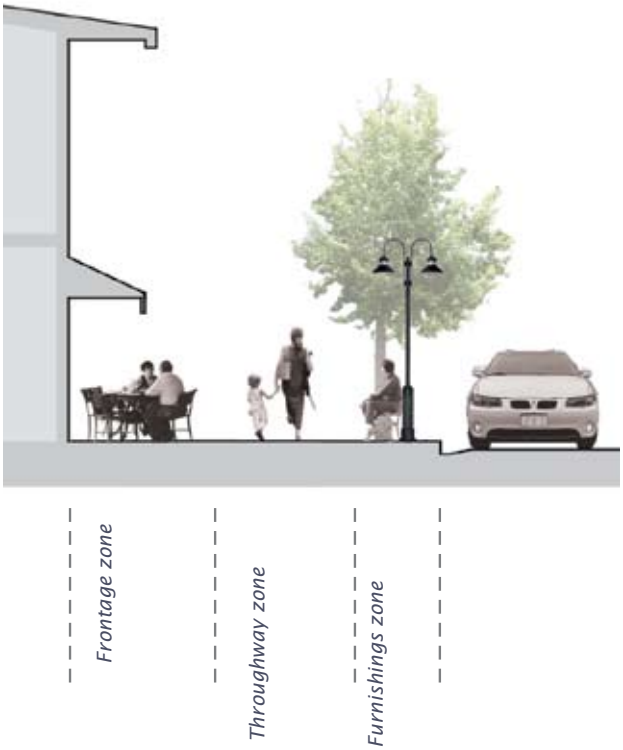
Sidewalks

The sidewalk is one of a variety of design elements that together contribute to an active and vibrant streetscape. Promoting a walkable environment requires safe, accessible, and connected sidewalks that unite the pedestrian with a desired destination or activity.

Public sidewalks should be provided on both sides of all urban roadways. Sidewalks should be wide enough to comfortably serve the volume and type of pedestrian traffic expected in a particular area. For example, certain urban core areas may benefit from a sidewalk wide enough to accommodate heavy pedestrian traffic in addition to outdoor dining or retail display. All sidewalks should be designed to have a minimum width of five feet. Sidewalks and pedestrian facilities should meet or exceed Americans with Disabilities Act (ADA) regulations to ensure the safety and access for all citizens. Curb ramps provide sidewalk and crosswalk access to the elderly and persons with disabilities throughout the pedestrian network. Curb ramps should be included at all intersections and pedestrian crossings. Pedestrian pads at transit stops create a paved link from the sidewalk to the curb, making it easier for wheelchairs to get on the bus.

Sidewalks should maintain a 3' minimum separation between the road and the paved sidewalk. This zone provides a buffer between pedestrians and vehicular traffic.

Street trees are recommended to provide shade for pedestrians and are also an effective way to ensure a comfortable pedestrian zone protected from moving traffic. This 3' separation may be used as a planting strip for street shade trees with a caliper of 2.5" to 3", spaced one for every 35' of street frontage. Lighting and other amenities such as benches or trash cans should be located either in the "furnishings zone" between the street and sidewalk or "frontage zone" next to the buildings and should not obstruct visibility at intersections.

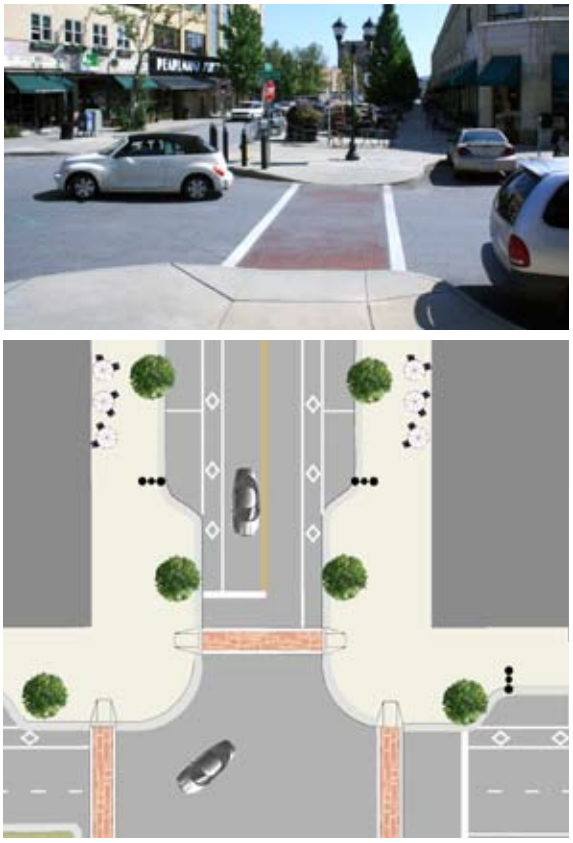


Pedestrian Crossings

Pedestrian crossings are a critical element of the pedestrian network. Safe and convenient crosswalks make a sidewalk system usable and appealing, encouraging pedestrian activity. Ensuring that people can cross streets safely and conveniently to access destinations is essential to creating an effective transportation network. People who are traveling by other modes will also need to cross streets; those who arrive by transit or car may need to cross the street to access a destination after getting off at a bus stop or parking, for example. People need to be able to cross streets at intersections and mid-block locations, at controlled (signals, stop signs, etc.) and uncontrolled locations, on major streets and on minor streets. Getting across the street can be one of the primary barriers to achieving true accessibility and mobility, and every effort should be made to accommodate efficient pedestrian crossings.

Crosswalks are needed to provide higher visibility to pedestrians at logical crossing points. Basic crosswalks consist of reflective white striping, although crosswalks with higher visibility, traffic calming measures (raised crosswalks), or those that are more aesthetically pleasing (colored concrete or brick crossings) are more appropriate in commercial areas or locations with high pedestrian volumes. To ensure safety and usability, crossing distances should not exceed 50'. Care should be used so that the surface does not impede wheelchair access or provide a hazard for the visually impaired or elderly. Crosswalk lighting should be provided at least to the level of general street illumination, although higher luminance should be used at key pedestrian crossings. Countdown pedestrian signals also facilitate pedestrian movement at intersections with heavy traffic volumes or signalized mid-block crossings. Some specific recommendations include:

- Incorporate guidance related to design and function of crosswalks as a critical element of a pedestrian circulation plan which may be addressed as part of the comprehensive plan.
- Establish a hierarchy of intersections to identify places where crosswalks would be required, such as schools, parks, public facilities, transit stops, parking structures, or other locations with a high demand for pedestrian crossing, as well as mid-block crossings in blocks greater than 1/8 of a mile in length.
- Work with NCDOT on potential implementation measures, such as incorporating crosswalks into future road improvements and seeking funding from the six year plan or federal grant programs to install crosswalks at key locations.



Cross-walks and bulbouts provide higher visibility, shorter crossing lengths and greater safety for pedestrians.

Advanced stop bar and ladder striping enhance visibility for pedestrians. Source: PBIC

Bicycle Facilities

The selection of appropriate streets for bicycle lanes is very important for the safety and the continuity of the bicycle system. Streets that provide the most direct and safest route to popular destinations such as, business districts, schools, parks, etc., and trail heads should be primary choices for inclusion on the on-street bicycle system. Bicycle lanes should be provided on both sides of the street. An exception may be made for multi-use paths, where travel can move in both directions. Bicycle facilities should provide continuous access from origin to destination. To provide bicycle facilities in rural areas, consider designating paved shoulders for shared use.

Designated Bicycle Lanes

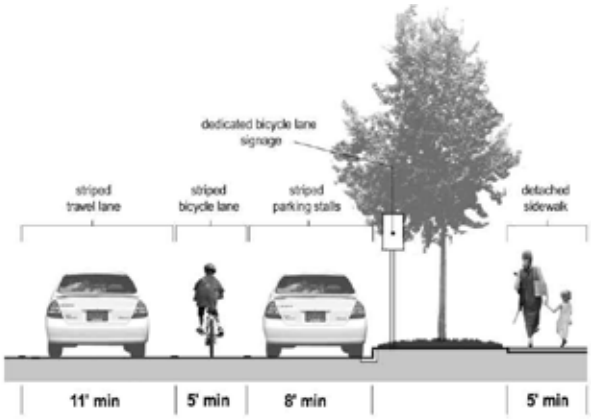
A designated bicycle lane is a portion of the roadway designated by striping, signing, and special pavement markings for the exclusive use of bicyclists. For safety purposes, sidewalks are not encouraged as substitutes for bicycle lanes. Regulatory bike lane signs inform motorists and bicyclists of this condition and are supplemented with pavement markings, including striping. Bike lanes are one-way facilities where the bike traffic moves in the same direction as the adjacent vehicular movement. In circumstances where on-street parking occurs, the bike lane should be located between the parking area and the travel way. Bike lanes should never be placed between the parking lanes and the curb, and parking lanes should be clearly marked with striping markings. The minimum bike lane width for curb and gutter roadways should be four feet. When on-street parking is present, the bike lane width should be five feet wide. At intersections with right turn lanes, the bicycle lane should continue adjacent to the through lane between the through lane and the right turn only lane. Advancing the stop bar in the bicycle lane ahead of the stop bar for cars creates a queue area for cyclists and increases their visibility to drivers.

Undesignated Bicycle Lanes (Paved Shoulders)

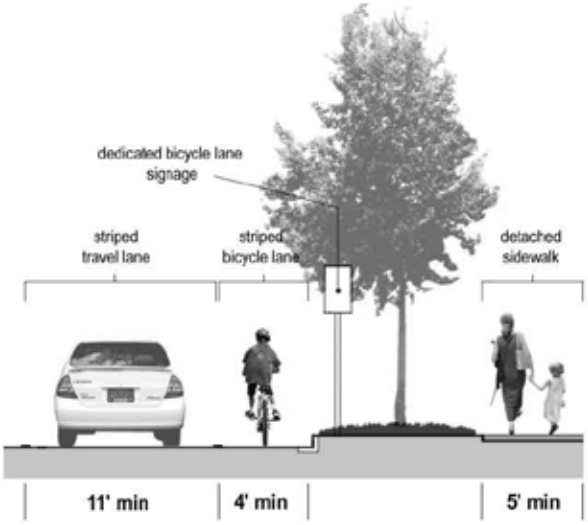
An undesignated bicycle lane, or paved shoulder, is open to motorized traffic. The use of "Share the Road" signage is useful to alert motorists to the likely and legitimate presence of bicyclists and to encourage cooperation between motorists and bicyclists.

Bicycle Sensitive Signals

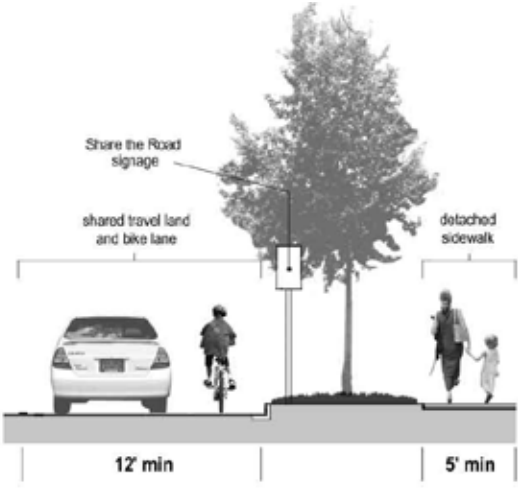
Bicycle sensitive signals provide added incentive and convenience for bicycle travel. Bicycle sensitive signals are commonly used when bicycle lanes are located between the through- and right-turning traffic lanes. The signal sensors must be well-marked on the pavement with nearby posted signs indicating that "X" marks the proper spot for bicycles to trigger the traffic signals.



Designated Bike Lane with On-Street Parking



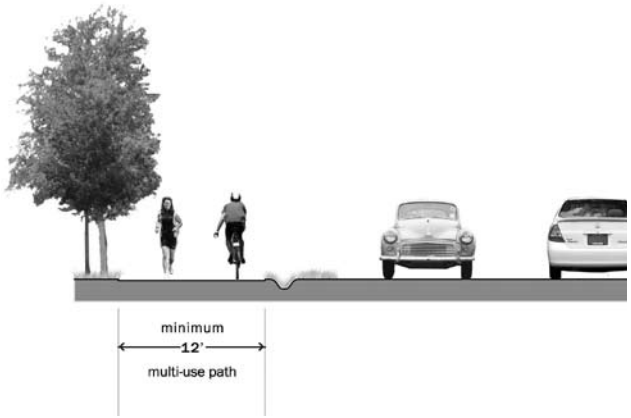
Designated Bike Lane w/o On-Street Parking



Undesignated Bicycle Lane

Multi-Use Path

Like bicycle trails and sidewalks, multi-use trails can play an integral role in completing the bicycle and pedestrian network. Multi-use trails should be paved, with the exception of those in environmentally sensitive areas where pervious surfaces are recommended, and adhere to the same lighting standards as pedestrian sidewalks. Where adjacent to roadways, trails can replace sidewalks. Trails should be clearly marked and easily accessible to pedestrian and bicycle traffic. Center striping should be considered to allow for free-flowing 2-way traffic.



Bicycle Parking

Secure, conveniently located bicycle parking is necessary to encourage bicycle use as an alternative mode of transportation. The bicycle parking area should be as close or closer than the nearest parking space and located in proximity to the building entrance to ensure visibility and accessibility. Large, distant, or hidden bicycle parking areas serving multiple buildings are discouraged. Smaller, more convenient racks provide greater accessibility and security for cyclists. The bicycle parking area location should not inhibit pedestrian or vehicular flows. Additionally, the area should provide aisles separating individual racks. The minimum aisle width between each row of parked bicycles should be 48 inches. Wider aisles should be used to accommodate areas with heavy bicycle traffic. A sheltered rack area located adjacent to a building wall or an awning is preferred to protect bicycles and riders from the elements. Effective bicycle racks should support the bicycle upright by its frame in two places. This allows for the bicycle to be secured in two places and prevents the bicycle from tipping over. The rack must be anchored and resistant to metal cutting tools to prevent vandalism.

An ample amount of bicycle parking located close the building entrance encourages bicycle activity.

Bicycle lockers are recommended for extremely high traffic, high turnover areas where bicycles are often parked for extended periods. A locker box should provide a sturdy, secure, and weather proof place to store a bicycle, equipment, and additional personal items. Parking garages, railroad and bus stations, and other transit hubs are examples of locations that should have bicycle lockers available in addition to bicycle racks. Lockers should be located in an area that is monitored to provide security. As a minimum standard for commercial and retail development, one bicycle parking space should be provided for every four motor vehicle spaces. Multi-family residential uses and public institutional uses, such as community schools, should provide one bike space per three vehicle spaces.

Medians

Medians are raised barriers in the center portion of the street or roadway that can serve as a landing place for pedestrians who cross a street mid-block or at an intersection location, storing or restricting left-turn vehicles, managing access, and providing an attractive landscaping or streetscaping treatment. Raised medians are most useful on high-volume roadways. They manage access and reduce conflict points thus serving the dual purpose of preserving roadway capacity and safety. They should be designed to provide tactile cues for pedestrians with visual impairments to indicate the border between the pedestrian refuge area and the motorized vehicle roadway. Medians installed to serve as pedestrian refuges should ideally be 8' in width, with 6' being the recommended minimum. Median widths to accommodate left turn lanes, should allow 16-18', and larger than 18' should only be used in more suburban or rural areas. The raised medians serve multiple improvement functions including:

- Separation of opposing traffic movements
- Manage motor vehicle traffic and provide comfortable left-hand turning pockets
- Provide a landing for pedestrians crossing the street
- Preserves traffic capacity
- Provides space for street trees, signage and other landscaping improvements

Raised medians help to establish the character of the roadway, provide refuge for pedestrians, and preserve roadway capacity through access management.
Images Source: PBIC Library, Dan Burden

Buildings and Frontages

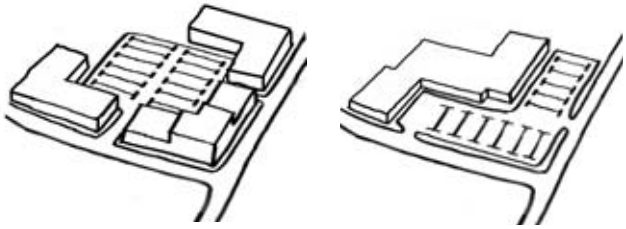
Building frontages are the interface between the public street and the building interior. Treatment of building fronts should reflect the building use. Retail frontage is intended to draw the public inside. Residential frontage protects the privacy of the interior, yet allows the residents to observe and engage with neighbors and passersby.

The ground level should always be given the most careful consideration. Ground floor heights, facade articulation, setbacks, and entry design have a critical impact on the overall street environment. The typical progression from street to building includes vehicular traffic, on-street parking, landscaping elements and street trees, sidewalk, and building entry. The dimensions and relationships between elements vary depending upon building types and uses, vehicle traffic, and pedestrian traffic. Minimum ground floor heights ensure that the civic nature of the streetscape is maintained.

Building Recommendations

Orientation

Buildings should be sited to complement the existing built environment, while recognizing the characteristics of the specific project site. Building placement must respect important existing features of the site, such as natural elements or historical structures. Building orientation should balance the combined impacts to building occupants, pedestrians, and open space users. Building entries should border main streets and public thoroughfares to foster vibrant, walkable streetscapes and allow for clear pedestrian access and circulation. When possible, principles of passive solar design, such as screening the south elevation to avoid daytime heat gain, should help orient buildings. Parking and building service equipment should be placed at the rear of the building lot, visually removed from the streetscape.



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Massing

Massing describes the physical form of a building or group of buildings. To maintain a comfortable scale, building massing must be carefully considered in building design. Massing should be compatible with surrounding buildings to create a streetscape that maintains a consistent scale, while allowing unique articulation between buildings. A single, uniform building mass should be avoided. Variations in height and horizontal divisions may be used to create facade articulation. Visual aspects of larger buildings must be detailed to maintain a sense of human scale, particularly at the pedestrian level. Varying window treatments and facade materials help break the mass of a building. Facade elements should highlight primary entrances and different building uses. Roof equipment should be screened from view using setbacks and parapets.

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Floor Articulation

In multiple story buildings, floors should have distinctive changes in exterior material, texture, ornamentation, and color. Floor articulation is especially important for mixed-use buildings. Facade treatment should reflect different interior uses, combining larger degrees of transparency for retail space and smaller openings for residential use. Typically, the first one or two stories of multiple story buildings are an architectural base meant to complement human scale and movement. The increased floor height of the base and covered walkways tie the building to the pedestrian environment. Prominent facade treatments at ground level highlight public entrances. Upper stories may be slightly setback from the base and treated with different materials and colors, particularly useful for mixed-use development.

Entries

Building entry treatment should vary by use. Retail, office, and residential entries have different purposes and priorities. Retail space should have a ground-floor entry fronting the public thoroughfare and visible to pedestrians. The entrance should incorporate transparent areas that integrate the interior space with street activity. Signage may be incorporated into the building facade or covered walkway. Often, offices require more private interiors. Office entries should also front public thoroughfares to ensure visibility. Residential entries, when part of a dense area, are set to the side or rear of the building. Often, significant entries are located along the street edge, but side and rear options handle routine traffic. In less dense areas, single-family residence entries are set back from the street right-of-way. Covered porches and stoops are suggested to make visual and spatial connections between the house and street.

Transparency

Transparent building façades generate interest for the pedestrian and improve security through enhanced visibility. For non-residential uses, storefront windows and doors help create an inviting environment for pedestrians. Shop windows break the monotony of a street wall and welcome pedestrians in off the sidewalk. Additionally, where facades create a continuous street wall, maximizing street-front fenestration will provide the best opportunity for natural interior lighting. Despite following the general design principles of articulation and massing, the building to the right remains unwelcoming to the pedestrian because it lacks appropriate fenestration. Awnings, typically used to highlight entryways or windows, appear out of place when not part of a window or door.

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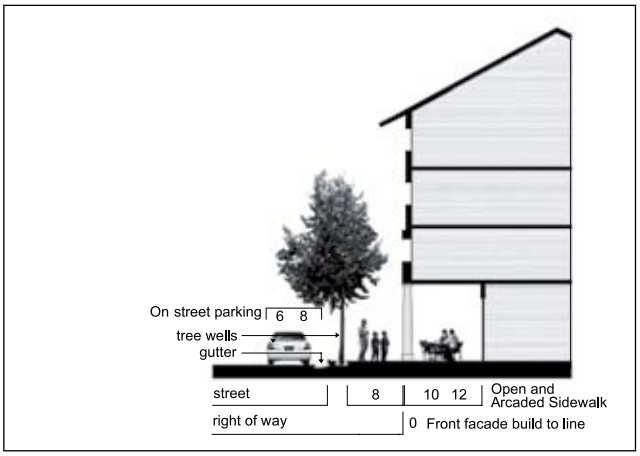
Arcade Front

Retail and Mixed Use

An arcade is a series of arches or piers often used to support an overhead covering, creating a partially enclosed and protected walkway. Arcade fronts draw the building to the edge of the right-of-way, integrating the sidewalk with the built space. The shared arcade space provides shade and weather protection. Ground floor retail functions can expand into the arcade space. The covered space is an ideal setting for outdoor cafe and restaurant seating.

Recommended Standards

Ground Floor Height . . . . . .14' minimum
Build to Line . . . . . 0'
Sidewalks . . . . . 8'
Arcade (covered sidewalk) . . . . . .10'-12'
On-street parking
Planting wells with shade trees



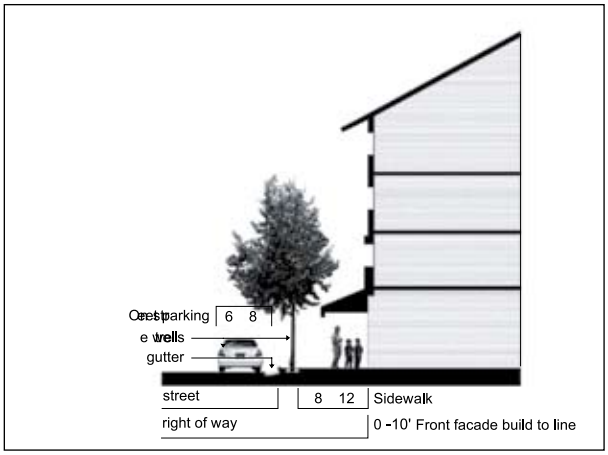
Shop Front

Retail and Mixed Use

A shop front is intended to promote retail activity. Building facade should be at or near the edge of the right-of-way. Minimum ground floor heights ensure a civic presence at street level. A ground floor facade often has large openings to draw attention inward. Awnings and signage may cantilever over the right-of-way.

Recommended Standards

Ground Floor Height . . . . . .14' minimum
Build to Line . . . . . 0'-10'
Sidewalks . . . . . 8'-12'
Planting wells with shade trees
On-street parking
Awnings and Cantilevered Sign



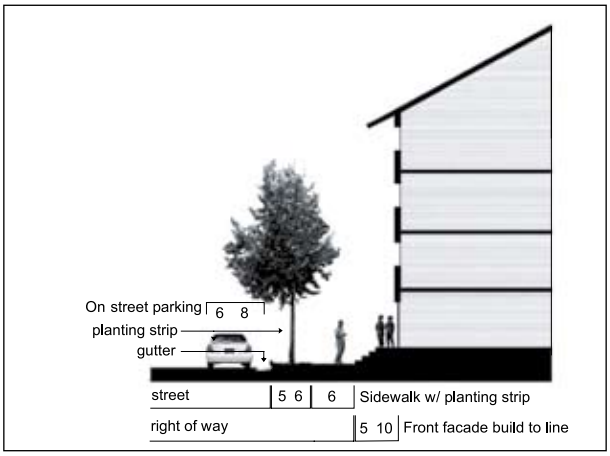
Stoop Front

Retail and Mixed Use

A stoop front provides a comfortable interface between the public streetscape and residential units. Elevating the entrance above sidewalk grade helps minimize the building setback. The 'stoop' should be oriented towards the street to encourage interaction between residents, neighbors, and passersby. Stoop fronts may mix with shop fronts on a street.

Recommended Standards

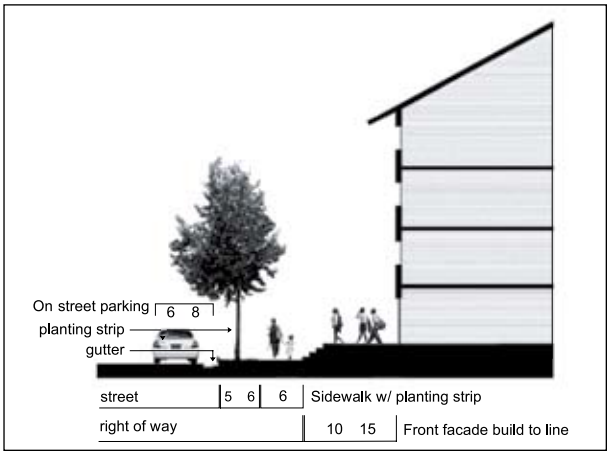
Elevated Ground floor entry . . . . . 5' maximum
Ground Floor Height . . . . . .10' minimum
Build to Line . . . . . 5'-10'
Sidewalks . . . . . 6'
Planting strips with shade trees . . . . . 5'-6'
On-street parking



Dooryard Front

Residential and Mixed Use

A dooryard front includes a paved or landscaped surface between the right-of-way and front facade line and provides gradual transition from sidewalk to building. The large transitional space and elevated entrance allow the building to negotiate significant elevational changes. The open surface can be enclosed as a porch or retained as outdoor space.



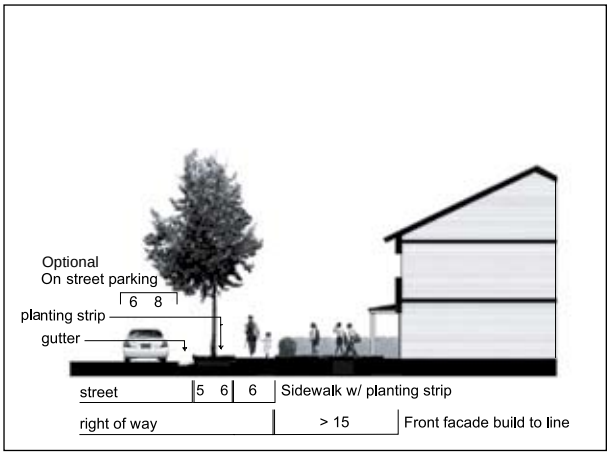
Recommended Standards

Elevated Ground floor entry . . . . . 5' maximum
Ground Floor Height . . . . . .10' minimum
Build to Line . . . . . 10'-15'
Sidewalks . . . . . 6'
Planting strips with shade trees . . . . . 5'-6'
On-street parking

Residential Yard

Residential

A common yard front uses a substantial building setback. The front yard created may be fenced or unfenced and should have similar landscaping to adjacent yards. With the deep setback as a buffer, common yards are suitable for higher speed thoroughfares.



Recommended Standards

Ground Floor Height . . . . . no minimum
Build to Line . . . . . >15'
Sidewalks . . . . . 6'
Planting strips with shade trees . . . . . 5'-8'
Landscaped yard

Lighting

Lighting should be carefully integrated with the built landscape. Building, streetscape, and high-speed roadway lighting have unique purposes and requirements. Scale, intensity, and fixture design should vary between areas of different densities and uses. Fixtures should contribute to the streetscape, fostering pedestrian activity and walkability. Ornamental light posts and fixtures help to create an attractive streetscape and should be consistent with the architectural character of the immediate area. In addition to aesthetics and scale, lighting is an important element of public safety. Well lit streets and alleys help to promote a secure environment and encourage night time activity.

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Building

Exterior building lighting has both safety and aesthetic purposes, illuminating dark areas and providing highlights and accents. Effective lighting should showcase building and landscape features, emphasize important spaces and promote night time vitality, appearance, and safety. Lighting should highlight entries and architectural features where appropriate. All light sources should be shielded to eliminate night time glare that could be harmful to other buildings or roadways. Light shields keep light focused downward, keeping the night time sky free from light pollution. Building mounted lights may be used in place of light posts to safely illuminate alleys and narrow side streets.

Streetscape

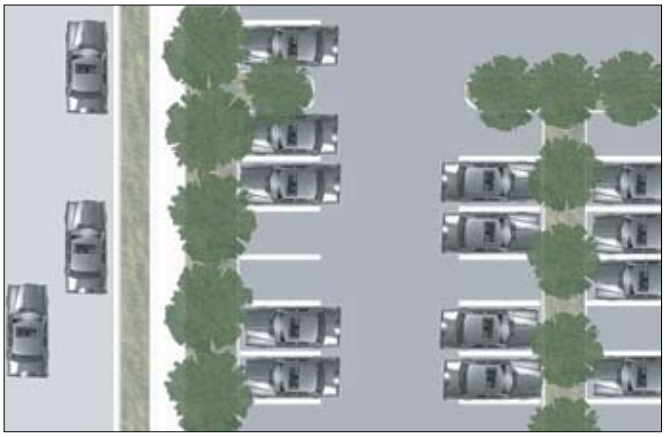
Street lighting should be integrated with the scale and character of surrounding buildings and pedestrian areas. A large number of low-intensity lights is preferred to fewer, higher-intensity lights to create an attractive pedestrian streetscape. In downtown areas, lightposts should be eight to twelve feet in height on both sides of the street and spaced no more than 30 feet apart. For natural quality, lighting elements should provide full-spectrum light to prevent color distortion. Light shields keep light focused downward. Ornamental fixtures allow lighting to fit seamlessly into the streetscape during daylight hours.

Roadway

Roadway lighting should be designed to enhance the safety of vehicular and pedestrian flows. Light posts may be located at both edges of the right-of-way or within a landscaped central median. Ornamental posts or posts that incorporate signage may be used to highlight dense centers and gateways. Lighting should be concentrated at intersections and crosswalks to enhance walkability. If needed in pedestrian areas, roadway lighting should not adversely affect the streetscape lighting. Light shields keep light focused downward to avoid excess lighting.

Landscape

Landscape design should aesthetically complement and enhance the character of buildings, roads, and the pedestrian streetscape. By drawing natural elements into the built environment, buffers harsh elements to maintain pedestrian-friendly and visually appealing streets. Different landscape strategies depend on building scale, density, thoroughfare type, and land use. Trees and plantings also have important environmental benefits, protecting air quality and water run-off and providing shading to buildings, cars, and pedestrians. Bricks and paving should be used to highlight important public spaces and signal significant roadway elements such as bus stops and crosswalks.



TYPICAL PARKING LOT BUFFER

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Building

Landscape design should help define the major paths and building entrances, while providing a buffer from busy vehicular traffic and paved parking areas. Landscape materials should be selected to enhance the building's texture, color, and pattern. Primary consideration should be given to elevations that border public streets. Buildings may also use landscape elements to create outdoor seating and congregation spaces. If planned considerately, trees can provide solar shading and visual screening for interior spaces.

Streetscape

An essential element of a vibrant attractive streetscape is landscaping. Landscape treatments buffer vehicular traffic from pedestrian movement, while providing a visually appealing and physically comfortable environment. Planting strips and trees help to distance paved sidewalks from the street, visually screen passing vehicles, and make the sidewalk a more intimate space. Street trees can help to create walkable streets in both high-density centers and residential neighborhoods. Landscape buffers may also screen parking lots and conceal building equipment.

Roadway

Landscape elements should be used to integrate roadways with the surrounding area. Tree and planting screens protect adjacent buildings, properties, and open land from high-speed traffic. Roadway landscape treatments help ease the transition between center and edge conditions, with landscaping taking a more formal appearance at gateway locations. Medians, which break down large road widths, also contribute to this transition.

Open Space

Carefully planned open space is necessary for the richness of mixed-use centers and the vitality of the public realm. Open space is a broad classification for public spaces, ranging from community recreational areas to civic squares. The scale, enclosure, and density of surrounding conditions determine the appropriate type of open space, such as formal/informal, active/passive, or open/contained. Formal civic spaces should be located in the center area, serving the area of highest intensity. Recreational facilities, greenways, and neighborhood parks should be strategically placed to serve the mixed-use communities surrounding the core.

Many qualities contribute to the appeal of open spaces. Often, environmental and natural features are integrated into open space planning. Wetlands, critical slopes, drainage swales, and vegetation should be conserved as open public space wherever possible. In urban settings, water retention systems can be rethought and formalized as landscape elements that punctuate design. Canals, ponds, fountains, and other attractive civic spaces in the center, promote gathering, interaction, and comfort. Moveable seating, tables, and multifunctional elements, such as planters that are at seat height, allow people to congregate and personally define spaces. Shade trees, greens, and cooling fountains help create a comfortable setting.

Plaza

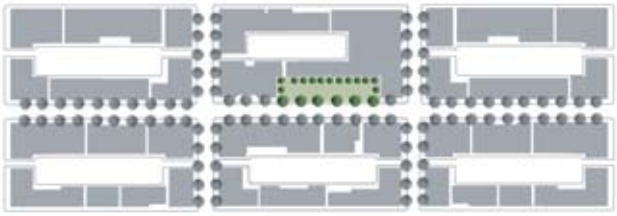
The most formal public space, a plaza, is generally less than half the size of a block and located at the intersection of important thoroughfares. It is devoted to civic uses and commercial activity and surrounded by buildings on all sides. Its landscape is composed primarily of durable pavement and formally planted trees. Features such as fountains, statues, and other vertical elements help mark the civic prominence of the plaza. These architectural features are most successful when planned in accordance with a strong visual axis, allowing the plaza to be read from a distance.

Urban Park

An urban park occupies at least a full downtown block. Its landscape consists of lawns, paved walks, and shade trees. Formal fountains and statues are also often incorporated. Landscape elements can help to organize the park into a series of smaller spaces that offer diverse qualities and uses. Urban parks may be surrounded by civic buildings and residential uses. In certain instances, civic buildings can accompany the park on a shared block. Urban parks may establish Farmers' Markets as a potential use to promote economic development activity in the area. Urban parks provide an excellent terminus for greenways and bicycle routes originating outside the core. In most cases, it is appropriate to frame the park within a visual axis.

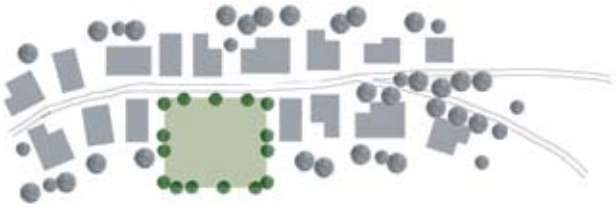
Pocket Park

A pocket park is a small park that often occupies a 'left over' space between buildings. Typically no longer than 100' of frontage, pocket parks provide vegetation, shade, and open space within densely built areas. Due to their small scale, pocket parks predominantly serve immediately adjacent buildings and thoroughfares. These small, informal breaks in the dense urban fabric provide alternatives to more prominent civic spaces such as urban parks and plazas. Pocket parks may have Farmers; Markets to promote activity and economic development activity in the area.



Neighborhood Park

A neighborhood park is an open public space serving a residential area. The space may be used for civic gatherings and recreation. Neighborhood parks provide a safe open area free from moving traffic for children and neighborhood residents. Neighborhood parks may be bound by residences or small-scale institutional or civic buildings to form a common green. These parks are intended to serve the local area, unlike recreational parks, which serve a larger residential population.



Recreational Park

Recreational parks are open public space, ranging from three to ten acres, reserved for civic gatherings and recreation. Often, recreational parks are designed around existing natural features. Its landscape consists primarily of grassy areas, paved or unpaved walks, and shade trees. Formal playing fields may be established to serve community needs. The park should be surrounded by a mix of residential, commercial, and civic buildings. Recreational parks may also serve nearby institutions. Parking needs and other necessary facilities must also be considered.

Stormwater

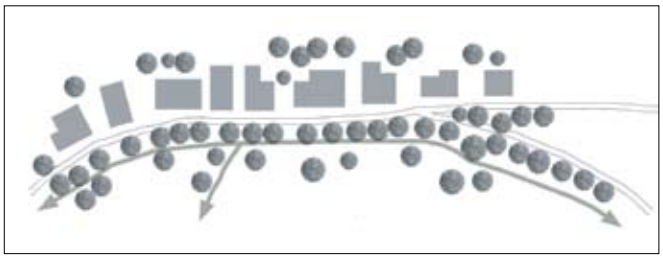
Planning for stormwater detention is essential to maintaining an ecological balance. Stormwater detention prevents flooding and helps decrease the amount of sediment and other pollutants that flow into other bodies of water. Stormwater ponds should not disturb wetlands, as wetlands natural stormwater retention areas. The use of shared stormwater retention systems for multiple sites is recommended.

Stormwater ponds and drainage swales should be developed as aesthetic amenities, with regard for the surrounding landscape and buildings. In urban settings, ponds may become formal pools with retaining walls, integrated into the dense fabric as a attractive public elements. Open space ponds should incorporate gradual side slopes and landscaped vegetation to create a natural setting. Gradual slopes reduce erosion and operate as safety features, eliminating the need for fencing. Stormwater ponds that must be enclosed should be located in the rear yard or not visible from the roadway. The reuse of stormwater for site irrigation is encouraged.

Greenways

Greenways can range in form from narrow urban trail corridors to winding river corridors to very wide, wilderness-like landscape linkages. The diversity of greenway types and forms, combined with geographic differences, means that different kinds of greenways should function differently, both ecologically and socially.

Ecologically, greenways can protect natural areas and diminish the isolating, disruptive effects of habitat fragmentation on wildlife and water resources. From a social perspective, greenways provide places for recreation and help maintain the scenic quality of landscapes. For transportation mobility and access, it is important for greenways to function by connecting places where people want to go, such as neighborhoods, business centers, shopping areas, schools and parks.



Typically, greenways that traverse environmentally sensitive lands can be considered "rural greenways" and corridors surrounding roadway networks can be considered "urban greenways." Multi-use trails will incorporate bicycle and pedestrian supportive design elements. The intersection of each greenway and multi-use trail should create a sense of place through pocket parks or a commercial node.

Parking

The proper supply, placement and design of parking is a key element in creating an environment conducive to pedestrians, bicyclists, transit users, and those traveling by car. Standard parking requirements can lead to an oversupply of parking spaces and open expanses of asphalt. Better management and design strategies can help integrate parking into high-density areas and reduce the demand for parking spaces.

Reducing minimum off-street parking requirements and setting average-usage standards instead of peak-usage standards make additional land available for development. Allowing developers to count on-street parking towards their requirement helps alleviate off-street parking needs. Shared parking allows activities and functions with different peak hours to use the same spaces, significantly cutting down the total number of spaces.

Structured parking is appropriate in high-density areas. Garages reduce the total amount of paved area and can fit well into an urban area, maintaining scale and facade articulation. Wrapping structured parking around the perimeter with liner buildings allows a seamless integration into the urban setting and maximizes the property's revenue potential.

Large lots with surface parking should relate to the established block size of the surrounding street grid. Parking aisle widths should be consistent with standard street right-of-way requirements. These considerations prepare the site for future infill development, in which surface parking areas are converted into a mix of buildings, garages and streets. Incentives often are needed to offset the high construction cost of parking garages.

On-street Parking

On-street parking provides parking spaces within the thoroughfare right-of-way. It contributes to the street environment, helping to buffer pedestrian space from vehicular traffic. Spaces are distributed evenly along the street edge, helping to maintain the visual consistency and appeal of downtown areas.

Recommended Standards

Parking space dimensions - 8' x 20'
Parking Angles - parallel, 30, 45
Trees may be planted to define separation between spaces
Curb bulb-outs are necessary at pedestrian crossings to limit crossing distances

Structured Parking

Structured parking allows for an efficient use of space in high density areas. Garages eliminate the need for extensive surface parking and help maintain a consistent density within downtown areas. Garages should be located within block interiors wrapped by perimeter liner buildings, or as stand alone structures. They should have facades that reflect proportion, rhythm and massing of surrounding buildings.

Recommended Standards

Parking space dimensions - 9' x 19'
Parking Angles - 45, 60, 75, 90
Aisle width - (1-way traffic) 15'-22'
Maximum ramp slope - 5%
Minimum Vert. Clearance - 8'2"-10'6"
Access is provided by mid-block alley

Surface Parking

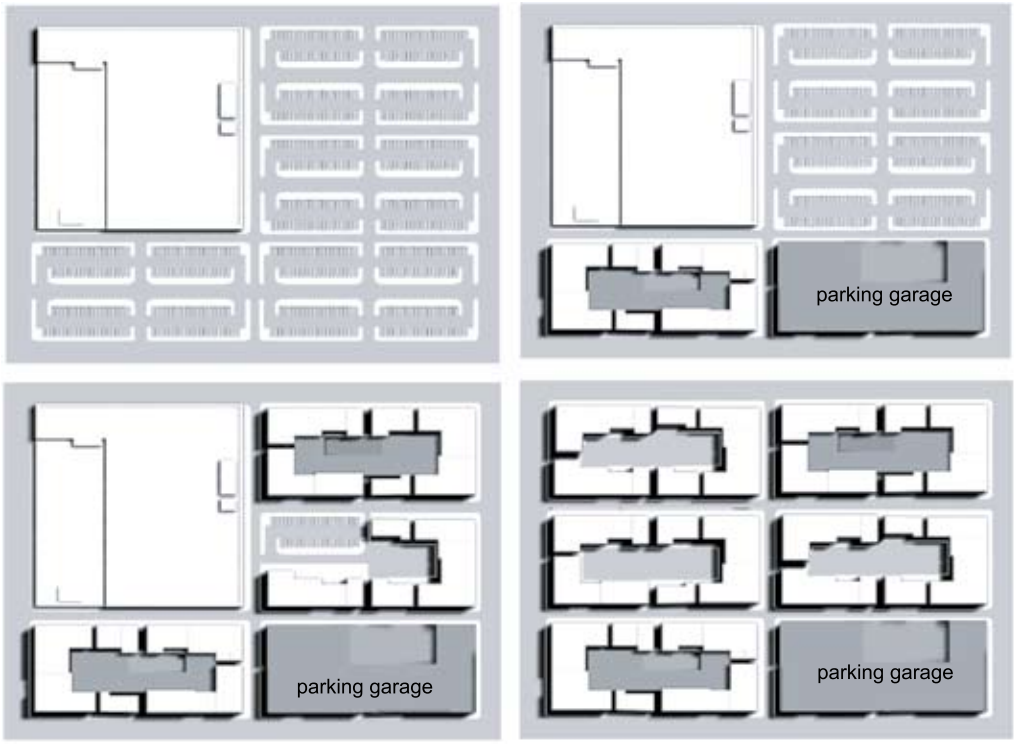
Landscaping is required to break the visual blight of large paved areas. Lots should be placed in the rear of buildings or in block interiors to minimize visual impact. Trees provide screening and noise reduction to help ease disruption. Plantings within parking lots also help to reduce storm water runoff, filter air, provide shade, and maintain property values.

Recommended Standards

Parking space dimensions - 9' x 19'
Parking Angles - 45, 60, 75, 90
Aisle width - (2-way traffic) 26'-30'
Max. uninterrupted spaces - 12
Landscape/plantings -10% of total area
Planted trees screen lot from road and divide
large lots into smaller scale zones

Parking and Planning for Future Development

Low density retail development is often characterized by wide, uninterrupted expanses of asphalt. Parking design and site layout often limit the opportunity for future development and increased density. In contrast, well planned parking strategies, can prepare a site for future growth. Arranging surface parking in accordance with standard block size and orientation allows the site to be developed gradually, lot by lot and block by block. Selective aisles should be designed consistent with standard right-of-way dimensions, creating a framework for future road development. By planning for future streets and blocks, parking lots can be gradually integrated with the surrounding urban fabric. Piece by piece, paved open lots may be transformed into higher-density centers.



APPENDIX C

Travel Demand Modeling Methodology

Baker

NC54 – I40 Corridor Study

To: William Wuensch, Jessica Haase

From: Anthony Hofmann, William Thomas III

Subject: Travel Demand Forecasting Methodology

Date: July 1, 2010

DRAFT

This document summarizes the process and assumptions used to develop alternative forecasts for the NC 54 corridor study. This study evaluates several socioeconomic scenarios along with incremental increases in transportation system investments for the horizon year 2035. This study's forecasting approach uses the version TCv4-2008 Triangle Regional Travel Demand Model (TRM) developed by the Triangle Regional Model Service Bureau. Demand estimates and performance measures were developed for the purpose of comparing the relative impacts of the different socioeconomic and transportation system alternatives. Transportation performance measures were developed for AM and PM peak periods in addition to the 24-hr daily time period.

The TRM is an advanced four step travel demand model incorporating trip generation, trip distribution, mode choice, and trip assignment. The modeled area incorporates both the Durham-Chapel Hill-Carrboro MPO (DCHCMPO) and the Capital Area MPO (CAMPO). The model was developed using survey data, 2000 Census data, and traffic counts throughout the Triangle Region. An overview of the model is available in the *Research Triangle Region 2035 Long Range Transportation Plan*[1], as well as the *Triangle Regional Travel Demand Model User's Guide*[2]. For more detailed information on the model development and calibration, see the *Triangle Regional Model 2006 Documentation*[3]. The 2005 TRM was used as the base year for this study.

The study area being evaluated surrounds NC 54 between US15-501 to the west and areas along I-40 to the east. In 2005, the study area contained 4,282 households and 3,233 employees. Model results in the study area were

[1] *Research Triangle Region 2035 Long Range Transportation Plan*, CAMPO and DCHCMPO, May 2009
[2] *Triangle Regional Travel Demand Model Users' Guide*, For Version TCv4–2008, Triangle Regional Model Service Bureau, June 2009
[3] *Triangle Regional Model 2006 Documentation*, Parsons Brinkerhoff Inc., September 2006

compared to 2005 traffic counts. The model estimates approximately 6.8% more traffic on NC 54 compared to the counts and approximately 2.5% more traffic on I-40. This comparison indicated that no adjustments to the model were necessary. *Table 1* below shows characteristics of NC 54 in the study area and daily performance measures for the 2005 Base year model. In the base year, over 70% of the vehicle miles of travel (VMT) are comprised of trips traveling through the study area on NC 54.

Table 1: NC 54 Traffic (2005 Base)

Direction	Number of Lanes	Distance (miles)	Free Flow Time (minutes)	Daily VMT	Daily VHT	Congested Daily Speed (mph)
EB	2	3	3.9	65,400	1,900	34
WB	2	3	3.9	70,400	2,200	32

As seen in *Table 2*, the heaviest congestion occurs during the PM peak period with delay accounting for nearly half of the travel time in the westbound direction.

Table 2: NC 54 Travel Time and Delay (2005 Base)

Direction	Congested Travel Time (minutes)				Delay/Overall Travel Time			
	Daily	AM Period	PM Period	OP Period	Daily	AM Period	PM Period	OP Period
EB	5.3	5.0	6.0	4.7	26%	22%	35%	17%
WB	5.7	4.6	7.0	5.2	31%	15%	44%	25%

Note: AM period = 6:00 AM - 10:00 AM, PM period = 3:30 PM - 7:30 PM, OP period = 10:00 AM - 3:30 PM & 7:30 PM - 6:00 AM.

Future 2035 analysis was based on the evaluation of 4 scenarios designated Trend Scenario A, Trend Scenario B, Alternative Scenario 1, and Alternative Scenario 2. The model networks were based on the 2035 Long Range Transportation Plan (LRTP). For each of the 2035 scenarios, non-motorized trip percentages were estimated outside the TRM and adjustments were made to the trip productions and attractions prior to the trip distribution process.

Trend Scenario A

For Trend Scenario A, socioeconomic assumptions are based on historical trends with minimum to mid-range densities and with land uses as specified in future land use plans rather than basing assumptions on the LRTP. These assumptions resulted in 7,751 households and 7,557 employees within the study

area. The transportation network was modified to expand NC 54 to 6 lanes and include HOV lanes on I-40. This network did not include any improvements to the collector street network and eliminated the extension of light rail transit (LRT) through the study area to the University of North Carolina-Chapel Hill.

In Trend Scenario A, VMT and VHT[4] increase by approximately 80% over the base year as shown in *Table 3*. With the increase in the number of lanes on NC 54 the travel times and delay, in *Table 4*, remain roughly the same. For the entire study area, average daily delay accounts for 31% of total travel time. Through traffic on NC 54 becomes a smaller percentage of the overall traffic, accounting for 57% of trips eastbound and 68% of trips westbound; down from 76% eastbound and 72% westbound in the base year.

Table 3: NC 54 Traffic (2035 Trend Scenario A)

Direction	Number of Lanes	Distance (miles)	Free Flow Time (minutes)	Daily VMT	Daily VHT	Congested Daily Speed (mph)
EB	3	3	3.9	113,100	3,200	35
WB	3	3	3.9	131,500	4,200	31

Table 4: NC 54 Travel Time and Delay (2035 Trend Scenario A)

Direction	Congested Travel Time (minutes)				Delay/Overall Travel Time			
	Daily	AM Period	PM Period	OP Period	Daily	AM Period	PM Period	OP Period
EB	5.1	4.4	6.5	4.6	24%	11%	40%	16%
WB	5.8	5.6	6.7	5.4	33%	30%	42%	28%

Note: AM period = 6:00 AM - 10:00 AM, PM period = 3:30 PM - 7:30 PM, OP period = 10:00 AM - 3:30 PM & 7:30 PM - 6:00 AM.

Table 5 shows the percentage of trips originating from zones in the study area for each mode of travel represented in the model. With adequate access to transit services throughout the study area and the availability of HOV lanes on I-40, transit and carpooling account for 42% of travel in Trend Scenario A.

[4] Vehicle Hours of Travel

Table 5: Mode Share (2035)

Mode	Trend Scenario A
Non-Motorized Trips	7.4%
Local Bus	2.0%
BRT	3.1%
LRT	0.0%
Total Transit	5.1%
Drive Alone	50.1%
2 Person Carpool	25.3%
3+ Person Carpool	12.1%
Total Auto	87.5%

Trend Scenario B

The same socioeconomic assumptions used for Trend Scenario A were applied to Trend Scenario B. The transportation network was modified to expand NC 54 to 6 lanes and include HOV lanes on I-40. This network did include improvements to the collector street network in the Leigh Village vicinity. This scenario also did not include the extension of LRT through the study area.

Improvements to the collector street system provide some relief to traffic on NC 54, with daily VMT only 68% more than in 2005 and VHT only 63% more, as compared to an approximate 80% increase in Trend Scenario A. In *Table 7*, travel times and delay are only slightly improved when compared to Trend Scenario A. Average daily delay accounts for 35% of total travel time in the study area. Through traffic on NC 54 also makes up a similar percentage of traffic as seen in Trend Scenario A.

Table 6: NC 54 Traffic (2035 Trend Scenario B)

Direction	Number of Lanes	Distance (miles)	Free Flow Time (minutes)	Daily VMT	Daily VHT	Congested Daily Speed (mph)
EB	3	3	3.9	103,300	2,800	36
WB	3	3	3.9	124,300	3,900	32

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Table 7: NC 54 Travel Time and Delay (2035 Trend Scenario B)

Direction	Congested Travel Time (minutes)				Delay/Overall Travel Time			
	Daily	AM Period	PM Period	OP Period	Daily	AM Period	PM Period	OP Period
EB	4.9	4.3	6.0	4.5	21%	10%	34%	12%
WB	5.6	5.5	6.3	5.2	31%	29%	38%	25%

Note: AM period = 6:00 AM - 10:00 AM, PM period = 3:30 PM - 7:30 PM, OP period = 10:00 AM - 3:30 PM & 7:30 PM - 6:00 AM.

The mode shares for Trend Scenario B, displayed in *Table 8*, are apportioned the same as in Trend Scenario A.

Table 8: Mode Share (2035)

Mode	Trend Scenario B
Non-Motorized Trips	7.4%
Local Bus	2.0%
BRT	3.2%
LRT	0.0%
Total Transit	5.2%
Drive Alone	49.9%
2 Person Carpool	25.3%
3+ Person Carpool	12.1%
Total Auto	87.4%

Alternative Scenario 1 – LRTP Policy Scenario – Light Rail Transit Moderate Forecast

Socioeconomic assumptions for Alternative Scenario 1 are based on policies specified in the LRTP. In this scenario, the study area contains an estimated 9,764 households and 15,070 employees. As in the previous scenarios, the transportation network was modified to expand NC 54 to 6 lanes and include HOV lanes on I-40. This network also includes improvements to the collector street system as in Trend Scenario B. In Alternative Scenario 1 the LRT is built and functioning with stops at Gateway Center, Leigh Village, Meadowmont, Friday Center, and UNC-Chapel Hill. The Friday Center station includes park-and-ride access. Additionally, the local Chapel Hill BRT service is extended along the corridor to Leigh Village.

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While the roadway system is the same as Trend Scenario B, the increase in households and jobs results in an increase over Trend Scenario B in daily VMT and VHT along NC 54, shown in *Table 9* at 74% and 79% respectively when compared to 2005. As shown in *Table 10*, travel time and delay on NC 54 are comparable to Trend Scenario A. For the study area as a whole, delay only accounts for 28% of travel time; an improvement compared to the previous scenarios. Through trips, on NC 54, account for 52% of eastbound traffic and 63% of westbound traffic, slightly less than Trend Scenario A.

Table 9: NC 54 Traffic (2035 Alternative Scenario 1)

Direction	Number of Lanes	Distance (miles)	Free Flow Time (minutes)	Daily VMT	Daily VHT	Congested Daily Speed (mph)
EB	3	3	3.9	110,700	3,200	35
WB	3	3	3.9	125,700	4,200	30

Table 10: NC 54 Travel Time and Delay (2035 Alternative Scenario 1)

Direction	Congested Travel Time (minutes)				Delay/Overall Travel Time			
	Daily	AM Period	PM Period	OP Period	Daily	AM Period	PM Period	OP Period
EB	5.2	4.4	6.4	4.6	25%	12%	39%	16%
WB	6.0	5.4	7.0	5.6	35%	28%	44%	30%

Note: AM period = 6:00 AM - 10:00 AM, PM period = 3:30 PM - 7:30 PM, OP period = 10:00 AM - 3:30 PM & 7:30 PM - 6:00 AM.

Alternative Scenario 1 includes the extension of LRT service through the study area based mainly on specifications included in the LRTP. This alignment includes station locations that are also served by multiple Bus Rapid Transit (BRT) and local bus lines. While the speed and frequency of LRT are competitive when compared to other services, the inclusion of fares does not enable LRT to compete favorably with BRT which is free. The pricing policies for transit services affect travel throughout the model region and as such it was not practical to change the relative pricing of modes in the model for this study. It is anticipated that if this were done for future analysis of transit in the corridor, LRT would have a higher percentage of mode share than currently shown in *Table 11*. In addition, it is important to note that the mode share of transit is representative of the entire study area, parts of which do not provide easy walk access/egress for transit, thus localized shares may be higher.

Table 11: Mode Share (2035)

Mode	Alternative Scenario 1
Non-Motorized Trips	6.8%
Local Bus	1.6%
BRT	4.2%
LRT	1.1%
Total Transit	6.9%
Drive Alone	50.8%
2 Person Carpool	24.4%
3+ Person Carpool	11.2%
Total Auto	86.3%

Further evaluation and adjustments made to the model to enhance walk access in areas around major transit stations, such as Friday Center which will incorporate transit oriented development, indicate that mode shares of approximately 20% can be achieved in adjacent zones. Overall, with LRT and expanded Chapel Hill bus service, transit shares increase compared to Trend Scenarios A and B.

Alternative Scenario 2 – Transit Focused High-Growth

For Alternative Scenario 2, socioeconomic assumptions are based on maximizing transit oriented development along the LRT corridor. In this scenario the study area contains an estimated 16,415 households and 21,261 employees. In addition to HOV lanes on I-40 as in Alternative Scenario 1, a full interchange on I-40 was added at Farrington Road. However, NC 54 remains at 4 lanes to the east of Farrington Road. This network also includes improvements to the collector street system as in Trend Scenario B. The LRT extension is included along with expanded BRT service along NC 54 to the east of I-40 as well as BRT service along US 15-501 to I-40. While the park-and-ride at Friday Center is removed, three new park-and-ride lots are implemented at Gateway Center, Leigh Village, and east of the study area near the NC 751 interchange on I-40.

Despite having more jobs and households, with less capacity on NC 54, *Table 12* shows that daily VMT is reduced compared to Alternative Scenario 1; VHT on the other hand increases. Compared to 2005 levels, VMT is 63% higher and VHT is 117% higher. *Table 13* shows the increased travel time and delay, compared to Alternative Scenario 1, which contribute to the higher VHT on NC 54. With increased congestion, through trips on NC 54 are reduced at 45% eastbound and 53% in the westbound direction. While delay on NC 54 has increased compared to Alternative Scenario 1, delay for the study area as a whole decreases to 27% of travel time for Alternative Scenario 2.

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Table 12: NC 54 Traffic (2035 Alternative Scenario 2)

Direction	Number of Lanes	Distance (miles)	Free Flow Time (minutes)	Daily VMT	Daily VHT	Congested Daily Speed (mph)
EB	2	3	3.9	105,300	3,900	27
WB	2	3	3.9	116,000	5,100	23

Table 13: NC 54 Travel Time and Delay (2035 Alternative Scenario 2)

Direction	Congested Travel Time (minutes)				Delay/Overall Travel Time			
	Daily	AM Period	PM Period	OP Period	Daily	AM Period	PM Period	OP Period
EB	6.7	5.0	8.8	5.8	42%	22%	56%	33%
WB	7.8	6.7	9.2	7.2	50%	42%	58%	46%

Note: AM period = 6:00 AM - 10:00 AM, PM period = 3:30 PM - 7:30 PM, OP period = 10:00 AM - 3:30 PM & 7:30 PM - 6:00 AM.

While land use in Alternative Scenario 2 was configured to maximize transit ridership, *Table 14* shows a slight decrease in transit share compared to Alternative Scenario 1. In fact transit trips have increased by more than 1,000 daily trips over Alternative Scenario 1, however at the same time, non-motorized and auto trips have also increased.

Table 14: Mode Share (2035)

Mode	Alternative Scenario 2
Non-Motorized Trips	7.5%
Local Bus	1.7%
BRT	3.6%
LRT	1.1%
Total Transit	6.4%
Drive Alone	52.7%
2 Person Carpool	23.5%
3+ Person Carpool	9.9%
Total Auto	86.1%

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Preferred Scenario

Following the evaluation of the preliminary scenarios by the steering committee, the study team devised the input assumptions for the Preferred Scenario. The socioeconomic assumptions are based on a combination of elements from Alternative Scenarios 1 and 2 and yield 16,059 households and 20,782 employees in the study area. The highway network for the Preferred Scenario retains the improvements made for Alternative Scenario 1. Turn movement restrictions were added at intersections along NC 54 consistent with the "Superstreet"[5] intersection concept and to restrict movements across NC 54 at Farrington Road.

With 6 lanes on NC 54 and jobs and households comparable to Alternative Scenario 2, the VMT and VHT in *Table 15 Table 15: NC 54 Traffic (2035 Preferred Scenario)*are higher than the previous scenarios. VMT is 92% higher and VHT is 142% higher, compared to 2005 levels. However with more capacity on NC 54, travel time and delay shown in *Table 16* are slightly better than Alternative Scenario 2. Conversely, travel delay for the study area as a whole increases to 37% of total travel time. While there are more through trips on NC 54 compared to the previous scenarios, they constitute a smaller percentage of the traffic overall at 38% eastbound and 48 % westbound. In total, through trips account for 43% of VMT on NC 54.

Table 15: NC 54 Traffic (2035 Preferred Scenario)

Direction	Number of Lanes	Distance (miles)	Free Flow Time (minutes)	Daily VMT	Daily VHT	Congested Daily Speed (mph)
EB	3	3	3.9	125,100	4,400	28
WB	3	3	3.9	135,800	5,600	24

Table 16: NC 54 Travel Time and Delay (2035 Preferred Scenario)

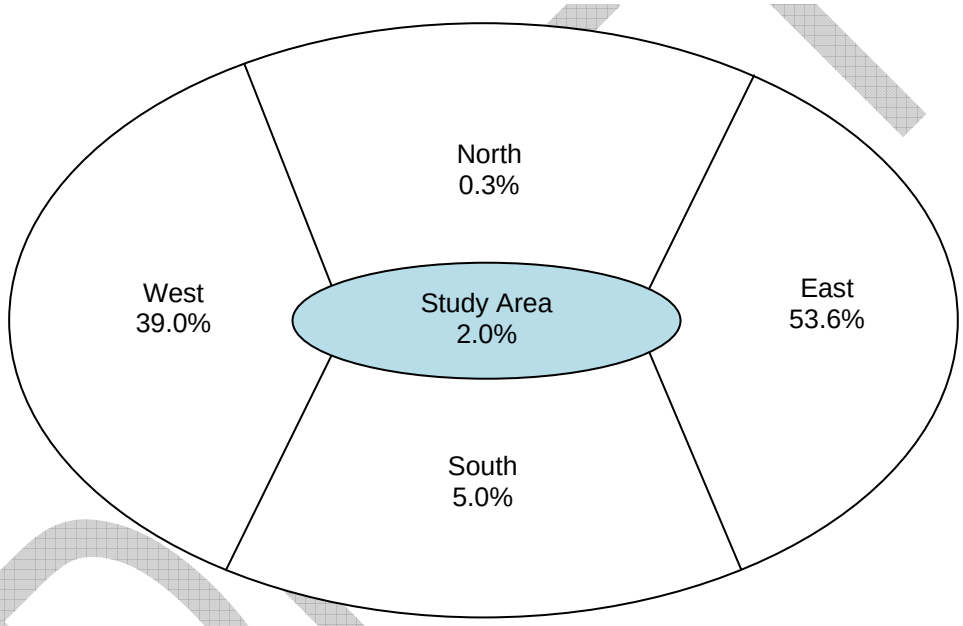
Direction	Congested Travel Time (minutes)				Delay/Overall Travel Time			
	Daily	AM Period	PM Period	OP Period	Daily	AM Period	PM Period	OP Period
EB	6.4	4.7	8.5	5.3	39%	17%	54%	27%
WB	7.4	6.1	8.6	6.8	47%	36%	55%	43%

[5] As presented at the "NC-54/I-40 Corridor - Blueprint for Mobility: Public Workshop #3", May 2010

Note: AM period = 6:00 AM - 10:00 AM, PM period = 3:30 PM - 7:30 PM, OP period = 10:00 AM - 3:30 PM & 7:30 PM - 6:00 AM.

Figure 1 below shows the regional distribution of trip origins for traffic that travels through the study area on NC 54.

Figure 1: Preferred Scenario Distribution of External Trip Origins (2035)



For the Preferred Scenario, the total number of auto and transit trips has increased compared to Alternative Scenario 2, however the relative percentage of trips for each share remain very similar as shown in

Table 17.

Table 17: Mode Share (2035)

Mode	Preferred Scenario
Non-Motorized Trips	8.0%
Local Bus	1.8%
BRT	3.3%
LRT	1.2%
Total Transit	6.3%
Drive Alone	53.3%
2 Person Carpool	23.0%
3+ Person Carpool	9.9%
Total Auto	86.2%

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Baker

NC54 – I40 Corridor Study

To: William Wuensch, Jessica Haase

From: Anthony Hofmann, William Thomas III

Subject: Response to Comments

Date: June 30, 2010

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Transit Comments

1) *Lots of discussion about mode share and why it was low. They asked if we tested the sensitivity of the fare for LRT versus free BRT and local bus. What change would result from no fare on LRT? I don't think this was done, but may be worth bouncing it off Baker to get their observations.*

   The sensitivity of LRT to fares was not evaluated as part of this study. Besides the inclusion of fares for LRT compared to free BRT, the representation of the LRT in terms of the location of stations in the study area and frequency of service is comparable to BRT. It is anticipated that if no fare were charged for LRT, the LRT would capture a larger share of transit trips along its corridor proportionate to the size of the markets being served within the Triangle Region.

2) *Need to discuss the insensitivity of the model relative to parking costs and constraints as a predictor of travel behavior. They tried to address this in the TTA model and supposedly have a new version coming out in December to address this issue.*

   Like many travel demand models which include a mode choice component, park and ride lot costs and zonal parking costs are some of the variables used to estimate the cost of using transit relative to other modes of transportation. Because mode choice is determined by a multitude of socioeconomic, performance and cost variables, parking cost alone is not a major factor in determining the usage of transit. For this study it was found that zones associated with park and ride lots along the

LRT corridor did not incur a parking cost however the zones near UNC do have an associated parking cost. In addition to parking cost, the model assigns terminal times to zones based on parking restrictions. Zones with more severe parking restrictions essentially incur a time penalty which would make driving to these zones more onerous.

3) *Did we have a summary of bus & LRT ridership at the Friday Center? Right now we just show LRT and the boardings/alightings are pathetically low. Suspicion is there is lots of bus riders not using the LRT due to cost and access.*

   Currently Baker has only produced a boardings/alightings summary for LRT ridership in the study area. We agree with your suspicion that many bus riders are not using LRT due to the cost of LRT. The model indicates that in 2005 approximately 2,600 transit trips are produced in the study area while for the preferred scenario in 2035, there are approximately 11,100 transit productions.

4) *How well does the validated model in the base year match existing bus ridership? Baker reports how the base model matches counts on 54 and I-40, but it might be useful to know how much it differs from existing ridership in the study area.*

   The documentation for the Triangle Regional Model development and validation prepared in 2006 does not provide any validation statistics for transit assignment.

5) *How much higher would mode share need to be to keep volumes below the threshold for further capacity expansion in Orange County (maintaining six lanes)?*

   In order to answer this question we would need to determine all the areas within the Triangle region which contribute to the traffic on NC 54. We could then test different values of mode share for these origins and destinations to determine the threshold for capacity expansion.

6) *Leta suggested that we look into the model documentation to address how the model handles park and ride use. Is it summarized as an auto trip or transit trip? In the study area, these really function as long auto trips and*

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short transit trips, unlike most places in the world. How are P&R trips captured/summarized in the model? A procedure was developed for the current model and this has been documented. She suggested calling the service bureau (Joe Huegy).

The Triangle Regional Model incorporates a unique process that models trips where the automobile is used for the main portion of the trip to a parking lot near the destination and then a shuttle bus is used to complete the journey. These trips are referred to as auto-intercept trips in the model. Auto-intercept trips are assigned to both the auto and transit networks for their respective portions of the trip. The model separately estimates traditional park and ride trips where transit is used for the main portion of the trip. Both the auto-intercept trips and traditional park and ride trips are included in the transit mode share portion of the mode share summary.

7) *What does TTC mean in the UNC-TTC table (slide 20)? They were unsure what destination/stop that represented for the LRT.*

TTC refers to the Triangle Town Center. UNC-TTC is the name of the LRT line used in the model.

8) *Same question for Student Union in the boardings summary. That stop isn't actually at the Union.*

The stop is coded at the intersection of Manning Dr and Ridge Rd/Skipper Bowles Dr. It was named Student Union based on its proximity to the Student Union BRT stop.

9) *For the VMT slide that 70% of the traffic is passing through the corridor today, Mickey Hopkins made a good point that if we draw a one- to two-mile radius around the study area and included that in the definition of "local" traffic, the 70% would go down dramatically. He wanted us to make the case that the improvements we're talking about are not for "outsiders;" they are for local people in the nearby vicinity.*

Expanding the definition of local traffic approximately 1 mile to the east and 2 miles to the west beyond the study area indicates that external

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traffic would account for 14% of VMT in the eastbound direction and 68% of VMT in the westbound direction, or 42% of total VMT.

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APPENDIX D

Public Involvement Summary

NC-54/I-40 Corridor Study – Public Involvement Summary

Focus Group Summary

A series of focus group meetings were held with representatives of various community and interest groups on October 12 and 13, 2009, to identify issues and concerns within the study corridor, and to guide the development of initial planning materials to be presented at a public workshop on November 18, 2009. Six groups were identified for the focus group process: commuters, businesses and developers, neighborhoods and environmental groups, policymakers, bicycle/pedestrian advocates, and transit users/advocates. The focus group session for commuters was held at the UNC Transportation Forum held on October 8, 2009, at the UNC Student Union. A table was set up in the exhibit/information area of the forum for people to provide comments on the NC 54 corridor study. During the other stakeholder meetings, separate meetings were held at the Courtyard by Marriot hotel near the UNC Friday Center on October 12 and 13. The project team also held a meeting with a select group of UNC representatives.

Focus Group	# of Attendees
Commuter	20
Business and Developers	6
Neighborhood and Environment	9
Policymakers	7
Bicycle and Pedestrian	8
Transit	9
UNC Representatives	4
Total	39

Some comments were recurring across different focus groups. For example, participants noted the intersection of NC 54 and Farrington Road as a traffic problem in several focus groups. Another common theme was the need for improved bicycle and pedestrian facilities and connections along NC 54 and improved local and regional transit service in the corridor. Opinions varied on the topic of development, with common participant comments including a desire for high-density development focused around transit stops and a focus on high-quality design and context-sensitivity. The location of the park-and-ride lots at the Friday Center was also noted as a contributing factor to congestion in the corridor in several focus groups—several participants recommended moving the park-and-ride lots closer to Interstate 40, and possibly providing direct access from the Interstate to the lots.

Workshop 1 Summary

On November 18, 2009, a public workshop was held at the Friday Center in Chapel Hill to gather input regarding the overall vision for land use and transportation in the NC 54 corridor. Over 100 people attended the first workshop; 111 signed the attendance sheet and several more arrived later in the presentation.

The session began with an informal open house that allowed meeting participants to review and discuss the information that had been gathered as part of the initial corridor scan. After a brief introduction to start the formal part of the workshop, members of the public were invited to participate in the first activity of the evening. Each person was given three post-it notes on which to write three items that represented their vision for what the NC 54 corridor should be. These were posted on large boards in the meeting room, and were organized into broad themes, which were reported back to attendees later in the workshop. The following broad themes were evident in the vision elements noted by workshop participants:

- Safety is a major concern of many participants, with a special emphasis on safety at intersections and safer access for pedestrians.
- Many participants noted a desire to improve intersections in the corridor, particularly those at Farrington Road and Interstate 40.
- There is a desire for the corridor to be multi-modal.
- There is strong interest in light rail transit in the corridor, as well as some interest in increased bus service and bus rapid transit (BRT).
- There is strong interest in improved bicycle and pedestrian accessibility in the corridor.
- Participants showed interest in decreasing environmental impacts in terms of air, water, and noise.
- Many participants noted a desire to preserve green space as a visually-pleasing gateway feature and buffer between NC 54 and surrounding neighborhoods.
- Many participants noted a desire for improved traffic flow and less congestion. Several ideas were noted for how this might be done, including: increased capacity on NC 54, greater connectivity between neighborhood streets, and the development of a new road that would connect the US 15-501 and Interstate 40 corridors south of the NC 54 corridor.
- The greatest degree of disagreement between participants was evident in the land use comments. Most comments were generally in favor of more residential development in the corridor. Several people would prefer mixed-use development, and several more are in favor of high-density development, to support transit improvements. However, another group of participants noted a preference for low-density development, similar to what is currently there.

The vision exercise was followed by a brief PowerPoint presentation on the activity completed to date and the goals for the workshop. A second participant exercise followed the presentation. In this exercise, participants were invited to work together with the other people sitting at their tables to mark up two maps. One map was marked-up with a land use and transportation scenario (or scenarios), while the other was marked-up with general comments, issues, and opportunities. At the end of the exercise, each table was provided with a sheet on which to record the main ideas discussed at the table for reporting back to the larger group.

Workshop 2 Summary

On Thursday, February 25, 2010, a second public workshop was held. The purpose of this workshop was to present information to the public on the land use and transportation scenarios that had been developed and tested for the corridor, and to collect feedback on these scenarios, including direction on the development of a preferred land use and transportation scenario. The meeting was well-attended, with about 120 participants (109 signed-in).

The workshop opened with a brief PowerPoint presentation summarizing the work that had preceded the meeting, including the results of the first public workshop (held in November 2009) and the technical work conducted by the consultant team. Workshop attendees were seated at 15 tables around the room, and each table was provided with a large blueprint-sized workbook consisting of maps, data tables, questions, and comment areas. Following the initial background presentation, each table was invited to open up its workbook and begin on the first exercise of the evening—a review of the three land use and transportation scenarios that were developed by the consultant team, based on input from the November workshop.

The three scenarios presented at the workshop consisted of a "trend" scenario and two potential policy-driven scenarios. The trend scenario (essentially 'business-as-usual') assumed primarily low-density residential growth and traditional roadway capacity-adding transportation improvements. Scenario 1 assumed a mid-range of increased development density, a limited amount of redevelopment in some areas, and the provision of light rail in the corridor, in addition to roadway widening on NC 54. Scenario 2 assumed a higher density of development in the corridor, focused around the light rail stations, significant redevelopment of several areas, including Glen Lennox and the Friday Center area, the shift of park and ride facilities to the proposed Leigh Village area, a new interchange on I-40 to directly serve the new park-and-ride facility, and no roadway widening on NC 54. The scenarios were developed to be intentionally different, so the varying aspects of each could be modeled and the performance measures of each compared and presented at the workshop.

In the workbooks at each table, a map and written description were provided for each of the three scenarios, and the participants were asked to answer a series of questions regarding these scenarios. The questions were the same for each scenario, and are listed below:

1. Does this scenario address the visioning issues from Workshop 1?
2. How is the land use and development in this scenario?
3. How is the density in this scenario?
4. Do the transportation improvements fit the scenario?
5. Is the growth assumption reasonable?
6. What did you like and dislike about the scenario?

The responses recorded at each table are presented in the full report that follows this summary.

After spending about 45 minutes going through each of the scenarios individually and recording comments, there was a brief presentation on the results of the analysis conducted on the three scenarios. Various performance measures were highlighted in this presentation, including:

- Traffic volume shift
- Mode split
- Percent delay
- Congested speed
- Jobs and households within ¼ mile of transit stops
- New development in walkable areas
- Light Rail boardings

The workshop participants were invited to fill out a large matrix with comments on the comparisons between the three scenarios, particularly with regard to the identified performance measures. The goal of this exercise was to collect information on participants' preferences with regard to each scenario, to provide guidance in the development of a preferred scenario for additional testing and refinement. The participants were also asked to clearly identify those comments that were consensus items among participants (by recording these in a different color), while still allowing individual comments to also be recorded.

Focus Group with Business and Developers

In order to test the draft Blueprint concepts in a real-world context, a follow-up focus group was held with members of the real estate, development, and design community on May 4, 2010. In addition to detailed questions on elements of the draft Blueprint plan, suggestions included requiring minimum densities and managed parking structures around transit stations, using a TIFF for financing infrastructure, concerns about a realistic mix of residential, retail and office development, and a desire for more specific details on the proposed NC-54 superstreet improvements.

Workshop 3

On Tuesday, May 11, the NC-54/I-40 Corridor Study project team held the third and final public involvement workshop and presented the preferred scenario. Attendance at the meeting showed the public continued to be interested; 71 people signed the sign-in sheet and several more joined the workshop later. The presentation including a quick summary of the background and past events of the project and then went into detail about the preferred scenario. The scenario included land use designations, transit centers, bicycle and pedestrian improvements, and a "superstreet concept" for NC-54.

The project team focused the workshop participants on various aspects of the scenario, starting with the land use, moving to the transit-oriented development phasing example, followed by transit, bicycle and pedestrian, and connectivity changes and improvements, and ending with the new "superstreet" concept. Following the conclusion of Workshop 3, participants were encouraged to complete a Comment Sheet, which included eight

statements about the land use, transit, bicycle and pedestrian, and roadway improvements presented in the preferred scenario. Participants scaled their level of agreement with the statements, which helped the project team assess the public's opinion about various elements of the preferred scenario. The workshop participants were also encouraged to submit their comments in response to the elements in the preferred scenario. The range of comments was then used to refine the Blueprint Master Plan.

NC 54 Corridor Study
Public Workshop # 1 Summary 12/16/09

On November 18, 2009, a public workshop was held at the Friday Center in Chapel Hill to gather input regarding the overall vision for land use and transportation in the NC 54 corridor.

The session began with an informal open house that allowed meeting participants to review and discuss the information that had been gathered as part of the initial corridor scan. After a brief introduction to start the formal part of the workshop, members of the public were invited to participate in the first activity of the evening—each person was given three post-it notes on which to write three items that represented their vision for what the NC 54 corridor should be. These were posted on large boards in the meeting room, and were organized into broad themes, which were reported back to attendees later in the workshop.

The following broad themes were evident in the vision elements noted by workshop participants:

- Safety is a major concern of many participants, with a special emphasis on safety at intersections and safer access for pedestrians.
- Many participants noted a desire to improve intersections in the corridor, particularly those at Farrington Road and Interstate 40.
- There is a desire for the corridor to be multi-modal.
- There is strong interest in light rail transit in the corridor, as well as some interest in increased bus service and bus rapid transit (BRT).
- There is strong interest in improved bicycle and pedestrian accessibility in the corridor.
- Participants showed interest in decreasing environmental impacts in terms of air, water, and noise.
- Many participants noted a desire to preserve green space as a visually-pleasing gateway feature and buffer between NC 54 and surrounding neighborhoods.
- Many participants noted a desire for improved traffic flow and less congestion. Several ideas were noted for how this might be done, including: increased capacity on NC 54, greater connectivity between neighborhood streets, and the development of a new road that would connect the US 15-501 and Interstate 40 corridors south of the NC 54 corridor.
- The greatest degree of disagreement between participants was evident in the land use comments. Most comments were generally in favor of more residential development in the corridor. Several people would prefer mixed-use development, and several more are in favor of high-density development, to support transit improvements. However, another group of participants noted a preference for low-density development, similar to what is currently there.

The vision exercise was followed by a brief PowerPoint presentation on the activity completed to date and the goals for the workshop. A second participant exercise followed the presentation. In this exercise, participants were invited to work together with the other people sitting at their tables to mark up two maps. One map was marked-up with a land use and transportation scenario (or scenarios), while the other was marked-up with general comments, issues, and opportunities. At the end of the exercise, each table was provided with a sheet on which to record the main ideas discussed (and largely agreed to) at each table for reporting back to the larger group. The table below shows the priority comment summary presented by each table. The section after the table shows complete comments from each table (summary presentation and comments made on maps).

Summary presentations from each table group

Table 1	• Limited amount can be accomplished by improving NC 54 • Future conditions and development outside the corridor (e.g. Carolina North) will determine the future of the corridor • Think about more I-40 interchanges • Park and rides should be away from interchange or there should be more lots
Table 2	• Bicycle/pedestrian/scooter/wheelchair lane from Farrington Road along collector lane to Meadowmont and into Chapel Hill • Safe all-purpose crossings along NC 54, from Farrington Road to 15-501 • Shopping street along "New Farrington" • "Town Center" along north side of NC 54 between existing Farrington and George King • Widen NC 54, but in balance with non-car uses • Exit to I-40 from existing north bridge • Bypass from Southern Village to 751 or Fayetteville Road
Table 3	• Green space near NC 54 • Alternate east-west routes both north and south of NC 54/I-40 • Employment near Barbee Chapel Road/NC 54; shuttle to nearby transit stops • High-density residential around Leigh Village transit stop • Maximize pedestrian and bike access and trails • Additional access to I-40 between NC 54 and 15-501 • HOV on I-40 and lanes that change directions at peak times
Table 4	• Connect neighborhoods to reduce traffic • Relocate UNC Hospital to I-40/NC 54 intersection (near Transit Station 1) • Expand and complete network of off-road greenways and bike paths from "inner" NC 54 out to I-40 • Build southern east/west connector road to funnel Chatham traffic to I-40 – somewhere south of this project's study area
Table 5	• Increase road capacity and add access points (an exit off I-40 to Ephesus Church Road, change Barbee Chapel Road to 4 lane to take traffic off NC 54 heading into Chapel Hill) • Develop east side (Farrington Road side) of NC 54 with low density • Use express bus instead of rail. When relocating stops, use existing roads – don't build new tracks • Improve pedestrian/bike safety, perhaps by adding a lane? • Development close to UNC campus should be more mixed-use
Table 6	• Separate bike lanes from traffic lanes on NC 54 and connect the bike lanes to Meadowmont and beyond • HOV/express bus lanes added to NC 54 and I-40 • Village center high-density development around transit in ¼ mile – village center low density in ½ mile • Hospital center near golf course transit stop • Town center near elementary school/15-501 and NC 54 • Park and ride garages right off I-40 • More bike racks on buses and trains and connect bike lanes to transit stops • If there is increase in road capacity, then transit will be less likely
Table 7	• Density and mixed use at transit stops • Create neighborhoods and employment centers – places rather than stops • Hospital campus at the Friday Center and Barbee Chapel Road • More East 54-type development at NC 54/15-501 Bypass • Develop Southwest Durham Parkway/George King Road

Table 8	• Create outer loop from Jack Bennett Road to I-40 • Run rail along NC 54 – rail is essential • Preserve NC 54 and Farrington's full access • Consider sound barriers for residential areas along NC 54 • Consider 4 lanes for NC 54 from I-40 to 751
Table 9	• Build out George King Road to NC 54 before projected housing build. Do not collapse Meadowmont Lane and Barbee Chapel Road intersections (as was done to Farrington Road). • Move transit station closer to Farrington Road/I-40 for ingress/egress to I-40. This makes access easier to a park and ride at I-40/NC 54. • Make transit line parallel to NC 54 to gain economies of scale in bridge system over creek and Corps land on the way to Meadowmont station • Connect bike/ped trails between the neighborhoods: the Oaks, Meadowmont, Downing Creek, Falconbridge
Table 10	• Reduce number of cars on NC 54 with a park and ride lot closer to I-40 – have commuters exit off I-40 straight into the lot. This lot can also be a commercial/housing center as well. • Need 0.6 miles of pedestrian/bicycle crossing over the wetland • NC 54 as a "complete street" from at least Meadowmont to 15-501 (unclear step down I-40 to Meadowmont) • Protect the ability of residents of north neighborhoods to get through • Fix the I-40/NC 54 intersection • Need bike/ped crossing over NC 54 near Farrington Road • Need bus stops at the rusty signs on NC 54 at Falconbridge
Table 11	• Traffic through corridor is mainly off map • Alternate route from 15-501 to I-540 and RTP besides NC 54 • Connect roads through area for locals, so they can avoid NC 54 • Light rail is in the wrong place –should go to Raleigh/RTP to relieve congestion • Funnel I-40 traffic off NC 54 using extra lanes, maybe toll roads, and cloverleaf intersection • Developers should pay for redirecting traffic, or development should be contingent on them to fund this • Some additional bike/ped paths
Table 12	• Preserve and protect Eastwood Park as a residential neighborhood. Add landscaping/walls/berms/whatever to isolate the neighborhood from NC 54. • Move the drainage ditch from between Celeste Circle and the NC 54 service road to the other side of NC 54 • Complete Southwest Durham Drive through Meadowmont Lane • Make NC 54 bike/ped friendly • Locate park and ride lot outside of the corridor (e.g. near 751 and I-40) • "Do not block intersection" sign eastbound on NC 54 at Huntingridge Road • Double-T intersection at Crossland/Huntingridge Road
Table 13	• Try to get traffic off NC 54 instead of accommodating it on NC 54 • Dense development near transit nodes: employment closer to the university, residential further out • Take Carolina North into consideration – make sure it is rail/transit accessible • No new interchange at Farrington Road – maintain low density residential there. Keep in mind that neighborhood is environmentally sensitive, historic, area where change is not anticipated (LDR), Creekside School, interchanges are points of congestion, transit node moved to south • Continuous bike lanes along NC 54 and a north-south connection • Usable green spaces by Leigh Farm Park, with some noise abatement • Accommodate Chatham County development and commuter traffic

Workshop 1 map exercise- complete comments

Complete comments from each table – on both maps, along with priority summaries as presented at end of workshop.

A record of post-workshop comments received is included after the workshop comments.

Table #1 Main Points

- Limited amount can be accomplished by improving NC-54.
- Future conditions and development outside the corridor (e.g., Carolina North) will determine the future of the corridor.
- Think about more I-40 interchanges.
- Park and rides should be away from interchange or there should be more lots.

Issues and Opportunities Map

- Full cloverleaf at north end of I-40
- Moratorium
- Park and ride to east of I-40
- First responder input.
- Park and ride at I-40 and NC-54 intersection.
- Get ride of I-40/NC-54 interchange and start over – use a full cloverleaf design.
- High density development along SW Durham Drive proposed road.
- Non-polluting electrical rail.
- Need a rail stop near the Meadowmont side of the Phase II planned rail corridor.
- No thru-traffic along SW Durham Drive proposed road.
- Bus stop at Rashkis.
- Very high density development at Flemington Road in Glen Lennox.
- Redevelop Glen Lennox.
- Any new development should not add air pollution or make pollution worse.
- How do you get to Carolina North if you live in the study area?

Workshop Basemap

- Rail design has a flaw – no direct to RTP.
- Southern end of the proposed Arterial (S Durham Drive) (off of George King Road) is marked through as "No Way" (aka "not happening).
- Corridor is a bridge to other growth areas we can't control.
- No build to 1,000 year flood plain.
- 3rd interchange – Southern Parkway and LA I-540 at the southern end of I-40.
- Park and Ride lot along Farrington (at NC-54).
- Park and Ride lot at current Palladium development.
- At Transit Station 1, inner circle is VRH.

Table #2 Main Points

- Bike/ped/scooter/wheelchair lane: from Farrington Road along Collector Lane to Meadowmont into Chapel Hill.
- Safe all-purpose crossings along NC-54, Farrington Road to 15-501.
- Shopping street along "New Farrington."
- "Town Center" along north side of NC-54 between existing Farrington and George King.
- Widen NC-54, but in balance with non-car uses.
- Exit to I-40 from existing north bridge.

- Bypass from Southern Village to 751 on Fayetteville Road.

Issues and Opportunities Map

- New exit ramp to I-40 from Farrington Road.
- Widen NC-54 (east of I-40) from two lanes.
- Widen NC-54, just off of I-40 exit. Need to double.
- The existing NC-54 bridge over I-40 should be widened.
- On southern end of study area, need a new east-west connector between 15-501 and I-40 and between I-40 and 751. Barbee Chapel Road can be improved to divert traffic from NC-54 to 751.
- **fix map: NC-54 at Barbee Chapel is prone to accidents and should be included in the "High Crash Areas" circle.**
- Transit Station 1 is a potential center of new employment and should be a top priority.

Workshop Basemap

- The collector plan is not considered in the Pedestrian Facilities Map. We've identified where there should be bike/ped lanes. Bike/ped along Farrington Road and NC-54. The bike/ped lane along Farrington Road should be safe enough for elementary students.
- Need a bike/ped bridge across I-40 to Farrington Road.
- At Transit Station 1, consider having a bicycle parking facility.
- Along NC-54, provide wheelchair access to cross over NC-54 in several places.
- Make a bike path on eastern end of NC-54 and connect it with the existing trail.
- At Celeste Circle neighborhood, opposing views: commercial vs. residential with local business/daycare development.
- Paved trail like American Tobacco Trail that connects to ATT.
- Pedestrian bridge across NC-54 near Barbee Chapel Road.
- At NC-54 and 15-501 intersection, improve the bike/ped crossing accessibility.

Table #3 Main Points

- Green space near NC-54.
- Alternate east-west routes both north and south of NC-54/I-40.
- Employment near Barbee Chapel Road/NC-54 with shuttle to nearby transit stops.
- High density residential around Leigh Village transit stop.
- Maximize pedestrian and bike access and trails.
- Additional access to I-40 between NC-54 and 15-501.
- HOV on I-40 and lanes that change directions at peak times.

Issues and Opportunities Map

- New interchange at I-40 and Farrington Road.
- HOV lanes on I-40.
- No walled developments next to school (Creekside).
- Bigger green buffers along Farrington Road – Retired don't need to walk to school.
- Green buffers along NC-54.
- Shuttle between Finely Forest and Downing Creek neighborhoods.
- Do not widen southern end of Farrington Road and Barbee Chapel road.
- Environmentally sound development in the grey place opportunities.
- Trails in the floodplains.

Workshop Basemap

- Transit is not a silver bullet, lots of solutions needed.
- Partial interchange at I-40 and Ephesus Church Road intersection.
- Widen NC-54 to same width all the way across.

- Keep green buffer along NC-54.
- Keep the Friday Center park and ride.
- Add trails in the floodplain to connect Downing Creek and Falconbridge neighborhoods.
- Alternate more-southern route from Chatham to RTP.

Table #4 Main Points

- Connect neighborhoods to reduce traffic.
- Relocate UNC Hospital to I-40/NC-54 intersection (near Transit Station 1).
- Expand and complete network of off-road greenways and bike paths from "inner" NC-54 out to I-40.
- Build southern east/west connector road to funnel Chatham traffic to I-40 – somewhere south of this project's study area.

Issues and Opportunities Map

- High density, mixed-use development on either side of 15-501 at Willow Drive (near Estes and Ephesus Church Road).
- Need several transit bus stops along NC-54, from I-40 to 15-501.
- Redevelop the Quadrangle complex to a park and ride garage.
- Pedestrian/Bike Bridge or sidewalk across wetlands along NC-54 east of I-40.
- Bike/Ped bath along outside of Phase Opportunities 2, 3, and 4; connecting to Barbee Chapel Road and NC-54.
- New Road from 15-501/Mason Farm down south (as an East-West corridor) that connects 15-501 to I-40.
- In Phase Opportunity 1, HC with VCH and VCL development on the edges and a park on the southwest end. Move hospital from campus.
- In Phase Opportunity 2, have a park on the east end and HC on the southern end bordering NC-54 and Barbee Chapel Road.

Workshop Basemap

- At Transit Station 1, inner circle is UNC Hospital; in outer circle, the development north of Celeste Circle neighborhood is VCH.
- At Transit Station 2, inner circle is VCH, outer circle has one area of HC and one area at the Barbee Chapel and NC-54 intersection is VCL.
- Along NC-54, time lights both ways.
- At Burning Tree/Finley Golf Course and NC-54 and at Hamilton and NC-54, have a 4-way stop intersection, with "no right turn on red" to facilitate heave bike/ped traffic.
- Close Farrington Road.
- Make the bus stop at Celeste Circle a "real" place to wait for the bus.
- Local bus along NC-54.
- New tunnel below NC-54 east of Barbee Chapel.
- Roundabout at NC-54 and Barbee Chapel intersection.

Table #5 Main Points

- Increase road Capacity and add access points (an exit off I-40 to Ephesus Church Road, Change Barbee Chapel Road to 4 lanes to take traffic off NC-54 heading into Chapel Hill).
- Develop east side (Farrington Road side) of NC-54 with low density.
- Use express bus instead of rail. When relocating stops, use existing roads, don't build new tracks.
- Improve pedestrian/bike safety, perhaps by adding a lane?

- Development close to UNC campus should be more mixed-use.

Issues and Opportunities

- The traffic on Farrington is due to huge development in Chatham County. They must be linked to I-40 to cut down on traffic.
- Additional interchange off I-40 at Farrington Road intersection.
- Co-locate shopping, dining, and park and ride north of the I-40 exit (exit 273B).
- Need 2 left turn lanes at NC-54 and Farrington.
- Extra merge lane off I-40 onto NC-54.
- Remove median on NC-54.
- Synchronized stop lights on NC-54.
- Reversible lane ability.
- Do not expand Meadowmont lane.
- NC-54 is 6 lanes at Meadowmont. Maybe make it 6 lanes from I-40 and use "lane change" arrows to help steady flow of traffic from UNC workers and on UNC game days. Incorporate bike/ped lanes.
- No rail. It would bring more people in and make NC-54 more congested. We do not need more density and ruined greenways with a train. Aesthetically unpleasing.
- Over the road pedestrian bride across NC-54 at Hamilton. School children and Glenwood shoppers cross this 6-lane road and it is very dangerous.
- To access 15-501, additional north/south exit lanes.

Workshop Basemap

- BRT along NC-54
- Bus station and park and ride lot on the east side of the I-40 exit ramp, to divert traffic away from Farrington side of I-40.
- Transit station 1 is considered not possible as an express bus stop.
- There should be a connection from Chatham County to I-40.
- Solar housing is good at the acreage near Stagecoach and Farrington.
- Need a stoplight at Barbee Chapel and Stagecoach.
- Pedestrian bridge across NC-54 near Glen Lennox.
- At Transit Station 2, expand current VCH. This stop is a possible priority bus stop.

Table #6 Main Points

- Separate bike lanes from traffic lanes on NC-54 and connect the bike lanes to Meadowmont and beyond.
- HOV/Express bus lanes added to NC-54 and I-40.
- Village Center High Density around Transit in ¼ mile – Village Center Low Density in ½ mile
- Hospital Center near golf course transit stop.
- Town Center near elementary school/15-501 and NC-54.
- Park and ride garages right off I-40.
- More bike racks on buses and trains and connect bike lanes to transit stops.
- If increase road capacity, then transit will be less likely.

Issues and Opportunities Map

- Bike lane along NC-54, 751, Barbee Chapel (to Southpoint), through Meadowmont, up to Easttowne.
- Rapid bus lanes/Commuter bus lanes along NC-54 and to Cary
- Add HOV lanes on NC-54, each way.

Workshop Basemap

- More bike capacity on bus and rail.
- Better bus connection from Chapel Hill transit to Durham, Cary, and Raleigh.
- Bike lane along Farrington Road (south of I-540 and NC-54) to Amberly.
- Bus route along Farrington Road (south of I-540 and NC-54) to Amberly.
- Bike lanes down NC-54.
- Connected bike route along Barbee Chapel, through Meadowmont, to Ephesus Church Road and Easttowne.
- Bus lanes and HOV lanes, inbound and outbound, a
- HOV lanes and priority bus lanes on I-40.
- Along NC-54, traffic too heavy for WOL, need separated bike lane.
- No interchange at the Farrington Road and I-40 intersection (north of NC-54).
- Park and Ride lot at Ephesus Church Road and Farrington Road, with a dedicated bus route taking commuters down George King Road.
- Park and Ride lot at Celeste Circle neighborhood.
- Neighborhood at the Barbee Chapel and NC-54 intersection is marked VRL.
- Glen Lennox neighborhood is marked TC.
- At Transit Station 1, inner circle is VCH, outer circle is VCL.
- At Transit Station 2, inner circle is HC.
- At Transit Station 3, inner circle is VCH.

Table #7 Main Points

- Density and mixed used at transit stops.
- Create neighborhoods and employment centers – places rather than stops.
- Hospital Campus at the Friday Center and Barbee Chapel Road.
- More East 54-type development at NC-54/15-501 Bypass.
- Develop SW Durham Parkway/George King Rd.

Issues and Opportunities Map

- Extend rail down I-40 to Triangle Metro Center.

Workshop Basemap

No comments on map, everything was colored and labeled.

Table #8 Main Points

- Create outerloop from Jack Bennett Road to I-40.
- Run rail along NC-54 – rail is essential.
- Preserve NC-54 and Farrington's full access.
- Consider sound barriers for residential areas along NC-54.
- Consider 4 lanes for NC-54 from I-40 to 751.

Issues and Opportunities

- Need 751 to 15-501 loop north and south of NC-54. This outer loop will take congestion off of I-40, NC-54, and 15-501. The more cars coming from Pittsboro and Raleigh that use the outer loop, the less on NC-54 and 15-501.
- Preserve full access at I-40/NC-54 intersection. Do other things to address congestion.
- Support transit, but consider transit impacts on NC-54.
- Near Transit Stations 2 and 3, have sound barriers for residential areas?

Workshop Basemap

- Transit line should follow NC-54 and I-40, not go through residential property that has already been established.
- School should preclude congested transit.

Table #9 Main Points

- Build out George King Road to NC-54 before projected housing build. Do not collapse Meadowmont Lane and Barbee Chapel Road intersections (as was done to Farrington Road).
- Move transit station closer to Farrington Road/I-40 for ingress/egress to I-40. This makes access easier to a park and ride at I-40/NC-54.
- Make transit line parallel to NC-54 to gain economies of scale, in bridge system over creek and Corps land on the way to Meadowmont station.
- Connect bike/ped trails between the neighborhoods: the Oaks/Meadowmont/Downing Creek/Falconbridge.

Issues and Opportunities Map

- Bus shelter needed on both sides of NC-54 near Celeste Circle neighborhood.
- Need bike/ped path connecting Downing Creek and Falconbridge neighborhoods and eventually connect bike path along NC-54 across I-40 to the American Tobacco Trail. This path would easily and safely create a whole bike network. Existing bike/ped tunnel allows connect for all of Falconbridge and Meadowmont if connection across wetlands is fixed.
- Planned rail corridor is in a terrible place. Should renegotiate with core folks to put rail easement along NC-54. Reasons are as stands: 1. economy of scale of building over creek, 2. access over creek as NC-54 develops, and 3. closer to NC-54 for easier park and ride access. System should come down Farrington Road to NC-54.
- Preserve Glen Lennox.

Table #10 Main Points

- Reduce number of cars on NC-54 with a park and ride lot closer to I-40 – have commuters exit off I-40 straight into the lot. This lot can also be a commercial/housing center as well.
- Need 0.6 miles of pedestrian/bike crossing over the wetland.
- NC-54 as a "complete street" from at least Meadowmont to 15-501 (unclear step down I-40 to Medowmont).
- Protect the ability of residents of north neighborhoods to get through.
- Fix the I-40/NC-54 intersection.
- Need bike/ped crossing over NC-54 near Farrington Road.
- Need bus stops at the rusty signs on NC-54 at Falconbridge.

Issues and Opportunities Map

- At Creekside School, traffic safety capacity.
- Disagree on: staging transit vs. no public transit and pay for improvements vs. no combined governments (Durham and Chapel Hill).
- Water problem in the floodplain area north of NC-54.

Workshop Basemap

- Crosswalk-bridge across NC-54 by Celeste Circle neighborhood and by Glen Lennox.
- Bike/ped path alongside NC-54.
- Keep NC-54 light.

- Boulevard quality bridge across NC-54 by Glen Lennox – wide sidewalks or "Long Bridge" (shops along overpass).

Table #11 Main Points

- Traffic through corridor is mainly off map.
- Alternate route from 15-501 to I-540 and RTP besides NC-54.
- Connect roads through area for locals, so they can avoid NC-54.
- Light rail is in the wrong place. It should go to Raleigh/RTP to relieve congestion.
- Funnel I-40 traffic off NC-54 using extra lanes, maybe toll roads, and clover leaf intersection.
- Developers should pay for redirecting traffic, or development should be contingent on them to fund this.
- Some additional bike/ped paths.

Issues and Opportunities

- Study should be expanding to Garrett Road/751.
- Need safe bike/ped crossing on I-40.
- Cloverleaf intersection at I-40 and NC-54.
- Farrington Road and NC-54 must be a grade-separated interchange.
- Park and ride lot off I-40 near Farrington.
- Express frontage roads to/from I-40.
- Bikes and sidewalks along NC-54.
- Grade separated bike/ped paths across NC-54 (bridge or tunnel) at various places.
- Reduce congestion by route to RTP to I-540
- Make the connection between Farrington Road and Barbee Chapel Road.
- Road improvement on Stagecoach Road and Barbee Chapel Road.

Workshop Basemap

- No left turn lane on I-40 exit ramp.
- Jordan Lake/Colvard Farms needs to pay for NC-54 improvements to mitigate their traffic impact.
- Need traffic signal at Farrington and Stagecoach and Farrington and Barbee Chapel and Farrington Mill Road.
- Light rail wrong route to RTP and Raleigh. Relieve traffic.
- Take watershed into development plan.
- Development should pay for any road expansion.
- No further development until alternate roads/paths are done. Then, have low density with green space.

Table #12 Main Points

- Preserve and protect Eastwood Park as a residential neighborhood. Add landscaping/walls/berms/whatever to isolate the neighborhood from NC-54.
- Move the drainage ditch from between Celeste Circle and the NC-54 service road to the other side of NC-54.
- Complete SW Durham Drive through Meadowmont Lane.
- Make NC-54 bike/ped friendly.
- Locate park and ride lot outside of the corridor (e.g., near 751 and I-40).
- "Do not block intersection" sign eastbound on NC-54 at Huntingridge Road.
- Double-T intersection at Crossland/Huntingridge Road.

Issues and Opportunities Map

- Move Friday Center park and ride lot somewhere else, for example, on 751 near I-40.
- Need more frequent TTA buses, especially around lunch.
- Rail stations are good.
- Add a "Do Not Block Intersection" sign at the exit-bound lane of Huntingridge Road and NC-54.

Workshop Basemap

- The tunnel under NC-54 is great. Need more ways like that to cross NC-54.
- Keep Celeste Circle neighborhood residential.
- At Transit Station 1, mixed use is ok in inner circle, mostly near I-40 and the transit center.
- Put in I-40/Farrington Road interchange and have a UNC park and ride.
- Do make the SW Durham Drive connection.
- Need to make NC-54 pedestrian/bike friendly.
- Protect Eastwood Park. Between the service road and NC-54, put vegetation/walls/earth beams to isolate Eastwood Park from NC-54. Close access between light at Huntingridge and the service road, making a T-intersection. The collector street plan calls for a nearby intersection of Crossland Drive with NC-54. This intersection will forms a "Double-T" intersection which, with lights timed appropriately, functions as a single light.
- The Farrington Mall parking lot drainage goes under NC-54 to a ditch between Celeste Circle and NC-54 service road. The volume of running water and mosquitoes are dangerous. It is a failed engineering project. A modern storm drainage system is needed, preferably on the Farrington Road side of NC-54.
- Need a bus shelter at the bus stop in front of Celeste Circle.
- Need an "outer loop" to connect 15-501 with I-40.

Table #13 Main Points

- Try to get traffic off NC-54 instead of accommodating it on NC-54.
- Dense development near transit nodes: employment closer to University, residential further out.
- Take Carolina North into consideration – make sure it is rail/transit accessible.
- No new interchange at Farrington Road – maintain low density residential there. Keep in mind that neighborhood is environmentally sensitive, historic, area where change is not anticipated (LDR), Creekside School, interchanges are points of congestion, transit node moved to south.
- Continuous bike lanes along NC-54 and a north-south connection.
- Usable green spaces by Leigh Farm Park, with some noise abatement.
- Accommodate Chatham County development and commuter traffic.

Issues and Opportunities

- Re-route I-40 between Raleigh and Greensboro, bypassing the Triangle to the south.
- No interchange at I-40 and Farrington Road.
- Noise abatement wall for Leigh Farm and residents.
- Along NC-54, bike lane/green way.
- At I-40/NC-54 interchange, improve exit flow.
- Outside of Transit Station 1, maintain low-density.
- Along NC-54, need safe pedestrian crossing facilities.
- Pave George King Road and make it a viable artery.
- Need a southern connection between 15-501 and 751 to ease pressure off NC-54.
- Take into account Chatham County development.

Workshop Basemap

- Along NC-54, bike lane.
- White parcels of areas of potential change east of I-40 and way north of NC-54 will not change because it is owned by Durham County, not town of Chapel Hill.
- Along Farrington Road, maintain low density residential.
- Noise abatement wall for Leigh Farm.
- Have some sort of north-south bike connection along Farrington Road, to Meadowmont.

Post-workshop comments

A record of post-workshop comments received follows, largely from e-mail but some mailed-in.

The majority were additional follow-up comments from focus group Invitees and public workshop participants, although several were from people who were nota able o attend the workshop.

Traffic Issues

I-40/NC-54/Farrington Road intersection:

- The left hand turn problem from westbound NC-54 into southbound Farrington Road remains, in my mind, the most difficult situation to resolve. Diverting some of that traffic elsewhere seems to be an absolute imperative. Some traffic coming off of I-40 cannot find a space in the left hand lane and is coming down to the traffic light at Huntingridge Road and making a 180-degree turn to get back to Farrington Road.
- Difficulty with left hand turn onto Falconbridge Road from westbound NC-54 during rush hours (eastbound traffic is backed up and blocks the lane despite DO NOT BLOCK INTERSECTION signs.)
- Much concern about possible increase in cut through traffic onto Huntingridge Road due to backup problems on NC-54. At present this mostly occurs during rush hours but can occur at other times due to congestion on NC-54.
- What do the I-40 / NC-751, I-40 / 15-501, I-40 / NC-86 interchanges look like during rush times? Could there be ways to make these interchanges more appealing that would take pressure off the NC-54 situation? One thing that differentiates the NC-54 interchange from I-40 west bound when compared to 751, 15-501, and 86 is that 54 is the only without a traffic light bounded left turn at the end of the exit ramp. Comparing 54 to 15-501, during non-traffic times, 54 seems like a faster drive to UNC than 15-501 when starting from their respective exit ramps. Obviously, the most important question is, where is everyone taking their cars such that slow downs and unsafe situations are being caused by back-ups. For example, if many of them are going to the Friday Center to park and ride to UNC then working with the 751 route (via Stage Coach and Barbee Chapel) to the Friday Center would likely be more helpful than others.
- Adding lanes and an interchange at Farrington Rd. would only funnel more traffic to the already abysmally dysfunctional intersection of Farrington Rd., NC 54 and I-40. Interchanges CREATE slowdowns and congestion; they do not relieve them. Open stretches of interstate highway allow for free flowing traffic; interchanges gum up the works. There is a logical reason why federal guidelines stipulate that interchanges should be 2 miles apart; that principle is violated here. Interchanges also bring tremendous pressure for dense, intense land use changes...simply not appropriate along this low-density residential portion of Farrington Rd. That decision was affirmed by the removal of a transit stop from the area (near Creekside School).
- Creekside School would be negatively impacted by the congestion accompanying an interchange.
- Pressure for an interchange is coming from Chapel Hill; Durham needs to say no to the continual push of development and congestion out of Chapel Hill and into SW Durham.

That process began by pushing Chapel Hill's outer belt loop, the Laurel Hill Parkway, from Sage Rd. to Pope Rd. to Farrington Rd. in an ever eastward progression. The name is now Southwest Durham Drive!

- While at first blush, an I-40 interchange at Farrington Road might seem like a good idea, upon appropriate examination, the negative consequences of such an interchange will again be realized. Last year such a proposal was put before the Transportation Advisory Committee. It was removed from **ANY** further consideration. An interchange at I-40 and Farrington Road would put our children at risk, threaten the historic Leigh Farm and environmentally sensitive Water Fowl Federal Lands, and violate the graves of those laid to rest at Markham Memorial Gardens cemetery.
- Specific land uses in the vicinity of Farrington and I-40 include the Prescott Place, Glenview Park and Trenton neighborhoods, the Markham Memorial Gardens cemetery and Leigh Farm Park, 86 acres of open space protected over the last 20 years by a public private partnership including the Jr. League of Durham and Orange Counties, Triangle Land Conservancy, the State Dept. of Cultural and Natural Resources, DUTAG, DOST, Historic Preservation of Durham, Durham Parks and Rec, SEEDS and Piedmont Wildlife. There is literally no room for an interchange without destroying something of great value (homes, graves, park land).
- Farrington Rd. is a low-density residential greenbelt with 5 sites on the Durham Inventory of Cultural and Natural Resources. Leigh Farm Park in particular is a gem of open space and anchor to the New Hope Creek Corridor trail system. It should be protected, not drowned in asphalt and congestion.
- As the director of Piedmont Wildlife Center, a nonprofit that actively uses Leigh Farm Park to teach children and adults the importance of protecting wildlife and our natural resources, I believe that Leigh Farm Park and the surrounding New Hope Creek watershed would be severely damaged by any increase in traffic brought on by an interchange at Farrington Road and I-40. The wetlands in Leigh Farm Park are already being damaged by runoff from I-40 and any additional impact could kill the wildlife and plants that protect our watershed. Please fight to protect the future of our environment!
- I live in the Trenton neighborhood. Several residents have been very vocal in their opposition to an interchange at I-40 and Farrington Road. I am not one of them. I would welcome easy access to I-40, and the ability to avoid the very busy and sometimes dangerous intersection at Farrington and 54.

Increased Congestion:

- Concerns about increased congestion from possible UNC medical facilities going into two buildings recently vacated on NW corner of NC-54 and Farrington Road. Egress from that site onto Farrington Road very difficult because entrance is only 30 to 40 feet from NC-54.

Other Traffic Issues:

- Is there a plan for a crossover at Hwy 54/Hamilton due to 54 East/Walking Traffic/schools?
- George King Road is re-routed to make a T-junction with NC54 via Crossland Drive, which is in our neighborhood. The Leigh Village map proposes to seal off and thus prevent access of our neighborhood to NC54 via the light at Huntingridge Road which leads from NC54 into the Falconbridge neighborhood. Thus, remaining would be a “double T” arrangement of George King and Huntingridge Roads which the developer thought were close enough so that the signals would be timed so that they functioned as a single light. Importantly also,

the Service Road and Celeste Circle access to NC54 would be via Leigh Village. To exit our neighborhood we would have to drive into Leigh Village and circle around to get to NC54. The neighbors that I have spoken with like this plan. It would make commercial development on the Service Road and Celeste Circle unattractive since access to NC54 would be inconvenient and there would be more plantings between the Service Road and NC54 which would make our neighborhood less visible.

- George King Rd. should be paved and the Meadowmont Connector built as planned.
- A Southern connector joining 15-501 and 751 should be investigated as an alternative route to help relieve congestion on NC 54.
- Another concept to investigate: Existing I-40 could become business I-40 (as with I-85 in Greensboro and I-40 in Winston-Salem) with a new I-40 bypassing the Triangle to the south.

Alternative Transportation

- Funding for transit may never materialize; exploding densities (based on the presupposition of transit corridors) could be a serious mistake, destroying the very character that makes North Carolina more attractive than New Jersey.
- The issue of a lack of good public transportation along the corridor was raised. Whether our residents in significant numbers would use it is questionable.
- Epcon senior citizen neighborhood is in full-swing (wrt construction), and these residents should have public transport as well. Stats show that with increase in age (past retirement) comes an increase in automobile accident incidents, and many older people no longer have a valid driver's license.

Public Bus Stops:

- 3 separate comments about getting a Durham public bus stop within walking distance of Creekside Elementary, as well as the Epcon Senior Citizen Neighborhood:

    1. Creekside Elementary currently is the only school (of which we are aware) that has no public bus stop within walking distance. Creekside is a beautifully diverse school, in terms of ethnicity and socio-economics, but this comes with its challenges. I have been involved in the School Improvement Plan, and the great disparity between low income students and mid-high income students was a subject of most serious concern. We have a tremendous number of bus riders, a large number of whose parents do not have personal transportation. This hinders their involvement and our ability to provide services/workshops/etc. for them at Creekside. At the very least, these low income families need reliable transportation outside of school bus hours in order to participate fully in the programs available to them at the school. Lack of public transport was also seen as an impediment to the involvement of 'Families and Community,' which is a goal upon which Creekside and all schools are judged. The fact that public bus transportation does not extend to Creekside was seen as the biggest problem with engaging the community and the parents.
    2. Any after-school (or before-school activities) must necessarily involve private transportation -- adding to traffic in this area. The lack of public transportation serving our school’s area limits family and community involvement at our school. The bus stop would enable parents to come to school for parent-teacher

conferences, math/literacy nights, family socials, PTA meetings, movie nights, etc.

3. I have contacted the Durham school board about this, and have been told they would support a public bus stop here. However, the city has not been as encouraging. It would help if you all recommended to the city that a public bus stop be put in this area to facilitate school transportation (particularly extracurricular transportation), and possible connection to public transport to Chapel Hill from Durham. If you could also involve the Durham Public School Board, that would help too!

Strong interest in biking, but safety is a concern:

- I live in Southern Village on the southern part of Chapel Hill and work in RTP. I love to cycle but have to extend my cycling path to commute to work via Stage Couch Rd, Massey Chapel, etc. as the 54 corridor is not negotiable safely. That extends my bicycle commute to ~75min one way which would likely be ~55min if I could safely go straight on 54.
- In my opinion an express bus or rail system to RTP as a center of gravity for employment would already reduce contention on this corridor significantly.
- Though I strongly lobby for off-road bike paths the impact to contention during rush hour will likely be limited. Other alternatives will need to consider alternative corridors going in parallel. Further widening of the current road falls short of increasing capacity as the intersections are and stay the bottleneck. Even with 4 lanes on 54 most people will have to turn right onto I-40 and thus funnel into one lane which will continue to gate the capacity. If higher vehicle capacity along this direction is required it will require alternative corridors connecting to I-40 further south/east in parallel to 54. Hopefully that can be avoided by improvement in public transportation and connections of bike and pedestrian facilities to enable people to get to bus and rail stops.
- I am concerned about 54 as one of the few routes between Chapel Hill and Durham which is extremely unfriendly to cyclists. The narrow section through the wetland has no shoulder and steep banks on either side. Riders have been pushed off the road and down the embankment through the blackberry bushes. One concept program that has the right idea is the complete streets program. The link is: http://www.completestreets.org/resources/new-pedestrian-safety-ranking-calls-for-complete-streets/.
- From my perspective, equal safe access for all modes of travel is a civil rights issue, just like the Americans with Disabilities act requires public ways and buildings be handicapped accessible, shopping centers, post offices, banks, government centers, churches, etc all need to be accessible by walking or bike, too. Pedestrians and cyclists are essentially fenced in by uncrossable highways. Whole most peds and cyclists travel locally, some do want to go to Durham. There are not any comfortable ways of getting there. While crossing Estes Drive during dusk, inside a crosswalk and with a crossing light, this commenter was almost hit by a car whose driver did not see her – and this has happened several times. Each time, she reports to the town of Chapel Hill that something needs to be done to improve safety. I have written to the town traffic people suggesting more light at this intersection, to paint the crosswalks solid white so a body silhouette is visible to drivers at dusk, and that there be rumple strips place a few seconds on approach to any crosswalk to alert the driver physically that a crosswalk is ahead.

Development Issues

- Eastwood Park neighborhood would like to avoid commercial development in their neighborhood and protect it from the hostile environment of NC-54 through the use of landscaping and vegetative/earth barriers. The proposed Leigh Village development shows a good way to incorporate commercial development while leaving the Eastwood Park neighborhood residential.
- To blame the UNC park and ride lots for the traffic on Highway 54 ignores the development along the corridor, the fact that housing in Chapel Hill has become less and less available for people who work in the Town and therefore have to travel to work, and the fact that more businesses are there now than in the past. It is unfortunate that the focus group organizers did not invite UNC representatives to come to the meetings with, for example developers, so that this could be clarified. The UNC park and ride lots are just one of many reasons for the high traffic counts on the highway, and on a given day make up a small percentage of the total traffic on the roadway.
- The development of Carolina North must be taken into account when studying future traffic needs in this area.

Other Issues

- Farrington Rd. is a low-density residential greenbelt with 5 sites on the Durham Inventory of Cultural and Natural Resources. Leigh Farm Park in particular is a gem of open space and anchor to the New Hope Creek Corridor trail system. Preservation, not more pavement, is our watchword.
- When a small turn in lane was added for eastbound traffic to turn into Huntingridge Road they made it very sharp so they did not have to move existing storm drain. This is a problem for many of our residents.
- Speed limit should be enforced. On the 54 corridor described, it goes through a wetland, so any expansion of the road immediately presents water displacement issues for the surrounding buildings. For this reason, the only way to add is to build a long bridge. If you do build a bike-ped path, make it far enough away so the traffic noise doesn't make the cyclists deaf. I am convinced that my husband's hearing issues are from years of traffic noise as he ran or biked on the street. I measured the traffic noise beside 15-501 to be over 80 dB with my sound meter.
- I am confused and concerned that all of the scheduled workshops are in Orange Co. and the majority of the proposed activity and destruction is in Durham Co. for the benefit of the people that live or commute to Orange Co.. Why are Durham residents being excluded or at least inconvenienced by you holding all workshops in Chapel Hill/Orange Co.? I also understand Carrboro has declared hands off and they will not be part of a "regional solution" to problems created by their continued lack of infrastructure improvements.

NC-54/I-40 Corridor Study: Public Workshop 2 Comments 3/05/10

Executive Summary

On Thursday, February 25, 2010, a second public workshop was held for the NC 54/Interstate 40 Corridor Study. The purpose of this workshop was to present information to the public on the land use and transportation scenarios that had been developed and tested for the corridor, and to collect feedback on these scenarios, including direction on the development of a preferred land use and transportation scenario. The meeting was well-attended, with about 120 participants (109 signed-in).

The workshop opened with a brief PowerPoint presentation summarizing the work that had preceded the meeting, including the results of the first public workshop (held in November 2009) and the technical work conducted by the consultant team. Workshop attendees were seated at 15 tables around the room, and each table was provided with a large blueprint-sized workbook consisting of maps, data tables, questions, and comment areas. Following the initial background presentation, each table was invited to open up its workbook and begin on the first exercise of the evening—a review of the three land use and transportation scenarios that were developed by the consultant team, based on input from the November workshop.

The three scenarios presented at the workshop consisted of a "trend" scenario and two potential policy-driven scenarios. The trend scenario (essentially 'business-as-usual') assumed primarily low-density residential growth and traditional roadway capacity-adding transportation improvements. Scenario 1 assumed a mid-range of increased development density, a limited amount of redevelopment in some areas, and the provision of light rail in the corridor, in addition to roadway widening on NC 54. Scenario 2 assumed a higher density of development in the corridor, focused around the light rail stations, significant redevelopment of several areas, including Glen Lennox and the Friday Center area, the shift of park and ride facilities to the proposed Leigh Village area, a new interchange on I-40 to directly serve the new park-and-ride facility, and no roadway widening on NC 54. The scenarios were developed to be intentionally different, so the varying aspects of each could be modeled and the performance measures of each compared and presented at the workshop.

In the workbooks at each table, a map and written description were provided for each of the three scenarios, and the participants were asked to answer a series of questions regarding these scenarios. The questions were the same for each scenario, and are listed below:

1. Does this scenario address the visioning issues from Workshop 1?
2. How is the land use and development in this scenario?
3. How is the density in this scenario?
4. Do the transportation improvements fit the scenario?
5. Is the growth assumption reasonable?
6. What did you like and dislike about the scenario?

The responses recorded at each table are presented in the full report that follows this summary.

After spending about 45 minutes going through each of the scenarios individually and recording comments, there was a brief presentation on the results of the analysis conducted on the three scenarios. Various performance measures were highlighted in this presentation, including:

- Traffic volume shift
- Mode split
- Percent delay
- Congested speed
- Jobs and households within ¼ mile of transit stops
- New development in walkable areas
- Light-rail boardings

The workshop participants were invited to fill out a large matrix with comments on the comparisons between the three scenarios, particularly with regard to the identified performance measures. The goal of this exercise was to collect information on participants' preferences with regard to each scenario, to provide guidance in the development of a preferred scenario for additional testing and refinement. The participants were also asked to clearly identify those comments that were consensus items among participants (by recording these in a different color), while still allowing individual comments to also be recorded. The responses recorded at each table are presented in the full report that follows this summary.

As might be expected, there was a diversity of opinion among the participants in the workshop. Relatively few tables noted any single one of the three scenarios as their preferred scenario, although a few did—more commonly, the participants noted aspects of all three scenarios that they liked or disliked. Some tables were able to arrive at consensus conclusions, while others were divided on many issues. The comments from Group 11 provide an excellent example of a divided group, where some participants preferred low-growth and others preferred high-density in support of transit. While there was not a unanimous consensus direction provided by the participants' comments, there are several themes that arise in many of the comments, including:

- Several comments are in favor of a new interchange on I-40 to serve the Leigh Village area and a re-located park-and-ride lot; however, almost all of them also note that this interchange should not be built in a way that would impact Leigh Farm Park. There are also several comments against a new interchange, due to the impact it would have on traffic and development in that area, and the potential impacts to the park.
- One common theme is that increased density could be problematic if light rail is not constructed; suggestions provided on how to address this include keeping development densities low, widening NC 54 in all alternatives, implementing improved bus service, and constructing an alternate route to serve Chatham County-to-RTP traffic. Some comments also acknowledge

that additional density and worsened congestion conditions could help promote transit ridership.

- Several participants noted the need to address bottleneck intersections, such as those at I-40, Farrington Road, and US 15-501.
- Several participants noted that the proposed light-rail system should serve Research Triangle Park, RDU Airport, and other points to the east. There was not consensus on whether the light-rail route should go through Meadowmont, as currently proposed, or should go along 54.
- Several comments were provided in favor of creating additional satellite park-and-ride lots at locations such as Leigh Village, Gateway Center, and Southpoint Mall.
- Many commenters were in favor of widening NC 54 to six lanes, some even thought it was needed for Scenario 2. However, some commenters were against widening NC 54, citing either the increased density it would bring or the need to improve other alternatives first.
- Multi-modal accessibility concerns were prevalent, whether it was for support of regional light rail, BRT, an improved bus regional service, or the need to incorporate a bike/ped system that would adequately serve those users.
- Several commenters favored the collector street network, but some voiced an opinion against the Meadowmont Lane portion due to the close proximity to a school. An equal number supported improving travel options through that area.

The following sections of this report present the comments that were provided by the workshop participants, as recorded on their group workbooks.

Group Workbook Comments

Participants in the workshop were seated at one of fifteen tables, and each table was provided with a group workbook. In the first section of the workbook, the groups were asked to generally comment on the transportation and land use scenarios that were developed for the workshop, and were provided with a list of six questions to address for each scenario. These comments were not limited to group consensus comments, and could include individual comments. In the second section, participants were provided with a large matrix, where they could make comments regarding elements of each of the scenarios that they liked and disliked, comparing the scenarios to each other, and providing guidance on their preferred scenarios. In this second section, individuals were still welcome to write comments, but group consensus items were also noted, by highlighting these in a different color in the workbooks—in the tables below, these consensus items are noted with **bold** font.

Additional Post-Workshop Comments (as of 3/5/10)

At the end of the summary from each table group, we added several comments that were received after the workshop, organized by topic.

Group 1

Comments on Trend	1. We don't feel this scenario addresses Workshop 1 issues because all it does is widen the highway. It doesn't address alternate transportation, and is a stopgap measure. 2. The land use – especially the predominance of single-family – is good. Too much commercial use would only add to the traffic. However, it also depends on the commercial type – if you have more residential, grocery-type/support stores, that means people need to drive more. 3. Growth in Orange County, which is slow, does not support the building of more offices. 4. We are not in favor of widening the highway because the gridlock is at the endpoints (15-501 and 40) and not on 54. Suggest bus "pull-offs" for loading/unloading on 54. 5. The amount of growth assumed in this scenario seems reasonable. 6. Like lower density. Dislike widening of highway idea.		
Comments on Scenario 1	1. Concerned that light rail can't go through this area due to topography. 2. Need more vegetation, especially in the mixed-use areas. 3. Keep higher density, smaller footprint around the transit hub. 4. BRT focus needed – concerned funding for light rail doesn't happen. The bus to light-rail linkage needs to be spelled out, other people won't be incentivized to use the light rail. Is there going to be any parking available at both ends of the light rail system? There needs to be. What does making 54 wider "do" in this scenario? BRT should be able to move the people, mitigating need for such a wide 54. 5. The growth assumptions aren't reasonable if there isn't money for light rail. However, light rail is the future, so if the planning doesn't "allow" for it, the region could lose out in the future. 6. Like mixed use. Dislike widening 54. Logical place for light rail is from Carrboro to Durham. Would rather keep development small around the base, not spread out.		
Comments on Scenario 2	1. Add bike lanes and ped crossings/paths concept to plans. 2. If BRT is fully developed, redeveloping close to the road makes sense. 4. Need to see how well the HOV lanes are used before expanding them. Need to clarify that there is direct access off I-40 to proposed Leigh Village park-and-ride for all vehicles – HOV lane and regular lane. 6. Like that park-and-ride traffic will bypass the 54/I-40 intersection, but not at the expense of any parking. Put a park-and-ride lot right off I-40 and connect it to light rail transit. Dislike taking any part of Leigh Farm Park for development. Dislike road widening because of pedestrian crossing impact. Want bike lanes as well as BRT.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns	Some in group want lowest density because they don't think the traffic problem can be solved to create space for high density.	Like mixed use.	Like mixed use.

Roadway Improvements to Existing Facilities			**Need to maintain full access at Farrington Road/54 (Does NCDOT have other plans?)**
New Roadway Construction			**Don't widen 54 – focus attention on improving other transit/transfer points.**
Bus Transit Service			**BRT going full length of 54 corridor.**
Park-and-Ride Facilities			**Like moving park-and-ride away from Friday Center, but with sensitivity to existing park-and-ride. Also, make sure it is adequate to meet demand.**
Light Rail Transit		Concerned that light rail will not come through – need to run scenarios that would not be dependent/would be viable if light rail didn't happen.	Concerned that light rail will not come through – need to run scenarios that would not be dependent/would be viable if light rail didn't happen.
Bike/Ped Network	**Not addressed on maps. We want them directly addressed in all the visual presentations/maps.**	**Not addressed on maps. We want them directly addressed in all the visual presentations/maps.**	**Not addressed on maps. We want them directly addressed in all the visual presentations/maps.**
What elements are absolutely essential for the preferred scenario?	**Need to address physical intersections of I-40 at 54 and 15-501 to tackle the bottlenecks.** **Pedestrian/bike/BRT.**	**Need to address physical intersections of I-40 at 54 and 15-501 to tackle the bottlenecks.** **Pedestrian/bike/BRT.**	**Need to address physical intersections of I-40 at 54 and 15-501 to tackle the bottlenecks.** **Pedestrian/bike/BRT.**

Group 2

Comments on Trend	1. This scenario does address workshop 1 issues. 6 lanes from Barbee to 40 going west is ok. 2. Prefer density development in downtown Chapel Hill rather than at Leigh Station or along the corridor. 3. More housing. 4. What are the transportation improvements in downtown Chapel Hill? 5. The growth assumptions are probably too low. 6. Widening 54 to 6 lanes will result in the loss of a significant part of Oaks Condominium property. This scenario stops at the Durham County line? Potential bottleneck at Chapel Hill/Orange County line.		
Comments on Scenario 1	1. Any express bus stop along the corridor? 2. The land use and development patterns in this corridor are reasonable and likely. 3. Density seems appropriate. Concerned about increasing density along this already over-used corridor. 4. Want light rail into downtown Chapel Hill, to DPAC, Durham Bulls Stadium, American Tobacco, Duke, RDU, Central University 5. Growth assumptions are reasonable. 6. Like collector street network. Dislike widening 54 to 6 lanes – need clarify about flow of traffic through the corridor. Dislike light rail through Meadowmont – realign along 54. If you do this, will you still need to widen 54?		
Comments on Scenario 2	1. To increase density to increase light rail, consider downtown Chapel Hill in the mix. 2. Concerns about the safety of a light rail terminal so close to Glenwood School. Keep Glen Lennox residential. 3. High density development should only be allowed with the guarantee of light rail. 4. Like collector street plan. Like additional exit off I-40. Want 6 lane 54 even with light rail. 5. Move light rail realignment along 54/George King – not Meadowmont Lane. (not everyone agrees) 6. Like 3 new park-and-rides to disperse traffic. Like Leigh Park interchange, but preserve park if possible. Concerns with additional development at Friday Center.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
		Widen NC-54 to six lanes but to Orange/Durham county line only. **Complete connector street network, but not Meadowmont lane if arterial.**	**Instead of removing the park-and-ride facility at Friday Center, disperse it in ways to decrease 54 traffic.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households		**Reduce density and no light rail.**	**Higher density only if light rail is guaranteed.**

Development Patterns			
Roadway Improvements to Existing Facilities		**Like collector street network to be only two lanes whenever possible.**	**Additional interchange is a good idea.** **Try to preserve Leigh Park.**
New Roadway Construction		**Do not widen 54 beyond Orange County line.**	
Bus Transit Service			
Park-and-Ride Facilities			**Disperse park-and-ride in ways that reduce traffic on 54.**
Light Rail Transit		**Consider alternate route for light rail.**	
Bike/Ped Network		**Bike/walk along corridor.**	
What elements are absolutely essential for the preferred scenario?	**Enlarge green space.** **Decrease impact on air/noise/water.**	**Decrease impact on air/noise/water.**	**Less traffic congestion on 54.**

Group 3

Comments on Trend	1. Does not address: safety issues along 54, zoning land use, funnel-flow not on Farrington and exits 273A and B, tax base increase or change in Orange County (i.e. maintains status quo). 2. More commercial in Orange County. Not realistic land use and development patterns. 3. Need higher density. 4. Transportation improvements don't fit scenario. 5. Growth assumptions are not reasonable. 6. Not a realistic scenario.		
Comments on Scenario 1	1. Better than trend. Does not address: congestion at 273A and B off I-40 (suggest ramp from I-40 exit 273A over I-40 and straight to park-and-ride at Leigh Village and suggest vertical separation of BRT at 54 intersection) and bringing enough commercial development to Chapel Hill (increase mixed use and density). 2. Not dense enough in this area. Move Finley Golf Course to Carolina North and turn into walkable dense use – "mixed" and green space. 3. More commercial, especially in Orange County. 4. Bus system needs to match LRTP. Grade separation along 54. 5. All scenarios too low in population and jobs. 6. Doesn't fix Farrington Road to I-40 funnel. Six lanes on 54 won't solve problem. 54 grade separation might be a solution for some scenarios.		
Comments on Scenario 2	1. This scenario is best of the three. Move ramp from east side of I-40 to west side, at proposed Leigh Village. Avoid sensitive area. 2. Free up Finley Golf Course for other uses. Modest density, mixed use, transport. 3. Utilize 2010 census in future plans, or amend plan once census data is available. 4. Match bus system to LRP stop. Consider grade variances on 54. Consider overhead and underground ramps north-south 54 (i.e., Meadowmont) 4. HOV flyover ramp makes sense. 5. Most reasonable growth scenario – still probably too low. 6. Like ramp to/from I-40. Move ramp (HOV only) north or south or to other side of I-40 if necessary to preserve park. Consider schools in park. Make park more accessible.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
			Preferred scenario, provided development tempered with adequate transportation infrastructure. **Consider telecommuting.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households	**Low**	**Low**	**Best option.**

Development Patterns		**Premature**	**Best option, but premature and communications increase land use planning with citizens.**
Roadway Improvements to Existing Facilities			**No 54 widening.**
New Roadway Construction			
Bus Transit Service	**Work with LRTP**	**Work with LRTP**	**Work with LRTP**
Park-and-Ride Facilities			**Best option**
Light Rail Transit		**Put transit in place to meet density increase.**	**Best option – optimal transit (BRT/light rail) must be in place for this scenario to happen.**
Bike/Ped Network			**Didn't see bicycle network.**
What elements are absolutely essential for the preferred scenario?			**HOV flyover and ramp to I-40.** **Overpasses and underpasses on NC-54 and North-South interchanges.**

Group 4

Comments on Trend	Need on ramp at I-40 and Leigh Village. 1. Does not address workshop 1 issues at all. Removes some traffic off 54 but, increases volume on 54 to accommodate growth and may move congestion to other hot points. 2. Low density may be desired, but as a long-term solution, it's impractical.		
Comments on Scenario 1	3. Utilize vertical mixed use along 54 corridor. Higher density along 54 and lower away from it. Better balance than trend scenario. A lot of green pockets to hide high density growth. 4. Still need new southern transit routes (North Chatham/Southern Orange). Early and late schedules are needed or rail/bus will not help UNC Hospital needs. Transportation improvement don't fit scenario. 75% of traffic on 54 is transit (passing through). There must be no increase in traffic lights. Focus on bottlenecks (40 and Farrington). Coordinate traffic lights. 5. Growth assumptions on Durham side seem reasonable. On Chapel Hill side, there is more high density not reflected in the study area (i.e., Carolina North). 6. Like light rail and may allow non-drivers to move in or access UNC/businesses, etc. Dislike that it changes the complexion of the neighborhoods/area.		
Comments on Scenario 2	2. Mixed use at Meadowmont too far from transit station. 3. Vertical mixed use/high density is good. Force mixed use. 4. No new interchange at designated location (ridiculous). No interchange period – utilize existing 54 and 15-501 efficiency. Move interchange to Farrington Road. Need southern access to 40 from south Orange County/north Chatham county. 5. Growth assumptions reasonable fro Durham. More growth expected in Chapel Hill outside study area. 6. Dislike that it negatively changes complexion of community neighborhoods.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
		Look at not 6 lanes to add light rail/bus usage	Need southern route to I-40 from north Chatham/south Orange county to reduce 54 through traffic. No new interchange on I-40 where proposed. Does not preserve older neighborhoods (i.e., Glen Lennox). Revisit North Chatham Parkway. Look at adding 6 lanes to 54.
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	This group did not choose a preferred scenario – they evaluated if the elements presented for each scenario worked for that scenario.		
Growth in Jobs & Households	**Chapel Hill/Orange County growth, jobs, and development not reflect in balance with North Chatham.**	**Chapel Hill/Orange County growth, jobs, and development not reflect in balance with North Chatham.**	**Chapel Hill/Orange County growth, jobs, and development not reflect in balance with North Chatham.**

Development Patterns	Some feel too low density, others feel too high density.	Some feel too low density, others feel too high density.	Some feel too low density, others feel too high density.
Roadway Improvements to Existing Facilities	**Fits with scenario presented.**	**Fits with scenario presented.**	**Fits with scenario presented.**
New Roadway Construction	**Fits with scenario presented.**	**Fits with scenario presented.**	**Like the I-40 interchange location.**
Bus Transit Service	**Fits with scenario presented.**	**Fits with scenario presented.**	**Fits with scenario presented.**
Park-and-Ride Facilities	**Fits with scenario presented.**	**Fits with scenario presented.**	**Fits with scenario presented.**
Light Rail Transit		**Must go to RTP/RDU or it will be a "bridge to nowhere."**	**Must go to RTP/RDU or it will be a "bridge to nowhere."**
Bike/Ped Network	**Fits with scenario presented.**	**Fits with scenario presented.**	**Fits with scenario presented.**
What elements are absolutely essential for the preferred scenario?	**Fit with surrounding development outside scope of plans – need to place plan in larger context.** **Aesthetics/Noise considerations.** **Bicycle/Pedestrian considerations.**	**Fit with surrounding development outside scope of plans – need to place plan in larger context.** **Aesthetics/Noise considerations.** **Bicycle/Pedestrian considerations.**	**Fit with surrounding development outside scope of plans – need to place plan in larger context.** **Aesthetics/Noise considerations.** **Bicycle/Pedestrian considerations.**

Group 5

Comments on Trend	Maintain tree canopy and existing roads in Glen Lennox. 1. Present infrastructure ignored by current collector street proposal. Will infrastructure be moved to fit Leigh Village? It appears proposed collector streets are there to accommodate Leigh Village. 2. Many "yellow" areas will be much denser – not realistic. 3. Celeste Circle should be commercial. 4. Collector streets don't connect well to 54. Where will the lights be? Too many to work? These transportation improvements do nothing to fix double left turn lanes at Friday Center (which are underutilized). Traffic from Barbee Chapel left to Chapel Hill is not addressed. Consider extra lane on Barbee Chapel for Chatham traffic. Widen Farrington? Why not route Falconbridge homeowners over to Farrington Road? 5. Several single family areas likely to be much lighter density than shown on plan (i.e., much shown as single family is currently commercial). 6. Don't understand what's really changing. Dislike that it's not an accurate starting point. Bradford Place is residential condos, not office. Yellow spot on Barbee Chapel is already rezoned for townhouses, not single family.		
Comments on Scenario 1	1. Existing infrastructure ignored (traffic lights, etc). 2. Hamilton Road construction area a mess. It should remain residential. 3. Land use types are more realistic than trend, but no consensus in group whether this is good or bad. Glen Lennox as mixed-use is inconsistent with probable designation as NCD. 4. No good access from built up Hamilton Road area. 4 lanes on Barbee Chapel to support higher density. Can we handle peak load? Collector road connections to 54 still not addressed. 5. Some like high density growth assumptions along 54. Others will like Woodmont will be the final straw in traffic failure on 54. 6. How to get to transit stop at Leigh Village. Need to pull park-and-ride off 54.		
Comments on Scenario 2	1. With Woodmont increasing traffic, you are not addressing traffic issue between 40 and Barbee Chapel. But still need to widen 54 to 6 lanes. Collectors to 54 continue to ignore existing infrastructure. 2. Sherwood Forest is not likely to sell out any time soon. Glen Lennox as apartment/condo is overdevelopment that is inconsistent with probable designation as NCD. 4. School traffic is challenging with HOV placement, although additional I-40 access is a good idea between exits 270 and 273 towards Farrington Bridge. 6. Like park-and-ride relocations, HOV lanes, and new I-40 interchange, but don't impact Leigh Park. **Other suggestion: Toll road on 54 with nearby free ride for local traffic and higher toll at peak hours –to encourage the use of transit and encourage off-set traffic schedules for mixed use areas.**		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	Like widening 54 to 6 lanes.	**Like widening 54 to 6 lanes.** **Like increasing bus service frequency and using**	**Like HOV lanes on 40.** **Like new park-and-ride facilities but keep Friday**

		express buses or BRT. **Like a structure park-and-ride facility at the Friday Center.** **Like light rail system plans.** Collector streets using current infrastructure is not addressed. Cannot leave 4 traffic lights in small area.	**Center lot.** **Highway 54 must be widened.** **Don't or limit impact to Leigh Farm Park.** **New ramp only if minimal impact to Leigh Farm Park.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households		**These are realistic.**	**These are realistic.**
Development Patterns			**Don't go more than 3-ish stories next to road, but higher is ok if it's bigger setbacks. Stair-stepping the layers is ok. Need light next to road. 54 East too close to road.** **Consider pedestrian aesthetics.**
Roadway Improvements to Existing Facilities			
New Roadway Construction	**Like widening 54.** **Don't like collector road.**	**Like widening 54.** **Don't like collector road.**	
Bus Transit Service			
Park-and-Ride Facilities		**Like**	
Light Rail Transit		**Like**	
Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?		**Widen 54.** **Revisit Collector Road plan.**	

Group 6

Comments on Trend	2. Woodmont Development is not really mixed use, it is office. 4. Widening 54 to Page helped relieve 40. What is the main purpose of SW Durham Drive becoming a new collector street?		
Comments on Scenario 1	2. Mixed use designation by the light rail station across from Meadowmont is wrong. 3. More density around transit stations. 4. 15-501 bus/express lanes should be curb-guided. Transit stops are too close together. Stagecoach and Barbee Chapel as collector streets. Need to improve I-40-54 interchange, perhaps by widening that intersection by 2 lanes. Light rail should go to RTP/RDU, not to Durham. Express bus along 15-501. 6. Dislike light rail going through Meadowmont.		
Comments on Scenario 2	Group preferred this scenario. 3. More density around transit stations. 4. Leigh Village park-and-ride too far from transit station. Should still widen 54 to 6 lanes. Move fly-over closer to transit station. Rail should be along 54. Barbee and Stagecoach road as collector streets.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
		Eliminate park-and-ride at Friday Center and put a large park-and-ride lot at Leigh Village.	**Like removing Friday Center park-and-ride and putting one at Leigh Village.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households	**Don't pressure University growth at Friday Center.**		
Development Patterns	**We think they are slightly over-stated in the highest level scenario.** **Consider sound and vision barriers at the waterfowl compound.**		

Roadway Improvements to Existing Facilities	**We are unified in all scenarios that:** **1. Light rail should go along the 54 corridor and to RTP, Raleigh, and Durham.** **2. Route to Durham should be on curb-guided buses up the 15-501 corridor to places in Durham that we use (Brightleaf, Tobacco, etc).** **3. Widen 54 to 6 lanes or more.** **4. Allow flyover access to a park-and-ride at Leigh Village, but move it to not affect Leigh Farm Park.** **5. Improve Farrington Road/Stage Coach/Barbee Chapel to collector streets. Important, especially for emergencies.**		
New Roadway Construction			
Bus Transit Service	**Improve service to Durham up 15-501 corridor.**		
Park-and-Ride Facilities	**Expand at Leigh Village and the flyover from I-40.**		
Light Rail Transit			
Bike/Ped Network	**They are good.**		
What elements are absolutely essential for the preferred scenario?	**Rail goes to RTP and Raleigh.** **Widen the roads.** **Park-and-ride at Leigh Village.**		

Group 7

Comments on Trend	1. Safety issues not addressed. M & M not addressed. Congestion – relieves some congestion at Pinehurst and Ephesus Church Road. Intersections – not clear how they are addressed. Could cause bigger problems. (Widening 54 might help in the short-term.) Environmental preservation – increases traffic flow, but also increases traffic (long-term negative) 2. Too much residential, not enough mixed use.		
Comments on Scenario 1	2. Makes the 54/I-40 interchange problem worse. 4. Improved transit (light rail and express bus), but no parking facilities to support. Park-and-ride facilities should be available on edge of corridor and east side of I-40. Bus service should be seamless and integrated between Chapel Hill and Durham. 6. Like additional busing and light rail. Dislike that the scenario does not adequately reduce congestion at I-40/54 interchange.		
Comments on Scenario 2	2. One person does not like high density because it will add to traffic on 54. 6. Concerns about the location of the interchange for I-40. There is a need for additional access to I-40.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns	**Too much residential. Need higher mixed-use ratio.**	**Has a more-balanced mixed use plan.**	**Excessive density, which could force scenario to acquire light rail funds.**
Roadway Improvements to Existing Facilities		**Pedestrian crossings needed at Farrington Road/I-40 intersection.**	**Pedestrian crossings needed at Farrington Road/I-40 intersection.**
New Roadway Construction			
Bus Transit Service	**Integrate bus between Chapel Hill, Durham, and Southpoint.**	**Integrate bus between Chapel Hill, Durham, and Southpoint.**	**Integrate bus between Chapel Hill, Durham, and Southpoint.**
Park-and-Ride Facilities	**Move park-and-ride outside of 54 corridor.** **Access facilities from 40.**	**Move park-and-ride outside of 54 corridor.** **Access facilities from 40.**	**Move park-and-ride outside of 54 corridor.** **Access facilities from 40.**
Light Rail Transit		**Light rail needs to connect to RDU and RBC Center.** **Connect light rail to buses to RTP businesses.**	Light rail needs to connect to RDU and RBC Center. Connect light rail to buses to RTP businesses.
Bike/Ped Network			

What elements are absolutely essential for the preferred scenario?		**Proactive work with business on flex hours.** **Easy access to 40.** **Alternate access to 50.** **6 lanes on 54.**	Proactive work with business on flex hours. Easy access to 40. Alternate access to 50. 6 lanes on 54.

Group 8

Comments on Trend	1. Deals with congestion via 6 lanes on 54 and collector street network. 6 lanes with status quo design makes pedestrian safety less likely. Multi-modal, but it makes no apparent improvement. 2. Architects = boring. Build-out perpetuates 3. Architects = not enough employment opportunities and not enough opportunities for mix use or density. Not enough mix. 4. Not enough internal connectors.		
Comments on Scenario 1	1. Congestion – Not addressed very well. Park-and-ride needs to be moved east of Friday Center. 4. Land use patterns not dense enough to support light rail investment. 5. Growth assumptions not reasonable when compared to the proposed investment. 6. Like light rail, express bus lanes, and TND plan at Leigh Village. Dislike park-and-ride location and light rail's limited destinations.		
Comments on Scenario 2	1. Addresses congestion issue. 4. Why not widen 54? 5. Growth assumptions reasonable with rail. 6. Like that it uses densities supportive of transit, more walkable communities, and redistribution of park-and-ride with express bus service. Dislike that Meadowmont's density is not enough for a light rail stop.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	This scenario pushes the congestion problem "down the road" and is not a solution.	**Seems odd that carpools are 30% and all transit maximum is only 4%.** **Adding/Moving park and ride east of outside the 54/40 interchange is good.** **Not dense enough to take advantage of rail – need scenario 2 density.**	
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns		**Not dense enough to work with transit. Must occur in step with development.**	
Roadway Improvements to Existing Facilities			
New Roadway Construction		**Inevitable.** **Needs to be funded.**	

Bus Transit Service		**Can support density before light rail is available.**	
Park-and-Ride Facilities	**OK**	**OK**	**Better location in Scenario 2.**
Light Rail Transit			**Needs to include RTP/RDU.**
Bike/Ped Network	**Yes**	**Yes**	**Yes**
What elements are absolutely essential for the preferred scenario?	**Must enhance I-40/54 interchange.**	**Must enhance I-40/54 interchange.**	**Must enhance I-40/54 interchange.**

Group 9

Comments on Trend	1. Pretty well, but even this option is too dense. 2. Eliminate commercial development at Farrington/I-40 bridge near Ephesus Church Road. 3. More low density residential. 4. Transportation improvements fit the scenario. Do not like connector from Farrington to Nottingham. HOV and 54 widening are enough; HOV is actually overkill. 5. Growth assumptions are reasonable. 6. Like lower densities and no negative impact on Leigh Farm Park. Dislike major sites of community importance, like Creekside School and Leigh Farm Park are not noted on the map.		
Comments on Scenario 1	1. Not well, light rail requires densities that are inappropriate. If light rail occurs, it should follow 15-501, between Durham and Chapel Hill. 2. Land use and development patterns are too dense. 3. Land use types are too dense. 4. Eliminate light rail. 5. Growth assumptions are overly high for an environmentally sensitive area. 6. Dislike impact of Chapel Hill-driven agenda that is forcing high densities onto Durham and that Leigh Farm Park and Creekside School are not noted on map.		
Comments on Scenario 2	1. Doesn't address workshop 1 issues at all. 2. Land use and development patterns too dense in the extreme. 3. Land use types too dense. 4. Scenario is inappropriate. 5. Growth assumptions far overblown. 6. Dislike that Leigh Farm Park not noted and the interchange on top of Leigh Farm Park.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Preferred Elements	**Trend Scenario (B)**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households	**Like**		
Development Patterns	**Like**		
Roadway Improvements to Existing Facilities	**Like**		
New Roadway Construction	**Like**		
Bus Transit Service	**Like**		
Park-and-Ride Facilities	**Like**		

Light Rail Transit	**No – the densities required are detrimental**		
Bike/Ped Network	**Like**		
What elements are absolutely essential for the preferred scenario?	**Protect and preserve Leigh Farm Park.** **Cut SW Durham Drive through to Meadowmont.** **Park-and-ride remains at Friday Center – build decks to use less land.** **No interchange on Farrington between 54 and 15-501.** **Widen 54.**		

Group 10

Comments on Trend	**Does not address thru traffic from Chatham County.** 2. Concerns about Southwest Drive. Land use and development patterns not optimal because goes through existing development. Development is big enough to support investment, but must ensure infrastructure. 3. Some mixed use in undeveloped areas. 4. Invariably more cars. 5. Some say growth assumptions are reasonable, others say not. 6. Like single family density. Dislike lack of mixed use.		
Comments on Scenario 1	**1. Does not address thru traffic from Chatham County. Rail works for UNC and Duke, but not east-west to RTP. None of the themes, issues, and opportunities from Workshop 1.** 2. Soft edit for high density development "density gradient" – concern with impact on lakes. Disagreement on whether high density can protect water quality. Concern about low price housing. **4. Bus transportation is good. Concerned about strip development.** Transit stops are too close.		
Comments on Scenario 2	**Does not address thru traffic from Chatham County.** **3. Problem with building up to get transit dollars. If we don't get it, then you are stuck in traffic.** **6. Dislike interchange's Leigh Farm impact. Protect New Hope Corridor – Ephesus Church to Jordan High School is not safe. Additional park-and-ride lots are good. Significantly more congestion.**		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
		Like completing the collector street network. **Like express bus or BRT options.** **Like changing Friday Center park-and-ride into a structure facility.**	**Like removing the Friday Center park-and-ride and adding 3 new facilities.** **Building light rail system is necessary to find out how to make transit work.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns			
Roadway Improvements to Existing Facilities			
New Roadway Construction			
Bus Transit Service			

Park-and-Ride Facilities			
Light Rail Transit		**Need train first – then development.**	
Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?			

Group 11

Comments on Trend	4. Transportation improvements do fit the scenario. 5. Growth assumptions, as minimal growth, are reasonable.		
Comments on Scenario 1	1. This alternative fairly addresses workshop 1 issues. 2. Land use and development patterns viewed as favorable. Would like to see slow growth. 3. Commercial and office mixed use ok. 4. Transportation improvements do fit the scenario. 5. I would prefer to have low density single family housing. We want density to support light rail. 6. Like that scenario supports light rail.		
Comments on Scenario 2	1. Moves beyond workshop 1 issues – as it should. Goes too far past workshop 1 issues – as it should not. 2. Land use and development patterns fit with transit community. Land use and development patterns are too much development. 2. Too much park areas. Too much development. 3. Some think density is too high. 4. Without 54 widening, the improvements do not fit the scenario. 5. Disagreement on whether growth assumptions are reasonable. 6. Like density as it supports transit plan. Dislike overdevelopment of area.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Preferred Elements	**Trend Scenario <u>(B)</u>** 2 prefer this	**Scenario 1** 3 prefer this	**Scenario 2**
Growth in Jobs & Households	*Reasonable growth.*	*Reasonable growth.*	
Development Patterns	*Reasonable mix.*	*Reasonable mix.*	
Roadway Improvements to Existing Facilities	*Need roadway improvements.*	*Need roadway improvements.*	
New Roadway Construction	*Collectors only.*	*Collectors only.*	
Bus Transit Service	*Important*	*Important*	
Park-and-Ride Facilities	*Ok and necessary.*	*Ok and necessary.*	
Light Rail Transit			
Bike/Ped Network	*Very important.*	*Very important.*	

What elements are absolutely essential for the preferred scenario?			

Group 12

Comments on Trend	1. Would prefer 54 to stay 4 lanes to reduce VMT and to encourage development of light rail. 3. Offices on Farrington Road will exacerbate traffic problems at the intersection with 54. 4. Fits every scenario like SW Durham Drive and other Durham connectors. What provisions are made to make the roads acceptable for public transportation/buses? 5. I think this is on the low end for 2035. 6. Like that it keeps Eastwood Park residential. Leaves congestion at stoplights, especially around Falconbridge Road and I-40.		
Comments on Scenario 1	2. Intense development makes 54/I-40 interchange worse. Traffic lights increase congestion. 4. Transportation improvements help, but traffic will still get worse, especially at intersections (54-Farrington-40). 5. Growth should be predicated upon first constructing the traffic infrastructure. 6. Like commercial near light rail station in Leigh Village and like Meadowmont lane. Dislike that Eastwood Park becomes commercial; it should stay residential. Need park-and-ride on 751 near I-40/54		
Comments on Scenario 2	3. Place commercial around light rail rather than around 54 to encourage use of rail vs. more strip malls and drive-thrus. 4. The transportation improvements help but still will probably have traffic congestion, especially at intersections. Need to improve intersections. 5. Would like to have road/rail infrastructure first, then if there is capacity, development. 6. Like satellite parking-and-ride, especially at 751. Dislike Eastwood Park as commercial, keep residential.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns			
Roadway Improvements to Existing Facilities			**Farrington/54 interchange.**
New Roadway Construction	**Complete all connectors.**	**Complete all connectors.**	**Limited or no impact on Leigh Farms park.**
Bus Transit Service			**More TTA.**
Park-and-Ride Facilities			**Keep the new park-and-ride lots in the plan. They are important and efficient, especially important is the 751/54 lot.**

Light Rail Transit			**We like the most intense ridership and policies that promote it in this scenario.**
Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?	**Keep Eastwood Park residential area.** No more mixed-use development on 54 unless light rail station is nearby.	**Keep Eastwood Park residential area.**	**Keep Eastwood Park residential area.**

Group 13

Comments on Trend	**2. Avoid Meadowmont Lane.** Preserve Glen Lennox. Keep low density **4. Move SW Durham Drive to George King – along UNC land. Need LRT.** More park-and-ride lots. 5. Growth assumptions reasonable, but it single family realistic east of Barbee Chapel? 6. Like that it is the lowest increase.		
Comments on Scenario 1	2. Dense 3. More housing/development on Farrington will be a problem. **4. If density does happen, light rail will be needed.** Eliminate Meadowmont transit station and enhance the station across from it. 6. Light rail routes need work.		
Comments on Scenario 2	1. Development is too dense and unsustainable. 2. Running out of resources. Do not disturb existing Glen Lennox neighborhood. 3. Development work/live scenarios 4. Transportation improvements fit scenarios only if light rail/bus happens. Avoid a Farrington/I-40 interchange. There's no parking land available at the proposed Meadowmont transit stop. 5. Growth assumptions are not sustainable. 6. Like light rail. Dislike I-40/Farrington exchange in Leigh Farm Park.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	Yes to LRT – put in. **No to widening 54.** **Friday Center park-and-ride stays.** **Add park-and-ride at I-40/54 interchange.**	**Do not widen 54.** **Yes to more mass transit.**	**Like focusing transportation investments on providing additional capacity through a variety of modes, not just on roadway.** **No Leigh Village ramps.** **No 54 widening.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households	**YES**		**Unsustainable**
Development Patterns	**YES**		**Unsustainable**
Roadway Improvements to Existing Facilities			**Unsustainable**
New Roadway Construction	**No widening 54.**		**Unsustainable** **No road down Meadowmont Lane.**
Bus Transit Service		**YES**	**Unsustainable**

Park-and-Ride Facilities		**YES**	**Unsustainable**
Light Rail Transit		**YES**	
Bike/Ped Network	**?**	**?**	**?**
What elements are absolutely essential for the preferred scenario?	**LRT**		

Group 14

Comments on Trend	1. Does not meet any workshop 1 issues. 6. Like single family development, green space preservation, no additional I-40 interchange on Farrington. Dislike additional development		
Comments on Scenario 1	6. Like no additional I-40 interchange on Farrington, light rail, and walkable community. But dislike that the communities are less dense.		
Comments on Scenario 2	6. Like that scenario encourages mass transit. Dislike that it relies on development of Leigh Village and no other scenarios of other transit stops, that the newly created I-40 interchange destroys part of Leigh Farm Park, and that there's no adjustment to Farrington/54 interchange to respond to the increased traffic volume from Leigh Village.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	Like widening 54 to 6 lines. Turn I-40 to business I-40 and build by-pass around area. Connectors need to go from 54 to Ephesus Church.	**Like park-and-ride lot at the Friday Center becoming a structure facility.** **Like the light rail system plan, except do not increase development at Leigh Village.** Leigh Village cannot be dense – the schooling is not adequate to support.	**Like express buses.** **Like Gateway Center and Southpoint Mall park-and-ride lots.** **Preserve Leigh Farm Park at all costs.** **Unfair development burden on Durham County.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns			
Roadway Improvements to Existing Facilities			
New Roadway Construction			
Bus Transit Service			
Park-and-Ride Facilities			
Light Rail Transit			
Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?			

Group 15

Comments on Trend	2. This is a "business-as-usual" vision. Does not take advantage of the strategic location of Leigh Village to accommodate growth in the area between Durham and Chapel Hill. 3. Seems like there are more jobs being added via mixed-use development. Development likely to be very slow due to the high cost of infrastructure (Water and sewer) with little incentive, if there's low density residential. 4. Improvements come short – already have problems at I-40/54 interchange. 54 and Farrington Foad will not handle increased commuter traffic and the intersection of Farrington, 54, and I-40 are currently inadequate for increased commuter traffic. 5. Scale of growth is unreasonable – numbers are too conservative. 6. Like low density and residential vision.		
Comments on Scenario 1	2. Like the walkable, small grid around the light rail nodes. 3. Mixed use center on both sides of 54 should be better integrated into light rail path. 4. Need to figure out southern connection to Farrington Road across 54. Currently, it appears to route through residential streets. Meadowmont Lane extension could become dangerous due to increased traffic through the residential area. New collector streets through Meadowmont will become very burdened by traffic from light rail node traffic moving toward Chapel Hill. Widening 54 is a necessity, especially if collector streets are dumping traffic onto 54. If Farrington Road is still a major artery (collector streets dumping traffic onto it), then the Farrington/54 intersection must be improved. A second access from Farrington to 40 is needed close to Trenton Ro. Seems this scenario is trying to use both rail transit and improve highways for cars and buses – in which case, highways will win and rail will be under-utilized. 5. Growth assumptions are reasonable. Population density may not be such that it would justify rail transit unless at the high end. 6. Like path of light rail.		
Comments on Scenario 2	3. Near Leigh Village, more density towards the transit station, so greenspace can be preserved. Potential for more high-tech businesses, medical facilities. 4. Not happy with I-40 flyover and cloverleaf (half). Do not want Leigh Park land used for this. Extension of Meadowmont to SW Durham Drive will reroute traffic from I-40 through Meadowmont, past school, in order to avoid congestion on 54 (especially when only 4 lanes). Creating a new interchange opens up more problems than it solves. What about transit access near the Friday Center? A second intersection of Farrington Rd and 40 at Trenton Road would really help relieve traffic on 54, especially if you keep 54 at 4 lanes. More park-and-rides are good, especially close to the transit station, but it could be north of the transit station and accessible from both Farrington/54 intersection and my proposed new intersection at Trenton Rd. This may eliminate the need for fly-over access and reduce impact on Leigh Park.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	Passing through traffic on SW Durham Drive through Meadowmont (passes by school) concerns us in all scenarios.	**Passing through traffic on SW Durham Drive through Meadowmont (passes by school) concerns us in all scenarios.**	**Consider widening 54 even in this scenario.** **Passing through traffic on SW Durham Drive through Meadowmont (passes by school) concerns us in all scenarios.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**

Growth in Jobs & Households		Like	
Development Patterns		Like, but mixed-use around Friday Center lacks access.	
Roadway Improvements to Existing Facilities		**Durham Drive/Meadowmont pass through traffic a concern (narrow street?).**	
New Roadway Construction		Parallel roadway to move cars from 15-501 S to I-40 for the cars that don't stop on 54.	**Like HOV lanes on I-40.** **Don't like new exit.**
Bus Transit Service			
Park-and-Ride Facilities			**Like additional location in Leigh Village.**
Light Rail Transit		**Needs to connect to RTP/RDU.**	
Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?		**Safety of Durham Drive/Meadowmont Lane.** **Mixed use, higher density (TODs).**	

Appendix – Email comments received since Public Workshop 1

Traffic Issues

I-40/NC-54/Farrington Road Solutions:

- At the Farrington Road – NC 54 intersection, approaching the intersection South bound on Farrington Road:
    a) Lengthen the right turn only lane to 300 to 400 yards back from the intersection.
    b) Widen Farrington Road to provide 2 left hand turn lanes with the left most turn lane for either NC 54 East bound and/or I 40 East bound and the second left turn only lane dedicated solely to I 40 East Bound.
    c) Extend the all turn lanes an additional 300 yards north of the intersection.
    d) Item (b) immediately above would probably also require a re-working of the entrance to I 40 East Bound to lengthen the merge lanes.
- Lengthen the left turn only lane on East bound NC 54 at Farrington Road back to the Falconbridge Road. It is too short now and cars turning left end up blocking car proceeding east bound on NC 54 through the Farrington Road intersection.
- North bound on Farrington Road at the NC 54 intersection:
    a) Widen and lengthen the left turn lane, and add a second left turn lane.
    b) Lengthen the right turn only lane.
- Install a “DO NOT BLOCK INTERSECTION” sign at Little John Road East bound on NC 54.
- To facilitate the flow of traffic on NC 54, into to Chapel Hill in the morning and exiting Chapel Hill in the evening rush hour, arrange all the traffic lights in both directions on NC 54 in sequence.
- Barbee Chapel Road north bound at NC 54:
    a) Widen to 3 lanes to include a right turn only lane.
    b) Extend multiple lanes back to almost the Finley Forest entrance.
- Widen NC 54 to 4 lanes between Farrington Road and NC 751.
- Provide a direct access to I 40 from Farrington Mill Road to accommodate the hundreds of cars driving from Chatham County to I 40 at Farrington Road. Or in the alternative, provide direct access from Farrington Mill Road to Stagecoach Road so Chatham County driver could access I 40 at NC 751.
- Install traffic signals at the Stagecoach Road - Farrington Road intersection.
- Install traffic signals where Farrington Mill Road “T” intersects with Farrington Road/Barbee Chapel Road.

- Widen Stagecoach Road at Farrington Road to provide both left and right turn lanes.
- Longer term, widen both Farrington Road and Barbee Chapel Road to 4 lanes.

I-40/NC-54/Farrington Road intersection comments:

- I live in the Trenton neighborhood. Several residents have been very vocal in their opposition to an interchange at I-40 and Farrington Road. I am not one of them. I would welcome easy access to I-40, and the ability to avoid the very busy and sometimes dangerous intersection at Farrington and 54.
- Adding lanes and an interchange at Farrington Rd. would only funnel more traffic to the already abysmally dysfunctional intersection of Farrington Rd., NC 54 and I-40. Interchanges CREATE slowdowns and congestion; they do not relieve them. Open stretches of interstate highway allow for free flowing traffic; interchanges gum up the works. There is a logical reason why federal guidelines stipulate that interchanges should be 2 miles apart; that principle is violated here. Interchanges also bring tremendous pressure for dense, intense land use changes...simply not appropriate along this low-density residential portion of Farrington Rd. That decision was affirmed by the removal of a transit stop from the area (near Creekside School).
- We are strongly opposed to the proposed interchange at Farrington Road and I-40. When I attended the initial hearing held in September of 2008 a great many people both through writing and in person expressed their concern with this proposed exit. The committee as well expressed their strong opposition to this proposal. This being said I am unclear how a proposal with such strong opposition from the public and from elected officials from multiple towns, cities and counties could become part of the preferred option transportation plan. I find it necessary, therefore, to reiterate the objections expressed during that meeting. They are as follows:
    a) Federal highway guidelines state that interchanges on interstate highways must be 2 miles apart. Creating one at Farrington Road would mean that there would be 3 interchanges within 2 miles. The proposed exit would therefore, violate federal law.
    b) Farrington Road is zoned as a low density residential greenbelt and is home to five sites on the Durham Inventory of Cultural and Natural Resources. Creating a interchange here would, therefore, violate the zoning ordinances.
    c) Durham planning documents state that activity centers should be at least a mile apart. Adding an interchange at Farrington Road would create an additional activity center less than a mile from the one at 54 and Farrington Road. The proposed exit, therefore, violates Durham public policy.
    d) The creation of the additional interchange in this low density area would create dangerous congestion for the numerous residents in the area and for the children attending both public and private

schools in the immediate vicinity. This proposed interchange would be within feet of a large cemetary, within yards of the newly constructed Creekside elementary school and within a couple of miles of Githens Middle School. The addition of this exit would, therefore, create adverse and possibly perilous situations for the residents of Durham and Chapel Hill and their children.

- Pressure for an interchange is coming from Chapel Hill; Durham needs to say no to the continual push of development and congestion out of Chapel Hill and into SW Durham. That process began by pushing Chapel Hill's outer belt loop, the Laurel Hill Parkway, from Sage Rd. to Pope Rd. to Farrington Rd. in an ever eastward progression. The name is now Southwest Durham Drive!
- An interchange at I-40 and Farrington Road would put our children at risk, threaten the historic Leigh Farm and environmentally sensitive Water Fowl Federal Lands, and violate the graves of those laid to rest at Markham Memorial Gardens cemetery.
- Specific land uses in the vicinity of Farrington and I-40 include the Prescott Place, Glenview Park and Trenton neighborhoods, the Markham Memorial Gardens cemetery and Leigh Farm Park, 86 acres of open space protected over the last 20 years by a public private partnership including the Jr. League of Durham and Orange Counties, Triangle Land Conservancy, the State Dept. of Cultural and Natural Resources, DUTAG, DOST, Historic Preservation of Durham, Durham Parks and Rec, SEEDS and Piedmont Wildlife. There is literally no room for an interchange without destroying something of great value (homes, graves, park land).
- Farrington Rd. is a low-density residential greenbelt with 5 sites on the Durham Inventory of Cultural and Natural Resources. Leigh Farm Park in particular is a gem of open space and anchor to the New Hope Creek Corridor trail system. It should be protected, not drowned in asphalt and congestion.

<u>Collector Street Plan:</u>

- Current proposed collector roads which run along Celeste Circle and Crossland Drive will adversely impact the access to and from the homes located within Eastwood Park. The homeowners of Eastwood Park proposed a new collector road which would utilize the current infrastructure located at NC54. The proposal utilizes an existing stoplight at the intersection of Highway 54 which is used by the homeowners of Eastwood Park and Falconbridge as well as the businesses located along the service road on Highway 54. The homeowners of Eastwood Park propose that the land located within Eastwood Park be allocated as Highway Commercial and Office Development.
- George King Rd. should be paved and the Meadowmont Connector built as planned.

Other Traffic Issues:

- A Southern connector joining 15-501 and 751 should be investigated as an alternative route to help relieve congestion on NC 54.
- Another concept to investigate: Existing I-40 could become business I-40 (as with I-85 in Greensboro and I-40 in Winston-Salem) with a new I-40 bypassing the Triangle to the south.
- Given that the reason that the location of Creekside Elementary School is why the study area extends as far north as it does -- per my direct request to MPO staff in an early discussion at the MPO -- it should shown on maps. School traffic leaving for other parts of its massive attendance zone, creates a stand-alone peak of about 30 minutes duration, almost all of it loading into south-bound Farrington Road and thence into the east-bound single left turn lane. There have been days when the left-turn wait itself approached the full 30 minutes of the peak period. That is to say, someone coming from the north (e.g., this writer) would have had to wait 30 minutes to get onto NC 54. I always U-turned and found another route to the RTP, or Raleigh, the latter trip taking hardly more than 30 minutes by itself. I have been told that adjustment of the signal cycle is not feasible for that stand-alone peak period because it is separated from the "normal" peak hour. Given that this turning movement is at LOS F for 6-8 hours a day, I have to wonder.

Alternative/Multi-Modal Transportation

- Funding for transit may never materialize; exploding densities (based on the presupposition of transit corridors) could be a serious mistake, destroying the very character that makes North Carolina more attractive than New Jersey.
- Safe passage through the I-40/NC54/exit 273 gauntlet. The interchange, with its one-leaf clover, is a deathtrap for cyclists and pedestrians heading west on NC54, especially since NCDOT widened the ramp into a double lane racetrack. Better options, in order of safety preference:
    a) Bike-ped bridge over (or tunnel under) I-40, just north of NC54, connecting with future light rail corridor
    b) Stoplight on the cloverleaf that bike-ped commuters can activate by push button
    c) 12', two-way bike-ped sidepath on south side of NC54
- The Exit 273 interchange area is generally considered the most dangerous section of surface street for 'cyclists in Durham and Orange Counties. We've never had a fatality on that part of NC 54 -- although have had another well-known one to the west -- probably because we simply avoid it.
- There is a 10-foot sidepath on the north and south sides of NC 54 for the entire length of the Meadowmont community. The sides are connected with a reconstructed cattle tunnel in Meadowmont. All other connections are at-

grade at signals, and I find them difficult because of the briefness of the available signal cycle.

- As a new Triangle Transit trustee, I am not aware of any use proposed within the 50-foot wide light rail corridor besides the 28-foot wide dual-track alignment. The TT Board of Trustees voted yesterday to initiate the NEPA process via an Alternatives Analysis, and additional use of the corridor may come up in that process. The heavily-used Libba Cotten trail is in an abandoned rail ROW.
- Rail-WITH-TRAIL, if light rail ever ventures into reality, should be incorporated into each and every design model. Plenty of working examples of RWT exist in the U.S., including the Libba Cotten Trail in Carrboro.

Development/Greenspace Issues

- The development of Carolina North must be taken into account when studying future traffic needs in this area.
- Farrington Rd. is a low-density residential greenbelt with 5 sites on the Durham Inventory of Cultural and Natural Resources. Leigh Farm Park in particular is a gem of open space and anchor to the New Hope Creek Corridor trail system. Preservation, not more pavement, is our watchword.

Level of Agreement Responses

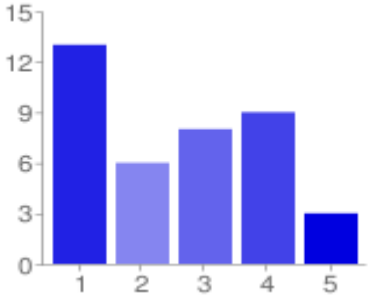
On Tuesday, May 11, the NC-54/I-40 Corridor Study project team held the third and final public involvement workshop and presented the preferred scenario. The scenario included land use designations, transit centers, bicycle and pedestrian improvements, and a "superstreet concept" for NC-54. Following the conclusion of Workshop 3, participants were encouraged to complete a Comment Sheet, which included eight statements about the land use, transit, bicycle and pedestrian, and roadway improvements presented in the preferred scenario. Participants scaled their level of agreement with the statements, which will help the project team assess the public's opinion about various elements of the preferred scenario.

Each of the eight statements below are accompanied by a bar chart illustrating each respondent's level of agreement, the count of the number of respondents who chose each level of agreement, the percent of respondents who chose each level of agreement, and the combined percent of respondents who were generally opposed to or in agreement with the statement.

Note: The number of respondents varies because not all respondents provided a response for all eight statements. The percentages are rounded to the nearest whole number, so they may not add up to exactly 100%.

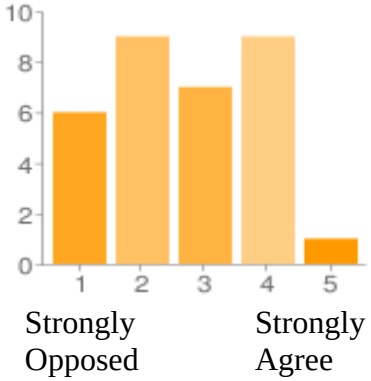
<u>Land Use Designations and Transit Improvements</u>

1. I like the land use designations and think they are in the right places, at appropriate scale and intensity



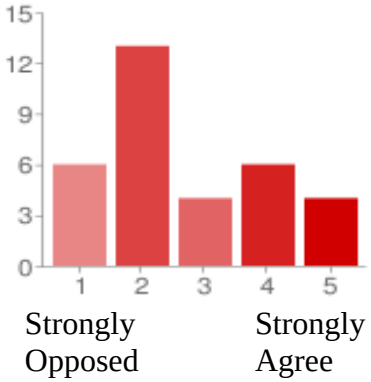
1 -	Strongly Opposed	**13**	33%	49%
2		**6**	15%	
3		**8**	21%	21%
4		**9**	23%	31%
5 -	Strongly Agree	**3**	8%	
	Total Respondents	**39**		

2. The land use designations and transit improvements fit with the proposed roadway/bike/ped improvements.



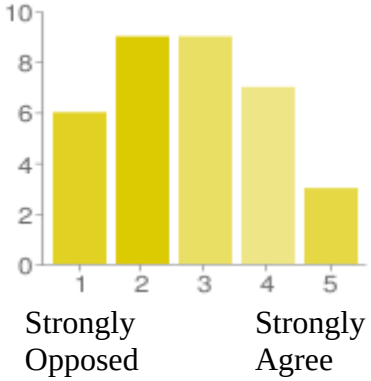
1 -	Strongly Opposed	**6**	19%	47%
2		**9**	28%	
3		**7**	22%	22%
4		**9**	28%	31%
5 -	Strongly Agree	**1**	3%	
	Total Respondents	**32**		

3. The phasing approach will enable transit to succeed in this corridor, while providing housing choice.



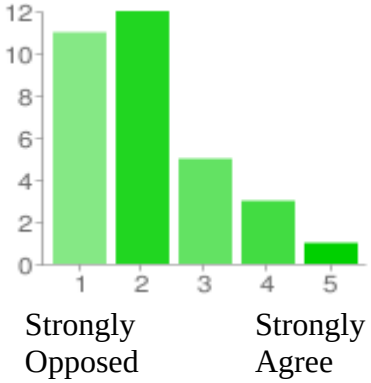
1 -	Strongly Opposed	**6**	18%	58%
2		**13**	32%	
3		**4**	12%	12%
4		**6**	18%	30%
5 -	Strongly Agree	**4**	12%	
	Total Respondents	**33**		

4. The draft Blueprint will improve the bicycle and pedestrian system and increase access and mobility in the study.



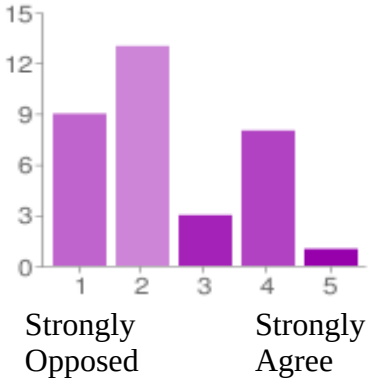
1 -	Strongly Opposed	**6**	18%	44%
2		**9**	26%	
3		**9**	26%	26%
4		**7**	21%	29%
5 -	Strongly Agree	**3**	9%	
	Total Respondents	**34**		

5. The example bicycle and pedestrian improvements illustrated will solve problems at critical locations.



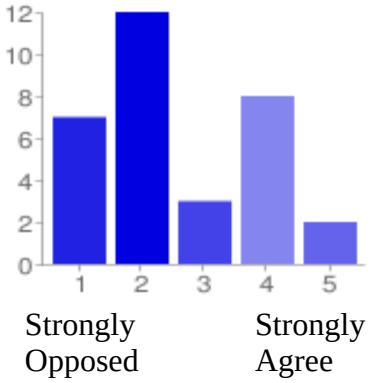
1 -	Strongly Opposed	**11**	34%	72%
2		**12**	38%	
3		**5**	16%	16%
4		**3**	9%	13%
5 -	Strongly Agree	**1**	3%	
	Total Respondents	**32**		

6. The draft Blueprint's roadway improvement strategy will improve vehicle travel along the NC-54 corridor.



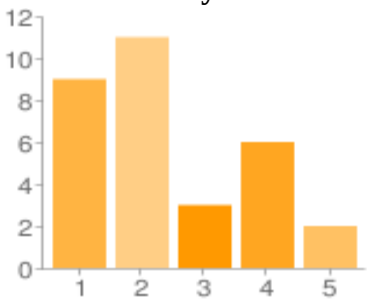
1 -	Strongly Opposed	**9**	26%	65%
2		**13**	38%	
3		**3**	9%	9%
4		**8**	24%	26%
5 -	Strongly Agree	**1**	3%	
	Total Respondents	**34**		

7. The roadway modifications consider the proposed land use and transit system improvements.



1 -	Strongly Opposed	**7**	22%	59%
2		**12**	38%	
3		**3**	9%	9%
4		**8**	25%	31%
5 -	Strongly Agree	**2**	6%	
	Total Respondents	**32**		

8. The roadway modifications will support the traffic growth in the corridor.



1 -	Strongly Opposed	**9**	29%	65%
2		**11**	35%	
3		**3**	10%	10%
4		**6**	19%	26%
5 -	Strongly Agree	**2**	6%	
	Total Respondents	**31**		

The number of respondents was low, compared to the actual number of participants who attended the third workshop. Generally, these level of agreement responses are skewed towards “strongly opposed” and “opposed,” but three statements were especially weighted in opposition: #5 - bicycle and pedestrian improvements will solve critical problems, #6 - the roadway improvement strategy will improve vehicle travel, and #8 - the roadway modifications support traffic growth.

Also, while the number of participants who “agreed” or “strongly agreed” was generally in the 26-31% range for most statements, only 13% of respondents “agreed” or “strongly agreed” with the statement about bicycle and pedestrian improvements solving critical problems (#5).

Comments

The workshop participants were also encouraged to submit their comments in response to the elements in the preferred scenario. Below is the summary of comments submitted on comment cards, comments submitted by email, and verbal comments made during the workshop.

Light Rail Transit

Summary of written comments submitted on comment cards and by email:
Many participants advocated moving the light rail transit line out of the environmentally sensitive area when it leaves Leigh Village and heads to 54. They all suggest running the line parallel to NC-54. Several others did not want the LRT line to run through Meadowmont, based on the proposed development and park and ride lot locations. Many commenters indicated that light rail must be in place before the density developments could start construction. One commenter saw the light rail as promoting growth in the area, which that commenter did not want. Participants stressed the need to connect the LRT line for Chapel Hill, Durham, RTP and RDU Airport.

Verbal comments made during the workshop:
One commenter asked if safety along the transit line was considered for the transit centers, since density was going to be so high and the goal was to make it very walkable. Another commenter was concerned with the current proposed alignment of the light rail because it runs through ecologically sensitive area. That person wondered if the light rail could run along 54. A last comment questioned if light rail was contingent on Wake County, Orange County, and Durham County all giving their approval.

Mass Transit and Park and Ride Lots

Summary of written comments submitted on comment cards and by email:
Many commenters were against the proposed park and ride lot near the Falconbridge neighborhood, at the wastewater plant, stating that it could cause dangerous traffic issues in that neighborhood and would exacerbate traffic problems at the NC-54/Farrington Rd intersection. One wondered why a park and ride was proposed on Farrington Rd, when the superstreet concept would essentially close Farrington Rd at the NC-54 intersection – suggesting that people would be motivated to cut through the Falconbridge neighborhood rather than back track around Barbee Chapel in order to go to points east or to gain access to I-40.Another commenter believes Farrington Road would become more congested with a park and ride, as well as with the addition of a transfer station in the Falconbridge Shopping Center. While the intention would be for commuters to park in the Park & Ride, the commenter thinks commuters will opt to park closer – in the shopping center at the corner of NC-54 and Farrington Road and on the streets in the neighborhood. They will cut through the neighborhood to reduce congested areas, and to avoid the traffic patterns created by the Super Streets. Commenters suggested locating the park and ride lots east of I-40 and NC-54, along the highway, and out of the corridor. One commenter included the caveat that shuttle service be provided and coordinated to serve both Chapel Hill and Durham. Other suggested locations included Southpoint Mall and New Hope Commons. This suggestion was supported by a commenter who felt the proposed park

and ride lot at Leigh Village would only serve to benefit UNC and would actually hinder traffic flow because, regardless of how commuters accessed that park and ride, the traffic into the park and ride would create a bottleneck because it would be coming off I-40. One commenter stated that the proposed NC-751 park and ride lot would not logically serve Chapel Hill. In general, participants recognized the need for a more robust transit system that would serve Chapel Hill, Durham, RTP and RDU Airport, among other locations.

One commenter suggested installing bus-only lanes on NC-54 to improve traffic flow during rush hour in the morning and evening.

Verbal comments made during the workshop:
Participants focused mostly on the park and ride lots proposed on Farrington and near 751. One commenter thought the Farrington park and ride would cause a lot more traffic issues on NC-54 and another asked whether impacts of the increased traffic on Farrington Road had been analyzed and accounted for. The comment about the park and ride lot near 751 supported it, believing that it would relieve some of the traffic heading to 54. However, another commenter said that people would not use that park and ride because they would not want to travel out of their way instead of heading straight into Chapel Hill.

Bicycle and Pedestrian
Summary of written comments submitted on comment cards and by email:
Participants were divided over the proposed bicycle and pedestrian system. While many supported the enhancements and felt they addressed the needs of the bike/ped community, others felt that the improvements were not enough, and still others did not believe there are enough users to support enhancing the system.

Safety was a major concern on all fronts. Participants took issue against the proposed separated bike lane dividing the right turn lane and through lane near the 15-501 interchange, stating safety concerns. Others advocated for bike lanes or paved lanes separate from the main road or wider and “protected” lanes. One commenter supported the bike lanes and their enhancement to safety, especially on the eastern side of the corridor.

Several comments asked to link the bike trail to the American Tobacco Trail in Durham and RTP. Others suggested a trail to connect Eastwood Park with the nearby proposed transit center. Another requested bike routes along Barbee Chapel, Farrington, Stagecoach, NC-751, Scott King, and Massey Chapel roads because of the number of commuters who bike that path from Chapel Hill to RTP.

Verbal comments made during the workshop:
There was opposition against the dedicated bike lane near the 54/15-501 intersection. People believed it would not be safe for bikers and would not be used. People do use the underpass to cross 54 near Meadowmont. Before major changes are made on the road to facilitate pedestrian crossings, commenters encouraged study on the use of the underpass. A commenter stated that the bike/ped path proposed to University Mall may not work

because that path is very wet. Another commenter asked if the bike/ped path in Little Creek will connect to the American Tobacco Trail.

Roadway Enhancement/Superstreet Concept/NC-54

Summary of written comments submitted on comment cards and by email:
There were numerous concerns about the "superstreet concept," including accessibility issues, impacts to neighborhoods, and lack of addressing congestion problems. Commenters referred to the existing superstreet at 15-501/Erwin Road and mentioned how it did not improve traffic conditions and has made it worse at times. Commenters were skeptical of how it would improve vehicle travel along the corridor and how it would support future traffic growth. Commenters were concerned with the impacts on access to neighborhoods and retail areas along NC-54. One commenter was concerned with the impacts on safety to bicyclists and pedestrians traveling along NC-54 Many participants who were against the superstreet concept advocated the use of flyovers instead. The fact that it would be an interim or short-term solution designed to be a cheap alternative to the long-term solution was also a point on contest.

Some commenters did support the "superstreet concept" and believed it would alleviate some of the congestion issues in the corridor. Support was shown for the proposed designs at major intersections. One commenter stated the need for dedicated merge lanes at the U-turn areas for the concept to succeed. Another commenter suggested looking at allowing vehicles to go straight across 54 from any of the side streets, but continue forcing left turns to U-turn.

Some commenters stated the need to widen 54, even up to eight lanes. However, one commenter stated that the problem is "peak time" travel problems, where the congestion only occurs during morning and evening rush hours. This commenter believed travel demand management strategies, not road widening, would address congestion issues. This commenter was also concerned with the environmental impacts from widening NC-54. This commenter provided several alternatives solutions: including 1) add one HOT lane in either direction for carpoolers (charge SOVs for use of the lane); 2) work with UNC to stagger employees' shifts so that employees enter and exit the corridor at different times; and 3) increase parking fees at UNC campus

Verbal comments made during the workshop:
There were diverse comments about the superstreet proposal. There were several concerns related to the actual learning curve, whether the superstreet actually reduces wait time, if it was worth spending money on that improvement instead of other alternatives, and if that improvement would actually encourage even more traffic on the corridor. One person commented on their positive experience with the superstreet at Erwin Road. One commenter suggested making the superstreet U-turn a dedicated lane for easy merging and so signals can be eliminated. Another solution was to have dedicated lanes on 54 straight to 40 for cars that want to travel straight through the corridor and a dedicated lane for cars that need to access side streets.

I-40/NC-54/Farrington Interchange

Summary of written comments submitted on comment cards and by email:
Commenters provided suggestions to improve the interchange and varied widely. One commenter suggested routing traffic via NC-751 to enter Chapel Hill; another suggested a new I-40 exit at Ephesus Church Road or a new I-40 exit directly to the Leigh Village park and ride lot; and another commenter stated the need for "overpasses or interchanges to go north-south across I-40 from Farrington Road." Some commenters believed the superstreet concept at this interchange in particular will not address or solve the traffic issues and might bring economic harm to businesses at the intersection. Commenters did agree that some kind of improvement was needed, and sooner rather than later. This might be one of the first things to address in the corridor.

Regarding the proposed changes at this intersection, one commenter had this statement. "The rerouted Farrington Road traffic will travel along a segment of what is now Celeste Circle and will utilize the current Celeste Circle/NC54 intersection. Placement of the rerouted road and widening of the Celeste Circle segment will require the removal of several homes in Eastwood Park and an adjacent neighborhood. A prior developer of Leigh Village believed that four houses would need to be removed. Remaining homes in Eastwood Park would be adversely affected. For example, a couple of homes will end up with a major road in their front yard and will be physically separated from the rest of the neighborhood. Two reasons not to reroute Farrington Road are suggested here:

- First, if the superstreet plan proposed by the corridor study is accepted, the current Farrington Road intersection will be largely atrophied, and the adverse effects of this intersection on traffic flow will be greatly reduced.
- Second, there is an alternative to locating the road through Eastwood Park. It should be possible to move the planned intersection about fifty yards to the northeast. This would put the rerouted Farrington Road behind the northeastern-most houses on Celeste Circle, instead of in front of them. The exact location of this road is as follows. As one exits NC-54 and enters Celeste Circle, the first building on the right (on the corner of the Service Road and Celeste Circle) is the Dermatology Center/Urgent Health Clinic. To the right of this Dermatology Building is a space where the proposed road would be located. The next object past this space is the Carolina Crossing Building. Thus as one travels on the Service Road from Celeste Circle towards Farrington Road, one encounters the Dermatology Clinic, the space for a road, the Carolina Crossing Building (a commercial establishment), then other commercial/office buildings, and then Farrington Road. Although moving the rerouted Farrington Road several yards closer to the northeast decreases its planned distance from the interstate, it is still much further from the interstate than the current Farrington Road and seems a reasonable compromise considering the insult to Eastwood Park that would be avoided. This newly proposed path for a rerouted Farrington Road makes sense in the context of the superstreet proposal. It is noted that currently across NC-54 from Celeste Circle is Falconbridge Road. In the superstreet proposal, traffic originating on the rerouted Farrington and Falconbridge roads is allowed to turn left or right onto NC54, and no left turns are allowed off of NC54 onto rerouted Farrington or Falconbridge Roads. Consequently, it is not necessary for the rerouted Farrington and Falconbridge Roads to be aligned "head to head". The

rerouted Farrington and Falconbridge Roads would be offset slightly (about 50 yards), but would be so close that they would constitute a double T arrangement and stop lights at each intersection could readily be synchronized with one another. In order for the rerouting of Falconbridge Road proposed here to work, it would make sense to atrophy the current Celeste Circle/NC54 intersection, by completely blocking direct access between Celeste Circle and NC54. To recapitulate, the plan for rerouting Farrington Road proposed here will not require loss of residences or serious adverse effects upon residences in or adjacent to Eastwood Park. The only structure in the path of the route proposed here is an unused small distribution warehouse. In the context of the superstreet, the adverse effects of present and anticipated Farrington Road traffic on the Corridor would be mitigated by a combination of two mechanisms, the first being the partial atrophy of the current Farrington Road and second, the additional connection of the rerouted Farrington road which would allow left turns onto NC54 at a location significantly further from the interstate than the current Farrington Road/NC54 intersection. The eastern end of the NC54 Corridor under study is challenging with respect to heavy traffic demands and the well being of local communities, and the Farrington Road plan proposed here is a reasonable compromise."

A business owner was particularly concerned with the traffic flow and economic impacts to the shopping center off Farrington Road on the north side of NC-54. The business owner stated that the additional lane on NC-54 to get onto I-40 greatly improved traffic flow at that intersection, even on Saturday game days. A resident located off Farrington Road echoed the traffic flow sentiments and was also concerned about the increase of traffic on safety. That commenter said the community clubhouse and swimming pool are adjacent to Farmington Rd, which is the street that wraps around the back side of the shopping center. Members walk and bike to the clubhouse, so the increase in traffic can have a major impact on local residents' accessibility to the clubhouse and swimming pool.

A few commenters were concerned that these drastic changes were first presented at the latest workshop and that there was no prior indication that major changes were going to be proposed for the intersection. Commenters worried that the proposed changes were made without any public input.

Collector Street Plan and other connecting streets

Summary of written comments submitted on comment cards and by email:
Comments were generally supportive of the Collector Street Plan and wanted it implemented soon. There were several comments of opposition to the currently-planned alignment of Southwest Durham Drive via Meadowmont Lane, mostly because of its close proximity to a school and a senior center. Instead, commenters stated that SW Durham Drive should be connected to George King Road. However, one commenter stated he heard from Meadowmont residents who attended the Collector Street Plan Meetings that those residents felt that the Southwest Durham Drive connection to Meadowmont Lane would be a plus in enhancing their choices for access to/egress from their community. The commenter believed it would also provide an alternative for

pedestrian and bicycle traffic which might otherwise pass through the region of the Corps of Engineers Land. The commenter also stated that, at the Chapel Hill town hall meeting, the Transportation Department representative responded to a question by stating that Meadowmont Lane had been constructed properly to serve its function as the southern end of Southwest Durham Drive; thus this commenter believes this intersection, which is about 9 lanes wide by 6 lanes wide would be a good intersection to use.

A direct connection to 54 from George King Road, and not through Crossland Drive, was proposed by several commenters.

Commenters advocated that the Collector Street Plan preserve neighborhoods and not channel traffic through them and deteriorate the neighborhoods. One commenter was concerned about traffic impacts from funneling traffic down Farrington Road and requested additional traffic studies to assess how that would affect traffic, access, and the businesses. Another commenter proposed two alternative solutions: 1) Target the area near the former Ecko warehouse; or 2) reroute Farrington Road through George King Road, currently a gravel road at the end of the Celeste Circle neighborhood.

One commenter focused on the area east of 15-501 Morgan Creek-Kings Mill and suggested “moving the big roads below the ground” because the commenter was concerned that the proposed addition lanes on NC-54 would “lock residents of the neighborhood in.”

Verbal comments made during the workshop:
Regarding the collector street system, participants had a few comments for specific streets. The participants noted that the collector street designation from George King Road straight down to NC-54 is wrong. (The project team will correct the alignment.) There was major concern with one of the proposed connector roads behind the shopping center – participants said that area was a neighborhood and a community pool and should not be a connector street and attract vehicles because it currently serves many children and pedestrians. One commenter questioned whether the SW Durham arterial road is coming to Meadowmont Lane and if it shouldn’t connect to George King Road instead, because near future development will be closer to George King Road. There were many concerns expressed about traffic on Meadowmont Lane in the future and the impacts it would have on the walkability of the community. A last comment urged consideration of traffic impacts because of Chapel Hill’s close proximity to RTP and the travel patterns between the two areas.

<u>Development</u>
Summary of written comments submitted on comment cards and by email:
There were several comments about the Leigh Village development, possibly because the workshop group used the Leigh Village location to illustrate a possible high-density transit center development. Commenters were concerned that Leigh Village was designed solely to support light rail and that it would increase congestion. It was also seen as unrealistic and encouraging unwanted growth in the corridor.

Land Use Designations

Summary of written comments submitted on comment cards and by email:
In general, commenters believed the land use designations were too dense and showed high growth that the residential community does not support. The proposed density was seen as unsustainable (especially at the Leigh Village development), only there to support light rail transit, and unrealistic, and having adverse environmental impacts. There were concerns about development near Farrington Road and how it might impact the senior assisted-living facility in the area. However, some participants did support the transit-supportive development and feel it will address future needs.

Another commenter felt the mixed use (tall buildings and retail on the ground floor) will not necessarily bring foot traffic or the vibrancy that is described when located on vast wide highways. Much of the area along 54 is low lying and adjacent to Jordan Lake, a major drinking water resource and the residents in this area depend on surface water for their water supply. Chapel Hill and Durham should not be encouraging major increases in building intensities so near buffer areas of Jordan Lake, a drinking water supply for the region.

A number of participants wanted Eastwood Park to be designated low density residential and did not want to see any new roads introduced into the neighborhood. Another wanted to see Eastwood Park incorporated into Leigh Village and yet another suggested turning Eastwood Park into a parking garage and office complex to siphon some traffic off the corridor earlier. One commenter added the necessity to consider the ecological sensitivity of the Waterfowl Impoundment Area at the southern end of George King Road.

Verbal comments made during the workshop:
The participants did not have major comments about the land use designations, but there were differences in opinion on the density. One commenter was opposed to the dense, mixed-use development because those would bring more cars and congestion to the corridor. Another commenter supported high density but believed the community needed education about the positive aspects of high density and also needs to develop a concise vision to guide development. Another commenter suggested that, besides density, access, time, and distance should also be considered when developing the ¼ and ½ mile radius transit centers.

Other

Summary of written comments submitted on comment cards and by email:
Participants submitted comments unrelated to the above topics. One commenter was concerned that this plan covers two counties and the implications of that for economic development. The commenter was particularly concerned with the tax burden on residents for non-residents to use the park and ride and free bus transportation. Another commenter continued to advocate for an alternative southern route around Chapel Hill to alleviate traffic coming from Chatham County, where development is occurring rapidly and from where a significant amount of traffic is entering the corridor. A comment was made that the proposed scenario seems to favor the needs of UNC over the residents living along the corridor, and another echoed that sentiment, stating the need for someone

to advocate the needs of Durham residents. Another commenter stressed that the assumptions guiding the study were made by “outsiders” and not submitted by residents in the corridor.

One commenter suggested lowering the speed limit to 35 mph on NC-54 to reduce the regional utility of the Corridor (thus reducing traffic) and would, to some degree, address safety concerns.

One commenter made this statement: “I would be very interested in knowing not only about congestion in general but I would be especially interested to know the duration of rush "hour" under the various scenarios that were considered and how they compare with the scenario that they decided upon in the third Workshop, with the superstreet arrangement. I hope that when the final scenario is presented to the governing bodies and the TAC, these interesting data will be made available. I would expect others with a more pragmatic view, including those underwriting the Study, the local citizens and the commuters also to be interested in what congestion will look like in the future, and how the Study plan will address this issue. In summary, how long will rush hour last with the superstreet plan and how will it compare with the duration of rush hour associated with the other plans considered? I honestly feel totally out of the loop as far as what to expect from these plans and sense that a catastrophe is within the realm of possibility. Consequently, to protect the folks who live near the Corridor and those who use the Corridor, it seems appropriate that the final Corridor Study plan should include a moratorium under which there will be no development in the Corridor until after proven capacity for handling the increase in associated traffic is made available.”

Another commenter stated, “What does one experience as they exit the interstate and enter Chapel Hill? With exceptions at the strip malls, for the most part, there is a relaxed, comfortable rural feel. This helps keep down the road rage which can at times be aroused by the traffic. Along the Corridor, there are numerous neighborhoods and offices close to NC54, but for the most part they are screened by landscaping. A noticeably different view is presented by my neighborhood, Eastwood Park. There is no effective barrier between Eastwood Park and NC54, and with the widening of NC54, the highway will be quite close to homes there. A theme universally utilized in all kinds of design, be it interior, landscaping, architecture or whatever, is continuity. There needs to be an effective level of landscaping/hardscaping between Eastwood Park and NC54 to confer a sense of continuity to the corridor. This is one of the few areas of the corridor where utility wires on telephone poles are prominently displayed. These wires/poles are not attractive, and the landscaping should be "beefy" enough to hide these from view. Aside from the esoteric contribution, a consistent background (that is, landscaping such as that seen across the highway, at Falconbridge), would make it less distracting for NC54 traffic maneuvering through intersections or a superstreet.”

NC-54/I-40 Corridor Study
Compilation of Public Comments

This Appendix incorporates the full set of public comments received during the NC-54/I-40 Corridor Study project. They include the comments recorded from the focus groups conducted at the beginning of the process, comments recorded from each of the three public workshop activities, a follow-up development focus group, and comments emailed to the project team throughout the process.

Focus Group Comments — October 12 and 13, 2009

Policy-Makers Focus Group

- Creekside Elementary brings in commuters from several areas of the state and is the cause of some traffic problems in that area.
- One participant asked if 54 East is designed to connect to the rest of the region. The project team responded that it was developed at a planned regional transit station.
- A participant noted that another transit station is planned at the Meadowmont/Friday Center location on NC-54.
- UNC stated that the school provides less than 50% parking for its employees and less than 10% parking for its students. The University is very focused on sustainable growth and development and believes in sustainability as one of its driving forces.
- UNC acknowledged that the Friday Center park-and-ride lot needs to be pushed back to the I-40 interchange and that the rail and transit infrastructure needs to be developed and strengthened.
- UNC stated that it's not the student population that drives growth, but research and research funding. This most often happens in the medical fields, which is why providing parking or access for UNC employees is crucial to the University.
- The project team should look at the University's 1999 Master Plan.
- One participant stated that there is not consensus on where the rail line from RTP should be extended first – Durham or Chapel Hill.
- SW Durham Drive should be a focus point in the study area because it will be the next big development. The study should consider any impacts 54 will have on that development, as well as potential impacts on the 54 corridor when SW Durham Drive is developed.
- Durham did a charette of the Leigh Village area. The study should take a look at those results.
- NCDOT did a study of the I-40 interchange about 6 years ago. Contact Jim Dunlop for that study.
- Talk to UNC's MAB for the geocode and other origin and destination analyses.

- From a healthcare patient's perspective, it's important to understand that hospital staff commute from all over the region; that access and parking are major deterrents to staff hiring and to patients going to the hospital; that the hospital has good parking and transit; that roadway and interchanges are improved; and that emergency vehicles have easy access through traffic, especially to SW Durham.
- Jordan High School's location has posed many traffic problems, especially for neighborhood residents in the area.
- 15-501 is really bad and UNC can't relieve some of the traffic issues by putting a park-and-ride on 15-501
- Any transit near the I-40 interchange needs to have direct access off the highway, probably in the Leigh Village area.
- One problem route is UNC employees leaving the campus, picking up students at Creekside Elementary, and then trying to get onto I-40.
- You should take a complete streets approach to 54.
- You should provide viable recommendations that are fundable – have a good financial plan.
- You should have short- and long-term roadway improvements, such as turn lanes and signalization.
- You should raise the level of education on what the long range plan for the corridor is and provide a really good map.
- You need to connect Chapel Hill transit with the rest of the regional transit systems and provide the steps we need to take to get here.
- I want to see improved traffic flow and transit opportunities along 54.
- You should provide a phased plan that viable economically.
- The plan shouldn't just consider people entering into Chapel Hill, but also account for the best ways to get people out of Chapel Hill.

Neighborhood/Environment Focus Group

- Farrington/NC-54 intersection is a big traffic problem. Coming from I-40, turning left onto Farrington is very hard. The left-turn lane is short and it's hard to cross over 2 lanes after getting off I-40 to get into that lane. The problem is the worst in the evening, during rush-hour. The alternative route is 751 Stagecoach, however, there is a lot of traffic and congestion on that road since there are no traffic lights to control the traffic. One suggestion for traffic control on Stagecoach may be a roundabout at Farrington at Stagecoach.
- You need to look at routing traffic onto 751 Stagecoach and off of NC-54.
- Now, people are going through the Falconbridge neighborhood instead of going onto 751 Stagecoach. Thus the neighborhood receives continual traffic. While the

neighborhood is mostly empty-nesters and there are few children, the traffic speed is still a concern. The neighborhood will probably need speedbumps in the future.

- If you figure out some traffic calming methods for the neighborhoods, we would be willing to maintain some accesses, for example Rogerson Road near Glen Lennox.
- The group thinks that roundabouts, while they are hard to get used to in the beginning, are a really great solution. However, size is important. The Pittsboro Courthouse is a good example of a successful roundabout. The Erwin and 751 Roundabout is an example where a roundabout doesn't work well.
- Connections were supported by residents as something they would like in order to stay in their neighborhoods and stay off of NC-54. Falconbridge neighborhood voiced concerns about connections in light of future development around their neighborhood and the fact that they are landlocked in other surroundings.
- It's interesting to note that development on Farrington has all occurred in the past 15 years, but the Farrington/I-40 intersection has not changed at all.
- If there were bike lanes into UNC, people would bike/walk more. Same into Durham.
- Sidewalks right up on the road are a safety issue, the sidewalks need a green buffer.
- Underground access is an important option to consider. In Portland, there are several bike routes underground.
- Biosoils
- Participants voiced sewer drainage concerns. For example, storm water from Friday Center side of 54 is drained into the Celeste Circle neighborhood on the other side of 54. Want to see stormwater run-off controls.
- Instead of taking wetlands mitigation elsewhere, keep it in this area.
- The problem with speed bumps is the wear and tear on tires and the constant speed change.
- 2-lane streets, on street parking, and winding roads is the best way to control traffic within neighborhoods. Glen Lennox is a good example of this strategy.
- Other traffic calming technologies are speed tables or green zones where, if you drive a specific speed limit, drivers will hit all green lights.
- Need more one-way streets.
- Towns keep okaying development in isolation, but there is no aggregate through over time. The infinite reservoir theory needs to be applied to the roads. There is a saturation point in Chapel Hill.
- Need to constrain traffic on 54 to the airport. There are many commuters on 54 heading to the airport who could use transit instead.
- Another strategy to accommodate bike/ped users is having lights at intersections turn red all ways – such as at C and C.
- Would like to see a TTA rep at the workshop.

- Would like to see enhanced bus or BRT along the corridor.
- Can you do a cost-benefit analysis of having park-and-ride lots off I-40 and buses running along 54 that service those lots?
- One participant does not think people would tolerate bus and HOV lanes along 54 because most people commuting into UNC are from Orange County and Orange County is very rural and get little bus access.
- Need a park-and-ride lot somewhere on I-40 along the rail line.
- Carolina North will change the dynamics of 86.
- Need a dedicated ramp off I-40 to a parking deck.
- Don't need to do much to 54.
- Need buffer space somewhere near golf course.
- Chapel Hill doesn't want to widen roads.
- Shared parking with shopping centers has been discussed but has not been well received.
- Connecting SW Durham Drive from South Hills Mall in Durham to 54 would reduce traffic on I-40 and 15-501
- Density-focused development talks should also consider water availability. However, one participant noted that OWASA would have the capacity to support several high-density developments.
- We want to see design conditions spelled out, such as the need for sidewalks, trees, buffers, etc. We do not want any "in lieu of" language. The design conditions must be required, not optional.
- One idea is to morph the 15-501/54 intersection to a more street-centered design and then, moving down 54, change the design. The corridor does not have to have the same look and feel the entire way down.
- The most important issues to tackle are the ramps from NC-54 onto I-40 and 15-501.
- Air Quality is an issue to look at.
- There is no currently-planned rail connection from UNC main campus to North Campus. Rail connection is important between these two campuses and should be there.
- The transit circulation should not just focus on transportation people to Downtown Chapel Hill or UNC, but also to other UNC places.

Transit Focus Group

- A political will is necessary in order to tie down the details of the corridor legally. Then, leaders need to definitively say where the transit stops will be and need to take a stand to say that development will only happen when it supports transit.

- Transit operators and previous studies have spoken and the results are out there. HOV study has been done. The balance is when new technology is introduced too soon and is premature to the system.
- We should build the high-density infrastructure, let people incur the problem of traffic until they realize transit is the answer. We can't hold off on high-density just because the transportation support isn't there just yet.
- Developers have said they are willing to have dedicated transit as an interim solution.
- The problem with the traffic on the corridor is that it stems fro ma variety of trip destinations. Any transit network solutions has to be wider, and not just for the corridor.
- You should consider the job opportunities along the corridor and the entertainment options. Things like sporting events will impact how you develop the transit infrastructure. It needs to respond to the ever-changing schedule due to the University's game-day and other special events schedules, such as extending service routes and times.
- Walkable centers make sense.
- Land use is an issue, especially in surrounding areas such as RTP. If RTP becomes a little more residential and less commercial, it will impact the trips to and from Chapel Hill.
- Now is a good time to engage the transit system boards, but these boards are more advisory groups, not decision makers. The actual decision makers are the city councils, so it's important to get them on board.
- Currently, there is some coordination between the area's transit systems, but it could be better.
- One idea for coordination is some kind of transportation smart card system that allows people to use the same payment source for all area buses.
- Steve Spade is the director for a program currently underway to coordinate the TTA, CAT, Chapel Hill Transit, DATA, and Robertson buses – the schedules, the payments, and the routes.
- To encourage transit and attract choice riders, the system needs to be frequent and reliable.
- A measure of good frequency is to go between Durham and Chapel Hill in 30 minutes.
- Other important destinations are the airport and RTP.
- Express service between Durham and Chapel Hill is very important for the commuter, but transit service also needs to provide for stops along the way for residents and local travel. Both types of services are needed.
- 70% of people working in Chapel Hill are coming from Durham, thus a Durham connection is crucial.

- The new transit station in Durham is the ideal stop in Durham for the Durham connection.
- Express lanes for buses are a good idea.
- Besides service and routes, transit considerations must include the condition of the buses and the services offered on the buses.
- Density development should be part of the plane.
- Sidewalk infrastructure needs to be improved.
- The 54 corridor needs a connected bicycle/pedestrian path all the way down.
- Crossing 54 is difficult, and there are a few places where pedestrians may wish to cross: Barbee Chapel, Downing Creek, Falconbridge.
- Other structures for pedestrians may be bridges or underground passes.
- We need to determine what the ultimate character of the street is.
- You need to plan in sound barriers for when traffic increases.
- We are open to the idea of 54 changing character from one end to the other. It makes sense. And the floodplains and drainage swamps provide natural separation barriers for the change.
- 54 has to have mixed-used density in order to grow successfully.
- If you create a design that accommodates bike/ped where the path is set back from the road, it creates an aesthetic view.
- Consider bike park stops, separate from bus stops, to help bicyclers on long rides.
- Parks and Rec might be a good group to work with, because they might have ideas and funding for some of the bike/ped infrastructure.
- If you put the focus more on the connector roads and less on the one major arterial (54), you may open up more places for bike/ped to get around within the corridor.
- One participant brought up crime-rate issues with high-density development and asked if anyone else had mentioned it. The project team replied that no one had brought up crime.
- One participant said that another important issue is pinpointing which agency will have responsibility for roadway maintenance for express bus lanes.

Bicycle/Pedestrian Focus Group

- People would love to ride bikes from Durham to Chapel Hill if they were provided safe access.
- NCDOT does not speak willingly about bike/ped and has not embraced urban streets and bike lanes. The agency needs to acknowledge that streets are different and need to accommodate a wide variety of transportation vehicles.

- The 15-501 and NC-54 intersection is very dangerous and is not accommodating to bicyclists and pedestrians.
- One avid cyclist would rather go through other connector roads than try to bike along 54.
- The issue is how to get different modes to co-exist because each mode feels it is entitled to the right-of-way. The participant does not believe the modes can co-exist and feels that any bike path should be separate from the road.
- Need to look at the adopted trails and bike plan.
- Get Meadowmont trail system connected.
- I-40/NC-54 interchange is a huge problem.
- There is no road going north-south that is a good bike path unless you weave through the neighborhood roads.
- The neighborhood roads are very wide and feel safe. They would probably still feel safe even if traffic increased.
- With higher density along the corridor, one participant expressed concerns for transit service along 54.
- Have shoulders on secondary roads.
- Improve bike infrastructure with bike locks at stores and facilities or along the routes near transit stops.
- There is a concern that any widening of lanes brings increased speed and environmental impacts.
- The group agreed the corridor is not suitable for seniors because it is not a walkable area. While it may not be a problem for future centers to be walkable between one another, the centers themselves should be walkable.
- Need grade separated crossings (tunnels, overpasses, etc) and at-grade facilities.
- The pavement surface is an issue. Coming down 54 away from UNC, bikes have a difficult time riding on the road because of the sewer drains.
- Take the American Tobacco Trail and use that as a connector for bike ped, instead of trying to bring it down NC-54.
- Improve the bike/ped and transit connections – several neighborhoods are within 0.5 miles of the Friday Center, but because there isn't any transit service to those neighborhoods and NC-54 is too dangerous to bike/walk down, people drive that short distance to park at the Friday Center, thus contributing to the congestion on 54.
- Need a connection to Durham across I-40.

Business/Developer Focus Group

Travel on NC-54 Corridor:

- There have been lots of improvements to the NC-54 and Farrington intersection. It is now a lot easier getting in and out of the shopping center with the Shell gas station.
- However, further down NC-54, the traffic is very bad, especially the rush-hour traffic in the afternoon.
- The Barbee Chapel and Farrington Road alternative is popular, but the traffic there will get worse as more people use that alternative to 54.
- The roads parallel to 54 do not seem to impact the businesses at all – they just serve the neighborhoods.
- The park-and-ride lots, such as the one at the Friday Center, are part of the congestion problem on 54. Commuters using those park-and-ride lots are clogging up those arteries because they are still accessing 54. The park-and-ride lots keep traffic away from downtown and the University, but bring traffic onto 54. Especially in the afternoons, you see cars turning right out of the Friday Center, heading toward I-40 – this is where a huge bottleneck is. There should be park-and-ride lots for commuters coming from Durham, on 15-501, and perhaps even down I-40. This would reduce a lot of the traffic using the I-40/NC-54 intersection.

Development in the area:

- Any development down Farrington Road is going to impact 54. This should be considered in the scenarios.
- The study must pay attention to sites of high impact, such as the Glen Lennox development. The developers of Glen Lennox are open to different development ideas and would like to see what alternatives are developed.
- A concern is shopping centers and businesses maintaining direct access onto 54. When developing future scenarios, you cannot get rid of access to 54, like from Farrington Road.
- You should look at previous instances where development close to the main road hasn't reduced the amount of traffic on the road, but actually is creating more traffic problems. One example is the development at Barbee Chapel and NC-54.
- There is a market for walkable, mixed-used development in this area, according to some, but not all the developers.
- Glen Lennox developers are looking into a multi-modal development, although some developers feel it will not reduce the traffic impacts on 54, but increase them.
- To move toward multi-modal development, the area would need a strong mass transit system. Light rail might not be the answer, but definitely a bus system.
- Participants agreed that there is a significant market for age-friendly developments. However, there are barriers to overcome. Down Barbee Chapel, in the Downing Creek neighborhood, there is interest in non-automobile trips, but there is no bus

service down that neighborhood. Same with Greenbridge and downtown Carrboro. Furthermore, in an East-54 development, realtors and developers are having problems because the age-friendly developments are priced higher than "normal" development. To really have age-friendly developments, you need more reasonable prices and a good transportation system in place.

- There needs to be education about density-filled development. Teach citizens about examples like Detroit and ??

Alternative forms of transportation:

- Any light rail stations will impact 54.
- There is a lack of awareness about carpooling. Perhaps if HOV lanes were introduced, either on I-40 or even NC-54, people would be more aware of the benefits to carpooling.
- Participants agreed that an HOV lane of 54 might be well received by people.
- Area businesses have employees commuting from all over, including Hillsborough and Clayton. Employees may be more receptive to carpooling, but on a personal level, the commenter likes having her car available should emergencies arise.
- While some places are very bicycle-friendly, in other places in Chapel Hill, it is just not safe to bike or walk on the roads. This discrepancy across the area is not conducive to promoting bikability or walkability.
- Studies by a developer group has found that coupling trips with retail does not happen as much. The most obvious focus for transit should be work to home trips.
- The same developer has found that there is a big benefit to co-occupation parking in mixed-used developments.
- Erwin Road is now a very busy, straight road. It used to be frequented by bicycler commuters coming from Durham into Chapel Hill, but it is too dangerous to ride bikes on that road now. It needs a bike lane.

Funding Comments:

- One of the challenges to the area planning organizations and governments is how to connect and fund connections between Raleigh, Durham, and Chapel Hill.
- There is a bill being pushed in the General Assembly that would authorize a local half-cent sales tax dedicated to bus and rail service (HB 148 and SB 151). Several different organizations (asphalt folks, Sierra Club, Durham Chambers) were all behind the bill.
- You should get buy-in from the Home Builders Association for private road development because it's difficult and time-consuming to obtain funding from DOT or the state.
- Chapel Hill is heavily taxed, so any additional taxes will be a hard sell.

Miscellaneous Comments:

- It's hard to talk about impacts or the future if there isn't a plan to respond to.
- One option may be to force alternative transportation or restrict vehicular traffic to wean people off of driving.
- The study should who is using 54, is it mostly local residents or is it commuters? This may impact how development goes. If private roads are designed to discourage travel on NC-54, you may find pushback from neighborhoods who do not want thru-traffic on their streets.
- Is it possible to get another ramp onto I-40?
- At the intersection of 15-501 and NC-54, it's one lane. This makes traffic difficult in that area, which may be why so many people use 54 instead of continuing on 15-501. Perhaps if the lane was widened, more people would use 15-501.
- Cedars neighborhood across from Meadowmont is interested in pedestrian development.
- There is a limit to what you can require developers to do. One developer was required to put in a pedestrian bridge between a neighborhood and a shopping center and has not seen any use of the bridge. The developer does not feel that particular requirement was useful. However, if careful community input is considered and planning done to determine the most useful pedestrian crossing sites, developers may be open to them.
- Look at what the public tax-base benefits are. Money talks.
- Do an Origin and Destination study.
- Will you look at the air quality implications?
- Why has Triangle Transit reduced the number of stops? Has it also reduced the number of routes it offers?

<u>UNC Commuter Forum</u> (October 8, 2009)

- How can we get people to use TTA buses to reach Chapel Hill instead of filling up all the CHT and UNC Park & Ride lots? The NC 54 lot in particular is full by 7 or 7:30 most mornings (and the UNC Friday Center lots fill up shortly thereafter). Many of the people using these lots on 54 are coming from the 15-501 corridor (Durham), and would be better served by better transit service in that corridor. Building more park and ride lots is not necessarily the answer.
- Can try to divert some park and ride trips to the Eubanks Rd and Chatham County lots (which are less full). Peak hour headways on MLK bus routes are comparable to those on NC 54 (every 10 minutes)
- Chapel Hill Transit recently completed a 2035 Transit Plan – they are looking at the possibilities of improved bus service (perhaps even BRT) between UNC main campus and Carolina North – are there possibilities for this type of improvement in other corridors?

- UNC Student Government – need to address issues such as sprawl and smart growth. Requested PDF file of save the date cards, so they could be distributed at a Student Government event on Nov 16.
- Is it possible to use a separated lane for bus traffic along NC 54 (to remove the traffic conflict between cars and buses) – saw this in Philadelphia and it seemed to work well for both buses and cars
- UNC Public Safety – major issues at I-40 interchange with NC 54 (right lane traffic must merge over to left immediately on EB to EB ramp – causes backups on both I-40 and NC 54); 15-501 interchange also has backup problems (WB to SB and NB to EB). Lane drop on WB 54 after Farrington and on EB 54 after Barbee Chapel cause problems with people who either are unfamiliar or do not want to wait in line at light (turns into a drag strip).
- NC 54 also needs widening east of the study area, down to the Hope Valley/Southpoint area
- Section of NC 54 near Glen Lennox has too many signals, and is also in need of repaving

Workshop 1 Comments November 18, 2009

During Workshop 1, eight to 10 participants sat at each table. Following the presentation and map exercise, the participants were encouraged to discuss what they saw as priority issues, and develop a quick summary of the main issues that the study needed to address. The table below shows the summary priorities recorded by each table.

Table 1	• Limited amount can be accomplished by improving NC 54 • Future conditions and development outside the corridor (e.g. Carolina North) will determine the future of the corridor • Think about more I-40 interchanges • Park and rides should be away from interchange or there should be more lots
Table 2	• Bicycle/pedestrian/scooter/wheelchair lane from Farrington Road along collector lane to Meadowmont and into Chapel Hill • Safe all-purpose crossings along NC 54, from Farrington Road to 15-501 • Shopping street along "New Farrington" • "Town Center" along north side of NC 54 between existing Farrington and George King • Widen NC 54, but in balance with non-car uses • Exit to I-40 from existing north bridge • Bypass from Southern Village to 751 or Fayetteville Road
Table 3	• Green space near NC 54 • Alternate east-west routes both north and south of NC 54/I-40 • Employment near Barbee Chapel Road/NC 54, with shuttle to nearby transit stops • High-density residential around Leigh Village transit stop • Maximize pedestrian and bike access and trails • Additional access to I-40 between NC 54 and 15-501 • HOV on I-40 and lanes that change directions at peak times
Table 4	• Connect neighborhoods to reduce traffic • Relocate UNC Hospital to I-40/NC 54 intersection (near Transit Station 1) • Expand and complete network of off-road greenways and bike paths from "inner" NC 54 out to I-40 • Build southern east/west connector road to funnel Chatham traffic to I-40 – somewhere south of this project's study area
Table 5	• Increase road capacity and add access points (an exit off I-40 to Ephesus Church Road, change Barbee Chapel Road to 4 lane to take traffic off NC 54 heading into Chapel Hill) • Develop east side (Farrington Road side) of NC 54 with low density • Use express bus instead of rail. When relocating stops, use existing roads – don't build new tracks • Improve pedestrian/bike safety, perhaps by adding a lane? • Development close to UNC campus should be more mixed-use
Table 6	• Separate bike lanes from traffic lanes on NC 54 and connect the bike lanes to Meadowmont and beyond

	• HOV/express bus lanes added to NC 54 and I-40 • Village center high-density development around transit in ¼ mile – village center low density in ½ mile • Hospital center near golf course transit stop • Town center near elementary school/15-501 and NC 54 • Park and ride garages right off I-40 • More bike racks on buses and trains and connect bike lanes to transit stops • If there is increase in road capacity, then transit will be less likely
Table 7	• Density and mixed use at transit stops • Create neighborhoods and employment centers – places rather than stops • Hospital campus at the Friday Center and Barbee Chapel Road • More East 54-type development at NC 54/15-501 Bypass • Develop Southwest Durham Parkway/George King Road
Table 8	• Create outer loop from Jack Bennett Road to I-40 • Run rail along NC 54 – rail is essential • Preserve NC 54 and Farrington's full access • Consider sound barriers for residential areas along NC 54 • Consider 4 lanes for NC 54 from I-40 to 751
Table 9	• Build out George King Road to NC 54 before projected housing build. Do not collapse Meadowmont Lane and Barbee Chapel Road intersections (as was done to Farrington Road). • Move transit station closer to Farrington Road/I-40 for ingress/egress to I-40. This makes access easier to a park and ride at I-40/NC 54. • Make transit line parallel to NC 54 to gain economies of scale in bridge system over creek and Corps land on the way to Meadowmont station • Connect bike/ped trails between the neighborhoods: the Oaks, Meadowmont, Downing Creek, Falconbridge
Table 10	• Reduce number of cars on NC 54 with a park and ride lot closer to I-40 – have commuters exit off I-40 straight into the lot. This lot can also be a commercial/housing center as well. • Need 0.6 miles of pedestrian/bicycle crossing over the wetland • NC 54 as a "complete street" from at least Meadowmont to 15-501 (unclear step down I-40 to Meadowmont) • Protect the ability of residents of north neighborhoods to get through • Fix the I-40/NC 54 intersection • Need bike/ped crossing over NC 54 near Farrington Road • Need bus stops at the rusty signs on NC 54 at Falconbridge
Table 11	• Traffic through corridor is mainly off map • Alternate route from 15-501 to I-540 and RTP besides NC 54 • Connect roads through area for locals, so they can avoid NC 54 • Light rail is in the wrong place – it should go to Raleigh/RTP to relieve congestion • Funnel I-40 traffic off NC 54 using extra lanes, maybe toll roads, and cloverleaf intersection • Developers should pay for redirecting traffic, or development should be

	contingent on them to fund this • Some additional bike/ped paths
Table 12	• Preserve and protect Eastwood Park as a residential neighborhood. Add landscaping/walls/berms/whatever to isolate the neighborhood from NC 54. • Move the drainage ditch from between Celeste Circle and the NC 54 service road to the other side of NC 54 • Complete Southwest Durham Drive through Meadowmont Lane • Make NC 54 bike/ped friendly • Locate park and ride lot outside of the corridor (e.g. near 751 and I-40) • "Do not block intersection" sign eastbound on NC 54 at Huntingridge Road • Double-T intersection at Crossland/Huntingridge Road
Table 13	• Try to get traffic off NC 54 instead of accommodating it on NC 54 • Dense development near transit nodes: employment closer to the university, residential further out • Take Carolina North into consideration – make sure it is rail/transit accessible • No new interchange at Farrington Road – maintain low density residential there. Keep in mind that neighborhood is environmentally sensitive, historic, area where change is not anticipated (LDR), Creekside School, interchanges are points of congestion, transit node moved to south • Continuous bike lanes along NC 54 and a north-south connection • Usable green spaces by Leigh Farm Park, with some noise abatement • Accommodate Chatham County development and commuter traffic

Workshop 2 Comments February 25, 2010

The following sections summarize the comments that were provided by the workshop participants, as recorded on their group workbooks, which were given to each table and included a map and written description for each of the three scenarios and a list of questions for the participants to answer.

As might be expected, there was a diversity of opinion among the participants in the workshop. Relatively few tables noted any single one of the three scenarios as their preferred scenario, although a few did—more commonly, the participants noted aspects of all three scenarios that they liked or disliked. Some tables were able to arrive at consensus conclusions, while others were divided on many issues. The comments from Group 11 provide an excellent example of a divided group, where some participants preferred low-growth and others preferred high-density in support of transit. While there was not a unanimous consensus direction provided by the participants' comments, there are several themes that arise in many of the comments, including:

- Several comments are in favor of a new interchange on I-40 to serve the Leigh Village area and a re-located park-and-ride lot; however, almost all of them also note that this interchange should not be built in a way that would impact Leigh Farm Park. There are also several comments against a new interchange, due to the impact it would have on traffic and development in that area, and the potential impacts to the park.
- One common theme is that increased density could be problematic if light rail is not constructed; suggestions provided on how to address this include keeping development densities low, widening NC 54 in all alternatives, implementing improved bus service, and constructing an alternate route to serve Chatham County-to-RTP traffic. Some comments also acknowledge that additional density and worsened congestion conditions could help promote transit ridership.
- Several participants noted the need to address bottleneck intersections, such as those at I-40, Farrington Road, and US 15-501.
- Several participants noted that the proposed light rail system should serve Research Triangle Park, RDU Airport, and other points to the east. There was not consensus on whether the light-rail route should go through Meadowmont, as currently proposed, or should go along 54.
- Several comments were provided in favor of creating additional satellite park-and-ride lots at locations such as Leigh Village, Gateway Center, and Southpoint Mall.
- Many commenters were in favor of widening NC 54 to six lanes, some even thought it was needed for Scenario 2. However, some commenters were against widening NC 54, citing either the increased density it would bring or the need to improve other alternatives first.
- Multimodal accessibility concerns were prevalent, whether it was for support of regional light rail, BRT, an improved bus regional service, or the need to incorporate a bike/ped system that would adequately serve those users.

- Several commenters favored the collector street network, but some voiced an opinion against the Meadowmont Lane portion due to the close proximity to a school. An equal number supported improving travel options through that area.

Group Workbook Comments

Participants in the workshop were seated at one of fifteen tables, and each table was provided with a group workbook. In the first section of the workbook, the groups were asked to generally comment on the transportation and land use scenarios that were developed for the workshop, and were provided with a list of six questions to address for each scenario. These comments were not limited to group consensus comments, and could include individual comments. In the second section, participants were provided with a large matrix, where they could make comments regarding elements of each of the scenarios that they liked and disliked, comparing the scenarios to each other, and providing guidance on their preferred scenarios. In this second section, individuals were still welcome to write comments, but group consensus items were also noted, by highlighting these in a different color in the workbooks—in the tables below, these consensus items are noted with **bold** font.

Group 1

Comments on Trend	1. We don't feel this scenario addresses Workshop 1 issues because all it does is widen the highway. It doesn't address alternate transportation, and is a stopgap measure. 2. The land use – especially the predominance of single-family – is good. Too much commercial use would only add to the traffic. However, it also depends on the commercial type – if you have more residential, grocery-type/support stores, that means people need to drive more. 3. Growth in Orange County, which is slow, does not support the building of more offices. 4. We are not in favor of widening the highway because the gridlock is at the endpoints (15-501 and 40) and not on 54. Suggest bus "pull-offs" for loading/unloading on 54. 5. The amount of growth assumed in this scenario seems reasonable. 6. Like lower density. Dislike widening of highway idea.		
Comments on Scenario 1	1. Concerned that light rail can't go through this area due to topography. 2. Need more vegetation, especially in the mixed-use areas. 3. Keep higher density, smaller footprint around the transit hub. 4. BRT focus needed – concerned funding for light rail doesn't happen. The bus to light-rail linkage needs to be spelled out, other people won't be incentivized to use the light rail. Is there going to be any parking available at both ends of the light rail system? There needs to be. What does making 54 wider "do" in this scenario? BRT should be able to move the people, mitigating need for such a wide 54. 5. The growth assumptions aren't reasonable if there isn't money for light rail. However, light rail is the future, so if the planning doesn't "allow" for it, the region could lose out in the future. 6. Like mixed use. Dislike widening 54. Logical place for light rail is from Carrboro to Durham. Would rather keep development small around the base, not spread out.		
Comments on Scenario 2	1. Add bike lanes and ped crossings/paths concept to plans. 2. If BRT is fully developed, redeveloping close to the road makes sense. 4. Need to see how well the HOV lanes are used before expanding them. Need to clarify that there is direct access off I-40 to proposed Leigh Village park-and-ride for all vehicles – HOV lane and regular lane. 6. Like that park-and-ride traffic will bypass the 54/I-40 intersection, but not at the expense of any parking. Put a park-and-ride lot right off I-40 and connect it to light rail transit. Dislike taking any part of Leigh Farm Park for development. Dislike road widening because of pedestrian crossing impact. Want bike lanes as well as BRT.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns	Some in group want lowest density because they don't think the traffic problem can be solved to create space for high density.	Like mixed use.	Like mixed use.
Roadway Improvements to Existing Facilities			**Need to maintain full access at Farrington Road/54 (Does NCDOT have other plans?)**

New Roadway Construction			**Don't widen 54 – focus attention on improving other transit/transfer points.**
Bus Transit Service			**BRT going full length of 54 corridor.**
Park-and-Ride Facilities			**Like moving park-and-ride away from Friday Center, but with sensitivity to existing park-and-ride. Also, make sure it is adequate to meet demand.**
Light Rail Transit		Concerned that light rail will not come through – need to run scenarios that would not be dependent/would be viable if light rail didn't happen.	Concerned that light rail will not come through – need to run scenarios that would not be dependent/would be viable if light rail didn't happen.
Bike/Ped Network	**Not addressed on maps. We want them directly addressed in all the visual presentations/maps.**	**Not addressed on maps. We want them directly addressed in all the visual presentations/maps.**	**Not addressed on maps. We want them directly addressed in all the visual presentations/maps.**
What elements are absolutely essential for the preferred scenario?	**Need to address physical intersections of I-40 at 54 and 15-501 to tackle the bottlenecks.** **Pedestrian/bike/BRT.**	**Need to address physical intersections of I-40 at 54 and 15-501 to tackle the bottlenecks.** **Pedestrian/bike/BRT.**	**Need to address physical intersections of I-40 at 54 and 15-501 to tackle the bottlenecks.** **Pedestrian/bike/BRT.**

Group 2

Comments on Trend	1. This scenario does address workshop 1 issues. 6 lanes from Barbee to 40 going west is ok. 2. Prefer density development in downtown Chapel Hill rather than at Leigh Station or along the corridor. 3. More housing. 4. What are the transportation improvements in downtown Chapel Hill? 5. The growth assumptions are probably too low. 6. Widening 54 to 6 lanes will result in the loss of a significant part of Oaks Condominium property. This scenario stops at the Durham County line? Potential bottleneck at Chapel Hill/Orange County line.		
Comments on Scenario 1	1. Any express bus stop along the corridor? 2. The land use and development patterns in this corridor are reasonable and likely. 3. Density seems appropriate. Concerned about increasing density along this already over-used corridor. 4. Want light rail into downtown Chapel Hill, to DPAC, Durham Bulls Stadium, American Tobacco, Duke, RDU, Central University 5. Growth assumptions are reasonable. 6. Like collector street network. Dislike widening 54 to 6 lanes – need clarify about flow of traffic through the corridor. Dislike light rail through Meadowmont – realign along 54. If you do this, will you still need to widen 54?		
Comments on Scenario 2	1. To increase density to increase light rail, consider downtown Chapel Hill in the mix. 2. Concerns about the safety of a light rail terminal so close to Glenwood School. Keep Glen Lennox residential. 3. High density development should only be allowed with the guarantee of light rail. 4. Like collector street plan. Like additional exit off I-40. Want 6 lane 54 even with light rail. 5. Move light rail realignment along 54/George King – not Meadowmont Lane. (not everyone agrees) 6. Like 3 new park-and-rides to disperse traffic. Like Leigh Park interchange, but preserve park if possible. Concerns with additional development at Friday Center.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
		Widen NC-54 to six lanes but to Orange/Durham county line only. **Complete connector street network, but not Meadowmont lane if arterial.**	**Instead of removing the park-and-ride facility at Friday Center, disperse it in ways to decrease 54 traffic.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households		**Reduce density and no light rail.**	**Higher density only if light rail is guaranteed.**
Development Patterns			
Roadway Improvements to Existing Facilities		**Like collector street network to be only two lanes whenever possible.**	**Additional interchange is a good idea.** **Try to preserve Leigh Park.**

New Roadway Construction		**Do not widen 54 beyond Orange County line.**	
Bus Transit Service			
Park-and-Ride Facilities			**Disperse park-and-ride in ways that reduce traffic on 54.**
Light Rail Transit		**Consider alternate route for light rail.**	
Bike/Ped Network		**Bike/walk along corridor.**	
What elements are absolutely essential for the preferred scenario?	**Enlarge green space.** **Decrease impact on air/noise/water.**	**Decrease impact on air/noise/water.**	**Less traffic congestion on 54.**

Group 3

Comments on Trend	1. Does not address: safety issues along 54, zoning land use, funnel-flow not on Farrington and exits 273A and B, tax base increase or change in Orange County (i.e. maintains status quo). 2. More commercial in Orange County. Not realistic land use and development patterns. 3. Need higher density. 4. Transportation improvements don't fit scenario. 5. Growth assumptions are not reasonable. 6. Not a realistic scenario.		
Comments on Scenario 1	1. Better than trend. Does not address: congestion at 273A and B off I-40 (suggest ramp from I-40 exit 273A over I-40 and straight to park-and-ride at Leigh Village and suggest vertical separation of BRT at 54 intersection) and bringing enough commercial development to Chapel Hill (increase mixed use and density). 2. Not dense enough in this area. Move Finley Golf Course to Carolina North and turn into walkable dense use – "mixed" and green space. 3. More commercial, especially in Orange County. 4. Bus system needs to match LRTP. Grade separation along 54. 5. All scenarios too low in population and jobs. 6. Doesn't fix Farrington Road to I-40 funnel. Six lanes on 54 won't solve problem. 54 grade separation might be a solution for some scenarios.		
Comments on Scenario 2	1. This scenario is best of the three. Move ramp from east side of I-40 to west side, at proposed Leigh Village. Avoid sensitive area. 2. Free up Finley Golf Course for other uses. Modest density, mixed use, transport. 3. Utilize 2010 census in future plans, or amend plan once census data is available. 4. Match bus system to LRP stop. Consider grade variances on 54. Consider overhead and underground ramps north-south 54 (i.e., Meadowmont) 4. HOV flyover ramp makes sense. 5. Most reasonable growth scenario – still probably too low. 6. Like ramp to/from I-40. Move ramp (HOV only) north or south or to other side of I-40 if necessary to preserve park. Consider schools in park. Make park more accessible.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
			Preferred scenario, provided development tempered with adequate transportation infrastructure. **Consider telecommuting.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households	**Low**	**Low**	**Best option.**
Development Patterns		**Premature**	**Best option, but premature and communications increase land use planning with citizens.**

Roadway Improvements to Existing Facilities			**No 54 widening.**
New Roadway Construction			
Bus Transit Service	**Work with LRTP**	**Work with LRTP**	**Work with LRTP**
Park-and-Ride Facilities			**Best option**
Light Rail Transit		**Put transit in place to meet density increase.**	**Best option – optimal transit (BRT/light rail) must be in place for this scenario to happen.**
Bike/Ped Network			**Didn't see bicycle network.**
What elements are absolutely essential for the preferred scenario?			**HOV flyover and ramp to I-40.** **Overpasses and underpasses on NC-54 and North-South interchanges.**

Group 4

Comments on Trend	Need on ramp at I-40 and Leigh Village. 1. Does not address workshop 1 issues at all. Removes some traffic off 54 but, increases volume on 54 to accommodate growth and may move congestion to other hot points. 2. Low density may be desired, but as a long-term solution, it's impractical.		
Comments on Scenario 1	3. Utilize vertical mixed use along 54 corridor. Higher density along 54 and lower away from it. Better balance than trend scenario. A lot of green pockets to hide high density growth. 4. Still need new southern transit routes (North Chatham/Southern Orange). Early and late schedules are needed or rail/bus will not help UNC Hospital needs. Transportation improvement don't fit scenario. 75% of traffic on 54 is transit (passing through). There must be no increase in traffic lights. Focus on bottlenecks (40 and Farrington). Coordinate traffic lights. 5. Growth assumptions on Durham side seem reasonable. On Chapel Hill side, there is more high density not reflected in the study area (i.e., Carolina North). 6. Like light rail and may allow non-drivers to move in or access UNC/businesses, etc. Dislike that it changes the complexion of the neighborhoods/area.		
Comments on Scenario 2	2. Mixed use at Meadowmont too far from transit station. 3. Vertical mixed use/high density is good. Force mixed use. 4. No new interchange at designated location (ridiculous). No interchange period – utilize existing 54 and 15-501 efficiency. Move interchange to Farrington Road. Need southern access to 40 from south Orange County/north Chatham county. 5. Growth assumptions reasonable fro Durham. More growth expected in Chapel Hill outside study area. 6. Dislike that it negatively changes complexion of community neighborhoods.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
		Look at not 6 lanes to add light rail/bus usage	Need southern route to I-40 from north Chatham/south Orange county to reduce 54 through traffic. No new interchange on I-40 where proposed. Does not preserve older neighborhoods (i.e., Glen Lennox). Revisit North Chatham Parkway. Look at adding 6 lanes to 54.
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	This group did not choose a preferred scenario – they evaluated if the elements presented for each scenario worked for that scenario.		
Growth in Jobs & Households	**Chapel Hill/Orange County growth, jobs, and development not reflect in balance with North Chatham.**	**Chapel Hill/Orange County growth, jobs, and development not reflect in balance with North Chatham.**	**Chapel Hill/Orange County growth, jobs, and development not reflect in balance with North Chatham.**
Development Patterns	Some feel too low density, others feel too high density.	Some feel too low density, others feel too high density.	Some feel too low density, others feel too high density.

Roadway Improvements to Existing Facilities	**Fits with scenario presented.**	**Fits with scenario presented.**	**Fits with scenario presented.**
New Roadway Construction	**Fits with scenario presented.**	**Fits with scenario presented.**	**Like the I-40 interchange location.**
Bus Transit Service	**Fits with scenario presented.**	**Fits with scenario presented.**	**Fits with scenario presented.**
Park-and-Ride Facilities	**Fits with scenario presented.**	**Fits with scenario presented.**	**Fits with scenario presented.**
Light Rail Transit		**Must go to RTP/RDU or it will be a "bridge to nowhere."**	**Must go to RTP/RDU or it will be a "bridge to nowhere."**
Bike/Ped Network	**Fits with scenario presented.**	**Fits with scenario presented.**	**Fits with scenario presented.**
What elements are absolutely essential for the preferred scenario?	**Fit with surrounding development outside scope of plans – need to place plan in larger context.** **Aesthetics/Noise considerations.** **Bicycle/Pedestrian considerations.**	**Fit with surrounding development outside scope of plans – need to place plan in larger context.** **Aesthetics/Noise considerations.** **Bicycle/Pedestrian considerations.**	**Fit with surrounding development outside scope of plans – need to place plan in larger context.** **Aesthetics/Noise considerations.** **Bicycle/Pedestrian considerations.**

Group 5

Comments on Trend	Maintain tree canopy and existing roads in Glen Lennox. 1. Present infrastructure ignored by current collector street proposal. Will infrastructure be moved to fit Leigh Village? It appears proposed collector streets are there to accommodate Leigh Village. 2. Many "yellow" areas will be much denser – not realistic. 3. Celeste Circle should be commercial. 4. Collector streets don't connect well to 54. Where will the lights be? Too many to work? These transportation improvements do nothing to fix double left turn lanes at Friday Center (which are underutilized). Traffic from Barbee Chapel left to Chapel Hill is not addressed. Consider extra lane on Barbee Chapel for Chatham traffic. Widen Farrington? Why not route Falconbridge homeowners over to Farrington Road? 5. Several single family areas likely to be much lighter density than shown on plan (i.e., much shown as single family is currently commercial). 6. Don't understand what's really changing. Dislike that it's not an accurate starting point. Bradford Place is residential condos, not office. Yellow spot on Barbee Chapel is already rezoned for townhouses, not single family.
Comments on Scenario 1	1. Existing infrastructure ignored (traffic lights, etc). 2. Hamilton Road construction area a mess. It should remain residential. 3. Land use types are more realistic than trend, but no consensus in group whether this is good or bad. Glen Lennox as mixed-use is inconsistent with probable designation as NCD. 4. No good access from built up Hamilton Road area. 4 lanes on Barbee Chapel to support higher density. Can we handle peak load? Collector road connections to 54 still not addressed. 5. Some like high density growth assumptions along 54. Others will like Woodmont will be the final straw in traffic failure on 54. 6. How to get to transit stop at Leigh Village. Need to pull park-and-ride off 54.
Comments on Scenario 2	1. With Woodmont increasing traffic, you are not addressing traffic issue between 40 and Barbee Chapel. But still need to widen 54 to 6 lanes. Collectors to 54 continue to ignore existing infrastructure. 2. Sherwood Forest is not likely to sell out any time soon. Glen Lennox as apartment/condo is overdevelopment that is inconsistent with probable designation as NCD. 4. School traffic is challenging with HOV placement, although additional I-40 access is a good idea between exits 270 and 273 towards Farrington Bridge. 6. Like park-and-ride relocations, HOV lanes, and new I-40 interchange, but don't impact Leigh Park. **Other suggestion: Toll road on 54 with nearby free ride for local traffic and higher toll at peak hours –to encourage the use of transit and encourage off-set traffic schedules for mixed use areas.**

Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	Like widening 54 to 6 lanes.	**Like widening 54 to 6 lanes.** **Like increasing bus service frequency and using express buses or BRT.** **Like a structure park-and-ride facility at the Friday Center.** **Like light rail system plans.**	**Like HOV lanes on 40.** **Like new park-and-ride facilities but keep Friday Center lot.** **Highway 54 must be widened.** **Don't or limit impact to Leigh Farm Park.**

		Collector streets using current infrastructure is not addressed. Cannot leave 4 traffic lights in small area.	**New ramp only if minimal impact to Leigh Farm Park.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households		**These are realistic.**	**These are realistic.**
Development Patterns			**Don't go more than 3-ish stories next to road, but higher is ok if it's bigger setbacks. Stair-stepping the layers is ok. Need light next to road. 54 East too close to road.** **Consider pedestrian aesthetics.**
Roadway Improvements to Existing Facilities			
New Roadway Construction	**Like widening 54.** **Don't like collector road.**	**Like widening 54.** **Don't like collector road.**	
Bus Transit Service			
Park-and-Ride Facilities		**Like**	
Light Rail Transit		**Like**	
Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?		**Widen 54.** **Revisit Collector Road plan.**	

Group 6

Comments on Trend	2. Woodmont Development is not really mixed use, it is office. 4. Widening 54 to Page helped relieve 40. What is the main purpose of SW Durham Drive becoming a new collector street?		
Comments on Scenario 1	2. Mixed use designation by the light rail station across from Meadowmont is wrong. 3. More density around transit stations. 4. 15-501 bus/express lanes should be curb-guided. Transit stops are too close together. Stagecoach and Barbee Chapel as collector streets. Need to improve I-40-54 interchange, perhaps by widening that intersection by 2 lanes. Light rail should go to RTP/RDU, not to Durham. Express bus along 15-501. 6. Dislike light rail going through Meadowmont.		
Comments on Scenario 2	Group preferred this scenario. 3. More density around transit stations. 4. Leigh Village park-and-ride too far from transit station. Should still widen 54 to 6 lanes. Move fly-over closer to transit station. Rail should be along 54. Barbee and Stagecoach road as collector streets.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
		Eliminate park-and-ride at Friday Center and put a large park-and-ride lot at Leigh Village.	**Like removing Friday Center park-and-ride and putting one at Leigh Village.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households	**Don't pressure University growth at Friday Center.**		
Development Patterns	**We think they are slightly over-stated in the highest level scenario.** **Consider sound and vision barriers at the waterfowl compound.**		

Roadway Improvements to Existing Facilities	**We are unified in all scenarios that:** **1. Light rail should go along the 54 corridor and to RTP, Raleigh, and Durham.** **2. Route to Durham should be on curb-guided buses up the 15-501 corridor to places in Durham that we use (Brightleaf, Tobacco, etc).** **3. Widen 54 to 6 lanes or more.** **4. Allow flyover access to a park-and-ride at Leigh Village, but move it to not affect Leigh Farm Park.** **5. Improve Farrington Road/Stage Coach/Barbee Chapel to collector streets. Important, especially for emergencies.**		
New Roadway Construction			
Bus Transit Service	**Improve service to Durham up 15-501 corridor.**		
Park-and-Ride Facilities	**Expand at Leigh Village and the flyover from I-40.**		
Light Rail Transit			
Bike/Ped Network	**They are good.**		
What elements are absolutely essential for the preferred scenario?	**Rail goes to RTP and Raleigh.** **Widen the roads.** **Park-and-ride at Leigh Village.**		

Group 7

Comments on Trend	1. Safety issues not addressed. M & M not addressed. Congestion – relieves some congestion at Pinehurst and Ephesus Church Road. Intersections – not clear how they are addressed. Could cause bigger problems. (Widening 54 might help in the short-term.) Environmental preservation – increases traffic flow, but also increases traffic (long-term negative) 2. Too much residential, not enough mixed use.		
Comments on Scenario 1	2. Makes the 54/I-40 interchange problem worse. 4. Improved transit (light rail and express bus), but no parking facilities to support. Park-and-ride facilities should be available on edge of corridor and east side of I-40. Bus service should be seamless and integrated between Chapel Hill and Durham. 6. Like additional busing and light rail. Dislike that the scenario does not adequately reduce congestion at I-40/54 interchange.		
Comments on Scenario 2	2. One person does not like high density because it will add to traffic on 54. 6. Concerns about the location of the interchange for I-40. There is a need for additional access to I-40.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns	**Too much residential. Need higher mixed-use ratio.**	**Has a more-balanced mixed use plan.**	**Excessive density, which could force scenario to acquire light rail funds.**
Roadway Improvements to Existing Facilities		**Pedestrian crossings needed at Farrington Road/I-40 intersection.**	**Pedestrian crossings needed at Farrington Road/I-40 intersection.**
New Roadway Construction			
Bus Transit Service	**Integrate bus between Chapel Hill, Durham, and Southpoint.**	**Integrate bus between Chapel Hill, Durham, and Southpoint.**	**Integrate bus between Chapel Hill, Durham, and Southpoint.**
Park-and-Ride Facilities	**Move park-and-ride outside of 54 corridor.** **Access facilities from 40.**	**Move park-and-ride outside of 54 corridor.** **Access facilities from 40.**	**Move park-and-ride outside of 54 corridor.** **Access facilities from 40.**
Light Rail Transit		**Light rail needs to connect to RDU and RBC Center.** **Connect light rail to buses to RTP businesses.**	Light rail needs to connect to RDU and RBC Center. Connect light rail to buses to RTP businesses.
Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?		**Proactive work with business on flex hours.** **Easy access to 40.** **Alternate access to 50.** **6 lanes on 54.**	Proactive work with business on flex hours. Easy access to 40. Alternate access to 50. 6 lanes on 54.

Group 8

Comments on Trend	1. Deals with congestion via 6 lanes on 54 and collector street network. 6 lanes with status quo design makes pedestrian safety less likely. Multi-modal, but it makes no apparent improvement. 2. Architects = boring. Build-out perpetuates 3. Architects = not enough employment opportunities and not enough opportunities for mix use or density. Not enough mix. 4. Not enough internal connectors.		
Comments on Scenario 1	1. Congestion – Not addressed very well. Park-and-ride needs to be moved east of Friday Center. 4. Land use patterns not dense enough to support light rail investment. 5. Growth assumptions not reasonable when compared to the proposed investment. 6. Like light rail, express bus lanes, and TND plan at Leigh Village. Dislike park-and-ride location and light rail's limited destinations.		
Comments on Scenario 2	1. Addresses congestion issue. 4. Why not widen 54? 5. Growth assumptions reasonable with rail. 6. Like that it uses densities supportive of transit, more walkable communities, and redistribution of park-and-ride with express bus service. Dislike that Meadowmont's density is not enough for a light rail stop.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	This scenario pushes the congestion problem "down the road" and is not a solution.	**Seems odd that carpools are 30% and all transit maximum is only 4%.** **Adding/Moving park and ride east of outside the 54/40 interchange is good.** **Not dense enough to take advantage of rail – need scenario 2 density.**	
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns		**Not dense enough to work with transit. Must occur in step with development.**	
Roadway Improvements to Existing Facilities			
New Roadway Construction		**Inevitable.** **Needs to be funded.**	
Bus Transit Service		**Can support density before light rail is available.**	

Park-and-Ride Facilities	**OK**	**OK**	**Better location in Scenario 2.**
Light Rail Transit			**Needs to include RTP/RDU.**
Bike/Ped Network	**Yes**	**Yes**	**Yes**
What elements are absolutely essential for the preferred scenario?	**Must enhance I-40/54 interchange.**	**Must enhance I-40/54 interchange.**	**Must enhance I-40/54 interchange.**

Group 9

Comments on Trend	1. Pretty well, but even this option is too dense. 2. Eliminate commercial development at Farrington/I-40 bridge near Ephesus Church Road. 3. More low density residential. 4. Transportation improvements fit the scenario. Do not like connector from Farrington to Nottingham. HOV and 54 widening are enough; HOV is actually overkill. 5. Growth assumptions are reasonable. 6. Like lower densities and no negative impact on Leigh Farm Park. Dislike major sites of community importance, like Creekside School and Leigh Farm Park are not noted on the map.		
Comments on Scenario 1	1. Not well, light rail requires densities that are inappropriate. If light rail occurs, it should follow 15-501, between Durham and Chapel Hill. 2. Land use and development patterns are too dense. 3. Land use types are too dense. 4. Eliminate light rail. 5. Growth assumptions are overly high for an environmentally sensitive area. 6. Dislike impact of Chapel Hill-driven agenda that is forcing high densities onto Durham and that Leigh Farm Park and Creekside School are not noted on map.		
Comments on Scenario 2	1. Doesn't address workshop 1 issues at all. 2. Land use and development patterns too dense in the extreme. 3. Land use types too dense. 4. Scenario is inappropriate. 5. Growth assumptions far overblown. 6. Dislike that Leigh Farm Park not noted and the interchange on top of Leigh Farm Park.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Preferred Elements	**Trend Scenario <u>(B)</u>**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households	**Like**		
Development Patterns	**Like**		
Roadway Improvements to Existing Facilities	**Like**		
New Roadway Construction	**Like**		
Bus Transit Service	**Like**		
Park-and-Ride Facilities	**Like**		
Light Rail Transit	**No – the densities required are detrimental**		

Bike/Ped Network	**Like**		
What elements are absolutely essential for the preferred scenario?	**Protect and preserve Leigh Farm Park.** **Cut SW Durham Drive through to Meadowmont.** **Park-and-ride remains at Friday Center – build decks to use less land.** **No interchange on Farrington between 54 and 15-501.** **Widen 54.**		

Group 10

Comments on Trend	**Does not address thru traffic from Chatham County.** 2. Concerns about Southwest Drive. Land use and development patterns not optimal because goes through existing development. Development is big enough to support investment, but must ensure infrastructure. 3. Some mixed use in undeveloped areas. 4. Invariably more cars. 5. Some say growth assumptions are reasonable, others say not. 6. Like single family density. Dislike lack of mixed use.		
Comments on Scenario 1	**1. Does not address thru traffic from Chatham County. Rail works for UNC and Duke, but not east-west to RTP. None of the themes, issues, and opportunities from Workshop 1.** 2. Soft edit for high density development "density gradient" – concern with impact on lakes. Disagreement on whether high density can protect water quality. Concern about low price housing. **4. Bus transportation is good. Concerned about strip development.** Transit stops are too close.		
Comments on Scenario 2	**Does not address thru traffic from Chatham County.** **3. Problem with building up to get transit dollars. If we don't get it, then you are stuck in traffic.** **6. Dislike interchange's Leigh Farm impact. Protect New Hope Corridor – Ephesus Church to Jordan High School is not safe. Additional park-and-ride lots are good. Significantly more congestion.**		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
		Like completing the collector street network. **Like express bus or BRT options.** **Like changing Friday Center park-and-ride into a structure facility.**	**Like removing the Friday Center park-and-ride and adding 3 new facilities.** **Building light rail system is necessary to find out how to make transit work.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns			
Roadway Improvements to Existing Facilities			
New Roadway Construction			
Bus Transit Service			
Park-and-Ride Facilities			
Light Rail Transit		**Need train first – then development.**	

Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?			

Group 11

Comments on Trend	4. Transportation improvements do fit the scenario. 5. Growth assumptions, as minimal growth, are reasonable.		
Comments on Scenario 1	1. This alternative fairly addresses workshop 1 issues. 2. Land use and development patterns viewed as favorable. Would like to see slow growth. 3. Commercial and office mixed use ok. 4. Transportation improvements do fit the scenario. 5. I would prefer to have low density single family housing. We want density to support light rail. 6. Like that scenario supports light rail.		
Comments on Scenario 2	1. Moves beyond workshop 1 issues – as it should. Goes too far past workshop 1 issues – as it should not. 2. Land use and development patterns fit with transit community. Land use and development patterns are too much development. 2. Too much park areas. Too much development. 3. Some think density is too high. 4. Without 54 widening, the improvements do not fit the scenario. 5. Disagreement on whether growth assumptions are reasonable. 6. Like density as it supports transit plan. Dislike overdevelopment of area.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Preferred Elements	**Trend Scenario <u>(B)</u>** 2 prefer this	**Scenario 1** 3 prefer this	**Scenario 2**
Growth in Jobs & Households	*Reasonable growth.*	*Reasonable growth.*	
Development Patterns	*Reasonable mix.*	*Reasonable mix.*	
Roadway Improvements to Existing Facilities	*Need roadway improvements.*	*Need roadway improvements.*	
New Roadway Construction	*Collectors only.*	*Collectors only.*	
Bus Transit Service	*Important*	*Important*	
Park-and-Ride Facilities	*Ok and necessary.*	*Ok and necessary.*	
Light Rail Transit			
Bike/Ped Network	*Very important.*	*Very important.*	
What elements are absolutely essential for the preferred scenario?			

Group 12

Comments on Trend	1. Would prefer 54 to stay 4 lanes to reduce VMT and to encourage development of light rail. 3. Offices on Farrington Road will exacerbate traffic problems at the intersection with 54. 4. Fits every scenario like SW Durham Drive and other Durham connectors. What provisions are made to make the roads acceptable for public transportation/buses? 5. I think this is on the low end for 2035. 6. Like that it keeps Eastwood Park residential. Leaves congestion at stoplights, especially around Falconbridge Road and I-40.		
Comments on Scenario 1	2. Intense development makes 54/I-40 interchange worse. Traffic lights increase congestion. 4. Transportation improvements help, but traffic will still get worse, especially at intersections (54-Farrington-40). 5. Growth should be predicated upon first constructing the traffic infrastructure. 6. Like commercial near light rail station in Leigh Village and like Meadowmont lane. Dislike that Eastwood Park becomes commercial; it should stay residential. Need park-and-ride on 751 near I-40/54		
Comments on Scenario 2	3. Place commercial around light rail rather than around 54 to encourage use of rail vs. more strip malls and drive-thrus. 4. The transportation improvements help but still will probably have traffic congestion, especially at intersections. Need to improve intersections. 5. Would like to have road/rail infrastructure first, then if there is capacity, development. 6. Like satellite parking-and-ride, especially at 751. Dislike Eastwood Park as commercial, keep residential.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns			
Roadway Improvements to Existing Facilities			**Farrington/54 interchange.**
New Roadway Construction	**Complete all connectors.**	**Complete all connectors.**	**Limited or no impact on Leigh Farms park.**
Bus Transit Service			**More TTA.**
Park-and-Ride Facilities			**Keep the new park-and-ride lots in the plan. They are important and efficient, especially important is the 751/54 lot.**
Light Rail Transit			**We like the most intense ridership and policies that promote it in this scenario.**

Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?	**Keep Eastwood Park residential area.** No more mixed-use development on 54 unless light rail station is nearby.	**Keep Eastwood Park residential area.**	**Keep Eastwood Park residential area.**

Group 13

Comments on Trend	**2. Avoid Meadowmont Lane.** Preserve Glen Lennox. Keep low density **4. Move SW Durham Drive to George King – along UNC land. Need LRT.** More park-and-ride lots. 5. Growth assumptions reasonable, but it single family realistic east of Barbee Chapel? 6. Like that it is the lowest increase.		
Comments on Scenario 1	2. Dense 3. More housing/development on Farrington will be a problem. **4. If density does happen, light rail will be needed.** Eliminate Meadowmont transit station and enhance the station across from it. 6. Light rail routes need work.		
Comments on Scenario 2	1. Development is too dense and unsustainable. 2. Running out of resources. Do not disturb existing Glen Lennox neighborhood. 3. Development work/live scenarios 4. Transportation improvements fit scenarios only if light rail/bus happens. Avoid a Farrington/I-40 interchange. There's no parking land available at the proposed Meadowmont transit stop. 5. Growth assumptions are not sustainable. 6. Like light rail. Dislike I-40/Farrington exchange in Leigh Farm Park.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	Yes to LRT – put in. **No to widening 54.** **Friday Center park-and-ride stays.** **Add park-and-ride at I-40/54 interchange.**	**Do not widen 54.** **Yes to more mass transit.**	**Like focusing transportation investments on providing additional capacity through a variety of modes, not just on roadway.** **No Leigh Village ramps.** **No 54 widening.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households	**YES**		**Unsustainable**
Development Patterns	**YES**		**Unsustainable**
Roadway Improvements to Existing Facilities			**Unsustainable**
New Roadway Construction	**No widening 54.**		**Unsustainable** **No road down Meadowmont Lane.**
Bus Transit Service		**YES**	**Unsustainable**
Park-and-Ride Facilities		**YES**	**Unsustainable**
Light Rail Transit		**YES**	

Bike/Ped Network	**?**	**?**	**?**
What elements are absolutely essential for the preferred scenario?	**LRT**		

Group 14

Comments on Trend	1. Does not meet any workshop 1 issues. 6. Like single family development, green space preservation, no additional I-40 interchange on Farrington. Dislike additional development		
Comments on Scenario 1	6. Like no additional I-40 interchange on Farrington, light rail, and walkable community. But dislike that the communities are less dense.		
Comments on Scenario 2	6. Like that scenario encourages mass transit. Dislike that it relies on development of Leigh Village and no other scenarios of other transit stops, that the newly created I-40 interchange destroys part of Leigh Farm Park, and that there's no adjustment to Farrington/54 interchange to respond to the increased traffic volume from Leigh Village.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	Like widening 54 to 6 lines. Turn I-40 to business I-40 and build by-pass around area. Connectors need to go from 54 to Ephesus Church.	**Like park-and-ride lot at the Friday Center becoming a structure facility.** **Like the light rail system plan, except do not increase development at Leigh Village.** Leigh Village cannot be dense – the schooling is not adequate to support.	**Like express buses.** **Like Gateway Center and Southpoint Mall park-and-ride lots.** **Preserve Leigh Farm Park at all costs.** **Unfair development burden on Durham County.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs & Households			
Development Patterns			
Roadway Improvements to Existing Facilities			
New Roadway Construction			
Bus Transit Service			
Park-and-Ride Facilities			
Light Rail Transit			
Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?			

Group 15

Comments on Trend	2. This is a "business-as-usual" vision. Does not take advantage of the strategic location of Leigh Village to accommodate growth in the area between Durham and Chapel Hill. 3. Seems like there are more jobs being added via mixed-use development. Development likely to be very slow due to the high cost of infrastructure (Water and sewer) with little incentive, if there's low density residential. 4. Improvements come short – already have problems at I-40/54 interchange. 54 and Farrington Road will not handle increased commuter traffic and the intersection of Farrington, 54, and I-40 are currently inadequate for increased commuter traffic. 5. Scale of growth is unreasonable – numbers are too conservative. 6. Like low density and residential vision.		
Comments on Scenario 1	2. Like the walkable, small grid around the light rail nodes. 3. Mixed use center on both sides of 54 should be better integrated into light rail path. 4. Need to figure out southern connection to Farrington Road across 54. Currently, it appears to route through residential streets. Meadowmont Lane extension could become dangerous due to increased traffic through the residential area. New collector streets through Meadowmont will become very burdened by traffic from light rail node traffic moving toward Chapel Hill. Widening 54 is a necessity, especially if collector streets are dumping traffic onto 54. If Farrington Road is still a major artery (collector streets dumping traffic onto it), then the Farrington/54 intersection must be improved. A second access from Farrington to 40 is needed close to Trenton Ro. Seems this scenario is trying to use both rail transit and improve highways for cars and buses – in which case, highways will win and rail will be under-utilized. 5. Growth assumptions are reasonable. Population density may not be such that it would justify rail transit unless at the high end. 6. Like path of light rail.		
Comments on Scenario 2	3. Near Leigh Village, more density towards the transit station, so greenspace can be preserved. Potential for more high-tech businesses, medical facilities. 4. Not happy with I-40 flyover and cloverleaf (half). Do not want Leigh Park land used for this. Extension of Meadowmont to SW Durham Drive will reroute traffic from I-40 through Meadowmont, past school, in order to avoid congestion on 54 (especially when only 4 lanes). Creating a new interchange opens up more problems than it solves. What about transit access near the Friday Center? A second intersection of Farrington Rd and 40 at Trenton Road would really help relieve traffic on 54, especially if you keep 54 at 4 lanes. More park-and-rides are good, especially close to the transit station, but it could be north of the transit station and accessible from both Farrington/54 intersection and my proposed new intersection at Trenton Rd. This may eliminate the need for fly-over access and reduce impact on Leigh Park.		
Scenario Comparison Statements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
	Passing through traffic on SW Durham Drive through Meadowmont (passes by school) concerns us in all scenarios.	**Passing through traffic on SW Durham Drive through Meadowmont (passes by school) concerns us in all scenarios.**	**Consider widening 54 even in this scenario.** **Passing through traffic on SW Durham Drive through Meadowmont (passes by school) concerns us in all scenarios.**
Preferred Elements	**Trend Scenario**	**Scenario 1**	**Scenario 2**
Growth in Jobs &		Like	

Households			
Development Patterns		Like, but mixed-use around Friday Center lacks access.	
Roadway Improvements to Existing Facilities		**Durham Drive/Meadowmont pass through traffic a concern (narrow street?).**	
New Roadway Construction		Parallel roadway to move cars from 15-501 S to I-40 for the cars that don't stop on 54.	**Like HOV lanes on I-40.** **Don't like new exit.**
Bus Transit Service			
Park-and-Ride Facilities			**Like additional location in Leigh Village.**
Light Rail Transit		**Needs to connect to RTP/RDU.**	
Bike/Ped Network			
What elements are absolutely essential for the preferred scenario?		**Safety of Durham Drive/Meadowmont Lane.** **Mixed use, higher density (TODs).**	

Focus Group with Business and Developers 5/4/2010

In order to test the draft Blueprint concepts in a real-world context, a follow-up focus group was held with members of the real estate, development, and design community.

Q = question
A = answer by project team
S = statement/suggestion

Plan feedback to incorporate

S: You should suggest a minimum threshold for density to ensure that the future development density supports transit.

S: You need to have interim density ratios. The current guidelines are too low without the transit infrastructure in place to support that density. Without those interim ratios, you might actually slow down development. Another solution is to have an agreement in place that, at the parking lots at the transit stations, once the transit is available, some of the parking spaces will be available for commuters.

S: You should talk to the people who purchased land around Barbee Chapel Road because they have a land use plan that is not as supportive of transit as your blueprint.
A: We request that you send us their information so that we can get in touch with them.

Q: By the Farrington transit station, will the parking structure be such that people can go there and park for long periods?
A: We understand the need for a sizable parking structure at that station; both residents and the Town of Chapel Hill want structured parking.
S: This is an ideal place to do a TIFF financing plan.
A: We will add a line about TIFF in the Blueprint report.

Q: Are there any changes to the traffic pattern or access to Leigh Village?
A: (There was a lot of discussion and concern around this topic.) We are considering closing southbound traffic on Farrington from crossing over NC-54 or turning left toward I-40. Traffic going northbound on Farrington would be able to turn left or right onto NC-54. If you come off I-40, you will be able to turn right onto Farrington, but to turn left, you will have to travel down the corridor and make a U-turn. This would be a super street concept using a diverted diamond interchange strategy. However, we are still considering other options and may end up proposing two different options and listing the pros and cons of each.
Several participants were concerned with this solution. They were told that access onto Farrington would not be affected, but this new solution does that uphold that statement. Concerns center around access to Harrington Bank and Nantucket Café, specifically, especially if people are traveling eastbound on NC-54 and are no longer able to turn left onto Farrington Road. The project team reiterated that the reason for such changes was to improve congestion and amend for the traffic problems caused by I-40 and Farrington Road interchanges being too close. The project team also mentioned that, while this solution might restrict some access, the complete Collector Street plan and any

new/additional development that results from more connected streets means those business on the north end of Farrington might get business from new developments in the north.

Q: In the mixed-used slides, why are you not showing more mixing of residential and office?
A: These pictures are just examples. We are not proposing any specific numbers in the design.
S: You are overstating the demand for office space; I do not think future demand will be that high, especially with how flexible employers are about workspace (telecommuting, extended hours, etc).
S: The Town of Chapel Hill just completed a study about the retail and office needs. There is still a lot of retail opportunity still available, but office space demand is limited.
A: The project team will include in their statement about mixed-used that the developments should be flexible in the type of space they offer.

Q: Are you making recommendations toward affordable housing developments?
A: We may produce general guidelines or targets set by other areas. We think it is important to consider how workforce housing might influence affordable housing.
S: Also, the floor area ratios you are proposing should encourage developers to include affordable housing in order to meet the ratio numbers.

Q: Are you concerned that the Friday Center and Meadowmont transit stations are too close together?
A: While the placement is not typical or ideal, we are trying to serve two different communities that are separated by significant division (NC-54). We might include an elevated walkway between the two stations or end up combining the stations into one. However, having only one station in this area makes it difficult for pedestrians to walk to certain localities.

S: Any architectural guidance in the plan should be more form, not design. It could include window placement and where parking should be located, but do not tell architects how to design the buildings because each location has its own character and is very site-specific.
S: I agree but think that the plan should allow for flexibility in the form. For example, allow some front-of-the-building parking. Do not try to make everything "one size fits all."

Other plan feedback
Q: Are the concepts in this plan contingent on getting light rail funded and implemented?
A: While the project team was charged with developing a blueprint that assumes light rail transit is a given, the opportunities in this plan are possible with other transit alternatives in place.

Q: Will this plan cause codes to change?

A: The intent of this plan is a blueprint for changing the codes. However, each jurisdiction will proceed separately and has its own process, which will dictate if any codes change.

Q: East of I-40 on NC-54, at the Quadrangle Complex, does this plan have them at lower density?
A: We expect that their density will increase in the future, but we do not have them at capacity right now.

Q: Are you proposing any transportation changes?
A: We are proposing more lanes to NC-54, possibly as early as 2020/20205.

Q: What about additional access between I-40 and 15-501?
A: Out of the picture – the residents are strongly against this.

Q: At the adoption phase of this project, will the approvers be going down to a Master Plan-type level and look at more specific numbers, concerning traffic counts and analyses?
A: We think they will lay out key principles and guidance for the area, but will not go more specific than that.

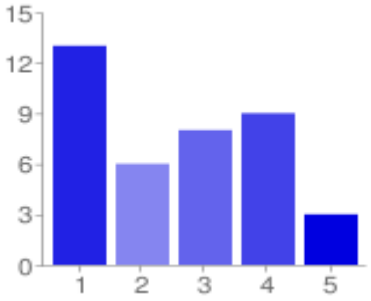
S: As development begins, you must make sure it is balanced, in terms of placement. If a residential area is over-developed but there is no retail to support it, the development will not succeed. You need a balanced mechanism.
A: We are doing a phasing plan, which basically lays out what things need to be in place before other things can move forward.

Workshop 3 Comments May 11, 2010

Each of the eight statements below are accompanied by a bar chart illustrating each respondent's level of agreement, the count of the number of respondents who chose each level of agreement, the percent of respondents who chose each level of agreement, and the combined percent of respondents who were generally opposed to or in agreement with the statement.

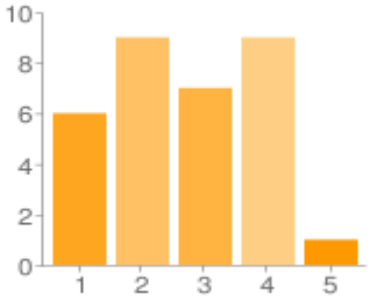
Note: The number of respondents varies because not all respondents provided a response for all eight statements. The percentages are rounded to the nearest whole number, so they may not add up to exactly 100%.

1. I like the land use designations and think they are in the right places, at appropriate scale and intensity



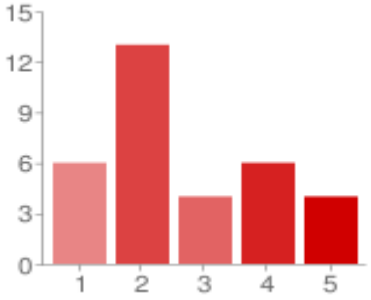
1 -	Strongly Opposed	**13**	33%	49%	
2		**6**	15%		
3		**8**	21%	21%	
4		**9**	23%	31%	
5 -	Strongly Agree	**3**	8%		
	Total Respondents	**39**			

2. The land use designations and transit improvements fit with the proposed roadway/bike/ped improvements.



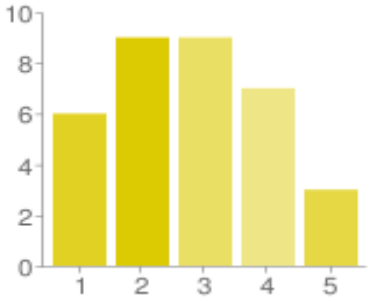
1 -	Strongly Opposed	**6**	19%	47%	
2		**9**	28%		
3		**7**	22%	22%	
4		**9**	28%	31%	
5 -	Strongly Agree	**1**	3%		
	Total Respondents	**32**			

3. The phasing approach will enable transit to succeed in this corridor, while providing housing choice.



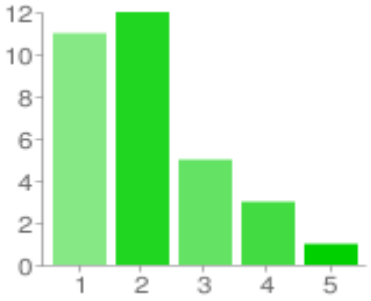
1 -	Strongly Opposed	**6**	18%	58%	
2		**13**	32%		
3		**4**	12%	12%	
4		**6**	18%	30%	
5 -	Strongly Agree	**4**	12%		
	Total Respondents	**33**			

4. The draft Blueprint will improve the bicycle and pedestrian system and increase access and mobility in the study.



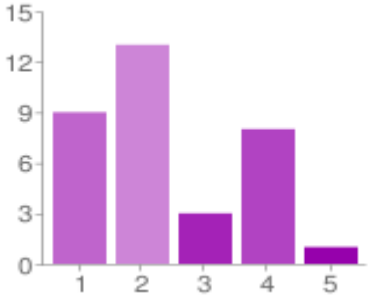
1 -	Strongly Opposed	**6**	18%	44%	
2		**9**	26%		
3		**9**	26%	26%	
4		**7**	21%	29%	
5 -	Strongly Agree	**3**	9%		
	Total Respondents	**34**			

5. The example bicycle and pedestrian improvements illustrated will solve problems at critical locations.



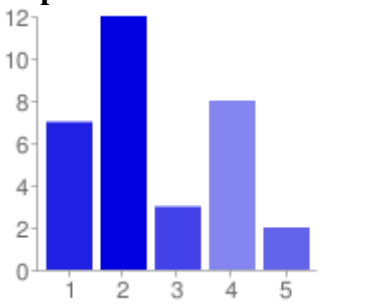
1 -	Strongly Opposed	**11**	34%	72%	
2		**12**	38%		
3		**5**	16%	16%	
4		**3**	9%	13%	
5 -	Strongly Agree	**1**	3%		
	Total Respondents	**32**			

6. The draft Blueprint's roadway improvement strategy will improve vehicle travel along the NC-54 corridor.



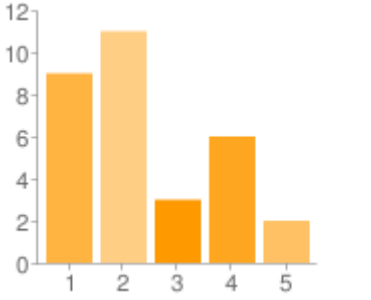
1 -	Strongly Opposed	**9**	26%	65%
2		**13**	38%	
3		**3**	9%	9%
4		**8**	24%	26%
5 -	Strongly Agree	**1**	3%	
	Total Respondents	**34**		

7. The roadway modifications consider the proposed land use and transit system improvements.



1 -	Strongly Opposed	**7**	22%	59%
2		**12**	38%	
3		**3**	9%	9%
4		**8**	25%	31%
5 -	Strongly Agree	**2**	6%	
	Total Respondents	**32**		

8. The roadway modifications will support the traffic growth in the corridor.



1 -	Strongly Opposed	**9**	29%	65%
2		**11**	35%	
3		**3**	10%	10%
4		**6**	19%	26%
5 -	Strongly Agree	**2**	6%	
	Total Respondents	**31**		

The number of respondents was low, compared to the actual number of participants who attended the third workshop. Generally, these level of agreement responses are skewed towards “strongly opposed” and “opposed,” but three statements were especially weighted in opposition: #5 - bicycle and pedestrian improvements will solve critical problems, #6 - the roadway improvement strategy will improve vehicle travel, and #8 - the roadway modifications support traffic growth.

Also, while the number of participants who “agreed” or “strongly agreed” was generally in the 26-31% range for most statements, only 13% of respondents “agreed” or “strongly

agreed" with the statement about bicycle and pedestrian improvements solving critical problems (#5). This highlighted the need to provide more details about recommended pedestrian and bicycle improvements in the Blueprint master plan.

The workshop participants were also encouraged to submit their comments in response to the elements in the preferred scenario. Below are the comments participants submitted on comment cards, comments submitted by email, and spoken comments made during the workshop.

Light Rail Transit

Summary:

Many commenters advocated moving the light rail transit line out of the environmentally-sensitive area between the Leigh Village site and Meadowmont. The commenters suggest running the line parallel to NC-54. Several others did not want the LRT line to run through Meadowmont, based on the proposed development and park and ride lot locations. Many comments indicated that light rail must be in place before dense development should begin. Two commenters saw the light rail as promoting growth in the area, which those commenters did not want. Commenters stressed the need to connect the LRT line to Chapel Hill, Durham, RTP and RDU Airport. One commented stated that the light rail is located in the wrong place to alleviate east-west traffic because I-40 does not have the capacity for high-speed buses and the FAA has always resisted HOV lanes or dedicated bus lanes.

Detailed Comments:

- LRT parallel with NC-54 (4)
- introducing rail increases growth; I want less growth
- build light rail from I-40, down 54 through UNC campus – this would solve some congestion.
- move light rail transit line to along NC-54 and out of an environmentally sensitive area (2)
- need to encourage less traffic and more mass transit in currently non-congested areas
- LRT through Meadowmont doesn't make sense based on proposed development and park and ride lot locations (3)
- need rapid transit to encompass RTP, Chapel Hill, Durham, Raleigh, etc
- light rail must be under construction before accompanying density can occur (3)
- Here are some alternative solutions to road capacity increases: Obviously, a rail line down the middle with be fabulous, provided it had connections or at least to a park 'n ride lot at Interstate 40. But I know how resistant CH has historically been to rail.
- The transit improvements are not adequate to support the new development. This gateway to Chapel Hill adjacent to I-40 will become impassable to commuters driving through the area (about 70%) and to the surrounding neighborhoods. The proposed plan seems to say the situation is bad now, so let's improve it by allowing greater amounts of development. It is unrealistic to assume that the solutions offered will more than off set the increased traffic brought by the new development.

- It appears that the light rail is located in the wrong place to alleviate east west traffic. I-40 does not have the capacity for high speed busses and the FAA has always resisted HOV lanes or dedicated bus lanes.

Comments from the workshop:
One commenter asked if safety along the transit line was considered for the transit centers, since density was going to be so high and the goal was to make it very walkable. Another commenter was concerned with the current proposed alignment of the light rail because it runs through ecologically sensitive area. That person wondered if the light rail could run along 54. A last comment questioned if light rail was contingent on Wake County, Orange County, and Durham County all giving their approval.

Mass Transit and Park and Ride Lots
Summary:
Many commenters were against the proposed park and ride lot near Falconbridge neighborhood, at the wastewater plant, stating that it could cause dangerous traffic issues in that neighborhood and would exacerbate traffic problems at the NC-54/Farrington Rd intersection. One wondered why a park and ride was proposed on Farrington Rd, when the superstreet concept would essentially close Farrington Rd at the NC-54 intersection – suggesting that people would be motivated to cut through the Falconbridge neighborhood rather than back track around Barbee Chapel in order to go to points east or to gain access to I-40.Another comment believes Farrington Road would become more congested with a park and ride, as well as with the addition of a transfer station in the Falconbridge Shopping Center. While the intention would be for commuters to park in the Park & Ride, the commenter thinks commuters will opt to park closer – in the shopping center at the corner of NC-54 and Farrington Road and on the streets in my neighborhood. They will cut through the neighborhood to reduce congested areas, and to avoid the traffic patterns created by the Super Streets. Commenters suggested locating the park and ride lots east of I-40 and NC-54, along the highway, and out of the corridor. One commenter included the caveat that shuttle service be provided and coordinated to serve both Chapel Hill and Durham. Other suggested locations included Southpoint Mall and New Hope Comments. This suggestion was supported by a commenter who felt the proposed park and ride lot at Leigh Village would only serve to benefit UNC and would actually hinder traffic flow because, regardless of how commuters accessed that park and ride, the traffic into the park and ride would create a bottleneck because it would be coming off I-40. One commenter stated that the proposed NC-751 park and ride lot would not logically serve Chapel Hill. In general, participants recognized the need for a more robust transit system that would serve Chapel Hill, Durham, RTP and RDU Airport, among other locations.

One commenter suggested installing bus-only lanes on NC-54 to improve traffic flow during rush hour in the morning and evening.

Detailed Comments:
- charge people to park if they are not from Orange or Durham counties.
- put mass transit facilities/park and ride lots in more strategic areas, such as near Southpoint Mall and New Hope Commons

- the 751 park and ride lot is not logical to serve Chapel Hill, maybe it should only serve Durham
- no park and ride in the Falconbridge neighborhood
- the Friday Center should take care of its own traffic and have a park and ride and its own bus system. Should consider requiring carpools or at least giving them priority.
- park and ride lot on Farrington is a poor idea. Makes congestion problem worse by moving traffic to intersection of Farrington and 54. Feeds traffic into Falconbridge to bypass congestion, which is dangerous for the residents.
- encourage park and ride outside of 54 corridor; what is an incentive for people to change?
- need more mass transit to RTP and 40
- park and ride lots should be east of I-40 and NC-54 (2), not in Leigh Village or Farrington
- park and ride on Farrington and the transfer location in the Falconbridge shopping center will have serious negative impact on the Falconbridge neighborhood and will exacerbate the traffic problems at Farrington and 54.
- shared parking is a good idea, but need to think about the regional draw required by certain retail businesses in order to survive
- Install bus only lanes on NC 54 off of the traveled road way for buses to pick-up and drop off passengers. This would greatly improve the flow of traffic into Chapel Hill particularly during the morning rush hour. Several additional bus only lanes to pick up or drop off passengers are also needed on east bound NC 54. (There are actually 2 such bus only pick-up/discharge lanes East bound on NC 54 now.) So the idea is to get buses off of the traveled road way when they pick up or discharge passengers.
- Here are some alternative solutions to road capacity increases: Add park and ride lot at NC54 and Interstate 40 with shuttle to campus from there (would obviously need to be coordinated with Durham)
- If Farrington Rd is ultimately going to have to be closed at 54, than why put a park and ride on it? Doing so will surely motivate people to cut through the Falconbridge neighborhood rather than back track around Barbee Chapel in order to go to points east or to gain access to I-40.
- The plan appears to locate new park-and-ride lots for UNC employees in Leigh Village. There were also other lots outside the corridor I believe on route 751 and around Southpoint Mall. Park-and-ride lots for UNC employees seem to be heavily used and valuable transportation elements. However, the park-and-ride lots in Leigh Village would not improve the transportation system and more likely would be an impediment to improved traffic flow. Why do I say that? Consider a commuter using the park-and-ride lot at Leigh Village. Consider how they exit and enter NC54 when accessing that lot. It doesn't matter how they do it, whether it's through the current Farrington Road, or a rerouted Farrington Road, it is going to be near I-40, which will slow traffic flow near intersections that need all the help they can get to flow more smoothly. Also, if there is a superstreet, all of those turns onto and off of NC54 into or out of the superstreet will challenge its capacity. In summary, why relocate a park-and-ride lot to a location (Leigh Village) where commuter traffic to and from the lot will pass through a bottleneck? If park-and ride capacity at the Friday Center must be relocated, it would best be relocated to somewhere in which traffic does not have to slow and turn in a bottleneck area, such as

the vicinity of Southpoint Mall area or route 751, somewhere outside the Corridor to keep individual commuters outside of the Corridor.
- I live in the Falconbridge neighborhood. All of the recommendations that increase traffic around the 54/Farrington intersection will, in my opinion, negatively impact my neighborhood. Farrington Road would become more congested with a park and ride located on the property owned by the city of Durham, as well as with the addition of a transfer station in the Falconbridge Shopping Center. While the intention would be for commuters to park in the Park & Ride, I think they will opt to park closer – in the shopping center and on the streets in my neighborhood. They will cut through the neighborhood to reduce congested areas, and to avoid the traffic patterns created by the Super Streets. I've lived in major metropolitan areas close to such transfer hubs, and this is what occurred. Safety is a major concern. The community clubhouse and swimming pool is adjacent to Farmington Rd, which is the street that wraps around the back side of the shopping center. Members walk and bike to the clubhouse. Children bike in. The traffic patterns will make this unsafe. Ultimately, what I want is for traffic to be caught about 5 miles before they reach the area, and redirect them through currently undeveloped areas. I agree with others at the meeting who want traffic funneled AWAY from the area, rather than into it, exacerbating the traffic issues instead of easing them. Put the park and ride and the transfer stations off of 751 by the car dealerships where there is open land.

Comments from the workshop:
Participants focused mostly on the park and ride lots proposed on Farrington and near 751. One commenter thought the Farrington park and ride would cause a lot more traffic issues on NC-54 and another asked whether impacts of the increased traffic on Farrington Road had been analyzed and accounted for. The comment about the park and ride lot near 751 supported it, believing that it would relieve some of the traffic heading to 54. However, another commenter said that people wouldn't use that park and ride because they would not want to travel out of their way instead of heading straight into Chapel Hill.

Bicycle and Pedestrian
Summary:
Participants were divided over the proposed bicycle and pedestrian system. While many supported the enhancements and felt they addressed the needs of the bike/ped community, others felt that the improvements were not enough, and still others did not believe there are enough users to support enhancing the system.

Safety was a major concern on all fronts. Participants took issue against the proposed separated bike lane dividing the right turn lane and through lane near the 15-501 interchange, stating safety concerns. Others advocated for bike lanes or paved lanes separate from the main road or wider and "protected" lanes. One commenter supported the bike lanes and their enhancement to safety, especially on the eastern side of the corridor.

Several comments asked to link the bike trail to the American Tobacco Trail in Durham and RTP. Others suggested a trail to connect Eastwood Park with the nearby proposed transit center. Another requested bike routes along Barbee Chapel, Farrington, Stagecoach, NC-751, Scott King, and Massey Chapel roads because of the number of commuters who bike that path from Chapel Hill to RTP.

Detailed Comments:
- link bikeway to American Tobacco Trail to Durham and RTP (3)
- having a bike lane in between the turn land and the thru-lane is a horrible idea
- using bike lanes for traffic calming creates a safety issue
- the bicycle and pedestrian system in the proposed scenario is not adequate or enough to solve problems at critical locations
- bicycle and pedestrian system improvements are a waste of money because you will not increase the number of system users
- like the east/west bicycle and pedestrian system improvements, if they preceded developments
- the north/south bicycle and pedestrian system improvements are very poor
- need overpasses/underpasses, especially over I-40 on both sides of NC-54
- prefer wider and "protected" bicycle lanes
- bike route from Leigh Village to the mall on 15-501 looks great
- proposed bike lanes are very dangerous
- not enough planned to encourage system users and proposed plans are not safe
- improve underpass from Friday Center to Meadowmont and the drainage issue (2)
- 15-501/54 intersection proposal very unsafe. (3) Too much time and effort focused on bicycle traffic, which benefits very few residents. Adding an extra lane obviously increases complexity in an already complex area. Removing bicycle drivers from the traffic flow for a short distance only to attempt to re-integrate them is fraught with conflicts. The appropriate operational maneuver for bicyclists is to use the full right lane. Motorists change lanes to pass. This behavior can be encouraged with appropriate signs.
- elevated crossings are not conducive to bikers
- need bicycle/pedestrian walkway from Eastwood Park to the rail station nearby.
- need to be offset from 54
- need bicycle land or paved path on Durham side of 54 (east side)
- trying to accommodate bicycles and sidewalks through the 15-501/54 interchange is a waste of money.
- if bicycle lanes are added on 54 before traffic issues are addressed, cars will likely use bicycle lanes – a huge safety issue
- protect bike paths using medians or have them off the street in shoulders on both sides of the road
- I am aware of numerous semi-regular bike commuters who travel to work at FHI from Chapel Hill. Our current route is via Barbee Chapel / Farrington / Stagecoach / NC 751 / Scott King/ Massey Chapel. Adding a bike lane or widening the roads would be a major upgrade to the Chapel Hill system. It is much safer and more pleasant to bike from Durham to RTP!
- The planned facilities for bicycle and pedestrian traffic within the eastern Corridor should enhance safety. The last person I know of killed in the corridor was a bicyclist

riding westbound on the shoulder. They were hit in the back of the head by the rear view mirror of a bus as they traveled in the vicinity of the "Welcome to Chapel Hill" sign. Currently the shoulder is narrow and dangerous for bicyclists and pedestrians.
- I appreciate the work to look at bicycle connections. The on road bicycle connections need to be wide enough to be safe from high speed traffic. Many cyclists would not dare to ride between two traffic lanes as depicted. More attention needs to be paid to how people will cross these imposing highways.

Comments from the workshop:
There was opposition against the dedicated bike lane near the 54/15-501 intersection. People believed it would not be safe for bikers and would not be used. People do use the underpass to cross 54 near Meadowmont. Before major changes are made on the road to facilitate pedestrian crossings, commenters encouraged study on the use of the underpass. A commenter stated that the bike/ped path proposed to University Mall may not work because that path is very wet. Another commenter asked if the bike/ped path in Little Creek will connect to the American Tobacco Trail.

Roadway Enhancement/Superstreet Concept/NC-54
Summary:
There were numerous concerns about the “superstreet concept”, including accessibility issues, impacts to neighborhoods, and lack of addressing congestion problems. Commenters referred to the existing superstreet at 15-501/Erwin Road and mentioned how it did not improve traffic conditions and has made it worse at times. Commenters were skeptical of how it would improve vehicle travel along the corridor and how it would support future traffic growth. Commenters were concerned with the impacts on access to neighborhoods and retail areas along NC-54. One commenter was concerned with the impacts on safety to bicyclists and pedestrians traveling along NC-54 Many participants who were against the superstreet concept advocated the use of flyovers instead. The fact that it would be an interim or short-term solution designed to be a cheap alternative to the long-term solution was also a point on contest.

Some commenters did support the “superstreet concept” and believed it would alleviate some of the congestion issues in the corridor. Support was shown for the proposed designs at major intersections. One commenter stated the need for dedicated merge lanes at the U-turn areas for the concept to succeed. Another commenter suggested looking at allowing vehicles to go straight across 54 from any of the side streets, but continue forcing left turns to U-turn.

Some commenters stated the need to widen 54, even up to 8 lanes. However, one commenter stated that the problem is “peak time” travel problems, where the congestion only occurs during morning and evening rush hours. This commenter believed travel demand management strategies, not road widening, would address congestion issues. This commenter was also concerned with the environmental impacts from widening NC-54. This commenter provided several alternatives solutions: including 1) add one HOT lane in either direction for carpoolers (charge SOVs for use of the lane); 2) work with

UNC to stagger employees' shifts so that employees enter and exit the corridor at different times; and 3) increase parking fees at UNC campus

Detailed Comments:
- superstreet is insufficient without a dedicated merge lane at U-turn areas.
- roadway improvement strategy will make vehicle travel along the corridor worse
- roadway improvement strategy will not support traffic growth in the corridor
- roadway improvement strategy will create traffic growth
- prefer elevated flyovers, etc to superstreet concept
- unrealistic to what is here now
- are insufficient
- roadway modifications will support traffic growth in the corridor, which is what we don't want
- cannot be practiced as studied when in actual use
- this concept will kill the retail
- widen 54 (3) to 8 lanes
- need flyovers and not this proposal, which will only postpone the inevitable at a much higher price
- you can't cut off the south side of 54 with all these superstreets
- not a practical solution; emphasis mass transit and park and ride lots near the highway
- need new grade-separations at 54 intersections and move forward with Collector Street Plan
- follow superstreet concepts – current access to/from on both sides of 54 absolutely means superstreet concept is correct at the major intersections (15-501/Erwin Road superstreet concept works fine and is a great improvement) (2)
- proposed expansion is too large for current space
- appears to penalize local existing residents
- use more roundabouts
- will need education
- flyovers do work
- proposed interchanges are unclear
- may have adverse impacts to residential areas of Farrington and Downing Creek
- how long will these changes take?
- superstreet at 15-501/Erwin Road does not work. Commute has increased by 10 minutes and public transit operators do not understand how to navigate.
- consider another version of the superstreet in which straight across is permitted but left turns still require U-turn
- The problem on NC54 is a peak travel problem. Notice that during off peak hours both sides are wide open. Thus, solution is traffic demand management, not road widening. If you add more lanes, studies show you increase the number of lane changes, thus accidents. Leave this stretch of sensitive watershed alone. Here are some alternative solutions to road capacity increases:
    - Add one HOT lane in either direction for carpoolers. (SOVs are charged to use it; carpoolers are not)
    - Add park and ride lot at NC54 and Interstate 40 with shuttle to campus from there (would obviously need to be coordinated with Durham)

- Work with UNC to convince them to vary start/ending times more so that there isn't a mass entrance/exit at peak time. As it is, everyone gets out at 5 pm and thus the jam from UNC to Interstate 40 5-7 pm every weekday evening.
- Again, this is a peak hour traffic problem. Why spend all that money increasing capacity so that it can accommodate 4-6 hrs. of traffic out of 24? Makes no sense. Rather, manage the traffic.
- Obviously, a rail line down the middle with be fabulous, provided it had connections or at least to a park 'n ride lot at Interstate 40. But I know how resistant CH has historically been to rail.
- Increase parking fees at UNC campus. Not politically attractive, obviously, but studies show that the availability of parking at one's destination is the factor that determines what mode a person takes to his/her destination.

- The super street idea does absolutely nothing for any Durham resident. The only thing the proposed super street concept does is allow a faster flow of traffic in and out of Chapel Hill for traffic coming from outside the corridor.
- I do have some experience with the superstreet structure in Chapel Hill on 15-501, and have spoken with Chapel Hill residents about it. Overall from my unscientific survey there seems to be grudging approval of the superstreet in Chapel Hill, although I doubt whether a superstreet will be able to substantially mitigate the problems associated with the traffic volumes on NC54 now and in the future. Consequently I do not see why money should be wasted on what I would expect to be an infrastructure of modest effectiveness. The other, long-range improvements presented at the third Workshop seem to have more promise and money should be saved for these improvements. In particular the flyover, in which eastbound NC54 traffic passes over the Farrington Road intersection and then merges with eastbound I-40, seems to be a real solution that will have a major positive effect towards easing congestion in the Corridor. The scale of the flyover and its potential seem to match the scale of the late afternoon rush hour problem which currently exists and will get worse. This long-term solution should be a priority as it will have much more benefit than widening NC54 or creating a superloop. As mentioned earlier, a Study such as this should run the numbers and present the data comparing the benefit of the various possible solutions such as the flyover versus lane widening etc.
- The proposed solutions are counter productive to the stated goal of increasing walking and bicycle use. The super street solution is unattractive, would increase air pollution, and would reduce walkability and bike usage. These unusual turning movements built into a super street would make it dangerous to walk or ride a bike. If the structured parking is moved out by I-40 by UNC, this will make it more difficult for commuters to reach the hospital complex.

Comments from the workshop:
There were diverse comments about the superstreet proposal. There were several concerns related to the actual learning curve, whether the superstreet actually reduces wait time, if it was worth spending money on that improvement instead of other alternatives, and if that improvement would actually encourage even more traffic on the corridor. One person commented on their positive experience with the superstreet at Erwin Road. One commenter suggested making the superstreet U-turn a dedicated lane

for easy merging and so signals can be eliminated. Another solution was to have dedicated lanes on 54 straight to 40 for cars that want to travel straight through the corridor and a dedicated lane for cars that need to access side streets.

I-40/NC-54/Farrington Interchange

Summary:

Commenters provided suggestions to improve the interchange and varied widely. One commenter suggested routing traffic via NC-751 to enter Chapel Hill; another suggested a new I-40 exit at Ephesus Church Road or a new I-40 exit directly to the Leigh Village park and ride lot; and another commenter stated the need for "overpasses or interchanges to go north-south across I-40 from Farrington Road." Some commenters believed the superstreet concept at this interchange in particular will not address or solve the traffic issues and might bring economic harm to businesses at the intersection. Commenters did agree that some kind of improvement was needed, and sooner rather than later. This might be one of the first things to address in the corridor.

Regarding the proposed changes at this intersection, one commenter had this statement. "The rerouted Farrington Road traffic will travel along a segment of what is now Celeste Circle and will utilize the current Celeste Circle/NC54 intersection. Placement of the rerouted road and widening of the Celeste Circle segment will require the removal of several homes in Eastwood Park and an adjacent neighborhood. A prior developer of Leigh Village believed that four houses would need to be removed. Remaining homes in Eastwood Park would be adversely effected. For example, a couple of homes will end up with a major road in their front yard and will be physically separated from the rest of the neighborhood. Two reasons not to reroute Farrington Road are suggested here:

- First, if the superstreet plan proposed by the corridor study is accepted, the current Farrington Road intersection will be largely atrophied, and the adverse effects of this intersection on traffic flow will be greatly reduced.
- Second, there is an alternative to locating the road through Eastwood Park. It should be possible to move the planned intersection about fifty yards to the northeast. This would put the rerouted Farrington Road behind the northeastern-most houses on Celeste Circle, instead of in front of them. The exact location of this road is as follows. As one exits NC-54 and enters Celeste Circle, the first building on the right (on the corner of the Service Road and Celeste Circle) is the Dermatology Center/Urgent Health Clinic. To the right of this Dermatology Building is a space where the proposed road would be located. The next object past this space is the Carolina Crossing Building. Thus as one travels on the Service Road from Celeste Circle towards Farrington Road, one encounters the Dermatology Clinic, the space for a road, the Carolina Crossing Building (a commercial establishment), then other commercial/office buildings, and then Farrington Road. Although moving the rerouted Farrington Road several yards closer to the northeast decreases its planned distance from the interstate, it is still much further from the interstate than the current Farrington Road and seems a reasonable compromise considering the insult to Eastwood Park that would be avoided. This newly proposed path for a rerouted Farrington Road makes sense in the context of the superstreet proposal. It is noted that currently across NC-54

> from Celeste Circle is Falconbridge Road. In the superstreet proposal, traffic originating on the rerouted Farrington and Falconbridge roads is allowed to turn left or right onto NC54, and no left turns are allowed off of NC54 onto rerouted Farrington or Falconbridge Roads. Consequently it is not necessary for the rerouted Farrington and Falconbridge Roads to be aligned "head to head". The rerouted Farrington and Falconbridge Roads would be offset slightly (about 50 yards), but would be so close that they would constitute a double T arrangement and stop lights at each intersection could readily be synchronized with one another. In order for the rerouting of Falconbridge Road proposed here to work, it would make sense to atrophy the current Celeste Circle/NC54 intersection, by completely blocking direct access between Celeste Circle and NC54. To recapitulate, the plan for rerouting Farrington Road proposed here will not require loss of residences or serious adverse effects upon residences in or adjacent to Eastwood Park. The only structure in the path of the route proposed here is an unused small distribution warehouse. In the context of the superstreet, the adverse effects of present and anticipated Farrington Road traffic on the Corridor would be mitigated by a combination of two mechanisms, the first being the partial atrophy of the current Farrington Road and second, the additional connection of the rerouted Farrington road which would allow left turns onto NC54 at a location significantly further from the interstate than the current Farrington Road/NC54 intersection. The eastern end of the NC54 Corridor under study is challenging with respect to heavy traffic demands and the well being of local communities, and the Farrington Road plan proposed here is a reasonable compromise."

A business owner was particularly concerned with the traffic flow and economic impacts to the shopping center off Farrington Road on the north side of NC-54. The business owner stated that the additional lane on NC-54 to get onto I-40 greatly improved traffic flow at that intersection, even on Saturday game days. A resident located off Farrington Road echoed the traffic flow sentiments and was also concerned about the increase of traffic on safety. That commenter said the community clubhouse and swimming pool are adjacent to Farmington Rd, which is the street that wraps around the back side of the shopping center. Members walk and bike to the clubhouse, so the increase in traffic can have a major impact on local residents' accessibility to the clubhouse and swimming pool.

A couple commenters were concerned that these drastic changes were first presented at the latest workshop and that there was no prior indication that major changes were going to be proposed fort the intersection. Commenters worried that the proposed changes were made without any public input.

Detailed Comments:
- an additional interchange from I-40 directly for the park and ride will be required
- moving Farrington Road would help a lot and this strategy should start with that first
- not enough detail; need more from a conceptual standpoint before proposed scenario can be determined as the solution
- try to get more traffic to enter Chapel Hill using the 751 entrance

- address this interchange ASAP
- this concept at Farrington will not work. Overpasses/interchanges are needed to get north-south across I-40.
- superstreet concept will bring economic harm to all businesses at the intersection
- what about a new I-40 exit for Ephesus Church road to access into Chapel Hill
- Skip all of the interim steps that the consultants may come up with and immediately start planning for and then building a new interchange at NC 54 and I 40. This could several years, but it would reduce the overall cost to only do one permanent fix for the problem.
- design and build a relocated interchange for I 40 and NC 54. I believe such a new interchange could be build off of Farrington Road within 1/2 half mile of NC 54. To do this you would then have to widen Farrington Road from the new interchange to NC 54.
- My concern about the recommendations are that they would greatly impede my customers' access to Nantucket Grill & Bar, my employees' job security and my current successful operation. I am concerned that any realized decrease in revenue would negatively impact not only my main location at NC-54/I-40, but my entire chain of stores. The traffic flow at NC-54/I-40 greatly improved with the new lane addition last year. Traffic flows extremely well on football Saturdays to/from the game and there is rarely a significant back-up. The daily traffic pattern from UNC has also improved greatly with that new lane addition on 54. The proposed recommendations are not ones that I support, as they would be very harmful to my ongoing business operation at NC-54/I-40.
- The rerouted Farrington Road traffic will travel along a segment of what is now Celeste Circle and will utilize the current Celeste Circle/NC54 intersection. Placement of the rerouted road and widening of the Celeste Circle segment will require the removal of several homes in Eastwood Park and an adjacent neighborhood. A prior developer of Leigh Village believed that four houses would need to be removed. Remaining homes in Eastwood Park would be adversely effected. For example, a couple of homes will end up with a major road in their front yard and will be physically separated from the rest of the neighborhood. The plan to destroy the northeast end of Eastwood Park in this manner was initiated in the Collector Street Plan several years ago, and has continued so far in the Corridor Study. The reason that planners could morally justify a plan such as this is that so far, the planners have considered Eastwood Park to be a place that is expected to change in the future from a residential area to something else. However, the Corridor Study, in its third Workshop, revealed for the first time that it believes the long-term land use for the Eastwood Park area should be residential. Consequently it is imperative to revisit the current plan to destroy this important part of an established neighborhood. The reason to relocate the busy Farrington Road/NC54 intersection is to move it away from I-40. The proximity of the intersection to the interstate restricts global traffic flow in an area where efficient traffic flow is badly needed. Two reasons not to reroute Farrington Road are suggested here:

    - First, if the superstreet plan proposed by the corridor study is accepted, the current Farrington Road intersection will be largely atrophied, and the adverse effects of this intersection on traffic flow will be greatly reduced.
    - Second, there is an alternative to locating the road through Eastwood Park. It should be possible to move the planned intersection about fifty yards to the northeast. This would put the rerouted Farrington Road behind the northeastern-

most houses on Celeste Circle, instead of in front of them. The exact location of this road is as follows. As one exits NC54 and enters Celeste Circle, the first building on the right (on the corner of the Service Road and Celeste Circle) is the Dermatology Center/Urgent Health Clinic. To the right of this Dermatology Building is a space where the proposed road would be located. The next object past this space is the Carolina Crossing Building. Thus as one travels on the Service Road from Celeste Circle towards Farrington Road, one encounters the Dermatology Clinic, the space for a road, the Carolina Crossing Building (a commercial establishment), then other commercial/office buildings, and then Farrington Road. Although moving the rerouted Farrington Road several yards closer to the northeast decreases its planned distance from the interstate, it is still much further from the interstate than the current Farrington Road and seems a reasonable compromise considering the insult to Eastwood Park that would be avoided. This newly proposed path for a rerouted Farrington Road makes sense in the context of the superstreet proposal. It is noted that currently across NC54 from Celeste Circle is Falconbridge Road. In the superstreet proposal, traffic originating on the rerouted Farrington and Falconbridge roads is allowed to turn left or right onto NC54, and no left turns are allowed off of NC54 onto rerouted Farrington or Falconbridge Roads. Consequently it is not necessary for the rerouted Farrington and Falconbridge Roads to be aligned "head to head". The rerouted Farrington and Falconbridge Roads would be offset slightly (about 50 yards), but would be so close that they would constitute a double T arrangement and stop lights at each intersection could readily be synchronized with one another. In order for the rerouting of Falconbridge Road proposed here to work, it would make sense to atrophy the current Celeste Circle/NC54 intersection, by completely blocking direct access between Celeste Circle and NC54. To recapitulate, the plan for rerouting Farrington Road proposed here will not require loss of residences or serious adverse effects upon residences in or adjacent to Eastwood Park. The only structure in the path of the route proposed here is an unused small distribution warehouse. In the context of the superstreet, the adverse effects of present and anticipated Farrington Road traffic on the Corridor would be mitigated by a combination of two mechanisms, the first being the partial atrophy of the current Farrington Road and second, the additional connection of the rerouted Farrington road which would allow left turns onto NC54 at a location significantly further from the interstate than the current Farrington Road/NC54 intersection. The eastern end of the NC54 Corridor under study is challenging with respect to heavy traffic demands and the well being of local communities, and the Farrington Road plan proposed here is a reasonable compromise.

- Also, re-routing NC54 traffic to I-40 without crossing Farrington intersection would help with much of the traffic jam and accidents there at peak times (which are increasing). This would enable local traffic the convenience of Farrington intersection and not hurt businesses there, and allow commuters a faster, more efficient way to reach I-40.

- Anything you can do to reduce jamming on 54 from Downing Creek to Farrington Road would be appreciated. Hopefully it can happen without routing lots of traffic through Celeste Circle.
- I have yet to see how the study partners envision the way westbound NC54 traffic will get onto Southbound Farrington Road. (a constant need) or northbound Farrington Road traffic will get to the other side of NC54 to go further north on Farrington. (A U turn on the eastside of the Interstate Cloverleaf?)
- During the first two workshops there was minimum discussion about a reference to that intersection and there was no indication prior to the third workshop that there was going to be a significant realignment of that intersection proposed as part of the draft NC-54/I-40 Corridor Blueprint for Mobility Master Plan ("Plan"). At the beginning of the third workshop there were a lot of people and some of the study staff congregated around one of the posted items that turned out to be the recommendation or proposal for turning this intersection into a Superstreet Intersection. There were very strong and even intense feelings and comments about this, basically opposing it. In the previous workshops we had not made this intersection a major discussion or input focus because there was no reason to devote everyone's time and energies to this if there was not going to be any recommendation of any changes to this intersection and certainly not the radical changes now being proposed. TOPS is very concerned about any part of the Plan that recommends de-emphasizing the Farrington Road-Highway 54 intersection by removing existing traffic signals, eliminating movement through the intersection, allowing right turns only and otherwise re-routing traffic from using that intersection, thereby limiting access to its store from I-40 and egress to Chapel Hill or otherwise lessening, limiting or actually restricting access and accessibility and mobility to is facilities at this intersection. The concern is that such a radical and restrictive reconfiguration of this intersection would confuse, frustrate or hinder existing customers and potential additional customers from seeking to use TOPS' products and facilities at this location.

Collector Street Plan and other connecting streets

Summary:

Comments were generally supportive of the Collector Street Plan and wanted it implemented soon. There were several comments of opposition to the currently-planned alignment of Southwest Durham Drive via Meadowmont Lane, mostly because of its close proximity to a school and a senior center. Instead, commenters stated that SW Durham Drive should be connected to George King Road. However, one commenter stated he heard from Meadowmont residents who attended the Collector Street Plan Meetings that those residents felt that the Southwest Durham Drive connection to Meadowmont Lane would be a plus in enhancing their choices for access to/egress from their community. The commenter believed it would also provide an alternative for pedestrian and bicycle traffic which might otherwise pass through the region of the Corps of Engineers Land. The commenter also stated that, at the Chapel Hill town hall meeting, the Transportation Department representative responded to a question by stating that Meadowmont Lane had been constructed properly to serve its function as the southern end of Southwest Durham Drive; thus this commenter believes this intersection, which is about 9 lanes wide by 6 lanes wide would be a good intersection to use.

A direct connection to 54 from George King Road, and not through Crossland Drive, was proposed by several commenters.

Commenters advocated that the Collector Street Plan preserve neighborhoods and not channel traffic through them and deteriorate the neighborhoods. One commenter was concerned about traffic impacts from funneling traffic down Farrington Road and requested additional traffic studies to assess how that would affect traffic, access, and the businesses. Another commenter proposed two alternative solutions: 1) Target the area near the former Ecko warehouse ; or 2) reroute Farrington Road through King Highway, currently a gravel road at the end of the Celeste Circle neighborhood.

One commenter focused on the area east of 15-501 Morgan Creek-Kings Mill and suggested "moving the big roads below the ground" because the commenter was concerned that the proposed addition lanes on NC-54 would "lock residents of the neighborhood in."

Detailed Comments:
- putting an access system via Meadowmont Lane through to Farrington Road directly interferes with the foundation and integrity of Meadowmont by changing a significant amount of the area to essentially a convenient bypass for drivers.
- Meadowmont Lane should not be a connector road – too much traffic passing a school and a senior center
- implement Collector Street Plan ASAP (2)
- reroute Farrington Road away from I-40 as a single collector street, not in multiple portions
- Collector Street Plan should preserve neighborhoods and not channel traffic through them (2)
- improvements to George King Road must consider traffic impacts to Creekside Elementary
- SW Durham Freeway should connect to George King Road, not Meadowmont (2) because 1) it's not built yet, so it can be done right; all new construction is east of Little Creek, so keep arterial traffic on SW Durham Parkway east of Little Creek on George King Road
- Crossland/Celeste Circle and 54 Service Road need to be taken out of the Collector Street Plan, unless you want to buy our property
- Route George King Road directly onto 54. Do not use Crossland Drive. (2)
- keep SW Durham Drive through Meadowmont Lane, not Crossland Drive
- concerned with where traffic being funneled down Farrington will go
- based on proposed scenario, someone coming from Durham on 54 and turning right onto Farrington Road will need to cut across 4 lanes of existing traffic to access the right turn – this doesn't seem safe
- build George King interchange before superstreet at Farrington
- flyovers at George King Road intersection with arterial traffic from SW Durham connected to 54

- A neighbor has made me aware of the proposal to re-route Farrington Road through our neighborhood, specifically through the house two down from me and in front of my yard. This is highly concerning to me since this would in effect cut me off from the neighborhood, putting me on the other side of a busy road and isolated between businesses and a major thoroughfare. Not only would this negatively impact my quality of living and that of a long time established neighborhood, it would lower my property value considerably. I do not see the feasibility of this plan when destroying a neighborhood and homes in the path of the new route. The warehouse behind my house has seemed to be vacant for some time now (former Ecko warehouse) and this seems to be an area that could be targeted. Another option might be King Highway (gravel road at the end of our neighborhood). I know little about traffic options, but I wonder if making Farrington a bridge over 54 might be more effective than re-routing major roads.
- I am talking about the area east of 15-501 Morgan Creek-Kings Mill. Currently we have 2 lanes each direction, I ride my bicycle and it's doable to cross the road if you are fast - the town council from Chapel Hill last summer was less courageous crossing the street by foot. Now we see and hear discussions about adding lanes - meaning we are locked in or make a big detour adding to more traffic. Thinking about unusual ideas: what would the consultants think about moving the big roads BELOW the ground - it's a very common solution in many parts of this country and in other countries. The current stretch of the road could be developed thereby gaining land?
- It makes no sense to me to route George King Road to Crossland Drive. Why not pave it all the way to NC54 along the current roadbed?
- During the third workshop, it was suggested by a participant that Southwest Durham Drive not be connected to Meadowmont Lane, which is the current plan. The consultants responded by saying essentially that the anticipated traffic on Meadowmont Lane that would result from the connection would not be that bad. I think that the connection makes a lot of sense because I learned in the Collector Street Plan Meetings that enhanced connectivity reduces congestion. In this case the connection would result in Meadowmont residents traveling less on NC54 and more on Southwest Durham Drive. I attended the Collector Street Plan Meetings in several locations including a special meeting held at Chapel Hill Town Hall. At these meetings I heard from a number of Meadowmont residents who felt that the Southwest Durham Drive connection to Meadowmont Lane would be a plus in enhancing their choices for access to/egress from their community. I believe that it would also provide an alternative for pedestrian and bicycle traffic which might otherwise pass through the region of the Corps of Engineers Land which seems to be the most dangerous and tick-infested part of the Corridor. At the Chapel Hill town hall meeting the Transportation Department representative responded to a question saying that Meadowmont Lane had been constructed properly to serve its function as the southern end of Southwest Durham Drive. This is easily seen in the gargantuan intersection at NC54 and Meadowmont Lane, which is about 9 lanes wide by 6 lanes wide. It would be a mistake not to use this intersection.

Comments from the workshop:
Regarding the collector street system, participants had a few comments for specific streets. The participants noted that the collector street designation from George King Road straight down to NC-54 is wrong. The project team will correct the alignment.

There was major concern with one of the proposed connector roads behind the shopping center – participants said that area was a neighborhood and a community pool and shouldn't be a connector street and attract vehicles because it currently serves many children and pedestrians. One commenter questioned whether the SW Durham arterial road is coming to Meadowmont Lane and if it shouldn't connect to George King Road instead, because near future development will be closer to George King Road. There were many concerns expressed about traffic on Meadowmont Lane in the future and the impacts it would have on the walkability of the community. A last comment urged consideration of traffic impacts because of Chapel Hill's close proximity to RTP and the travel patterns between the two areas.

Development

Summary:

There were several comments about the Leigh Village development, possibly because the workshop group used the Leigh Village location to illustrate a possible high-density transit center development. Commenters were concerned that Leigh Village was designed solely to support light rail and that it would increase congestion. It was also seen as unrealistic and encouraging unwanted growth in the corridor.

Specific Comments:

- extremely doubtful that Leigh Village will get enough transit to keep traffic manageable with superstreet and lower-cost road changes, absent huge cost increase in gas.
- why build a community like Leigh Village? Is it only to support light rail, because it seems like that will only increase congestion.
- why can't Leigh Village be lower density with more greenspace? It would contribute less to the congestion.
- Leigh Village phasing needs to be tied to building the collector roads
- Leigh Village is unrealistic in the short term
- want slow growth
- developers shouldn't build if the roadways can't handle the traffic that such developments will bring

Land Use Designations

Summary:

In general, commenters believed the land use designations were too dense and showed high growth that the residential community does not support. The proposed density was seen as unsustainable (especially at the Leigh Village development), only there to support light rail transit, and unrealistic, and having adverse environmental impacts. There were concerns about development near Farrington Road and how it might impact the senior assisted-living facility in the area. However, some participants did support the transit-supportive development and feel it will address future needs.

Another commenter felt the mixed used (tall buildings and retail on the ground floor) do not necessarily bring foot traffic or the vibrancy that is described when located on vast wide highways. Much of the area along 54 is low laying and adjacent to Jordan Lake, a

major drinking water resource and the residents in this area depend on surface water for their water supply. Chapel Hill and Durham should not be encouraging major increases in building intensities so near buffer areas of Jordan lake, a drinking water supply for the region.

A number of participants wanted Eastwood Park to be designated low density residential and did not want to see any new roads introduced into the neighborhood. Another wanted to see Eastwood Park incorporated into Leigh Village and yet another suggested turning Eastwood Park into a parking garage and office complex to siphon some traffic off the corridor earlier. One commenter added the necessity to consider the ecological sensitivity of the Waterfowl Impoundment Area at the southern end of George King Road.

Specific Comments:
- land use is too dense
- transit improvements aren't enough to justify dense land use
- put Eastwood Park on the corridor study map as low density residential so that it can be changed in Durham's Comprehensive Plan
- are unrealistic given what already exists
- did you consider environmental impacts, considerations for green construction and land use, school, fire station, and police station locations?
- what is meant by lower-cost housing?
- Eastwood Park neighborhood should be incorporated into the Leigh Village development
- maintain Eastwood Park as low density residential and do not introduce any new roads into the neighborhood (7)
- the proposed scenario is structured for an urban area with a huge population. Any development, particularly retail, is doomed with this forced approach, especially the parking per square ft restrictions
- future planning must take into account the Palladian and Quadrangle office parks/corporate centers that are immediately east of the I-40/54 interchange. Hundreds of employees work in these locations and future development is anticipated in Palladian (Leigh Farm Road)
- general correct concepts, but Leigh Village tapering to lower density is a suspect model
- Leigh Village concept is gigantic and not appropriate for Chapel Hill
- growth is currently not there, do not create it. you stated this is market demand for what "might be desired" – but this growth is not desired by residents.
- proposed scenario seems to be forced to accommodate future light railway system.
- proposed density is unsustainable for this area
- need to limit density
- concerned with development near Farrington Road – keep senior assisted-living facility in perspective. Too much development will cause further issues to existing residential areas such as Downing Creek, unless road access improvements follow.
- transit-oriented communities are very progressive
- do not like the pro-development tone; while there will be some growth, it will never be enough to support the proposed scenario developments

- turn Eastwood Park into a parking garage and office complex to ease traffic into UNC and points west
- not enough attention paid to low-lying areas near wildlife impoundment.
- I just wanted to lend my voice to the chorus of support for Chris' proposals below, and a general vote of support for switching Eastwood Park's future-use policy to residential. As you know by now, many of the residents of Eastwood Park are committed to preserving the neighborhood and its quality of life for the medium- and long-term future. The only consideration I would add to Chris' items is the ecological sensitivity of the Waterfowl Impoundment Area at the southern end of George King Road. As you are probably aware, the land along 54 from that area and east to just before 751 was, prior to human development, a low-lying wetlands akin to a swamp. Though this area has been deeply compromised through the years, it still exists in enough fragments to support some vestiges of an important ecosystem and the ensuing biodiversity. Further encroachment into this remaining area will further crowd out existing species, while likely adding considerable water runoff problems to existing and future development.
- The great preponderance of mixed use 2 is not justified. Tall buildings and retail on the ground floor do not necessarily bring foot traffic or the vibrancy that is described when located on vast wide highways. Much of the area along 54 is low laying and adjacent to Jordan Lake, a major drinking water resource. We depend on surface water in our region, not ground water, to serve the water needs of our cities. The Jordan Lake rules offer some protections, but Chapel Hill and Durham should not be encouraging major increases in building intensities so near buffer areas of Jordan lake, a drinking water supply for the region.
- I am in favor of Eastwood Park remaining residential, that I am in agreement with the alternate collector street route proposed by Chris Selby, and that I would also encourage Durham to improve the area between Eastwood Park and Highway 54 with plants or walls to buffer the traffic noise. This would be in keeping with maintaining the area as a residential neighborhood and would help improve the quality of life in Eastwood Park.

Comments from the workshop:

The participants did not have major comments about the land use designations, but there was differences in opinion on the density. One commenter was opposed to the dense, mixed-use development because those would bring more cars and congestion to the corridor. Another commenter supported high density but believed the community needed education about the positive aspects of high density and also needs to develop a concise vision to guide development. Another commenter suggested that, besides density, access, time, and distance should also be considered when developing the ¼ and ½ mile radius transit centers.

Other

Summary:

Participants submitted comments unrelated to the above topics. One commenter was concerned that this plan covers two counties and the implications of that for economic development. The commenter was particularly concerned with the tax burden on residents for non-residents to use the park and ride and free bus transportation. Another commented continued to advocate for an alternative southern route around Chapel Hill to

alleviate traffic coming from Chatham County, where development is occurring rapidly and from where a significant amount of traffic is entering the corridor. A comment was made that the proposed scenario seems to favor the needs of UNC over the residents living along the corridor, and another echoed that sentiment, stating the need for someone to advocate the needs of Durham residents. Another commenter stressed that the assumptions guiding the study were made by “outsiders” and not submitted by residents in the corridor.

One commenter suggested lowering the speed limit to 35 mph on NC-54 to reduce the regional utility of the Corridor (thus reducing traffic) and would, to some degree, address safety concerns.

One commenter made this statement: “I would be very interested in knowing not only about congestion in general but I would be especially interested to know the duration of rush "hour" under the various scenarios that were considered and how they compare with the scenario that they decided upon in the third Workshop, with the superstreet arrangement. I hope that when the final scenario is presented to the governing bodies and the TAC, these interesting data will be made available. I would expect others with a more pragmatic view, including those underwriting the Study, the local citizens and the commuters also to be interested in what congestion will look like in the future, and how the Study plan will address this issue. In summary, how long will rush hour last with the superstreet plan and how will it compare with the duration of rush hour associated with the other plans considered? I honestly feel totally out of the loop as far as what to expect from these plans and sense that a catastrophe is within the realm of possibility Consequently, to protect the folks who live near the Corridor and those who use the Corridor, it seems appropriate that the final Corridor Study plan should include a moratorium under which there will be no development in the Corridor until after proven capacity for handling the increase in associated traffic is made available.”

Another commenter stated, “What does one experience as they exit the interstate and enter Chapel Hill? With exceptions at the strip malls, for the most part, there is a relaxed, comfortable rural feel. This helps keep down the road rage which can at times be aroused by the traffic. Along the Corridor, there are numerous neighborhoods and offices close to NC54, but for the most part they are screened by landscaping. A noticeably different view is presented by my neighborhood, Eastwood Park. There is no effective barrier between Eastwood Park and NC54, and with the widening of NC54, the highway will be quite close to homes there. A theme universally utilized in all kinds of design, be it interior, landscaping, architecture or whatever, is continuity. There needs to be an effective level of landscaping/hardscaping between Eastwood Park and NC54 to confer a sense of continuity to the corridor. This is one of the few areas of the corridor where utility wires on telephone poles are prominently displayed. These wires/poles are not attractive, and the landscaping should be "beefy" enough to hide these from view. Aside from the esoteric contribution, a consistent background (that is, landscaping such as that seen across the highway, at Falconbridge), would make it less distracting for NC54 traffic maneuvering through intersections or a superstreet.”

Detailed Comments:
- concerned about this plan covering 2 counties and the implications for economic development, especially the county responsible for taxes. People who currently use the park and ride areas and the free bus transportation are not from Orange County and are not paying those taxes but should be responsible for some of it as well.
- add a phasing timeline to help keep this scenario logical
- proposed scenario appears to favor UNC over residents who reside along the corridor
- Durham and Chapel Hill would significantly have to change their zoning regulations to implement your development proposals
- assumptions for this study were made by outsiders who do not know the land and are "telling us what to do"
- consider impact of RTP and RDU traffic on the corridor. People living in the corridor travel to RTP as well
- conduct traffic studies on Farrington Road to asses impact of adding more traffic on the road due to the park and ride or rail station
- still need an alternative southern route around Chapel Hill to alleviate congestion
- rapid development occurring in Chatham County, so commuters from the south funnel into Chapel Hill through Farrington – must consider this
- I came away from the third public session with the impression that all of the recommendations being finalized by the consultants favor UNC, the UNC Health system and the Town of Chapel Hill. Therefore, someone has to stand up and fight for Durham and Durham residents.
- I think that the overall direction for considering improvements within the limited budget and existing ROW - FOR THE NC 54 SECTION WEST OF THE LITTLE CREEK BRIDGE (PRIMARILY CHAPEL HILL AREA) is good.
- I would be very interested in knowing not only about congestion in general but I would be especially interested to know the duration of rush "hour" under the various scenarios that were considered and how they compare with the scenario that they decided upon in the third Workshop, with the superstreet arrangement. I hope that when the final scenario is presented to the governing bodies and the TAC, these interesting data will be made available. I would expect others with a more pragmatic view, including those underwriting the Study, the local citizens and the commuters also to be interested in what congestion will look like in the future, and how the Study plan will address this issue. In summary, how long will rush hour last with the superstreet plan and how will it compare with the duration of rush hour associated with the other plans considered? The consultants offered no information suggesting that there would be substantially increased capacity for traffic with their plan. Without data to support their plans, and confidence that travel will be vastly improved when these plans are implemented, it is possible that their plans will lead to a catastrophic situation. I'm sorry to say something like this which seems like not a nice thing to say, I don't intend to be mean. I honestly feel totally out of the loop as far as what to expect from these plans and sense that a catastrophe is within the realm of possibility Consequently, to protect the folks who live near the Corridor and those who use the Corridor, it seems appropriate that the final Corridor Study plan should include a moratorium under which there will be no development in the Corridor until after proven capacity for handling the increase in associated traffic is made available.

- During a question and answer session at the third Workshop I suggested that a lowering of the speed limit to 35 mph on NC54 in the eastern portion of he Corridor would reduce the regional utility of the Corridor (thus reducing traffic) and would, to some degree, address safety concerns raised during the meeting. The speaker responded to the effect that the state of North Carolina has some authority over the issue. There was no questioning of the validity of the 35 mph idea. In fact this could be a valuable idea in offering a "low-hanging fruit" (easy and inexpensive) type of contribution to long-term problems in the corridor. Since the result of the corridor study is to make recommendations and not replace signs, I believe that such a recommendation could in fact be made in the final Corridor Study report and would be potentially quite valuable. I wish to note that people have been and will continue to be killed by traffic in the corridor.
- Aside from the safety and congestion issues is the esoteric value. What does one experience as they exit the interstate and enter Chapel Hill? With exceptions at the strip malls, for the most part, there is a relaxed, comfortable rural feel. This helps keep down the road rage which can at times be aroused by the traffic. Along the Corridor, there are numerous neighborhoods and offices close to NC54, but for the most part they are screened by landscaping. A noticeably different view is presented by my neighborhood, Eastwood Park. There is no effective barrier between Eastwood Park and NC54, and with the widening of NC54, the highway will be quite close to homes there. A theme universally utilized in all kinds of design, be it interior, landscaping, architecture or whatever, is continuity. There needs to be an effective level of landscaping/hardscaping between Eastwood Park and NC54 to confer a sense of continuity to the corridor. This is one of the few areas of the corridor where utility wires on telephone poles are prominently displayed. These wires/poles are not attractive, and the landscaping should be "beefy" enough to hide these from view. Aside from the esoteric contribution, a consistent background (that is, landscaping such as that seen across the highway, at Falconbridge), would make it less distracting for NC54 traffic maneuvering through intersections or a superstreet.

Emailed Comments

Traffic Issues

I-40/NC-54/Farrington Road intersection:

- The left hand turn problem from westbound NC-54 into southbound Farrington Road remains, in my mind, the most difficult situation to resolve. Diverting some of that traffic elsewhere seems to be an absolute imperative. Some traffic coming off of I-40 cannot find a space in the left hand lane and is coming down to the traffic light at Huntingridge Road and making a 180-degree turn to get back to Farrington Road.
- Difficulty with left hand turn onto Falconbridge Road from westbound NC-54 during rush hours (eastbound traffic is backed up and blocks the lane despite DO NOT BLOCK INTERSECTION signs.)
- Much concern about possible increase in cut through traffic onto Huntingridge Road due to backup problems on NC-54. At present this mostly occurs during rush hours but can occur at other times due to congestion on NC-54.
- What do the I-40 / NC-751, I-40 / 15-501, I-40 / NC-86 interchanges look like during rush times? Could there be ways to make these interchanges more appealing that would take pressure off the NC-54 situation? One thing that differentiates the NC-54 interchange from I-40 west bound when compared to 751, 15-501, and 86 is that 54 is the only without a traffic light bounded left turn at the end of the exit ramp. Comparing 54 to 15-501, during non-traffic times, 54 seems like a faster drive to UNC than 15-501 when starting from their respective exit ramps. Obviously, the most important question is, where is everyone taking their cars such that slow downs and unsafe situations are being caused by back-ups. For example, if many of them are going to the Friday Center to park and ride to UNC then working with the 751 route (via Stage Coach and Barbee Chapel) to the Friday Center would likely be more helpful than others.
- Adding lanes and an interchange at Farrington Rd. would only funnel more traffic to the already abysmally dysfunctional intersection of Farrington Rd., NC 54 and I-40. Interchanges CREATE slowdowns and congestion; they do not relieve them. Open stretches of interstate highway allow for free flowing traffic; interchanges gum up the works. There is a logical reason why federal guidelines stipulate that interchanges should be 2 miles apart; that principle is violated here. Interchanges also bring tremendous pressure for dense, intense land use changes...simply not appropriate along this low-density residential portion of Farrington Rd. That decision was affirmed by the removal of a transit stop from the area (near Creekside School).
- Creekside School would be negatively impacted by the congestion accompanying an interchange.
- Given that the reason that the location of Creekside Elementary School is why the study area extends as far north as it does -- per my direct request to MPO staff in an early discussion at the MPO -- it should show on maps. School traffic leaving for other parts of its massive attendance zone, creates a stand-alone peak of about 30 minutes duration, almost all of it loading into south-bound Farrington Road and

thence into the east-bound single left turn lane. There have been days when the left-turn wait itself approached the full 30 minutes of the peak period. That is to say, someone coming from the north (e.g., this writer) would have had to wait 30 minutes to get onto NC 54. I always U-turned and found another route to the RTP, or Raleigh, the latter trip taking hardly more than 30 minutes by itself. I have been told that adjustment of the signal cycle is not feasible for that stand-alone peak period because it is separated from the "normal" peak hour. Given that this turning movement is at LOS F for 6-8 hours a day, I have to wonder.

- Pressure for an interchange is coming from Chapel Hill; Durham needs to say no to the continual push of development and congestion out of Chapel Hill and into SW Durham. That process began by pushing Chapel Hill's outer belt loop, the Laurel Hill Parkway, from Sage Rd. to Pope Rd. to Farrington Rd. in an ever eastward progression. The name is now Southwest Durham Drive!
- While at first blush, an I-40 interchange at Farrington Road might seem like a good idea, upon appropriate examination, the negative consequences of such an interchange will again be realized. Last year such a proposal was put before the Transportation Advisory Committee. It was removed from **ANY** further consideration. An interchange at I-40 and Farrington Road would put our children at risk, threaten the historic Leigh Farm and environmentally sensitive Water Fowl Federal Lands, and violate the graves of those laid to rest at Markham Memorial Gardens cemetery.
- Specific land uses in the vicinity of Farrington and I-40 include the Prescott Place, Glenview Park and Trenton neighborhoods, the Markham Memorial Gardens cemetery and Leigh Farm Park, 86 acres of open space protected over the last 20 years by a public private partnership including the Jr. League of Durham and Orange Counties, Triangle Land Conservancy, the State Dept. of Cultural and Natural Resources, DUTAG, DOST, Historic Preservation of Durham, Durham Parks and Rec, SEEDS and Piedmont Wildlife. There is literally no room for an interchange without destroying something of great value (homes, graves, park land).
- Farrington Rd. is a low-density residential greenbelt with 5 sites on the Durham Inventory of Cultural and Natural Resources. Leigh Farm Park in particular is a gem of open space and anchor to the New Hope Creek Corridor trail system. It should be protected, not drowned in asphalt and congestion.
- As the director of Piedmont Wildlife Center, a nonprofit that actively uses Leigh Farm Park to teach children and adults the importance of protecting wildlife and our natural resources, I believe that Leigh Farm Park and the surrounding New Hope Creek watershed would be severely damaged by any increase in traffic brought on by an interchange at Farrington Road and I-40. The wetlands in Leigh Farm Park are already being damaged by runoff from I-40 and any additional impact could kill the wildlife and plants that protect our watershed. Please fight to protect the future of our environment!
- I live in the Trenton neighborhood. Several residents have been very vocal in their opposition to an interchange at I-40 and Farrington Road. I am not one of them. I

would welcome easy access to I-40, and the ability to avoid the very busy and sometimes dangerous intersection at Farrington and 54.

- Lengthen the left turn only lane on East bound NC 54 at Farrington Road back to the Falcon Bridge Road. It is too short now and cars turning left end up blocking car proceeding east bound on NC 54 through the Farrington Road intersection. Also, at the Farrington Road – NC 54 intersection, approaching the intersection South bound on Farrington Road:

    a) Lengthen the right turn only lane to 300 to 400 yards back from the intersection.

    b) Widen Farrington Road to provide 2 left hand turn lanes with the left most turn lane for either NC 54 East bound and/or I 40 East bound and the second left turn only lane dedicated solely to I 40 East Bound. This would probably also require a re-working of the entrance to I 40 East Bound to lengthen the merge lanes.

    c) Extend the all turn lanes an additional 300 yards north of the intersection.

  North bound on Farrington Road at the NC 54intersection:

    a) Widen and lengthen the left turn lane, and add a second left turn lane.

    b) Lengthen the right turn only lane.

- The proposal to add a new ramp at NC54 and I-40 so people coming from Hillsborough to Durham adds 2 more lanes of people coming off I-40 (and just getting off moving at highway speeds) to be crossed by someone coming from Durham to get across to turn on Farrington (or the new intersection formed by bringing George King Road down to NC54). Note that that "someone" could be a student -- that is an inexperience driver -- driving home from Jordan High School.
- Have you modeled what happens when I-40 breaks down? When Old Chapel Hill Road breaks down? What alternative routes are people likely to take?
- In the long run, I guess most of the traffic that now goes down Farrington Road would swing over to George King, past the school (I hope someone is thinking about school traffic mixing with I-40 back-up traffic, and what this means for all of trying to walk to Creekside Elementary School).
- I really prefer 1 phase (no signal) traffic signal solutions. That is the ultimate solution, isn't it? I do believe it is feasible if we allow ourselves to be out of box and a little bit more innovative.
- This exercise becomes extremely convoluted, expensive and ill-focused. WHY are we even contemplating such histrionics to accommodate automobile traffic instead of pushing alternatives. Specifically, I refer to park & ride lots at the 54/40 intersection, a limited-time HOV lane, and alternate routing to UNC (which is the culprit in all this). There is enough vacant land between I-40 and Manning Drive for a NEW THOROUGHFARE directly between the two that wouldn't affect existing businesses or residences.

Superstreet Concept:

- One commenter expressed big concerns about the "super street" concept, and the changes in access. They expressed shock and dismay that we would suggest people might not enjoy the same level of direct access in and out of their facilities, especially at the Friday Center (restricting NB lefts who leave and are returning to Chapel Hill), the new imaging center at Burning Tree Drive, and their remote health care facilities at Farrington Road.

    a) They expressed concern about patients being confused about changes in access and having to make U-turns or travel out of direction.

    b) They said they've been working toward making a more seamless, interconnected network of satellite facilities, and this just undermines all that, including their recent $$$million investment in new facilities.

    c) They've located their facilities for the best accessibility, and now we're changing that.

- One commenter wanted to see a flyover at Farrington and I-40 instead of the superstreet concept that restricts access at Farrington; similarly, they felt a major redesign of the I-40 interchange should be in our plan, not just an "interim solution" for 2020.

- Going south on Farrington, you could only make a right turn onto NC54. If you want to go left, you would go down George King Road (assuming the new intersection there got built first), where you could make a left turn. If you wanted to go down toward Stagecoach Road, you would need to turn right at George King Road (or at Farrington) and go west to a U-turn at Huntingridge (like the new superstreet on 15-501) -- or more likely sneak through the neighborhood.

- If you wanted to go down Burning Tree or through Meadowmont to get to the golf course (or the Botanical Gardens or Friday Center), you would need to go west through how many stop lights before you could make a U-turn?

- During the meeting (Workshop 3), I added one more idea. I called it "SWOLLEN solution" during the meeting if you could hear me. I dubbed it SWOLLEN because the street might not be straight around this part. The on-going street swerve outward to allow to add one lane for U-turn. This lane is solely dedicated to the U-turn traffic without any signal light and allows the U-turn traffic merge gracefully to the incoming traffic. During our phone conversation, I compared it to how we enter the interstate traffic. You pointed out the main difference, instead of merging into the traffic from left to right, drivers need to learn to merge from right to left. As we all experienced the first time to enter the interstate and got frozen with terror when we tried to merge into the non-stopping traffic, this could be a little confusing but every average driver will learn it in a day or two. There is first time for everything. In Orlando, the exit to Universal Studio theme park from I-4 East bound is not on the right side. You need to change to the left most lane to exit. If you miss that exit, you need to take the next exit to come back. It was confusing in the first time. If this dedicated lane is long enough, it will even reduce this confusion. I didn't have a chance to measure the distance for this. We know how to merge from left to right. It

happens all the time on high way. If the dedicated lane is long enough, after a very slow U-turn, cars would have enough time to speed up to speed limit on Hwy 54 and merge gracefully to in-coming traffic. The main advantage of having a fly over or underground U-turn road is the length required to allow the cars to speed up to the speed to safely merge into the traffic. The main disadvantage is the construction cost. Alternative solution one (alternative two): merge ahead lane - If necessary, the left most lane of the Hwy 54 can be marked as "merge ahead from right, slow down to 40 mph." Even in this scenario, only the left most lane is subject to this restriction, not the rest. The rest lanes enjoy green signal without any speed reduction. Alternative solution two : 1 and 1/2 PHASE SUPERSTREET: In case this is the hindrance in the implementation, I'd like to present 1 and 1/2 phase superstreet: The idea is quite simple. Before Hwy 54 lanes approaches the intersection with the U-turn lane, the left most lane is split from the rest of the lanes. This separated left most lane is subject to the 2 phase traffic signal to allow the U-turn traffic to flow alternatively. The rest of the lane besides the left most will not be disrupted as 1 phase. We can expect that most of cars would try to avoid this slow left most-lane by switching the lane if the situation allows. the separation of the left most lane can be done with a simple construction of median etc. In consideration of the all proposed development along Hwy 54, I do believe we need eventually to add more lanes to Hwy 54. Without superstreet, adding lanes wouldn't help; however, with the implementation of superstreet especially 1 or 1 and 1/2 phase superstreet, adding lane would really add the capacity. I'd like to recommend - phase one - super street; phase two - adding more lanes to Hwy 54 (long term solution but need to reserve some land along Hwy 54).

Increased Congestion:

- Concerns about increased congestion from possible UNC medical facilities going into two buildings recently vacated on NW corner of NC-54 and Farrington Road. Egress from that site onto Farrington Road very difficult because entrance is only 30 to 40 feet from NC-54.

Collector Roads:

- Current proposed collector roads which run along Celeste Circle and Crossland Drive will adversely impact the access to and from the homes located within Eastwood Park. The homeowners of Eastwood Park proposed a new collector road which would utilize the current infrastructure located at NC54. The proposal utilizes an existing stoplight at the intersection of Highway 54 which is used by the homeowners of Eastwood Park and Falconbridge as well as the businesses located along the service road on Highway 54. The homeowners of Eastwood Park propose that the land located within Eastwood Park be allocated as Highway Commercial and Office Development.

George King Road:

- George King Road is re-routed to make a T-junction with NC54 via Crossland Drive, which is in our neighborhood. The Leigh Village map proposes to seal off and thus prevent access of our neighborhood to NC54 via the light at Huntingridge Road which leads from NC54 into the Falconbridge neighborhood. Thus, remaining would

be a "double T" arrangement of George King and Huntingridge Roads which the developer thought were close enough so that the signals would be timed so that they functioned as a single light. Importantly also, the Service Road and Celeste Circle access to NC54 would be via Leigh Village. To exit our neighborhood we would have to drive into Leigh Village and circle around to get to NC54. The neighbors that I have spoken with like this plan. It would make commercial development on the Service Road and Celeste Circle unattractive since access to NC54 would be inconvenient and there would be more plantings between the Service Road and NC54 which would make our neighborhood less visible.

- George King Rd. should be paved and the Meadowmont Connector built as planned.
- I understand there is discussion about George King and Farrington and how best to direct the traffic in the future. My hope would be that George King is left alone, gravel and all. It is a wonderful refuge for all of us who live close by for walks, retreats, and enjoying the wildlife area. I would hope that it wouldn't change at all but I have been told there is not a chance of that happening. I believe there would be a significant negative environmental impact to re-route and/or pave George King. I actually believe it should be closed to traffic except for the folks who need to access their own driveways. Why can't we have one piece of road left that is a refuge for wildlife and people who enjoy being near the wildlife.

Other Traffic Issues:

- Is there a plan for a crossover at Hwy 54/Hamilton due to 54 East/Walking Traffic/schools?
- A Southern connector joining 15-501 and 751 should be investigated as an alternative route to help relieve congestion on NC 54.
- Another concept to investigate: Existing I-40 could become business I-40 (as with I-85 in Greensboro and I-40 in Winston-Salem) with a new I-40 bypassing the Triangle to the south.
- Install a "DO NOT BLOCK INTERSECTION" sign at Little John Road East bound on NC 54.
- To facilitate the flow of traffic on NC 54, into to Chapel Hill in the morning and exiting Chapel Hill in the evening rush hour, arrange all the traffic lights in both directions on NC 54 in sequence.
- Barbee Chapel Road north bound at NC 54:
    a) Widen to 3 lanes to include a right turn only lane.
    b) Extend multiple lanes back to almost the Finley Forest entrance.
- Widen NC 54 to 4 lanes between Farrington Road and NC 751.
- Provide a direct access to I 40 from Farrington Mill Road to accommodate the hundreds of cars driving from Chatham County to I 40 at Farrington Road. Or in the alternative, provide direct access from Farrington Mill Road to Stagecoach Road so Chatham County driver could access I 40 at NC 751.

- Install traffic signals at the Stagecoach Road - Farrington Road intersection.
- Install traffic signals where Farrington Mill Road "T" intersects with Farrington Road/Barbee Chapel Hill Road.
- Widen Stagecoach Road at Farrington Road to provide both left and right turn lanes.
- Longer term, widen both Farrington Road and Barbee Chapel Road to 4 lanes.
- UNC is very supportive of the 6-laning of 54 east through Durham.
- For those of us who already take our lives in our hands (including me & my entire neighborhood in Glen Lennox)--and that of children & elders & folks of all ages--because we LIVE parallel to NC54 and MUST travel it just to get in/out of our neighborhoods & to/from work, schools, church, hospital, veterinarians, grocery store & related necessities, & home again, dear Lord help us and save us, AND the LAST thing we need is MORE TRAFFIC & anything like these Michigan U-turn things or anything else that will ADD to the traffic on THAT road, and PLEASE do NOT expand NC 54 to 6 lanes. It is NOT safe now, and adding U-turn things is NOT going to make it safer!!
- In fact, there are traffic/safety studies showing that when you add lanes, you increase car accidents because of the lane changes that more lanes induce and also because speed (temporarily) increases. Then there is induced traffic. De to the phenomenon of induced traffic, by adding capacity you will draw more drivers to the area (hence, vehicle miles traveled) than would have otherwise used that route had it remained with fewer lanes. By increasing capacity we would also, obviously, be adding more air pollution from cars and trucks. Oh yeah, more noise pollution, too.
- One entrance to/from Pinehurst, NC has had a traffic-calming, & I believe accident-lessening traffic circle for approximately 45 or so--it joins 4 entrances/exits as it joins Midland Road coming from Southern Pines to Pinehurst, and Highway 2 & Highway 15-501 at one circle that is also very close to the regional hospital and has an entrance/exit to the hospital, as well as the entrance/exit to Pinehurst continuing Midland Road. If you don't understand how to drive it on it initially, you might find yourself circling it a couple of times until you figure it out...however it avoids head-on collisions where there were no stop-lights, etc. The round-a-bout on Ephesus/Pope Road has increased safety as has what I believe is a similar round-about thing at Pope Road & Old Chapel Hill Road. The traffic pattern at Farrington Rd/NC 54/I40 is a dangerous take your life in your hands nightmare. I am opposed to anything that will deliberately encourage more traffic on NC 54. We need to have less traffic and safer way to use that road now and nothing to encourage more traffic on what is already an extremely dangerous road. I do not want to see any lanes added, & I just don't see how things like those configurations that were added at 15-501 & Erwin or across from Environ Way on NC 54 could possibly do anything but make a bad situation worse. Adding lanes I believe should be considered not an option, period!!

Alternative Transportation

- Funding for transit may never materialize; exploding densities (based on the presupposition of transit corridors) could be a serious mistake, destroying the very character that makes North Carolina more attractive than New Jersey.
- The issue of a lack of good public transportation along the corridor was raised. Whether our residents in significant numbers would use it is questionable.
- Epcon senior citizen neighborhood is in full-swing (wrt construction), and these residents should have public transport as well. Stats show that with increase in age (past retirement) comes an increase in automobile accident incidents, and many older people no longer have a valid driver's license.
- Rail-WITH-TRAIL, if light rail ever ventures into reality, should be incorporated into each and every design model. Plenty of working examples of RWT exist in the U.S., including the Libba Cotten Trail in Carrboro.
- As a new Triangle Transit trustee, I am not aware of any use proposed within the 50-foot wide light rail corridor besides the 28-foot wide dual-track alignment. The TT Board of Trustees voted yesterday to initiate the NEPA process via an Alternatives Analysis, and additional use of the corridor may come up in that process. The heavily-used Libba Cotten trail is in an abandoned rail ROW.
- Most of UNC's patients will not use transit. They do recognize the need for rail and additional bus transit, but not at the expense of improving auto access and mobility.
- UNC suggested that the light rail transit station south of 54 behind the East 54 development did not make sense given our clustering of development nodes with the walkable ¼ to ½ mile circles. They felt we should be joining them in challenging that location because of its proximity to a golf course, and the better location was north of 54 at Glen Lenox. They acknowledged it was outside of our scope, but said we should be critiquing that station location. I let them know the AA would address it.
- UNC did not see the value of park and ride lots outside of the corridor, such as at NC 751 and 15-501. They contend "their" people will not use those lots, and don't see them providing value. Most of their park and ride lot users drive a relatively long way to the Friday Center, and then take a short bus ride to their destination. There is a comfortable mindset knowing that it is UNC-owned property and if they have an emergency, the university will take care of them so they aren't stranded. They have a unique park and ride profile due to the severe parking limits on campus…unlike conventional park and ride users, their folks act more like auto commuters than transit riders. The idea that we have different markets being served did not resonate with them. They could not fathom someone riding 15-25 minutes on the bus after driving to a park and ride lot.
- UNC strongly supports the Leigh Village park and ride, especially if it offers more space for commuter lots than they currently have at the Friday Center. UNC is moving to restrict Friday Center commuter lot access to non-university faculty, staff and patients. They do not see a future for park and ride remaining at the Friday Center beyond the near term.

- The parking limits we showed for the ¼ mile area around the stations were a problem. Unlike the business/developer group (which indicated those parking ratios would be achievable), this group did not think there would be any market value for such restrictions on health care-related uses, even in the ¼ mile area (primarily at the Friday Center). They said the Meadowmont center is declining because of a lack of parking, and will need more parking at the Friday Center station area than we've indicated.

Public Bus Transportation:

- I like the idea of the more bus service, but it doesn't help someone like me who mostly goes 5-10 miles around southern Durham, and not to a node likely to be on multiple bus routes. If I have to take 2-3 different buses to go 5 miles, congestion and gas prices would have to get much, much worse to get me out of my car.
- 3 separate comments about getting a Durham public bus stop within walking distance of Creekside Elementary, as well as the Epcon Senior Citizen Neighborhood:
    1. Creekside Elementary currently is the only school (of which we are aware) that has no public bus stop within walking distance. Creekside is a beautifully diverse school, in terms of ethnicity and socio-economics, but this comes with its challenges. I have been involved in the School Improvement Plan, and the great disparity between low income students and mid-high income students was a subject of most serious concern. We have a tremendous number of bus riders, a large number of whose parents do not have personal transportation. This hinders their involvement and our ability to provide services/workshops/etc. for them at Creekside. At the very least, these low income families need reliable transportation outside of school bus hours in order to participate fully in the programs available to them at the school. Lack of public transport was also seen as an impediment to the involvement of 'Families and Community,' which is a goal upon which Creekside and all schools are judged. The fact that public bus transportation does not extend to Creekside was seen as the biggest problem with engaging the community and the parents.
    2. Any after-school (or before-school activities) must necessarily involve private transportation -- adding to traffic in this area. The lack of public transportation serving our school's area limits family and community involvement at our school. The bus stop would enable parents to come to school for parent-teacher conferences, math/literacy nights, family socials, PTA meetings, movie nights, etc.
    3. I have contacted the Durham school board about this, and have been told they would support a public bus stop here. However, the city has not been as encouraging. It would help if you all recommended to the city that a public bus stop be put in this area to facilitate school transportation (particularly extracurricular transportation), and possible connection to public transport to Chapel Hill from Durham. If you could also involve the Durham Public School Board, that would help too!

Strong interest in biking, but safety is a concern:

- I live in Southern Village on the southern part of Chapel Hill and work in RTP. I love to cycle but have to extend my cycling path to commute to work via Stage Couch Rd, Massey Chapel, etc. as the 54 corridor is not negotiable safely. That extends my bicycle commute to ~75min one way which would likely be ~55min if I could safely go straight on 54.
- In my opinion an express bus or rail system to RTP as a center of gravity for employment would already reduce contention on this corridor significantly.
- Though I strongly lobby for off-road bike paths the impact to contention during rush hour will likely be limited. Other alternatives will need to consider alternative corridors going in parallel. Further widening of the current road falls short of increasing capacity as the intersections are and stay the bottleneck. Even with 4 lanes on 54 most people will have to turn right onto I-40 and thus funnel into one lane which will continue to gate the capacity. If higher vehicle capacity along this direction is required it will require alternative corridors connecting to I-40 further south/east in parallel to 54. Hopefully that can be avoided by improvement in public transportation and connections of bike and pedestrian facilities to enable people to get to bus and rail stops.
- I am concerned about 54 as one of the few routes between Chapel Hill and Durham which is extremely unfriendly to cyclists. The narrow section through the wetland has no shoulder and steep banks on either side. Riders have been pushed off the road and down the embankment through the blackberry bushes. One concept program that has the right idea is the complete streets program. The link is: http://www.completestreets.org/resources/new-pedestrian-safety-ranking-calls-for-complete-streets/.
- From my perspective, equal safe access for all modes of travel is a civil rights issue, just like the Americans with Disabilities act requires public ways and buildings be handicapped accessible, shopping centers, post offices, banks, government centers, churches, etc all need to be accessible by walking or bike, too. Pedestrians and cyclists are essentially fenced in by uncrossable highways. Whole most peds and cyclists travel locally, some do want to go to Durham. There are not any comfortable ways of getting there. While crossing Estes Drive during dusk, inside a crosswalk and with a crossing light, this commenter was almost hit by a car whose driver did not see her – and this has happened several times. Each time, she reports to the town of Chapel Hill that something needs to be done to improve safety. I have written to the town traffic people suggesting more light at this intersection, to paint the crosswalks solid white so a body silhouette is visible to drivers at dusk, and that there be rumple strips place a few seconds on approach to any crosswalk to alert the driver physically that a crosswalk is ahead.
- Safe passage through the I-40/NC54/exit 273 gauntlet. The interchange, with its one-leaf clover, is a deathtrap for cyclists and pedestrians heading west on NC54, especially since NCDOT widened the ramp into a double lane racetrack. Better options, in order of safety preference:

a) Bike-ped bridge over (or tunnel under) I-40, just north of NC54, connecting with future light rail corridor

b) Stoplight on the cloverleaf that bike-ped commuters can activate by push button

c) 12', two-way bike-ped sidepath on south side of NC54

- The Exit 273 interchange area is generally considered the most dangerous section of surface street for 'cyclists in Durham and Orange Counties. We've never had a fatality on that part of NC 54 -- although have had another well-known one to the west -- probably because we simply avoid it.
- There is a 10-foot sidepath on the north and south sides of NC 54 for the entire length of the Meadowmont community. The sides are connected with a reconstructed cattle tunnel in Meadowmont. All other connections are at-grade at signals, and I find them difficult because of the briefness of the available signal cycle.

Development Issues

- Eastwood Park neighborhood would like to avoid commercial development in their neighborhood and protect it from the hostile environment of NC-54 through the use of landscaping and vegetative/earth barriers. The proposed Leigh Village development shows a good way to incorporate commercial development while leaving the Eastwood Park neighborhood residential.
- Celeste Circle resident would like to have the hardscaping barriers and also some landscaping put in place to try and offset some of the noise and pollution if there is a change that increases noise and pollution.
- To blame the UNC park and ride lots for the traffic on Highway 54 ignores the development along the corridor, the fact that housing in Chapel Hill has become less and less available for people who work in the Town and therefore have to travel to work, and the fact that more businesses are there now than in the past. It is unfortunate that the focus group organizers did not invite UNC representatives to come to the meetings with, for example developers, so that this could be clarified. The UNC park and ride lots are just one of many reasons for the high traffic counts on the highway, and on a given day make up a small percentage of the total traffic on the roadway.
- The development of Carolina North must be taken into account when studying future traffic needs in this area.
-

Other Issues

- Farrington Rd. is a low-density residential greenbelt with 5 sites on the Durham Inventory of Cultural and Natural Resources. Leigh Farm Park in particular is a gem of open space and anchor to the New Hope Creek Corridor trail system. Preservation, not more pavement, is our watchword.

- When a small turn in lane was added for eastbound traffic to turn into Huntingridge Road they made it very sharp so they did not have to move existing storm drain. This is a problem for many of our residents.
- Speed limit should be enforced. On the 54 corridor described, it goes through a wetland, so any expansion of the road immediately presents water displacement issues for the surrounding buildings. For this reason, the only way to add is to build a long bridge. If you do build a bike-ped path, make it far enough away so the traffic noise doesn't make the cyclists deaf. I am convinced that my husband's hearing issues are from years of traffic noise as he ran or biked on the street. I measured the traffic noise beside 15-501 to be over 80 dB with my sound meter.
- The concept of staging/phasing is important. It was a bit lost on them at the outset that we were talking about changes in the corridor over a 5-10-20 year time frame. When we discussed the timing and overall horizon for the plan, they seemed to recognize big changes were likely to occur, and were needed.

APPENDIX E

Synchro Traffic Analysis

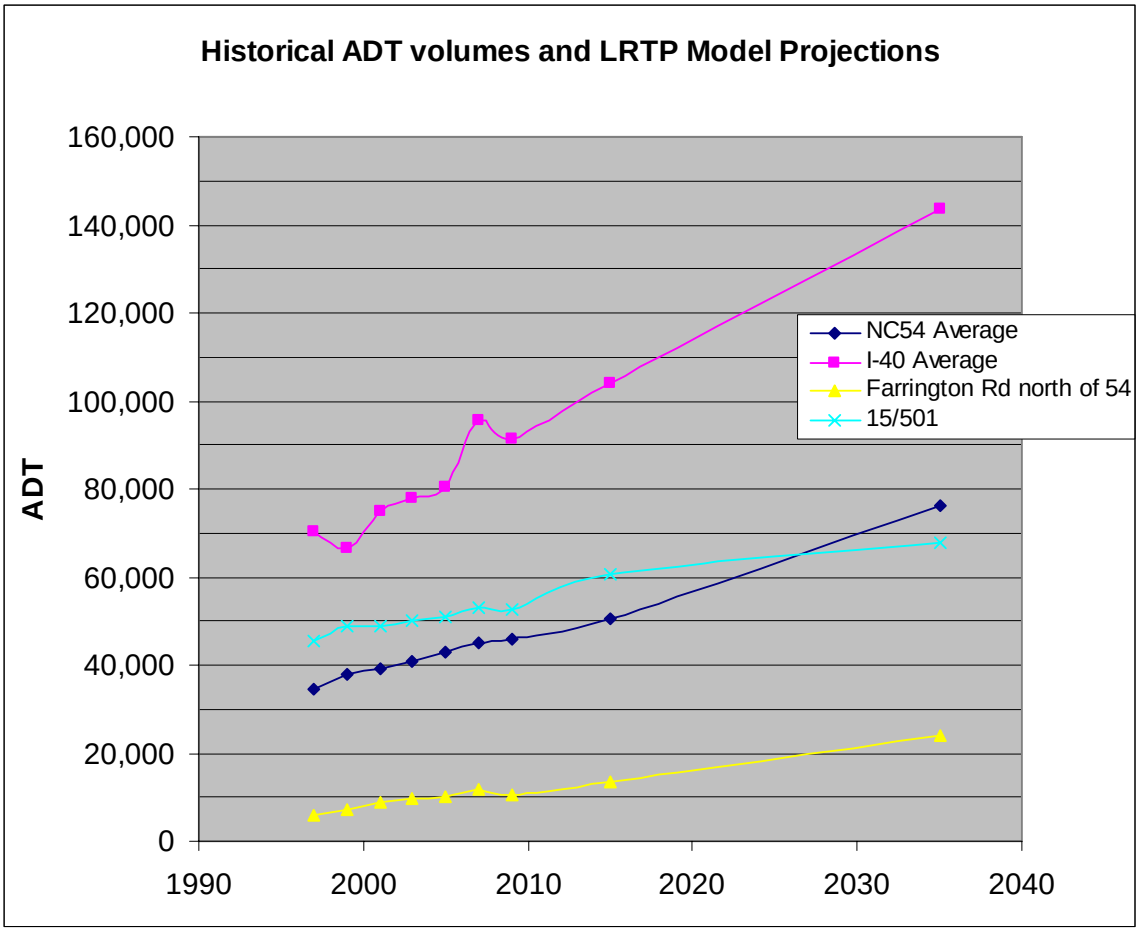
Future Traffic Projection Methodology

Historical traffic volumes are available for the major roadways within the study area from 1997 through 2007 (and 2008 for I-40). The average historical growth rate for the study area from the past decade is approximately 3 percent per year, non-compounded. Farrington Road and Barbee Chapel Road have extremely high historical growth rates of 8 to 10 percent per year.

	Historical Growth Rate	Original Regional Travel Demand Model Growth Rate
Average growth rate for entire study area	3%	2%
NC 54	3%	2.5%
I-40 West	3%	2%
I-40 East	4%	2%
15/501	2%	1%
Farrington Road north	8.5%	4%
Barbee Chapel	8.5%	3%
Other roads	2%	Not included in regional model

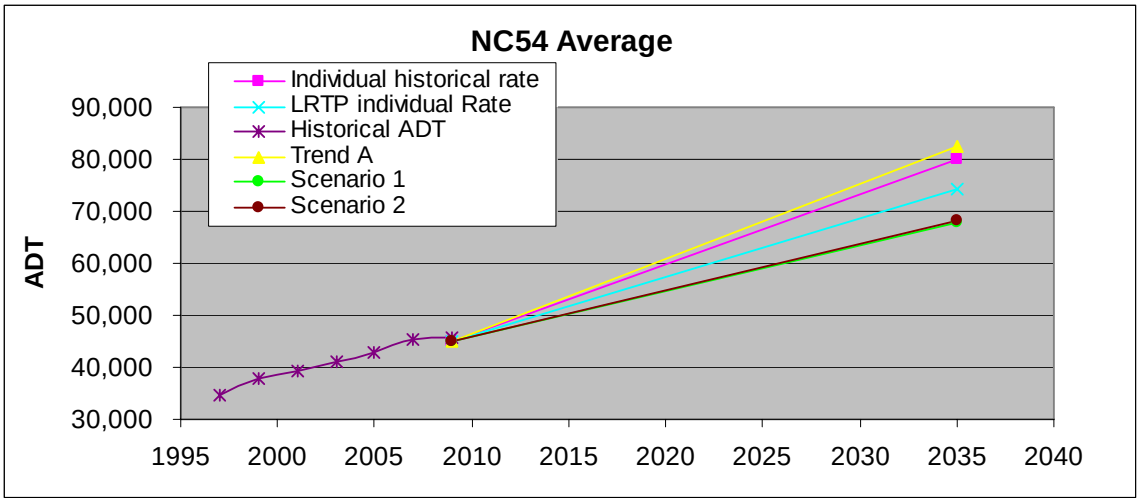
The Durham – Chapel Hill – Carrboro Metropolitan Planning Organization (MPO)'s regional travel demand model produces traffic forecasts based on the planning policies and programs from the adopted long range transportation plan (LRTP) with a horizon year of 2035. The traffic projections from the model have a lower rate of growth than the historical traffic patterns, as shown in Table 1. The average growth rate of the study area is 2 percent per year.

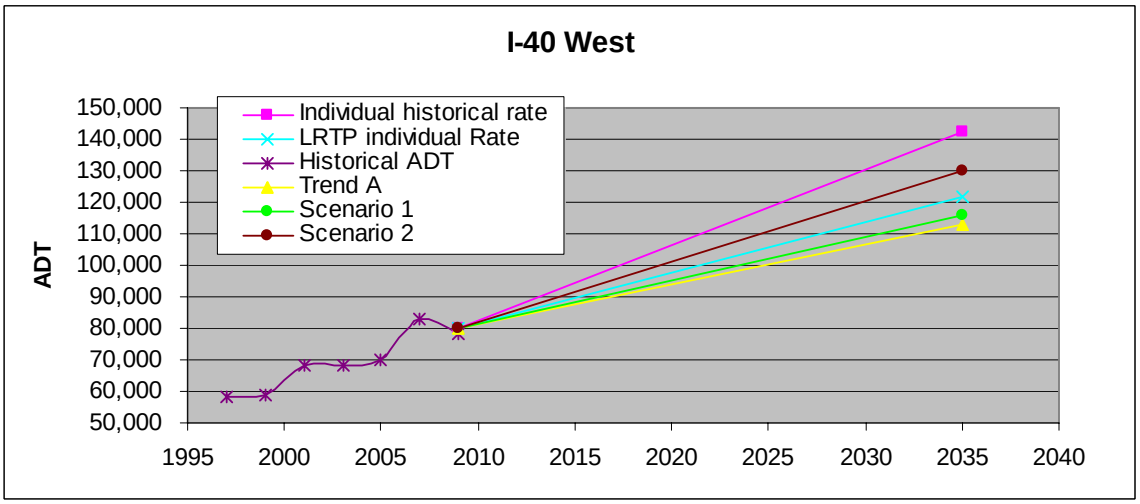
The study team examined the historical and projected growth rates for the major roads within the study area, as shown in the graph on the following page.

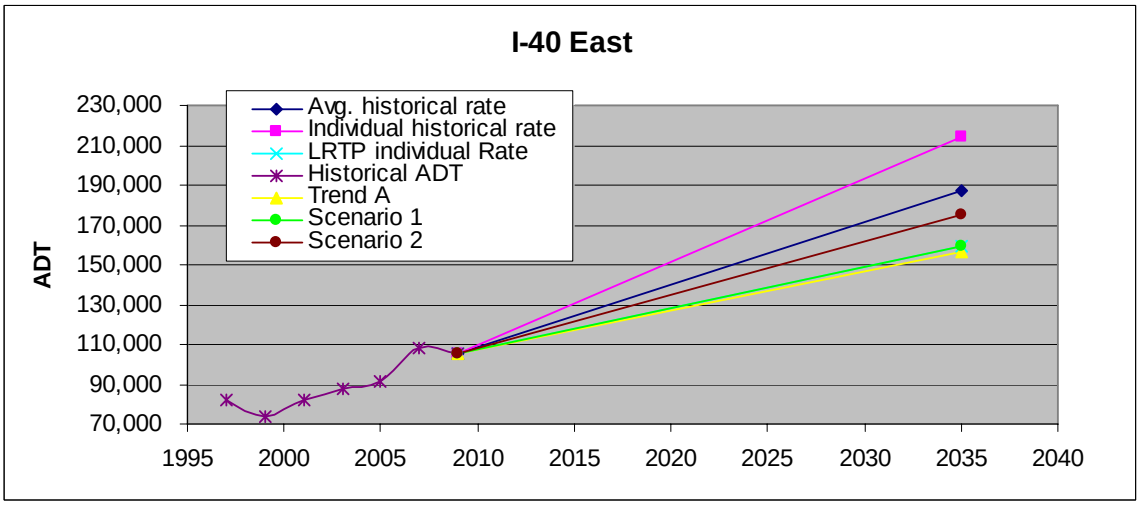


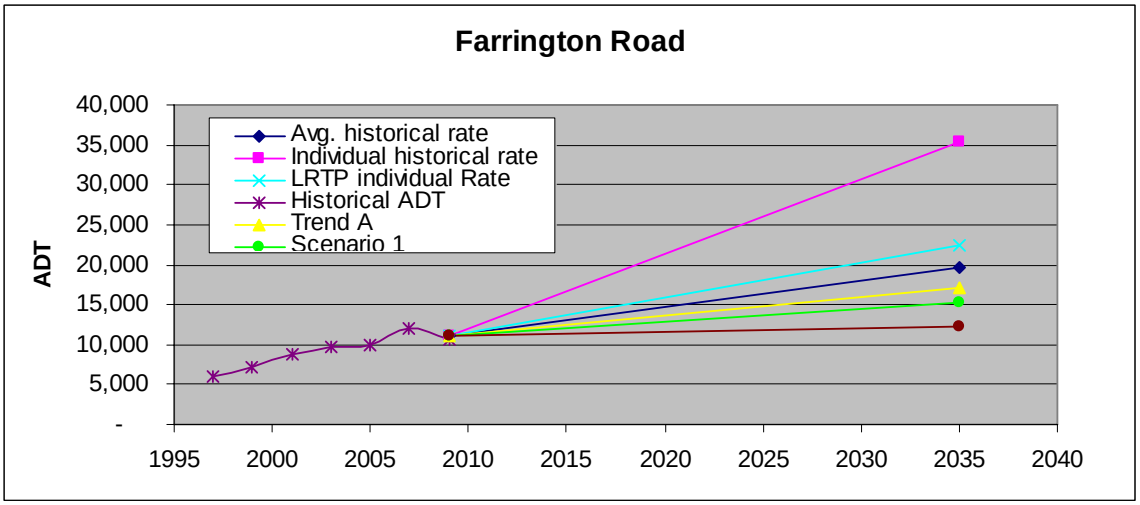
The study team then examined the projected growth rates for these roads according to the trend and alternative scenarios. The differences in the growth rates correspond to the volume shifts caused by the different development patterns and transportation improvements. Each of the roads are graphed on the following pages. Please note that the dark blue lines represent the average historical growth rate for all of the roads within the study area. The Pink lines represent the historical growth rate for the individual road.

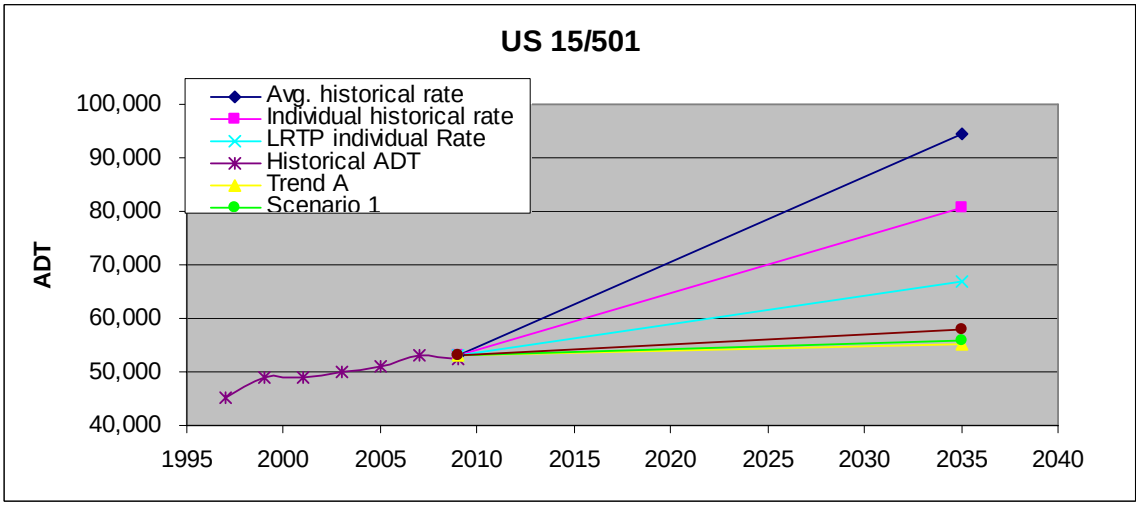
Annual Non-Compounded Growth Rates						
	Historical	LRTPModel	Trend A	Trend B	Scen 1	Scen 2
Average growth rate for entire study area	3%	2%				
NC 54	3%	2.5%	3.2%	2.8%	1.9%	2.0%
I-40 West	3%	2%	1.6%	1.6%	1.7%	2.4%
I-40 East	4%	2%	1.9%	1.9%	2.0%	2.6%
15/501	2%	1%	0.2%	0.2%	0.2%	0.4%
Farrington Road north	8.5%	4%	2.1%	0.6%	1.5%	0.4%
Barbee Chapel	8.5%	3%	1.4%	1.5%	2.4%	3.1%
Other roads	2%	-	-	-	-	-


NC54 Average
Individual historical rate
LRTP individual Rate
Historical ADT
Trend A
Scenario 1
Scenario 2
ADT
90,000
80,000
70,000
60,000
50,000
40,000
30,000
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040


I-40 West
Individual historical rate
LRTP individual Rate
Historical ADT
Trend A
Scenario 1
Scenario 2
ADT
150,000
140,000
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040


I-40 East
Avg. historical rate
Individual historical rate
LRTP individual Rate
Historical ADT
Trend A
Scenario 1
Scenario 2
ADT
230,000
210,000
190,000
170,000
150,000
130,000
110,000
90,000
70,000
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040





For the most part, the LRTP original travel demand model projections are somewhere in the middle of the different growth rates. The study team expected that the model results from the final "most reasonable" scenario, formerly referred to as the preferred scenario, would fall somewhere near the LRTP original travel demand projections and the projections from the various scenarios. Using the growth rates from the original travel demand model will produce the following volumes. These volumes may be slightly different based on the final elements modeled in the "most recent" scenario, but these volumes provide the study team with a starting point for the function design of the roadway improvements.

Average Traffic Volumes based on 2035 LRTP Projections				
	2009	2020	2025	2035
NC 54	45,000	57,000	63,000	74,000
I-40 West	80,000	98,000	106,000	122,000
I-40 East	105,000	128,000	139,000	160,000
15/501	53,000	59,000	61,000	67,000
Farrington Road north	11,000	16,000	18,000	22,000
Barbee Chapel	9,000	12,000	13,000	16,000

At the 3/11 meeting, steering committee members agreed that using a design year of 2020 would be the most reasonable for functional design of the transportation improvements, with the intent that traffic will continue to be monitored for additional improvements after 2020.

The preferred scenario was tested and higher volumes resulted. The projected 2020 preferred scenario volumes are similar to the 2035 LRTP volumes, averaging about 70,000 to 75,000 vehicles per day on NC 54. Ultimately the development densities within the corridor are accelerating the travel demand, and the transportation improvements would be needed under the LRTP scenario in 2035 (due to regional growth) will be needed in 2020 under the preferred scenario (due to growth within the corridor). The preferred scenario growth projection assumes a steady rate of development in the corridor and growth in traffic volumes. In reality, the preferred scenario cannot occur until the light rail system is imminent or in place, and the demand that the model projects may not actually occur until 2030 or 2035.

The study team proceeded in modeling the 2020 future volumes for the preferred scenario in Synchro and obtained a recommended solution which was presented at the third public workshop in May 2010. The Synchro analysis notes and levels of service are found later in this appendix.

Following this workshop, the study team was instructed to recommend a solution for the long-term 2035 traffic demand, which is about 90,000 to 95,000 vehicles per day on the Chapel Hill side of the corridor and reaches up to 100,000 vehicles per day near Farrington Road and the I-40 interchange. .

The demand of 70,000 to 75,000 vehicles per day will require significant interchange improvements and superstreet intersections, as discussed in the Roadway Recommendations section of the report. Demand in excess of 70,000 to 75,000 vehicles per day will need a new interchange or a modification to the existing interchange for direct access to Leigh Village in addition to the superstreet intersections. This improvement, coupled with the other improvements in transit service, light rail and pedestrian and bicyclist infrastructure will accommodate the overall travel demand for the corridor.

Synchro Analysis Intersection Delays (seconds) and Levels of service

Tan values show the EB thru movements to highlight the difference in delay between the traditional signals and superstreets
Purple values show the WB thru movements to highlight the difference between the traditional signals and superstreets
Pink values are the delays for the sidestreet right turns. At these locations, the thru movements have been restricted and must turn right.
Pale yellow values are aggregated (e.g. NB R delay + u-turn delay + WB T delay = NB L delay when restricted)
Green values are overall intersection delays calculated by turning movement but excluding aggregate delays of restricted turns.
Pale blue values are those estimated by Synchro with a yield-control

NC-54 & Hamilton Road

	Scenario	Overall		EB L		EB TR		WB L		WB TR		NB L		NB T		NB R		SB L		SB TR	
AM	Existing (2009)	25	C	73	E	32	C	60	E	7	A	89	F	47	D	62	E	50	D	50	D
	No Build (2020) - optimized	89	F	116	F	81	F	120	F	95	F	115	F	48	D	56	E	57	E	63	E
	Future (2020) - traditional signal	60	E	162	F	52	D	97	F	59	E	161	F	52	D	11	B	61	E	31	C
PM	Existing (2009)	22	C	78	E	25	C	85	F	6	A	84	F	53	D	62	E	57	E	55	D
	No Build (2020) - optimized	64	E	103	F	84	F	170	F	33	C	91	F	49	D	64	E	56	E	53	D
	Future (2020) - traditional signal	86	F	79	E	93	F	201	F	70	E	195	F	75	E	17	B	65	E	42	D

NC-54 & Burning Tree Drive/ Finley Golf Course Road

	Scenario	Overall		EB L		EB TR		WB L		WB TR		NB LTR		NB L		NB R		SB LTR		SB L		SB R	
AM	Existing (2009)	10	A	39	D	2	A	93	F	6	A	20	B	-	-	-	-	167	F	-	-	-	-
	No Build (2020) - optimized	24	C	39	D	5	A	78	E	30	C	20	B	-	-	-	-	178	F	-	-	-	-
	Future (2020) - superstreet	14	B	58	E	15	B	62	E	3	A	-	-	86	F	33	C	-	-	122	F	86	F
PM	Existing (2009)	13	B	35	C	5	A	97	F	10	A	71	E	-	-	-	-	34	C	-	-	-	-
	No Build (2020) - optimized	43	D	45	D	60	E	134	F	12	B	144	F	-	-	-	-	37	D	-	-	-	-
	Future (2020) - superstreet	26	C	53	D	36	D	70	E	2	A	-	-	174	F	98	F	-	-	185	F	81	F

No need for a superstreet at this intersection

NC-54 & West Barbee Chapel Road

	Scenario	Overall		EB L		EB T		EB R		WB L		WB T		WB R		NB L		NB TR		SB L		SB TR	
AM	Existing (2009)	12	B	43	D	13	B	5	A	29	C	7	A	0	A	79	E	0	A	68	E	34	C
	No Build (2020) - optimized	16	B	78	E	3	A	0	A	67	E	19	B	0	A	108	F	1	A	75	E	58	E
	Future (2020) - superstreet	11	B	85	F	2	A	0	A	48	D	8	A	0	A	95	F	31	C	157	F	103	F
PM	Existing (2009)	33	C	52	D	7	A	4	A	8	A	31	C	10	A	644	F	29	C	56	E	35	C
	No Build (2020) - optimized	37	D	76	E	43	D	10	A	6	A	20	B	5	A	207	F	25	C	53	D	44	D
	Future (2020) - superstreet	22	C	50	D	19	B	0	A	57	E	9	A	2	A	189	F	130	F	212	F	87	F

No need for a superstreet at this intersection

NC-54 & Meadowmont Lane/ Friday Center Drive

	Scenario	Overall		EB L		EB T		EB R		WB L		WB T		WB R		NB L		NB T		NB R		NB approach		SB L		SB T		SB R		SB approach	
AM	Existing (2009)	73	E	73	E	38	D	8	A	352	F	12	B	2	A	82	F	80	E	9	A	65	E	73	E	75	E	9	A	44	D
	No Build (2020) - optimized	82	F	90	F	52	D	23	C	52	D	104	F	1	A	87	F	85	F	22	C	63	E	86	F	123	F	203	F	152	F
	Future (2020) - superstreet	40	D	58	E	5	A	3	A	40	D	57	E	3	A	224	F	170	F	0	A	137	F	183	F	181	F	114	F	148	F
PM	Existing (2009)	64	E	81	F	99	F	1	A	46	D	24	C	2	A	66	E	64	E	48	D	52	D	74	E	63	E	22	C	47	D
	No Build (2020) - optimized	138	F	69	E	194	F	7	0	60	E	20	B	1	A	247	F	271	F	245	F	353	F	77	E	69	E	215	F	238	F
	Future (2020) - superstreet	12	B	40	D	6	A	0	A	79	E	9	A	0	A	72	E	63	E	2	A	37	D	171	F	165	F	71	E	182	F

NC-54 & East Barbee Chapel Road

	Scenario	Overall		EB L		EB T		EB R		WB L		WB T		WB R		NB L		NB TR		SB L		SB TR	
AM	Existing (2009)	48	D	2	A	5	A	0	A	14	B	48	D	3	A	152	F	148	F	77	E	68	E
	No Build (2020) - optimized	168	F	68	E	15	B	0	A	24	C	259	F	7	A	260	F	261	F	94	F	81	F
	Future (2020) - reverse superstreet	31	C	167	F	9	A	0	A	76	E	36	D	1	A	84	F	70	E	67	E	55	D
PM	Existing (2009)	32	C	4	A	46	D	2	A	38	D	18	B	1	A	75	E	71	E	76	E	76	E
	No Build (2020) - optimized	98	F	20	B	180	F	7	A	45	D	17	B	0	A	173	F	153	F	143	F	135	F
	Future (2020) - reverse superstreet	13	B	50	D	11	B	2	A	83	F	4	A	0	A	73	E	94	F	100	F	87	F

NC-54 & Huntingridge Road (and new Crossland Drive)

	Scenario	Overall		EB L		EB T		EB R		WB L		WB TR		NB L		NB TR		SB L		SB TR	
AM	Existing (2009)	22	C	7	A	9	A	4	A	4	A	30	C	40	D	0	A	39	D	23	C
	No Build (2020) - optimized	262	F	167	F	84	F	7	A	23	C	388	F	370	F	34	C	51	D	83	F
	Future (2020) - superstreet	62	E	120	F	15	B	3	A	25	C	86	F	66	E	18	B	58	E	79	E
PM	Existing (2009)	15	B	4	A	20	B	6	A	9	A	8	A	41	D	24	C	40	D	35	C
	No Build (2020) - optimized	219	F	102	F	296	F	2	A	39	D	120	F	73	E	37	D	603	F	31	C
	Future (2020) - superstreet	30	C	27	C	37	D	4	A	98	F	4	A	0	A	49	D	0	A	25	C

NC-54 & Falconbridge Road

	Scenario	Overall		EB L		EB TR		WB L		WB TR		NB L		NB T		NB R		SB L		SB TR	
AM	Existing (2009)	Not included in data collection or analyzed for existing conditions																			
	No Build (2020) - optimized																				
	Future (2020) - 3 WB lanes	-	-	-	-	15	B	-	-	173	F	66	E	-	-	206	F	58	E	57	E
	Future (2020) - 4 WB lanes	-	-	-	-	15	B	-	-	146	F	66	E	-	-	206	F	58	E	57	E
PM	Existing (2009)	Not included in data collection or analyzed for existing conditions																			
	No Build (2020) - optimized																				
	Future (2020) - 3 WB lanes	-	-	-	-	26	C	-	-	109	F	78	E	-	-	61	E	149	F	63	E
	Future (2020) - 4 WB lanes	-	-	-	-	26	C	-	-	94	F	78	E	-	-	61	E	149	F	63	E

NC-54 & Farrington Road

	Scenario	Overall		EB L		EB TR		WB L		WB TR		NB L		NB T		NB R		SB L		SB T		SB R	
AM	Existing (2009)	172	F	357	F	94	F	146	F	80	F	230	F	302	F	701	F	364	F	109	F	95	F
	No Build (2020) - optimized	294	F	451	F	139	F	412	F	412	F	52	D	52	D	383	F	183	F	61	E	26	C
	Future (2020) - 3 WB lanes	94	F	120	F	8	A	25	C	156	F	66	E	239	F	131	F	58	E	66	E	234	F
	Future (2020) - 4 WB lanes	29	C	120	F	11	B	25	C	34	C	55	D	201	F	74	E	58	E	69	E	112	F
PM	Existing (2009)	162	F	283	F	130	F	451	F	24	C	275	F	251	F	461	F	740	F	317	F	69	E
	No Build (2020) - optimized	383	F	373	F	568	F	444	F	229	F	243	F	95	F	304	F	436	F	163	F	37	D
	Future (2020) - 3 WB lanes	153	F	27	C	125	F	98	F	203	F	59	E	168	F	193	F	149	F	274	F	75	E
	Future (2020) - 4 WB lanes	104	F	27	C	128	F	98	F	81	F	57	E	151	F	180	F	149	F	277	F	73	E

NC-54 & I-40 Eastbound Ramps

	Scenario	Overall		EB T		EB R		WB L		WB T		SB LT		SB R	
AM	Existing (2009)	93	F	144	F	140	F	53	4	26	C	79	E	263	F
	No Build (2020) - optimized	168	F	210	F	79	E	114	F	176	F	53	D	180	F
	Future (2020) - w/ partial cloverleaf	7	A	15	B	3	A	19	B	Free	-	11	B	19	B
PM	Existing (2009)	111	F	168	F	128	F	414	F	15	B	74	E	123	F
	No Build (2020) - optimized	293	F	432	F	355	F	423	F	145	F	70	E	383	F
	Future (2020) - w/ partial cloverleaf	60	E	95	F	36	D	63	E	Free	-	15	B	63	E

In the future, the SB L will use the new partial cloverleaf for EB I-40 to EB NC-54 traffic

NC-54 & I-40 Westbound Ramps

	Scenario	Overall		EB L		EB T		WB T		WB R		NB LT		NB R	
AM	Existing (2009)	123	F	314	F	6	A	185	F	6	A	76	E	31	C
	No Build (2020) - optimized	154	F	195	F	4	A	279	F	9	A	63	E	91	F
	Future (2020) - 4 WB lanes across bridge	24	C	24	C	Free	-	26	C	3	A	-	-	Stop	-
PM	Existing (2009)	51	D	253	F	4	A	38	D	8	A	77	E	18	B
	No Build (2020) - optimized	126	F	264	F	4	A	224	F	5	A	-	-	19	B
	Future (2020) - 4 WB lanes across bridge	24	C	36	D	Free	-	23	C	4	A	-	-	Stop	-

NC-54 & Leigh Farm Road/ Quadrangle Drive

	Scenario	Overall		EB L		EB TR		WB L		WB TR		NB LT		NB R		SB LT		SB R	
AM	Existing (2009)	8	A	12	B	3	A	4	A	11	B	45	D	27	C	45	D	26	C
	No Build (2020) - optimized	17	B	43	D	7	A	5	A	18	B	29	C	17	B	29	C	17	B
	Future (2020)	20	C	5	A	9	A	6	A	31	C	56	E	27	C	56	E	27	C
PM	Existing (2009)	20	B	8	A	16	B	8	A	11	B	69	E	8	A	40	D	7	A
	No Build (2020) - optimized	21	C	2	A	5	A	12	B	18	B	107	F	18	B	58	E	32	C
	Future (2020)	18	B	4	A	11	B	11	B	25	C	30	C	15	B	21	C	18	B

Notes from Synchro Analysis:

NC 54 & Hamilton Road:
NB approach has been restriped to 1L, 1T, 1R. The traffic sub-committee asked to have it function as a traditional signal, with access to fire station and elementary school preserved.
Put back to original signal plan as requested.
Functions at overall LOS E in AM peak hour. Relatively low side-street volumes – too small to warrant double left turn lanes.
Big difference between No Build optimized and future –different green time splits to because of offsets from superstreets at intersections of Burning Tree and West Barbee Chapel.

NC 54 & Burning Tree Drive/ Finley Golf Course Road:
Superstreet intersection works because of low number of left turns onto NC54. Higher delays occur where WB left turns conflict with eastbound thru movement in PM peak. This intersection seems to function relatively well with the future volumes when the signal cycle lengths and offsets are optimized with the current intersection geometry. It does not appear that a superstreet intersection is necessary at this location.

NC 54 & West Barbee Chapel Road:
Operates very similarly to Burning Tree/ Friday Center. It does not appear that a superstreet is necessary at this location.

NC 54 & Meadowmont Lane/ Friday Center Drive:
Superstreet works best for progression. EB and WB thru traffic experience significant delay reductions when superstreet is implemented. Heavy side-street right turns will need free flow right turns or multiple lanes. Westbound left turns need two left turn lanes because of heavy traffic turning into Friday Center in AM.

NC 54 & East Barbee Chapel Road:
We recommend a reverse superstreet at this location. This intersection needs directional egress especially for AM northbound left turns. Will need triple left turn for AM volumes (~700 vph). Implementing a standard superstreet in this location would cause 910 u-turns to conflict with ~3700 eastbound thru vehicles, causing very long backups in the AM peak.
The reverse superstreet concepts allows side-street left turns out, but restricts mainline left turns from turning onto the side-streets. EB and WB left turns could utilize the nearby Meadowmont/ Friday Center intersection to turn left – good connectivity on north side of 54, south side has potential connection between Friday Center Drive and Barbee Chapel Road.

Access Changes due to Woodmont Development:
Approximately 1300 ft east of E Barbee Chapel Rd, the new Woodmont project image shows an access road with proposed westbound left turn in (but not a northbound left

turn out). It looks like there is significant distance to allow a U-turn for EB to WB traffic 600' east of E Barbee Chapel (between E Barbee Chapel and Site Driveway).

Collector Streets:

Assuming development is focused within the Leigh Village station area, the new collector street system and Farrington Road will see heavy volumes, especially with the implementation of a park-and-ride facility. Most volumes are expected to want to access the I-40 interchange.

Dispersing the left turn traffic to minimize conflicts with heavy thru traffic must be balanced with restricting access especially near the interchange ramps.

The intent of the recommendations is to essentially have primary ingress at one location and primary egress at another to balance the interruptions to the thru traffic. This will require significant connectivity between collector streets on both sides of NC 54.

One of the public workshop participants suggested having the two new collector streets function as a one-way pair.

NC 54 & Huntingridge Road (and new Crossland Drive)

The western collector street (Crossland Drive) and Huntingridge Road can essentially function as a superstreet, providing primary ingress to the developments on either side of NC54. EB and WB left turns are allowed, but side-street left turns and thru traffic must turn right. This will be coupled with way-finding signage so that vehicles who want to make a left turn out will know to utilize the Falconbridge intersection to do so instead of this intersection.

We heard some discussion about making a connection to NC 54 at George King Road instead of Crossland Drive to keep thru traffic out of the Celeste Circle/ Eastwood Park neighborhood.

NC 54 & Falconbridge Road:

Falconbridge Road and the eastern collector street can function as primary egress. NB and SB left turns will be allowed at this intersection, but EB and WB left turns will be prohibited. Way-finding signage will help direct NC 54 traffic to make a left turn at Huntingridge instead of Falconbridge or Farrington. This concentrates all southbound left turns from the Leigh Village area into one location, warranting a SB triple left turn, especially for PM traffic leaving the Leigh Village park-and-ride.

It is the PM eastbound NC-54 movement to eastbound I-40 that is the most problematic, and where eventual grade separation will be necessary. One potential long-term solution is for a partial access ramp to Leigh Village directly from I-40 - would need to be designed and constructed only on the west side of I-40 to avoid impacts to Leigh Farm Park.

Falconbridge Road was not counted during the data collection phase of this study and was not analyzed as part of existing or 'no build' conditions. Turning movement counts for the future year 2020 have been estimated based on adjacent intersections and the proposed future land use plan.

Westbound NC 54 between I-40 Eastbound Ramps and Falconbridge Road

The westbound traffic on NC 54 is extremely heavy, especially in the AM peak hour. We've found that the system works best if there are four westbound thru lanes that go

across the bridge over I-40 and continue on until one becomes a right turn lane at the eastern collector street (opposite of Falconbridge Road).
Another option is to have three westbound thru lanes between the I-40 eastbound ramps and the eastern collector street. This option does not perform as well having four WB thru lanes – westbound delays are higher, and the queues extend longer especially at the I-40 WB off-ramp, which further exacerbates the problem of backing up onto the interstate.
Providing four westbound thru lanes decreases delays at the Farrington Road and Falconbridge Road intersections, which is shown in the delay & LOS tables.

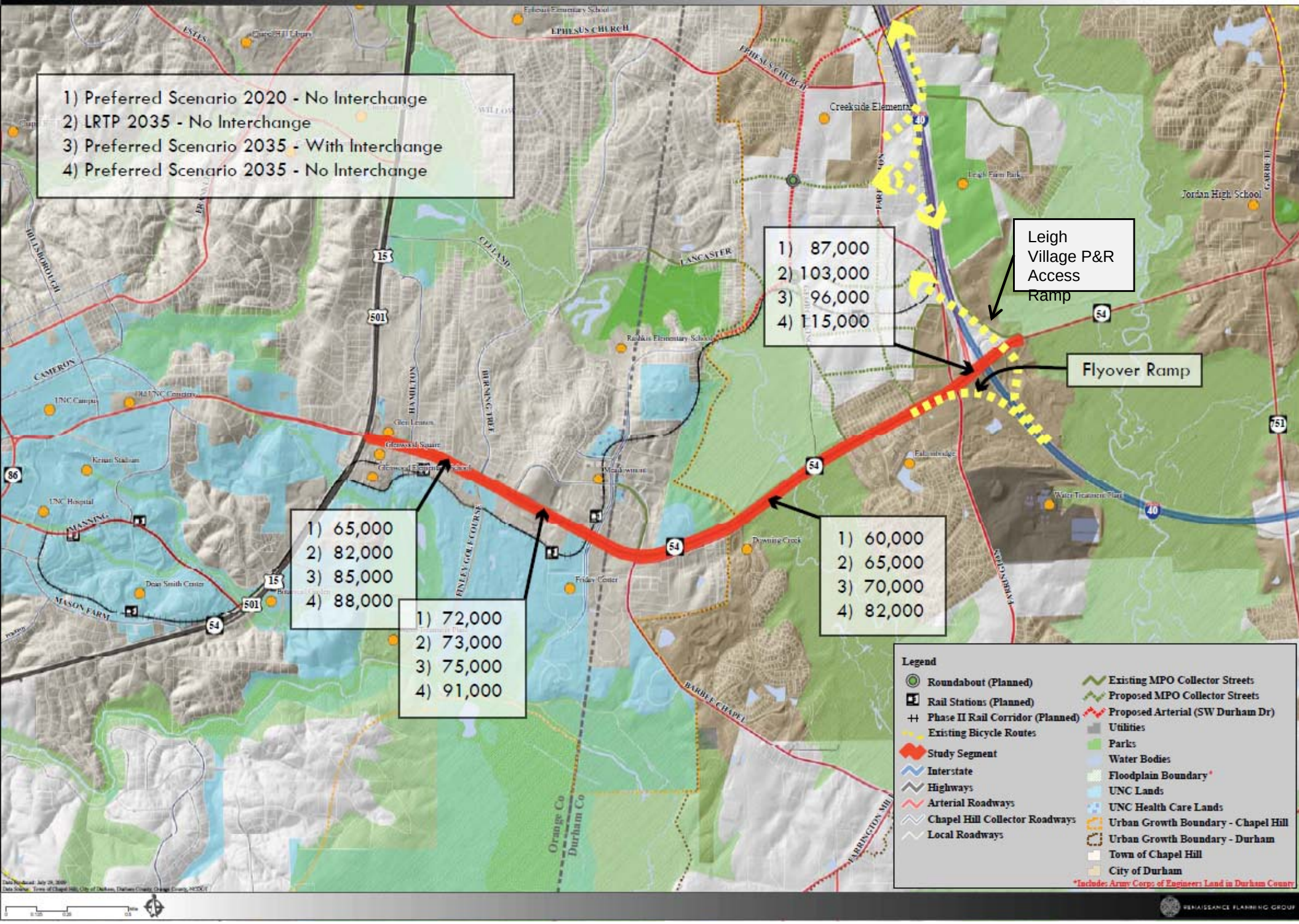
Farrington & I-40 EB ramps:
The close proximity of Farrington Rd and the I-40 ramps makes implementing a superstreet unfeasible. Restricting left turns to only the northbound movement helps move the westbound thru traffic along as much as possible. The eastbound traffic especially in the PM peak is simply too heavy for a three-lane road with traffic signals to handle.
Constructing a ramp for the Farrington Road NB right turns that bypasses the signal reduces the amount of time necessary for the NB phase, giving more green time to the EB thru phase, lessening EB delays.
EB traffic can turn left at the western collector street (Crossland Drive). WB traffic can turn left at Huntingridge Road. Traffic from the Leigh Village area can access EB 54 at the new eastern collector (across from Falconbridge Road). Vehicles who what to make a SB thru movement can make a SBL at eastern collector then EBR at Farrington. Vehicles who want to make a NB thru movement can make a NBL at Farrington then WBR at Falconbridge.

Partial Cloverleaf
A new I-40 EB to NC-54 EB ramp will allow the westbound traffic to move through this intersection without a signal, reducing delays and helping to keep WB traffic moving to avoid backups onto the interstate.

I-40 WB ramps:
The westbound I-40 off-ramp is experiencing capacity deficiencies even today. The goal of keeping signals away from this interchange will allow the ramp to flow as continuously as possible.
Two lanes are needed for westbound NC 54 to function adequately.

NC 54 & Leigh Farm Road/ Quadrangle Drive:
No improvements are necessary for this intersection. The improvements at the I-40 interchange will allow this intersection to function better in the future.

NC-54 CORRIDOR ANALYSIS - Projected ADTs



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

March 26, 2010

MEMORANDUM

To: CMAQ Eligible Metropolitan & Rural Planning Organizations

From: Terry C. Arellano, PE

Subject: North Carolina CMAQ Program Update – Effects of Federal Rescission, Interagency Review of Applications for Updated STIP & Revisions to CMAQ Funding Target Allocations

Please note the following important updates concerning the North Carolina CMAQ Program. If you have any questions or require clarification, please contact me by email at tarellano@ncdot.gov.

Effects of Federal-Aid Highway Fund Rescission

On September 30, 2009, the Federal Highway Administration rescinded almost $250 million of unobligated contract authority from North Carolina, including $55 million in CMAQ funding. NCDOT has analyzed its cash reserves and obligation authority and determined that this rescission effectively has no impact on the CMAQ projects currently programmed in the 2009 – 2015 State Transportation Improvement Program (STIP). The impact of Congress's decision to restore certain rescinded programs has not been determined. If rescinded CMAQ funds are restored, they will be made available during the next prioritization cycle.

Interagency Review of CMAQ Applications for Updated STIP

All applications for new CMAQ projects submitted through the NCDOT project priority template have been reviewed by the Interagency Review Team (IRT) for CMAQ eligibility. Please see the attachment entitled "Interagency Review Results" for comments received on applications submitted by your MPO/RPO. Please work with the local project sponsor for all affected projects and provide the requested additional information or clarifications to me by email no later than **Monday, May 3, 2010**.

Revisions to CMAQ Funding Target Allocations

In order to align with the overall Departmental focus on managing investment strategies by tier and to better protect North Carolina's CMAQ obligation authority from future Federal rescissions, NCDOT is revising the allocation of CMAQ funding into three broad categories, as follows:

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
TRANSPORTATION PLANNING BRANCH
1554 MAIL SERVICE CENTER
RALEIGH NC 27699-1554

NCDOT TPB
TRANSPORTATION PLANNING BRANCH
www.ncdot.org

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH, NC 27601
Phone: 919-733-4705
Fax: 919-733-2417

Statewide - Funds administered by NCDOT that will be allocated to prioritized CMAQ eligible projects in non-attainment and maintenance areas. These are not subject to regional allocations or the allocation formula, but will be subject to MPO approval. This category will account for 35% of the total North Carolina CMAQ apportionment.

Regional – Formerly labeled the "Statewide Projects" portion; locally-administered projects spanning more than one air quality region that can not be considered local projects. Air quality regions are Catawba, Great Smoky Mountains National Park, Metrolina, Rocky Mount, Triad and Triangle. These projects will require endorsement by the affected MPOs/RPOs and will require approval of the MPOs. This category will account for 5% of the total North Carolina CMAQ apportionment.

Sub-Regional – Formerly labeled the "Local Projects" portion; locally-administered projects within eligible counties awarded at the MPO/RPO level from a selection of candidate projects submitted up to the target yearly allocation for the MPO/RPO. This category will account for 60% of the total North Carolina CMAQ apportionment.

The individual target allocations for each MPO/RPO will be based on the distribution formula approved by NCDOT in 2008:

$$\text{Yearly MPO/RPO CMAQ Target Allocation} = \frac{\text{Factored Population for MPO/RPO}}{\text{Total Statewide AQ Area Population}} \times \text{Total Yearly NC CMAQ Allocation}$$

In order to align with the Department's 5-Year Work Plan, the updated STIP will include CMAQ projects for Federal Fiscal Years 2013, 2014 and 2015. The attached table presents target allocations for these years based on anticipated annual obligation authority of $50,330,000, $51,550,000 and $52,460,000, respectively. Eligible projects, with sufficient additional information provided as applicable, will be programmed in these three years up to the noted target allocation for each area.

Please see the attachment entitled "Summary of CMAQ Revised Target Allocations & Requests" for a comparison of your MPO/RPO's revised target allocation to submitted applications. **If your MPO/RPO did not submit sufficient applications to fully utilize the funding target for 2013 – 2015**, you may submit additional applications up to your indicated funding target. All additional applications must be submitted on the NCDOT CMAQ application (attached) and include all required supplemental documentation (including a full description that details how the emissions reductions were calculated) and documentation of MPO/RPO support. Additional applications should be submitted by the MPO/RPO in digital format no later than **Monday, May 3, 2010** to the following email address: **CMAQ_Application@ncdot.gov**. These applications will be submitted for Interagency Review during the month of May and projects deemed eligible will be submitted for programming the in the Draft STIP prior to the MPO/RPO Review Sessions. **Due to this tight timeframe, NCDOT will only consider complete applications; all incomplete applications will be returned to the MPO/RPO.** Please note that any target allocation funds not programmed by final adoption of the STIP will revert to the Statewide funding pool.

If your MPO/RPO submitted applications in excess of the funding target for 2013 -2015, please provide me direction as to which projects to program no later than **Monday, May 3, 2010**. If no direction is provided by this deadline, projects will be programmed based on the priority assigned in application submittal period up to the available funding target.

Please note that programming in the STIP is not a funding guarantee – until a local agreement is executed for a particular project and funding is authorized by FHWA, funds are not guaranteed.

Attachments

cc: NCDOT Division Engineers
Mike Bruff, PE, Transportation Planning Branch
Al Avant, PE, TIP Development Unit

Summary of CMAQ Revised Target Allocations & Requests

Tier	Split	2013 Target	2014 Target	2015 Target	Target Total	New Requests	Difference	Required Action
Statewide[1]	35.00%	**$ 17,615,500.00**	**$ 18,042,500.00**	**$ 18,361,000.00**	***$ 54,019,000.00***			NA
Regional[2]	5.00%	**$ 2,516,500.00**	**$ 2,577,500.00**	**$ 2,623,000.00**	***$ 7,717,000.00***	$ 7,021,905.00		NA
Sub-Regional[3]	60.00%	**$ 30,198,000.00**	**$ 30,930,000.00**	**$ 31,476,000.00**	***$ 92,604,000.00***			
Burlington-Graham MPO	*0.24%*	$ 95,255.00	$ 97,564.00	$ 99,286.00	*$ 292,105.00*	$ 287,322.00	$ 4,783.00	No action required since requested additional amount available is less than the required project mimimum threshold of $100,000. However, additional funding may be added to existing new requests to fully utilize available funding
Cabarrus-Rowan MPO	*6.48%*	$ 2,610,927.00	$ 2,674,216.00	$ 2,721,423.00	*$ 8,006,566.00*	$ 7,741,296.00	$ 265,270.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
CAMPO	*19.19%*	$ 7,726,926.00	$ 7,914,227.00	$ 8,053,935.00	*$ 23,695,088.00*	$ 25,727,650.00	$ (2,032,562.00)	MPO/RPO submitted applications in excess of the funding target for 2013 -2015 and must provide NCDOT direction as to which projects to program or revise funding amounts accordingly
DCHC MPO	*8.38%*	$ 3,375,661.00	$ 3,457,487.00	$ 3,518,521.00	*$ 10,351,669.00*	$ 10,221,850.00	$ 129,819.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Gaston MPO	*4.21%*	$ 1,695,555.00	$ 1,736,655.00	$ 1,767,312.00	*$ 5,199,522.00*	$ 3,994,863.00	$ 1,204,659.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Greensboro MPO	*8.65%*	$ 3,482,310.00	$ 3,566,721.00	$ 3,629,684.00	*$ 10,678,715.00*	$ 8,125,276.00	$ 2,553,439.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Hickory MPO	*3.21%*	$ 1,543,819.00	$ 1,581,242.00	$ 1,347,646.00	*$ 4,472,707.00*	$ 3,780,178.00	$ 692,529.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
High Point MPO	*3.94%*	$ 1,584,541.00	$ 1,622,950.00	$ 1,913,109.00	*$ 5,120,600.00*	$ 209,088.00	$ 4,911,512.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Kerr Tarr RPO	*2.05%*	$ 824,619.00	$ 844,608.00	$ 859,517.00	*$ 2,528,744.00*	$ 160,000.00	$ 2,368,744.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Lake Norman RPO	*3.08%*	$ 1,241,254.00	$ 1,271,342.00	$ 1,293,785.00	*$ 3,806,381.00*	$ 2,080,648.00	$ 1,725,733.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Land of Sky RPO	*0.21%*	$ 167,082.00	$ 171,132.00	$ 174,154.00	*$ 512,368.00*	$ 590,407.00	$ (78,039.00)	MPO/RPO submitted applications in excess of the funding target for 2013 -2015 and must provide NCDOT direction as to which projects to program or revise funding amounts accordingly
Mecklenburg Union MPO	*23.29%*	$ 9,376,634.00	$ 9,603,924.00	$ 9,773,460.00	*$ 28,754,018.00*	$ 1,678,000.00	$ 27,076,018.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
NW Piedmont RPO	*0.79%*	$ 316,307.00	$ 323,974.00	$ 329,693.00	*$ 969,974.00*	$ -	$ 969,974.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Piedmont Triad RPO[4]	*2.20%*	$ 885,060.00	$ 906,514.00	$ 922,516.00	*$ 2,714,090.00*	$ 2,101,600.00	$ 612,490.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Rocky Mount MPO	*1.75%*	$ 703,528.00	$ 720,582.00	$ 733,302.00	*$ 2,157,412.00*	$ -	$ 2,157,412.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Rocky River RPO	*0.48%*	$ 194,209.00	$ 198,917.00	$ 202,428.00	*$ 595,554.00*	$ -	$ 595,554.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Southwestern RPO	*0.21%*	*See LOSRPO*	*See LOSRPO*	*See LOSRPO*	*See LOSRPO*	*See LOSRPO*		*See LOSRPO*
Triangle RPO	*0.71%*	$ 284,862.00	$ 291,767.00	$ 296,918.00	*$ 873,547.00*	$ 120,000.00	$ 753,547.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Unifour RPO	*0.62%*	*See HMPO*	*See HMPO*	*See HMPO*	*See HPMO*	*See HMPO*		*See HMPO*
Upper Coastal Plain RPO	*2.94%*	$ 1,185,132.00	$ 1,213,860.00	$ 1,235,288.00	*$ 3,634,280.00*	$ -	$ 3,634,280.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
Winston-Salem MPO	*7.38%*	$ 2,970,319.00	$ 3,042,320.00	$ 3,096,025.00	*$ 9,108,664.00*	$ 7,675,000.00	$ 1,433,664.00	MPO/RPO did not submit applications to fully utilize the funding target for 2013 – 2015 and may submit additional applications up to specified funding target allocation and/or request additional funding to existing new request to fully utilize available funding
TOTAL	**100.00%**	**$50,330,000**	**$51,550,000**	**$52,460,000**	***$ 154,340,000.00***	**$ 81,980,110.00**		

Notes

1 - Statewide - *Funds administered by NCDOT that will be allocated to prioritized CMAQ eligible projects in non-attainment and maintenance areas. These are not subject to regional allocations or the allocation formula, but will be subject to MPO approval.*

2 - Regional - *Formerly labeled the "Statewide Projects" portion; locally-administered projects spanning more than one air quality region that can not be considered local projects; will require endorsement by affected MPOs/RPOs and approval of the MPOs.*

3 - Sub-Regional - *Formerly labeled the "Local Projects" portion; locally-administered projects within eligible counties awarded at the MPO/RPO level from a selection of candidate projects submitted up to the target yearly allocation for the MPO/RPO.*

4 *-* ***New Requests*** *amount does not reflect Proposal PT-6, which was deemed ineligible by IRT review*

From:	Arellano, Terry C
To:	Bob Harkrader; "burlmpo"; Phil Conrad; (campo-staff@ci.raleigh.nc.us); Nwoko, Felix; Beckmann, Ellen; Hanna Cockburn; Graham, Hank; Meyer, Tyler; John Tippett; "DAVID HYDER"; Mike Ciriello; Bjorn Hansen; Carrie Runser-Turner; Bill Eaker; Cook, Robert (Planning); Marc Allred; Bob League; Dana Stoogenke; Ryan Sherby; pblack@tjcog.org; John Marshall; Daniel Van Liere; Greg Errett
Cc:	Bruff, Michael S; Thomas, Dan; Schmidt, Derry A
Subject:	Re: CMAQ Updates
Date:	Tuesday, March 30, 2010 2:02:04 PM
Attachments:	CMAQ Application_Rev7_30mar10.doc
Importance:	High

Good afternoon,

Despite the original distribution glitch, I hope that everyone has had a chance to review and absorb the CMAQ update that was recently sent out. Again, if you have questions or need clarification, you are welcome to contact me by email or telephone. I have received a few questions and will be responding directly to those in short order.

The purpose of this email is to let you know that NCDOT has reconsidered the May 3, 2010 deadline cited in the CMAQ update letter (dated March 26, 2010) for submitting applications to utilize target allocation balances within your MPO or RPO. Realizing that several areas have a substantial balance, we have moved the deadline out to allow more time to work with your local partners and develop complete application packages. Therefore, please note the following:

If your MPO/RPO did not submit sufficient applications to fully utilize the funding target indentified in the "Summary of CMAQ Revised Target Allocations" (dated March 26, 2010) that was sent out previously and wishes to submit additional applications, these applications must be submitted to NCDOT no later than Thursday, September 30, 2010. As specified earlier, all applications must be submitted on the attached NCDOT CMAQ application and must include all required supplemental documentation, including a full description detailing how the emissions reductions were calculated and documentation of MPO/RPO support. All applications should be submitted to the following email address: CMAQ_Application@ncdot.gov. Please note that NCDOT will only consider complete applications; all incomplete applications will be returned to the MPO/RPO.

In addition, NCDOT is also accepting applications for Regional CMAQ projects. These projects would span two or more non-attainment regions, would be administered locally and would require a local match, just like the Sub-Regional projects. These projects require endorsement from the appropriate MPO/RPOs and applications must be submitted via the above email address no later than Thursday, September 30, 2010.

NCDOT will also identify a list of Statewide projects based on the prioritization process and other identified needs. It is envisioned that these projects would consist of large-scale improvements such as major signal system improvements, major intercity rail or transit projects, etc. Statewide projects will be administered by NCDOT and NCDOT will provide all or part of the match, depending on the type of project and its location. Statewide projects will typically be large projects and will not be subject to the regional allocation formula. The list of Statewide projects will be finalized as part of the STIP development process. If you have ideas for these types of projects, please contact me as soon as possible via telephone or email, so that we can discuss your ideas and approach the

appropriate NCDOT personnel to ascertain interest in developing an application.

Finally, I hope that this is the last update email that I have to send. Thanks for your patience!

Have a nice afternoon,
~terry

- - - - -

Terry C. Arellano, PE
Systems Planning Group Supervisor
NCDOT Transportation Planning Branch
919-715-5482 X 393

Email correspondence to and from this sender is subject to the N.C. Public Records Law and may be disclosed to third parties.

RESOLUTION TO ENDORSE CANDIDATE CONGESTION MITIGATION AIR QUALITY (CMAQ) PROJECT PROPOSALS FOR FY 2013-2017

August 12, 2009

A motion was made by TAC Member Ellen Reckhow and seconded by TAC Member Michael Gering for the adoption of the following resolution, and upon being put to a vote, was duly adopted.

WHEREAS, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA) (Public Law 109-59, August 10, 2005) continues the Congestion Mitigation and Air Quality Improvement Program (CMAQ) (23 U.S.C. § 149); and

WHEREAS, CMAQ is a Federal program that funds transportation projects and programs in air quality nonattainment and maintenance areas to help achieve and maintain national standards for pollutants; and

WHEREAS, the North Carolina Department of Transportation (NCDOT) administers the CMAQ program on behalf of non-attainment and maintenance areas within North Carolina; and

WHEREAS, in the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO), Durham County, Orange County, and northeastern Chatham County are in a maintenance area for ozone and Durham County is in a maintenance area for carbon monoxide pollution; and

WHEREAS, the DCHC MPO has administered a CMAQ project selection process among local area jurisdictions in air quality non-attainment and maintenance counties; and

WHEREAS, the resulting candidate project proposals meet the requirements of CMAQ and the guidelines established by NCDOT to administer the program; and

WHEREAS, upon approval of the candidate project proposals for CMAQ funding by the NCDOT, the DCHC MPO will amend its Metropolitan Transportation Improvement Program to include these projects; and

WHEREAS, these projects are included in the DCHC MPO's 2035 Long Range Transportation Plan; and

BE IT THEREFORE RESOLVED that the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Transportation Advisory Committee endorses the attached listing of proposed CMAQ candidate projects provided here on this, the 12th day of August, 2009.

TAC Chair

STATE of: North Carolina
COUNTY of Durham

I, FREDERICK BRIAN RHODES, a Notary Public of Durham County, North Carolina do hereby certify that personally J. Michael Woodard appeared before me on the 12th day of August, 2009, to affix his signature to the foregoing document.

Notary Public

(Seal) My commission expires 5/10/10

OFFICIAL SEAL
Notary Public, North Carolina
Durham County
Frederick Brian Rhodes
My Commission Expires 5/10/2010

TCC Recommendation for DCHC MPO CMAQ FY 2013-2017 Project Applications

Rank	Applicant	Project	Project Cost			FY 2013		FY 2014		FY 2015		FY 2016		FY 2017		Unfunded		FY 2013-2017 DCHC MPO CMAQ Funding	Annual Emissions Reductions (kg/year)		Cost/ annual total kg reduction
1	TJ COG	Triangle Transportation Demand Management Program	Federal*	$ 2,253,663	21%	implementa	$ 382,929	implementa	$ 385,275	implementa	$ 457,502	implementa	$ 505,402	implementa	$ 522,555	$ -		$ 2,253,663	CO	105,763	
			Local**	$ 5,063,281	46%														VOC	4,286	
			State	$ 3,612,903	33%														NOx	3,549	$ 20
2	DATA	Operating Assistance for New Fixed Route	Federal	$ 1,949,756	80%	operation	$ 951,100	operation	$ 998,655							$ -		$ 1,949,756	CO	17,618	
			Local	$ 487,439	20%														VOC	829	
																			NOx	(126)	$ 106
3	Cary	New Hope Church Road (ATT) Trailhead Park and Ride Lot	Federal	$ 445,000	53%	constructio	$ 222,500									$ 222,500		$ 222,500	CO	3,673	
			Local	$ 395,000	47%														VOC	167	
																			NOx	138	$ 112
4	Chapel Hill	MLK Jr. Blvd. Shared Pathway (0.7 miles)	Federal	$ 724,620	80%	ROW	$ 16,648									$ -		$ 724,620	CO	4,533	
			Local	$ 181,155	20%	constructio	$ 707,972												VOC	211	
																			NOx	158	$ 148
5	Durham	Sidewalks on Campus Walk Avenue and Lasalle Street (0.92 miles)	Federal	$ 269,842	80%			constructio	$ 269,842							$ -		$ 269,842	CO	1,082	
			Local	$ 66,853	20%														VOC	50	
																			NOx	38	$ 231
6	Chapel Hill	Estes Dr. Bicycle and Pedestrian Improvements (0.65 miles)	Federal	$ 945,762	80%			ROW	$ 165,795	constructio	$ 779,966					$ -		$ 945,761	CO	2,639	
			Local	$ 236,440	20%														VOC	123	
																			NOx	92	$ 331
7	DATA	Replacement of Five Cutaway Vans with Hybrid Electric Vans	Federal	$ 583,443	80%					capital	$ 583,443					$ -		$ 583,443	CO	789	
			Local	$ 145,861	20%														VOC	82	
																			NOx	289	$ 503
8	Carrboro	Jones Creek Greenway to Twin Creeks/Morris Grove Elementary	Federal	$ 240,000	80%					PE	$ 24,000	implementa	$ 9,600			$ -		$ 240,000	CO	321	
			Local	$ 60,010	20%					constructio	$ 206,400								VOC	14	
																			NOx	11	$ 694
9	Durham	Sidewalks and Bike Lanes on Hope Valley Road (1.14 miles)	Federal	$ 1,108,542	80%							PE	$ 106,965			$ -		$ 1,108,542	CO	1,022	
			Local	$ 277,135	20%							constructio	$ 1,001,577						VOC	48	
																			NOx	36	$ 1,002
10	Durham	Sidewalks on Cameron Avenue (1.66 miles)	Federal	$ 777,924	80%							constructio	$ 777,924			$ -		$ 777,924	CO	601	
			Local	$ 194,481	20%														VOC	28	
																			NOx	21	$ 1,197
11	Durham	Sidewalks on Alston Avenue (1.4 miles)	Federal	$ 923,785	80%									constructio	$ 803,294	constructic	$ 120,471	$ 803,294	CO	661	
			Local	$ 230,946	20%														VOC	31	
																			NOx	23	$ 1,292
12	Hillsborough	Riverwalk, Phase II	Federal	$ 496,000	80%									PE	$ 40,000	PE	$ -	$ 222,500	CO	30	
			Local	$ 124,000	20%									ROW	$ 182,500	ROW	$ 163,100		VOC	1	
																constructio	$ 110,400		NOx	1	$ 15,500
13	DATA	Replacement of Five Diesel Buses with Hybrid Electric Buses	Federal	$ 2,674,114	80%											capital	$ 2,674,114	$ -		CO	218	
			Local	$ 668,528	20%														VOC	95	
																			NOx	1,392	$ 1,568
14	Chapel Hill	Replacement of Two 40' Deisel Buses with Hybrid 60' Buses	Federal	$ 1,653,088	80%											capital	$ 1,653,088	$ -		CO	105	
			Local	$ 413,272	20%														VOC	(0)	
																			NOx	133	$ 6,948
			Total Federal	$ 15,045,539		total	$ 2,281,149	total	$ 1,819,567	total	$ 2,051,311	total	$ 2,401,468	total	$ 1,548,349	total	$ 4,943,673	$ 10,101,845			
			Available	$ 10,101,845		available	$ 2,020,369	available	$ 2,020,369	available	$ 2,020,369	available	$ 2,020,369	available	$ 2,020,369			$ 10,101,845			
			Difference	$ (4,943,694)		difference	$ (260,780)	difference	$ 200,802	difference	$ (30,942)	difference	$ (381,099)	difference	$ 472,020			$ 0			

*CMAQ request for DCHC MPO only; TJ COG is also requesting $2,794,184 of CAMPO CMAQ federal funds

**Service Provider Matching Funds

Durham	$ 5,492,801	70%
Orange	$ 2,132,881	27%
Chatham	$ 222,500	3%
Regional	$ 2,253,663	

RESOLUTION TO ENDORSE CANDIDATE CONGESTION MITIGATION AIR QUALITY (CMAQ) PROJECT PROPOSALS FOR FY 2013-2015

August 11, 2010

A motion was made by TAC Member _____and seconded by TAC Member _____ for the adoption of the following resolution, and upon being put to a vote, was duly adopted.

WHEREAS, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA) (Public Law 109-59, August 10, 2005) continues the Congestion Mitigation and Air Quality Improvement Program (CMAQ) (23 U.S.C. § 149); and

WHEREAS, CMAQ is a Federal program that funds transportation projects and programs in air quality nonattainment and maintenance areas to help achieve and maintain national standards for pollutants; and

WHEREAS, the North Carolina Department of Transportation (NCDOT) administers the CMAQ program on behalf of non-attainment and maintenance areas within North Carolina; and

WHEREAS, in the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO), Durham County, Orange County, and northeastern Chatham County are in a maintenance area for ozone and Durham County is in a maintenance area for carbon monoxide pollution; and

WHEREAS, the DCHC MPO has administered a CMAQ project selection process among local area jurisdictions in air quality non-attainment and maintenance counties; and

WHEREAS, the resulting candidate project proposals meet the requirements of CMAQ and the guidelines established by NCDOT to administer the program; and

WHEREAS, upon approval of the candidate project proposals for CMAQ funding by the NCDOT, the DCHC MPO will amend its Metropolitan Transportation Improvement Program to include these projects; and

WHEREAS, these projects are included in the DCHC MPO's 2035 Long Range Transportation Plan; and

BE IT THEREFORE RESOLVED that the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Transportation Advisory Committee endorses the attached listing of proposed CMAQ candidate projects provided here on this, the 11th day of August, 2010.

_____

J. Michael Woodard, TAC Chair

Durham County, North Carolina

I certify that J. Michael Woodard personally appeared before me this day acknowledging to me that he signed the forgoing document.

Date: August 11, 2010

_____

_____, Notary Public

My commission expires: _____

TCC Recommended Schedule for DCHC MPO CMAQ FY 2013-2015 Funding

Rank	Applicant	Project	Project Cost			FY 2013		FY 2014		FY 2015		Unfunded		FY 2013-2015 DCHC MPO CMAQ Funding	Increase in Requested Federal Funding	Annual Emissions Reductions (kg/year)		Cost/ annual total kg reduction
		Triangle Transportation	Federal*	$ 2,759,689	37%	implementa	$ 382,929	implementa	$ 385,275	implementa	$ 457,502	$	-	$ 1,225,706		CO	61,716	
		Demand Management	Local**	$ 2,698,976	36%											VOC	2,501	
1	TJ COG	Program	State	$ 2,044,191	27%											NOx	2,071	$ 18
			Federal	$ 1,949,756	80%	operation	$ 951,100	operation	$ 998,655			$	-	$ 1,949,756		CO	17,618	
		Operating Assistance for	Local	$ 487,439	20%											VOC	829	
2	DATA	New Fixed Route														NOx	(126)	$ 106
		New Hope Church Road	Federal	$ 796,850	67%	constructio	$ 796,850					$	-	$ 796,850	$ 351,850	CO	3,673	
		(ATT) Trailhead Park and	Local	$ 395,000	33%											VOC	167	
3	Cary	Ride Lot														NOx	138	$ 200
			Federal	$ 724,620	80%	ROW	$ 180,073	constructio	$ 544,547			$	-	$ 724,620		CO	4,533	
		MLK Jr. Blvd. Shared	Local	$ 181,155	20%											VOC	211	
4	Chapel Hill	Pathway (0.7 miles)														NOx	158	$ 148
		Sidewalks on Campus Walk	Federal	$ 269,842	80%	constructio	$ 269,842					$	-	$ 269,842		CO	1,082	
		Avenue and Lasalle Street	Local	$ 66,853	20%											VOC	50	
5	Durham	(0.92 miles)														NOx	38	$ 231
		Estes Dr. Bicycle and	Federal	$ 1,145,998	80%	ROW	$ 165,795	constructio	$ 980,204			$	-	$ 1,145,999	$ 200,236	CO	2,639	
		Pedestrian Improvements	Local	$ 286,500	20%											VOC	123	
6	Chapel Hill	(0.65 miles)														NOx	92	$ 402
		Replacement of Five	Federal	$ 583,443	80%	capital	$ 583,443					$	-	$ 583,443		CO	789	
		Cutaway Vans with Hybrid	Local	$ 145,861	20%											VOC	82	
7	DATA	Electric Vans														NOx	289	$ 503
		Jones Creek Greenway to	Federal	$ 279,965	80%	PE	$ 23,510	constructio	$ 246,855	implementa	$ 9,600	$	-	$ 279,965	$ 39,965	CO	321	
		Twin Creeks/Morris Grove	Local	$ 69,991	20%											VOC	14	
8	Carrboro	Elementary														NOx	11	$ 809
		Sidewalks and Bike Lanes on	Federal	$ 1,108,542	80%			PE	$ 106,965	constructio	$ 1,001,577	$	-	$ 1,108,542		CO	1,022	
		Hope Valley Road (1.14	Local	$ 277,135	20%											VOC	48	
9	Durham	miles)														NOx	36	$ 1,002
			Federal	$ 777,924	80%					constructio	$ 777,924	$	-	$ 777,924		CO	601	
		Sidewalks on Cameron	Local	$ 194,481	20%											VOC	28	
10	Durham	Avenue (1.66 miles)														NOx	21	$ 1,197
			Federal	$ 1,003,200	80%					constructio	$ 1,003,200	$	-	$ 1,003,200	$ 79,415	CO	661	
		Sidewalks on Alston Avenue	Local	$ 250,800	20%											VOC	31	
11	Durham	(1.4 miles)														NOx	23	$ 1,403
			Federal	$ 496,000	80%	PE	$ 40,000	ROW	$ 345,600	constructio	$ 110,400	$	-	$ 496,000		CO	30	
			Local	$ 124,000	20%											VOC	1	
12	Hillsborough	Riverwalk, Phase II														NOx	1	$ 15,500
		Replacement of Five Diesel	Federal	$ 2,674,114	80%							capital	$ 2,674,114	$ -		CO	218	
		Buses with Hybrid Electric	Local	$ 668,528	20%											VOC	95	
13	DATA	Buses														NOx	1,392	$ 1,568
		Replacement of Two 40'	Federal	$ 1,653,088	80%							capital	$ 1,653,088	$ -		CO	105	
		Deisel Buses with Hybrid 60'	Local	$ 413,272	20%											VOC	(0)	
14	Chapel Hill	Buses														NOx	133	$ 6,948
			Total Federal	$ 16,223,031		total	$ 3,393,542	total	$ 3,608,101	total	$ 3,360,203	total	$ 4,327,202	$ 10,361,847	$ 671,466			
			Available	$ 10,351,669		available	$ 3,375,661	available	$ 3,457,487	available	$ 3,518,521			$ 10,351,669				
			Difference	$ (5,871,362)		difference	$ (17,881)	difference	$ (150,614)	difference	$ 158,318			$ (10,178)				

*CMAQ request for DCHC MPO and CAMPO combined

**Service Provider Matching Funds

Durham	$ 5,692,707	62%	
Orange	$ 2,646,584	29%	
Chatham	$ 796,850	9%	
Regional	$ 1,225,706		

RESOLUTION TO MODIFY THE
2009-2015 TRANSPORTATION IMPROVEMENT PROGRAM
FOR THE DURHAM-CHAPEL HILL-CARRBORO URBAN AREA

AMENDMENT #16
August 11, 2010

A motion was made by TAC Member _____ and seconded by TAC Member _____ for the adoption of the following resolution, and upon being put to a vote, was duly adopted.

WHEREAS, the Metropolitan Transportation Improvement Program (MTIP) is a staged multiple year listing of all federally funded transportation projects scheduled for implementation within the Durham-Chapel Hill-Carrboro Urban Area which have been selected from a priority list of projects; and

WHEREAS, the document provides the mechanism for official endorsement of the program of projects by the Transportation Advisory Committee (TAC); and

WHEREAS, the inclusion of the TIP in the transportation planning process was first mandated by regulations issued jointly by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) and no project within the planning area will be approved for funding by these federal agencies unless it appears in the officially adopted TIP; and

WHEREAS, the procedures for developing the MTIP have been modified in accordance with certain provisions of the SAFETEA-LU Federal Transportation Act and guidance provided by the State; and

WHEREAS, projects listed in the MTIP are also included in the State TIP (STIP) and balanced against anticipated revenues as identified in the STIP; and

WHEREAS, the North Carolina Department of Transportation and the Transportation Advisory Committee have determined it to be in the best interest of the Urban Area to amend the FY 2009-2015 Metropolitan Transportation Improvement Program as described in the attached sheet; and

WHEREAS, there has been no change in the MTIP project schedule or project design concept and scope with regard to the air quality conformity finding made by the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Transportation Advisory Committee on August 13, 2008; and

WHEREAS, the DCHC MPO certifies that this MTIP amendment is consistent with the intent of the DCHC MPO 2035 LRTP; and

BE IT THEREFORE RESOLVED that the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Transportation Advisory Committee hereby amends the FY 2009-2015 Metropolitan Transportation Improvement Program of the Durham-Chapel Hill-Carrboro Urban Area, as approved by the TAC on August 13, 2008, and as described in the "Attachment to

Resolution for Amendment #16 to DCHC 2009-2015 MTIP" provided here on this, the 11th day of August, 2010.

_____

J. Michael Woodard, TAC Chair

Durham County, North Carolina

I certify that J. Michael Woodard personally appeared before me this day acknowledging to me that he signed the forgoing document.

Date: August 11, 2010

_____

_____, Notary Public

My commission expires: _____

Attachment to Resolution for Amendment #16 to DCHC 2009-2015 MTIP

Amended Project

TIP	System	Description	Funding	Phase	FY 2011
TT-4911	Triangle Transit	Technology: Automatic Passenger Counters - DCHC funded	STPDA	C	$ 39,396
			L	C	$ 9,849

Amended Project

TIP	System	Description	Funding	Phase	FY 2011
TT-5110	Durham/DATA	Technology: Automatic Passenger Counters - DCHC funded	STPDA	C	$ 78,792
			L	C	$ 19,698

Amended Project

TIP	System	Description	Funding	Phase	FY 2011
TT-5109	Chapel Hill Transit	Technology: Automatic Passenger Counters - DCHC funded	STPDA	C	$ 44,649
			L	C	$ 11,162

DCHC MPO STPDA Funding Table for FY 2010 through 2015 - Approved April 14, 2010 - With Proposed August 11, 2010 Update

Jurisdiction	TIP No		Description	Cost 100%	Cost 80%	2010		2011		2012		2013		2014		2015	
						Phase	Cost	Phase	Cost	Phase	Cost	Phase	Cost	Phase	Cost	Phase	Cost
Carrboro	U-4726		Multi-use Path from Wilson Park to Estes Dr.	$ 210,855	$ 168,684	Construction	$168,684										
Carrboro	EL-4994		Bolin Creek Greenway - Carrboro (Homestead to Estes)	$ 737,500	$ 590,000			Construction	$590,000								
Carrboro	EL-4828		Morgan Creek Greenway - Carrboro	$ 600,000	$ 480,000	Planning	$84,000	Construction	$396,000								
Carrboro	U-4726		Bolin Creek Greenway (Jones Creek)	$ 268,375	$ 214,700			Construction	$214,700								
Carrboro	U-4726		Rogers Road - Sidewalk (Homestead to Meadow Run)	$ 536,200	$ 428,960	Planning	$ 65,000	Construction	$363,960								
Carrboro	U-4726		S. Greensboro St. - Sidewalk	$ 58,300	$ 46,640					Construction	$46,640						
Carrboro	U-4726		Bicycle Loop Detectors	$ 37,500	$ 30,000			Construction	$30,000								
Carrboro	U-4726		Bel Arbor-Plantation Acres Multi-use Path	$ 83,750	$ 67,000							Construction	$ 67,000				
Chapel Hill	TG-4731		Chapel Hill Transit - Misc. Capital - Tires Purchase	$ 255,415	$ 204,332			Capital	$ 204,332								
Chapel Hill	U-4727		Chapel Hill Transit Planning	$ 951,250	$ 761,000	UPWP/Planr	$ 388,000	UPWP/Planr	$ 373,000								
Chapel Hill	U-4727		Intersection & Traffic Study @ RAMS Plaza	$ 100,000	$ 80,000	UPWP/Planr	$ 32,000	UPWP/Planr	$ 48,000								
Chapel Hill	U-4726	P	CH - Culbreth Rd: Cobble Ridge to Rossburn sidewalk	$ 135,000	$ 108,000	Construction	$ 108,000										
Chapel Hill	U-5119		NC 86/US 15-501 BRT improvements	$ 565,000	$ 452,000					Construction	$ 452,000						
Chapel Hill	xxxxxx		FCC Radio Communications (Upgrade fleet)	$ 1,656,250	$ 1,325,000			Capital	$ 1,325,000								
Chapel Hill	xxxxxx		Morgan Creek Greenway Phase 2 - Chapel Hill	$ 700,000	$ 560,000			Construction	$ 560,000								
Chapel Hill	U-4726	IF	Bolin Creek Stairs - Chapel Hill	$ 125,000	$ 100,000			Construction	$ 100,000								
Chapel Hill	U-4726	F	CH - Chapel Hill Sidewalks	$ 400,000	$ 320,000			Construction	$ 320,000								
Chapel Hill	U-4726		NC86/other locations Pedestrian Safety Improvements	$ 375,000	$ 300,000			Construction	$ 150,000	Construction	$ 150,000						
Chapel Hill	U-4727		Greenways/Bike Ped Maps	$ 30,000	$ 24,000			UPWP/Planr	$ 24,000								
Chapel Hill	U-4726		Bolin Creek Greenway construction	$ 937,500	$ 750,000							Construction	$ 750,000				
Chapel Hill	TT-5109		Technology: Automatic Passenger Counters	$ 55,811	$ 44,649			Capital	$ 44,649								
Durham	U-4445		NC 147 Bicycle/Pedestrian Bridge - Durham	$ 500,000	$ 400,000	Construction	$400,000										
Durham	E-2921E		American Tobacco Trail Phase E - Durham, Durham County	$ 1,680,000	$ 1,344,000	Construction	$1,344,000										
Durham	U-4726		Barbee Rd. (Orindo to Pearsontown Elem.) Sidewalk	$ 19,600	$ 15,680	Construction	$15,680										
Durham	U-4726		DATA Sidewalk	$ 19,800	$ 15,840	Construction	$15,840										
Durham	C-4928		Morreene Road - Bike/Ped Facilities (Neal to Erwin)	$ 1,560,000	$ 1,248,000	Planning	$ 317,400	Construction	$930,600								
Durham	U-4724		Cornwallis Road - Bike/Ped Facilities (S. Roxboro to University or C.H.)	$ 2,395,000	$ 1,916,000	Planning	$ 340,500	Construction	$1,575,500								
Durham	U-3804		Hillandale (I-85 to Carver) - Sidewalks	$ 81,144	$ 64,915	Construction	$64,915										
Durham	U-4726	O	DUR - Carpenter Fletcher RD;Woodcroft- Alston bike impr.	$ 142,740	$ 114,192	Planning	$ 17,129			Construction	$97,063						
Durham	U-4726	O	Carpenter Fletcher - Bike/Ped Facilties (Woodcroft to Alston)	$ 1,282,976	$ 1,026,381	Planning	$ 153,957			Construction	$872,424						
Durham	U-4726		Avondale - Sidewalk (I-85 to Geer)	$ 515,000	$ 412,000					Construction	$412,000						
Durham	U-4726		Cheek - Bike/Ped Facilities (Geer to Hardee)	$ 695,000	$ 556,000			Planning	$83,400			Construction	$ 472,600				
Durham	U-4726	K	DUR - Hillandale:Club to I-85 5' sidewalk on both sides	$ 165,484	$ 132,387			Planning	$19,858			Construction	$ 112,529				
Durham	U-4726		Hillandale - Bike/Ped Facilities (I-85 to Fulton)	$ 1,150,000	$ 920,000			Planning	$138,000			Construction	$ 782,000				
Durham	U-4726	G	DUR - Holloway St sidewalks	$ 157,106	$ 125,685									Construction	$ 125,685		
Durham	TT-5110		Technology: Automatic Passenger Counters	$ 98,490	$ 78,792			Capital	$78,792								
LPA	U-4727		UPWP - staff and routine	$ 5,176,492	$ 4,141,193	UPWP/Planr	$ 432,794	UPWP/Planr	$ 662,709	UPWP/Planr	$ 883,959	UPWP/Planr	$ 699,526	UPWP/Planr	$ 720,370	UPWP/Planr	$ 741,836
LPA	U-4727		UPWP - ITS Deployment Plan Update	$ 70,000	$ 56,000	UPWP/Planr	$ 56,000										
LPA	U-4727		UPWP - Bike/Ped (non-motorized trip)Model Development	$ 175,000	$ 140,000	UPWP/Planr	$ 113,500	UPWP/Planr	$ 26,500								
LPA	U-4727		UPWP - GIS Integration and Automation	$ 200,000	$ 160,000	UPWP/Planr	$ 160,000										
LPA	U-4727		UPWP - Land Use Model Development	$ 250,000	$ 200,000	UPWP/Planr	$ 200,000										
LPA	U-4727		UPWP - MPO Collector Street Plan	$ 50,000	$ 40,000	UPWP/Planr	$ 40,000										
LPA	U-4727		UPWP - NC 54 Subarea Study	$ 250,000	$ 200,000	UPWP/Planr	$ 150,000	UPWP/Planr	$ 50,000								
LPA	U-4727		UPWP - Commercial Vehicle Study	$ 125,000	$ 100,000	UPWP/Planr	$ 55,100	UPWP/Planr	$ 44,900								
LPA	U-4727		UPWP - GIS Integration Phase II	$ 375,000	$ 300,000					UPWP/Planr	$ 150,000	UPWP/Planr	$ 150,000				
LPA	U-4727		UPWP - Parking Study	$ 125,000	$ 100,000					UPWP/Planr	$ 100,000						
LPA	U-4727		UPWP - Transit Studies	$ 546,454	$ 437,163					UPWP/Planr	$ 137,163	UPWP/Planr	$ 300,000				
NCDOT	EB-4707		Old Durham-Chapel Hill Road - Chapel Hill, Durham	$ 4,639,000	$ 3,711,200	ROW	$511,200	Construction	$3,200,000								
Triangle Transit	TT-4911		Technology: Automatic Passenger Counters	$ 49,245	$ 39,396			Capital	$39,396								
				$ 31,312,237	**$ 25,049,789**		**$ 5,233,699**		**$11,593,296**		**$3,301,249**		**$ 3,333,655**		**$ 846,055**		**$ 741,836**

Updated 8/11/2010

DCHC

DURHAM • CHAPEL HILL • CARRBORO METROPOLITAN PLANNING ORGANIZATION

Member Governments
Town of Carrboro
Town of Chapel Hill
County of Chatham
City of Durham
County of Durham
Town of Hillsborough
NC Department of Transportation
County of Orange

August 11, 2010

Ms. Miriam Perry, Director
Public Transportation Division
N.C. Department of Transportation
1550 Mail Service Center
Raleigh, NC 27699-1550

Dear Ms. Perry:

The Durham-Chapel Hill-Carrboro MPO requests the transfer of STPDA funds for FFY 2011 from the Federal Highway Administration to the Federal Transit Administration for the three STPDA projects listed below. The DCHC MPO funding is as follows:

TIP #	System	Project	FFY11 (federal funds)	Funding Source
TT-5109	Chapel Hill Transit	Technology: Automatic Passenger Counters	$44,649	STPDA
TT-5110	Durham/DATA	Technology: Automatic Passenger Counters	$78,792	STPDA
TT-4911	Triangle Transit	Technology: Automatic Passenger Counters	$39,396	STPDA

This request was approved by the Durham-Chapel Hill-Carrboro Transportation Advisory Committee at its meeting on August 11, 2010 (see attached resolution). Your assistance with these projects is greatly appreciated.

Sincerely,

J. Michael Woodard, Chair
Transportation Advisory Committee

cc: Bill Barlow, NCDOT - Public Transportation Division
John Tallmadge, Triangle Transit
Pierre Osei-Owusu, DATA
Brian Litchfield, Chapel Hill Transit
Felix Nwoko, DCHC MPO

Triangle J Council of Governments	Sustainable Communities Regional Planning Grant Program	
	Triangle Partnership for Development & Infrastructure	June 23, 2010 Notice of Funding Availability

The Department of Housing and Urban Development (HUD), in partnership with US DOT and US EPA, has issued a Notice Of Funding Availability (NOFA) for a Sustainable Communities Regional Planning Grant Program. TJCOG is applying for a grant as the "managing partner" of the Triangle Development & Infrastructure Partnership. The grant program is expected to be extremely competitive. The grant program is designed to:

> "support metropolitan and multijurisdictional planning efforts that integrate housing, land use, economic and workforce development, transportation, and infrastructure investments in a manner that empowers jurisdictions to consider the interdependent challenges of:
>
> (1) economic competitiveness and revitalization;
> (2) social equity, inclusion, and access to opportunity;
> (3) energy use and climate change; and
> (4) public health and environmental impact."

Regions of >500,000 population (the Triangle's size category) are eligible for up to $73 million, with a $5 million maximum award per region; projects may take up to 3 years. There is a minimum local requirement of "leveraged resources" equal to 20% of the federal grant amount; in-kind resources are allowed and other federal funds may be counted.

Outcomes

The program places a priority on investing in **partnerships** that translate livability **principles** into **strategies** that direct long-term development and reinvestment, address **issues of regional significance**, utilize **data to set and monitor progress** toward **performance goals**, and **engage stakeholders and citizens in meaningful decision-making roles**. Plans should:

1. Identify regional affordable housing, transportation, land use, water, economic development, open space, energy & environmental conservation priorities;
2. Clearly define a single, integrated plan for regional development over 20+ years with 3 to 5-year benchmark performance targets, and delineate strategies to meet performance goals;
3. Set performance goals and measures that are consistent with the Livability Principles;
4. Use geo-coded data sets and other metrics to assess investment scenarios on the goals;
5. Provide plans, policies & strategies to be implemented by all jurisdictions to meet goals;
6. Prioritize projects to implement the regional plan, responsible entities and funding sources;
7. Show how the plan will be used for Consolidated Plans (housing), Analysis of Impediments to Fair Housing Choice, Long Range Transportation Plans and Asset Management Plans;
8. Engage residents and stakeholders substantially and meaningfully, including communities traditionally marginalized, limited English speakers, persons with disabilities and the elderly.

Expectations

Applicants would be expected to identify a set of locally-appropriate performance metrics that are consistent with the Partnership's Livability Principles, as well as the Partnership's own metrics, and then measure the outcomes of proposed growth/reinvestment scenarios against those metrics.

Funding in this category would support data analysis, urban design and outreach efforts to achieve broad consensus among groups, citizens, and decision-makers for a single vision/scenario and to have that plan adopted by all appropriate regional governmental bodies.

Applicant Requirements

- Applications must be from a consortium that covers either a Metropolitan Statistical Area or a Metropolitan Planning Organization (larger areas, but not smaller, are permitted); the consortium must consist of (at a minimum):
    - The traditional principal city of the area.
    - The city, county, or other unit of government representing the largest population of the area.
    - Additional cities, counties, or other units of government to ensure that the consortium represents a minimum of 50 percent of the area's population.
    - The Metropolitan Planning Organization for the area.
    - A non-profit organization, foundation, or educational institution within the area that with the capacity to engage a diverse representation of the general population in the planning area.
    - Applicants are encouraged to include additional partners over and above the minimum required consortium.
- Consortium duties include:
    - A consortium designates a lead applicant responsible for submitting the application to HUD, signing a cooperative agreement, and administering the program
    - Partnership agreements, memoranda of understanding, or other proof of commitment by consortium members must be submitted with the application.
    - The Consortium can establish its own governance structure that reflects the diversity of its partners and allows for maximum participation in decision-making
    - A final consortium agreement must be executed no later than 120 days after the effective start date of the grant agreement
- The type of applicant is determined by the population range within the applicant's region. A region is defined as a geographic area that includes, but may be larger than:
    - The jurisdiction of a single MPO, or the jurisdictions of two or more adjacent MPOs
    - A Metropolitan or Micropolitan Statistical Area;

Application deadline is August 23rd. Additional information on the grant program including the NOFA, FAQ documents and webcast archives, is available on HUD's Office of Sustainability website at: http://portal.hud.gov/portal/page/portal/HUD/program_offices/sustainable_housing_communities

PRISM RESEARCH TRIANGLE

to form a more sustainable region

A sustainable region supports creative people engaged in rewarding enterprises in a distinctive place.

The purpose of PRISM Research Triangle is to ensure that we provide our people and enterprises with a distinctive place in which to thrive, by bringing together those responsible for development and infrastructure decisions and building on their principles and plans. As the region adds another 1.2 million people over the next generation, it will only be through working together that each community can sustain the character and achieve the future that it seeks.

Just as a prism helps us understand how different wavelengths combine to form visible light, the PRISM Research Triangle program will help us understand how our different communities can come together to form a more sustainable region.

The Federal Interest

- The Departments of Housing & Urban Development (HUD) and Transportation (DOT) and the Environmental Protection Agency (EPA) created a Regional Sustainable Development Planning Grant Program oriented to "cooperative regional planning efforts" for "regional plans for sustainable development."
- Key elements of federal interest:
  - Regional (MSA/MPO) scale
  - "Place-based" emphasizing integration of housing, transportation, land use & environmental planning
  - Livability Principles
  - Scenario analysis with performance metrics
  - Stakeholder engagement
  - **Implementation Strategies & Use in Investment Decisions**

What We Propose To Do

- Create a *Regional Sustainable Development Plan* for the Triangle built from a spectrum of places ranging from vibrant mixed-use activity centers to protected natural areas -- a **P**lan for a **R**egional, **I**ntegrated, **S**ustainable **M**etropolitan **Research Triangle**, or PRISM Research Triangle. Key elements in the plan will be transportation investment, water resource protection and housing that works for everyone – from young to old and rich to poor – so that we match our region's development with the infrastructure investments we make, the needs of our citizens and the environment we wish to conserve.

PRISM: What we mean by …

… **P**lan: place-based tools and strategies to help us understand what we are today, what we can become in the future and how we can achieve the future that we seek, all based on a unified vision and set of development, conservation and mobility principles for the Research Triangle Region.

… **R**egional: our metropolitan area, including the federally-defined Metropolitan Statistical Areas and our Metropolitan Planning Organizations; but also other communities in the state-defined Triangle J and Kerr-Tar regions who wish to participate.

… **I**ntegrated: both among *sectors* (government, university, business, civic) and among *issues* (land use, transportation, housing, water resources, air quality, energy)

… **S**ustainable: patterns of growth and investment that promote social, economic and environmental well-being for all of the region's communities and residents.

… **M**etropolitan: the spectrum of places in our region: urban, suburban and rural; built and natural; each of which relies on and benefits from the

- The Plan can be based on development, conservation and mobility principles created by the *Regional Development Choices Project,* matched to the federal livability principles, reinforced by the *Research Triangle Reality Check* project's three guiding principles, and all harking back to the basic principle of the 1969 Development Guide: A Good Fusion of Town and Country.
- The Plan will be honed through creating and analyzing Development & Infrastructure Investment scenarios; scenarios will be informed by our principles, current community and stakeholder plans and extensive stakeholder and public engagement, and analyzed using performance measures.
- The Plan can link the regional scale with the neighborhood scale through "opportunity sites" at key locations that are selected based on community interest and commitment along with site sustainability characteristics, such as proximity to transit or educational and job opportunities, the presence of brownfield sites, and the potential for housing and neighborhood revitalization.
- The Plan will be built on and tightly linked to established plans and planning processes, including the development of the 2040 Long Range Transportation Plan, the region's "Shape of Things to Come" economic development strategy, the housing assessment called for in the state's "Intermodal Bill," the development of the region's transit financial plan, Jordan Lake and Falls Lake nutrient management strategies, and local Consolidated Plans for housing.

How We Can Do It

- The principal organization will be the *Triangle Development & Infrastructure Partnership*, a collaboration of two dozen regional, state and local sponsoring partners that first met in 2008. Triangle J Council of Governments is the managing partner and grant applicant.
- Effective engagement in regional activities happens at two scales: Stakeholder engagement at the regional scale and direct public engagement at the local scale. Regional engagement can use:
  - Technical teams to provide input on complex tasks related to analysis, especially on tools and models used to create and analyze development and infrastructure investment scenarios
  - Guidance teams to provide insight on issues addressed in the plan; where possible, existing teams (indicated by an asterisk*) can be used. Guidance teams by issue may include:
    - ❖ Land Use & Transportation*
    - ❖ Water Resources*
    - ❖ Green Space
    - ❖ Energy & Greenhouse Gases*
    - ❖ Housing, Neighborhood & Economic Vitality
    - ❖ Healthy, Child-Safe & Senior-Friendly Development
  - Engagement teams to provide easy ways for organizations and associations to have meaningful participation and to both provide and receive information, for example:
    - ❖ Aging Advisory Council*
    - ❖ Civic Engagement Team
      - Next-generation leaders
      - Membership organizations
    - ❖ RTRP Institutional Partners*
    - ❖ Council of Government Boards & Committees*
      - Executive Committee & Board of Delegates
      - Smart Growth Committee
- Local Engagement can:
  - Work with and through existing organizations and associations
  - Create an engagement "Server" for community and civic groups: materials, surveys, etc.
- Tasks will be accomplished by COG staff, partners and contractors.

RESOLUTION TO ENABLE THE DURHAM-CHAPEL HILL-CARRBORO MPO TO BE A COMMITTED MEMBER OF THE CONSORTIUM APPLYING FOR A FEDERAL REGIONAL SUSTAINABLE DEVELOPMENT PLANNING GRANT

August 11, 2010

A motion was made by TAC Member _____and seconded by TAC Member _____for the adoption of the following resolution, and upon being put to a vote, was duly adopted.

WHEREAS, the Triangle J Council of Governments is applying for a federal grant through the DOT/HUD/EPA sustainability program to create a Regional Sustainable Development Plan for the Research Triangle on behalf of the Triangle Development & Infrastructure Partnership – to be called PRISM Research Triangle; and

WHEREAS, the activities to be conducted as part of the project would support the development of the 2040 Long Range Transportation Plan and are designed to address planning requirements in North Carolina's Intermodal Bill; and

WHEREAS, grant applications that achieve a minimum threshold will be accorded "preferred status" that may enable local agencies to be more competitive for other federal funds; and

WHEREAS, HUD requires that MPOs provide proof of commitment and identification of leveraged resources in order for Regional Sustainable Planning Grant applications to be successful;

BE IT THEREFORE RESOLVED that the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Transportation Advisory Committee offers this proof of commitment of $75,000 in leveraged resources if Triangle J COG is awarded a grant, consisting of:

(i) already programmed and planned federal STP-DA funding to Triangle J COG for integrated land use/transportation/air quality planning services over a 3-year period of $30,000;

(ii) an additional $30,000 in federal STP-DA funds to the project over a 3-year period to support the special study activities of PRISM Research Triangle; and

(iii) $15,000 in DCHC staff in-kind participation in the project over a 3-year period;

provided here on this, the 11th day of August, 2010.

_____
J. Michael Woodard, TAC Chair

Durham County, North Carolina

I certify that J. Michael Woodard personally appeared before me this day acknowledging to me that he signed the forgoing document.

Date: August 11, 2010

_____
_____, Notary Public
My commission expires: _____

TIGER II DISCRETIONARY GRANTS PROGRAM

TIGER II Funding: On Monday, April 26, 2010, the Department of Transportation solicited applications for the TIGER II discretionary grant program, a $600 million competitive grant program for surface transportation projects. Pre-applications are due on July 16, 2010, and final applications are due on August 23, 2010. The pre-application will include basic information on projects and will be used by DOT to determine eligibility, the presence of the appropriate match and whether NEPA has been initiated.

Funding is available to units of government – including state, tribal and local governments, transit agencies, port authorities, MPOs and multi-jurisdictional entities – for capital investments in highway or bridge projects; public transportation projects; passenger and freight rail transportation projects; port infrastructure investments; and intermodal facilities.

Individual awards can be $10-200 million, with up to 80% of project costs eligible for federal funding. $140 million is reserved for projects in rural areas, where 100% of project costs are eligible for funding and project awards can be as low as $1 million. No one state can receive more than 25% of program funds.

Up to $150 million is available to support TIFIA financing, and up to $35 million is available for transportation planning grants. Applicants may apply for capital grants, TIFIA financing or planning grants, though applicants for capital grants may be awarded TIFIA financing or a planning grant, if it is determined that is the most appropriate award.

Public Comments: The solicitation also provides two weeks for comments on the proposed selection criteria and guidance for awarding TIGER II Discretionary Grants. The Department will take all comments into consideration and may revise the solicitation by May 28, 2010.

HUD Community Challenge Grants: DOT and HUD are requesting comments on a proposal to solicit and evaluate applications for TIGER II transportation planning grants and HUD's $40 million in Community Challenge Grants jointly. Activities eligible for HUD's grants are corridor or station-area plans, revisions to zoning or building codes and creating or preserving affordable housing for low-income families near transit.

Because the DOT's TIGER II planning funding and HUD's Community Challenge Planning Grant funding is for similar, related purposes DOT and HUD are interested in conducting a multi-agency evaluation and award process. This multi-agency approach is consistent with DOT's and HUD's participation in the "Partnership for Sustainable Communities" to help Americans in all communities – rural, suburban and urban – gain better access to affordable housing, more transportation options, lower transportation costs and a cleaner environment.

Selection Criteria: The Department will give priority to projects that have a significant impact on the following long-term outcomes:

- State of Good Repair: Improving the condition of existing transportation facilities and systems, with particular emphasis on projects that minimize life-cycle costs.
- Economic Competitiveness: Contributing to the economic competitiveness of the United States over the medium- to long-term.
- Livability: Fostering livable communities through place-based policies and investments that increase transportation choices and access to transportation services for people in communities across the United States.
- Sustainability: Improving energy efficiency, reducing dependence on oil, reducing greenhouse gas emissions and benefitting the environment.

- Safety: Improving the safety of U.S. transportation facilities and systems.

Projects will also be evaluated based on the extent to which they include the following:

- Job Creation & Economic Stimulus: The Department will give priority to projects that are expected to quickly create and preserve jobs and stimulate rapid increases in economic activity, particularly jobs and activity that benefit economically distressed areas.
- Innovation: Priority will be given to projects that use innovative strategies to pursue the long-term outcomes outlined above.
- Partnership: The Department will give priority to projects that demonstrate strong collaboration among a broad range of participants and/or integration of transportation with other public service efforts.

TIGER Discretionary Grant Process and Awards: DOT received over 1400 applications totaling almost $60 billion for the $1.5 billion TIGER Discretionary Grant program created under ARRA. In February, 51 awards were announced for projects ranging from bridge replacements, freight rail corridor improvements, streetcar extensions, and bicycle/pedestrian networks. The largest grant award was $105 million for a multi-state freight rail project, and the average award size was $30 million.

DOT expects the TIGER II Discretionary Grant program to be just as competitive, though the total funding available is lower.

US Department of Transportation Tiger II Pre-Application This Site: US Department of Tr

U.S. DOT TIGER II Grant Pre-Application: Triangle Area Greenway - A Central North Carolina Bike/Ped Network

New Item | Edit Item | Workflows

Project Name	Triangle Area Greenway - A Central North Carolina Bike/Ped Network
Was a TIGER I application submitted for this project?	No
DUNS	044379568
Applicant / Organization Name	City of Raleigh
Applicant / Organization Contact Person	Vic Lebsock
Applicant / Organization Contact Business Phone Number	919-996-4786
Applicant / Organization Contact Business E-mail	victor.lebsock@raleighnc.gov
Applicant / Organization Contact Business Street Address	333 Fayetteville Street, Suite 300
Applicant / Organization Contact City	Raleigh
Applicant / Organization Contact State	NC-NORTH CAROLINA
Applicant / Organization Contact Zip	27601
Primary Applicant Type	Local Govt.
Co-Applicant Type	Local Govt.
Is the Project Multimodal?	Yes
Primary Project Type	Bicycle & Pedestrian
Secondary Project Type	Transit
Additional Project Type Information	Other
Is this application for a Planning Grant?	No
If Planning Grant, please select the related funding opportunity	
Primary Planning Grant Type	
Secondary Planning Grant	

Type	
Additional Planning Grant Type	
Additional Planning Grant information	
Project Description	This project will complete missing links in a bike/ped network connecting over 200 miles of greenways and non-motorized routes through nine municipalities and five counties in central North Carolina. In addition to greenway construction, the grant will fund trailhead improvements, neighborhood and transit connections, and two road widening projects.
Total Amount Requested from TIGER II Funds	$26,000,000.00
Total Project Cost	$35,000,000.00
Cities Impacted by Proposed Project	Raleigh, Cary, Durham, Wake Forest, Chapel Hill, Apex, Morrisville, Knightdale, Clayton
Counties Impacted by Proposed Project	Wake, Durham, Orange, Johnston, Chatham
Primary Proposed Project State	NC-NORTH CAROLINA
Additional Project State (1)	
Additional Project State (2)	
Additional Project State (3)	
Additional Project State (4)	
Additional Project State (5)	
Additional Project State (6)	
Primary Congressional District	NORTH CAROLINA - 13th District
Additional Congressional District (1)	NORTH CAROLINA - 2nd District
Additional Congressional District (2)	NORTH CAROLINA - 4th District
Additional Congressional District (3)	
Additional Congressional District (4)	
Additional Congressional District (5)	
Additional Congressional District (6)	
Additional Congressional District (7)	
Additional Congressional District (8)	
Additional Congressional District (9)	

Additional Congressional District (10)	
Type of Jurisdiction	Urban
Economically Distressed Area	No
Federal Wage Rate Certificate	Yes
Requesting TIGER II TIFIA Payment	No
NEPA Status	CE Expected
NEPA Comment	It is anticipated that a Categorical Exclusion will be required for all parts of this project. For the majority of the work, the environmental data collection has been completed and will be submitted by the end of calendar year 2010. Small portions of this project have not yet begun environmental documentation, but it is anticipated that all work will be completed and a Categorical Exclusion will be approved prior to September, 2012.
Project has secured 20% Matching Funds	Yes
20% Matching Funds Comment	Partners in this grant have pooled private funds, municipal general funds, and voter-approved bond funds to provide 25% match.
Application ID	kathycapps-1230
Full Application ID	aspnetsqlmembershipprovider:kathycapps-1230

Created at 7/22/2010 12:24 PM by KathyCapps
Last modified at 7/22/2010 12:29 PM by KathyCapps

US Department of Transportation Tiger II Pre-Application

This Site: US Department of Tr

U.S. DOT TIGER II Grant Pre-Application: Hillsborough Multi-modal Station

New Item | Edit Item | Workflows

Project Name	Hillsborough Multi-modal Station
Was a TIGER I application submitted for this project?	No
DUNS	091570440
Applicant / Organization Name	Town of Hillsborough
Applicant / Organization Contact Person	Tom King
Applicant / Organization Contact Business Phone Number	919-732-1270
Applicant / Organization Contact Business E-mail	tom.king@hillsboroughnc.org
Applicant / Organization Contact Business Street Address	101 East Orange Street
Applicant / Organization Contact City	Hillsborough
Applicant / Organization Contact State	NC-NORTH CAROLINA
Applicant / Organization Contact Zip	27278
Primary Applicant Type	Local Govt.
Co-Applicant Type	
Is the Project Multimodal?	Yes
Primary Project Type	Rail
Secondary Project Type	Road & Bridge
Additional Project Type Information	Bicycle & Pedestrian
Is this application for a Planning Grant?	Yes
If Planning Grant, please select the related funding opportunity	TIGER II Planning Grant

Primary Planning Grant Type	Rail (TIGER)
Secondary Planning Grant Type	Road & Bridge (TIGER)
Additional Planning Grant Type	Bicycle & Pedestrian (TIGER)
Additional Planning Grant information	N/A-Not Applicable
Project Description	The project will fund planning, engineering, design and construction of a multi-modal transit center on a site owned by the Town. The project includes extending Orange Grove Street to and through the site to connect with US 70A East. The connection involves a grade-separated crossing of the adjacent NC Railroad Company rail corridor.
Total Amount Requested from TIGER II Funds	$10,400,000.00
Total Project Cost	$13,000,000.00
Cities Impacted by Proposed Project	Hillsborough
Counties Impacted by Proposed Project	Orange
Primary Proposed Project State	NC-NORTH CAROLINA
Additional Project State (1)	
Additional Project State (2)	
Additional Project State (3)	
Additional Project State (4)	
Additional Project State (5)	
Additional Project State (6)	
Primary Congressional District	NORTH CAROLINA - 4th District
Additional Congressional District (1)	NA - Not Applicable
Additional Congressional District (2)	NA - Not Applicable
Additional Congressional District (3)	NA - Not Applicable
Additional Congressional District (4)	NA - Not Applicable
Additional Congressional District (5)	NA - Not Applicable
Additional Congressional District (6)	NA - Not Applicable

Additional Congressional District (7)	NA - Not Applicable
Additional Congressional District (8)	NA - Not Applicable
Additional Congressional District (9)	NA - Not Applicable
Additional Congressional District (10)	NA - Not Applicable
Type of Jurisdiction	Urban
Economically Distressed Area	No
Federal Wage Rate Certificate	Yes
Requesting TIGER II TIFIA Payment	No
NEPA Status	EIS Expected
NEPA Comment	The NEPA process has not been initiated at this time. The Town has spent the last year preparing a small area plan for the project site and a large tract of vacant land to the south. However, a stream call has been performed for a potential on-site water feature. The stream call determined the water feature is not subject to stream buffers enacted under the NCDENR Neuse River Rules. The Town is committed to securing the necessary environemtal studies and approvals required for the project as it proceeds through the planning and development process.
Project has secured 20% Matching Funds	Yes
20% Matching Funds Comment	The Hillsborough Town Board authorized this application on June 14, 2010 and agreed to secure the 20% match through a financing agreement that would be repaid with general fund revenues over time. Additionally, the Town has requested $445,000 in the form of a Congressional Appropriation for this project.
Application ID	tomking-0783
Full Application ID	aspnetsqlmembershipprovider:tomking-0783

Created at 7/19/2010 7:56 AM by tomking
Last modified at 7/19/2010 7:56 AM by tomking

US Department of Transportation Tiger II Pre-Application

U.S. DOT TIGER II Grant Pre-Application: Martin Luther King, Jr. Boulevard Corridor Study

New Item | Edit Item | Workflows

Project Name	Martin Luther King, Jr. Boulevard Corridor Study
Was a TIGER I application submitted for this project?	No
DUNS	075563783
Applicant / Organization Name	Chapel Hill Transit/Town of Chapel Hill
Applicant / Organization Contact Person	Brian Litchfield
Applicant / Organization Contact Business Phone Number	919-969-4908
Applicant / Organization Contact Business E-mail	blitchfield@townofchapelhill.org
Applicant / Organization Contact Business Street Address	6900 Millhouse Road
Applicant / Organization Contact City	Chapel Hill
Applicant / Organization Contact State	NC-NORTH CAROLINA
Applicant / Organization Contact Zip	27516
Primary Applicant Type	Transit Agency
Co-Applicant Type	Local Govt.
Is the Project Multimodal?	Yes
Primary Project Type	Transit
Secondary Project Type	Bicycle & Pedestrian
Additional Project Type Information	N/A
Is this application for a Planning Grant?	Yes
If Planning Grant, please select the related funding opportunity	Combination of TIGER & HUD Planning Grants
Primary Planning Grant Type	Transit (TIGER)

Secondary Planning Grant Type	Development and implementation of local, corridor, or district plans/strategies promoting livability (HUD)
Additional Planning Grant Type	Strategies for creating/preserving affordable housing (HUD)
Additional Planning Grant information	-Identify opportunities for economic development. -Create connections between affordable housing and employment.
Project Description	The project will evaluate transit investments, including BRT, and opportunities for expanding mobility and transit oriented development along a major transit corridor in Chapel Hill, North Carolina. Recommended strategies will incorporate affordable housing, economic development, livability, public art, travel choices and access to employment in the corridor.
Total Amount Requested from TIGER II Funds	$480,000.00
Total Project Cost	$600,000.00
Cities Impacted by Proposed Project	Chapel Hill
Counties Impacted by Proposed Project	Orange
Primary Proposed Project State	NC-NORTH CAROLINA
Additional Project State (1)	
Additional Project State (2)	
Additional Project State (3)	
Additional Project State (4)	
Additional Project State (5)	
Additional Project State (6)	
Primary Congressional District	NORTH CAROLINA - 4th District
Additional Congressional District (1)	
Additional Congressional District (2)	
Additional Congressional District (3)	
Additional Congressional District (4)	
Additional Congressional District (5)	
Additional Congressional District (6)	
Additional Congressional District (7)	
Additional Congressional	

District (8)	
Additional Congressional District (9)	
Additional Congressional District (10)	
Type of Jurisdiction	Urban
Economically Distressed Area	No
Federal Wage Rate Certificate	Yes
Requesting TIGER II TIFIA Payment	No
NEPA Status	CE Expected
NEPA Comment	Categorical Exclusion
Project has secured 20% Matching Funds	Yes
20% Matching Funds Comment	Chapel Hill Transit and the Town of Chapel Hill will provide the 20% local match from the Transit Capital Reserve and the Town's General Funds. Additional sources of funding and overmatch may be determined prior to the final application.
Application ID	bml5110-1234
Full Application ID	aspnetsqlmembershipprovider:bml5110-1234

Created at 7/22/2010 12:42 PM by bml5110
Last modified at 7/26/2010 9:05 AM by bml5110

TAC 8/11/2010 Attachment 10A

US Department of Transportation Tiger II Pre-Application

This Site: US Department of Tr

US Department of Transportation Tiger II Pre-Application > U.S. DOT TIGER II Grant Pre-Application > The Chatham Plan—a framework for a sustainable rural future

U.S. DOT TIGER II Grant Pre-Application: The Chatham Plan—a framework for a sustainable rural future

New Item | Edit Item | Workflows

Project Name	The Chatham Plan—a framework for a sustainable rural future
Was a TIGER I application submitted for this project?	No
DUNS	13-135-66
Applicant / Organization Name	Chatham County
Applicant / Organization Contact Person	Cynthia Van Der Wiele
Applicant / Organization Contact Business Phone Number	919-545-8394
Applicant / Organization Contact Business E-mail	cynthia.vanderwiele@chathamnc.org
Applicant / Organization Contact Business Street Address	80 East Street
Applicant / Organization Contact City	Pittsboro
Applicant / Organization Contact State	NC-NORTH CAROLINA
Applicant / Organization Contact Zip	27312
Primary Applicant Type	Local Govt.
Co-Applicant Type	
Is the Project Multimodal?	Yes
Primary Project Type	N/A
Secondary Project Type	
Additional Project Type Information	
Is this application for a Planning Grant?	Yes
If Planning Grant, please select the related funding opportunity	Combination of TIGER & HUD Planning Grants

Primary Planning Grant Type	Development of master or comprehensive plans to promote affordable housing (HUD)
Secondary Planning Grant Type	Road & Bridge (TIGER)
Additional Planning Grant Type	Transit (TIGER)
Additional Planning Grant information	Also includes Bicycle and Pedestrian
Project Description	Chatham County and its towns will ask citizens to articulate their vision for future development, specifically as it relates to land use, transportation, economic development and natural resources. The vision will be used to develop a detailed plan to guide local and state policies and investments.
Total Amount Requested from TIGER II Funds	$575,528.00
Total Project Cost	$987,500.00
Cities Impacted by Proposed Project	Siler City, Pittsboro, Goldston, Cary
Counties Impacted by Proposed Project	Chatham
Primary Proposed Project State	NC-NORTH CAROLINA
Additional Project State (1)	
Additional Project State (2)	
Additional Project State (3)	
Additional Project State (4)	
Additional Project State (5)	
Additional Project State (6)	
Primary Congressional District	NORTH CAROLINA - 2nd District
Additional Congressional District (1)	NORTH CAROLINA - 4th District
Additional Congressional District (2)	
Additional Congressional District (3)	
Additional Congressional District (4)	
Additional Congressional District (5)	
Additional Congressional District (6)	

Additional Congressional District (7)	
Additional Congressional District (8)	
Additional Congressional District (9)	
Additional Congressional District (10)	
Type of Jurisdiction	Rural
Economically Distressed Area	No
Federal Wage Rate Certificate	Yes
Requesting TIGER II TIFIA Payment	No
NEPA Status	CE Expected
NEPA Comment	A CE is expected since this project is a plan that does not involve any capital project.
Project has secured 20% Matching Funds	Yes
20% Matching Funds Comment	Matching funds will be provided in the form of local revenue already budgeted for this project and in-kind staff resources.
Application ID	chathamnc-1427
Full Application ID	aspnetsqlmembershipprovider:chathamnc-1427

Created at 7/23/2010 9:49 AM by ChathamNC
Last modified at 7/26/2010 1:45 PM by ChathamNC

US Department of Transportation Tiger II Pre-Application

[This Site: US Department of Transportation Tiger II Pre-Application \/] [ ]

U.S. DOT TIGER II Grant Pre-Application: Crossing The Bridge - Using A "Complete Streets " Approach And A Proposed Regional Rail Station As A Framework To Reunite And Revitalize Five Durham Neighborhoods Severed By Urban Renewal Highway Construction Of The 1970's

[Close]

New Item | Edit Item | Workflows

Project Name	Crossing The Bridge - Using A "Complete Streets " Approach And A Proposed Regional Rail Station As A Framework To Reunite And Revitalize Five Durham Neighborhoods Severed By Urban Renewal Highway Construction Of The 1970's
Was a TIGER I application submitted for this project?	No
DUNS	075566695
Applicant / Organization Name	City of Durham
Applicant / Organization Contact Person	Constance Stancil
Applicant / Organization Contact Business Phone Number	919-560-1415
Applicant / Organization Contact Business E-mail	constance.stancil@durhamnc.gov
Applicant / Organization Contact Business Street	101 City Hall Plaza

Address	
Applicant / Organization Contact City	Durham
Applicant / Organization Contact State	NC-NORTH CAROLINA
Applicant / Organization Contact Zip	27701
Primary Applicant Type	Local Govt.
Co-Applicant Type	
Is the Project Multimodal?	Yes
Primary Project Type	N/A
Secondary Project Type	N/A
Additional Project Type Information	N/A
Is this application for a Planning Grant?	Yes
If Planning Grant, please select the related funding opportunity	Combination of TIGER & HUD Planning Grants
Primary Planning Grant Type	Development of master or comprehensive plans to promote affordable housing (HUD)
Secondary Planning Grant Type	Transit (TIGER)
Additional Planning Grant Type	Planning, establishing, and maintaining acquisition funds and/or land banks (HUD)
Additional Planning Grant information	The planning grant will be used to develop a comprehensive master plan and a complete streets program that builds on existing projects and ensures that these projects are aligned with the overall goal of enhancing livability in five Durham communities. This includes the development of enhancements to the Alston Avenue widening project and the development of a station area plan for the future Alston Avenue transit station. The

station area plan will include bicycle, pedestrian, and transit bus access to the station; and land use, affordable housing, and economic development strategies that will encourage transit-oriented-development near the station. The master plan will also include neighborhood revitalization projects in the five communities, brownfield redevelopment, streetscape enhancements on the Fayetteville Street and Angier/Driver corridors, and economic development strategies throughout the planning area. Several existing planning and demonstration projects are needed to build capacity and maintain momentum. We are planning to include some small demonstration projects as 'learning-by-doing' that will ensure local citizens get hands-on/reality based appreciation of how to influence planning to help them create realistic project timeframes.

Examples of potential outcomes of the master plan include:
1. A complete streets design for the Alston Avenue corridor that includes transit, streetscape, and economic development. Alston Avenue is a prime example of an arterial plan void of: transit, building-to-building streetscapes and economic development considerations (e.g. pre-complete streets mentality). “Getting it Right” on this regional corridor engineering plan will be an acid test for all future low-income redevelopment and market value

development in the greater Triangle region.
2. A design for a pedestrian and bicycle network that provides access from Alston Avenue to the transit station. This future Triangle regional rail station lies at the exact center of the five neighborhoods and will help create an interconnected network which would radiate out from the proposed site to reweave the community together and ensure sustainable redevelopment.
3. A plan for the improvement of bus transit service and passenger amenities in the planning area.
4.The establishment of land use, housing, and economic development strategies that will encourage environmentally-designed transit-oriented-development in the station area.
5. A green transit oriented development is being planned in proximity to the future rail station.
6. An expansion of the community-led nationally known bicycle donation program.
7. A development of affordable housing with an estimated project cost of $150 million. The first two phases of the project will include mixed-income rental of 235 units, 2/3 of those units as affordable, 40 homeownership units, 30 of those units as affordable.
8. A redevelopment of a major housing project to create a neighborhood choice development (Durham Housing Authority).
9. Greenway plan that connects the

	five communities to consist of: pocket parks, trails, wetland restoration of Goose Creek, and outdoor classrooms with the neighborhood schools located within one of the five communities. 10. An expansion of the community-led urban garden program for low-to moderate income level households and schools within the five communities. 11. Adaptive reuse of an industrial structure for the purposes of a green job training program. 12. An expansion of the nationally recognized Brownfield site assessment and job training program. 13. An enhancement of the existing Neighborhood Energy Retrofit Program. 14. Planning for marketplaces that will provide access to healthy food choices for the five distressed communities. 15. Development of a local university consortium for urban modeling and metrics. 16. Planning for the enhancement and replication of Durham's successful Community Engagement Participatory Design Module. *The five communities share key commonalities which are: (a) all are econmically distressed, (b) high crime rates, (c) lack of quality housing, (d) poor air quality, (e) lack of transportation choices, and (f) the highest unemployment rates.*
Project Description	This community-driven master plan reconnects five distressed Durham communities, which were severed by

	urban renewal. The project transcends prior silo project mentality to reweave the social, economic, and physical fabric through sustainable housing, creating and accessing jobs, and providing greener transportation choices. Partnerships will be strengthened during planning project implementation.
Total Amount Requested from TIGER II Funds	$3,000,000.00
Total Project Cost	$9,000,000.00
Cities Impacted by Proposed Project	Durham
Counties Impacted by Proposed Project	Durham
Primary Proposed Project State	NC-NORTH CAROLINA
Additional Project State (1)	
Additional Project State (2)	
Additional Project State (3)	
Additional Project State (4)	
Additional Project State (5)	
Additional Project State (6)	
Primary Congressional District	NORTH CAROLINA - 4th District
Additional Congressional District (1)	
Additional Congressional District (2)	
Additional Congressional District (3)	
Additional Congressional District (4)	
Additional Congressional District (5)	
Additional Congressional District (6)	
Additional Congressional District (7)	
Additional Congressional District (8)	

Additional Congressional District (9)	
Additional Congressional District (10)	
Type of Jurisdiction	Urban
Economically Distressed Area	Yes
Federal Wage Rate Certificate	Yes
Requesting TIGER II TIFIA Payment	No
NEPA Status	CE Expected
NEPA Comment	Planning programs being structured with some demonstration. 98% of projects are planning and any implementation are demonstration projects. (CE) The Alston Avenue widening project has a completed Environmental Assessment that is currently under review for environmental justice concerns. The planning grant will be used to develop enhancements to the project that are not expected to require further revision of the Environmental Assessment. (NEPA complete) Brownfield sites are being considered. (EIS Expected)
Project has secured 20% Matching Funds	Yes
20% Matching Funds Comment	The City of Durham is requesting a grant amount of $3,000,000. The 20% matching requirement for this grant request is $600,000. The City will provide matching funds of $3,082,923. This amount exceeds the 20% match requirement by $2,482,923. The contributors to the matching amount are: unexpended project planning and design funds of $1,925,078 and a local

	government In-Kind Contribution of $1,157,845. The City has committed to dedicate staff time from a cross-functional Interdepartmental Task Team for the creation of a Master Plan for the Five Central City Communities. The City of Durham has an Interdepartmental Task Team that meets weekly to plan and implement development and revitalization strategies in central city neighborhoods and downtown. The Interdepartmental Task Team is comprised of directors and assistant directors from departments that include: Transportation, Community Development, Neighborhood Improvement Services, Planning, Human Relations, Office Economic and Workforce Development, Public Works, Parks and Recreations, Building Inspections, General Services, Solid Waste, Police, and representatives from the City Manager's Office. Representatives from these departments have committed staff time specifically to the implementation of this Master Plan Project. Their staff-time commitment is reflected in the in-kind contribution.
Application ID	constanes9210-0471
Full Application ID	aspnetsqlmembershipprovider:constanes9210-0471
Attachments	

Created at 7/13/2010 4:35 PM by constaneS9210
Last modified at 7/27/2010 8:30 AM by constaneS9210

[Close]

RESOLUTION TO ENDORSE THE CITY OF RALEIGH'S APPLICATION FOR A DOT TIGER II DISCRETIONARY GRANT

August 11, 2010

A motion was made by TAC Member _____and seconded by TAC Member _____for the adoption of the following resolution, and upon being put to a vote, was duly adopted.

WHEREAS, the United States Department of Transportation (DOT) is soliciting applications for the TIGER II Discretionary Grant Program, a $600 million competitive grant program for surface transportation project capital investments and planning; and

WHEREAS, as part of the DOT/Housing and Urban Development (HUD)/Environmental Protection Agency (EPA) Partnership for Sustainable Communities, the TIGER II Discretionary Grant Program for planning projects is being coordinated with the HUD Community Challenge Planning Grants, a competitive grant program for reforming and reducing barriers to achieving affordable, economically vital, and sustainable communities; and

WHEREAS, the City of Raleigh is submitting an application for DOT capital funding for the creation and improvement of bicycle and pedestrian facilities in the Triangle area, including facilities within the City of Durham, Durham County, and Town of Chapel Hill; and

WHEREAS, this project is consistent with the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization's 2035 Long Range Transportation Plan; and

WHEREAS, this project will improve access and create more transportation choices in the MPO; and

BE IT THEREFORE RESOLVED that the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Transportation Advisory Committee supports the City of Raleigh's grant application "Triangle Area Greenway – A Central North Carolina Bike/Ped Network" provided here on this, the 11th day of August, 2010.

_____
J. Michael Woodard, TAC Chair

Durham County, North Carolina

I certify that J. Michael Woodard personally appeared before me this day acknowledging to me that he signed the forgoing document.

Date: August 11, 2010

_____
_____, Notary Public
My commission expires: _____

RESOLUTION TO ENDORSE THE TOWN OF HILLSBOROUGH'S APPLICATION FOR A DOT TIGER II DISCRETIONARY GRANT

August 11, 2010

A motion was made by TAC Member _____and seconded by TAC Member _____for the adoption of the following resolution, and upon being put to a vote, was duly adopted.

WHEREAS, the United States Department of Transportation (DOT) is soliciting applications for the TIGER II Discretionary Grant Program, a $600 million competitive grant program for surface transportation project capital investments and planning; and

WHEREAS, as part of the DOT/Housing and Urban Development (HUD)/Environmental Protection Agency (EPA) Partnership for Sustainable Communities, the TIGER II Discretionary Grant Program for planning projects is being coordinated with the HUD Community Challenge Planning Grants, a competitive grant program for reforming and reducing barriers to achieving affordable, economically vital, and sustainable communities; and

WHEREAS, the Town of Hillsborough is submitting an application for DOT capital and planning funding for the Hillsborough Multi-modal Station; and

WHEREAS, this project is consistent with the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization's 2035 Long Range Transportation Plan; and

WHEREAS, this project will improve the efficiency of the road network and improve access to more transportation choices in the MPO; and

BE IT THEREFORE RESOLVED that the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Transportation Advisory Committee supports the Town of Hillsborough's grant application "Hillsborough Multi-modal Station" provided here on this, the 11th day of August, 2010.

_____
J. Michael Woodard, TAC Chair

Durham County, North Carolina

I certify that J. Michael Woodard personally appeared before me this day acknowledging to me that he signed the forgoing document.

Date: August 11, 2010

_____
_____, Notary Public
My commission expires: _____

RESOLUTION TO ENDORSE THE TOWN OF CHAPEL HILL'S APPLICATION FOR A DOT TIGER II AND HUD COMMUNITY CHALLENGE PLANNING GRANT

August 11, 2010

A motion was made by TAC Member _____and seconded by TAC Member _____for the adoption of the following resolution, and upon being put to a vote, was duly adopted.

WHEREAS, the United States Department of Transportation (DOT) is soliciting applications for the TIGER II Discretionary Grant Program, a $600 million competitive grant program for surface transportation project capital investments and planning; and

WHEREAS, as part of the DOT/Housing and Urban Development (HUD)/Environmental Protection Agency (EPA) Partnership for Sustainable Communities, the TIGER II Discretionary Grant Program for planning projects is being coordinated with the HUD Community Challenge Planning Grants, a competitive grant program for reforming and reducing barriers to achieving affordable, economically vital, and sustainable communities; and

WHEREAS, the Town of Chapel Hill is submitting an application for DOT and HUD planning funding for a study of transit investments and transit-oriented development along a corridor; and

WHEREAS, this project is consistent with the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization's 2035 Long Range Transportation Plan; and

WHEREAS, this project will evaluate opportunities to increase transportation choices, promote economic development, and provide affordable housing in the MPO; and

BE IT THEREFORE RESOLVED that the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Transportation Advisory Committee supports the Town of Chapel Hill's grant application "Martin Luther King, Jr. Boulevard Corridor Study" provided here on this, the 11th day of August, 2010.

_____
J. Michael Woodard, TAC Chair

Durham County, North Carolina

I certify that J. Michael Woodard personally appeared before me this day acknowledging to me that he signed the forgoing document.

Date: August 11, 2010

_____
_____, Notary Public
My commission expires: _____

RESOLUTION TO ENDORSE CHATHAM COUNTY'S APPLICATION FOR A DOT TIGER II AND HUD COMMUNITY CHALLENGE PLANNING GRANT

August 11, 2010

A motion was made by TAC Member _____and seconded by TAC Member _____for the adoption of the following resolution, and upon being put to a vote, was duly adopted.

WHEREAS, the United States Department of Transportation (DOT) is soliciting applications for the TIGER II Discretionary Grant Program, a $600 million competitive grant program for surface transportation project capital investments and planning; and

WHEREAS, as part of the DOT/Housing and Urban Development (HUD)/Environmental Protection Agency (EPA) Partnership for Sustainable Communities, the TIGER II Discretionary Grant Program for planning projects is being coordinated with the HUD Community Challenge Planning Grants, a competitive grant program for reforming and reducing barriers to achieving affordable, economically vital, and sustainable communities; and

WHEREAS, Chatham County is submitting an application for DOT and HUD planning funding for development of a comprehensive land use, transportation, economic development, and natural resources plan; and

WHEREAS, this project is consistent with the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization's 2035 Long Range Transportation Plan; and

WHEREAS, this project will evaluate opportunities to increase transportation choices, promote economic development, and provide affordable housing in the MPO; and

BE IT THEREFORE RESOLVED that the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Transportation Advisory Committee supports Chatham County's grant application "The Chatham Plan – A Framework for a Sustainable Rural Future" provided here on this, the 11th day of August, 2010.

_____
J. Michael Woodard, TAC Chair

Durham County, North Carolina

I certify that J. Michael Woodard personally appeared before me this day acknowledging to me that he signed the forgoing document.

Date: August 11, 2010

_____
_____, Notary Public
My commission expires: _____

RESOLUTION TO ENDORSE THE CITY OF DURHAM'S APPLICATION FOR A DOT TIGER II AND HUD COMMUNITY CHALLENGE PLANNING GRANT

August 11, 2010

A motion was made by TAC Member _____and seconded by TAC Member _____for the adoption of the following resolution, and upon being put to a vote, was duly adopted.

WHEREAS, the United States Department of Transportation (DOT) is soliciting applications for the TIGER II Discretionary Grant Program, a $600 million competitive grant program for surface transportation project capital investments and planning; and

WHEREAS, as part of the DOT/Housing and Urban Development (HUD)/Environmental Protection Agency (EPA) Partnership for Sustainable Communities, the TIGER II Discretionary Grant Program for planning projects is being coordinated with the HUD Community Challenge Planning Grants, a competitive grant program for reforming and reducing barriers to achieving affordable, economically vital, and sustainable communities; and

WHEREAS, the City of Durham is submitting an application for DOT and HUD planning funding for development of a comprehensive master plan for transportation, economic development, and affordable housing in an area of the City; and

WHEREAS, this project is consistent with the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization's 2035 Long Range Transportation Plan; and

WHEREAS, this project will evaluate opportunities to increase transportation choices, promote economic development, and provide affordable housing in the MPO; and

BE IT THEREFORE RESOLVED that the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization Transportation Advisory Committee supports the City of Durham's grant application "Crossing the Bridge – Using a 'Complete Streets' Approach and a Proposed Regional Rail Station as a Framework to Reunite and Revitalize Five Durham Neighborhoods Severed by Urban Renewal Highway Construction of the 1970s" provided here on this, the 11th day of August, 2010.

_____
J. Michael Woodard, TAC Chair

Durham County, North Carolina

I certify that J. Michael Woodard personally appeared before me this day acknowledging to me that he signed the forgoing document.

Date: August 11, 2010

_____
_____, Notary Public
My commission expires: _____

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

Release: Immediate
Contact: Dara Demi, (919) 733-2522
Release No.: XXX

Date: July 29, 2010
Distribution: Statewide

STATEMENT REGARDING URBAN LOOP PRIORITIZATION

When Gov. Bev Perdue took office, she clearly instructed Transportation Secretary Gene Conti to change the way NCDOT does business – and take the politics out of transportation planning.

Over the past year, department engineers have worked diligently with local leaders and transportation planning organizations across the state to develop a formula for prioritizing urban loop projects. The new process is based on hard facts, and it applies the same criteria to all loop projects.

Consider the facts:
FACT: North Carolina's needs are great – 25 loop projects currently need funding.

FACT: To build every loop project would cost **$8 billion**.

FACT: NCDOT only receives $150 million each year in loop funding, leaving **$7.85 billion in projects it simply cannot afford to build.**

The formula is based on the following criteria:

- Needs – NCDOT uses crash data and traffic congestion figures to calculate the role the project would play in improving safety and mobility.

- Benefits – The department examines factors such as travel time savings, economic development and future traffic levels to determine how the project would enhance the region.

With every project, each factor under "Needs" and "Benefits" is given a score. Those points are added up and divided by the project's total cost. The result is the number NCDOT uses to rank the project. For a more in-depth look at the prioritization criteria, click on the attached document.

The department is in the beginning stages of this process, and it encourages the public to share its thoughts, concerns and questions with NCDOT. By getting engaged, citizens can

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
COMMUNICATIONS OFFICE
1503 MAIL SERVICE CENTER
RALEIGH NC 27699-1503

TELEPHONE: 919-733-2522
FAX: 919-733-9980
CUSTOMER SERVICE: 1-877-368-4968

WEBSITE: WWW.NCDOT.GOV

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

help the department take the next step in transportation reform. The department will work with them, as well as local leaders and transportation planning organizations, to find creative solutions to funding the projects that are important to communities across the state.

*****NCDOT*****

DRAFT Urban Loop Prioritization Process - Data and Results

TIP #	Area	Route	Description	Improvement Type	Length (miles)	Total Remaining R/W Cost	Total Remaining Const. Cost	Utilities R/W Relocation Cost	Total Remaining R/W + Const. + Util. Cost	Non-Loop Funding (Federal & State only)	Non-Loop Funding Notes	Total Remaining Loop Funding Needed	Needs - Safety (Loop) Points	Weighted V/C	Needs - Mobility (Loop) Points	Travel Time Savings (VHT) - Individual Project	Travel Time Savings (VHT) - All Loop Projects	Travel Time Savings - Individual Project Points	Travel Time Savings - All Loop Projects Points	Economic Development Points	2035 Average Loop ADT (Weighted from Model)	Forecasted ADT Points	2035 Truck Volume (AADTT) E+C w/o Project	2035 Truck Volume (AADTT) E+C w/ Project	Truck Volume Difference	Freight Points	Multi-modal Options (Managed Lanes or Rapid Transit)	Multi-modal Points	# Parcels Purchased	R/W $ Spent	In Protected Corridor?	Protected Corridor / Partial R/W Acquired Points	Connectivity Route Length	Connectivity Factor (% Decrease in Length)	Total Points	Priority Ratio
Weight													**5%**		**10%**			**10%**	**15%**	**15%**		**10%**				**10%**		**5%**					**10%**		**10%**		
Segments																																					
U-3321	*Gastonia*	*Garden Parkway*	*I-85 West Of Gastonia To NC 150 In Mecklenburg County*	*New Location*	*21.7*	*$167,000,000*	*$572,000,000*	*Included in Right-of-Way Cost*	*$739,000,000*	*$738,999,999*	*Rough estimate of tolling revenues and gap funding (approved by the NC General Assembly) provided by the NC Turnpike Authority. This estimate is not a "Decision Grade" estimate.*	*$1*	*56*	*0.94*	*94*	*37,514*	*49,503*	*38*	*50*	*76.26*	*20,257*	*20.26*	*0*	*3,700*	*3,700*	*37.00*	*None*	*0*			*No*	*0*	*24.4*	*12.44*	*41.79*	*4,178,587,791.60*
U-4722	Durham	US 501 (Roxboro Road)	US 501 Bypass (Duke Street) To SR 1640 (Goodwin Road)	Existing	2.6	$8,900,000	$17,800,000	$1,780,000	$28,480,000			$28,480,000	78	0.91	91	-1,529	9,615	0	10	46.4	50,400	50.40	1500	1,300	-200	0.00	None	0			No	0	2.6	0.00	26.44	92.85
U-4434	Wilmington	Independence Blvd Ext.	Randall Parkway to the Martin Luther King Jr. Parkway	Part Existing, Part New Location	1.7	$27,675,000	$25,700,000	$2,700,000	$56,075,000			$56,075,000	89	0.98	98	3,610	95,165	4	95	23.95	41,035	41.04	0	3,700	3,700	37.00	None	0			No	0	3.3	94.12	49.69	88.62
R-4902	Charlotte	I-485	I-77 South To US 521	Existing	6.4	$100,000	$62,000,000	$750,000	$62,850,000			$62,850,000	56	1.82	100	7,031	14,947	7	15	70.09	115,855	100.00	20,300	20,300	0	0.00	None	0			Yes	100	6.6	3.12	46.57	74.10
X-0002C	Fayetteville	I-295	East Of NC 210 (Murchison Rd) To US 401 (Ramsey St)	New Location	5.0	$0	$139,500,000	$0	$139,500,000			$139,500,000	89	0.86	86	8,028	17,999	8	18	19.04	35,681	35.68	0	6,600	6,600	66.00	None	0	120	$17,350,439	Yes	100	7.8	56.00	45.18	32.38
U-0071	Durham	East End Connector	NC 147 To North Of NC 98	Part Existing, Part New Location	3.2	$47,125,000	$104,500,000	$2,356,250	$153,981,250			$153,981,250	11	0.91	91	1,669	9,615	2	10	49.71	78,000	78.00	0	8,700	8,700	87.00	None	0	4	$3,379,994	No	50	6.2	93.15	49.53	32.17
R-2721/R-2828	*Raleigh*	*NC 540 (Southern Wake Freeway)*	*NC 55 (South) To I-40*	*New Location*	*16.8*	*$135,000,000*	*$415,000,000*	*Included in Right-of-Way Cost*	*$550,000,000*	*$334,945,272*	*Rough estimate of tolling revenues provided by the NC Turnpike Authority. This estimate is not a "Decision Grade" estimate.*	*$215,054,728*	*67*	*0.92*	*92*	*40,119*	*54,588*	*40*	*55*	*65.51*	*34,056*	*34.06*	*0*	*10,300*	*10,300*	*100.00*	*None*	*0*	*17*	*$18,971,234*	*Yes*	*75*	*26.3*	*56.55*	*61.14*	*28.43*
I-4743	Durham	I-85	US 70 To SR 1632 (Red Mill Road)	Existing	3.5	$20,300,000	$81,200,000	$1,015,000	$102,515,000			$102,515,000	33	0.68	68	-988	9,615	0	10	46.95	97,300	97.30	21700	23,400	1,700	17.00	None	0			No	0	3.5	0.00	28.36	27.67
R-2633B	Wilmington	I-140/US 17	US 74/76 East of Malmo To US 421 North Of Wilmington	New Location	7.8	$28,625,000	$217,500,000	$1,595,561	$247,720,561			$247,720,561	44	0.79	79	49,812	95,165	50	95	24.76	64,090	64.09	0	9,600	9,600	96.00	None	0	8	$4,027,527	No	50	11.7	50.00	59.08	23.85
U-2524 (C&D)	Greensboro	I-840 (Western Loop)	North Of Bryan Blvd To Lawndale Drive	New Location	4.9	$25,875,000	$198,200,000	$9,900,000	$233,975,000			$233,975,000	44	1.04	100	64,843	76,787	65	77	36.23	33,016	33.02	0	5,600	5,600	56.00	None	0	11	$10,696,868	Yes	75	5.4	10.20	53.06	22.68
R-2608	Gastonia	Garden Parkway	I-85 West Of Gastonia To US 321 North Of Gastonia	New Location	7.3	$42,500,000	$110,000,000	$5,000,000	$157,500,000			$157,500,000	33	0.73	73	3,938	49,503	4	50	53.13	17,847	17.85	0	2,000	2,000	20.00	None	0			No	0	8.8	20.55	30.58	19.41
U-2525 (B&C)	Greensboro	I-840 (Eastern Loop)	Lawndale Drive To US 70	New Location	10.4	$35,250,000	$252,800,000	$5,000,000	$293,050,000			$293,050,000	33	1.01	100	66,674	76,787	67	77	37.9	33,760	33.76	0	6,900	6,900	69.00	None	0	12	$14,106,327	Yes	75	10.2	0.00	53.30	18.19
R-2829	*Raleigh*	*NC 540 (Eastern Wake Freeway)*	*I-40 To US 64/264 Bypass*	*New Location*	*10.6*	*$75,000,000*	*$360,000,000*	*Included in Right-of-Way Cost*	*$435,000,000*	*$165,684,097*	*Rough estimate of tolling revenues provided by the NC Turnpike Authority. This estimate is not a "Decision Grade" estimate.*	*$269,315,903*	*22*	*0.83*	*83*	*17,974*	*54,588*	*18*	*55*	*63.39*	*29,400*	*29.40*	*0*	*8,800*	*8,800*	*88.00*	*None*	*0*			*No*	*0*	*14.7*	*38.68*	*44.50*	*16.52*
R-2250	Greenville	Greenville Southwest Bypass	NC 11 To US 264 Greenville Bypass	New Location	12.0	$45,525,000	$166,400,000	$5,300,000	$217,225,000			$217,225,000	67	0.54	54	15,487	15,487	15	15	19.44	31,084	31.08	0	3,900	3,900	39.00	None	0	1	$622,718	Yes	75	13.4	11.67	31.21	14.37
U-4720	Durham	US 70	Lynn Road To The Proposed Northern Durham Parkway	Existing	7.8	$99,600,000	$132,800,000	$5,000,000	$237,400,000			$237,400,000	89	0.94	94	-2,251	9,615	0	10	50.36	82,800	82.80	9100	11,000	1,900	19.00	None	0			No	0	7.8	0.00	33.03	13.91
R-2247	Winston-Salem	Northern Beltway - Western Section	I-40 To US 52	New Location	14.8	$104,750,000	$344,700,000	$5,237,500	$454,687,500			$454,687,500	33	0.75	75	66,246	76,427	66	76	33.21	26,712	26.71	0	4,800	4,800	48.00	None	0	32	$43,187,217	Yes	75	18.3	23.65	49.56	10.90
U-4721	Durham	Northern Durham Parkway	I-540 To US 501 (Roxboro Road)	Part Existing, Part New Location	18.0	$51,750,000	$207,000,000	$2,587,500	$261,337,500			$261,337,500	67	0.74	74	4,390	9,615	4	10	53.45	28,300	28.30	0	900	900	9.00	None	0			No	0	18.0	0.00	24.38	9.33
U-4738	*Wilmington*	*Cape Fear Skyway*	*US 17 In Brunswick County To US 421 In New Hanover County*	*New Location*	*9.8*	*$180,000,000*	*$572,000,000*	*Included in Right-of-Way Cost*	*$752,000,000*	*$192,530,748*	*Rough estimate of tolling revenues provided by the NC Turnpike Authority. This estimate is not a "Decision Grade" estimate.*	*$559,469,252*	*56*	*0.85*	*85*	*26,837*	*95,165*	*27*	*95*	*48.15*	*37,159*	*37.16*	*0*	*5,600*	*5,600*	*56.00*	*None*	*0*			*Yes*	*50*	*10.3*	*5.10*	*50.31*	*8.99*
U-2519	Fayetteville	I-295	I-95 South Of Fayetteville To West Of NC 24/87 (Bragg Boulevard)	New Location	20.2	$62,750,000	$422,700,000	$3,100,000	$488,550,000			$488,550,000	89	0.58	58	8,207	17,999	8	18	29.34	32,900	32.90	0	5,300	5,300	53.00	None	0	29	$14,540,119	Yes	75	21.3	5.45	34.81	7.12

North Carolina Turnpike Authority projects are denoted in italics

DRAFT Urban Loop Prioritization Process - Data and Results

TIP #	Area	Route	Description	Improvement Type	Length (miles)	Total Remaining R/W Cost	Total Remaining Const. Cost	Utilities R/W Relocation Cost	Total Remaining R/W + Const. + Util. Cost	Non-Loop Funding (Federal & State only)	Non-Loop Funding Notes	Total Remaining Loop Funding Needed	Needs - Safety (Loop) Points	Weighted V/C	Needs - Mobility (Loop) Points	Travel Time Savings (VHT) - Individual Project	Travel Time Savings (VHT) - All Loop Projects	Travel Time Savings - Individual Project Points	Travel Time Savings - All Loop Projects Points	Economic Development Points	2035 Average Loop ADT (Weighted from Model)	Forecasted ADT Points	2035 Truck Volume (AADTT) E+C w/o Project	2035 Truck Volume (AADTT) E+C w/ Project	Truck Volume Difference	Freight Points	Multi-modal Options (Managed Lanes or Rapid Transit)	Multi-modal Points	# Parcels Purchased	R/W $ Spent	In Protected Corridor?	Protected Corridor / Partial R/W Acquired Points	Connectivity Route Length	Connectivity Factor (% Decrease in Length)	Total Points	Priority Ratio
I-2513	Asheville	I-26 Connector	I-26 To US 19/23/70	Part Existing, Part New Location	5.1	$81,375,000	$473,100,000	$1,033,037	$555,508,037			$555,508,037	44	1.06	100	17,782	17,782	18	18	40.1	70,206	70.21	11,600	14,900	3,300	33.00	None	0	1	$309,372	No	50	5.5	7.84	38.77	6.98
U-2579	Winston-Salem	I-74 (Northern Beltway - Eastern Section)	US 52 To US 311	New Location	16.8	$263,925,000	$564,100,000	$11,445,200	$839,470,200			$839,470,200	22	0.77	77	71,719	76,427	72	76	37.81	51,759	51.76	0	8,800	8,800	88.00	None	0	174	$38,770,134	Yes	75	17.6	4.76	55.06	6.56

Interchanges

TIP #	Area	Route	Description	Improvement Type	Length (miles)	Total Remaining R/W Cost	Total Remaining Const. Cost	Utilities R/W Relocation Cost	Total Remaining R/W + Const. Cost	Non-Loop Funding (Federal & State only)	Non-Loop Funding Notes	Total Remaining Loop Funding Needed	Needs - Safety (Y-line) Points	Weighted V/C (Y-line)	Needs - Mobility (Y-line) Points	Travel Time Savings (VHT) - Individual Project	Travel Time Savings (VHT) - All Loop Projects	Travel Time Savings - Individual Project Points	Travel Time Savings - All Loop Projects Points	Economic Development Points	2035 Average Y-line ADT (Weighted from Model)	Forecasted ADT Points	2035 Truck Volume (AADTT) E+C w/o Project	2035 Truck Volume (AADTT) E+C w/ Project	Truck Volume Difference	Freight Points	Multi-modal Options (Managed Lanes or Rapid Transit)	Multi-modal Points	# Parcels Purchased	R/W $ Spent	In Protected Corridor?	Protected Corridor / Partial R/W Acquired Points	Connectivity Route Length	Connectivity Factor (% Decrease in Length)	Total Points	Priority Ratio
Weight													5%		10%			10%	15%	15%		10%				10%		5%				10%		10%		
U-2524F	Greensboro	I-840 (Western Loop)	New Interchange at Lewiston-Fleming Road Extension	New Interchange		$2,280,000	$11,400,000	$228,000	$13,908,000			$13,908,000	83	0.84	84	68,529	76,787	69	77	27.59	38,318	38.32	0	6,500	-3,800	0.00	None	0			Yes	75		0.00	46.39	333.56
U-2525D	Greensboro	I-840 (Eastern Loop)	New Interchange at Cone Blvd	New Interchange		$2,280,000	$11,400,000	$400,000	$14,080,000			$14,080,000	50	0.76	76	25,346	76,787	25	77	27.22	36,849	36.85	0	7,500	-2,800	0.00	None	0			Yes	75		0.00	39.42	279.98
U-4436	Wilmington	I-140	New Interchange at Blue Clay Road	New Interchange		$4,000,000	$6,600,000	$228,000	$10,828,000			$10,828,000	67	0.65	65	1,079	95,165	1	95	17.00	17,890	17.89	500	700	200	2.00	None	0			No	0		0.00	28.77	265.72
R-211 EC	Charlotte	I-485	New Interchange at Weddington Road	New Interchange		$11,000,000	$15,200,000	$358,400	$26,558,400			$26,558,400	67	1.07	100	7,829	14,947	8	15	49.52	24,843	24.84	800	900	100	1.00	None	0	5	$494,852	Yes	50		0.00	31.39	118.18

North Carolina Turnpike Authority projects are denoted in italics

Urban Loop Prioritization Process DRAFT Schedule - SUBJECT TO CHANGE

July 22, 2010
TAC 8/11/2010 Attachment 11

TIP	Priority Ratio	Area	Route	Section	Description	SFY 2010	SFY 2011	SFY 2012	SFY 2013	SFY 2014	SFY 2015	SFY 2016	SFY 2017	SFY 2018	SFY 2019	SFY 2020
U-4434	88.62	Wilmington	Independence Blvd Ext.		Randall Parkway to the Martin Luther King Jr. Parkway											
R-4902	74.10	Charlotte	I-485 Widening		I-77 South to US 521											
X-0002	32.38	Fayetteville	I-295	BB	West of NC 24/87 (Bragg Blvd) to NC 210 (Murchison Road) - Paving of U-2519E / X-0002B											
X-0002	32.38	Fayetteville	I-295	BC / CA	NC 210 (Murchison Road) to East of SR 1600 (McArthur Road)											
X-0002	32.38	Fayetteville	I-295	CB	East of SR 1600 (McArthur Road) to US 401											
X-0002	32.38	Fayetteville	I-295	CC	NC 210 (Murchison Road to US 401) - Paving of X-0002BC, CA, & CB											
U-0071	32.17	Durham	East End Connector		NC 147 To North Of NC 98											
R-2633	23.85	Wilmington	I-140/US 17	BA	US 74/76 East of Malmo to SR 1430											
R-2633	23.85	Wilmington	I-140/US 17	BB	SR 1430 to US 421 North of Wilmington											
R-2633	23.85	Wilmington	I-140/US 17	BC	US 74/76 East of Malmo to US 421 North of Wilmington - Paving of R-2633BA & BB											
U-2524	22.68	Greensboro	I-840 (Western Loop)	C	Bryan Blvd to East of US 220 (Battleground Avenue)											
U-2525	18.19	Greensboro	I-840 (Eastern Loop)	B	North of US 70 to US 29											
R-2250	14.37	Greenville	Greenville Southwest Bypass	A	South of Old NC 11 to South of NC 102											
R-2250	14.37	Greenville	Greenville Southwest Bypass	B	South of NC 102 to South of SR 1126 (Forlines Road)											
R-2250	14.37	Greenville	Greenville Southwest Bypass	C	South of SR 1126 (Forlines Road) to US 264											

Note: Only funded projects using loop dollars are shown (i.e., Turnpike Projects are not shown)

= Right-of-Way Acquisition

= Construction

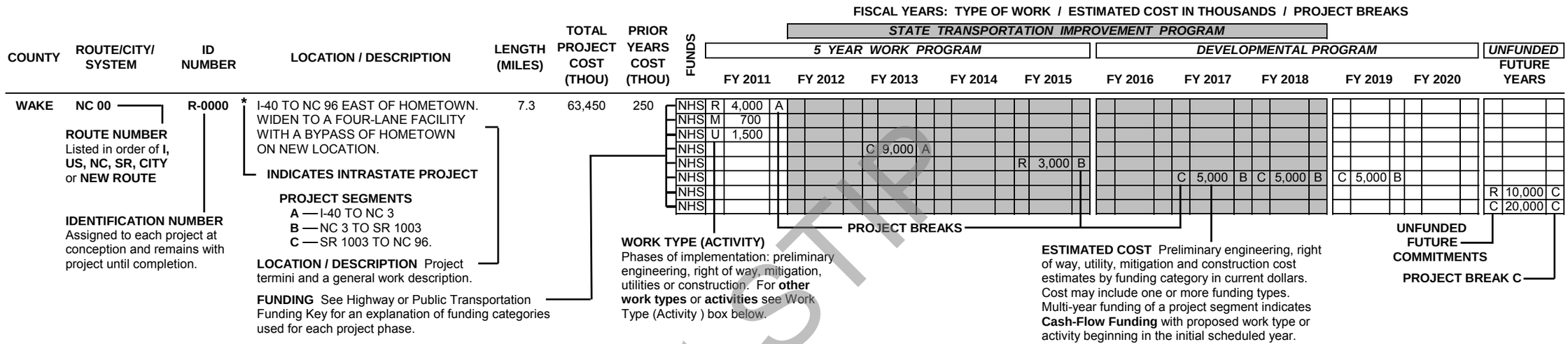
Draft STIP Supplement

Durham-Chapel Hill-Carrboro Metropolitan Planning Organization

2011 – 2020

August 2010

2011-2020 DRAFT STIP (HIGHWAY PROGRAM) FUNDING CATEGORIES



Draft STIP

WORK TYPE (ACTIVITIES)
A - Acquisition
AD - Administration
B - Booklets
C - Construction
CG - Construction (GARVEE)
CP - Capital
F - Feasibility Study
G - Grading and Structures
I - Inspections
L - Landscaping
M - Mitigation
MP - Mapping
N - Implementation
O - Operations
P - Paving
PE - Preliminary Engineering
R - Right of way
RG - Right of way (GARVEE)
S - Structures
SG - Signing
T - Training
U - Utilities

KEY TO HIGHWAY FUNDING SOURCES	
APD - Appalachian Development	**NHS -** National Highway System
BOND - Revenue Bond	**NHS(E) -** National Highway System E:
BRGI - Bridge Inspectio	**NRT -** National Recreation Trails
C - City	**O** - Others
CMAQ - Congestion Mitigation	**PLF** - Personal Automobile License Plate Funds
DOD - Department of Defense	**RR -** Rail-Highway Safety
DP - Discretionary or Demonstration	**S** - State
FA - Bridge Replacement On-Federal-Aid System	**S(E) -** State Exempt
FLPF - Federal Lands Program (Forest Highways)	**SF -** State Ferries
FLPI - Federal Lands Program (Indian Reservation Roads)	**SG -** Safety Grant
FLPP - Federal Lands Program (Park Roads)	**S(M)** - State Match
FLPR - Federal Lands Program (Refuge Roads)	**S(5) -** State (Highway) Tr
HES - High Hazard Safety	**SRTS -** Safe Routes to School
HFA - Highway Fund Appropriation	**STHSR -** Stimulus High Speed Rail
HP - Federal-Aid High Priority	**STP -** Surface Transportation Program
HRRR - High Risk Rural Roads	**STP -** Surface Transportation Program
IM - Interstate Maintenance	**STPEB -** Surface Transportation Program, Enhancements (Bike)
IM(E) - Interstate Maintenance Exempt	**STPEL** - Surface Transportation Program, Enhancements (Local)
IMPM - Interstate Preventative Maintenance	**STPEP -** Surface Transportation Program, Enhancements (Pedestrian)
L - Local Matching Share	**STPER -** Surface Transportation Program, Enhancements (Roadside)
MOB - Mobility Funds	**T** - Highway Trust Funds
NFA - Bridge Replacement Off-Federal-Aid System	**T2001** - State Rail Funds
NFAM - Municipal Bridge Replacement Program	**TIFIA** - Transportation Infrastructure Finance and Innovation Loan

DURHAM-CHAPEL HILL-CARRBORO METROPOLITAN PLANNING ORGANIZATION

FISCAL YEARS: TYPE OF WORK / ESTIMATED COST IN THOUSANDS / PROJECT BREAKS

STATE TRANSPORTATION IMPROVEMENT PROGRAM

COUNTY	ROUTE/CITY	ID NUMBER	LOCATION / DESCRIPTION	LENGTH	TOTAL PROJ COST (THOU)	PRIOR YEARS COST (THOU)	FUNDS	5 YEAR WORK PROGRAM FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	DEVELOPMENTAL PROGRAM FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	UNFUNDED FUTURE YEARS
INTERSTATE PROJECTS																		
ORANGE	I-40	I-5364	EAST OF SR 1734 (ERWIN ROAD) TO DURHAM COUNTY LINE. PAVEMENT REHABILITATION.	0.4	250		IMPM								C 250			
ALAMANCE GUILFORD ORANGE	I-40, I-73 AND I-85	I-5207	INTERSTATE MAINTENANCE PRESERVATION FOR DIVISION 7.		11550		IMPM	C 1155	C 1155	C 1155	C 1155	C 1155	C 1155	C 1155	C 1155	C 1155	C 1155	
ORANGE	I-40/85	I-5142	WEST OF SR 1114 (BUCKHORN ROAD) TO I-40/85 INTERCHANGE. MILL, RESURFACE, PAVEMENT MARKINGS AND INSTALL RUMBLE STRIPS.		12000	12000	UNDER CONSTRUCTION											
ORANGE	I-40	I-4716	I-85 TO DURHAM COUNTY LINE. DIAMOND GRINDING, JOINT SEALING, SLAB REPAIR AND MARKING.	11.0	3303	3303	UNDER CONSTRUCTION											
DURHAM ORANGE	I-40	I-3306	I-85 IN ORANGE COUNTY TO NC 147 (BUCK DEAN FREEWAY) IN DURHAM COUNTY. ADD ADDITIONAL LANES.	20.7	128452	81452	IM NHS									C 4700 A C 7050 A	C 4700 A C 7050 A	C 9400 A C 14100 A
							A I-85 TO DURHAM COUNTY LINE. B ORANGE COUNTY LINE TO NC 147 (BUCK DEAN FREEWAY) IN DURHAM - COMPLETE.											
DURHAM GRANVILLE	I-85	I-5145	NORTH OF US 70 IN DURHAM COUNTY TO NORTH OF NC 56 IN GRANVILLE COUNTY. PAVEMENT PRESERVATION.	12.9	8500		IM	C 8500										
DURHAM	I-85	I-5334	SOUTH OF US 15-501 TO NORTH OF US 70. CLEAN AND RESEAL JOINTS, AND REPAIR SPALLS.	4.6	3000		IMPM							C 3000				
DURHAM	I-85	I-5331	NORTH OF MILE POST 183 TO GRANVILLE COUNTY LINE. CLEAN AND RESEAL JOINTS AND REPAIR SPALLS.	0.7	250		IMPM						C 250					
ORANGE	I-85	I-5312	EAST OF I-40 TO DURHAM COUNTY LINE. PAVEMENT REHABILITATION.	7.6	6450		IMPM					C 6450						
ORANGE	I-85	I-5138	I-40/85 SPLIT NEAR HILLSBOROUGH TO SR 1006 (ORANGE GROVE ROAD). MILL, RESURFACE AND OVERLAY.		2023	2023	UNDER CONSTRUCTION											

Draft STIP

* INDICATES INTRASTATE PROJECT

COST AND SCHEDULES ARE PRELIMINARY AND SUBJECT TO SIGNIFICANT CHANGE AS MORE INFORMATION BECOMES AVAILABLE

DURHAM-CHAPEL HILL-CARRBORO METROPOLITAN PLANNING ORGANIZATION

FISCAL YEARS: TYPE OF WORK / ESTIMATED COST IN THOUSANDS / PROJECT BREAKS

STATE TRANSPORTATION IMPROVEMENT PROGRAM

COUNTY	ROUTE/CITY	ID NUMBER	LOCATION / DESCRIPTION	LENGTH	TOTAL PROJ COST (THOU)	PRIOR YEARS COST (THOU)	FUNDS	5 YEAR WORK PROGRAM FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	DEVELOPMENTAL PROGRAM FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	UNFUNDED FUTURE YEARS
INTERSTATE PROJECTS																		
ORANGE	I-85	I-0305*	I-40 AT HILLSBOROUGH TO DURHAM COUNTY LINE. WIDEN TO SIX LANES AND RECONSTRUCT INTERCHANGES AND STRUCTURES.	7.5	212582	1800	NHS						R 10134 A	R 10133 A	R 10133 A		C 21066 A
							NHS						U 409 A	U 408 A	U 408 A			C 31600 A
							NHS								M 538 A			U 560 B
							IM									C 10534 A		R 19700 B
							NHS									C 15800 A		M 359 B
							NHS											C 31600 B
							NHS											C 47400 B
							NHS											
							IM											
							NHS											

A SR 1006 NEAR HILLSBOROUGH TO EAST OF SR 1709.
B EAST OF SR 1709 TO DURHAM COUNTY LINE.

PLANNING/DESIGN IN PROGRESS

DURHAM WAKE	NC 540	I-5378	NC 54 TO I-40. CLEAN AND RESEAL JOINTS, AND REPAIR SPALLS.	1.0	1475		IMPM									C 1475		
DURHAM GRANVILLE VANCE WAKE WARREN	I-40, I-85, I-440 AND I-540	I-5205	INTERSTATE MAINTENANCE PRESERVATION FOR DIVISION 5.		15420		IMPM	C 1542	C 1542	C 1542	C 1542	C 1542	C 1542	C 1542	C 1542	C 1542	C 1542	
DURHAM	DURHAM	I-4743*	I-85, US 70 TO SR 1632 (RED MILL ROAD), EXIT 182. ADD LANES.	6.4														

UNFUNDED LOOP PROJECT - THE CROSS SECTION FOR THIS PROJECT WILL BE ESTABLISHED BY MUTUAL AGREEMENT OF THE MPO AND NCDOT THROUGH THE STATE AND FEDERAL ENVIRONMENTAL REVIEW PROCESS

RURAL PROJECTS

DURHAM	NC 54 SR 1973	R-2904	NC 54, SR 1999 (DAVIS DRIVE) TO SR 1959 (MIAMI BOULEVARD) AND SR 1973 (PAGE ROAD), NC 54 TO I-40. WIDEN TO MULTI-LANES AND REPLACE RAILROAD STRUCTURE.	1.1	5500	5500												
DURHAM WAKE	VARIOUS	R-5164	RESURFACING ON FEDERAL-AID ROUTES.		7993	7993												

UNDER CONSTUCTION - PROJECT LET WITH U-4026

A I-85, ORANGE COUNTY LINE TO SR 1401(COLE MILL ROAD); NC 147, I-85 TO THE END OF ASPHALT ROADWAY NEAR EXIT 14; US 15-501 BYPASS, I-85 TO US 15-501 BUSINESS - $8.65 M - UNDER CONSTRUCTION.

B I-40, NC 147 TO EAST OF I-540 - $3.75 M - WORK TO BE ACCOMPLISHED UNDER R-2000AF.

C US 15-501BUSINESS SOUTH, NC 98 TO US 15/501 BUSINESS; US 15-501 BUSINESS NORTH, US 15-501 TO NC 98, US 15-501 BUSINESS, US 15-501 TO SR 1361 (VICKERS AVENUE) AND SR 1127 (CHAPEL HILL STREET), GREAT JONES TO MOREHEAD AVENUE - $1.09 M - UNDER CONSTRUCTION.

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DURHAM-CHAPEL HILL-CARRBORO METROPOLITAN PLANNING ORGANIZATION

FISCAL YEARS: TYPE OF WORK / ESTIMATED COST IN THOUSANDS / PROJECT BREAKS

STATE TRANSPORTATION IMPROVEMENT PROGRAM

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RURAL PROJECTS																		
ORANGE	VARIOUS	R-5178	RESURFACING ON FEDERAL-AID ROUTES.		1505	1505												
							A	NC 57, NC 86 TO SR 1544 (PEARSON ROAD) - UNDER CONSTRUCTION.										
							B	NC 86 (SOUTH COLUMBIA STREET) FROM SR 1010 (FRANKLIN STREET) TO CAMERON AVENUE - UNDER CONSTRUCTION.										
DURHAM	SR 1004 OLD OXFORD ROAD	R-5135	US 501 BUSINESS (NORTH ROXBORO STREET) TO THE GRANVILLE COUNTY LINE. WIDEN AND RESURFACE.		1670	1670												
							UNDER CONSTRUCTION											
DURHAM WAKE	RALEIGH I-540 NC 540	R-2000*	NORTHERN WAKE FREEWAY, NC 55 WEST OF MORRISVILLE TO US 64 EAST NEAR KNIGHTDALE. FREEWAY ON NEW LOCATION.	29.0	660077	660077												
							AA	NC 55 WEST OF MORRISVILLE TO RESEARCH TRIANGLE PARK EAST LIMITS - COMPLETE.										
							AB	RESEARCH TRIANGLE PARK EAST LIMITS TO SOUTHWEST OF I-40 - COMPLETE.										
							AC	SOUTHWEST OF I-40 TO I-40 - COMPLETE.										
							AD	TOLL PLAZA BETWEEN NC 55 AND NC 54 - WORK TO BE ACCOMPLISHED UNDER U-4763B - NORTH CAROLINA TURNPIKE AUTHORITY PROJECT.										
							AE	ITS DEVICES, I-540 AND NC 54/EMPEROR BOULEVARD - COMPLETE.										
							AF	I-540/I-40 INTERCHANGE IMPROVEMENTS - UNDER CONSTRUCTION.										
							BA	I-40 TO NORTHEAST OF I-40 - COMPLETE.										
							BB	NORTHEAST OF I-40 TO SOUTHWEST OF LUMLEY ROAD - COMPLETE.										
							BD	SOUTHWEST OF LUMLEY ROAD TO NORTHEAST OF LUMLEY ROAD - COMPLETE.										
							BE	NORTHEAST OF LUMLEY ROAD TO NORTHEAST OF US 70 - COMPLETE.										
							CA	NORTHEAST OF US 70 TO SOUTHWEST OF SR 1826 (RAY ROAD) - COMPLETE.										
							CB	SOUTHWEST OF SR 1826 (RAY ROAD) TO EAST OF NC 50 - COMPLETE.										
							D	EAST OF NC 50 TO WEST OF SR 2000 (FALLS OF NEUSE ROAD) - COMPLETE.										
							EA	WEST OF SR 2000 (FALLS OF NEUSE ROAD) TO EAST SR 2013 (GRESHAM LAKE ROAD) - COMPLETE.										
							EB	EAST OF SR 2013 (GRESHAM LAKE ROAD) TO EAST OF US 1 - COMPLETE.										
							F	EAST OF US 1 TO SOUTH OF SR 2215 (BUFFALOE ROAD) - COMPLETE.										
							G	SOUTH OF SR 2215 (BUFFALOE ROAD) TO US 64 EAST NEAR KNIGHTDALE - COMPLETE.										
URBAN PROJECTS																		
DURHAM	NC 55	U-5143	DURHAM, SR 1171 (RIDDLE ROAD) INTERSECTION. CONSTRUCT TURN LANES.		250	250												
							UNDER CONSTRUCTION											
CHATHAM DURHAM ORANGE	VARIOUS	U-4727	DURHAM-CHAPEL HILL-CARRBORO URBAN AREA PLANNING (DCHC) ALLOCATION AND UNIFIED WORK PROGRAM.		13331	6739	STPDA	PE 1229	PE 1434	PE 1150	PE 720	PE 742						
							L	PE 307	PE 358	PE 287	PE 180	PE 185						
							IN PROGRESS											

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URBAN PROJECTS																		
CHATHAM DURHAM ORANGE	VARIOUS	U-5023	DURHAM-CHAPEL HILL-CARRBORO (DCHC) DA FUNDS - RESERVED FOR FUTURE PROGRAMMING.		20138		STPDA						C 3730	C 4102	C 4102	C 4102	C 4102	
DURHAM	VARIOUS	U-5146	DURHAM, SIGNAL UPGRADE AT VARIOUS LOCATIONS ON CITY MAINTAINED SYSTEM.		180	180												
							UNDER CONSTRUCTION											
DURHAM	VARIOUS	U-5142	INSTALL LED TRAFFIC SIGNALS ON CITY MAINTAINED SYSTEM		550	550												
							UNDER CONSTRUCTION											
ORANGE	CARRBORO	U-2803	SR 1919 (SMITH LEVEL ROAD), ROCK HAVEN ROAD TO BRIDGE NO. 88. WIDEN TO MULTI-LANES.	0.6	11051	3601	S R 3100 S C 4350											
							PLANNING/DESIGN/RIGHT OF WAY IN PROGRESS											
DURHAM ORANGE	DURHAM CHAPEL HILL	EB-4707	SR 2220 (OLD CHAPEL HILL ROAD)- SR 1838 (OLD DURHAM ROAD), SR 1116 (GARRETT ROAD) IN DURHAM COUNTY TO US 15-501 IN ORANGE COUNTY. BICYCLE IMPROVEMENTS.	2.7	5450	1450	STPDA C 3200 C C 800											
							DIVISION DESIGN/LET - IN PROGRESS											
ORANGE	CHAPEL HILL	U-3306	SR 1733 (WEAVER DAIRY ROAD), NC 86 TO SR 1734 (ERWIN ROAD). CORRIDOR UPGRADE, PART ON NEW LOCATION.	2.8	17125	11025	STP C 6100											
							RIGHT OF WAY/CONSTRUCTION IN PROGRESS											
DURHAM ORANGE	CHAPEL HILL	U-4704	CHAPEL HILL-CARRBORO COMPUTERIZED TRAFFIC SIGNAL SYSTEM.		5450	5450												
							UNDER CONSTRUCTION											
DURHAM ORANGE	CHAPEL HILL	U-5119	BUS RAPID TRANSIT OPERATIONAL IMPROVEMENTS		625		STPDA PE 48 C PE 12 STPDA C 452 C C 113											
							PLANNING, DESIGN, RIGHT OF WAY AND CONSTRUCTION BY TOWN											
ORANGE	CHAPEL HILL	U-0624	NC 86 (SOUTH COLUMBIA STREET), SR 1906 (PUREFOY ROAD) TO SR 1902 (MANNING DRIVE). CORRIDOR UPGRADE TO INCLUDE BICYCLE LANES.	0.7	7310	3010	STP C 4300											
							RIGHT OF WAY IN PROGRESS											
ORANGE	CHAPEL HILL	U-5304	US 15-501, NC 86 (SOUTH COLUMBIA STREET) TO SR 1742 (EPHESUS CHURCH ROAD). SIDEWALKS, WIDE OUTSIDE LANES AND TRANSIT ACCOMMODATIONS.	4.0	5150		NHS									C 5150		

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URBAN PROJECTS																		
DURHAM	DURHAM	U-3308	NC 55 (ALSTON AVENUE), NC 147 (I. L. "BUCK" DEAN FREEWAY) TO US 70 BUSINESS-NC 98 (HOLLOWAY STREET). WIDEN TO FOUR LANE DIVIDED FACILITY AND REPLACE NORFOLK-SOUTHERN RAILROAD BRIDGES.	1.0	31024	2596	STP	R 800										
							STP		M 28									
							STP				C 13800	C 13800						
DURHAM	DURHAM	U-0071*	EAST END CONNECTOR, NC 147 (BUCK DEAN FREEWAY) TO NORTH OF NC 98. MULTI-LANE DIVIDED, PART ON NEW LOCATION.	3.2	181789	9056	T		R 21950	R 21950								
							T		U 3000	U 3000								
							T			M 3833								
							T				C 29750	C 29750	C 29750	C 29750				
			PLANNING/DESIGN IN PROGRESS															
DURHAM	DURHAM	U-4722*	US 501 (ROXBORO ROAD), US 501 BYPASS (DUKE STREET) TO SR 1640 (GOODWIN ROAD).	4.4														
			UNFUNDED LOOP PROJECT - THE CROSS SECTION FOR THIS PROJECT WILL BE ESTABLISHED BY MUTUAL AGREEMENT OF THE MPO AND NCDOT THROUGH THE STATE AND FEDERAL ENVIRONMENTAL REVIEW PROCESS															
DURHAM	DURHAM	U-4012	US 15-501, NORTH OF MT. MORIAH ROAD TO SOUTH OF GARRETT ROAD. ADD AN ADDITIONAL NORTH AND SOUTHBOUND LANE AND CONSTRUCT AN ADDITIONAL RIGHT TURN LANE IN THE SOUTHEAST QUADRANT OF INTERCHANGE AT I-40 (EXIT 270).	0.9	15609	15609												
			UNDER CONSTRUCTION															
DURHAM	DURHAM	U-4011	SR 1959 (SOUTH MIAMI BOULEVARD), SOUTH OF SR 2112 (METHODIST STREET) TO NORTH OF SR 1960 (BETHESDA AVENUE). WIDEN TO FIVE LANES TO PROVIDE CENTER TURN LANE.	0.7	8265	8265												
			RIGHT OF WAY/CONSTRUCTION IN PROGRESS															
DURHAM	DURHAM	U-4009	SR 1126 (SERVICE ROAD) PARALLEL TO US 15-501. RELOCATE EXISTING SERVICE ROAD.	0.3	5683	5683												
			UNDER CONSTRUCTION															
DURHAM WAKE	DURHAM	U-4721*	NORTHERN DURHAM PARKWAY, I-540 TO ROXBORO ROAD. (COORDINATE WITH U-4720)	18.8														
			UNFUNDED LOOP PROJECT - THE CROSS SECTION FOR THIS PROJECT WILL BE ESTABLISHED BY MUTUAL AGREEMENT OF THE MPO AND NCDOT THROUGH THE STATE AND FEDERAL ENVIRONMENTAL REVIEW PROCESS															
DURHAM	DURHAM	U-3309	SR 2028 (T.W. ALEXANDER DRIVE), SR 1121 (CORNWALLIS ROAD) TO SR 1959 (MIAMI BOULEVARD). WIDEN TO A FOUR LANE DIVIDED FACILITY.	1.7	14933	11214	STP	C 3719 A										
			A SR 1121 (CORNWALLIS ROAD) TO EAST OF NC 147 - UNDER CONSTRUCTION.															
			B EAST OF NC 147 TO SR 1959 (MIAMI BOULEVARD) - COMPLETE.															

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URBAN PROJECTS																		
DURHAM	DURHAM	U-4720*	US 70, LYNN ROAD TO THE PROPOSED NORTHERN DURHAM PARKWAY. (COORDINATE WITH U-4721)	7.8														
							UNFUNDED LOOP PROJECT - THE CROSS SECTION FOR THIS PROJECT WILL BE ESTABLISHED BY MUTUAL AGREEMENT OF THE MPO AND NCDOT THROUGH THE STATE AND FEDERAL ENVIRONMENTAL REVIEW PROCESS											
DURHAM	DURHAM	U-5151	DURHAM, SR 1670 (GEER STREET) AT MIAMI BOULEVARD. INTERSECTION REDESIGN.		80	80												
							UNDER CONSTRUCTION											
DURHAM	DURHAM	U-5122	NC 98, SR 1838 (JUNCTION ROAD) TO SR 1811 (SHERRON ROAD). MILL AND RESURFACE.		1285	1285												
							UNDER CONSTRUCTION											
DURHAM	DURHAM	U-5124	DURHAM, SR 1978 (OLD PAGE ROAD), SR 1926 (ANGIER AVENUE) TO SR 2095 (PAGE ROAD EXTENSION). PATCH AND RESURFACE.		128	128												
							UNDER CONSTRUCTION											
DURHAM	DURHAM	U-5126	US 501 BYPASS (DUKE STREET), SR 1443 (HORTON ROAD) TO HUDSON STREET. MILL AND RESURFACE.		770	770												
							UNDER CONSTRUCTION											
DURHAM	DURHAM	U-3804	SR 1321 (HILLANDALE ROAD), I-85 TO SR 1407 (CARVER STREET). WIDEN TO MULTI-LANES.	0.7	11941	11941												
							UNDER CONSTRUCTION											
DURHAM	DURHAM	U-5127	DURHAM, SR 1321 (HILLANDALE-FULTON STREET), I-85 TO SR 1320 (ERWIN ROAD). MILL AND RESURFACE.		300	300												
							UNDER CONSTRUCTION											
DURHAM	DURHAM	U-5150	DURHAM, WILLIAM PENN STREET AT BEN FRANKLIN STREET. INSTALL TRAFFIC SIGNAL.															
							UNDER CONSTRUCTION - LET WITH U-5148											
DURHAM	DURHAM	U-5149	DURHAM, RENAISSANCE PARKWAY AT SOUTHPOINT MALL ENTRANCE NEAR SOUTHPOINT CINEMA AND AT AMERICAN TOBACCO TRAIL. INSTALL TRAFFIC SIGNALS.		300	300												
							UNDER CONSTRUCTION											
DURHAM	DURHAM	U-5148	DURHAM, NORTHPOINTE DRIVE, HOME DEPOT TO KROGER. INSTALL TRAFFIC SIGNAL.		400	400												
							UNDER CONSTRUCTION - INCLUDES U-5150											

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URBAN PROJECTS																		
DURHAM WAKE	DURHAM MORRISVILLE	U-4716	SR 1978 (HOPSON ROAD), SR 1980 (CHURCH STREET), AND NORFOLK SOUTHERN RAILROAD-NORTH CAROLINA RAILROAD, SOUTH OF I-40 TO NORTH OF MCCRIMMON PARKWAY. CONSTRUCT A GRADE SEPARATION AT HOPSON ROAD, EXTEND CHURCH STREET TO HOPSON ROAD, CLOSE CHURCH STREET CROSSING 734 748M OF THE NORFOLK SOUTHERN-NORTH CAROLINA RAILROAD, CONSTRUCT SECOND TRACK, AND WIDEN HOPSON ROAD FROM EAST OF SR 1999 (DAVIS DRIVE) TO NC 54.		31016	3555	STHSR	PE 459 A	PE 465 A	PE 473 A									
							STHSR	R 690 A	R 1400 A	R 591 A								
							O	R 1147 A	R 1147 A	R 1147 A								
							STHSR	C 450 A	C 2875 A	C 1348 A								
							STHSR	PE 187 C	PE 190 C	PE 193 C								
							STHSR	R 114 C	R 232 C	R 236 C								
							STHSR	C 1396 C	C 3272 C	C 2429 C								
							O											R 634 B
							O											C 2100 B
							O											R 1126 D
							O											C 3160 D

A CONSTRUCT RAILROAD GRADE SEPARATION AT SR 1978 (HOPSON ROAD) AND SHIFT RAIL LINE.
B SR 1980 (CHURCH STREET), REALIGN AND CLOSE CROSSING 734 748M OF THE NORFOLK SOUTHERN-NORTH CAROLINA RAILROAD.
C CONSTRUCT SECOND TRACK.
D SR 1978 (HOPSON ROAD), EAST OF SR 1999 (DAVIS DRIVE) TO NC 54, WIDEN TO MULTILANES.

PLANNING/DESIGN IN PROGRESS

DURHAM WAKE	RESEARCH TRIANGLE PARK	U-4026	SR 1613-SR 1999 (DAVIS DRIVE), SR 3014 (MORRISVILLE-CARPENTER ROAD) IN WAKE COUNTY TO NC 54 IN DURHAM COUNTY. WIDEN TO MULTI-LANES.	5.7	39063	39063												

A SR 3014 (MORRISVILLE-CARPENTER ROAD) TO SR 1635 (KOPPERS ROAD-MCCRIMMON PARKWAY) - UNDER CONSTRUCTION.
B SR 1635 (KOPPERS ROAD-MCCRIMMON PARKWAY) IN WAKE COUNTY TO NC 54 IN DURHAM COUNTY - UNDER CONSTRUCTION.

PROJECT LET WITH R-2904

DURHAM WAKE	RESEARCH TRIANGLE PARK	U-4763B	NEW ROUTE - TRIANGLE PARKWAY, NC-540 TO I-40. MULTI-LANE FACILITY ON NEW LOCATION.	3.5	190568	176568	BOND	C 8400										
							TIFIA	C 5180										
							S(E)	C 420										

NORTH CAROLINA TURNPIKE AUTHORITY PROJECT (DESIGN-BUILD PROJECT) - UNDER CONSTRUCTION

FEASIBILITY STUDIES

CHATHAM DURHAM	DURHAM	FS-1008B	NC 751, US 64 IN CHATHAM COUNTY TO NORTH OF SR 1118 (FAYETTEVILLE ROAD) IN DURHAM COUNTY. WIDEN TO MULTILANES WITH BICYCLE LANES.															

SCHEDULED FOR FEASIBILITY STUDY

DURHAM	DURHAM	FS-1005C	NC 54, I-40 TO NC 55 IN DURHAM. WIDEN TO MULTILANES WITH TRANSIT ACCOMMODATIONS, BIKE LANES, AND SIDEWALKS.	5.2														

SCHEDULED FOR FEASIBILITY STUDY

FEDERAL BRIDGE PROJECTS

DURHAM	US 70 BUSINESS	B-3638	CAMPUS DRIVE. REPLACE BRIDGE NO. 316		1680	380	FA		C 1300									

RIGHT OF WAY IN PROGRESS

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FEDERAL BRIDGE PROJECTS																		
ORANGE	US 70 BYPASS	B-4962	ENO RIVER. REPLACE BRIDGE NO. 46		6600		FA							R 600				
							FA								C 6000			
ORANGE	SR 1002	B-4216	STROUDS CREEK. REPLACE BRIDGE NO. 66		1054	1054												
							UNDER CONSTRUCTION											
ORANGE	SR 1005	B-5348	PHIL'S CREEK. REPLACE BRIDGE NO. 85		1063		FA								R 97			
							FA									C 966		
DURHAM	SR 1116	B-3450	NEW HOPE CREEK. REPLACE BRIDGE NO. 217, SANDY CREEK. REPLACE BRIDGE NO. 122.		4986	4986												
							UNDER CONSTRUCTION											
DURHAM	SR 1616	B-4943	DIAL CREEK (LAKE MICHIE). REPLACE BRIDGE NO. 20.		477		NFA									R 40		
							NFA									U 52		
							NFA										C 385	
ORANGE	VARIOUS	B-5191	BRIDGE EXPANSION JOINT REPAIRS AT SELECTED LOCATIONS.		160	160												
							UNDER CONSTRUCTION											
CHATHAM HOKE LEE MONTGOMERY MOORE RANDOLPH RICHMOND SCOTLAND	VARIOUS	BD-5108	DIVISION 8 PURCHASE ORDER CONTRACT BRIDGE REPLACEMENT PROJECTS AT SELECTED LOCATIONS.		36000	2000	NFA	R 600	R 200	R 200	R 200	R 200	R 300	R 400	R 400	R 400	R 500	
							NFA	C 5400	C 1800	C 1800	C 1800	C 1800	C 2700	C 3600	C 3600	C 3600	C 4500	
							IN PROGRESS - BRIDGE PURCHASE ORDER CONTRACT (BPOC)											
DURHAM FRANKLIN GRANVILLE PERSON VANCE WAKE WARREN	VARIOUS	BD-5105	DIVISION 5 PURCHASE ORDER CONTRACT BRIDGE REPLACEMENT PROJECTS AT SELECTED LOCATIONS.		36000	2000	NFA	R 600	R 200	R 200	R 200	R 200	R 300	R 400	R 400	R 400	R 500	
							NFA	C 5400	C 1800	C 1800	C 1800	C 1800	C 2700	C 3600	C 3600	C 3600	C 4500	
							IN PROGRESS - BRIDGE PURCHASE ORDER CONTRACT (BPOC)											

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FEDERAL BRIDGE PROJECTS																		
ALAMANCE CASWELL GUILFORD ORANGE ROCKINGHAM	VARIOUS	BD-5107	DIVISION 7 PURCHASE ORDER CONTRACT BRIDGE REPLACEMENT PROJECTS AT SELECTED LOCATIONS.		36000	2000	NFA	R 600	R 200	R 200	R 200	R 200	R 300	R 400	R 400	R 400	R 500	
							NFA	C 5400	C 1800	C 1800	C 1800	C 1800	C 2700	C 3600	C 3600	C 3600	C 4500	
								IN PROGRESS - BRIDGE PURCHASE ORDER CONTRACT (BPOC)										
MITIGATION PROJECTS																		
CHATHAM HOKE LEE MONTGOMERY MOORE RANDOLPH RICHMOND SCOTLAND	VARIOUS	EE-4908	ECOSYSTEM ENHANCEMENT PROGRAM FOR DIVISION 8 PROJECT MITIGATION.		8756	8756												
								IN PROGRESS										
DURHAM FRANKLIN GRANVILLE PERSON VANCE WAKE WARREN	VARIOUS	EE-4905	ECOSYSTEM ENHANCEMENT PROGRAM FOR DIVISION 5 PROJECT MITIGATION.		5167	5167												
								IN PROGRESS										
ALAMANCE CASWELL GUILFORD ORANGE ROCKINGHAM	VARIOUS	EE-4907	ECOSYSTEM ENHANCEMENT PROGRAM FOR DIVISION 7 PROJECT MITIGATION.		7221	7221												
								IN PROGRESS										
BICYCLE AND PEDESTRIAN PROJECTS																		
ORANGE	VARIOUS	EB-5108	SR 1112 (DAIRYLAND ROAD), SR 1111 UNION (CHAPEL GROVE ROAD) TO SR 1006 (ORANGE GROVE ROAD). ADD WIDE PAVED SHOULDERS.															
								SCHEDULED FOR FEASIBILITY STUDY										

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COUNTY	ROUTE/CITY	ID NUMBER	LOCATION / DESCRIPTION	LENGTH	TOTAL PROJ COST (THOU)	PRIOR YEARS COST (THOU)	FUNDS	5 YEAR WORK PROGRAM FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	DEVELOPMENTAL PROGRAM FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	UNFUNDED FUTURE YEARS
BICYCLE AND PEDESTRIAN PROJECTS																		
ORANGE	CARRBORO CHAPEL HILL	EL-4995	DRY CREEK GREENWAY.		736	36	O											C 700
			PLANNING, DESIGN, RIGHT OF WAY AND CONSTRUCTION BY TOWN - IN PROGRESS															
ORANGE	CARRBORO	EL-4994	BOLIN CREEK GREENWAY.		1476	738	STPDA	C 590										
							C	C 148										
			PLANNING, DESIGN, RIGHT OF WAY AND CONSTRUCTION BY TOWN															
ORANGE	CARRBORO	U-3100B	SR 1107 (OLD FAYETTEVILLE ROAD), NC 54 TO SR 1106 (STROUD LANE). PROVIDE BICYCLE AND PEDESTRIAN FACILITIES AND TRANSIT ACCOMMODATIONS.	0.5	6534	6534												
			UNDER CONSTRUCTION - PROJECT U-3100A COMPLETE															
ORANGE	CHAPEL HILL	EB-5110	BOLIN CREEK GREENWAY, NC 86 (MARTIN LUTHER KING, JR. BOULEVARD TO UMSTEAD PARK.															
			SCHEDULED FOR FEASIBILITY STUDY															
ORANGE	COUNTYWIDE	EB-3606	BICYCLE ROUTE MAPPING AND SIGNING.		50	50												
			IN PROGRESS															
CHATHAM	DURHAM	EB-2921F	AMERICAN TOBACCO RAIL TRAIL. DURHAM COUNTY LINE TO WAKE COUNTY LINE. CONSTRUCT A MULTI-PURPOSE TRAIL.		2392	2392												
			UNDER CONSTRUCTION															
ORANGE	SR 1006 ORANGE GROVE ROAD	EB-4980	CONSTRUCT PEDESTRIAN BRIDGE OVER I-40.															
			SCHEDULED FOR FEASIBILITY STUDY															
CONGESTION MITIGATION PROJECTS																		
DURHAM ORANGE WAKE	TRIANGLE TRANSIT AUTHORITY	C-5173	EXPANDED EXPRESS BUS SERVICE, HOLLY SPRINGS TO DOWNTOWN RALEIGH VIA APEX AND CARY. OPERATING ASSISTANCE TO EXTEND CURRENT ROUTE BETWEEN APEX AND DOWNTOWN RALEIGH AND CONSTRUCT TWO NEW PARK AND RIDE LOTS.		4466		CMAQ	PE 281										
							O	PE 70										
							CMAQ	R 1283										
							O	R 321										
							CMAQ	C 655										
							O	C 164										
							CMAQ	O 451	O 451	O 451								
							O	O 113	O 113	O 113								

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DURHAM-CHAPEL HILL-CARRBORO METROPOLITAN PLANNING ORGANIZATION

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CONGESTION MITIGATION PROJECTS																		
ORANGE	CARRBORO	C-5181	JONES CREEK GREENWAY, CONSTRUCT A 100 FOOT BRIDGE AND 650 FOOT PAVED TRAIL TO FILL GAP BETWEEN THE CARRBORO UPPER BOLIN TRAIL AND TWIN CREEKS GREENWAY AND IMPLEMENT PROGRAM TO SUPPORT NON-VEHICLE TRIPS TO MORRIS GROVE ELEMENTRY SCHOOL.		300		CMAQ								PE 24						
							C											
							CMAQ											
							C											
							CMAQ						N 10					
							C						N 2					
DURHAM ORANGE	CHAPEL HILL	C-5104	PURCHASE TWO (2) HYBRID ELECTRIC BUSES AND PROVIDE PORTION OF OPERATING EXPENSE FOR THREE YEARS.		2100	1979	CMAQ	O 97										
							C	O 24										
							IN PROGRESS											
ORANGE	CHAPEL HILL	C-5177	MLK, JR. SHARED PATHWAY, CONSTRUCT PATHWAY ALONG MLK, JR. BOULEVARD, HOMESTEAD ROAD TO PINEY MOUNTAIN ROAD.		906		CMAQ			R 180								
							C			R 45								
							CMAQ			C 545								
							C			C 136								
ORANGE	CHAPEL HILL	C-5179	NORTH ESTES DRIVE, CONSTRUCT A TEN FOOT PATHWAY, FIVE FOOT SIDEWALKS AND A FOUR FOOT BIKE LANE.		1182		CMAQ				R 166							
							C				R 41							
							CMAQ					C 780						
							C					C 195						
MECKLENBURG ORANGE	CHARLOTTE HILLSBOROUGH	C-5111	INSTALL TWO STATE MAINTAINED E-85 FUELING SITES.		250	250												
							IN PROGRESS											
CHATHAM DURHAM FRANKLIN GRANVILLE HARNETT JOHNSTON ORANGE WAKE	TRIANGLE J COUNCIL OF GOVERNMENTS	C-5102	TRIANGLE TRANSPORTATION DEMAND MANAGEMENT PROGRAM SERVICES FOR EMPLOYERS AND ORGANIZATIONS IN THE TRIANGLE OZONE NON-ATTAINMENT REGION. MARKETING AND OUTREACH.		8028	1627	CMAQ	N 343 A	N 371 A									
							O	N 86 A	N 93 A									
							CMAQ	N 279 B	N 299 B									
							O	N 70 B	N 75 B									
							CMAQ			N 382 B	N 385 B	N 458 B	N 505 B	N 523 B				
							O			N 423 B	N 431 B	N 496 B	N 579 B	N 603 B				

A CAPITAL AREA MPO PARTICIPATION - IN PROGRESS BY TRIANGLE J COUNCIL OF GOVERNMENT.

B DURHAM-CHAPEL HILL-CARRBORO MPO PARTICIPATION - IN PROGRESS BY TRIANGLE J COUNCIL OF GOVERNMENT.

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CONGESTION MITIGATION PROJECTS																		
ORANGE	COUNTYWIDE HILLSBOROUGH	C-4932A	CONSTRUCT A PARK AND RIDE SHELTER AND INSTALL BIKE RACKS ON BUSES. SECTION A: DURHAM-CHAPEL HILL-CARRBORO (DCHC) MPO TO PARTICIPATE IN CONSTRUCTION AND OPERATING ASSISTANCE FOR ONE YEAR FOR A NEW TRANSIT SERVICE.		93	93													
							IN PROGRESS											
DURHAM	DURHAM	C-4928	MORREENE ROAD, NEAL ROAD TO ERWIN ROAD. CONSTRUCT BIKE LANES AND SIDEWALKS.		1441		STPDA	C 931										
							CMAQ	C 222										
							C	C 288										
							PLANNING, DESIGN, RIGHT OF WAY AND CONSTRUCTION BY CITY											
DURHAM	DURHAM	C-4929	BICYCLE PARKING PROGRAM. INSTALL BIKE RACKS AT VARIOUS LOCATIONS.		48	48												
							IN PROGRESS											
DURHAM	DURHAM	C-5103	PURCHASE TWO (2) HYBRID ELECTRIC BUSES AND PROVIDE PORTION OF OPERATING ASSISTANCE FOR TWO YEARS.		1686	1686												
							IN PROGRESS											
DURHAM	DURHAM	C-5175	DURHAM AREA TRANSIT AUTHORITY (DATA) OPERATING ASSISTANCE FOR NEW FIXED ROUTE.		2438		CMAQ			O 951	O 999							
							C			O 238	O 250							
DURHAM	DURHAM	C-5178	CAMPUS WALK AVENUE, MORREENE ROAD TO LASALLE STREET AND LASALLE STREET, KANGAROO DRIVE TO ERWIN ROAD. CONSTRUCT SIDEWALKS.		336		CMAQ				C 269							
							C				C 67							
DURHAM	DURHAM	C-5180	DURHAM AREA TRANSIT AUTHORITY (DATA), REPLACEMENT OF FIVE HYBRID CUTAWAYS (LIGHT TRANSIT VEHICLES).		729		CMAQ					A 583						
							C					A 146						
DURHAM	DURHAM	C-5182	HOPE VALLEY ROAD, CONSTRUCT SIDEWALKS AND BIKE LANES BETWEEN MLK, JR. PARKWAY AND US 15-501 BUSINESS		1386		CMAQ						R 107					
							C						R 27					
							CMAQ						C 1002					
							C						C 250					

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CONGESTION MITIGATION PROJECTS																		
DURHAM	DURHAM	C-5183	CONSTRUCT SIDEWALKS.		2127		CMAQ						C 778 A					
							C						C 194 A					
							CMAQ							C 924 B				
							C							C 231 B				
							A CAMERON BOULEVARD, ERWIN ROAD AND DUKE UNIVERSITY ROAD.											
							B ALSTON AVENUE, CARPENTER FLETCHER ROAD TO SEDWICK ROAD.											
DURHAM	DURHAM	C-4702	TEN (10) - REPLACEMENT BUSES.		3000	3000												
							IN PROGRESS - FUNDS FLEXED TO FEDERAL TRANSIT ADMINISTRATION											
ORANGE	HILLSBOROUGH	C-5184	RIVERWALK TRAIL, PHASE III. CONSTRUCT A PAVED OFF-ROAD TAIL ALONG ENO RIVER CONNECTING RIVER PARK, GOLD PARK AND THE OCCONEECHEE MOUNTAIN STATE NATURAL AREA.		621		CMAQ							PE 40				
							C							PE 10				
							CMAQ							R 183				
							C							R 250				
							C								C 138			
DURHAM ORANGE WAKE	TRIANGLE J COUNCIL OF GOVERNMENTS	C-4924	TRIANGLE J COUNCIL OF GOVERNMENTS (COG). DEVELOP A FLEXIBLE WORK SCHEDULE FOR EMPLOYEES AND ORGANIZATIONS IN TRIANGLE OZONE NON-ATTAINMENT AREA FOR THREE YEARS.		5626	300	CMAQ			N 481	N 482	N 572	N 620	N 640				
							C			N 423	N 430	N 496	N 579	N 603				
							A DEVELOP FLEXIBLE WORK SCHEDULES FOR EMPLOYEES IN CAPITAL AREA MPO (CAMPO) - IN PROGRESS.											
							B DEVELOP FLEXIBLE WORK SCHEDULES FOR EMPLOYEES IN DURHAM-CHAPEL HILL-CARRBORO (DCHC) - IN PROGRESS.											
							IN PROGRESS BY TRIANGLE J COUNCIL OF GOVERNMENTS											
ENHANCEMENT PROJECTS (LOCAL PROJECTS)																		
ORANGE	VARIOUS	EL-5103	CARRBORO, INSTALL BUS SHELTERS AT SELECTED LOCATIONS.		76	76												
							UNDER CONSTRUCTION BY TOWN											
CHATHAM DURHAM ORANGE	VARIOUS	U-4726	DCHC URBAN AREA BICYCLE AND PEDESTRIAN ALLOCATION.		11941	4606	STPDA	C 1980	C 1578	C 2184	C 126							
							C	C 495	C 395	C 546	C 31							
							PLANNING, DESIGN, RIGHT OF WAY AND CONSTRUCTION BY OTHERS - IN PROGRESS											
ORANGE	CARRBORO	EL-4828	MORGAN CREEK GREENWAY (WEST). SMITH LEVEL ROAD TO UNIVERSITY LAKE. CONSTRUCT GREENWAY.		535	40	STPDA	C 396										
							C	C 99										
							PLANNING, DESIGN, RIGHT OF WAY AND CONSTRUCTION BY TOWN - IN PROGRESS											

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ENHANCEMENT PROJECTS (LOCAL PROJECTS)																		
ORANGE	CHAPEL HILL	EL-4601	MORGAN CREEK GREENWAY (EAST). US 15-501-CULBETH ROAD TO SMITH LEVEL ROAD. TEN FOOT MULTI-USE ASPHALT PATH INCLUDING ACCESS TO MERRITT PASTURE.		1290	1290												
							PLANNING, DESIGN, RIGHT OF WAY AND CONSTRUCTION BY TOWN - IN PROGRESS													
DURHAM	DURHAM	EL-4999	BICYCLE AND PEDESTRIAN TRAILS IN DURHAM AND DURHAM COUNTY. ACQUISITION OF RAIL CORRIDORS AND CONSTRUCTION.															
							PROGRAMMED FOR PLANNING AND ENVIRONMENTAL STUDY ONLY - PLANNING, DESIGN, RIGHT OF WAY AND CONSTRUCTION BY OTHERS												
DURHAM	DURHAM	EL-2921E	AMERICAN TOBACCO RAIL TRAIL. NC 54 TO CHATHAM COUNTY LINE. CONSTRUCT A MULTI-PURPOSE TRAIL.		5762	5762												
							PARTS A-D COMPLETE; PLANNING, DESIGN, RIGHT OF WAY AND CONSTRUCTION BY CITY - IN PROGRESS												
DURHAM	DURHAM	U-4445	NC 147 (DURHAM FREEWAY), NEAR ALSTON AVENUE. CONSTRUCT PEDESTRIAN BRIDGE OVER NC 147 AND REMOVE EXISTING SUBSTANDARD PEDESTRIAN BRIDGE.		2000	2000												
							UNDER CONSTRUCTION BY OTHERS													
DURHAM	DURHAM	U-4724	CORNWALLIS ROAD, SOUTH ROXBORO ROAD TO UNIVERSITY DRIVE. BIKE AND PEDESTRIAN FEATURES.		1970		STPDA	C 1576										
							C	C 394										
							PLANNING, DESIGN, RIGHT OF WAY AND CONSTRUCTION BY CITY													
HAZARD ELIMINATION PROJECTS																		
ORANGE	US 70 NC 751	SF-4907B	INSTALL RIGHT TURN LANE.		165	165												
							IN PROGRESS													
ORANGE	NC 86	W-5318	NC 57 TO CASWELL COUNTY LINE. GEOMETRIC IMPROVEMENTS, PAVED SHOULDERS AND RUMBLE STRIPS.	12.2	4654		HES			R 227								
							HES					C 4427						
ORANGE	NC 57 NC 157	SF-4907C	WIDEN NC 57 FOR LEFT TURN LANES AND INSTALL A TRAFFIC SIGNAL AT THE INTERSECTION OF NC 157.		654	54	HES		R 50									
							HES		C 550									
							IN PROGRESS													
CHATHAM	NC 751	SF-4908I	INTERSECTION WITH SR 1731 (O'KELLY CHURCH ROAD). INSTALL TRAFFIC SIGNAL AND LEFT TURN LANE.		593	593												
							UNDER CONSTRUCTION													

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HAZARD ELIMINATION PROJECTS																		
CHATHAM HOKE LEE MONTGOMERY MOORE RANDOLPH RICHMOND SCOTLAND	VARIOUS	W-5208	DIVISION 8 RUMBLE STRIPS, GUARDRAIL AND LIGHTING IMPROVEMENTS AT SELECTED LOCATIONS.		100	100												
			DIVISION PURCHASE ORDER CONTRACT (DPOC) - IN PROGRESS															
ALAMANCE CASWELL GUILFORD ORANGE ROCKINGHAM	VARIOUS	W-5207	DIVISION 7 RUMBLE STRIPS, GUARDRAIL AND LIGHTING IMPROVEMENTS AT SELECTED LOCATIONS.		500	500												
			DIVISION PURCHASE ORDER CONTRACT (DPOC) - UNDER CONSTRUCTION															
DURHAM FRANKLIN GRANVILLE PERSON VANCE WAKE WARREN	VARIOUS	W-5205	DIVISION 5 RUMBLE STRIPS, GUARDRAIL AND LIGHTING IMPROVEMENTS AT SELECTED LOCATIONS.		180	180												
			DIVISION PURCHASE ORDER CONTRACT (DPOC) - IN PROGRESS															
DURHAM	DURHAM	W-5110	NC 55 (ALSTON AVENUE) AT LAWSON STREET. CONSTRUCT LEFT TURN LANES ON NC 55.	0.2	975		HES	R 500										
							HES		C 475									

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DURHAM-CHAPEL HILL-CARRBORO METROPOLITAN PLANNING ORGANIZATION

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PASSENGER RAIL PROJECTS																		
ALAMANCE CABARRUS DURHAM GUILFORD MECKLENBURG ROWAN WAKE	AMTRAK	P-2918	TRAIN 73/74 OPERATIONS BETWEEN CHARLOTTE AND RALEIGH AND CAPITAL YARD MAINTENANCE FACILITY.		194910	103248	S(5)	O 2600	O 2600	O 2600	O 2600	O 2600	O 2600	O 2600	O 2600	O 2600	O 2600	
							T2001	O 4000	O 4000	O 4000	O 4000	O 4000	O 4000	O 4000	O 4000	O 4000	O 4000	
							STHSR	PE 50 E										
							STHSR	O 478 E										
							STHSR	PE 160 F	PE 154 F									
							STHSR	C 8711 F	C 4679 F									
							STHSR	C 6257 G										
							STHSR	PE 51 H										
							STHSR	R 567 H										
							STHSR	C 3797 H										
							STHSR	PE 91 I										
							STHSR	C 667 I										

A EQUIPMENT REBUILD - 2 F59PHI LOCOMOTIVES - IN PROGRESS.
B PURCHASE 2 USED LOCOMOTIVES - ACQUIRED.
C EQUIPMENT REHAB - 3 LOCOMOTIVES - IN PROGRESS.
D EQUIPMENT REHAB - 3 PASSENGER CARS - IN PROGRESS.
E PASSENGER TRAIN SECURITY SYSTEM, CCTVDATA NETWORK AND GENERATORS - IN PROGRESS.
F CRISP CHARLOTTE MAINTENANCE FACILITY TRACK EXTENSION AND SHOP BUILDING - IN PROGRESS.
G EQUIPMENT - PURCHASE 4 USED PASSENGER CARS AND REHAB 7 - IN PROGRESS.
H CAPITAL YARD PHASE 1 IMPROVEMENTS - EXTEND TRACKS 1 AND 2, MAJOR WORK TRACK 3 - IN PROGRESS.
I EQUIP 9 STATIONS AND PLATFORMS WITH ADA/FRA PIDS - IN PROGRESS.

IN PROGRESS

ALAMANCE CABARRUS DURHAM EDGECOMBE GUILFORD JOHNSTON MECKLENBURG NASH ROWAN WAKE WILSON	AMTRAK	P-2908	CAPITAL AND OPERATIONS COST OF TRAIN 79/80 BETWEEN CHARLOTTE AND ROCKY MOUNT.		47795	35795	S(5)	O 2400	O 2400	O 2400	O 2400	O 2400						

IN PROGRESS

ORANGE	CARRBORO	Z-4007B	SR 1927 (BREWER ROAD) IN CARRBORO AT NORFOLK SOUTHERN RAILWAY CROSSING 735 179M. SAFETY IMPROVEMENTS.		95	95												

FUNDED - CONSTRUCTION NOT AUTHORIZED

DURHAM	DURHAM	P-3802	STATION CONSTRUCTION.		1250	1250	CMAQ											

UNDER CONSTRUCTION

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INTERSTATE PROJECTS																		
STATEWIDE	I-95	M-0412	CORRIDORS OF THE FUTURE PROGRAM. INTERSTATE MAINTENANCE DISCRETIONARY FUNDS (IMD) FOR IMPROVEMENTS TO I-95 FROM FLORIDA TO VIRGINIA. NORTH CAROLINA TO PROVIDE FUNDS TO ADJOINING STATES UNDER TERMS OF AN AGREEMENT.		16800	16800												
							IN PROGRESS											
STATEWIDE	VARIOUS	I-9999	IM BALANCE.	0.0														
STATEWIDE	VARIOUS	I-9998	INTERSTATE PREVENTATIVE MAINTENANCE.															
RURAL PROJECTS																		
STATEWIDE	VARIOUS	M-0405	STATEWIDE MOWING MAINTENANCE CONTRACTS FOR PROPERTIES ACQUIRED BY NCDOT IN ADVANCE OF STIP PROJECTS.		1372	372	S	N 100	N 100	N 100	N 100	N 100	N 100	N 100	N 100	N 100	N 100	
							IN PROGRESS											
STATEWIDE	VARIOUS	M-0281	CENTER FOR TRANSPORTATION AND THE ENVIRONMENT	0.0	1500	1500												
							IN PROGRESS											
STATEWIDE	VARIOUS	M-0360	DESIGN SERVICES, PRELIMINARY ENGINEERING FOR MISCELLANEOUS PROJECTS.		15980	5980	S	PE 1000	PE 1000	PE 1000	PE 1000	PE 1000	PE 1000	PE 1000	PE 1000	PE 1000	PE 1000	
							IN PROGRESS											
STATEWIDE	VARIOUS	M-0376	STATEWIDE GEOTECHNICAL STUDIES AND INVESTIGATIONS PROJECT TO COVER NON-PROJECT SPECIFIC WORK.		14900	5900	S	PE 900	PE 900	PE 900	PE 900	PE 900	PE 900	PE 900	PE 900	PE 900	PE 900	
							IN PROGRESS											
STATEWIDE	VARIOUS	M-0377	ENVIRONMENTAL STREAMLINING. COORDINATE, PLAN, FACILITATE, IMPLEMENT AND TRACK INITATIVES.		3000	3000												
							IN PROGRESS											
STATEWIDE	VARIOUS	M-0391	STRUCTURE DESIGN, PRELIMINARY ENGINEERING FOR MISCELLANEOUS PROJECTS		6978	2978	S	PE 400	PE 400	PE 400	PE 400	PE 400	PE 400	PE 400	PE 400	PE 400	PE 400	
							IN PROGRESS											
STATEWIDE	VARIOUS	M-0392	HYDRAULICS, PRELIMINARY ENGINEERING FOR MISCELLANEOUS PROJECTS.		2800	1200	S	PE 160	PE 160	PE 160	PE 160	PE 160	PE 160	PE 160	PE 160	PE 160	PE 160	
							IN PROGRESS											
STATEWIDE	VARIOUS	R-4701	TRAFFIC SYSTEM OPERATIONS PROGRAM (SIGNAL MAINTENANCE).		375230	175230	STP	C 20000	C 20000	C 20000	C 20000	C 20000	C 20000	C 20000	C 20000	C 20000	C 20000	
							IN PROGRESS											

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RURAL PROJECTS																		
STATEWIDE	VARIOUS	R-4500	ECONOMIC DEVELOPMENT.		10000		S	C 5000	C 5000									
								IN PROGRESS										
STATEWIDE	VARIOUS	R-2929	NATIONAL PARKS SERVICE SPOT SAFETY AND SIGN REHABILITATION.	0.0	1000		FLPP	C 100	C 100	C 100	C 100	C 100	C 100	C 100	C 100	C 100	C 100	
								UNDER CONSTRUCTION BY FEDERAL HIGHWAY ADMINISTRATION										
STATEWIDE	VARIOUS	R-4436	NPDES PERMIT, RETROFIT FOURTEEN SITES PER YEAR TO PROTECT WATER QUALITY.		41878	16878	STP	N 2500	N 2500	N 2500	N 2500	N 2500	N 2500	N 2500	N 2500	N 2500	N 2500	
								IN PROGRESS										
STATEWIDE	VARIOUS	R-4067	POSITIVE GUIDANCE PROGRAM (PAVEMENT MARKINGS AND MARKERS, LED SIGNAL HEAD REPLACEMENT)		103412	63412	STP	C 4000	C 4000	C 4000	C 4000	C 4000	C 4000	C 4000	C 4000	C 4000	C 4000	
								IN PROGRESS										
STATEWIDE	VARIOUS	R-4066	WETLAND RESTORATION PROGRAM. COMPLETION OF WATERSHED ASSESSMENT PLANS IN ALL SEVENTEEN (17) RIVER BASINS TO IDENTIFY WETLAND AND STREAM RESTORATION PROJECTS FOR MITIGATION.		17500	17500												
								IN PROGRESS										
STATEWIDE	VARIOUS	R-8888	STATEWIDE PLANNING FOR TRAFFIC FORECASTING, PRE-TIP PLANNING AND PURPOSE AND NEED STUDIES.		1494	494	S	F 100	F 100	F 100	F 100	F 100	F 100	F 100	F 100	F 100	F 100	
								IN PROGRESS										
STATEWIDE	VARIOUS	R-2930	NATIONAL PARKS SERVICE EMERGENCY PAVEMENT REHABILITATION.	0.0	700		FLPP	C 70	C 70	C 70	C 70	C 70	C 70	C 70	C 70	C 70	C 70	
								UNDER CONSTRUCTION BY FEDERAL HIGHWAY ADMINISTRATION										
STATEWIDE	VARIOUS	R-4454	IMPROVEMENT PROJECTS THAT FURTHER ECONOMIC GROWTH AND DEVELOPMENT IN SMALL URBAN AND RURAL AREAS.		47000	47000												
								IN PROGRESS										
STATEWIDE	VARIOUS	R-4049	TRAFFIC OPERATIONS (INCIDENT MANAGEMENT, 511, SMARTLINK, TEC, TMC)	0.0	230792	100792	IM	C 9750	C 9750	C 9750	C 9750	C 9750	C 9750	C 9750	C 9750	C 9750	C 9750	
							NHS	C 3250	C 3250	C 3250	C 3250	C 3250	C 3250	C 3250	C 3250	C 3250	C 3250	
								IN PROGRESS										
STATEWIDE	VARIOUS	R-4073	ASPHALT MATERIALS TESTING LABORATORIES CORRECTIVE ACTION PLAN FOR GROUNDWATER CLEAN-UP AT 54 SITES.		22632	12632	STP	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	
								IN PROGRESS										

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STATEWIDE PROJECTS

FISCAL YEARS: TYPE OF WORK / ESTIMATED COST IN THOUSANDS / PROJECT BREAKS

COUNTY	ROUTE/CITY	ID NUMBER	LOCATION / DESCRIPTION	LENGTH	TOTAL PROJ COST (THOU)	PRIOR YEARS COST (THOU)	FUNDS	STATE TRANSPORTATION IMPROVEMENT PROGRAM										UNFUNDED
								5 YEAR WORK PROGRAM					DEVELOPMENTAL PROGRAM					
								FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FUTURE YEARS
RURAL PROJECTS																		
STATEWIDE	VARIOUS	R-9999WM	ENVIRONMENTAL MITIGATION AND MINIMIZATION.		178681	61631	NHS	M 50	M 1500	M 1500	M 1500	M 8500	M 7000	M 4000	M 11000	M 12000	M 11500	
							T		M 1500	M 1500	M 1500	M 8500	M 7000	M 4000	M 11000	M 12000	M 11500	
							IN PROGRESS											
STATEWIDE		M-0359	PROGRAM DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH. DEVELOP A PROCEDURES MANNUAL.		300	300												
							IN PROGRESS											
STATEWIDE		M-0428	ADVANCED VEHICLE RESEARCH CENTER (AVRC).		297	297												
							IN PROGRESS											
URBAN PROJECTS																		
STATEWIDE	VARIOUS	U-4500	ECONOMIC DEVELOPMENT.		3667		S		C 3667									
							IN PROGRESS											
FEDERAL BRIDGE PROJECTS																		
STATEWIDE	VARIOUS	B-4693	STATEWIDE SURVEY OF HISTORICAL BRIDGES.		1000	1000												
							IN PROGRESS											
STATEWIDE	VARIOUS	B-4700	BRIDGE PRESERVATION ISSUES AT SELECTED SITES.		129316	49316	FA	C 2500	C 2500	C 2500	C 2500	C 5000	C 5000	C 5000	C 5000	C 5000	C 5000	
							NFA	C 2500	C 2500	C 2500	C 2500	C 5000	C 5000	C 5000	C 5000	C 5000	C 5000	
							IN PROGRESS											
STATEWIDE	VARIOUS	B-9999	BRIDGE INSPECTION PROGRAM.	0.0	238572	128572	BRGI	I 11000	I 11000	I 11000	I 11000	I 11000	I 11000	I 11000	I 11000	I 11000	I 11000	
							IN PROGRESS											
STATEWIDE	VARIOUS	BK-5131	BRIDGE PRESERVATION AT SELECTED LOCATIONS.		1500	1500												
							UNDER CONSTRUCTION											
STATEWIDE	VARIOUS	BK-5102	BRIDGE PAINTING AT 19 SELECTED LOCATIONS.		2027	2027												
							IN PROGRESS											
STATEWIDE	VARIOUS	BK-5132	IN-DEPTH ENGINEERING EVALUATION OF WEIGHT RESTRICTIONS ON LOAD POSTED BRIDGES ON US AND NC DESIGNATED ROUTES.		1000	1000												
							IN PROGRESS											
STATEWIDE	VARIOUS	BK-5101	DECK PRESERVATION AT 15 SELECTED LOCATIONS.		7747	7747												
							UNDER CONSTRUCTION											
STATEWIDE	VARIOUS	BK-5100	ESTABLISH BRIDGE MANAGEMENT SYSTEM.		5000	5000												
							IN PROGRESS											

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STATE TRANSPORTATION IMPROVEMENT PROGRAM

COUNTY	ROUTE/CITY	ID NUMBER	LOCATION / DESCRIPTION	LENGTH	TOTAL PROJ COST (THOU)	PRIOR YEARS COST (THOU)	FUNDS	5 YEAR WORK PROGRAM FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	DEVELOPMENTAL PROGRAM FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	UNFUNDED FUTURE YEARS
FEDERAL BRIDGE PROJECTS																		
STATEWIDE	VARIOUS	BR-5100	REHABILITATE BRIDGES AT SELECTED LOCATIONS.		150000		FA					C 25000	C 25000	C 25000	C 25000	C 25000	C 25000	
							SCHEDULED FOR PLANNING AND ENVIRONMENTAL STUDY ONLY											
STATEWIDE	VARIOUS	M-0418	STORM WATER RUNOFF. RESEARCH, DESIGN, CONSTRUCT, MAINTAIN AND MONITOR STORM WATER DRAINAGE FROM 50 BRIDGES OVER WATERWAYS. (HB 2346, SECTION 25.18)		5860	5860												
							UNDER CONSTRUCTION											
STATEWIDE	VARIOUS	M-0379	SCOUR EVALUATION PROGRAM OF EXISTING BRIDGES.		3100	3100												
							IN PROGRESS											
BICYCLE AND PEDESTRIAN PROJECTS																		
STATEWIDE	VARIOUS	EB-5130	BICYCLE MAPS AND ROUTES. REVISE, UPDATE, REPRINT MAPS AND SIGN ROUTES.		600		STPEB	MP 5 A	MP 5 A	MP 5 A	MP 5 A	MP 5 A	MP 5 A	MP 5 A	MP 5 A	MP 5 A	MP 5 A	
							STPEB	MP 5 B	MP 5 B	MP 5 B	MP 5 B	MP 5 B	MP 5 B	MP 5 B	MP 5 B	MP 5 B	MP 5 B	
							STPEB	MP 50 C	MP 50 C	MP 50 C	MP 50 C	MP 50 C	MP 50 C	MP 50 C	MP 50 C	MP 50 C	MP 50 C	
							A NORTH CAROLINA BICYCE HIGHWAY MAPS.											
							B LOCAL BICYCLE MAPS.											
							C URBAN, REGIONAL AND COUNTY BICYCLE MAPS.											
STATEWIDE	VARIOUS	EB-2956	STATEWIDE BICYCLE PROGRAM.	0.0	13645	8645	STPEB	C 500	C 500	C 500	C 500	C 500	C 500	C 500	C 500	C 500	C 500	
							IN PROGRESS											
STATEWIDE	VARIOUS	EB-2966	SAFETY-EDUCATION PROJECTS.	0.0	670	420	STPEB	B 25	B 25	B 25	B 25	B 25	B 25	B 25	B 25	B 25	B 25	
							IN PROGRESS											
STATEWIDE	VARIOUS	EB-4012	NORTH CAROLINA BICYCLING HIGHWAYS NO. 10 (SANDHILLS SECTOR): MAPPING AND SIGNING.	0.0														
							DELETED - WORK TO BE ACCOMPLISHED UNDER EB-3120											
STATEWIDE	VARIOUS	EB-4013	SPOT IMPROVEMENTS: SHORT PAVEMENT SECTIONS, BICYCLE RACKS AND SIGNING NEEDS.	0.0	3830	2830	STPEB	C 100	C 100	C 100	C 100	C 100	C 100	C 100	C 100	C 100	C 100	
							IN PROGRESS											
STATEWIDE	VARIOUS	EB-4411	ROADWAY IMPROVEMENTS FOR BICYCLE SAFETY ON STATE AND LOCAL DESIGNATED BIKE ROUTES.		9880	7880	STPEB	C 200	C 200	C 200	C 200	C 200	C 200	C 200	C 200	C 200	C 200	
							IN PROGRESS											
STATEWIDE	VARIOUS	EB-3314	STATEWIDE PEDESTRIAN FACILITIES PROGRAM.	0.0	5600	4100	STPEP	C 150	C 150	C 150	C 150	C 150	C 150	C 150	C 150	C 150	C 150	
							IN PROGRESS											
STATEWIDE	VARIOUS	EB-5118	STATEWIDE BIKE AND PEDESTRIAN FACILITY DEVELOPMENT.		3331	3331												
							IN PROGRESS											

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BICYCLE AND PEDESTRIAN PROJECTS																		
STATEWIDE	VARIOUS	EB-9999	BIKE-PEDESTRIAN BALANCE		30000		STPEB					C 5000	C 5000	C 5000	C 5000	C 5000	C 5000	
STATEWIDE	REGIONAL	EB-4410	AREA-WIDE BICYCLE IMPROVEMENTS FEASIBILITY STUDIES.		200	150	STPEB	F 5	F 5	F 5	F 5	F 5	F 5	F 5	F 5	F 5	F 5	
								IN PROGRESS										
CONGESTION MITIGATION PROJECTS																		
STATEWIDE	NC RAILROAD	C-4901	RAIL DIVISION, CONSTRUCT A SECOND MAIN LINE BETWEEN THOMASVILLE AND LEXINGTON IN DAVIDSON COUNTY.		52295	7776	STHSR	PE 1119	PE 1135	PE 1154								
							STHSR	R 2749	R 5852	R 5951								
							STHSR	C 4475	C 12045	C 7789								
							O	C 750	C 750	C 750								
								A NCRRIP - RESTORE DOUBLE TRACK, BOWERS TO LAKE - UNDER CONSTRUCTION.										
STATEWIDE	VARIOUS	C-3600	DEPARTMENT OF MOTOR VEHICLES (DMV), VEHICLE EMISSION COMPLIANCE SYSTEM. UPGRADE NORTH CAROLINA'S MOTOR VEHICLE EMISSIONS INSPECTION AND MAINTENANCE (I/M) PROGRAM.	0.0	6702	6702												
								IN PROGRESS BY DEPARTMENT OF MOTOR VEHICLES										
STATEWIDE	VARIOUS	C-4982	TRANSPORTATION OPERATIONS CENTER TO ALLOW COORDINATED STATE AND REGIONAL TRANSPORTATION FUNCTIONS IN CONJUNCTION WITH THE STATE HIGHWAY PATROL COMMUNICATIONS CENTER AND OTHER EMERGENCY SERVICES PROVIDERS.		6900	6900												
								IN PROGRESS										
STATEWIDE	NON-ATTAINMENT AND MAINTENANCE AREAS	C-5100	SCHOOL BUS DIESEL PARTICULATE FILTER AND CLOSED CASE VENTILATION SYSTEM RETROFITS.		2000	2000												
								IN PROGRESS BY DEPARTMENT OF AIR QUALITY										
STATEWIDE	NORTH CAROLINA DIVISION OF AIR QUALITY	C-4903	NORTH CAROLINA AIR AWARENESS OUTREACH PROGRAM TO PROVIDE EDUCATION AND PRODUCE DAILY AIR QUALITY FORECAST.		1500	500	CMAQ	N 80	N 80	N 80	N 80	N 80	N 80	N 80	N 80	N 80	N 80	
							O	N 20	N 20	N 20	N 20	N 20	N 20	N 20	N 20	N 20	N 20	
								IN PROGRESS BY DEPARTMENT OF AIR QUALITY										
STATEWIDE	STATEWIDE	C-9999	CONGESTION MITIGATION AIR QUALITY (CMAQ) PROGRAM BALANCE IN NON-ATTAINMENT AREAS		123000		CMAQ						C 12000	C 21000	C 30000	C 30000	C 30000	

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STATE TRANSPORTATION IMPROVEMENT PROGRAM

COUNTY	ROUTE/CITY	ID NUMBER	LOCATION / DESCRIPTION	LENGTH	TOTAL PROJ COST (THOU)	PRIOR YEARS COST (THOU)	FUNDS	5 YEAR WORK PROGRAM FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	DEVELOPMENTAL PROGRAM FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	UNFUNDED FUTURE YEARS
CONGESTION MITIGATION PROJECTS																		
STATEWIDE	NORTH CAROLINA STATE UNIVERSITY	C-4902	NCSU, NORTH CAROLINA SOLAR CENTER CLEAN TRANSPORTATION PROGRAM. DEVELOP AND ADMINISTER A SEVEN YEAR CLEAN FUEL-ADVANCED TECHNOLOGY REBATE PROGRAM IN ALL CMAQ ELIGIBLE COUNTIES TO REDUCE EMISSIONS.		10378	1600	CMAQ			N 1384	N 1386	N 1411	N 1413	N 1428				
							O			N 346	N 347	N 353	N 353	N 357				
							IN PROGRESS BY NORTH CAROLINA STATE UNIVERSITY											
ENHANCEMENT PROJECTS																		
STATEWIDE	VARIOUS	E-4603	ECOSYSTEMS ENHANCEMENT PROGRAM. STRUCTURED MITIGATION FOR PROTECTION, ENHANCEMENT AND RESTORATION OF ECOLOGICAL FUNCTIONS AS COMPENSATION FOR PROJECT IMPACTS AT THE WATERSHED LEVEL.		625	625												
							PROGRAMMED FOR PLANNING AND PROGRAM DEVELOPMENT ONLY											
STATEWIDE	VARIOUS	E-4599	INSTALL RIVER BASIN HIGHWAY SIGNS.		187	187												
							IN PROGRESS											
STATEWIDE	VARIOUS	E-4018	NATIONAL RECREATIONAL TRAILS.		12645	645	NRT	C 1200	C 1200	C 1200	C 1200	C 1200	C 1200	C 1200	C 1200	C 1200	C 1200	
							IN PROGRESS											
STATEWIDE	VARIOUS	E-3821	PRESERVE HISTORIC BRIDGES FROM DEMOLITION.	0.0	250	250												
							IN PROGRESS											
STATEWIDE	VARIOUS	E-4602	GIS ARCHAEOLOGICAL DATABASE. STATEWIDE DATABASE TO CALCULATE ARCHAEOLOGICAL SITES LOCATED WITHIN OR NEAR NCDOT PROJECTS.		750	750												
							IN PROGRESS											
STATEWIDE	STATEWIDE	E-9999	ENHANCEMENT BALANCE.		3000		STPE	C 1000	C 1000	C 1000								
ENHANCEMENT PROJECTS (ROADSIDE)																		
STATEWIDE	VARIOUS	ER-3611	COLOR CANOPY AND TREE PLANTING STATEWIDE.	0.0	5727	3227	STPEL	L 250	L 250	L 250	L 250	L 250	L 250	L 250	L 250	L 250	L 250	
							IN PROGRESS											
STATEWIDE	VARIOUS	ER-5100	ROADSIDE ENVIRONMENTAL PROJECTS AND TREE PLANTINGS.		7605	7605												
							IN PROGRESS											
STATEWIDE	VARIOUS	ER-3419	NORTH CAROLINA STATE BYWAYS BOOKLET PRINTING.	0.0	50	50												
							IN PROGRESS											

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STATE TRANSPORTATION IMPROVEMENT PROGRAM

COUNTY	ROUTE/CITY	ID NUMBER	LOCATION / DESCRIPTION	LENGTH	TOTAL PROJ COST (THOU)	PRIOR YEARS COST (THOU)	FUNDS	5 YEAR WORK PROGRAM FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	DEVELOPMENTAL PROGRAM FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	UNFUNDED FUTURE YEARS
ENHANCEMENT PROJECTS (ROADSIDE)																		
STATEWIDE	VARIOUS	ER-3102	IMPLEMENTATION OF STATEWIDE SCENIC BYWAYS PROGRAM.	0.0	1781	1031	STPEL	N 75	N 75	N 75	N 75	N 75	N 75	N 75	N 75	N 75	N 75	
								IN PROGRESS										
STATEWIDE	VARIOUS	ER-3101	SPECIAL EVENTS PLANTING STATEWIDE.	0.0	13429	9429	STPEL	L 400	L 400	L 400	L 400	L 400	L 400	L 400	L 400	L 400	L 400	
								IN PROGRESS										
STATEWIDE	VARIOUS	ER-3100	PLANTING OF WILDFLOWERS AND PERENNIAL BULBS ON FEDERAL-AID SYSTEM.	0.0	17849	11849	STPEL	L 600	L 600	L 600	L 600	L 600	L 600	L 600	L 600	L 600	L 600	
								IN PROGRESS										
STATEWIDE	VARIOUS	ER-2973	ROADSIDE BEAUTIFICATION PROJECTS IN ALL FOURTEEN HIGHWAY DIVISIONS.	0.0	62993	32993	STPEL	L 3000	L 3000	L 3000	L 3000	L 3000	L 3000	L 3000	L 3000	L 3000	L 3000	
								IN PROGRESS										
STATEWIDE	VARIOUS	ER-2971	SIDEWALK PROGRAM IN ALL FOURTEEN HIGHWAY DIVISIONS.	0.0	27358	13358	STPER	C 1400	C 1400	C 1400	C 1400	C 1400	C 1400	C 1400	C 1400	C 1400	C 1400	
								IN PROGRESS										
STATEWIDE	BLUE RIDGE PARKWAY	ER-3817	SCENIC ENHANCEMENT AND VIEWSHED PROTECTION.	101.4	2200	2200												
								IN ACQUISITION										
HAZARD ELIMINATION PROJECTS																		
STATEWIDE	VARIOUS	SI-4902	FREEWAY SIGNING INITIATIVE. INSTALL OR REPLACE CRITICAL DIRECTIONAL SIGNS.		200	200												
								UNDER CONSTRUCTION										
STATEWIDE	VARIOUS	SI-4901	NO NEED 2 SPEED SAFETY INITIATIVE. SIGNING, EVALUATION, AND IMPLEMENTATION.		280	280												
								IMPLEMENTATION IN PROGRESS										
STATEWIDE	VARIOUS	SI-4900	BLUE STAR MEMORIAL HIGHWAY SIGNING. INSTALL SIGNS AT VARIOUS LOCATIONS STATEWIDE.		250	250												
								UNDER CONSTRUCTION										
STATEWIDE	VARIOUS	SI-4735	SAFETY MANAGEMENT INITIATIVES.		1107	1107												
								IN PROGRESS										
STATEWIDE	VARIOUS	W-4715	POSITIVE MEDIAN BARRIER PROJECTS.		9000		HES	C 500	C 500	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	
STATEWIDE	VARIOUS	W-9999	HIGH HAZARD BALANCE, FISCAL YEARS 11-15.	0.0	117000		HES					C 19500	C 19500	C 19500	C 19500	C 19500	C 19500	

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HAZARD ELIMINATION PROJECTS																		
STATEWIDE	VARIOUS	W-5301	LANE DEPARTURE SYSTEMIC IMPROVEMENTS.		50000		HES	C 5000	C 5000	C 5000	C 5000	C 5000	C 5000	C 5000	C 5000	C 5000	C 5000	
STATEWIDE	VARIOUS	W-4716	MEDIAN INLET REPLACEMENT PROJECT.															
							UNDER CONSTRUCTION											
STATEWIDE	VARIOUS	W-4714	RUMBLE STRIPS, SHOULDERS, ROADSIDE SAFETY IMPROVEMENTS, AUXILIARY TURN LANES, RAISED PAVEMENT MARKERS AND PROFILE PAVEMENT MARKINGS.		10050	50	HES	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	
STATEWIDE	VARIOUS	W-4447	SAFETY MANAGEMENT PROGRAM, PROJECT IDENTIFICATION, ANALYSIS AND PRELIMINARY ENGINEERING.		75829	23829	HES	PE 5200	PE 5200	PE 5200	PE 5200	PE 5200	PE 5200	PE 5200	PE 5200	PE 5200	PE 5200	
							IN PROGRESS											
STATEWIDE	VARIOUS	W-5300	SIGNAL RETIMING TO IMPROVE SAFETY.		10000		HES	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	
SAFE ROUTES TO SCHOOLS																		
STATEWIDE	VARIOUS	SR-5000	SAFE ROUTES TO SCHOOL PROGRAM. EDUCATIONAL,TRAINING AND OTHER NON-INFRASTRUCTURE NEEDS.		1925	925	SRTS	N 100	N 100	N 100	N 100	N 100	N 100	N 100	N 100	N 100	N 100	
							IN PROGRESS											
STATEWIDE	VARIOUS	SR-5001	SAFE ROUTES TO SCHOOL PROGRAM. PROJECTS TO IMPROVE SAFETY, REDUCE TRAFFIC, FUEL COMSUMPTION AND AIR POLLUTION IN VICINITY OF SCHOOLS.		45307	1307	SRTS	R 400	R 400	R 400	R 400	R 400	R 400	R 400	R 400	R 400	R 400	
							SRTS	C 4000	C 4000	C 4000	C 4000	C 4000	C 4000	C 4000	C 4000	C 4000	C 4000	
							IN PROGRESS											
PASSENGER RAIL PROJECTS																		
STATEWIDE	VARIOUS	P-3809	RAILROAD SAFETY INSPECTIONS IN ALL FOURTEEN (14) DIVISIONS.		5810	4310	RR	I 50	I 50	I 50	I 50	I 50	I 50	I 50	I 50	I 50	I 50	
							T2001	I 100	I 100	I 100	I 100	I 100	I 100	I 100	I 100	I 100	I 100	
							IN PROGRESS											
STATEWIDE	VARIOUS	P-4702	MAINTENANCE OF RAILROAD TRACK AND SIGNAL IMPROVEMENTS.		14130	5730	T2001	C 840	C 840	C 840	C 840	C 840	C 840	C 840	C 840	C 840	C 840	
							IN PROGRESS											
STATEWIDE	VARIOUS	P-5202	ENVIRONMENTAL STUDIES FOR RAIL CAPITAL PROJECTS.		19251		T2001	C 1750	C 1787	C 1824	C 1863	C 1902	C 1942	C 1982	C 2024	C 2067	C 2110	
STATEWIDE	VARIOUS	P-4701	CAPACITY AND TRAVEL TIME IMPROVEMENTS TO FREIGHT AND PASSENGER RAIL CORRIDORS, NEW EQUIPMENT AND MATCH FOR FEDERAL FUNDS.		173118	98518	T2001	C 7460	C 7460	C 7460	C 7460	C 7460	C 7460	C 7460	C 7460	C 7460	C 7460	
							A RESTORE DOUBLE TRACK TO HOSKINS - UNDER CONSTRUCTION.											
							PART UNDER CONSTRUCTION											

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PASSENGER RAIL PROJECTS																		
STATEWIDE	VARIOUS	P-4700	RAILROAD STATION REHABILITATION PROJECTS.		6900	6900												
							IN PROGRESS											
STATEWIDE	VARIOUS	P-4404	SOUTHEAST HIGH SPEED RAIL CORRIDOR. UPDATE RAIL CROSSING INVENTORY FROM SOUTH CAROLINA STATE LINE TO THE VIRGINIA STATE LINE VIA RALEIGH AND CHARLOTTE AND THE APEX/CARY BYPASS SEGMENT.		150	150												
							IN PROGRESS											
STATEWIDE	VARIOUS	P-4001	RAIL INDUSTRIAL ACCESS PROGRAM.	0.0	19000	9000	T2001	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	
							IN PROGRESS											
STATEWIDE	VARIOUS	P-3814	CROSSING CONSOLIDATION PROJECTS AS IDENTIFIED IN SOUTH END SEHSRC TRAFFIC SEPARATION STUDY. RIGHT OF WAY TO BE ACQUIRED BY MUNICIPALITIES.	0.0	597	597												
							UNDER CONSTRUCTION											
STATEWIDE	VARIOUS	P-3419	SEALED CORRIDOR-SELECTED SEHSRC CROSSINGS. MEDIAN BARRIERS, ARTICULATED GATES, FOUR- QUADRANT GATES, WARNING DEVICE REVISIONS, SIGNAGE AND CAMERA SYSTEMS.	0.0	12307	12307												
							UNDER CONSTRUCTION											
STATEWIDE	VARIOUS	P-5003	SOUTHEASTERN NORTH CAROLINA PASSENGER RAIL SERVICE, RALEIGH TO WILMINGTON VIA FAYETTEVILLE.		132357	2356	T2001											C 130001
							RIGHT OF WAY IN PROGRESS											
STATEWIDE	VARIOUS	P-5004	SOUTHEASTERN NORTH CAROLINA PASSENGER RAIL SERVICE, RALEIGH TO WILMINGTON VIA GOLDSBORO.		192087	3086	T2001											C 189001
							RIGHT OF WAY IN PROGRESS											
STATEWIDE	VARIOUS	P-3418	PLANNING, MANAGEMENT AND RESEARCH STUDIES.	0.0	14367	6367	T2001	F 800	F 800	F 800	F 800	F 800	F 800	F 800	F 800	F 800	F 800	
							IN PROGRESS											
STATEWIDE	VARIOUS	P-3309	AT-GRADE CROSSING ELIMINATION AND IMPROVEMENT PROJECTS, CORRIDOR INVENTORIES AND STUDIES IN ALL FOURTEEN (14) DIVISIONS.	0.0	9452	6452	RR	C 150	C 150	C 150	C 150	C 150	C 150	C 150	C 150	C 150	C 150	
							T2001	C 150	C 150	C 150	C 150	C 150	C 150	C 150	C 150	C 150	C 150	
							IN PROGRESS											

Draft STIP

* INDICATES INTRASTATE PROJECT

COST AND SCHEDULES ARE PRELIMINARY AND SUBJECT TO SIGNIFICANT CHANGE AS MORE INFORMATION BECOMES AVAILABLE

STATEWIDE PROJECTS

FISCAL YEARS: TYPE OF WORK / ESTIMATED COST IN THOUSANDS / PROJECT BREAKS

STATE TRANSPORTATION IMPROVEMENT PROGRAM

COUNTY	ROUTE/CITY	ID NUMBER	LOCATION / DESCRIPTION	LENGTH	TOTAL PROJ COST (THOU)	PRIOR YEARS COST (THOU)	FUNDS	5 YEAR WORK PROGRAM FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	DEVELOPMENTAL PROGRAM FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	UNFUNDED FUTURE YEARS
PASSENGER RAIL PROJECTS																		
STATEWIDE	VARIOUS	P-3815	CROSSING CONSOLIDATION PROJECTS AS IDENTIFIED IN NEWTON-HICKORY-CONOVER MPO TRAFFIC SEPARATION STUDY.	0.0	1620	1620												
							UNDER CONSTRUCTION											
STATEWIDE	VARIOUS	Y-4100	HIGHWAY-RAIL CROSSINGS SAFETY IMPROVEMENTS AND INVENTORY PASSENGER ROUTES.		15384	5384	RR	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	
							UNDER CONSTRUCTION											
STATEWIDE	VARIOUS	Y-9999	HIGHWAY-RAIL CROSSING SAFETY IMPROVEMENTS, PASSENGER ROUTES.		13215	8315	RR	C 490	C 490	C 490	C 490	C 490	C 490	C 490	C 490	C 490	C 490	
							IN PROGRESS											
STATEWIDE	VARIOUS	Y-4415	HIGHWAY-RAIL CROSSING INVENTORY.		3075	2575	RR	C 50	C 50	C 50	C 50	C 50	C 50	C 50	C 50	C 50	C 50	
							IN PROGRESS											
STATEWIDE	VARIOUS	Y-4800	TRAFFIC SEPARATION STUDY IMPLEMENTATION AND CLOSURES.		17285	17285												
							IN PROGRESS											
STATEWIDE	VARIOUS	Z-4100	HIGHWAY-RAIL CROSSING SAFETY IMPROVEMENTS AND INVENTORY.		9000	9000												
							IN PROGRESS											
STATEWIDE	VARIOUS	Z-5200	HIGHWAY-RAIL GRADE CROSSING SAFETY IMPROVEMENTS.															
							IN PROGRESS											
STATEWIDE	VARIOUS	Z-9999	HIGHWAY-RAIL CROSSING SAFETY IMPROVEMENTS.		90511	25511	RR	C 6500	C 6500	C 6500	C 6500	C 6500	C 6500	C 6500	C 6500	C 6500	C 6500	
							IN PROGRESS											
STATEWIDE	CSX	P-5005	HIGH PRIORITY NORTH-SOUTH RAIL CORRIDOR OF THE FUTURE.		25975	950	STHSR PE 425 A											
							STHSR R 503 A											
							STHSR C 5326 A											
							STHSR PE 430 B											
							STHSR R 400 B											
							STHSR C 5941 B											
							T2001 C 4000											
							O C 8000											
							A PIEDMONT CORRIDOR - CSXT MP A 101.0 (ENFIELD CROSSING).											
							B PIEDMONT CORRIDOR - CSXT MP A 115.9 (ARMSTRONG CROSSING).											
STATEWIDE	NCRR	P-3414	TRAVEL TIME IMPROVEMENTS TO FREIGHT AND PASSENGER RAIL CORRIDORS BETWEEN RALEIGH AND CHARLOTTE AND MATCH FEDERAL FUNDS.	0.0	71500	61500	T2001	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	C 1000	
							IN PROGRESS											

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STATEWIDE PROJECTS

FISCAL YEARS: TYPE OF WORK / ESTIMATED COST IN THOUSANDS / PROJECT BREAKS

STATE TRANSPORTATION IMPROVEMENT PROGRAM

COUNTY	ROUTE/CITY	ID NUMBER	LOCATION / DESCRIPTION	LENGTH	TOTAL PROJ COST (THOU)	PRIOR YEARS COST (THOU)	FUNDS	5 YEAR WORK PROGRAM FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	DEVELOPMENTAL PROGRAM FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	UNFUNDED FUTURE YEARS
PASSENGER RAIL PROJECTS																		
STATEWIDE	NCRR-CSX	P-3819	FEDERALLY-DESIGNATED HIGH SPEED RAIL CORRIDOR BETWEEN CHARLOTTE AND VIRGINIA STATE LINE, ENVIRONMENTAL STUDY, PRELIMINARY ENGINEERING, RIGHT OF WAY, DESIGN AND CONSTRUCTION.	260.0	16894	8746	T2001	R 1695										
							O	R 3955										
							STHSR	PE 12 A	PE 12 A	PE 12 A								
							STHSR	R 5 A	R 11 A	R 11 A								
							STHSR	C 478 A	C 967 A	C 990 A								
							A FAIRGROUNDS CROSSING.											
							IN PROGRESS											
STATEWIDE	STATEWIDE	Z-5100	HIGHWAY-RAIL GRADE CROSSING SAFETY IMPROVEMENTS.															
							IN PROGRESS											
ROADSIDE ENVIRONMENTAL PROJECTS (REST AREA)																		
STATEWIDE	VARIOUS	K-4704	INTERSTATE REST AREA SYSTEM PRESERVATION. PAVEMENT, PAVEMENT MARKING, CURB AND GUTTER, SIDEWALKS AND OTHER REHABILITATION ITEMS.		6700	2700	IMPM	C 400	C 400	C 400	C 400	C 400	C 400	C 400	C 400	C 400	C 400	
							IN PROGRESS											
ROADSIDE ENVIRONMENTAL PROJECTS (SCENIC)																		
STATEWIDE	VARIOUS	L-1000	REPLACEMENT PLANTS AT SELECTED LOCATIONS WITHIN THE 14 HIGHWAY DIVISIONS. LANDSCAPE.	0.0	3303	2403	PLF	L 90	L 90	L 90	L 90	L 90	L 90	L 90	L 90	L 90	L 90	
							IN PROGRESS											
STATEWIDE	VARIOUS	L-2133	PLANTING OF PERENNIAL BULBS AND WILDFLOWERS WITHIN THE 14 HIGHWAY DIVISIONS. LANDSCAPE.	0.0	26960	15960	PLF	L 1100	L 1100	L 1100	L 1100	L 1100	L 1100	L 1100	L 1100	L 1100	L 1100	
							IN PROGRESS											
STATEWIDE	VARIOUS	L-2500	COLOR AND CANOPY AND TREE PLANTING.	0.0	5743	743	PLF	L 500	L 500	L 500	L 500	L 500	L 500	L 500	L 500	L 500	L 500	
							IN PROGRESS											
STATEWIDE	VARIOUS	S-5001	NORTH CAROLINA SCENIC BYWAYS LAND CONSERVATION INITIATIVE TO IMPLEMENT RESOURCE PROTECTION AND HERITAGE TOURISM DEVELOPMENT TO ENHANCE AND PRESERVE SCENIC VISTAS AND TOURISM CORRIDORS ALONG 26 OF NORTH CAROLINA'S SCENIC BYWAYS.		316	316												
							IN PROGRESS											

Draft STIP

* INDICATES INTRASTATE PROJECT

COST AND SCHEDULES ARE PRELIMINARY AND SUBJECT TO SIGNIFICANT CHANGE AS MORE INFORMATION BECOMES AVAILABLE

MEMORANDUM

To: Transportation Advisory Committee (TAC)
DCHC MPO

From: DCHC MPO Lead Planning Agency

Date: August 11, 2010

Subject: **Lead Planning Agency (LPA) Staff Report**

This memorandum provides a summary status of tasks for projects in the FY 2010-2011 Unified Planning Work Program.

- • Indicates that task is complete.
- ✓ Indicates that task is ongoing or not complete.

2010-2011 Unified Planning Work Program (UPWP) – Projects

Comprehensive Transportation Plan (CTP)

- Draft CTP – December 2010/January 2011 – Depends on NCDOT Schedule
- Public Input
- Recommended CTP
- Adopted CTP
- Technical report and implementation

NC 54/I-40 Corridor/Sub-Area Study

- ✓ Staff study initiation meeting
- ✓ Draft scope of services
- ✓ Agency review of scope and time
- ✓ Request for Proposal notice – October 2008
- ✓ Proposal due January 2009
- ✓ Consultant selected
- ✓ Contract negotiation underway
- ✓ Council contract approval May 18, 2009
- ✓ Notice to Proceed – June 2009
- ✓ Kickoff Meeting – July 2009
- ✓ Public Outreach Plan – August 2009
- ✓ Prepare Corridor / Subarea Community Profile – Dec 2009
  - ▪ Public Workshop #1 – Fall 2009
- ✓ Development and Evaluation of Scenarios – Apr 2010
  - ▪ Public Workshop #2 – Feb 25, 2010
- ✓ Transportation/Land Use Master Plan – June 2010
  - ▪ Public Workshop #3 – May 11, 2010

- ✓ Documentation and Final Presentation – June 2010
- Local agency review - ongoing
- Study completion – March 2011

Commercial Vehicle/Freight Survey (TRM Service Bureau Project)

- ✓ Pilot study
- ✓ Obtain DMV records
- ✓ Finalize sample plan
- ✓ Begin survey mail out – Jan 2010
- ✓ Surveyor Training – Jan 2010
- ✓ Survey Data Collection – Jan through March 2010
- ✓ Data Processing/Geocoding – June 2010
- ✓ Weighting and Expansion – June 2010
- ✓ Analysis/Draft Report – June 2010
- Final Report/Draft Dataset – December 2010

GIS/Data Integration and Automation

- ✓ Phase I in progress
- ✓ Initial Kick of meeting and scan completed
- ✓ Initiation Workshop report completed
- ✓ Draft Requirement Assessment & Application Development Report - October 2008
- ✓ Needs Assessment Workshop
- ✓ Final Draft Needs Assessment Report
- ✓ Application Development Plan – Sept 09
- ✓ Application Plan/Algorithm for CMP – complete
- ✓ Application Plan/Algorithm for LRTP Tool – Oct 2009
- ✓ Application Plan/Algorithm for SE Data Tool – Oct 2009
- ✓ Supporting Hardware/Software Recommendation – complete
- ✓ Functional capability for TELUDE – Nov 2009
- ✓ Database Design – Feb 2010
- ✓ Database Design Document – Feb 2010
- ✓ Strategic Planning Document – Feb 2010
- TELUDE User's Handbook v1 – August 2010
- Hands-on Training – August 2010
- TELUDE Test and Evaluation Manual – August 2010
- Project Completion – August 2010

Land-use Model Development

- ✓ Multi-year project in progress
- ✓ Review of existing data and need/requirement analysis completed
- ✓ Land use data collection completed
- ✓ Development of Model specification Completed
- ✓ Model architecture and design completed
- ✓ Zone level model for Triangle Region v1
    - ✓ Database completion – Aug 09
    - ✓ Initial model estimation – Sept 09

- ✓ Initial calibration – Oct 09
- ✓ 2035 model run – Jan 2010
- ✓ Installation and documentation – Feb 2010

- Parcel level model for DCHC
  - Initial database – TBD
  - Initial model estimation – TBD
  - Initial calibration – TBD

Non-Motorized Model Development

- ✓ Phase 1 completed.
- ✓ Phase 2 underway
- ✓ Update and enhancement of Generation Choice Models – Sept 2009
- ✓ Development of improved Model Choice model – Jan 2010
- ✓ Revision and revalidation of Destination choice models – June 2010
- ✓ Prepare and implement new TransCAD routines to implement new models – June 2010
- Documentation, User's manual, and training – August 2010
- Project completion date anticipated in August 2010

MPO Collector Street Plan

- ✓ Supplemental Agreement with Kimley Horn and Associates
- ✓ Data collection underway
- ✓ Coordination with partner agencies to classify roads and identify collector streets
- Public review (with Comprehensive Transportation Plan in late 2010 or early 2011)
- Completion of study and integration with related plans and review processes

MPO Parking Survey and Study (postponed)

- Parking model specification
- Regional Coordination and planning
- Draft scope of services
- Request for Proposal notice
- Consultant selection
- Council contract approval
- Project commences

TAC 8/11/2010 Attachment 16

Contract Number:	C200840	**Route:**	NC-54
Physical Division:	5	**County:**	Durham
Administrative Division:	5	**TIP Number:**	R-2904, U-4026
Length:	6.363 miles	**Federal Aid Number:**	STP-54(5)
Resident Engineer:	Jeffrey D. Allen, PE	**RE Phone Number:**	(919)733-9499
Location Description:	NC-54 FROM SR-1999 IN DURHAM CO TO SR-1959 IN DURHAM CO & SR-1999 FROM SR-3014 IN WAKE CO TO NC-54 IN DURHAM CO.		
Type of Work:	WIDENING, GRADING, DRAINAGE, PAVING, SIGNALS & CULVERTS.		
Contractor Name:	FSC II LLC DBA FRED SMITH COMPANY		
Contract Amount:	$35,467,891.08	**Cost Overrun/Underrun:**	5.7%
Availability Date:	2/5/2007	**Letting Date:**	12/19/2006
Completion Date:	11/1/2009	**Work Began:**	2/19/2007
Revised Completion Date:	12/28/2009	**Estimated Completion:**	7/7/2010
Last Estimate Thru:	5/31/2010	**Scheduled Progress:**	100%
Last Estimate Paid:	6/8/2010	**Actual Progress:**	99.84%

Contract Number:	C201487	**Route:**	US-15
Physical Division:	5	**County:**	Durham
Administrative Division:	5	**TIP Number:**	B-3450, U-4009, U-4012
Length:	1.769 miles	**Federal Aid Number:**	BRSTP-1116(6)
Resident Engineer:	Chad D. Hinnant	**RE Phone Number:**	(919)220-4680
Location Description:	BRIDGES OVER SANDY CRK & TRIBUTARY & APPROACHES ON SR-1116, SR-1126 NEAR US-15/501 & SR-1116, US-15/501 AT MT MORIAH RD.		
Type of Work:	GRADING, DRAINAGE, PAVING, SIGNALS, AND STRUCTURES.		
Contractor Name:	DLB, INC DBA DLB INC (OF VA)		
Contract Amount:	$18,810,912.36	**Cost Overrun/Underrun:**	4.63%
Availability Date:	10/1/2007	**Letting Date:**	8/21/2007
Completion Date:	8/1/2010	**Work Began:**	10/1/2007
Revised Completion Date:	8/3/2010	**Estimated Completion:**	10/31/2010
Last Estimate Thru:	6/30/2010	**Scheduled Progress:**	94.5%
Last Estimate Paid:	7/26/2010	**Actual Progress:**	82.53%

Contract Number:	C201994	**Route:**	NC-147
Physical Division:	5	**County:**	Durham
Administrative Division:	15	**TIP Number:**	U-4763B
Length:	4.2 miles	**Federal Aid Number:**	TIFIA-540(2)
Resident Engineer:	D. Brian Harrington, PE	**RE Phone Number:**	(919)836-4873
Location Description:	TRIANGLE PARKWAY FROM NC-540 IN WAKE CO TO I-40 IN DURHAM CO		
Type of Work:	GRADING, DRAINAGE, PAVING, SIGNALS, TOLL FACILITIES & STRS.		
Contractor Name:	S. T. WOOTEN CORPORATION		
Contract Amount:	$137,446,000.00	**Cost Overrun/Underrun:**	
Availability Date:	9/19/2008	**Letting Date:**	8/5/2008
Completion Date:	7/1/2011	**Work Began:**	8/3/2009
Revised Completion Date:		**Estimated Completion:**	
Last Estimate Thru:		**Scheduled Progress:**	
Last Estimate Paid:		**Actual Progress:**	

Contract Number:	C202064	**Route:**	SR-2028
Physical Division:	5	**County:**	Durham
Administrative Division:	5	**TIP Number:**	U-3309A
Length:	1.165 miles	**Federal Aid Number:**	STP-2028(4)
Resident Engineer:	Cadmus Capehart, PE	**RE Phone Number:**	(919)840-0914
Location Description:	SR-2028 (TW ALEXANDER DR) FROM CORNWALLIS RD TO EAST OF NC-147 IN DURHAM.		
Type of Work:	WIDENING, GRADING, DRAINAGE, PAVING & SIGNALS.		
Contractor Name:	THOMPSON CONTRACTING GRADING PAVING & UTILITIES INC		
Contract Amount:	$6,502,648.68	**Cost Overrun/Underrun:**	0.12%
Availability Date:	2/1/2010	**Letting Date:**	12/15/2009
Completion Date:	8/15/2011	**Work Began:**	2/8/2010
Revised Completion Date:		**Estimated Completion:**	8/15/2011
Last Estimate Thru:	6/30/2010	**Scheduled Progress:**	14.4%
Last Estimate Paid:	7/20/2010	**Actual Progress:**	20%

Contract Number:	C202277	**Route:**	I-40
Physical Division:	5	**County:**	Durham
Administrative Division:	5	**TIP Number:**	R-2000AF, R-5164B
Length:	3.56 miles	**Federal Aid Number:**	STM-540(15)
Resident Engineer:	Jeffrey D. Allen, PE	**RE Phone Number:**	(919)733-9499

Location Description: NORTHERN WAKE FREEWAY INTERCHANGE IMPROVEMENTS AT I-540 AND I-40, AND I-40 FROM NC-147 TO EAST OF I-540.
Type of Work: WIDENING, GRADING, DRAINAGE, MILLING, PAVING, & STRUCTURE .
Contractor Name: FSC II LLC DBA FRED SMITH COMPANY
Contract Amount: $7,577,355.48 **Cost Overrun/Underrun:** 0.74%
Availability Date: 3/1/2010 **Letting Date:** 1/19/2010
Completion Date: 12/31/2010 **Work Began:** 4/1/2010
Revised Completion Date: 1/7/2011 **Estimated Completion:** 12/31/2010
Last Estimate Thru: 7/7/2010 **Scheduled Progress:** 34%
Last Estimate Paid: 7/13/2010 **Actual Progress:** 23.69%

Contract Number: C202408 **Route:** US-501
Physical Division: 5 **County:** Durham
Administrative Division: 5 **TIP Number:**
Length: 18.15 miles **Federal Aid Number:**
Resident Engineer: Chad D. Hinnant **RE Phone Number:** (919)220-4680
Location Description: US-501 BUS FROM SOUTH OF SR-1669 (CLUB BLVD) TO SR-1443 (HORTON RD) AND 8 SECTIONS OF SECONDARY ROADS.
Type of Work: MILLING, RESURFACING & SHOULDER RECONSTRUCTION.
Contractor Name: FSC II LLC DBA FRED SMITH COMPANY
Contract Amount: $2,694,654.51 **Cost Overrun/Underrun:** 9.68%
Availability Date: 10/5/2009 **Letting Date:** 8/18/2009
Completion Date: 6/11/2010 **Work Began:** 4/5/2010
Revised Completion Date: **Estimated Completion:** 8/15/2010
Last Estimate Thru: 7/15/2010 **Scheduled Progress:** 100%
Last Estimate Paid: 8/2/2010 **Actual Progress:** 97.15%

Contract Number: C202493 **Route:** I-85
Physical Division: 5 **County:** Durham
Administrative Division: 5 **TIP Number:** R-5164A
Length: 9.6 miles **Federal Aid Number:** STM-085-4(114)171
Resident Engineer: Cadmus Capehart, PE **RE Phone Number:** (919)840-0914
Location Description: 1 SECTION OF I-85, 1 SECTION OF US-15/501, AND 1 SECTION OF NC-147.
Type of Work: MILLING, RESURFACING & MILLED RUMBLE STRIPS.
Contractor Name: REA CONTRACTING A DIVISION OF THE LANE CONSTRUCTION CORPORAT
Contract Amount: $6,088,736.11 **Cost Overrun/Underrun:**
Availability Date: 3/15/2010 **Letting Date:** 1/19/2010
Completion Date: 12/16/2010 **Work Began:**
Revised Completion Date: **Estimated Completion:**
Last Estimate Thru: **Scheduled Progress:**
Last Estimate Paid: **Actual Progress:**

Contract Number: C202496 **Route:** US-15501
Physical Division: 5 **County:** Durham
Administrative Division: 5 **TIP Number:** R-5164C
Length: 2.9 miles **Federal Aid Number:** STM-0015(30)
Resident Engineer: Chad D. Hinnant **RE Phone Number:** (919)220-4680
Location Description: 3 SECTIONS OF US-15/501 BUS AND 3 SECTIONS OF SECONDARY ROADS.
Type of Work: MILLING & RESURFACING.
Contractor Name: REA CONTRACTING A DIVISION OF THE LANE CONSTRUCTION CORPORAT
Contract Amount: $861,556.72 **Cost Overrun/Underrun:** 0%
Availability Date: 5/19/2010 **Letting Date:** 1/19/2010
Completion Date: 9/15/2010 **Work Began:** 5/19/2010
Revised Completion Date: **Estimated Completion:** 9/15/2010
Last Estimate Thru: 7/7/2010 **Scheduled Progress:** 98.4%
Last Estimate Paid: **Actual Progress:** 19.79%

Contract Number: C202538 **Route:** NC-55, NC-751, SR-1118 SR-1357, SR-1404, SR-1615 SR-1641, SR-1646, SR-1656 SR-1670, SR-1671, SR-1901 SR-1954, SR-1955, SR-1981 US-70
Physical Division: 5 **County:** Durham
Administrative Division: 5 **TIP Number:**
Length: 22.96 miles **Federal Aid Number:**
Resident Engineer: Cadmus Capehart, PE **RE Phone Number:** (919)840-0914
Location Description: 1 SECTION OF US-70, 1 SECTION OF NC-55, 1 SECTION OF NC-751 & 13 SECTIONS OF SECONDARY ROADS.

Type of Work: MILLING, RESURFACING & SHOULDER RECONSTRUCTION.
Contractor Name: TRIANGLE GRADING & PAVING, INC
Contract Amount: $4,474,348.51 **Cost Overrun/Underrun:** 0%
Availability Date: 3/15/2010 **Letting Date:** 1/19/2010
Completion Date: 12/16/2010 **Work Began:** 4/5/2010
Revised Completion Date: **Estimated Completion:** 12/16/2010
Last Estimate Thru: 7/22/2010 **Scheduled Progress:** 34.5%
Last Estimate Paid: 7/27/2010 **Actual Progress:** 13.81%

Contract Number: DO00031 **Route:** NC-147
Physical Division: 5 **County:** Durham
Administrative Division: 5 **TIP Number:** B-4700AD
Length: 0 miles **Federal Aid Number:** BRNHS-000S(370)
Resident Engineer: Chad D. Hinnant **RE Phone Number:** (919)220-4680
Location Description: BRIDGES #160, 163, 144, 138, AND 140 ON NC-147.
Type of Work: BRIDGE PAINTING.
Contractor Name: SAFFO CONTRACTORS INC
Contract Amount: $782,555.00 **Cost Overrun/Underrun:**
Availability Date: 5/3/2010 **Letting Date:** 3/18/2010
Completion Date: 9/14/2010 **Work Began:** 6/15/2010
Revised Completion Date: **Estimated Completion:**
Last Estimate Thru: **Scheduled Progress:**
Last Estimate Paid: **Actual Progress:**

Contract Number: DO00050 **Route:** NC-147
Physical Division: 5 **County:** Durham
Administrative Division: 5 **TIP Number:** B-4700AC
Length: 0 miles **Federal Aid Number:** BRNHS-000S(370)
Resident Engineer: Chad D. Hinnant **RE Phone Number:** (919)220-4680
Location Description: BRIDGES #71 ON US-15/501, 191, 192, 177, 180, 173, 175, 164, & 166 ON NC-147.
Type of Work: BRIDGE PAINTING.
Contractor Name: SAFFO CONTRACTORS INC
Contract Amount: $792,555.00 **Cost Overrun/Underrun:**
Availability Date: 5/3/2010 **Letting Date:** 3/18/2010
Completion Date: 9/14/2010 **Work Began:** 7/26/2010
Revised Completion Date: **Estimated Completion:**
Last Estimate Thru: **Scheduled Progress:**
Last Estimate Paid: **Actual Progress:**

ACTIVE NCDOT PROJECTS LOCATED IN ORANGE COUNTY - DCHC MPO
ARRA

County	WBS #	Route	Location Description	Amount	Status
Orange	B-5191A	Various	Repairs to Bridge expansion joints (Bridge #6 on US 70 Bus. over the Eno River)	$40,000	ARRA- Applied Polymerics, Inc.- compl. 1/28/10; final invoice paid 7/13/10
Orange	EL-4601	Morgan Creek Greenway	Construct Greenway	$940,000	ARRA- Sullivan Eastern =16.5% compl.Invoice #1 reimbursed 5/18/10; Inv. #2 app. for reimbursement
Orange	EL-5103	Carrboro	Construct bus shelters at 4 locations	$48,296	ARRA- WC Construction =**100% compl.;** M.A. compl. 7/14/10-**revised to 9/14/10**
Orange	ER-5100 GE	US 15-501@ SR 1734 (Erwin Rd./Europa Dr.)	Plantings	$65,000	ARRA -Plymouth Nursery and Landscaping **=**planting compl.; warranty period underway
Orange	I-5138	I-85	Mill, resurface, and overlay from I-85/I-40 split to Bridge over SR 1006 (Orange Grove Rd.)	$2.0 million	ARRA-Rea Contracting, LLC; Night work- =**100% compl.-rev. compl. 7/30/10**
Orange	R-5178A	NC 57	Widen for two foot paved shoulders and resurface from NC 86 to SR 1544 (Pearson Road)	$1.0 million	ARRA-Riley Paving, Inc.; work began 6/2/10; **90.65% compl.**
Orange	R-5178B	NC 86 (S. Columbia St.) from SR 1010 (Franklin St.) to Cameron Ave.	Mill, resurface, and replace curband gutter	$200,000.00	ARRA-Eastern Services, LLC dba Raleigh Paving- work has not begun
Orange	TA-5117		Two 28' light transit vehicles w/ wheelchair lift	$183,200.00	ARRA-funds flexed to FTA; Buses ordered by Chapel Hill Transit for delivery in Summer 2010 & then leased to Orange Co.
Orange	U-3100B	SR 1107 (Old Fayetteville Rd.) from NC 54 to SR 1106 (Stroud Lane)	Safety Improvements (Bicycle, Pedestrian, and Transit Accommodations)	$1.8 million	ARRA-Atwell Const. Co., Inc., Greenville, NC= **30.6% compl.**
Orange	**U-3306 34913.3.ST1 STM-1733 (16)**	**SR 1733 (Weaver Dairy Rd.) from NC 86 to Old Sterling Road**	**Grading, drainage, paving, signals, curb and gutter, retaining wall**	**$13.4 million**	**Yates Construction Co., Inc. to be compl. by 6/15/13**

ACTIVE NCDOT PROJECTS LOCATED IN ORANGE COUNTY - DCHC MPO
ARRA

Orange	U-4704	Chapel Hill-Carrboro	Computerized Traffic Signal System	$5.175 million	ARRA-Brooks Berry Haynie & Assoc., Inc.; Mableton, Ga. **=10.75% compl.-** additional contractor forces have been employed after meeting with NCDOT
Orange	U-4726 DA	Carrboro	Construct sidewalk on Ashe St. from W. Main St. to Shelton St.	$284,176.00	ARRA- Centurion Construction Co.=**94% compl.** ; reimbursement #1 on 6/15/10; M.A. compl. 7/2/10-**rev. to 9/2/10**
Orange	U-4726 DB	Carrboro	Construct sidewalk on Bim St. from SR 1005 (Jones Ferry Rd.) to Fidelity St.	Combined w/ U-4726 DA	ARRA-Centurion Construction Co; **=94% compl**.;reimbursement #1 on 6/15/10;; M.A. compl. 7/2/10-**rev. to 9/2/10**
Orange	U-4726 GA	Twin Creeks Park Greenway	Linear park: 10' multi-use asphalt trail including bridge over Jones Creek	$429,457.00	ARRA- McQueen Construction **=32.54% compl.**;approval for bridge design pending revisions; M.A. compl. 1/16/11
Orange	U-4726 IA	Chapel Hill	ADA ramps at selected locations	$53,924.00	ARRA- Econ International **=100% compl.;** M.A. compl. 7/16/10-**rev. to 8/31/10**
Orange	U-4726 IB	Chapel Hill	Raised crosswalks/traffic calming	$65,189.00	ARRA -Turner Asphalt **=100% compl.**; M.A. compl. 7/16/10-**rev. to 8/31/10**
Orange	U-4726 IC	Chapel Hill	Pedestrian safety improvements (refuge islands @ 7 locations)	$370,014.80	ARRA-Econ International=**100% compl.**-M.A. compl. 7/16/10-**rev. to 8/31/10**
Orange	U-4726 ID	Chapel Hill	Install in-street pedestrian lighting	$0.00	ARRA-Project voided by request of Town; funds redistributed to other Town projects

ACTIVE NCDOT PROJECTS LOCATED IN ORANGE COUNTY - DCHC MPO
ARRA

Orange	U-4726 IE	Chapel Hill	Sidewalk construction on US 15-501/NC54 from SR 1902 (Manning Dr.) to Old Mason Farm Rd.	$142,613.00	ARRA- Holmes Contracting**=100% compl. -** Supplemental construction agreement to be paid by Town; Final insp. held 4/30/10; Final 5/27/10; M.A. compl. 7/16/10-**rev. to 8/31/10**
Orange	U-4726 JA	Hillsborough	Construct sidewalks	$1,034,110.00	ARRA, STP-DA, & Contingency - S.T. Wooten Corp.=**21.06% compl.**; Inv. #1 reimbursement on 6/3/10; **Inv. #2 app. for reimbursement**; M.A. compl. 7/24/11-**rev. to 9/17/11**
NCDOT PROJECTS CURRENTLY IN 12 MONTH LETTNG LIST					
County	**TIP #**	**Route**	**Location Description**	**TIP Est.**	**Est. Let Date**

ACTIVE NCDOT PROJECTS LOCATED IN ORANGE COUNTY - DCHC MPO

County	WBS #	Route	Location Description	Amount	Status
Orange	36945	SR 1010 (Franklin St.) @ Mallette St.	Upgrade traffic signal and install pedestrian signal heads REVISION: Install mast arm	$110,000.00	Spending Authority FY '10-'11
Orange	41593	Union Street	Construct 750 feet of sidewalk and a crosswalk to connect Hillsborough Elementary School to SR 1156 (Nash St.)	$32,000 (Statewide Contingency)	See U-4726 JA
Orange	42501	US 15/501/NC54 (Fordham Blvd.) at SR 1900 (Old Mason Farm Rd.)	Construct bus pulloffs on both sides	$140,000	Design underway by District-**F.A. const. to begin after U-4726 IE and M.A. with UNC/Town for crosswalks, WCR, & ped heads is complete**
Orange	42502	SR 1010 (Franklin St.) between Hillsborough St. and Plant Rd.	Replace deteriorated curb and gutter at several locations on both sides	$30,000	Municipal Agreement sent to Town for execution 3/9/10; Const. FY '10-'11
Orange	**43030**	**SR 1843 (Seawell School Rd.)**	**Safety improvements near railroad crossing #736157R (signing, tree removal, grading for visibility, paved shoulders, wedging, short overlay & snow-plowable pavement markers)**	**$45,000**	**F.A. construction**
Orange	7CR.10681.16 7CR.20681.16	NC 54 **from 560' west of Greenwood Dr. to County line** and 11 sections of secondary roads	Milling, resurfacing and shoulder reconstruction	$3.028 million	S.T. Wooten Corp. = 54.2% compl.
Orange	B-4216	SR 1002 (St. Mary's Road)	Replacement of Bridge # 66 over Stroud's Creek	$800,000	Dane Const. Inc.= **55.92% compl.**
Orange	I-4716	I-40	Grind and reseal joints on I-40 from I-85 to Durham Co. (Patching spalls, Diamond grinding and slab repair added)	$7.4 million	Safety Grooving & Grinding, L.P., Napolean, Ohio - =**25.75% compl.**
Orange	I-5142	I-85/I-40	Mill, resurface and install pavement markers and rumble strips from west of SR 1114(Buckhorn Road) to the I-85/I-40 interchange	$8.60 million	C.C. Mangum Co., LLC; pre-con 6/7/10; **will begin work 8/9/10** and compl. all lanes in one direction by Dec.-lanes in other direction will be compl. by 7/15/11

ACTIVE NCDOT PROJECTS LOCATED IN ORANGE COUNTY - DCHC MPO

Orange	42170 SS-4907 T 42204.2 42204.1	SR 1710 (Old NC 10) @ NC 86	Construct a right turn lane on SR 1710 and install a traffic signal	$215,000	JP env. field review-4/21/10; DPOC pending signal design ; **R/W compl.-final utility & signal meeting 7/30/10**
Orange	42171 SS-4907 U 42205.2 42205.1	SR 1710 (Old NC 10) @ SR 1713 (Mt. Herman Church Road)	Improve sight distance on SR 1710 by lowering the crest vertical curve on the westbound approach to the intersection	$300,000	Design underway; Const. FY '10-'11
Orange	42423.3 42423.1 SS -4907V	SR 1005 (Old Greensboro Rd.) @ SR 1951 (White Cross Rd.)	Realign intersection	$165,000	Survey compl.& Design pending; Const. FY '10-'11; flasher has been installed by separate project
NCDOT PROJECTS CURRENTLY IN 12 MONTH LETTNG LIST					
County	**TIP #**	**Route**	**Location Description**	**TIP Est.**	**Est. Let Date**
Orange	U-0624	NC 86 (S. Columbia St.)	Corridor upgrade including Bicycle lanes from SR 1906 (Purefoy Rd.) to SR 1902 (Manning Dr.)	$4.30 million	Nov. 16, 2011

TARPO TCC/TAC Meeting
Division 8 Project Report

8/4/2010

COUNTY	WBS #	ROUTE	DESCRIPTION	TOTAL FUNDING ALLOCATION	CONTRACT BID AMOUNT	STATUS	MAP
Chatham	41700 SF-4908J	NC 751	Install protected permitted traffic signal and left turn lane at intersection of NC 751 and SR 1731 (O'Kelly Church Road)	PE: $10,000 ROW: $58,214.50 Const: $523,000.00	$301,260.69	S.T. Wooten Corp began work on 3/16/10 and is currently at 84.6% complete; Scheduled completion date is 4/30/10; Claim pending, probable time extension. **Economic Stimulus Project**	
Chatham	8CR.20191.12	8 sections of secondary roads	Contract resurfacing	$2,600,000.00	$2,641,575.45	Awarded to Riley Paving, Inc.; Available 11/30/09; Scheduled completion 8/13/10	
Chatham	42221	NC 87 from south of SR 1516 to north of SR 1516	Construct eliptical roundabout near CCCC in Pittsboro	$375,000.00	$584,478.20	Sanford Contractors, Inc began work on 4/19/10; Currently at 55.2% complete; Scheduled completion date is 8/13/10; **Economic Stimulus Project**	
Chatham	36268 U-4726FA & 45067 ER-5100HA	US 15-501 from Cole Park Plaza to Orange County	Install pedestrian facilities (sidewalk) & Streetscaping/Landscaping	U-4726FA PE: $22,000.00 Const: $198,000.00 ER-5100HA PE: $2,525.00 Const: $22,730.00	$144,614.00	Chatham County Municipal Agreement; Letting scheduled for 12/3/09; Awarded to White Oak Construction Corp; Availability Date is 1/5/10; Scheduled completion is 6/15/10; **Economic Stimulus Project; Complete, accepted 4/30/10**	
Chatham	41848.3 SS-4908K	US 64 and SR 2229 (Treatment Plant Road)/SR 1363 (Pearlman Teague Road)	Island construction and improvements to accommodate U-turns	PE: $28,708.28 ROW: $11,000.00 CONST: $346,600.00		Let on 5/27/10; Awarded to S.T. Wooten Corp.; Availability date is 6/28/10: Scheduled completion date is October 29, 2010	
Chatham	33710.3.1 B-4459	NC 42	Structure replacement of #56 over Buckhorn Creek and approaches	PE: $76,000.00 ROW: $55,000.00 CONST: $1,600,000.00	$1,307,174.12	Awarded to APAC-Thompson Arthur; Scheduled to begin work on 8/5/10; Scheduled completion date is 12/31/11.	Map
Chatham	8CR.10191.14	US 1 from the Lee Co. line to Wake County and 3 sect of Secondary Roads	Contract Resurfacing	$2,900,000.00		Letting scheduled for 8/17/10	

Board delays decision on Smith Level Road

Jun 3, 2010 • Posted in: News, Top Story • 0 Comments

By Kirk Ross
Carrboro Citizen Staff Writer

Carrboro – The Carrboro Board of Aldermen held off on making a final decision on the latest proposal for Smith Level Road, sending a series of questions on to state Department of Transportation officials for response.

At its meeting Tuesday night at Town Hall, the board approved seeking clarification on five concerns raised by board members and another nine points raised by the town's Transportation Advisory Board.

Major items the two boards want feedback on include:

• the necessity for a median along the stretch from BPW Club Road to the Morgan Creek bridge;

• the extent of clearing along the right-of-way;

• where sidewalks should be located near the Rock Haven intersection;

• alternatives to prevent a left turn out of Willow Oak Lane and;

• signals and crosswalks at intersections.

The board also asked town planners to contact UNC's Highway Safety Center for advice on the project and the cost of conducting a separate bicycle and pedestrian safety study.

The questions came after another round of comments from residents.

Terri Buckner, who helped lead the Smith Level Road Task Force, said the plan for the road was close, but needed further refinement in order to be acceptable. She encouraged the board and the DOT to give a lot of thought to how students will use the new sidewalks. Students, she said, may not abide by engineering studies.

The major sticking point in the plan is the road's width. Although the plan calls for a two-lane road with a median from BPW Club Road to the Morgan Creek bridge, it also includes acquiring enough right-of-way from BPW Club Road to the Morgan Creek bridge to enable the eventual construction of a four-lane divided road.

Although DOT officials have said they would not widen the road unless the town requested it, residents in the area are uneasy about the potential for a wider road under the deal worked out earlier this year.

Transportation Advisory Board chair Charlie Hileman urged the board to find a way to make the new plan work, calling the current situation on Smith Level Road terrible for bicyclists and pedestrians.

"There are things in here we don't like," he said of the design, "but if we're going to get it done we're going to have to work with DOT.

Heidi Perry, who has served in several capacities on town transportation boards, said the current situation on Smith Level has led many to give up on using it for alternative transportation. She said she would like to see the town and DOT come to an agreement, but also has reservations about the extent of the footprint.

The board is expected to take up the matter again in September.

In other action Tuesday night, the board approved adding an area near the Eubanks Road landfill to the county's no-fault well-replacement policy.

The board also set a public hearing on pedestrian- and bicycle-access alternatives in the Estes Drive area for its June 22 meeting. The meeting begins at 7:30 p.m. at Town Hall.

Local officials please mobility fund in N.C. budget draft

06.06.10 - 06:01 pm

By Ray Gronberg

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DURHAM -- Local officials are pleased that N.C. House members included in their draft of the state's fiscal 2010-11 budget a version of the "mobility fund" Gov. Beverly Perdue wants to set up to underwrite major road and transit projects.

House members would seed the fund with $160 million over the coming four fiscal years, drawing it in part from an existing and so-far untapped subsidy for toll-road construction.

As Perdue asked, they've assigned first dibs on the money to the planned replacement of Interstate 85's Yadkin River bridge at the border of Rowan and Davidson counties. But the House didn't go along with Perdue's request for vehicle-fee increases to help pay for it.

Local officials were happy because the budget bill includes a provision that says that once the N.C. Department of Transportation finishes the Yadkin bridge, major transit projects that would qualify for state construction subsidies should receive preferential consideration for a share of the fund.

Especially with that stipulation, "it's encouraging it's back in," said Mayor Bill Bell, who said he has asked city administrators to pass the word to Durham's legislative delegation that he'd like to see the mobility fund receive "strong consideration" as the budget moves to a House/Senate conference.

Bell, who chairs the N.C. Metropolitan Mayors Coalition, added that he and other city-government leaders around the state also want legislators to get behind Perdue's request for mobility-fund earmarks for repairs to interstates and in-town roads.

Lobbying is necessary because the N.C. Senate's initial draft of the budget didn't include the mobility fund. Bell's group and business interests have been helping Perdue and DOT push for the measure.

Triangle Transit General Manager David King joined Bell in praising the House decision.

"It's a great thing, but not just for transit," King said, noting that the key feature of Perdue's initiative is that the new fund would bypass the "equity formula" that has divvied up road money among urban and rural regions since the late 1980s.

Critics of the formula say it has shortchanged congestion-plagued urban areas, while making it all but impossible for DOT to finance major, high-cost initiatives like the Yadkin bridge replacement in rural areas without shutting down other transportation projects in them for several years.

"The equity formula was a very noble attempt to make sure everybody felt they were getting their fair share," King said. "But there are roads and projects that supercede everything."

The Yadkin bridge -- a key link on the highway that connects Washington, D.C., with Atlanta -- had become the poster child for the equity formula's deficiencies, he said.

It's "obviously a high-priority project," King said. "The inability to do that within the equity formula is just jarring in this day and age."

But the House's move didn't come without controversy. Supporters of the mobility fund had to fend off an amendment by state Rep. Ric Killian, R-Mecklenburg, that would have shut it down after completion of the Yadkin bridge or on July 1, 2014, whichever came first.

The Killian amendment fell by a vote of 81-34 against. All but two of the Democrats who voted wanted to keep the fund going post-Yadkin. Republicans were split. Most lined up behind Killian, but House Minority Leader Paul Stam, D-Wake, and 17 other GOP members joined Democrats in voting against establishing a sunset date for the fund.

Basnight says Senate will accept House plan for Mobility Fund -- more or less

Submitted by N&O's BruceSiceloff on 06/10/2010 - 17:42

It wasn't in the Senate's proposed budget, but Senate leaders probably will agree on some version of Gov. Bev Perdue's N.C. Mobility Fund when they work out a budget deal with the House, Senate leader Marc Basnight says.

Perdue wanted $94.6 million, mostly from DMV fee hikes, to inaugurate her proposed new fund for major statewide transportation needs. The Senate budget made no mention of the Mobility Fund (Basnight says Senate leaders had planned instead to make it the subject of separate legislation).

The House budget would set aside $70 million to start the Mobility Fund, with $39 million in unspent turnpike funds and a $31 million slice of the yearly transfer from the Highway Trust Fund to the General Fund.

"There will be a change in that," Basnight said in an interview today. "They [the House] did something that was surprising. The Mid-Currituck bridge, one of the original toll projects, they took the money from that and moved it somewhere. That will not be acceptable at all."

However much money the legislature sets aside for the Mobility Fund, and wherever that money comes from, it still seems to be agreed that the first use of it will be to widen Interstate 85 for about six miles just north of the Yadkin River bridge near Salisbury.

After that, we'll see.

Read more: http://blogs.newsobserver.com/crosstown/basnight-says-senate-will-accept-house-plan-for-mobility-fund-more-or-less#ixzz0qYcq3IrV

State budget gives ferries a $11.3M boost and cuts $4.4M from road maintenance

Submitted by N&O's BruceSiceloff on 06/29/2010 - 12:48

Sharply increased spending in the state Ferry Division will eat up an extra $11.3 million from the state Highway Fund, according to a new state budget moving toward approval in the legislature today - and the state Department of Transportation will have to cut road maintenance spending by $4.4 million.

The 2010-2011 budget proposed by House and Senate conferees also will:

* Set aside just $46 million to inaugurate the N.C. Mobility Fund proposed by Gov. Bev Perdue, who had sought nearly $100 million. The fund is supposed to pay for big statewide transportation projects, but it will take several years to produce enough money for its first priority, a $150 million widening project on Interstate 85 north of the Yadkin River bridge at Salisbury.

Perdue had proposed $75 million in increased motor vehicle registration fees to help launch the Mobility Fund. Legislators nixed the DMV fee hikes but agreed to create the Mobility Fund with some of the money that otherwise would be transferred each year from the Highway Trust Fund to the state's General Fund.

* Create two more exemptions to the so-called "equity formula" for distributing state and federal road-building money across the state.

Federal grants for the Appalachian Development Highway System now will be spent only in the mountain counties for which they are intended, instead of being shared with other counties across the state.

Also, along with the N.C. Mobility Fund project to widen I-85 near the Yadkin Bridge, the budget will exempt a related $150 million project getting under way this year to widen the bridge itself. That means this $300 million in Yadkin / I-85 spending will not be subtracted from other road-building money distributed in nearby counties under the equity formula.

* Soften a House proposal to punish the Global TransPark Authority, a state-owned industrial park in Lenoir County, for ignoring the legislature's March deadline for a report on the authority's plan for paying down its $37.8 million debt to the state.

The new budget will cut $320,000 or 25 percent from the state's appropriation for Global TransPark. The House had proposed cutting twice that much. And Global TransPark has a new deadline for filing that report: Dec. 31.

House members, alarmed by steep increases in the state ferry budget, had proposed a measure that would prod NCDOT to make ferry travelers cover a larger share of the operating costs.

Most ferries are free, and the toll ferries at Ocracoke and Southport charge riders much less than comparable ferries in other states. Ferry riders now cover only 6 percent of the cost. The House proposal, which would direct the Ferry Division to come up with toll rates that would cover 100 percent of the cost, was not included in the budget released this week.

Council nears vote on DATA

Approval would put Triangle Transit in charge of bus system

By Ray Gronberg, Herald-Sun

gronberg@heraldsun.com; 419-6648

DURHAM -- City Council members have scheduled a June 21 vote on whether to approve a contract that would put Triangle Transit in charge of managing the Durham Area Transit Authority.

The move comes as City Attorney Patrick Baker and Triangle Transit General Counsel Wib Gulley continue work on the contract.

Baker said a draft shown to the council Thursday is "very close to the final product" but may still see "some tweaking between" now and the vote.

Council members put the vote on the general business agenda for their June 21 meeting, meaning that they expect and will take public comment on the proposed management handoff.

But it nonetheless appears that the deal is moving toward approval. A previously skeptical DATA Board of Trustees has is now supporting it.

The DATA board's chairman, Chris Harder, told City Council members Thursday that he's sold on the idea in part because Triangle Transit has "strong leadership and a highly professional staff."

It and the city Transportation Department have also shown that they're committed to consulting DATA riders about future service changes, Harder said.

The draft contract is a three-year deal that includes an automatic year-to-year rollover clause that will kick in the fall of 2013. The management handoff would take effect Oct. 1.

Either side has the right to terminate the deal on a year's notice. The city will continue paying all DATA's bills, while Triangle Transit's duties will include preserving "productive labor relations" with the bus system's unionized drivers and mechanics.

Triangle Transit will also be responsible for choosing, in consultation with city officials, the outside operator that will actually employ the drivers and mechanics. A state prohibition on public sector collective bargaining means that either the city or Triangle Transit needs to work with the employees through an intermediary.

The draft contact also commits Triangle Transit to holding monthly community meetings to gather public input about the bus system. The RTP-based system further has to report monthly on DATA's operating and financial performance.

Meanwhile, plans for the launch of a new downtown connector that will link Duke University and the Golden Belt business complex are also moving toward a June 21 approval vote.

City Manager Tom Bonfield is seeking permission from the council to sign a deal with Duke University that will secure a Duke subsidy for the new route.

Duke has already written a $375,000 to help pay for new buses that will free up existing DATA coaches for use on the so-called "Bull City Connector."

The university has also pledged $650,000 in operating subsidies over two years. City officials intend to combine that with a $544,816 federal grant and $992,387 in revenue from a recent increase in vehicle registration fees.

The combined $2.2 million will pay for fare-free service on the route. Buses will run every 15 minutes on weekdays from 7 a.m. to 6 p.m., and every 20 minutes from 6 p.m. to 11 p.m. on weeknights and on Saturdays.

The route basically runs along Main Street and Erwin Road. It will loop into the Duke campus along Trent and Flowers drives, loop again downtown near Durham Station, and loop a third time next to Golden Belt along Angier Avenue and South Elm Street.

Bonfield and his staff see the new route as the first big route change to come about in Durham stemming from planning for a regional transit network. A three-county citizen panel in 2008 called among other things for the creation of high-frequency "circulator" routes in places like downtown Durham.

A couple of City Council members, Cora Cole-McFadden and Howard Clement most vocally, are miffed that the new route doesn't include N.C. Central University. That school's administration, led by Chancellor Charlie Nelms, declined to help pay for it.

City administrators do intend to allow NCCU students and employees ride for free on normal DATA routes between

campus and downtown. Transportation Director Mark Ahrendsen said officials will meet next week with staff at NCCU "to go over operational details and how they can promote" the availability of the service.

Council OKs budget, DATA contract

06.21.10 - 10:31 pm
By Ray Gronberg

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DURHAM -- City Council members on Monday finished their work for the first half of the year, approving a fiscal 2010-11 budget that raises in-town property taxes by 2.2 percent and a contract that puts Triangle Transit in charge of Durham's bus system.

Both moves came on unanimous votes, as did decisions in favor of launching a new downtown-to-Duke University bus route and putting a $20 million street-paving bond on the November ballot.

The vote on the budget confirmed City Manager Tom Bonfield's request for a property tax rate of 55.19 cents per $100 of assessed value, 1.19 cents higher than last year's.

The new rate will cost the owner of a $150,000 house an extra $17.85 per year. The additional money is going to cover rising debt payments and operational costs for the Durham Area Transit Authority.

Approving the contract with Triangle Transit also put council members on the record behind another of Bonfield's major moves. The regional bus system will take over day-to-day operations at DATA on Oct. 1.

The contract leaves the city on the hook for paying the system's operating expenses, but Triangle Transit will inherit responsibility for dealing with drivers, mechanics and the private-sector company they work for.

Triangle Transit General Manager David King has vowed a seamless first-year transition, with any discussion of efficiency-seeking service changes to come next year. The new contract sets a Feb. 1 deadline for King's agency to prepare a fiscal 2011-12 budget request for DATA.

Among the routes Triangle Transit will inherit will be the new Bull City Connector. It will link Duke, downtown and the Golden Belt business center with buses running every 15 minutes on weekdays and every 20 minutes at night and on Saturday.

Officials are funding the connector basically as a pilot program. A grant from the federal government and contributions from Duke are picking up about 45 percent of the first two years' operating costs, which will run at about $2.2 million.

The rest is coming out of the proceeds of last year's $5 increase in the city's vehicle registration fee. By law, money from that had to go to new service, rather than underwriting DATA's existing routes.

Monday's bond-related votes gave administrators permission to begin the N.C. Local Government Commission review process that must precede a referendum.

Officials want the added $20 million in borrowing authority to keep private-sector pavers on the job long enough to knock out a remaining backlog of 105 miles of crumbling streets. A referendum this fall would be the city's third street bond in five years.

Oberstar points to road problem: a shortage of federal gas-tax revenue (MinnPost.com)

Oberstar points to road problem: a shortage of federal gas-tax revenue (MinnPost.com)

WASHINGTON — The problem is simple, says Rep. Jim Oberstar, who chairs the House Transportation Committee: There simply isn't enough money coming in through the federal gas tax right now to meet the nation's current needs for road and bridge repairs.

And as fuel efficiency increases, drivers will invariably take fewer trips to the gas station and the amount of revenues generated by the gas tax will drastically shrink.

It's as Transportation Secretary Ray LaHood explained earlier this year:

In the past, the Highway Trust Fund has been largely user-supported through fuel-tax revenue. The idea is that drivers who use the roadways will need to buy gas, and generally how much gas they buy corresponds to how many miles they've driven or how much they've used our roadways.

However, technology and behavior have changed enough that this approach is no longer sufficient. As we move forward with surface transportation reauthorization, we need lawmakers and experts to think creatively about how we're going to fund our transportation infrastructure in the 21st century.

The good news is that there are several possible solutions that could bridge the funding gap, including raising the gas tax in the short term and implementing congestion or mileage fees sometime in the next decade.

The bad news: Absolutely none of those ideas seem to have even the remotest chance of passing in the current political climate.

More mileage, more problems
Let's say that in November, when the Chevy Volt rolls off the production line, I scrounged up the cash, traded in my 122,000-mile-old 2000 Subaru Legacy and actually purchased GM's new plug-in hybrid.

Currently, my car is rated at 19 mpg city/25 mpg highway, which wasn't too shabby back then. The Department of Energy estimates that an average driver covers 15,000 miles and spend $1,842 a year in fuel costs, which (at their estimate of $2.58 a gallon) translates to almost 714 gallons of gas a year.

Multiply that by 18.4 cents a gallon for the federal gas tax, and I'm on the hook to Uncle Sam for $132 a year, give or take a few cents. Almost all of that money goes to the Highway Trust Fund, which pays for road and bridge repairs, infrastructure and mass transit projects.

Now say I got the Volt, which is powered for its first 40 miles by an electric battery alone and to which the EPA assigned a (somewhat controversial) 230 mpg fuel economy estimate. If I somehow hit that estimate, my contribution to the highway tax fund would shrink to around $12.

And you simply can't fund a highway system on $12 a year.

That may be a fairly drastic example, but it's a simple maxim that, all else being equal, better fuel economy means fewer trips to the pump.

Fewer trips to the pump mean less money spent on gas. The less spent on gas, the less paid on the gas tax, currently set at a flat rate of 18.4 cents a gallon (18.3 cents of which goes to the Highway Trust Fund).

And less gas tax money means a reduction in dollars to the Highway Trust Fund, which is used to fund road and bridge repairs to an infrastructure system that has already begun to show its age.

"With more fuel efficient cars or the alternative propellant forces, you need to increase the user fee," Oberstar said.

Revenues don't match needs

Gas taxes were originally conceived as a simple substitute for vehicle miles traveled, under the thinking that those who used the roads more would fuel up more and then pay more. By and large, that's how it has worked so far.

"For 54 years of the interstate highway program, the public has paid its own way," Oberstar said. "You use the system, you pay for it."

Because it is not adjusted for inflation, the federal gas tax has experienced a cumulative loss in purchasing power of 33 percent since 1993 — the last time the federal gas tax was increased.

All in all, there remains a $140 billion gap over the next 6 years between expected revenues and what Oberstar said we "actually need" to bring roads and bridges into good repair.

And not only is there not enough money to do all that, there's not even enough coming in to keep the fund solvent. Because the Highway Trust Fund is designed to be revenue neutral, any shortfall in the fund would just be partially reimbursed for transportation spending until Congress bails out the fund.

Congress has had to bail out the trust fund twice in the past few years.

"People who are buying more fuel efficient cars are fueling up less but still driving and still using the roads," said Annette Nellen, an expert on taxation and transportation at San Jose State University.

"You would think that because there's not enough money going in there right now that this would be addressed."

Minnesota, which received $581 million in federal highway aid in 2009, is equally impacted with all other states here. Say there were $100 billion in requests, but only $50 billion in the fund. States would be reimbursed at 50 cents to the dollar until the fund is bailed out. For states with cash shortages — like Minnesota — that could be a tough wait.

Fuel economy gains speeding crisis

Presently, vehicles are required to average 27.5 miles per gallon. A 2007 law increases that requirement to 35 mpg by 2020, however an April rule by the Obama administration speeds it up to 35.5 mpg by model year 2016.

Much of the gain in fuel economy currently is coming from the rise of gas-electric hybrids and an increasing willingness to by automakers to produce (and drivers to purchase) smaller cars and trucks.

Hybrid vehicles are increasingly more common, boosted by greater fuel efficiency, wider availability and federal tax credits of up to $3,400 per vehicle. Additionally, automakers have begun selling the kind of small, fuel-efficient cars to Americans that were once only available in Europe.

Last year Volkswagen unveiled a North American version of the Golf, the most popular car across the pond (the TDI clean diesel version of which gets 41 highway miles per gallon). Earlier this year, Ford rolled out an American version of the Fiesta, which gets around 38 miles per gallon.

Automakers are also planning to overhaul their fleets to meet the surging demand for more fuel-efficient vehicles — Chrysler for one plans to increase its fleet-wide fuel economy by 2014.

On the horizon: hyper-efficient plug-in hybrid electric vehicles like GM's Chevrolet Volt and its 230 miles per gallon.

Several suggested solutions, but scant support

Seeing the need to move off the gas tax, Congress commissioned a bipartisan study of future revenue sources during the last surface transportation reauthorization process. That committee reported its findings in early 2009. [PDF]

The headline of the press release accompanying the report was direct. [PDF] “The U.S. Should Shift From the Gas Tax to a Mileage-Based Usage Fee by 2020. The current federal motor fuels tax is unsustainable over the long term.”

“We must start transitioning to a new paradigm now,” said Mike Krusee, a commissioner who also served at the time as a Republican state representative in Texas. “If we don’t start, we will never get there.”

Problem is, none of the possible solutions have anywhere close to the number of votes required to pass in Congress.

That gas tax hike Oberstar is looking for? Scuttled by his own party which doesn’t want to push it without Republicans on board.

A White House spokesman, very succinctly, said that “the White House does not support a gas tax increase.”

Rep. Chris Van Hollen of Maryland, a senior House Democrat who heads the DCCC (the organization tasked with electing more House Democrats), said earlier this year that it “certainly won’t fly this year, because we’re going to have to have some kind of bipartisan consensus before you more forward on any kind of funding mechanism like that.”

When Minnesota raised its gas tax in 2008, lawmakers had to override Gov. Tim Pawlenty’s veto to do it, and Republicans who crossed over suffered for it during the campaign.

The conservative Heritage Foundation suggested another idea — scrap the federal gas tax altogether, get the federal government out of road funding and let the states levy the taxes they need. States would then be free to put in whatever system worked best for them.

Republicans would have to have a sizeable majority to have a chance at passing something like that — and even the best projections from the upcoming elections don’t put them anywhere close to a number that big.

At least one Republican on the House Transportation Committee floated the idea of switching the gas tax from a flat fee to a percentage, similar to state sales taxes, so that revenues would go up as prices go up (and down if they go down).

That plan, which Oberstar said he was willing to consider, was ultimately rejected by GOP leaders for looking too much like a tax increase.

Then there’s the idea of counting vehicle miles traveled, either through regular odometer checks or installing a tracking system on cars to see how far they’ve gone. Such systems have been piloted, but haven’t yet gone widespread.

“It’s not viewed as a burning issue yet, and whenever the discussion comes up about tracking vehicle mileage you have to ask how you’re going to measure that,” Nellen said. “First there’s an issue of privacy, and second, is it that dire of a situation yet? And I think it is.”

“You could also have more tollbooths, but that isn’t highly desirable either.”

Oberstar has not specifically endorsed a vehicle mileage tracking solution, rather his surface transportation bill would establish pilot programs to test potential solutions. The best of those would be folded into the 2015 surface transportation reauthorization.

But that bill may not even come up this year, and if it does a lame duck session is the likeliest time for it.

Nellen said solutions (and the unpopular votes needed to pass them) won't likely be fully realized until lawmakers realize the looming crisis in transportation funding — and that something needs to be done about it.

"And as far as I can tell, no one's really paying attention to it."

By Derek Wallbank | Published Thu, Jun 17 2010 8:38 am; As Posted on NC Metropolitan Mayors Coalition

Triangle Transit wishes it could recapture that $19.6 million "disappearmark"

Submitted by N&O's BruceSiceloff on 06/22/2010 - 13:01

One thing Triangle Transit had to give up in 2006, when it was forced to shelve a three-county rail transit plan, was a $19.6 million federal grant that had been earmarked for the project in a congressional appropriations bill.

It is the largest of $120 million in so-called "disappearmarks" listed today in a report from the Washington-based Sunlight Foundation, a non-partisan open-government advocacy group.

David King, Triangle Transit's general manager, says the local agency could have made good use of that money now, as it develops a new regional transit plan that will be discussed in a series of public meetings that start next week.

The Sunlight report says the government's authority to dole out the earmarked money lapsed in 2008, and the Federal Transit Administration now plans to reallocate the funds for other bus and rail transit needs around the country.

The Triangle Transit earmark had been included in a huge transportation spending package passed in 2005 and known as SAFETEA-LU. The three-county agency dropped its project in 2006 after the Federal Transit Administration ruled that it fell short of strict new cost-benefit standards.

Local money is being spent to study possible routes and combinations of buses and electric light-rail trains.

"It would have been nice to have that source of federal money for that," King said. "The potential to buy additional right-of-way north of Raleigh would have been a great use of those funds."

Local leaders hope to win voter approval in 2011 for a half-cent sales tax hike that would help fund long-term transit improvements -- and eventually to win federal funds, too.

The new Triangle regional transit plans will be aired in a round of six public hearings next week and in early July, and refined in two more rounds of hearings in the fall and early 2010. Next week's hearings, from 5:30 to 8 p.m., are Monday at the Raleigh Convention Center and Wednesday at the Durham Public Library.

Earmarks are targeted appropriations for specific projects, usually at the request of individual members of Congress. These funds were not spent because the projects were later canceled.

The second-largest "disappearmark" on the Sunlight list was nearly $10 million for a project in Rochester, N.Y., canceled in 2009, that would have included a bus terminal, a college satellite campus and a performing arts center.

NCDOT: Number of stimulus-related jobs jumps

Triangle Business Journal – Thursday, June 24, 2010 - by Chris Baysden

Payrolls for workers toiling on stimulus-related road construction projects rose 9 percent in May, according to data compiled by the North Carolina Department of Transportation.

A total of 6,899 workers received $6.1 million in payroll for working 362,234 hours last month. That was up from the 6,547 workers who got $5.6 million for 315,634 hours of work in April. Road construction typically slows down in the winter due to weather conditions, then picks up steam in the spring and summer.

Almost all of North Carolina's stimulus road construction projects have been awarded. As of June 1, 2010, NCDOT had advertised 377 contracts representing $643 million in stimulus funding. Of those, 375 worth almost $640 million have been awarded and the vast majority – 353 – are under way.

About 84 of the 377 contracts advertised for bid, representing $92 million, have been completed.

Reporter e-mail: cbaysden@bizjournals.com

Hopeful signs for walkers, cyclists in city

07.02.10 - 11:49 am

I've complained often since I moved back here in 2005 that many of our streets and roads are uninviting or even dangerous toward pedestrians and bicyclists.

Given the generally high marks for quality of life in Durham and Chapel Hill, I'd expected provisions for cyclists, for example, to be more ambitious than scattered signs urging motorists to "share the road." Those signs seem far more abundant than real bike paths or lanes, or even shoulders wide enough to provide some off-motorway room for bikes.

And as a jogger, I'm constantly struck by the scarcity of sidewalks in many areas (not to mention the crumbling state of some that do exist). About once a year, I'll run a route that includes Shannon Road -- which happens to stretch from near my home to near my office -- and remember why I vowed I'd never do it again. And on my daily commute, barely a week passes that I don't fear for the life of a pedestrian navigating Shannon's narrow curves devoid or sidewalks or even curbs.

But a couple of nearly simultaneous discoveries last week prompted to think perhaps I'd been a bit too harsh in my characterizations, or at least a bit too pessimistic about whether the situation could improve.

First was a new study that ranks Durham as a comparatively safe place for pedestrians -- third safest among North Carolina's 15 metro areas, and substantially safer than neighboring Raleigh.

The ratings come from Transportation for America, which describes itself as "a national coalition committed to creating a new national transportation program that will take America into the 21st Century by building a modernized infrastructure and healthy communities where people can live, work and play."

I confess the ratings seem based on a somewhat thin set of data, but the organization produced a "Pedestrian Danger Index" for the country's metropolitan areas. Durham's index was 54.2 , not too far behind Jacksonville, which with

an index of 32.2 was North Carolina's safest. The Raleigh-Cary metro area, by contrast, had a danger index of 128.6.

Rocky Mount, the scariest place in the state to walk along the highway, rated an index of 201.8. Orlando-Kissimmee, Fla., in spite (because?) of DisneyWorld, was the most dangerous area in the country with an index of 221.5.

Shortly after Transportation for America's "Dangerous by Design" report arrived, I saw a mention of a new "Durham Bike and Hike" map put out by the city's transportation department.

It is an impressive compilation that serves as a reminder we do have a number of excellent venues for biking and walking safely, ranging from short trails in parks to the American Tobacco Trail. The ATT stretches from downtown to Southpoint, then continues past I-40 into Chatham County.

The map strives to help cyclists avoid the most congested streets, said Dale McKeel, the city's bicycle and pedestrian coordinator. And the brochure notes pointedly that "the designation of a street on this map does not guarantee any minimum road width, acceptable traffic volume or road condition. When using these streets, cyclists must exercise the same caution they would use on undesignated streets."

(A PDF of the map is available on the city's website, at http://www.durhamnc.gov/departments/transportation/bike_hike_map.cfm. And they will be available at a booth at the Festival of the Eno, with a $1 contribution asked to defray production costs.)

So it's worth noting, this mid-summer holiday weekend, perhaps things are looking up for those of us who bike or walk -- or jog -- along our city streets.

And maybe we're a bit safer than I feared. Still, we have, dare I say, miles to go before we're a truly bike-pedestrian friendly city.

Bob Ashley is editor of The Herald-Sun. Contact him at (919) 419-6678 or by e-mail at bashley@heraldsun.com.

NCDOT's new criteria for loop-building gives East End Connector a 2014 start date

Submitted by BruceSiceloff on 07/29/2010 - 14:51

NCDOT expects to start construction in fiscal year 2014 on Durham's East End Connector, one of North Carolina's longest-delayed road projects.

First proposed in the 1970s, the $162 million project on the east side of Durham would create a north-south, stoplight-free drive between Interstate 85 and Research Triangle Park. It would upgrade part of U.S. 70 into a freeway and build a link between it and the Durham Freeway.

The 2014 start date shows up in a new draft schedule (attached below, with separate rating sheet) for DOT urban loop projects across the state. Groundbreaking had been set for fiscal year 2013 in a schedule published two years ago, although DOT officials later said that delays were likely because of limited funds. *[5pm update: NCDOT issued this statement regarding urban loop prioritization.]*

Following up on Gov. Bev Perdue's pledge to remove politics from the state's decision process for road construction, DOT is publishing a new set of criteria it will use to set priorities for urban loops.

The state Board of Transportation will receive a draft version next week, with the final list to be adopted in 2011 after more than a year of review and public comment across the state.

The East End Connector and other projects are rated (attached below) by factors including how much car and truck traffic they will serve and how much travel time they will save, compared against project costs.

The East End Connector ranked sixth out of 21 loop projects evaluated across the state in the new rating system. But it was one of only seven projects where construction is tentatively scheduled to start in the next 10 years.

That's all the state can afford to build.

"If we were going to build all the loops today, it would cost us $8 billion," said Greer Beaty, DOT spokeswoman. "But this year we have only $150 million in loop money to spend, so we don't even come close to having enough."

Other start dates are fiscal 2011 (this year) for I-295 in Fayetteville, 2013 for an I-40 and US 17 project in Wilmington, 2014 for an I-485 widening in Charlotte, 2014 and 2017 for the next sections of Greensboro's loop, and 2020 for Greenville's Southwest Bypass.

"This is a realistic schedule," Beaty said.

Another Durham project ranks higher under the new loop criteria – a bypass for U.S. 501 on the north side of the city – but much more environmental and design work is needed before it can be put on the construction schedule, Beaty said.

Two projects to complete Raleigh's 540 Outer Loop are included on DOT's evaluation list, but they are not listed on the construction schedule because their fates will be determined separately as toll projects. The Southern Wake Freeway is ranked seventh, and the Eastern Wake Freeway is ranked 13th.

The Triangle Expressway, which includes the western portion of the 540 Loop, is under construction now and will open as the state's first modern toll road in 2011 and 2012.

Price: Use $2M rail corridor earmark soon

07.31.10 - 07:31 pm

House recently passed bill that would rescind some unspent funds

By Ray Gronberg

gronberg@heraldsun.com; 419-6648

DURHAM -- Aides to U.S. Rep. David Price, D-N.C., have warned Durham officials that they need to find a way soon to use a $2 million budget earmark intended to help finance the preservation of a rail corridor.

House members recently passed a bill that would rescind some $713 million in old, unspent earmarks for transportation, a move that though it didn't affect the money reserved for Durham in 2005 showed that it's increasingly risky for projects like the city's to remain in stasis.

"Although we seem to be in the clear for now, there is no guarantee these funds will remain available for use indefinitely," Price aide Kate Roetzer said Wednesday in an e-mail to city and N.C. Department of Transportation officials.

Roetzer, the 4th District congressman's legislative assistant, added that she would "strongly encourage" officials here "to find a way to obligate these funds for acquisition of some rail corridor in the near term."

The 2005 earmark was supposed to become part of the financing for the purchase from the Norfolk Southern Corp.

of the so-called "Duke Beltline," a stretch of track that circles downtown Durham.

The beltline loops north from the N.C. Railroad's main line, linking up to it at points near the downtown Amtrak station and Fayetteville Street's crossing of the Durham Freeway. It reaches as far north as the Markham Avenue area.

The loop was built by the Duke family to bring in supplies for Durham's tobacco factories and enable them to ship finished goods, city Transportation Director Mark Ahrendsen said.

Officials had figured on combining the federal money with matching $1.5 million allocations from the city, the county and DOT, and using the resulting sum to buy the loop and a spur off its east side that runs north into Person County.

They wanted to make sure both corridors remain available for rail use decades into the future, and think it could also serve in the short run as a walking path like the American Tobacco Trail.

The project began when officials noticed that the beltline and the spur had fallen into disuse, Ahrendsen.

But Norfolk Southern never officially abandoned them, and soon after the federal money was available the railroad made it clear it wanted to hang onto the spur and part of the beltline.

The company has at least one client on the beltline, a cement plant near the intersection of Avondale Drive and East Geer Street.

With the company unwilling to deal, and DOT more interested in the spur, the whole deal went on ice. The earmark and the city's $1.5 million -- money available from a recent bond issue -- weren't enough by themselves to finance Norfolk Southern's asking price for the part of the beltline the company didn't need.

Recently, however, the company has signaled it's willing to renew discussions about the beltline. DOT officials are now trying to put together a meeting.

"We want to make sure we've at least explored and determined whether or not [a purchase is] a possibility," Ahrendsen said. "It it's a possibility, we'd like to pursue it while that earmark is still available. And if it's not a possibility, we might consider other uses for the funds."

Legally, the federal earmark is ticketed for rail-corridor acquisition in general, not specifically for the beltline. So it's possible officials could use it for other land needed for the area's transit network, Ahrendsen said.

The beltline itself hasn't figured in the area's transit plans to date, but the most recent versions have called for "circulator" routes in downtown Durham that would feed into a regional system.

Officials are getting a head start on that later this month with the launch of a new bus route connecting downtown with Duke University. But it's possible some sort of rail service would follow someday.

Corridor preservation is a key issue for rail advocates because it's at the very least difficult and expensive to acquire new right of way in urban areas, and in many places impossible. So they see the preservation of existing corridors as critical.

Budget problems, however, have prodded both federal and city officials to comb through reserves, on the hunt for money they can free up from projects that seem unlikely to be carried out.

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Raleigh-Charlotte train traffic jumps 200%

Triangle Business Journal - by James Gallagher

The new mid-day trains between Raleigh and Charlotte boosted rail travel on **Amtrak**'s Piedmont line by more than 200 percent during June.

Ridership on trains between North Carolina's two largest cities climbed from 5,258 in June 2009, to 15,426 in June 2010. Amtrak officials credit the surge to the new mid-day trains, which started running June 5. The new service added two more trains to the four already running. Three of the trains run from Raleigh to Charlotte; the others run from Charlotte to Raleigh.

"The additional trains in the mid-day have given business travelers, families and college students more options to travel via rail," said State Transportation Secretary Gene Conti. "Ridership gains show when more trains are offered, more travelers will ride."

The new service, which takes just over three hours to complete and includes stops in Cary, Durham, Burlington, Greensboro, High Point, Salisbury and Kannapolis, is expected to attract 43,000 riders in its first year.

The news comes as Amtrak's overall train ridership in North Carolina is climbing. For the period of October through June, ridership overall jumped 26 percent, with 65,956 people riding the rails so far this year compared to 52,347 during the same period a year ago.

Reporter e-mail: jgallagher@bizjournals.com

Residents speak out on rail station

By Robin Clayton

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(919) 732-2171

With only standing room left, local residents took to the podium Monday evening to voice their concerns — and, largely, praise — for a proposed rail station in Hillsborough.

About a dozen people spoke during the town's public hearing held at the Town Barn, but many more were present.

Discussion about the station began with a PowerPoint presentation detailing the station's final plan, given by Elizabeth Read, who is the executive director for the Alliance for Historic Hillsborough and also a member of the town's Rail Station Task Force.
Read gave an overview of plans for the station, which will built in phases over about 20 years.

The first phase will be basic, including not much more than a platform.

The following phases will add a police station, fire station, meeting space, parking deck and civic center.

Residents of the Tuscarora neighborhood, while largely supportive of the project, expressed concerns about the effect the station will have on their community.

Gerald Ponder, who lives in the Tuscarora community, said when plans for the station were first proposed, many of his neighbors signed a petition in favor of it.

“We had this vision of a kind of Mayberry station,” he said.

But in March, conceptual drawings for the project were unveiled and, Ponder said, he and his neighbors developed concerns.

They are worried about increased congestion resulting from the construction of a tunnel at the intersection of U.S. 70-A and Tuscarora Drive.

Such a tunnel could also result in safety issues and criminal activity, Ponder said.

He said he wants the town to know that he and his neighbors offer their general support but hope the town will take into consideration the effects on his community.

Tuscarora residents are working together to conserve their neighborhood and 80 percent have signed a petition to do so.

Ponder presented a PowerPoint slideshow to town board outlining the community’s requests, which are for the town to complete a traffic impact study, ascertaining traffic flow and congestion in and around the historic Tuscarora neighborhood; complete an environmental study to ascertain the impact of the rail station and associated development on water, air, noise and wildlife; evaluate the potential for crime and its impact on the area; and continue open dialogue with the residents regarding the plan.

Ann Brown, who also lives in the Tuscarora neighborhood said she was generally supportive of the station but is concerned about safety.

“I’m concerned about crime; I’m concerned about traffic,” she said.

Brown described her neighborhood as safe and stable. But over the past year, she said, there have been some problems, such as people sleeping in their cars.

She’s concerned those issues will only grow once the station is built.

“I’m not opposed to the railroad station … but I think it needs to be thought out,” she said.

Others, like Elizabeth Woodman, spoke completely in favor of the station.

Woodmen, who serves on the Hillsborough Tourism Board, said she took a trip by train to Salisbury and was amazed by the impact the town’s train station had on its downtown.

“It was a thriving downtown that was once not thriving,” she said.

Woodmen said she stayed within a half-mile of the station and was pleased at the businesses that were benefiting from train passengers.

She said the site chosen for Hillsborough’s station - just southeast of downtown - is a good location.

Originally, Woodman said, she had hoped for the station to be located in West Hillsborough,

but “the site that has been chosen is the next best site.”

James Carnahan, who works with The Village Project in Carrboro, a nonprofit organization dedicated to transforming the region into walkable communities, said he strongly supports the station.

“Having this train station means folks … throughout Orange would have access to transportation up and down the East coast.”

While funding for the rail station project has not been secured, Senior Planner Tom King said last month the town hopes to receive some grant money.

The town board is likely to vote on the rail station’s final plan in September.

For more information, visit http://www.hillsboroughnc.org/content/rail-station-task-force.

City joins bid to find site for grocery

Or else Alston Ave. widening might nip mission property

By Ray Gronberg, gronberg@heraldsun.com; 419-6648

DURHAM -- City officials will try helping the N.C. Department of Transportation find an alternative site for a North-East Central Durham grocery store threatened by the planned widening of Alston Avenue.

Their willingness to lend a hand to the quest emerged during a meeting Tuesday afternoon with DOT engineers who hope to start buying right-of-way for two extra travel lanes next May.

City assistance with a site search "was one of the things put on the table and discussed," Durham Transportation Director Mark Ahrendsen said. "We asked if we were successful in doing that, would that address the environmental justice issue. And DOT said it would."

Ahrendsen's use of the term "environmental justice" was shorthand for the harm DOT and local officials agree demolition of the Los Primos grocery would do to residents of North-East Central.

The store stands at the corner of Alston Avenue and East Main Street, scarcely more than a few yards away from Alston's pavement. Officials want to see it stay because there are few other food markets handy to the neighborhood.

But early plans for the widening called for the store's demolition. DOT engineers over the winter suggested a design change, but city elected officials aren't keen on it because it would save the grocery by moving Alston's new lanes slightly to the east.

Doing that would mean going across the street to take a bit of property away from the Durham Rescue Mission -- property the mission and its leaders have big plans for.

They last week applied for a rezoning that would allow them to build up to 299 multifamily dwellings, 5,000 square feet of space for church uses and 5,000 square feet of office space on mission-controlled land.

The request covers 6.5 acres to 7.1 acres. City/county planners are in the early stages of reviewing it, but don't know much more about the mission's intentions than what they've seen spelled out on the blueprints, Planning Supervisor Scott Whiteman said.

The plans do say mission leaders would like to place housing "along street frontages" of the site.

City Council members, some of them at least, don't want DOT to get in the mission's way.

"If we assume we still want to go with the original [widening] proposal, in terms of the four lanes, the question is how best we can do that and still allow for a grocery in the area while addressing the mission's proposed plan for how they intend to redevelop in the area," said Mayor Bill Bell, who participated in Tuesday's meeting.

DOT engineers did come to the meeting with "some information" about getting around the dilemma by going with a three-lane project instead of the previously assumed four.

But making that change would at the very least delay the project, and could even undermine the rationale for the state to fund it at all.

"A three-lane improvement is really just a streetscape improvement," Ahrendsen said.

He added that "the consensus" coming out of Tuesday's meeting was to continue with a four-lane design, stick to the original placement of the new lanes and try to "mitigate the impact" on the grocery.

For that, "our preference would be relocation," Ahrendsen said.

City and DOT officials have floated that possibility before, with state engineers saying last year they'd look at acquiring a church-owned former Winn-Dixie grocery store on Liberty Street that's been vacant for many years.

But they subsequently gravitated to the idea of moving part of the road onto Rescue Mission property, to save money and because there they didn't see any buildings nearby that were both vacant and in nearly move-in-ready condition.

The agency's insistence on a so-called "turnkey" alternative had City Council members suspecting in January that it didn't try all that hard to find the grocery a new home.

Now, however, DOT is willing to give city officials a chance to look.

Administrators may have some leads. "My understanding is there's something in the works," said Councilwoman Diane Catotti, who also sat in on the meeting.

Bell likewise hinted that officials have an idea where to look. "They know some alternatives they might want to consider," he said. "They can pursue those and see where it leads."

STATE OF NORTH CAROLINA
OFFICE OF THE GOVERNOR
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BEVERLY EAVES PERDUE
GOVERNOR

June 28, 2010

The Honorable Michael Woodward, Chairman
Durham Transportation Advisory Committee
101 City Hall Plaza
Durham, North Carolina 27701

Dear Chairman Woodward:

I wish to personally thank you and the Durham Transportation Advisory Committee for the issuance of a resolution supporting the Mobility Fund. Your support, and similar expressions from other municipalities, organizations and transportation advisory committees across the state, is a testament to the importance leaders like you place on supporting transportation legislation crucial to the success of our state. You and the Durham Transportation Advisory Committee clearly recognize that improving connectivity, reducing logistical bottlenecks, enhancing economic development and creating jobs is directly related to our ability to create a new and open prioritization model for transportation projects in conjunction with local governments, stakeholders and the public.

I look forward to working with you and leaders across North Carolina to be sure that the Mobility Fund has a meaningful and positive impact on the direction of transportation funding in this state.

Thanks for all you do for your community, region and the State of North Carolina.

Sincerely,

Bev Perdue

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
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1501 MAIL SERVICE CENTER, RALEIGH, N.C. 27699-1501

EUGENE A. CONTI, JR.
SECRETARY

July 8, 2010

Mr. J. Michael Woodard, Chair
Durham-Chapel Hill-Carrboro MPO
101 City Hall Plaza, 4th Floor
Durham, North Carolina 27701

Dear Chairman Woodard:

Thank you for your letter regarding support for the East End Connector or what was also identified as "the Triangle Connector to I-85." We understand that you consider it the highest freeway priority for the region and appreciate your reiterating the many benefits of the connector.

As you know, the Department is working on the initial phase of prioritizing urban loop projects. The evaluation criteria were finalized after two rounds of public comments, two webinars and extensive interactions with planning staff from each of the 10 urban loop areas. Staff from the Durham and Raleigh areas provided excellent comments during the process, and changes were made to the selection criteria based on those comments. The East End Connector is being prioritized according to those criteria.

The Department will release a draft schedule of the urban loop projects, and we anticipate there will be additional discussions with each urban loop area before any final funding schedule is set. We look forward to those discussions.

It was discovered this week that our response to your letter had not been sent out in a timely manner, and I want to apologize for that delay.

Sincerely yours,

Ted Vaden

Ted Vaden
Deputy Secretary for Internal and
External Affairs

TV/dv

cc: Eugene A. Conti, Jr., Secretary
Jim Trogdon, PE, Chief Operating Officer
Susan Coward, Deputy Secretary for Intergovernmental Affairs and Budget Coordination
Don Voelker, Director, Strategic Planning Office
Wally Bowman, PE, Division Engineer