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)

October 13, 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. **September 8, 2010 TAC Meeting Minutes (9:00-9:05)**
(Attachment 5)

A copy of the September 8, 2010 TAC meeting minutes is enclosed as Attachment 5.

TAC Action: Approve minutes of the September 8, 2010 TAC meeting.

6. **NC Turnpike Authority Update (9:05-9:30)**
(Attachment 6)
Jennifer Harris, NC Turnpike Authority

The North Carolina Turnpike Authority (NCTA) will provide an update on current and planned projects in the DCHC MPO and Triangle area. The NCTA recently broke ground on the 18.8 mile Triangle Expressway in Durham and Wake County and awarded contracts to implement a completely electronic tolling system on that roadway. In addition, the NCTA has begun planning activities for extending the Triangle Expressway around the southern end of Wake County to complete the NC 540 loop around Raleigh.

TAC Action: Receive update from the NC Turnpike Authority and provide comments.

7. **Triangle Regional Transit Program-Transitional Analysis (9:30-10:15)**
(Attachment 7)
Patrick McDonough, Triangle Transit

The Triangle Transit has released a draft Transitional Analysis that presents quantitative evaluation data on the eighteen passenger rail corridors being considered in the Triangle. The report identifies two passenger rail corridors for further evaluation in the Alternatives Analysis phase: UNC-Chapel Hill hospitals to Alston Ave. in Durham; and, northwest Cary to the Northeast Regional Center in Raleigh. The contents of this draft report have been presented to

the public for their input through a series of workshops throughout the region and to the TAC at the recent joint TAC meeting for the DCHC MPO and CAMPO on September 29, 2010.

Attachment 7 is a copy of the executive summary of the Transitional Analysis. The full report, which is 117 pages, is available among the attachments for today's meeting at the MPO's Web site. The full report includes appendices that discuss corridors to Hillsborough (dated 6/25/10), Carrboro (dated 9/24/10) and Zebulon (dated 6/9/10).

TCC Recommendation: The TCC recommends supporting the Transitional Analysis conclusions to advance the UNC-Chapel Hill hospitals to Alston Ave. in Durham, and northwest Cary to the Northeast Regional Center in Raleigh corridors for more detailed Alternatives Analysis, and conduct a special Alternatives Analysis of commuter rail service in the corridor between Durham and Raleigh.

TAC Action: Receive the Transitional Analysis presentation, and support the Transitional Analysis conclusions to advance the UNC-Chapel Hill hospitals to Alston Ave. in Durham, and northwest Cary to the Northeast Regional Center in Raleigh corridors for more detailed Alternatives Analysis, and conduct a special Alternatives Analysis of commuter rail service in the corridor between Durham and Raleigh.

8. <u>Draft 2011-2020 STIP</u> (10:15-10:45)
(Attachments 8, 8A, 8B)
Andy Henry, LPA Staff

The North Carolina Department of Transportation (NCDOT) released the draft Fiscal Year 2011-2020 State Transportation Improvement Program (STIP) in early August. At their August and September meetings, the TAC received a copy of the FY 2011-2020 STIP for the DCHC MPO, several documents comparing the draft STIP with the FY2009-2015 STIP, the One-on-One meeting notes for the FY09-15 STIP process, and a schedule for approving the MPO's Metropolitan Transportation Improvement Program (MTIP).

The schedule for the FY 11-20 MTIP shows the release of the MTIP for public comment in the fall 2010 and the approval of the MTIP in April 2011. One-on-One meetings among MPO and NCDOT staff and board members are being scheduled for November 2010. Attachment 8 provides a comparison of the FY2009-2015 and FY2011-2010 STIPs, and Attachments 8A (Divisions 5 and 8) and 8B (Division 7) are draft One-on-One meeting agendas that include the discussion points for the meetings.

TCC Recommendation: Recommend that the TAC use the One-on-One meeting agendas as a basis for discussions with the NCDOT.

TAC Action: Review and provide comments on the One-on-One meeting agendas for use as basis for discussion with the NCDOT on the draft FY2011-2020 State Transportation Improvement Program.

9. FFY 2010 JARC and New Freedom Program Appropriation (10:45-10:50)
(Attachment 9, 9A, 9B)
Maricia Brown, LPA Staff

The MPO receives an annual allocation of Job Access Reverse Commute (JARC) and New Freedom (NF) funds from FTA. JARC is targeted for improving transportation for low income populations and NF is targeted at persons with disabilities. The MPO plans to hold a 2010 Call of Projects and Attachment 9 is a memo that details the updated schedule.

The tables in Attachment 9A summarize the funds available for the JARC and NF programs. The MPO has a remaining JARC balance of $72,671 from FFY 2009. The FFY 2010 appropriation is $195,374. The total of $268,045 will be offered for competitive programming in the 2010 Call-for-projects.

The MPO has a remaining NFP balance of $10,769 from FFY 2009. The FFY 2010 appropriation is $87,757. The total of $98,526 will be offered for competitive programming in the 2010 Call-for-projects.

Attachment 9B is the 4th quarter FY10 expenditure report.

TCC Recommendation: Recommend that the TAC approve the proposed 2010 JARC and New Call-for-Projects schedule.

TAC Action: Receive & approve proposed 2010 JARC and New Freedom Call-for-Projects schedule.

10. MTIP Amendment #17 (10:50-10:55)
(Attachment 10)
Andy Henry, LPA Staff

The North Carolina Department of Transportation (NCDOT) has amended the FY2009-2015 State Transportation Improvement Program (STIP) to include three new projects in the DCHC MPO: interstate maintenance in Division 5; interstate maintenance in Division 7; and, interstate preservation in Durham County (specifically I-85). The DCHC MPO must amend the FY2009-2015 Metropolitan Transportation Improvement Program (MTIP) to include these three projects so the various contracts can be let.

Attachment 10 is a Resolution to amend the FY2009-2015 MTIP, and includes a detailed table of the three projects.

TCC Recommendation: Recommend that the TAC amend FY2009-2015 MTIP to include the three new projects.

TAC Action: Amend FY2009-2015 MTIP to include the three new projects.

REPORTS:

11. **Report from the TAC Chair (10:55-11:00)**
    Mike Woodard, TAC Chair

    TAC Action: Receive Report from TAC Chair

12. **Report from Staff (11:00-11:05)**
    (Attachment 12)
    Felix Nwoko, LPA Staff

    TAC Action: Receive Report from Staff

13. **Report from the TCC Chair (11:05-11:10)**
    Mark Ahrendsen, TCC Chair

    TAC Action: Receive Report from TCC Chair

14. **NCDOT Report (11:10-11:15)**
    (Attachment 14)
    Wally Bowman, Division 5 – NCDOT
    Mike Mills, Division 7 – NCDOT

    TAC Action: Receive report of NCDOT

INFORMATIONAL ITEMS

15. **Recent News Articles and Updates**
    (Attachment 15)

16. **Triangle Transit Appointment letter to the DCHC MPO**
    (Attachment 16)

Adjourn

Next meeting: November 10, 2010

Dates of Upcoming Transportation-Related Meetings:

10/15/2010, 10:30 a.m. Tri-MAP meeting @ RDU Airport Authority Headquarters
10/22/2010, 8:30 a.m. Regional Elected Officials Roundtable Meeting, Triangle Transit, 4600 Emperor Blvd, Durham

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	Completed: Results—Mobility Fund and Congestion Relief legislation, and NCDOT SPOT program
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: Status provided to TAC, TAC Chair and elected officials 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. Study has been drafted.
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.
8/11/10	Follow-up with UNC-Chapel Hill during public involvement period for NC 54 Corridor Study.	Completed:

TRANSPORTATION ADVISORY COMMITTEE

September 8, 2010

MINUTES OF MEETING

The Transportation Advisory Committee met on September 8, 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 – Board Member
**Mike Woodard	City of Durham (TAC Chair)
Mark Ahrendsen	City of Durham/Transportation (TCC Chair)
David Bonk	Town of Chapel Hill (TCC Vice-Chair)
Maricia Brown	City of Durham/Transportation
Jeff Brubaker	Town of Carrboro
Bonnie Estes	City/County Planning
Ray Gronberg	Herald Sun Newspaper
Andy Henry	City of Durham/Transportation
John Hodges-Copple	Triangle J COG
Tom King	Town of Hillsborough
Karen Lincoln	Orange County Planning
Ray Magyar	UNC – Transportation
Patrick McDonough	Triangle Transit
Dale McKeel	City of Durham/Transportation
Felix Nwoko	City of Durham/Transportation
Brian Rhodes	City of Durham/Transportation
Meg Scully	Durham County
Bruce Siceloff	News & Observer Newspaper
Mila Vega	Orange County
Chris Wells	DCRP Student – UNC
Patrick Wilson	NCDOT – Division 7

**Voting Member
*Alternate or Non-Voting Member

Mike Woodard, TAC Chair, called the meeting to order at 9:02 a.m. and the Roll Call was conducted.

PRELIMINARIES:

Adjustments to the Agenda

Mark Ahrendsen identified the handouts that were distributed at the beginning of the meeting which will be referred to during the meeting.

Public Comments

There were no public comments.

Directives to Staff (Attachment 4)

The Directives to Staff are attached for review.

ACTION ITEMS:

August 11, 2010 TAC Meeting Minutes (Attachment 5)

Alice Gordon stated line 173-174 should read as follows: "It appears to be in direct conflict with the Town of Hillsborough's project."

A motion was made by Alice Gordon and seconded by Diane Catotti to approve the August 11, 2010 TAC Meeting Minutes with the amendment above noted. The motion carried unanimously. Lydia Lavelle abstained because she had not attended the August 11th meeting.

Triangle Regional Transit Program – Study Corridors (Attachments 6, 6A, and 6B)

Mark Ahrendsen provided an introduction for the Triangle Regional Transit Program – Study Corridors, along with the attachments.

Patrick McDonough provided an update on the project. The transitional analysis is looking at seventeen corridors throughout the region including six in Durham and/or Orange Counties and evaluating them on a series of metrics which includes mobility, socioeconomic (which includes low income and minority communities along the lines), land use impacts and financial (which includes costs).

Then the analysis compares the various corridors in terms of performance to identify which corridors would be the most successful in receiving Federal Transit Authority (FTA) New Start funding. The analysis will likely identify which corridor will be the most successful for each MPO. Once that is done, the Alternatives Analysis will further evaluate the corridors and provide more detailed data that will be brought to a series of public meetings for feedback.

Triangle Transit received a request from CAMPO to evaluate additional corridors, some of which were not in the 2035 Long Range Transportation Plan (2035 LRTP), and will respond to both MPOs in reference to CAMPO's request. If a corridor is added at this time, it will affect the project schedule. At the same time, Triangle Transit wants to avoid starting the alternatives analysis phase and then having to backtrack to add another corridor, and therefore wants to solidify the decision on which corridors to include. A corridor that is not studied in the current process could be studied in subsequent years and still possibly be proposed for rail service

Mark Ahrendsen stated the attached letter from UNC recommends that corridors not be added. This does not mean that other corridors can't be considered in the future. However, low impact corridors, or those that are likely to perform relatively poorly in the transitional analysis, will distract from the study focus.

Mike Woodard wanted to bring this to the TAC's attention today so there will be no desire to go backwards and revisit the corridors once the alternatives analysis has begun.

Lydia Lavelle stated the Board of Alderman's for the Town of Carrboro is on record supporting the extension of the rail from the hospital to the Town of Carrboro. The Town of Carrboro recognizes it is not part of the plan; but they want to keep it in focus for the future.

Eric Hallman stated the Town of Hillsborough is independently pursuing a rail station and the funding for it; but they want to keep it in focus for the future as well.

Alice Gordon asked if we are looking at both light rail transit and commuter rail transit studies west of Durham particularly in Orange County and Durham County parts. Patrick McDonough stated the answer is more complicated than "yes" or "no." Within each individual corridor in the county there are physical attributes about the corridor that help guide what is studied. Right now we don't have an alternative extending commuter rail to Hillsborough and it is not in the current study. The LRTP was the basis for identifying the corridors to be studied. It is possible, through the high speed rail process for example, that a station could be built and service added to extend commuter rail.

Alice Gordon asked why not split UNC-Duke instead of UNC-Gateway? Patrick McDonough stated they are trying to design projects that have the best independent utility and when staff looked at how to connect Durham and Chapel Hill, and East Durham residential has a travel demand connection to shops in the Gateway area. Ms. Gordon stated Orange County's perspective might be UNC to Duke. Ms. Gordon stated UNC hospital to Duke has similar vehicle requirements which are not being considered. The segments don't speak to the interests of the voters such as UNC hospital to Duke. Patrick McDonough stated there are additional steps in the process to add or subtract stations and corridor sections once the first corridor has been selected.

Mark Ahrendsen stated staff felt these 16 corridors could capture any combination that the TAC ultimately wants to advance as the locally preferred alternative. This was the first cut at choosing the best performing corridor.

Diane Catotti asked whether we be able to see the ridership between each station as long as it is a single corridor. Patrick McDonough stated that station-to-station ridership is not available, but subsequent analysis of the chosen corridor will provide greater ridership details.

Ed Harrison asked if that means UNC hospital to Duke can be analyzed and Patrick McDonough stated it can be done at a later step.

Lydia Lavelle asked if the CAMPO requests will delay finishing the alternative analysis. Patrick McDonough stated if Triangle Transit can answer the CAMPO questions adequately, no corridors will be added and the study will move forward. But, CAMPO might push to go back and study other things. Mr. McDonough stated they don't know the impacts on the schedule, yet, if corridors were to be added. The New Starts application is due August 15, 2011, and the local Referendum is due date is May 2011. More schedule information will be available at the joint TAC meeting.

Alice Gordon stated that the answer to Diane Catotti's questions about ridership data make her more determined to include UNC hospital to Duke as a single study corridor. Ms. Gordon believes we should do it now so we don't have to come back later. Patrick McDonough stated it is too late to add that corridor for the public meetings because we can't provide and evaluate quality analysis data before the meetings. Patrick McDonough stated at this point we are selecting a corridor that is the most promising for New Starts funding; but we are not selecting a corridor to be the Locally Preferred Alternative (LPA). We are selecting a corridor to advance to the detailed alternative analysis phase. The next phase will provide data to evaluate the UNC hospital to Duke corridor question.

Mike Woodard stated the letter from David King asked the TAC members if we should deviate from the 2035 LRTP and the answer appears to be "no." The letter also asked that the TAC indentify any new study alternatives deemed necessary, and if that is done, that the TAC provide justification. Mr. Woodard stated that Patrick McDonough and the LPA staff heard Ms. Gordon's question and they will be addressed later. Ellen Reckhow stated she thinks Alice Gordon's questions will be answered in subsequent phases of the study.

Ellen Reckhow asked how the extra service in the corridor is accounted for in regards to commuter rail. Patrick McDonough stated they are going to study commuter rail in that corridor as compared to light rail. Patrick McDonough stated FTA is not interested in commuter rail since there is no assurance that it will be a reality. Mr. McDonough stated they will provide analysis of the synergy

between light rail transit and commuter rail. Mr. Ahrendsen said that he and John Hodges-Copple have requested this commuter rail analysis.

Mark Kleinschmidt believes we should always think about selling to the voters. The UNC hospital to Duke serves a narrow market segment and is not interesting to a wider group of voters. Alice Gordon stated she will ask the same question later in the process and it must be answered. Otherwise she won't support the plan.

Mike Woodard stated the TAC was asked if they want to deviate from the 2035 LRTP during the alternative analysis and the consensus was "no." Mike Woodard stated that the TAC was also asked if they want to identify any new alternatives that are necessary as part of this phase and the consensus was "no." However, the study will have data on the UNC hospital to Duke route in the fall time period.

A motion was made by Bill Bell and seconded by Ellen Reckhow to authorize the TAC and TCC chairs to draft a response to Triangle Transit indicating the consensus of the TAC members. The motion carried unanimously.

Request to Transfer FY 2011 STPDA Funds to FTA (Attachments 7 and 7A)

Maricia Brown provided an introduction for the Request to Transfer FY 2011 STPDA Funds to FTA, along with the attachment.

A motion was made by Mark Kleinschmidt and seconded by Alice Gordon to approve the resolution requesting that the FY 2011 STP-DA funds for transit projects be transferred to FTA. The motion carried unanimously.

North Carolina Mobility Fund (Attachments 8 and 8A)

Mark Ahrendsen provided an overview of the North Carolina Mobility Fund, along with the attachments. Mark Ahrendsen stated that the recommended changes are marked on the letter that was distributed at the beginning of the meeting. Alice Gordon made a change on page 2, #4, the bullet that says "Protect critical natural resources and environmentally sensitive areas." Alice Gordon also made a

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change on page 2, #5, the bullet that says "Protect critical natural resources and environmentally sensitive areas." Alice Gordon also made a change on page 4; the second to last paragraph, the word "associated" is misspelled.

Ellen Reckhow asked if transit was in the 21st Century Report and Dale McKeel stated he thought it was. Ellen Reckhow stated that we need to add it to the letter to give more power to our argument.

Mark Ahrendsen stated NCDOT will release the preliminary recommendations for project selection and prioritization by the end of the month and we will have about a month to respond. We can be more specific at that time with our comments.

A motion was made by Alice Gordon and seconded by Ellen Reckhow to approve the letter with the recommended edits. The motion carried unanimously.

Draft 2011-2020 MTIP (Attachments 9, 9A, and 9B)

Andy Henry introduced the attachments for this item and provided an update for the Draft 2011-2020 STIP and the review schedule. Andy Henry is in the process of scheduling the Division meetings. Sally Kost asked that a meeting for Division 8 be arranged. Andy Henry will send an email to the TAC members when the meetings have been scheduled.

REPORTS:

Report from the TAC Chair

Mike Woodard stated there will be a Joint TAC meeting on September 29, 2010 beginning at 8:30 a.m. at the RDU Authority Conference Room. A meeting has been schedule with UNC on September 27, 2010 regarding the NC-54 corridor study.

Report from Staff

The Report from Staff is attached for review.

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Report from the TCC Chair

Mark Ahrendsen stated the second round of public information workshops on the alternative analysis will be conducted in the next couple of weeks. There will be a citizen's information workshop on the East End Connector on September 20, 2010 from 4 p.m. to 7 p.m. at the Orange Grove Missionary Baptist Church.

NCDOT Report (Attachment 13)

NCDOT Division 5 is not in attendance; but the report is attached for review.

Patrick Wilson, NCDOT Division 7 engineer, provided an update on projects. Ed Harrison stated that UNC is concerned about the Cameron Street resurfacing project which was to be finished before UNC classes started this fall but was stopped before completion. Mr. Wilson will follow up with the construction engineer and will get back to Mr. Harrison.

Lydia Lavelle asked the status of the trail and bridge over Jones Creek. Ms. Lavelle asked for an understanding of the signage regarding the status of the project. Mr. Wilson will check with Mike Mills and will get back to Lydia Lavelle.

INFORMATIONAL ITEMS:

Recent News Articles and Updates (Attachment 14)

The recent news articles and updates are attached for review.

Letter from NCDOT Division of Bicycle and Pedestrian Transportation, TIP Project EB-4980, Orange Grove Road Pedestrian Bridge (Attachment 15)

The letter from NCDOT Division of Bicycle and Pedestrian Transportation, TIP Project EB-4980, Orange Grove Road Pedestrian Bridge is attached for review.

Adjournment

There being no further business before the Transportation Advisory Committee, the meeting was adjourned at 10:34 a.m.

Triangle Expressway Southeast Extension

DCHC

Durham-Chapel Hill-Carrboro MPO
TAC Meeting
October 13, 2010

Triangle Expressway Southeast Extension

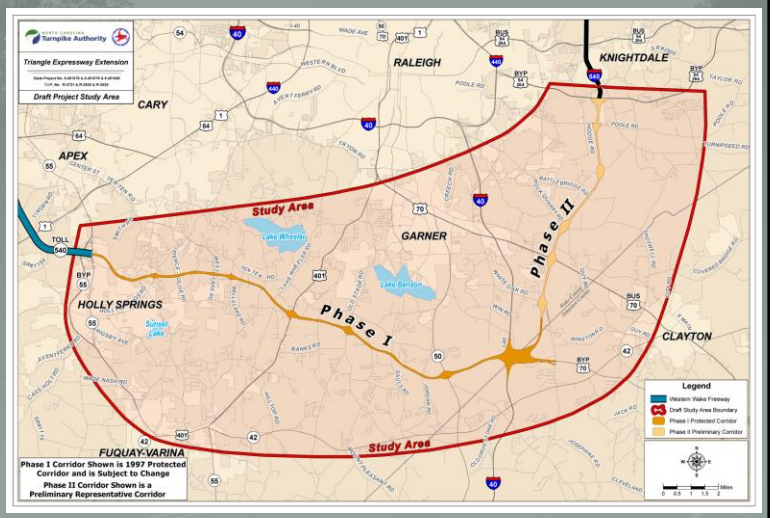
Current Activities

- Field surveys
- Developing Purpose and Need
- Developing alternative concepts and preliminary alternatives
- Agency coordination
- Public involvement – hotline, blog, small group meeting

Triangle Expressway SOUTHEAST EXTENSION

NORTH CAROLINA Turnpike Authority

Project Study Area



Triangle Expressway SOUTHEAST EXTENSION

NORTH CAROLINA Turnpike Authority

Project Needs

- **Mobility for movement of people and goods**
  - 2035 LRTP goal
  - Completion of Raleigh Outer Loop is 2025 horizon year project
  - Local resolutions
- **Limited transportation options for local and through travel**
  - Conflict between local and through travel on I-40/I-440
  - Few controlled access roadways in project area
  - Limited transit options in project area
- **Existing and projected poor LOS**
  - Inconsistent with NC Strategic Highway Corridor vision

Triangle Expressway SOUTHEAST EXTENSION

NORTH CAROLINA Turnpike Authority

Project Purpose

- Improve transportation mobility and enhance connectivity
  - High-speed, safe and efficient regional transportation infrastructure
  - Local and regional travel
- System linkage
- Support sustainability and livability goals
  - Potential to decrease commute times for project area residents

Triangle Expressway SOUTHEAST EXTENSION

NORTH CAROLINA Turnpike Authority

Alternatives Screening Methodology

- Identify alternative concepts
  - No Build
  - Mass Transit/Multi-Modal
  - TSM and TDM
  - Build options (New Location, Improve Existing, Hybrid)
- Qualitative first screening
  - Does alternative concept meet each element of purpose and need?
- Quantitative second screening
  - Develop GIS map of environmental constraints
  - Develop preliminary segments/corridors to avoid/minimize impacts
  - Apply environmental screening criteria to establish corridors
- Quantitative third screening
  - Develop conceptual designs for alternative corridors
  - Calculate and compare potential impacts

Triangle Expressway SOUTHEAST EXTENSION

NORTH CAROLINA Turnpike Authority

Qualitative First Screening – Ability to Meet Purpose and Need

Alternative Concept	Improves Transportation Mobility	Enhances Connectivity	Reduces Congestion	Consistent with NC SHC Vision	Improves System Linkage	Decreases Commute Times
No-Build	✖	✖	✖	✖	✖	✖
Transportation Demand Management	✓	✖	✖	✖	✖	✖
Transportation System Management	✓	✖	✖	✖	✖	✖
Mass Transit/Multi-Modal	✓	✖	✖	✖	✖	✖
Improve Existing Roadways (Widening Arterial) (Freeway)	✓ ✓	✖ ✓	✖ ✓	✖ ✓	✖ ✓	✖ ✓
New Location Highway	✓	✓	✓	✓	✓	✓
New Location/Improve Existing Roadway Hybrids	✓	✓	✓	✓	✓	✓

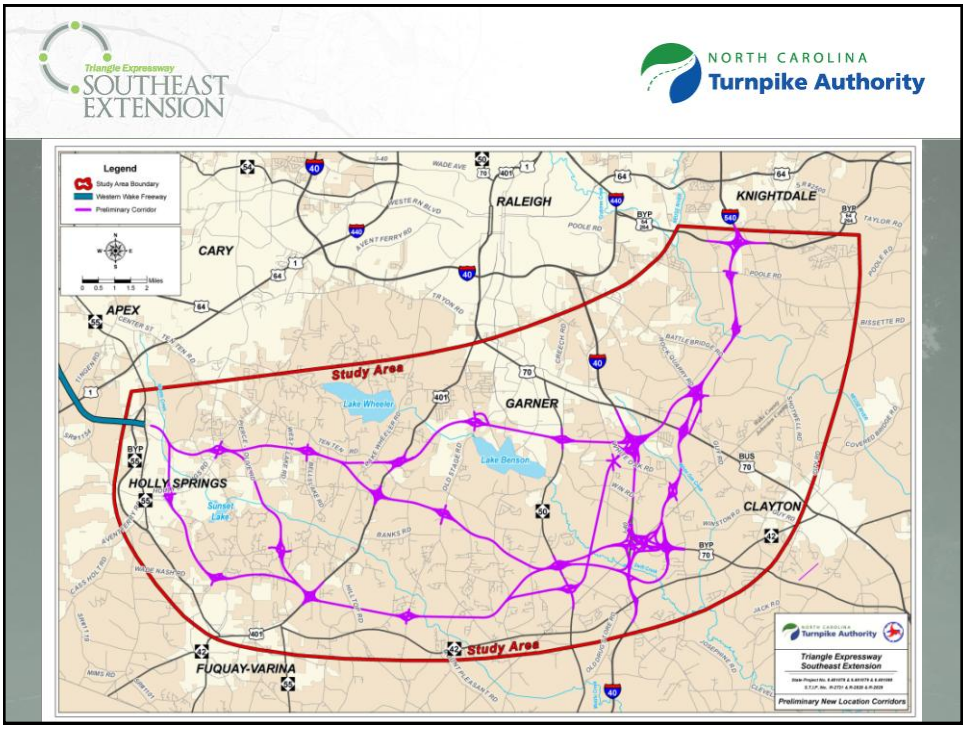
✖ - means the alternative cannot be designed to meet this element of purpose and need
✓ - means the alternative could be designed to meet this element of purpose and need

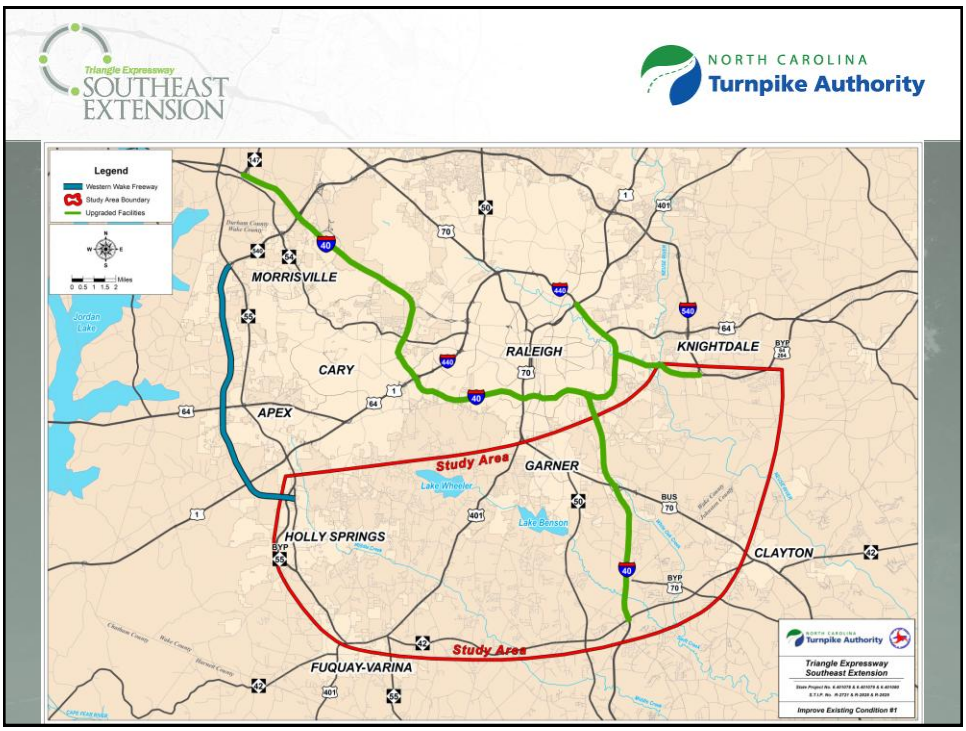
Triangle Expressway SOUTHEAST EXTENSION

NORTH CAROLINA Turnpike Authority

Build Alternatives

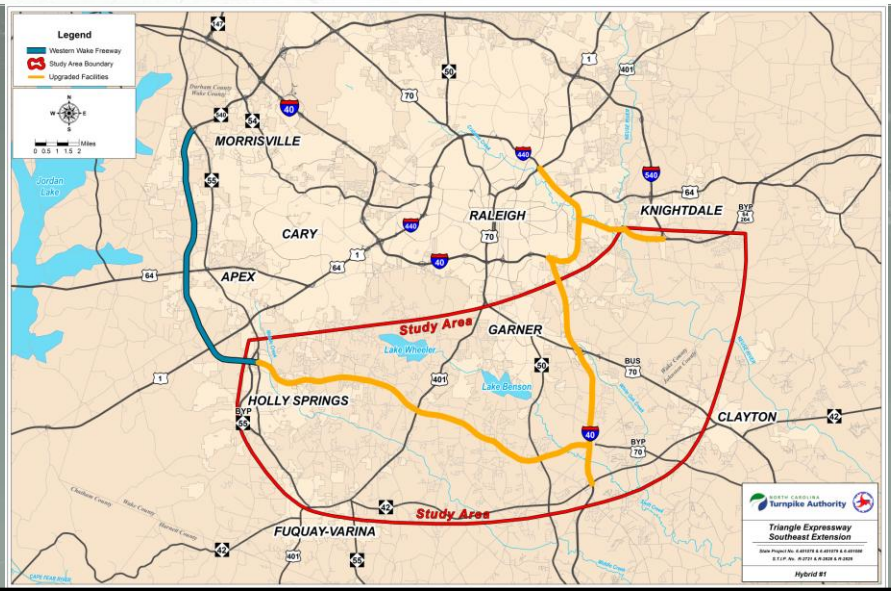
- Nine preliminary new location corridors
- One improve existing roadways alternative
  - I-40, I-440, US 64/264 Bypass
- One hybrid new location/improve existing alternative
  - Build Phase I on new location; improve I-40, I-440, US 64/264 Bypass in Phase II area


Triangle Expressway
SOUTHEAST EXTENSION
NORTH CAROLINA
Turnpike Authority
Legend
Study Area Boundary
Western Wake Freeway
Preliminary Corridor
CARY
APEX
RALEIGH
KNIGHTDALE
GARNER
CLAYTON
HOLLY SPRINGS
FUQUAY-VARINA
Study Area
Study Area
Lake Wheeler
Lake Benson
Sunset Lake
Triangle Expressway
Southeast Extension
Preliminary New Location Corridors


Triangle Expressway
SOUTHEAST EXTENSION
NORTH CAROLINA
Turnpike Authority
Legend
Western Wake Freeway
Study Area Boundary
Upgraded Facilities
MORRISVILLE
CARY
APEX
RALEIGH
KNIGHTDALE
GARNER
CLAYTON
HOLLY SPRINGS
FUQUAY-VARINA
Study Area
Study Area
Jordan Lake
Lake Wheeler
Lake Benson
Triangle Expressway
Southeast Extension
Improve Existing Condition 9T

Triangle Expressway SOUTHEAST EXTENSION

NORTH CAROLINA Turnpike Authority



Triangle Expressway SOUTHEAST EXTENSION

NORTH CAROLINA Turnpike Authority

Public Informational Meetings

- Presented purpose and need, preliminary alternatives
- Three meeting
  - September 21, Wake Tech – 558 attendees
  - September 22, Holly Springs High School – 473 attendees
  - September 23, Barwell Road Community Center – 146 attendees
- Comment period ends October 22
- Agency, local government, and public comments will be considered

Triangle Expressway SOUTHEAST EXTENSION

NORTH CAROLINA Turnpike Authority

Project Schedule

- Selection of Detailed Study Alternatives – November 2010
- Draft Environmental Impact Statement – 2012
- Final Environmental Impact Statement – 2013
- Record of Decision – 2013
- Phase I Open to Traffic – 2019

Schedule is draft and still under development

Triangle Expressway SOUTHEAST EXTENSION

NORTH CAROLINA Turnpike Authority

Questions, Comments, and/or Concerns?

Toll-Free Hotline: 1-800-554-7849

E-mail: southeast@ncturnpike.org

Triangle Regional Transit Program

Transitional Analysis Report

REVISED DRAFT

Executive Summary

September 24, 2010

Original Draft Dated September 2, 2010

Prepared for: Triangle Transit

Prepared by: URS Team

EXECUTIVE SUMMARY

INTRODUCTION AND PURPOSE

Triangle Transit has commissioned a major study to initiate fixed-guideway transit service within Wake, Durham, and Orange counties of North Carolina. The Triangle Regional Transit Program (TRTP) is a collaborative framework for developing an efficient and sustainable regional transportation system that addresses the Triangle's critical need for improved connectivity and mobility choices while promoting its economic prosperity, job growth, and an enhanced quality of life. While previous transportation plans for the region have recommended the introduction of fixed-guideway transit, this study is significant due to the passage of HB 148 by the North Carolina General Assembly, which authorizes Durham, Orange, and Wake counties to hold referenda that, if passed, would allow each county to levy a ½ percent sales tax increase to fund improvements in public transportation.

The studies being conducted over the next year will recommend which transit corridors should initially be built. Planning work being undertaken includes two phases:

Phase 1: A system-level Transitional Analysis, which is the subject of this report, will define and prioritize up to three transit corridors from the adopted 2035 Joint Long Range Transportation Plan (LRTP) to be studied in further detail in the Phase 2 Alternatives Analysis process. Given the geography of the region, including three counties and two Metropolitan Planning Organizations (MPOs), it is anticipated that one corridor within each of the MPO areas will be carried forward into the Alternatives Analysis process. A third commuter rail corridor spanning the region is possible as an early implementation project, with potential collaboration with the North Carolina Railroad and NCDOT.

Phase 2: Triangle Transit will conduct Alternatives Analysis studies for up to three priority corridors to evaluate and screen alternative alignments, modes and station locations within each corridor. The Alternatives Analysis process will conclude with the selection and MPO adoption of a Locally Preferred Alternative for each of the priority corridors. The Alternatives Analysis process is a requirement of the Federal Transit Administration (FTA) for a fixed-guideway project to be eligible for federal funds.

It is unlikely that all fixed-guideway transit corridors in the LRTP can be implemented in the near-term, even with a sales tax increase. It is expected that corridors not included in the Phase 2 Alternatives Analysis studies would be implemented in later phases. Fixed-guideway transit projects would also be complemented by improvements and expansion to regional and local bus services so that all communities in the region have improved transit access. Improvements to bus service could begin soon after the referendum if voters approve a ½ percent sales tax increase.

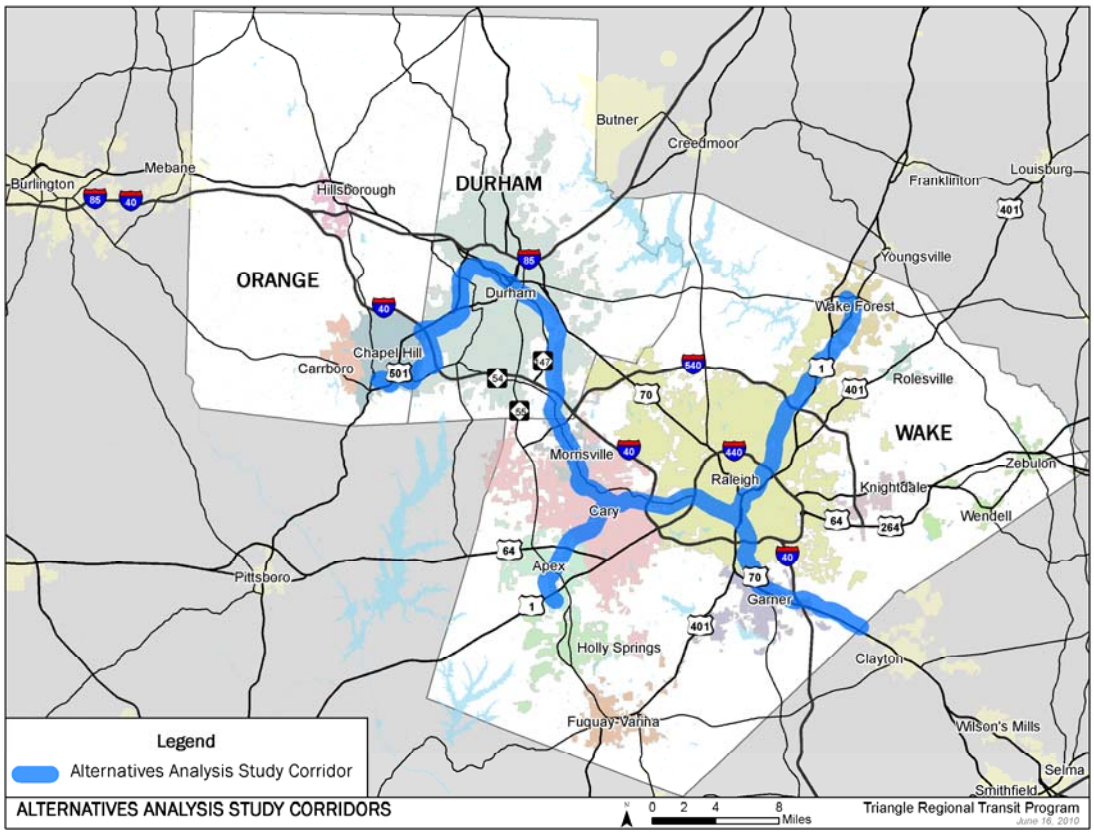
The primary purpose of the Transitional Analysis is to define the corridor(s) for inclusion in the Alternatives Analysis studies. The Transitional Analysis acts as the bridge between the system plan in the LRTP and the more focused and detailed study performed in an Alternatives Analysis.

For the Transitional Analysis, the system plan has been broken down into a set of smaller corridors that have been evaluated in order to recommend a limited number of priority corridors to move forward into the Alternatives Analysis process. This Transitional Analysis applies a set of evaluation criteria and measures to each corridor for evaluation and prioritization of the corridors. For the purposes of this analysis, a corridor consists of a relatively wide band up to one mile wide with major activity centers identified. Examples of activity centers include the Northeast Regional Center (NERC), Downtown Raleigh, NC State Fairgrounds, Cary, Research Triangle Park (RTP), Downtown Durham, and Gateway East. In the detailed Alternatives Analysis, the exact number and locations of stations will be identified, as well as the exact alignment of the planned service, the termini, and the type of vehicles.

CORRIDORS

Using the 2035 Joint LRTP for both the CAMPO and the DCHC-MPO (see Figure ES.1), as well as input from Triangle Transit, both MPO's, and other stakeholders, 12 corridors were identified in Wake County and 6 were identified in Durham and Orange counties.

Figure ES.1 Transitional Analysis Study Corridors



The study corridors were presented to the CAMPO, the DCHC-MPO and to elected officials. The identification of corridors was also widely communicated to various cities, towns, counties, and organizations. The Wake County Technical Committee, the Durham-Orange County Technical Committee, and the Public Involvement Steering Committee, which were established

for this project, were also presented with the corridors. All known stakeholders attended one of these presentations. Comments received from stakeholders have been considered and incorporated into this Transitional Analysis.

EVALUATION CRITERIA

The corridors were evaluated by the consulting team using the following criteria, which were developed in consultation with Triangle Transit, DCHC-MPO and CAMPO. Where applicable, the evaluation year is noted in parentheses.

Mobility

- Number of daily total trips in corridor (2035) (normalized as daily total trips/mile)
- Number of daily transit trips in corridor (2035) (normalized as daily transit trips/mile)
- Transit passenger miles traveled (PMT) for rail (2035)
- Relative peak hour corridor travel times for rail and highway travel (2035)

Socioeconomic

- Population and density within a mile-wide corridor (2005 and 2035)
- Number and density of low-income households within a mile-wide corridor (2000)
- Number and density of minority households within a mile-wide corridor (2000)
- Number and density of jobs within a mile-wide corridor (2005 and 2035)

Land Use

- Public sector/regulatory support - Existing comprehensive plans consistent with the concepts of compact, mixed-used development near public transportation, or transit-oriented development (TOD); allowable densities and flexibility of zoning districts
- Activity centers served (employment, retail, institutions, mixed use, special attractions)
- Development potential – future TOD potential considering potential household and employment density and future growth

Financial

- Total capital cost (2010 dollars)
- Capital cost per mile (2010 dollars)
- Capital cost per weekday transit trip (2010 dollars, 2035 ridership)
- Capital cost per weekday transit passenger mile traveled (2010 dollars, 2035 PMT)
- Total Operating and Maintenance (O&M) cost (2010 dollars)
- O&M cost per weekday transit trip (2010 dollars, 2035 ridership)
- Annual O&M cost per weekday transit passenger mile traveled (2010 dollars, 2035 PMT)

Public Input

Citizens and project stakeholders will be provided an opportunity to review and comment on the evaluation criteria and the draft results of the corridor analysis. This information will be presented at a series of six public workshops that will be held between September 14 and September 23, 2010.

RESULTS

Each of the corridors was evaluated based on the above criteria. This section presents the results of this evaluation for the Wake County corridors and for the corridors in Durham and Orange counties. As stated in Chapter 5, all of the criteria that were evaluated in this study were developed by the consulting team in partnership with Triangle Transit, DCHC-MPO, and CAMPO. All criteria may be useful or informative regarding any given corridor, and as such all results of the analysis have been included in Chapter 6 of this document. However, some criteria do not meaningfully distinguish between separate corridors, and are not included in the summary performance of each corridor. Tables ES.1 and ES.2 summarize the evaluation criteria that were most helpful in distinguishing between corridors.

Wake County

Twelve corridors in Wake County were evaluated and the results can be seen in Table ES.1. A summary of the findings is also presented.

Conclusions

Results of the analysis indicate that Wake Alternatives 9 (from Downtown Cary to the Northeast Regional Center) and 10 (from the State Fairgrounds to the Northeast Regional Center) are the overall highest performers. A summary of the evaluation follows:

- Wake Alternatives 9 and 10 have the highest daily rail trip estimates on a per mile basis, with 394 and 402 rail trips per mile respectively. The comparatively stronger ridership is a reflection of the large concentrations of people living within the vicinity of the corridors and the number of dense employment nodes – including downtown Raleigh, NERC, and Cary – that are served by both corridors.

- The corridor alternatives serving the segment from downtown Raleigh to the NERC have the highest levels of future household and employment densities. These include Wake 8 (Northwest Cary to NERC), Wake 9 (Downtown Cary to NERC), Wake 10 (State Fairgrounds to NERC), and Wake 11 (Downtown Raleigh to NERC).

- The jurisdictions in the region have adopted strong policies supportive of transit-oriented development in the planned transit corridors. This is a direct result of the ongoing comprehensive planning process that incorporates the LRTP into the comprehensive plans for the cities, towns, and counties in the region. The analysis of the land use plans and policies and Zoning by Right illustrate that the potential for higher densities of population, households, and employment is relatively strong in all of the proposed corridor alternatives. It then becomes the issue of identifying the best performing corridors. In an effort to summarize the economic and demographic factors, a Relative Future Density/Growth (RDFG) Factor was formulated and normalized on a per mile

basis. In this analysis, the Wake Alternatives 8 through 11 have the highest factors and Wake 11 performs the best. Wake 7 (TMC to NERC) and the regional corridor, Wake 12 (Duke Medical to Downtown Raleigh), also perform well but have factors just under Wake 8.

- From a cost perspective, Wake Alternatives 9 and 10 are relatively expensive to build when compared to other corridors on a cost per mile basis. Wake Alternatives 9 and 10 would cost $65M per mile and $67M per mile respectively. The higher cost, as compared with other corridors, can be attributed to more expensive infrastructure needs related to limited right-of-way and required infrastructure improvements, particularly in the vicinity of downtown Raleigh. On a per mile basis, longer corridors can spread out the costs associated with these infrastructure upgrades. Unlike other corridors however, Wake Alternative 9, which is 16 miles and Wake Alternative 10, which is 12 miles, are not long enough to spread out the costs of the infrastructure improvements required in the vicinity of downtown Raleigh.

- Although they are higher on a capital cost per mile basis than other corridors, Wake Alternatives 9 and 10 perform relatively well in terms of cost effectiveness due to their strong ridership. The capital cost per transit trip for Wake Alternative 9 is approximately $54 per trip and the capital cost per transit trip for Wake Alternative 10 is approximately $55 per trip.

While Wake Alternatives 9 and 10 are the overall strongest performers among the Wake corridors, Wake Alternative 8, which extends the transit line an additional two miles from downtown Cary to NW Cary, is not significantly far behind in performance. A terminal station in downtown Cary could be problematic due to limited property available for locating an end-of-line park and ride. A relatively short extension to NW Cary, therefore, may improve the feasibility of this corridor by providing more opportunities to locate a park and ride and related transit infrastructure and potentially increasing ridership. Given that this is a high-level screening process and that Wake Alternatives 8 and 11 are not significantly lower performing than Wake Alternatives 9 and 10, consideration should be given to performing the detailed analysis on Wake Alternative 8 which incorporates all of the alignments coincident to Wake Alternatives 9, 10, and 11.

The detailed Alternatives Analysis can fine tune this larger corridor in looking at the most optimal, best-fit initial starter line that may involve cutting back on the alignments at both ends to arrive at the most effective corridor for New Starts funding. This is in recognition of Federal funding capacity and that most starter lines initially constructed are in the 10-12 mile range. Extensions from the initial line would start the full build-out process consistent with funding availability.

Table ES.1 Evaluation Criteria Summary (Wake County)

Study Corridor	Corridor Length (mi) / Total Cost M$ (2010)	Mobility		Socioeconomic				Land Use		Financial			
		Total In Corridor Trips per Mile (2035)	Rail Trips/Mile (2035)	Population Density (2035)	Employment Density (2035)	Low Income Population Density (2000)	Minority Population Density (2000)	Supports Transit Oriented Development, Zoning by Right	Relative Future Density / Growth Factor	Capital Cost (2010)	Capital Cost per Mile (2010 Dollars, 2035 Ridership)	Capital Cost per Weekday Transit Trip (2010 Dollars, 2035 Ridership)	Operating & Maintenance Cost/ Weekday Transit Trip (2010 Dollars, 2035 Ridership)
Wake Alternative 1 (UNC Hospitals to Wake Forest)	59/$3,500	◒	◒	○	○	◒	◒	◒	○	○	●	●	●
Wake Alternative 2 (Triangle Metro Center to Wake Forest)	33/$1,900	◒	○	◒	○	○	○	◒	◒	◒	●	◒	◒
Wake Alternative 3 (Veridea to Wake Forest)	33/$2,000	◒	○	◒	○	○	○	◒	◒	○	●	◒	◒
Wake Alternative 4 (Downtown Cary to Wake Forest)	25/$1,500	◒	○	◒	◒	○	○	◒	◒	◒	●	◒	◒
Wake Alternative 5 (State Fairgrounds to Wake Forest)	20/$1,200	◒	○	◒	◒	○	○	◒	◒	◒	●	○	○
Wake Alternative 6 (Downtown Raleigh to Wake Forest)	17/$1,000	◒	○	◒	◒	○	○	◒	◒	●	◒	○	○
Wake Alternative 7 (Triangle Metro Center to NERC)	24/$1,500	◒	●	◒	◒	○	○	◒	◒	◒	●	●	●
Wake Alternative 8 (Northwest Cary to NERC)	18/$1,100	●	●	●	●	◒	◒	●	●	◒	◒	●	◒
Wake Alternative 9 (Downtown Cary to NERC)	16/$1,000	●	●	●	●	◒	◒	●	●	●	◒	●	●
Wake Alternative 10 (State Fairgrounds to NERC)	11/$780	●	●	●	●	◒	◒	●	●	●	○	●	◒
Wake Alternative 11 (Downtown Raleigh to NERC)	8/$580	●	◒	●	●	◒	◒	●	●	●	○	○	◒
Wake Alternative 12 (Duke Medical to Downtown Raleigh)	29/$1,700	◒	○	◒	◒	◒	◒	◒	◒	◒	●	◒	◒
Summary of Evaluation Criteria and Rankings													
High Performer = ●		>22,060 Trips/Mile	>363.5 Trips/Mile	> 3.9 Households/Acre	>13.3 Jobs/Acre	>0.61 Persons/Acre	>1.61 Persons/Acre	Considers the # of stations and allowable densities within jurisdiction	>0.9	<1052	<$62.0 M/Mile	<$56.9/Trip	<$9.9/Trip
Average Performer = ◒		18,452 - 22,060 Trips/Mile	311.3-363.5 Trips/Mile	2.9 - 3.9 Households/Acre	10.3 - 13.3 Jobs/Acre	0.38 - 0.61 Persons/Acre	1.04 - 1.61 Persons/Acre		>0.5-0.89	1052-1925	$62.0 - $66.3 M/Mile	$56.9-66.4/Trip	$9.9-12.1/Trip
Low Performer = ○		<18,452 Trips/Mile	<311.3 Trips/Mile	<2.9 Households/Acre	<10.3 Jobs/Acre	<0.38 Persons/Acre	<1.04 Persons/Acre		<0.50	>1925	>$66.3 M/Mile	>$66.4/Trip	>$12.1/Trip

Note: The breakpoints for the bins are ±0.5 standard deviations from the mean. Data results are given in greater detail in Chapter 6.

Durham-Orange Counties

Six corridors in Durham and Orange counties were evaluated and the results can be seen in Table ES.2. A summary of the findings follows the table.

Conclusions

Results of the analysis indicate that Durham-Orange Alternatives 4 (from UNC Hospitals to Alston Avenue), 5 (from UNC Hospitals to Gateway) and 6 (from Gateway to Alston Avenue) are the overall highest performers (note that Alternatives 5 and 6 are subsets of Alternative 4). Primary discriminators between the alternatives include mobility, socio-economics and cost-effectiveness, as discussed here:

- Durham-Orange Alternatives 4 and 5 have the highest daily rail trip estimates on a per mile basis, with 394 and 399 rail trips per mile respectively. This primarily reflects the high employment at UNC and UNC Hospitals, Duke University and Duke Medical Center, and downtown Durham. Several significant mixed-use developments also exist or are planned within the corridor.

- Durham-Orange Alternatives 4 and 6, both of which terminate at Alston Avenue, are the most effective at reaching transit-dependent populations.

- The jurisdictions in the region have adopted strong policies supportive of transit-oriented development in the planned transit corridors. This is a direct result of the ongoing comprehensive planning process that incorporates the LRTP into the comprehensive plans for the cities, towns, and counties in the region. The analysis of the land use plans and policies and Zoning by Right illustrate that the potential for higher densities of population, households, and employment is relatively strong in all of the proposed corridor alternatives. It then becomes the issue of identifying the best performing corridors. In an effort to summarize the economic and demographic factors, a Relative Future Density/Growth (RDFG) Factor was formulated and normalized on a per mile basis. In this analysis, DO 6 (Gateway to Alston Avenue) has the highest factor of the Durham-Orange corridors. The regional corridor, DO 2 (Duke Medical to Downtown Raleigh) also performs well, but is just under DO 6 and slightly better than DO 4 (UNC Hospitals to Alston Avenue).

- From a cost perspective, Durham-Orange Alternatives 4 and 5 are relatively more expensive to build compared to other corridors ($68M per mile and $66M per mile respectively). This is because these corridors are primarily on new alignment that requires more right-of-way acquisition and infrastructure improvements than alternative corridors that use existing railroad right-of-way (e.g., Durham-Orange Alternatives 1 and 2).

- Although they are higher on a capital cost per mile basis than other corridors, Durham-Orange Alternatives 4 and 5 perform better in terms of cost effectiveness due to their strong ridership. The capital cost per transit trip for Durham-Orange Alternative 4 and 5 is approximately $55 and $53 per transit trip, respectively.

Durham-Orange Alternative 4 is the combination of Durham-Orange Alternatives 5 and 6, and hence, advancing this longer corridor allows for the most optimal starter line analysis for submission for Federal funding.

Durham-Orange Alternative 2 (from Duke Medical Center to Downtown Raleigh) was average in terms of socio-economic and strong in land-use factors, but not strong in terms of mobility and costs. Cost-effectiveness would improve if costs could be reduced. The ridership may have been low in part because the ridership model assumed light rail-type service rather than commuter rail-type service, which may be more appropriate for this corridor. For this initial study, costs assumed light rail transit, which is significantly more expensive than commuter rail, which uses primarily existing infrastructure. If connecting the region is a high priority over maximizing the potential for federal funds, then consideration should be given to this alternative. However, if federal funds are achieved with the other, better performing corridors as noted above, then full build out towards Wake Forest and Chapel Hill will occur sooner. If these corridors fail to be competitive for federal funds, then the decision can be revisited on which corridor to advance into preliminary engineering. The opportunity for Federal funding will become evident relatively soon after the New Starts submittal in the fall of 2011.

Table ES.2 Evaluation Criteria Summary (Durham-Orange Counties)

Study Corridor	Corridor Length (mi) / Total Cost M$ (2010)	Mobility		Socioeconomic				Land Use		Financial			
		Total In Corridor Trips per Mile (2035)	Rail Trips/Mile (2035)	Population Density (2035)	Employment Density (2035)	Low Income Population Density (2000)	Minority Population Density (2000)	Supports Transit Oriented Development, Zoning by Right	Relative Future Density / Growth Factor	Capital Cost (2010)	Capital Cost per Mile (2010 Dollars, 2035 Ridership)	Capital Cost per Weekday Transit Trip (2010 Dollars, 2035 Ridership)	Operating & Maintenance Cost/ Weekday Transit Trip (2010 Dollars, 2035 Ridership)
Durham-Orange Alternative 1 (UNC Hospitals to Wake Forest)	59/$3,500	◒	◒	○	○	◒	◒	◒	○	○	●	●	●
Durham-Orange Alternative 2 (Duke Medical to Downtown Raleigh)	29/$1,700	◒	○	◒	◒	◒	◒	◒	◒	◒	●	◒	◒
Durham-Orange Alternative 3 (UNC Hospitals to Triangle Metro Center)	26/$1,600	○	◒	○	○	●	●	●	○	◒	◒	◒	◒
Durham-Orange Alternative 4 (UNC Hospitals to Alston Ave)	17/$1,200	○	●	○	◒	●	●	●	◒	◒	○	●	●
Durham-Orange Alternative 5 (UNC Hospitals to Gateway)	7/$470	○	●	○	○	◒	○	◒	○	●	◒	●	◒
Durham-Orange Alternative 6 (Gateway to Alston Ave)	10/$750	●	◒	◒	●	●	●	◒	●	●	○	○	○
Summary of Evaluation Criteria and Rankings													
High Performer = ●		>22,060 Trips/Mile	>363.5 Trips/Mile	> 3.9 Households/Acre	>13.3 Jobs/Acre	>0.61 Persons/Acre	>1.61 Persons/Acre	Considers the # of stations and allowable densities within jurisdiction	>0.9	<1052	<$62.0 M/Mile	<$56.9/Trip	<$9.9/Trip
Average Performer = ◒		18,452 - 22,060 Trips/Mile	311.3-363.5 Trips/Mile	2.9 - 3.9 Households/Acre	10.3 - 13.3 Jobs/Acre	0.38 - 0.61 Persons/Acre	1.04 - 1.61 Persons/Acre		>0.5-0.89	1052-1925	$62.0 - $66.3 M/Mile	$56.9-66.4/Trip	$9.9-12.1/Trip
Low Performer = ○		<18,452 Trips/Mile	<311.3 Trips/Mile	<2.9 Households/Acre	<10.3 Jobs/Acre	<0.38 Persons/Acre	<1.04 Persons/Acre		<0.50	>1925	>$66.3 M/Mile	>$66.4/Trip	>$12.1/Trip

Note: The breakpoints for the bins are ±0.5 standard deviations from the mean. Data results are given in greater detail in Chapter 6.

Regional Corridor

The current LRTP prepared by both the CAMPO and the DCHC-MPO includes a regional rail system that is comprised of both light rail transit (LRT) and commuter rail service, with the majority of the system being LRT, to be implemented in stages. This systems plan includes the provision of LRT service between Raleigh and Durham and between Durham and Chapel Hill. There is an overlap in the LRT plans and the commuter rail plans from downtown Raleigh to the Northeast Regional Center (in the location of Capital Boulevard and I-540). The purpose of the Transitional Analysis is to select which segments or corridors of the LRT system should be implemented first with the full system to be constructed in future phases. It is not practical or financially feasible to construct the entire LRT system as a single project and only the most effective segments or corridors should be initiated first, particularly if funding is to be requested from the Federal Transit Administration (FTA) under the New Starts program.

The Transitional Analysis examined a total of 16 corridors, including those that connected the two MPO regions and those that were entirely within either the CAMPO region or the DCHC-MPO region. The corridor alternatives were evaluated in the context of all day, frequent service that is typical of a LRT system. By contrast, a commuter rail system provides service only during the AM and PM peak period trips using a lower frequency of service (typically every 30-60 minutes). While LRT must operate on exclusive tracks, commuter rail can, and typically does, operate on tracks shared with freight and other intercity passenger rail service. In the Triangle Region, the term “express rail” has been identified to include the combination of existing AMTRAK passenger rail, existing and expanded NCDOT passenger rail service between Raleigh and Charlotte, and the additional commuter rail service during the peak periods.

The initial findings of the Transitional Analysis indicate that the corridor alternatives that operate in Wake County from Cary through downtown Raleigh and to the Northeast Regional Center (NERC) perform the best in terms of ridership, riders per mile, and cost per rider. This set of corridor alternatives is followed in performance by those that operate from UNC Hospitals to downtown Durham. The corridor alternative that connects Durham to Raleigh, passing through the Research Triangle Park, performed below both of the previous sets of alternatives. While the provision of LRT service between Durham and Raleigh is not the most cost-effective alternative for initial implementation, the early connection of these two major areas in the region can be provided by commuter rail or express rail service that can be implemented with lower costs than either of the LRT projects. Future extensions of the LRT systems in Wake and Durham counties would connect the two areas with LRT as identified in the LRTP. The major investments in commuter rail would not be wasted because the tracks could continue to be used by other freight and intercity passenger rail service (including the potential High Speed Rail service) and the vehicles could be moved to extensions of the commuter rail service to the areas on the edges of the region serving the downtowns of Raleigh and Durham.

For these reasons, an additional special Alternatives Analysis study will be prepared that evaluates commuter rail service versus LRT. The LRT service would connect the ends of the two initial LRT systems in Wake and Durham counties versus commuter rail service that extends from downtown Durham to east of Clayton using the existing NCRR alignment. This will allow informed decisions to be made on whether early implementation of commuter rail service is worth the investment. If requested, we could also compare LRT service from Durham to Raleigh against commuter rail service from Durham to Raleigh with the assumption that the Wake County and Durham County LRT systems are not implemented.

Other Considerations

With the analysis of corridor performance, rail transit extensions to the Research Triangle Park, Wake Forest, Apex, and points beyond would not be carried forward for further consideration in the more detailed Alternatives Analysis studies. This does not, however, mean that service to these areas would be eliminated; it simply recognizes that they will be studied in greater detail at a later time. These extensions are truly noteworthy as the system expands, but the purpose of this first set of Alternative Analysis studies is to focus on the most effective corridors for initial transit investment and implementation. This is the formula other cities have used to develop and implement system-wide extensions.

Therefore, for those areas of the region that are not directly considered for initial detailed study in the Alternatives Analysis, additional studies have either been conducted or are recommended as follows:

- Extension of LRT to Garner: Technical memorandum detailing the future extension of the rail transit service from Raleigh to Garner.

- Extensions of commuter rail to Wake Forest and Apex: Technical memoranda analyzing implementation of commuter rail service to Wake Forest and Apex. (This has been suggested by CAMPO as a viable alternative). Considerations could include the following: termini, freight track alignments, operations, and cost.

- Extension of commuter rail service to Hillsborough and Zebulon: There have been requests to include extensions to both Hillsborough and to Zebulon in the study. The purpose of the Transitional Analysis is to determine the priority corridors for early implementation, but not preclude future extensions. White papers further discussing these two extensions are included as Appendix A and B.

- Extension to Carrboro: Project stakeholders from the municipality of Carrboro, Orange County and the DCHC-MPO, as well as citizens from Carrboro have indicated an interest in studying a rail transit connection to Carrboro. Per stakeholder comments, a draft white paper technical study providing an overview of the strategic issues that need addressing to extend rail transit to Carrboro was prepared and is presented in Appendix C.

When completed, the memoranda will be included as Appendices to this Transitional Analysis before it is finalized. These memoranda, along with the results of the Alternatives Analysis process can be used by both the CAMPO and the DCHC-MPO as input to the updates of their respective long range transportation plans.

NEXT STEPS

On September 29, 2010 there will be a special joint meeting of the Durham-Chapel Hill-Carrboro MPO and the Capital Area MPO to review and comment on the corridors for study in the Alternatives Analysis.

Comparison of FY2009-2015 STIP and FY2011-2020 STIP

Highway, Bridge, Bicycle and Pedestrian Projects

New Projects

				Total Cost (thousands)			Year Begin Construction			$ Funded			$ Unfunded	
Division	Project #	Route	Description	2009-2015	2011-2020	Difference	2009-2015	2011-2020	Delay	2009-2015	2011-2020	Difference	2009-2015	2011-2020
7	I-3306	I-40	I-85 in Orange Co. to US 15-501	47,000	47,000	-	post year	2019	new	-	23,500	23,500	47,000	23,500
7	I-0305	I-85	I-40 at Hillsborough to Durham County Line.	210,782	210,782	-	post year	2020	new	-	58,497	58,497	210,782	152,285
5	U-4716	SR 1978 (Hopson Rd.)/SR 1980 (Church St.)	Construct a grade separation, extend Church St. and close Church St. crossing	6,500	31,016	24,516	post year	2011	new	-	20,441	20,441	6,500	7,020
7	U-5304	US 15-501 (Bypass)	S. Columbia St. to Ephesus Ch. Rd.; bicycle, pedestrian and transit accommodations	-	5,150	5,150	post year	2019	new	-	5,150	5,150	-	-
7	B-4962	Eno River	Replace Bridge No. 46	6,200	6,600	400	2015	2018	new	3,350	6,600	3,250	2,850	-
7	B-5348	Phil's Creek	Replace Bridge No. 85	-	1,063	1,063	post year	2019	new	-	1,063	1,063	-	-
5, 8	FS-1008B	NC 751 (Feasibility Study)	US 64 in Chatham to north of Fayetteville Rd in Durham; widen to multi-lanes	n/a	n/a	n/a	n/a	n/a	new	n/a	n/a	n/a	n/a	n/a
5	FS-1005C	NC 54 (Feasibility Study)	I-40 to NC 55; widen to multi-lanes	n/a	n/a	n/a	n/a	n/a	new	n/a	n/a	n/a	n/a	n/a
5	C-5175	DATA	Operating assistance for new fixed route	-	2,438	2,438	n/a	2013	new	-	2,438	2,438	-	-
7	C-5177	MLK Jr. (shared pathway)	Homestead Rd. to Piney Mtn. Rd.	-	906	906	n/a	2013	new	-	906	906	-	-
5	C-5178	Campus Walk (Morreene Rd. to Lasalle St.) and Lasalle St. (Kangaroo Dr. to Erwin Rd.)	Construct sidewalks	-	336	336	n/a	2014	new	-	336	336	-	-
7	C-5179	Estes Dr.	Construct pathway, sidewalk & bike lanes	-	1,182	1,182	n/a	2015	new	-	1,182	1,182	-	-
5	C-5182	Hope Valley Rd.	MLK Pkway and US 15-501 Bus.; sidewalks and bike lanes	-	1,386	1,386	n/a	2016	new	-	1,386	1,386	-	-
5	C-5183	Cameron Blvd. (Erwin Rd. to Duke Univ. Rd.) and Alston Ave. (Carpenter Fletcher and Sedwick	Construct sidewalks	-	2,127	2,127	n/a	2016	new	-	2,127	2,127	-	-
7	C-5184	Riverwalk Trail	Construct paved trail along Eno River (Phase III)	-	621	621	n/a	2018	new	-	621	621	-	-
7	W-5318	NC 86	NC 57 to Caswell Co.; geometric and shoulder improvements	-	4,654	4,654	n/a	2015	new	-	4,654	4,654	-	-
7	C-5181	Jones Creek Greenway	Bridge and connector trail	-	300	300	n/a	2015	new	-	300	300	-	-
						45,079						**125,851**		

Notes:

1. The tables in this document do not include highway maintenance and repaving projects, and those projects funded by traditional transit funding sources.
2. The MPO designates which projects receive Congestion Mitigation and Air Quality (CMAQ) funding, which are identified in these tables with the "C" prefix in the project number. Therefore, an issue with the funding or schedule of a CMAQ projects needs to be addressed with the MPO, and not NCDOT.

Change in Cost and Schedule

Division	Project #	Route	Description	Total Cost (thousands)			Year Begin Construction			$ Funded			$ Unfunded	
				2009-2015	2011-2020	Difference	2009-2015	2011-2020	Delay	2009-2015	2011-2020	Difference	2009-2015	2011-2020
5, 7	EB-4707	SR 2220 (Old Chapel Hill Rd.)-SR 1838 (Old Durham Rd.)/US 15-501	Durham Co. to Orange Co. bicycle improvements	3,828	5,450	1,622	2009	2011	2	3,828	4,000	172	-	-
5	U-4763B	Triangle Parkway	I-540 to I-40	190,610	190,568	(42)	2009	2011	2	190,610	190,568	(42)	-	-
7	U-3306	SR 1733/Weaver Dairy Rd.	NC 86 to Erwin Rd.	15,995	17,125	1,130	2010	2011	1	15,995	17,125	1,130	-	-
7	U-2803	SR 1919/Smith Level	Rock Haven Road to Bridge NO. 88	5,400	7,450	2,050	2011	2013	2	5,400	7,450	2,050	-	-
7	U-0624	NC 86/S. Columbia St.	SR 1906 (Purefoy Rd.) to SR 1902 (Manning Drive)	6,660	7,310	650	2009	2012	3	6,660	7,310	650	-	-
5	U-0071	East End Connector	NC 147 to north of NC 98	155,401	172,733	17,332	2013	2014	1	122,151	172,733	50,582	33,250	-
5	U-3308	NC 55/Alston Ave.	NC 147 to US 70 Bus-NC 98	23,321	28,428	5,107	2011	2014	3	23,321	28,428	5,107	-	-
7	U-3808	Elizabeth Brady Road Extension	South of US 70 Bus to north of US 70 Bypass at St. Mary's Rd.	33,994	-	(33,994)	2012	Deleted	n/a	33,994	-	(33,994)	-	-
5	B-3638	US 70 Bus/Main St.	Campus Drive Replace Bridge	975	1,300	325	2010	2012	2	975	1,300	325	-	-
5	B-4943	SR 1616	Sandy Creek Replace Bridge	415	477	62	2013	2020	7	415	477	62	-	-
5	C-4928	Morreene Rd., Neal Rd./Erwin Rd.	Construct bike lanes and sidewalks	556	1,441	885	2009	2011	2	556	1,441	885	-	-
5	W-5110	NC 55 and Lawson St.	Construct left turn lanes on NC 55	975	975	-	2011	2012	1	975	975	-	0	0
7	EL-4994	Orange County	Bolin Creek Greenway	738	1476	738	2008	2011	3	738	1,476	738	0	0
5	U-4724	Cornwallis Rd., S. Roxboro Rd./University Dr.	Bike and pedestrian feature	2,270	1,970	(300)	2010	2011	1	2,270	1,970	(300)	-	-
				Project Cost Increase		**29,601**			**Project Funding Increase**			**61,701**		
				Net Cost Change		**(4,435)**			**Net Funding Change**			**27,365**		

Funded Projects Currently Under Construction or In Progress

Division	Project #	Route	Description	Total Cost (thousands) 2009-2015	2011-2020	Difference	Construction 2011-2020
5	U-3309	SR 2028/T.W. Alexander Dr.	Cornwallis Rd to Miami Blvd.	13,961	14,933	972	under const.
5	U-3804	SR 1321/Hillandale Rd.	I-85 to Carver Street	11,191	11,941	750	under const.
5	U-4009	SR 1126/Service Rd.	Parallel to US 15-501 at Garrett Rd.	5,683	5,683	-	under const.
5	U-4011	SR 1959/S. Miami Blvd.	South of SR 2112 (Methodist St.) to north of SR 1960 (Bethesda Avenue)	6,477	8,265	1,788	under const.
5	U-4012	US 15-501	N. of Mt. Moriah Rd. to S. of Garrett Rd.	15,609	15,609	-	under const.
5	U-4026	SR 1613/Davis Dr.	Morrisville-Carpenter Rd. to NC 54	38,706	39,063	357	under const.
7	U-4704	Chapel Hill	Chapel Hill-Carrboro Computerized Traffic Signal System	5,000	5,450	450	under const.
5,7,8	U-4726	Urban Area Bike/Ped Allocation	DCHC MPO planning area	7,419	11,941	4,522	in progress
7	B-4216	SR 1002 - Strouds Creek	Replace bridge No. 66	1,125	1,054	(71)	under const.
5	B-3450	SR 1116 (Garrett Rd.)	New Hope Creek, Replace Bridge; Sandy Creek, Replace Bridge	4,986	4,986	-	under const.
8	EB-2921F	American Tobacco Rail Trail	Durham Co. to Wake Co.	2,392	2,392	-	in progress
7	C-4932A	Orange County	125 Space Park and Ride Lot.	275	275	-	under const.
5	C-4702	Durham County	10 Replacement buses	3,000	3,000	-	in progress
7	EL-4828	Morgan Creek Greenway West	Smith Level Rd. to University Lake	600	535	(65)	in progress
7	EL-4601	Morgan Creek Greenway East	US 15-501 Culbeth Rd. to Smith Level Rd	872	1,290	418	in progress
5	EB-3606	Orange County	Bicycle route mapping and signing	50	50	-	in progress
5, 7	C-4924	TJCOG	Develop flexible work schedule for employees and organizations in Triangle ozone non-attainment area for 3 yrs.	300	5,626	5,326	in progress
5	C-4929	Bicycle Parking Program	Install bike racks at various locations	48	48	-	in progress
				Net funding change		**14,447**	

Note: Funding increase for some ongoing programs might be based on increase in plan years
(FY09-15 TIP = 7 years; FY11-20 TIP = 10 years)

UnFunded Projects (No change in unfunded status)

Division	Project #	Route	Description	Total Cost 2009-2015	Total Cost 2011-2020	Difference	Year begin
5	I-4743	I-85	US 70 to SR 1632 (Red Mill Rd.)	n/a	n/a	n/a	post year
7	R-3438	Hillsborough Western Bypass	US 70 to NC 57	7,450	7,450	-	post year
7	R-2825	SR 1009/S. Churton St.	I-40 to Eno River	19,300	22,750	3,450	post year
7	U-2805	SR 1777 (Homestead Rd.)/SR 1834 (High School Rd.)	Widen to multi-lanes	10,600	10,600	-	post year
7	U-2909	SR 1780 (Estes Dr.)/SR 1772 (Greensboro St.)	Widen to multi-lanes	7,600	6,855	(745)	post year
5	U-2405	MLK Jr. Parkway/NC 55	Construct interchange	25,800	29,850	4,050	post year
5,7	U-2807	US 15-501 SR 1010 (Franklin St.)/US 15-501 bypass in Durham	Major corridor upgrade	123,000	156,000	33,000	post year
5	U-4720	US 70	Lynn Rd. to the proposed Northern Durham Parkway	n/a	n/a	n/a	post year
5	U-4721	Proposed Northern Durham Parkway	I-540 to Roxboro Rd.	n/a	n/a	n/a	post year
5	U-4722	US 501 (Roxboro Rd.)	US 501 bypass (Duke St.) to SR 1640 (Goodwin Rd.)	n/a	n/a	n/a	post year
5	U-2831B	Riddle Rd./SR 1951 (So-Hi Dr.)	Briggs Ave extension	10,685	10,685	-	post year
7	U-3436	SR 1148 (Eno Mountain Rd.) and SR 1192 (Mayo St.) at SR 1006 (Orange	Realign intersection and make safety improvements	2,350	2,350	-	post year
7	EL-4995	Orange County	Dry Creek Greenway	700	700	-	post year
7, 8	EB-5110	Bolin Creek Greenway (Chapel Hill)	NC 86 to Umstead Park	-	-	-	Feasibility Study
7	EB-4710	Seawell School Rd.	Homestead to Estes. Bicycle improvements	2,000	-	(2,000)	Deleted

Division 5 and Division 8 One-on-One Meeting
FY 2011-2020 Transportation Improvement Program

Agenda

1. **2011-2020 TIP Items for Discussion**
   a. **General Funding and Design Issues**
   b. **Major Project Schedules and Funding**
   c. **Project Study and Project Management Requests**

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1. 2011-2020 TIP Items for Discussion

The DCHC MPO has reviewed the 2011-2020 Draft STIP and developed the following list of issues for discussion. The MPO is developing the 2011-2020 MTIP which will be approved in late spring 2011.

a. General Funding and Design Issues

1. **SPOT and Loop Evaluation Processes**
   The DCHC MPO commends the NCDOT for developing the SPOT and Loop evaluation processes that incorporate a more objective and open methodology for equity formula and loop highway projects. The MPO appreciates NCDOT's solicitation of input to the development of those evaluation methodologies and the willingness of the NCDOT to address many of the MPO's concerns and incorporate its suggestions.

2. **Project selection**
   The MPO wants to make project selection, a power granted to the MPO through federal transportation legislation. This power is usurped in several ways but most notably when the NCDOT does not provide the STIP budget to the MPO and does not permit the MPO to move funding from deleted, scaled back and under budget projects to other projects designated by the MPO. As an example in Division 5, the East End Connector (U-0071) was to use $33 million in Surface Transportation Program (STP) funding in the FY 2009-2015 STIP but will be completely funded by loop funding in the draft STIP. However, the MPO is not given the opportunity to reapportion this funding to projects that are MPO priorities.

3. **Need additional funding for transportation**
   The MPO commends the NCDOT for their part in getting the Mobility Fund enacted by the North Carolina General Assembly. As the NCDOT develops the evaluation process and criteria for this fund, the MPO encourages the NCDOT to prioritize large projects in urban areas.

DCHC MPO has only one new highway project (i.e., Hopson Road project, which has only moderate regional impact) and three relatively minor bicycle, pedestrian and transit related projects in Division 5 funded in the draft FY 2011-2020 STIP that are new. These are few projects given continued growth in population and employment in this region, the fact that the draft FY 2011-2020 STIP assumes five additional planning years (from 2015 through 2020), and the East End Connector will no longer use $33 million in STP funding. Where has the funding gone? The project cost increases would only consume a small portion of these funds.

4. **Funding for bicycle, pedestrian, and transit projects**
   The DCHC MPO strongly supports multi-modal transportation. Many of the MPO's top priorities are bicycle, pedestrian, and transit projects (see Regional Priority List). Unfortunately, the traditional funding sources for these projects have been disproportionately targeted for rescissions in the past and the SPOT process, which the MPO believes to be a substantial improvement over the previous prioritization process, does not allocate sufficient funding to bicycle, pedestrian and transit projects.

   In addition, the policy for sharing projects costs is skewed against bicycle and pedestrian facilities. Local governments are not required to share in the cost of highway facilities but must share a large portion, 30% to 50%, of the cost of bicycle and pedestrian facilities.

   The DCHC MPO wants bicycle, pedestrian and transit projects to receive more funding, even if the funding increase must come from funds traditionally used for highway projects (such as STP), and to remove the bias against bicycle and pedestrian projects in the cost sharing policy.

5. **Complete Streets/Project Descriptions**
   NCDOT has changed its approach to highway design from accommodating motor vehicles only to providing for a multi-modal transportation system. The Complete Streets program has initiated much of this needed change. However, on roadway projects that include widening and multi-modal facilities, the STIP persists in describing projects with "widen to multi-lanes" with no mention of multi-modal facilities. The DCHC MPO continues to believe that the TIP would better communicate to the public and to NCDOT departments the actual project scope if the project descriptions said "widen to multi-lanes and include bicycle, pedestrian, and transit facilities" where appropriate.

b. Major Project Schedules and Funding

6. **U-0071 (East End Connector)**
   The DCHC MPO strongly supports the change in funding for the East End Connector. In the FY2009-1015 STIP, part of this project (i.e., $33.5 million) was

funded using STP funds, which drew down from the region's available equity formula funds. In the draft STIP, Highway Trust Funds appropriately fund the entire project.

The DCHC MPO requests that construction for this project not be delayed any further. The first year for construction was delayed from 2013 to 2014 between the FY2009-2015 STIP and draft FY2011-2020 STIP, which follows a two year delay between the previous set of STIPs. This project is Durham's highest priority and would greatly improve safety, congestion, and access through Durham.

7. **FS-1005C (NC 54, from I-40 to NC 55) and C-4402 (NC 54 Bicycle Improvements)**
   The schedule for this project, which includes additional lanes and accommodations for bicyclists, pedestrians and transit, should be accelerated. It placed #1 among statewide subregional highway projects in the NCDOT Strategic prioritization process. The draft STIP only designates a feasibility study, and does not even include planning or environmental work for the project, let alone construction funding, over the next ten years. The MPO wants to accelerate the schedule for this project and use STP funding that was previously designated for the East End Connector (U-0071) for constructing this project.

   The MPO believes that the NC 54 bicycle improvements (C-4402) project should be integrated with the feasibility study and planning of the NC 54 capacity improvements.

8. **New Project (Fayetteville Road, from Woodcroft Parkway to Riddle Rd.)**
   This project is at the top of the MPO's regional priority list and placed #2 among Division 5 subregional highway projects in the NCDOT Strategic prioritization process. It is a critical element for reducing congestion in the north/south corridor of south-central Durham. The City of Durham has already completed some preliminary design and environmental work on this alignment, and plans to construct a realignment of the Fayetteville Rd./Riddle Rd./Buxton Rd. intersection. Thus, the widening of Fayetteville Rd. will help leverage the benefits of the City's investment in this corridor and the project might be ready for construction in a relatively short time frame. The MPO use STP funding that was previously designated for the East End Connector (U-0071) to construct this project.

9. **New Project (Erwin Road, from US 15-501 to NC 751)**
   This project, which is #3 in the MPO's regional priority list and placed #3 among Division 5 subregional highway projects in the NCDOT Strategic prioritization process, includes bicycle, pedestrian and safety improvements. It is a critical transportation link between Durham and Chapel Hill and as a consequence the levels of vehicle, bicycle and pedestrian traffic along segments of this route are

increasing. The MPO wants to work with the NCDOT to complete a feasibility analysis of this project and identify construction funding.

10. U-3308 (NC 55/Alston Avenue, NC 147 to Holloway St.)
The construction of this project has been delayed three years in the draft STIP to the year 2014. The DCHC MPO appreciates the willingness of the NCDOT to continue working with local officials to find design and economic justice solutions for this project. The City of Durham still supports this project, and therefore wants the construction to begin as soon as possible after a community consensus is reached.

11. U-2405 (M. L. King Jr. Parkway and NC 55 Interchange)
With the completion of M. L. King Jr. Parkway from US 15-501 to NC 55, it is appropriate to complete the last link of this important thoroughfare from NC 55 to Cornwallis Road to serve the Research Triangle Park. The MPO wants to move forward by funding Alternative 2 from the 2008 feasibility study that considered two alternatives for this intersection. That alternative proposed a modified at-grade intersection with a cost of $29,850,000.

12. FS-1008B (NC 751, Feasibility Study for adding lanes) [Div. 5 and Div. 8]
This feasibility study proposes to add lanes between US 64 in Chatham County and north of Fayetteville Road in Durham County. The study is at odds with the MPO's 2035 Long Range Transportation Plan (2035 LRTP), which does not have any capacity improvements to that segment of NC 751. Two major projects in the same travel corridor, the NC 55 widening and the new NC 540 alignment, appear to already support the travel demand in that corridor. The MPO wants to use feasibility study resources for more worthy projects identified in the agenda.

13. Chatham County highway projects [Div. 8]
There are four Chatham County highway projects in the DCHC MPO Regional Priority List that are not in the draft STIP. These projects rank high on the SPOT statewide project lists and should be addressed in the STIP.

a. Jack Bennett Road [SR1717] (US 15-501 to Lystra Rd [SR1721]), safety improvements. This project is #4 on the priority list and #2 on the statewide SPOT ranking for Subregional Safety.
b. Lystra Road [SR1721] (US 15-501 to Farrington Point Rd [SR1008]), safety improvements. This project is #7 on the priority list and #12 on the statewide SPOT ranking for Subregional Modernization.
c. Lystra Road [SR1721] (Jack Bennett Rd [SR1717] to west side of N. Chatham Elementary), increase length of turn lanes. This project is #16 on the priority list and #18 on the statewide SPOT ranking for Subregional Safety.

d. Jeremiah Drive [SR1762] (Lystra Rd [SR1721] to End), elevate road for flood control. This project is #17 on the priority list and #17 on the statewide SPOT ranking for Subregional Modernization.

c. Planning Study and Project Management Requests

14. Loop Projects: U-4720 (US 70), U-4721 (Northern Durham Parkway),U-4722 (US 501/Roxboro Rd.), and I-4743 (I-85)

With the East End Connector (U-71) included in the draft FY 2011-2020 STIP, it is important to initiate the planning process for the next priority Highway Trust Fund projects in Durham. The loop projects to be considered for study include: the US 70 conversion to a freeway; construction of the Northern Durham Parkway; the widening of Roxboro Road from Duke Street to Goodwin Road; and the widening of I-85 from US 70 to Redwood Road. In the statewide ranking of loop projects, the Roxboro Road project was ranked second and the I-85 project ranked higher than one-half of the funded loop projects. The high ranking of Roxboro Road is at odds with the DCHC MPO's stated priority, which has Roxboro Road as the last loop project to be constructed. The DCHC MPO and NCDOT need to discuss and identify the next loop project to be studied and reserve funding to move that study forward.

15. U-4724 (Cornwallis Rd., S. Roxboro Rd. to Chapel Hill Rd.)

This project is currently funded using the MPO's STP-DA funds. Additional funding may be needed depending on a revised cost estimate.

16. Additional DCHC MPO Priority Projects

There are three additional Division 5 highway projects in the DCHC MPO Regional Priority List that are not addressed in the draft STIP:

a. NC 54 (from I-40 west to Barbee Chapel Rd.), widen to six lanes divided with sidewalks. This project is #21 on the priority list and a feasibility study should be considered.
b. Old Oxford Highway (Roxboro Road to Hamlin Road), expand capacity, bike lanes and sidewalks. This project is #22 on the priority list and placed #10 among Division 5 subregional highway projects in the NCDOT Strategic prioritization process. A feasibility study should be considered.
c. NC 751 (S. Roxboro Road to NC 54), widen to four lanes, bike lanes and sidewalks. The City of Durham plans to construct this project but will need substantial cooperation from the NCDOT to avoid delays.

Division 7 One-on-One Meeting
FY 2011-2020 Transportation Improvement Program

Agenda

FY 2011-2020 TIP Items for Discussion
a. General Funding and Design Issues
b. Project Schedules and Funding
c. Other Items

FY 2011-2020 TIP Items for Discussion

The DCHC MPO has reviewed the FY 2011-2020 Draft STIP and developed the following list of issues for discussion. The MPO is developing the FY 2011-2020 MTIP which will be approved in late spring/early summer 2008.

a. General Funding and Design Issues

1. **SPOT and Loop evaluation processes**
   The DCHC MPO commends the NCDOT for developing the SPOT and Loop evaluation processes that incorporate a more objective and open methodology for equity formula and loop highway projects. The MPO appreciates NCDOT's solicitation of input to the development of those evaluation methodologies and the willingness of the NCDOT to address many of the MPO's concerns and incorporate its suggestions.

2. **Project selection**
   The MPO wants to make project selection, a power granted to the MPO through federal transportation legislation. This power is usurped in several ways but most notably when the NCDOT does not provide the STIP budget to the MPO and does not permit the MPO to move funding from deleted, scaled back and under budget projects to other projects designated by the MPO. As an example in Division 7, the MPO anticipates that the Smith Level (U-2803) and Weaver Dairy (U-3306) projects will be well under the budgets stated in the draft STIP because the project designs are to be scaled back while the draft STIP has actually increased the projects costs, and the Elizabeth Brady Road Extension has been deleted from the STIP. However, the MPO is not given the opportunity to reapportion this funding to projects that are MPO priorities.

3. **Need additional funding for transportation**
   The MPO commends the NCDOT for their part in getting the Mobility Fund enacted by the North Carolina General Assembly. As the NCDOT develops the

evaluation process and criteria for this fund, the MPO encourages the NCDOT to prioritize large projects in urban areas.

The DCHC MPO has two new major highway projects in Division 7 shown in the draft FY 2011-2020 STIP, including I-3306 (I-40 widening) and I-0305 (I-85 widening), which are scheduled for construction relatively far into the future (years 2019 and 2020, respectively). The high cost of these projects has left no funding for other projects, except for two minor bridge projects, in the second half of the draft STIP, i.e., years 2016 to 2020. The Mobility Fund needs to finance projects like the I-40 widening and I-85 widening so funding is also available for other roadway, bicycle, pedestrian and transit projects.

Meanwhile, all Division 7 roadway projects in the first half of the draft STIP, i.e., years 2011 to 2015, have been delayed one to three years when compared to the FY2009-2015 STIP. These projects have been delayed even though the Elizabeth Brady Road Extension, budgeted at $34 million and planned for a 2012 construction start, was deleted from the draft STIP. Where has the funding gone? The project cost increases would only consume a small portion of these funds.

4. **Funding for bicycle, pedestrian, and transit projects**
The DCHC MPO strongly supports multi-modal transportation. Many of the MPO's top priorities are bicycle, pedestrian, and transit projects in Orange County (see Regional Priority List). Unfortunately, the traditional funding sources for these projects have been disproportionately targeted for rescissions in the past and the SPOT process, which the MPO believes to be a substantial improvement over the previous prioritization process, does not allocate sufficient funding to bicycle, pedestrian and transit projects.

In addition, the policy for sharing projects costs is skewed against bicycle and pedestrian facilities. Local governments are not required to share in the cost of highway facilities but must share a large portion, 30% to 50%, of the cost of bicycle and pedestrian facilities.

The DCHC MPO wants bicycle, pedestrian and transit projects to receive more funding, even if the funding increase must come from funds traditionally used for highway projects (such as Surface Transportation Program – STP), and to remove the bias against bicycle and pedestrian projects in the cost sharing policy.

5. **Complete Streets/Project Descriptions**
NCDOT has changed its approach to highway design from accommodating motor vehicles only to providing for a multi-modal transportation system. The Complete Streets program has initiated much of this needed change. However, on roadway projects that include widening and multi-modal facilities, the STIP persists in describing projects with "widen to multi-lanes" with no mention of multi-modal facilities. The DCHC MPO continues to believe that the TIP would better communicate to the public and to NCDOT departments the actual project

scope if the project descriptions said "widen to multi-lanes and include bicycle, pedestrian, and transit facilities" where appropriate.

b. Project Schedules and Funding

6. Churton Street Congestion in the Town of Hillsborough

The Elizabeth Brady Road Extension project (U-3808) was eliminated from the FY2011-2020 STIP. The principal purpose of that project was to relieve traffic congestion on Churton Street. The Town of Hillsborough and the DCHC-MPO are currently analyzing several projects from the draft STIP and 2035 LRTP to identify those whose cumulative effects will have the greatest positive impact on Churton Street congestion. The MPO asks that the NCDOT study the following set of projects as an alternative to the Elizabeth Brady Extension. The MPO understands that these projects cannot be implemented as quickly as the Elizabeth Brady Extension had been scheduled, i.e., year 2012, but asks that these projects be moved forward as soon as possible.

a. R-2825 (South Churton Street): A Feasibility study was completed for this project in the mid-1990s but will need to be updated to recognize local planning efforts such as the South Churton Corridor Study and the schedule for the I-85 widening project. It appears that this project, which includes congestion management, access limits, aesthetic and capacity improvements between US 70 Business and Interstate 40, cannot move forward until the I-85 widening is complete. One study concluded that the South Churton Street project alone will improve corridor travel time by 10%.

b. U-3436 (Eno Mountain Road/Mayo Street alignment): This project is to realign the intersection and make additional safety improvements.

c. NC 86 widening between US 70-A and Old NC 10: This project is in the 2035 LRTP but not the draft STIP. This project could be integrated with the I-85 widening.

d. NC 86 widening from US 70 Bypass to Coleman Loop Road: This project is in the 2035 LRTP but not the draft STIP. The segment between the US 70 Bypass and NC 57 is the highest priority.

e. Orange Grove Road Extension to US 70-Alternate: This project is in the 2035 LRTP but not the draft STIP. One study concluded that this project alone will improve corridor travel time by 10%.

7. **I-0305 (I-85 widening, from I-40 to Durham County line)**
   I-3306 (I-40 widening, from I-85 to Durham County line)
   These projects are not among the DCHC MPO priority highway projects and the I-40 widening project in particular is a low priority among the highway projects in the 2035 LRTP (in which it is scheduled for the 2025-2035 completion period). The MPO is concerned that the cost and scheduling of this large project precludes consideration of the set of projects submitted as an alternative to the former Elizabeth Brady Road Extension project (U-3808), which is discussed above, and consideration of higher priority sidewalk, bike lanes and safety improvement projects in Chapel Hill, Carrboro and Hillsborough.

   The MPO wants the NCDOT to consider a design alternative for the I-40 widening (I-3306) that would only add a westbound lane between the Durham/Orange county line and NC 86 (or, possibly a point before NC 86). This added capacity would address the worst level of congestion experienced in that section of the corridor, which is caused by the through lanes being reduced from three to two lanes, the long uphill grade for westbound traffic, and the traffic weaving of the on-ramp and lane reduction.

8. **U-5304 (US 15-501 bypass, bike/pedestrian/ transit accommodations from S. Columbia St. to Ephesus Church Road)**
   This project is #6 in the MPO's highway priority list. The construction year, 2019, should be moved to an earlier year given the high priority of the project and the lack of highway projects in the second half of the draft STIP.

9. **New Project (Erwin Road, from US 15-501 to NC 751)**
   This project, which is #3 in the MPO's regional priority list and placed #3 among Division 5 subregional highway projects in the NCDOT Strategic prioritization process, includes bicycle, pedestrian and safety improvements. It is a critical transportation link between Durham and Chapel Hill and as a consequence the levels of vehicle, bicycle and pedestrian traffic along segments of this route are increasing. The MPO wants to work with the NCDOT to complete a feasibility analysis of this project and identify construction funding.

10. **EB-4980 (Orange Grove Road Pedestrian Bridge)**
    This project is the number one priority for Orange County and was also listed on the Town of Hillsborough's priority list. The NCDOT Director of Division of Bicycle and Pedestrian Transportation recommends removing this project from the current five-year work plan and TIP schedule due to a lack of necessary supporting pedestrian facilities along Orange Grove Road. The DCHC MPO requests that this project remain on the TIP schedule. The County is developing a CTP, anticipated to be adopted in Spring 2012, and is also developing a Safe Routes to School Action Plan to address barriers to walking and bicycling at three Orange County schools including New Grady Brown Elementary. The pedestrian bridge is necessary for safe transport across I-40 for many of these school children, and a key part of the plan for that school.

11. Hillsborough Train Station and Multimodal Center

This project is the top transit priority for the Town of Hillsborough. The MPO wants to work with NCDOT to identify an appropriate funding source for this project.

c. Other Items

12. Roadway Signage in the Hillsborough Area

The Town of Hillsborough's Wayfinding Task Force recently made several recommendations to add, consolidate and relocate roadway signs in the Hillsborough area. NCDOT staff was involved and very helpful during the Wayfinding Task Force planning process. The Town of Hillsborough wants to work with the NCDOT to move forward in implementing the Task Force recommendations.

13. B-4962 (Replace Bridge #46, Eno River and US 70 bypass)

Orange County sent a letter, dated October 27, 2009, to the NCDOT/PDEA/ Bridge Project Unit stating some concerns with the replacement of this bridge. For example, County staff was not clear whether a temporary bridge would be used to permit continued use of the roadway during construction. Please indentify to what extent the bridge design and construction staging will accommodate each of the items specified in that letter.

MEMORANDUM

TO: Transportation Advisory Committee (TAC)
DCHC MPO

FROM: Lead Planning Agency

DATE: October 13, 2010

RE: Job Access Reverse Commute and New Freedom 2010 Call for Projects

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The available funds are from two sources – Job Access/Reverse Commute (JARC) and New Freedom (NF). JARC funds are intended to fund "the development and maintenance of transportation services designed to transport welfare recipients and eligible low-income individuals to and from jobs and activities related to their employment". NF funds are intended to provide improved public transportation services and alternatives to public transportation for people with disabilities beyond those required by the Americans with Disabilities Act of 1990 (ADA). Eligible applicants for both programs include state or local governments, private non-profit organizations, and operators of public transportation services including private operators of public transportation services. Funds may be used for planning, capital, or operating costs. Funds can be used according to the following limits:

- Up to 80% for capital projects.
- Up to 50% for operating assistance.
- Up to 10% for program administration.

As required by the FTA, the DCHC MPO created a Coordinated Public Transit - Human Services Transportation Plan to guide the selection and funding of future JARC and NF projects. The TAC approved this plan in March 2007. The DCHC MPO has held three Calls for Projects in 2007, 2008, and 2009 for the MPO's FY 2006- FY 2009 JARC and NF funds using the procedures outlined in the Coordinated Public Transit - Human Services Transportation Plan. The DCHC MPO has allocated all of the FY 2007, 2008 and a portion of FY 2009 funds. The remainder of FY 2009 funds available will be made available for allocation during FY 2010's Call for Projects.

2010 Call for Projects – Funds Available

The tables in **Attachment 8A** summarize the funds available for the JARC and NF programs. The MPO has received appropriations for FYY's 2006 - 2010. All approved funding have been obligated in FTA's financial system. The MPO's remaining JARC appropriations are $72,671 from FFY 2009, and $195,374 from FFY 2010. The total of $268,045 will be offered for use in the MPO's FY 2010 Call-for-projects.

The MPO's remaining NFP appropriations that have not already been committed to a project are $10,769 from FFY 2009 and an additional $87,757 from FFY2010. The total of $98,526 will be offered for use in the MPO's FY 2010 Call-for-projects.

2010 Call for Projects – Updated Schedule

The LPA recommends the following schedule for the 2010 Call for Projects:

- 12/16/2009 TCC update on 2010 Call for Projects & prior year's project status
- August 2010 FTA released FY 2010 appropriations
- 9/22/2010 TCC received FFY 2010 appropriation & updated schedule for 2010 Call for Projects.
- 10/13/2010 TAC receives updated schedule for 2010 Call for Projects.
- 10/27/2010 TCC will receive 2010 Call-for-Projects application package.
- 11/10/10 TAC approve application package and request LPA staff begins project solicitations.
- 12/10/10 – 2/28/11 Begin Advertising & Solicitation for applications
- 1/19/11 Application Workshop
  Time: 10am – noon
  Location: Transportation Conference Room, 4th Floor
  Durham City Hall
  101 City Hall Plaza
  Come to hear a brief presentation on the JARC/NF application process, discuss your application with staff, and get your questions answered.
- 2/28/11 Application deadline
- 3/1/11 – 3/31/11 Review Committee reviews and scores proposals
- 3/31/11 – 4/15/11 Review Committee selects CPT-HSTP projects for recommendation to the TCC
- 4/27/2011 TCC action on Review Committee recommendations
- 5/11/2011 TAC action on TCC recommendations
- 5/31/2011 Funding recipients receive notification
- 6/30/2011 FTA Application Deadline for obligation 2010 program of projects.
- 09/23/2011 FY 2009 funds lapse if not obligated

Program Management Plan

A Program Management Plan (PMP) is required by FTA to document and describe the methods or processes used by the City of Durham, the designated recipient of the Job Access Reverse Commute (JARC) and New Freedom (NF) funds, to solicit, select, award and administer both JARC and NF funds. The MPO developed a PMP and submitted it to FTA. The PMP was approved by FTA on July 30, 2008. The MPO will submit the new Program of Projects (POP) with the FY 2010 JARC and NFP applications.

PROGRAM OF PROJECTS
JARC (5316)

MPO Approval Date	Sub-Recipient	Agency Type	Project Status	Project Description	Project Type	FTA PROJECT ID#	PROJECT COSTS Total Cost	Federal Share	Program Admin.
6/14/2006	DATA	Public Transit	COMPLETE	Downtown Durham to the Brier Creek	Operating	NC-37-X010-00	$ 193,752	$ 96,876	$ -
6/13/2007	DATA	Public Transit	COMPLETE	Evening service extension	Operating	NC-37-X017-00	$ 203,138	$ 100,000	$ -
6/13/2007	CHT	Public Transit	COMPLETE	Evening service extension	Operating	NC-37-X017-00	$ 101,098	$ 50,549	$ -
5/14/2008	DATA	Public Transit	COMPLETE	New Hope Commons Project	Operating	NC-37-X017-01	$ 145,986	$ 72,993	$ -
5/13/2009	DATA	Public Transit	ON HOLD	Continuation of Downtown to Brier Creek Service	Operating	NC-37-X017-01	$ 188,566	$ 94,283	$ -
5/14/2008	CHT	Public Transit	In-Progress	Rogers Road Project	Operating	NC-37-X017-01	$ 169,936	$ 84,968	$ -
5/13/2009	CHT	Public Transit	In-Progress	Continuation of NS&G (night service)	Operating	NC-37-X017-01	$ 118,534	$ 59,267	$ -
9/13/2006	TTA	Public Transit	Not-Applicable	Administrative Costs	Administration	NC-37-X010-00	$ 22,433	$ 22,433	$ 22,433
6/13/2007	DATA	Public Transit	Not-Applicable	Administrative Costs	Administration	NC-37-X017-00	$ 12,856	$ 14,463	$ 14,463
5/14/2008	DURHAM	Public Transit	Not-Applicable	Administrative Costs	Administration	NC-37-X017-01	$ 13,928	$ 13,928	$ 13,928
5/13/2009	DURHAM	Governmental	Not-Applicable	Administrative Costs	Administration	NC-37-X017-01	$ 16,347	$ 16,347	$ 16,347

MPO Approved Funding		Total:	$ 626,107
DCHC MPO Appropriations	FY 2006		$ 152,453
	FY 2007		$ 160,702
	FY 2008		$ 174,094
	FY 2009		$ 204,341
	FY 2010		$ 195,374
		Appropriations Total:	$ 886,964
		Prior Balance (FY 2009)	$ 72,671
		FY 2010 Appropriation:	$ 195,374
		Remaining Balance :	$ 268,045

Designated Recipient: DCHC-MPO

PROGRAM OF PROJECTS
NEW FREEDOM (5317)

MPO Approval Date	Sub-Recipient	Agency Type	Project Status	Project Description	Project Type	FTA PROJECT ID#	PROJECT COSTS		
							Total Cost	Federal Share	Planning & Administrative
6/13/2007	DURHAM	Governmental	Not-Applicable	Administrative	Administration	NC-57-X006-02	$ 5,745	$ 5,745	$ 5,745
5/14/2008	DURHAM	Governmental	Not-Applicable	Administrative	Administration	NC-57-X006-02	$ 6,206	$ 6,206	$ 6,206
5/13/2009	DURHAM	Public Transit	Not-Applicable	Administrative	Administration	NC-57-X006-02	$ 7,153	$ 7,153	$ 7,153
5/14/2008	CHT & OPT	Public Transit	DELAYED	Elderly population feeder service	Operating	NC-57-X006-02	$ 97,600	$ 48,800	$ -
6/13/2007	DATA/TTA/CHT	Public Transit	In-Progress	Paratransit Eligibility Assessment	Operating	NC-57-X006-02	$ 35,000	$ 17,500	$ -
5/13/2009	DATA	Public Transit	In-Progress	Taxicab service to supplement ACCESS service	Operating	NC-57-X006-02	$ 140,760	$ 70,380	$ -
5/13/2009	DCCSC	Non-profit	In-Progress	Travel Training / Mobility Manager	Capital	NC-57-X006-02	$ 31,357	$ 20,000	$ -
5/13/2009	CHT	Public Transit	In-Progress	Go Triangle Regional Transit Information Center	Capital	NC-57-X006-02	$ 50,614	$ 40,491	$ -
5/14/2009	CHT	Public Transit	In-Progress	Mobility Manager	Capital	NC-57-X006-02	$ 70,000	$ 35,000	

MPO Approved Funding		Total: $ 251,275
DCHC MPO Appropriations	FY 2006	$ 71,878
	FY 2007	$ 71,810
	FY 2008	$ 77,573
	FY 2009	$ 89,416
	FY 2010	$ 87,757
	Appropriations Total:	$ 398,434
	Lapsed funds (FY 2006):	$ (48,633)
	Remainging Balance :	$ 98,526

Federal Financial Reporting (FFR)

NEW FREEDOM (5317)

DR FY	MPO Approval Date	Sub-Recipient	Project Description	PROJECT COSTS		1stQtr2010 Expenditures		2ndQtr2010 Expenditures		3rd Qtr2010 Expenditures		4th Qtr2010 Expenditures		Year To Date Expenditures		Percent Of Cost Expended To Date
				Total Cost	Federal Share	Total Cost	Federal Share	Total Cost	Federal Share	Total Cost	Federal Share	Total Cost	Federal Share	Total Cost	Federal Share	
2008	6/13/2007	DATA	Paratransit Eligibility	$ 35,000	$ 17,500	-	-	-	-	-	-	1,800	900	1,800	900	5%
2010	5/13/2009	DATA	ACCESS Taxi cab supplement service	$ 140,760	$ 70,380	-	-	-	-	-	-	79,138	39,569	79,138	39,569	56%
2009	5/14/2008	CHT & OPT	Cross Town Shuttle	$ 97,600	$ 48,800	-	-	-	-	-	-	-	-	-	-	0%
TOTAL OPERATING COST - NC-57-4006				**$ 273,360**	**$ 136,680**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 80,938**	**$ 40,469**	**$ 80,938**	**$ 40,469**	
2010	5/13/2009	CHT	Call Center (capital)	$ 50,614	$ 40,491	-	-	-	-	20,038	16,030	10,019	8,015	30,057	24,046	59.4%
2010	5/13/2009	CHT	Mobility Manager (capital)	$ 70,000	$ 35,000	-	-	3,860	3,088	14,722	11,778	17,313	13,850	35,896	28,716	51.3%
2010	5/13/2009	DCCSC	Senior Travel Training	$ 31,357	$ 20,000	-	-	-	-	-	-	-	-	-	-	0.00%
TOTAL CAPITAL EXPENDITURES - NC-57-0006				**$ 151,971**	**$ 95,491**	**$ -**	**$ -**	**$ 3,860**	**$ 3,088**	**$ 34,760**	**$ 27,808**	**$ 27,332**	**$ 21,866**	**$ 65,953**	**$ 52,762**	
2008	6/13/2007	DATA	Administrative - FY07	$ 5,745	$ 5,745	-	-	-	-	-	-	-	-	-	-	0.0%
2009	5/14/2008	City of Durham	Administrative - FY08	$ 6,206	$ 6,206	-	-	328	328	1,094	1,094	2,864	2,864	4,286	4,286	69.1%
2010	5/13/2009	City of Durham	Administrative - FY09	$ 7,153	$ 7,153	-	-	-	-	1,261	1,261	3,200	3,200	4,461	4,461	62.4%
TOTAL ADMINITRATIVE EXPENDITURES - NC-57-6006				**$ 19,104**	**$ 19,104**	**$ -**	**$ -**	**$ 328**	**$ 328**	**$ 2,355**	**$ 2,355**	**$ 6,064**	**$ 6,064**	**$ 8,747**	**$ 8,747**	
			TOTALS $			**$ -**	**$ -**	**$ 4,188**	**$ 3,416**	**37,115**	**30,163**	**114,334**	**68,399**	**155,638**	**101,978**	

Federal Financial Reporting (FFR)

JARC (5316)

DR FY	MPO Approval Date	Sub-Recipient	Project Description NC-37-X0017-01	Project Costs Total Cost	Project Costs Federal Share	1stQtr2010 Total Cost	1stQtr2010 Federal Share	2ndQtr2010 Total Cost	2ndQtr2010 Federal Share	3rd Qtr2010 Total Cost	3rd Qtr2010 Federal Share	4thQtr2010 Total Cost	4thQtr2010 Federal Share	Year To Date Expenditures Total Cost	Year To Date Expenditures Federal Share	Percent Of Cost Expended To Date
2009	5/14/2008	CHT	Rogers Road community	$ 169,936	$ 84,968	$ 15,551	$ 7,776	$ 35,874	$ 17,937	$ 35,874	17,937.16	$ 37,013	$ 18,507	$ 124,313	$ 62,156	73%
2010	5/13/2009	CHT	NS Route Expansion (service to Rogers Rd.)	$ 118,534	$ 59,267	$ 6,536	$ 3,268	$ 14,494	$ 7,247	$ 14,494	7,247.16	$ 14,954	$ 7,477	$ 50,479	$ 25,239	43%
2009	5/14/2008	DATA	New Hope Commons.	$ 145,986	$ 72,993	$ 145,986	$ 72,993	Project Complete						$ 145,986	$ 72,993	100%
2010	5/13/2009	DATA	Downtown Durham to Brier Creek.	$ 188,566	$ 94,283	ON HOLD										
TOTAL OPERATING COST - NC-37-4017				**$ 623,022**	**$ 311,511**	**$ 168,073**	**$ 84,036**	**$ 50,369**	**$ 25,184**	**$ 50,369**	**25,184.32**	**$ 51,968**	**$ 25,984**	**$ 320,778**	**$ 160,389**	
2009	5/14/2008	City of Durham	Administrative - FY08	$ 13,928	$ 13,928	$ 11	$ 11	$ 196	$ 196	$ 2,846	2,845.92	$ 5,612	$ 5,612	$ 8,664	$ 8,664	62%
2010	5/13/2009	City of Durham	Administrative - FY09	$ 16,347	$ 16,347	$ -	$ -	$ -	$ -	$ 2,882	2,882.34	$ 6,636	$ 6,636	$ 9,518	$ 9,518	58%
TOTAL ADMINITRATIVE EXPENDITURES - NC-37-6017				**$ 30,275**	**$ 30,275**	**$ 11**	**$ 11**	**$ 196**	**$ 196**	**$ 5,728**	**5,728.26**	**$ 12,247**	**$ 12,247**	**$ 18,182**	**$ 18,182**	
			TOTALS $	$ 22,098	$ 11,055	$ 50,564	$ 25,380	$ 56,097	30,912.58	$ 64,215	$ 38,231	**$ 338,960**	**$ 178,571**			

RESOLUTION TO MODIFY THE
2009-2015 TRANSPORTATION IMPROVEMENT PROGRAM
FOR THE DURHAM-CHAPEL HILL-CARRBORO URBAN AREA

AMENDMENT #17
October 13, 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 #17 to DCHC 2009-2015 MTIP" provided here on this, the 13th day of October, 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: October 13, 2010

_____

Frederick Brian Rhodes, Notary Public
My commission expires: May 10, 2015

MEMORANDUM

To: Transportation Advisory Committee (TAC)
DCHC MPO

From: DCHC MPO Lead Planning Agency

Date: October 13, 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 ongoing and not complete.
- ✓ Indicates that task is 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)

- ✓ Project near completion
- Final Report/Draft Dataset – December 2010

GIS/Data Integration and Automation

- ✓ Phase I completed. Internal review and implementation in progress
- ✓ Phase 2 to commence in January 2011

Land-use Model Development

- ✓ Multi-year project in progress
- ✓ Phase 1 completed
- ✓ Sensitivity analysis and testing in progress
- Phase 2- Parcel level model for DCHC – To commence in January 2011
    - Initial database – TBD
    - Initial model estimation – TBD
    - Initial calibration – TBD

Non-Motorized Model Development

- ✓ Phase 1 completed.
- ✓ Phase 2 completed

  Sensitivity analysis and testing in progress

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

MPO Community Viz. Scenarios Planning and Visualization

- Project kick- off in November 2010

TAC 10/13/2010 Attachment 14

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:**	9/17/2010
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:**	5.3%
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:**	10/15/2010
Last Estimate Thru:	9/22/2010	**Scheduled Progress:**	100%
Last Estimate Paid:	10/4/2010	**Actual Progress:**	90.67%

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:**	2.12%
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:	9/22/2010	**Scheduled Progress:**	25%
Last Estimate Paid:	9/28/2010	**Actual Progress:**	33.32%

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:** 1.21%
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: 9/21/2010 **Scheduled Progress:** 69.57%
Last Estimate Paid: 9/23/2010 **Actual Progress:** 64.2%

Contract Number: C202340 **Route:** SR-1321
Physical Division: 5 **County:** Durham
Administrative Division: 5 **TIP Number:** U-3804
Length: 1.07 miles **Federal Aid Number:** STM-0505(50)
Resident Engineer: Chad D. Hinnant **RE Phone Number:** (919)220-4680
Location Description: SR-1321 (HILLANDALE RD) FROM I-85 TO NORTH OF SR-1407 (CARVER AVE).
Type of Work: GRADING, DRAINAGE, PAVING, AND SIGNAL.
Contractor Name: REA CONTRACTING A DIVISION OF THE LANE CONSTRUCTION CORPORAT
Contract Amount: $4,222,625.78 **Cost Overrun/Underrun:**
Availability Date: 8/30/2010 **Letting Date:** 7/20/2010
Completion Date: 6/15/2012 **Work Began:**
Revised Completion Date: **Estimated Completion:**
Last Estimate Thru: **Scheduled Progress:**
Last Estimate Paid: **Actual Progress:**

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:** 17.44%
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:** 10/15/2010
Last Estimate Thru: 9/15/2010 **Scheduled Progress:** 100%
Last Estimate Paid: 9/28/2010 **Actual Progress:** 99.92%

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:** 0%
Availability Date: 3/15/2010 **Letting Date:** 1/19/2010
Completion Date: 12/16/2010 **Work Began:** 8/4/2010
Revised Completion Date: **Estimated Completion:** 12/16/2010
Last Estimate Thru: 9/7/2010 **Scheduled Progress:** 35%
Last Estimate Paid: 9/10/2010 **Actual Progress:** 22.38%

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:** 1.59%
Availability Date: 5/19/2010 **Letting Date:** 1/19/2010
Completion Date: 9/15/2010 **Work Began:** 5/19/2010

Revised Completion Date: 9/25/2010 **Estimated Completion:** 9/29/2010
Last Estimate Thru: 9/7/2010 **Scheduled Progress:** 100%
Last Estimate Paid: 9/27/2010 **Actual Progress:** 55.41%

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: 1.21%
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: 9/22/2010
Scheduled Progress: 45%
Last Estimate Paid: 9/27/2010
Actual Progress: 48.17%

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: -2.29%
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: 10/15/2010
Last Estimate Thru: 9/22/2010
Scheduled Progress: 100%
Last Estimate Paid: 9/24/2010
Actual Progress: 100%

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: -0.76%
Availability Date: 5/3/2010
Letting Date: 3/18/2010
Completion Date: 9/14/2010
Work Began: 8/5/2010
Revised Completion Date:
Estimated Completion: 10/15/2010
Last Estimate Thru: 9/22/2010
Scheduled Progress: 70%
Last Estimate Paid: 9/24/2010
Actual Progress: 90.78%

Contract Number: DO00069
Route: NC-147
Physical Division: 5
County: Durham
Administrative Division: 5
TIP Number: BK-5102G
Length: 0 miles
Federal Aid Number: BRNHS-0147(4)
Resident Engineer: Cadmus Capehart, PE
RE Phone Number: (919)840-0914
Location Description: BRIDGES #12, 71, 137, 154, 156, AND 169 ON NC-147.
Type of Work: BRIDGE PAINTING.
Contractor Name: S & D INDUSTRIAL PAINTING, INC.
Contract Amount: $922,562.15
Cost Overrun/Underrun:
Availability Date:
Letting Date: 8/19/2010
Completion Date:
Work Began:
Revised Completion Date:
Estimated Completion:
Last Estimate Thru:
Scheduled Progress:
Last Estimate Paid:
Actual Progress:

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	**Advertisement for Let 11/4/10**
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 by District-F.A. const. to begin after U-4726 IE and M.A. w/UNC/Town for crosswalks, WCR, & ped heads-**FA const. underway**
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-**resent 9/30/10**; 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 to be co-ordinated w/ 2011 resurfacing; **est. compl. 5/30/11**
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. = **92.3% compl.**
Orange	B-4216	SR 1002 (St. Mary's Road)	Replacement of Bridge # 66 over Stroud's Creek	$800,000	Dane Const. Inc.= **88% compl.; Ingle & Son Landscaping, Inc.= low bid for landscape project on slope**
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 - =**82.63% compl.;** grinding compl.- joint sealing underway

ACTIVE NCDOT PROJECTS LOCATED IN ORANGE COUNTY - DCHC MPO

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=12% compl.; pre-con 6/7/10; will begin work 8/9/10 and **compl. all WB lanes by Dec.-EB lanes will be compl. by 7/15/11**
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; signal plans being revised -multi-use pole; **Let 10/20/10**
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
Orange	SS-4907AC 43040.1.1 PE 07-10-727	SR 1734 (Erwin Rd.) and SR 1791 (Mt. Moriah Rd.) near Chapel Hill	Installation of a left turn lane on Erwin Rd. and a traffic signal		Survey pending
NCDOT PROJECTS CURRENTLY IN 12 MONTH LETTNG LIST					
County	**TIP #**	**Route**	**Location Description**	**TIP Est.**	**Est. Let Date**
Durham/ Orange	**EB-4707**	**DURHAM/ CHAPEL HILL (SR 1838/SR 2220) FROM SR 1116 (GARRETT ROAD) IN DURHAM COUNTY TO US 15-501 IN ORANGE COUNTY**	**Bicycle improvements(Bikeway and signals)**	**$3.75 million**	**19-Apr-11**
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

ACTIVE NCDOT PROJECTS LOCATED IN ORANGE COUNTY - DCHC MPO
ARRA

County	WBS #	Route	Location Description	Amount	Status
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; **ARRA funds added($47,488) Suppl. to Town 9/13/10**
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; invoice reimbursement pending final inspection
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; 94.89% compl.
Orange	R-5178B	NC 86 (S. Columbia St.) from SR 1010 (Franklin St.) to Cameron Ave.	Mill, resurface, and replace curb and gutter	$200,000.00	ARRA-Eastern Services, LLC dba Raleigh Paving=**71.8% compl.**
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.- vehicles have been received by C.H. Transit
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= **70.8% compl.**

ACTIVE NCDOT PROJECTS LOCATED IN ORANGE COUNTY - DCHC MPO
ARRA

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; **began const. 9/710**
Orange	U-4704	Chapel Hill-Carrboro	Computerized Traffic Signal System	$5.175 million	ARRA-Brooks Berry Haynie & Assoc., Inc.; Mableton, Ga. =**14.37% 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.=100% compl. ; reimbursement #1 on 6/15/10; M.A. compl. 7/2/10-rev. to 9/2/10; inv. reimbursement pending final inspection
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; =100% compl.;reimbursement #1 on 6/15/10;; M.A. compl. 7/2/10-rev. to 9/2/10; inv. reimbursement pending final inspection
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 =**42.6% compl.**;structure design review has been received; M.A. compl. 1/16/11; inv. Reimbursed; **Suppl. Const. Agree. for bridge pending**
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; inv. reimbursement pending

ACTIVE NCDOT PROJECTS LOCATED IN ORANGE COUNTY - DCHC MPO
ARRA

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; inv. reimbursement pending
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; inv. reimbursement pending
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; inv. reimbursement pending
Orange	U-4726 JA	Hillsborough	Construct sidewalks	$1,034,110.00	ARRA, STP-DA, & Contingency - S.T. Wooten Corp.=**36.54% compl.;** 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**

Council OKs DATA computer system deal

Majority of $729,637 in funding coming from economic stimulus

The Herald Sun 09.07.10 - 10:54 pm by Ray Gronberg

DURHAM -- City Council members voted unanimously Tuesday to approve a $729,637 contract that will begin equipping the Durham Area Transit Authority with a computer system capable of telling passengers when they can expect their bus to arrive.

A majority of the necessary funds is coming of a $4.2 million grant DATA received last year from federal economic stimulus legislation.

Officials are backing $565,974 in stimulus money drawn from last year's allotment with a $227,393 grant from the N.C. Department of Transportation and a $25,266 city match.

The allocations will cover the costs of buying equipment and services from a Durham-based company, Digital Recorders Inc. They'll also pay for $88,996 in utility work.

For its money, the city will gain the ability to track DATA's buses in real time, using GPS and wireless technology, and display predicted arrival times to patrons waiting at Durham Station and 13 key bus stops scattered around town.

The system is similar to one already operating in neighboring Chapel Hill -- and the same as one Triangle Transit is buying for its regional service. DATA and Triangle transit jointly solicited offers from companies offering so-called real-time passenger information systems.

Six companies put in bids, city Senior Transportation Planner Pierre Osei-Owusu said in a memo explaining the deal.

Triangle Transit directors approved their piece of the deal in June, giving the regional authority's staff permission to sign a purchase contract with Digital Recorders worth up to $465,000.

The system will track 73 DATA and 58 Triangle Transit buses in all.

Digital Recorders Inc. is based on Patriot Drive on the edge Durham's Research Triangle Park. It's a subsidiary of a Texas company, DRI Corp., that sells similar systems in countries all over the world.

DRI's most recent annual report, for calendar 2009, said only 40 percent of its net sales come from its U.S.-based operations. It has overseas offices in Australia, Brazil, Sweden, Germany and India. DRI claims it holds a dominant market position in Scandinavia, and in its most recent quarterly report said sales in India are on the rise.

For 2009 DRI reported net sales of $82.3 million and an after-taxes profit of nearly $2 million.

The company in its annual report said its U.S. business can and does ebb and flow along with federal, state and local transit budgets. As of the spring, it was expecting to do about $8 million in work funded by the federal economic stimulus bill.

Locally, Digital Recorders Inc. employs 51 people, according to the count in Osei-Owusu's memo and information attached to the contract.

DRI Corp. reported to stockholders and the U.S. Securities and Exchange Commission that as of last Dec. 31, it employed 244 people worldwide, with 89 of those based in the U.S. The Durham operation is its only one in the U.S. that handles service and repair, equipment warehousing and assembly.

City Transportation Director Mark Ahrendsen said he couldn't tell whether the company would hire additional workers to fulfill the Durham contract.

City officials fielded a query from Kevin Davis, a Trinity Park resident, blogger and IT professional who urged them to make sure the deal allows them to make the system's data "openly accessible to the public."

That would allow third-party publishers and software developers to use it and help spread the word about the city's transit services, as they have in places like San Francisco, Davis said.

The draft contract with Digital Recorders specified that the real-time data generated by the system would become city property. But the database itself, and its design, would be available only to "authorized agents of the city."

Obama Offers a Transit Plan to Create Jobs (The New York Times)

Obama Offers a Transit Plan to Create Jobs (The New York Times) 09.07.10 - 9:45 am

MILWAUKEE — President Obama, looking to stimulate a sluggish economy and create jobs, called Monday for Congress to approve major upgrades to the nation's roads, rail lines and runways — part of a six-year plan that would cost tens of billions of dollars and create a government-run bank to finance innovative transportation projects.

With Democrats facing an increasingly bleak midterm election season, Mr. Obama used a speech at a union gathering on Labor Day, the traditional start of the campaign season, to outline his plan. It calls for a quick infusion of $50 billion in government spending that White House officials said could spur job growth as early as next year — if Congress approves.

That is a big if. Though transportation bills usually win bipartisan support, hasty passage of Mr. Obama's plan seems unlikely, given that Congress has only a few weeks of work left before lawmakers return to their districts to campaign and that Republicans are showing little interest in giving Democrats any pre-election victories.

Central to the plan is the president's call for an "infrastructure bank," which would be run by the government but would pool tax dollars with private investment, the White House says. Mr. Obama embraced the idea as a senator; with unemployment still high despite an array of government efforts, the concept has lately been gaining traction in policy circles and on Capitol Hill.

Indeed, some leading proponents of such a bank — including Gov. Arnold Schwarzenegger, Republican of California; Gov. Ed Rendell, Democrat of Pennsylvania; and Michael R. Bloomberg, the independent mayor of New York — would like to see it finance a broader range of projects, including water and clean-energy projects. They say such a bank would spur innovation by allowing a panel of experts to approve projects on merit, rather than having lawmakers simply steer transportation money back home.

"It will change the way Washington spends your tax dollars," Mr. Obama said here, "reforming the haphazard and patchwork way we fund and maintain our infrastructure to focus less on wasteful earmarks and outdated formulas, and more on competition and innovation that gives us the best bang for the buck."

But the notion of a government-run bank — indeed, a government-run anything — is bound to prove contentious during an election year in which voters are furious over bank bailouts and over what many perceive as Mr. Obama pursuing a big government agenda. Even before the announcement Monday, Republicans were expressing caution.

"It's important to keep in mind that increased spending — no matter the method of delivery — is not free," said Representative Pat Tiberi, an Ohio Republican who is on a Ways and Means subcommittee that held hearings on the bank this year. He warned that "federally guaranteed borrowing and lending could place taxpayers on the hook should the proposed bank fail."

The announcement comes after weeks of scrambling by a White House desperate to give a jolt to the lackluster recovery, and is part of a broader package of proposals that Mr. Obama intends to introduce on Wednesday during a speech in Cleveland. The transportation initiative would revise and extend legislation that has lapsed.

Specifically, the president wants to rebuild 150,000 miles of road, lay and maintain 4,000 miles of rail track, restore 150 miles of runways and advance a next-generation air-traffic control system.

The White House did not offer a price tag for the full measure or say how many jobs it would create. If Congress simply reauthorized the expired transportation bill and accounted for inflation, the new measure would cost about $350 billion over the next six years. But Mr. Obama wants to "frontload" the new bill with an additional $50 billion in initial investment to generate jobs, and vowed it would be "fully paid for." The White House is proposing to offset the $50 billion by eliminating tax breaks and subsidies for the oil and gas industry.

After months of campaigning on the theme that the president's $787 billion stimulus package was wasteful, Republicans sought Monday to tag the new plan with the stimulus label. The Republican National Committee called it "stimulus déjà vu," and Representative Eric Cantor of Virginia, the House Republican whip, characterized it as "yet another government stimulus effort."

But Governors Rendell and Schwarzenegger, and Mayor Bloomberg, who in 2008 founded a bipartisan coalition to promote transportation upgrades, praised Mr. Obama. And in policy circles, the plan, especially the call for the infrastructure bank, is generating serious debate.

"This is a very ripe policy question now," said Robert Puentes, a senior fellow at the Brookings Institution's Metropolitan Policy Program, who has been working for several years on blueprints for a bank.

On Capitol Hill, Representatives James L. Oberstar, Democrat of Minnesota and chairman of the House Transportation and Infrastructure Committee, has been developing his own bill, as has Representative Rosa DeLauro, Democrat of Connecticut.

Ms. DeLauro's plan would create an infrastructure bank that would be part of the United States Treasury, where it would attract money from institutional investors, then channel the funds to projects selected by a panel. The program, which would make loans

much like the World Bank, would finance projects with the potential to transform whole regions, or even the national economy, the way the interstate highway system and the first transcontinental railway once did.

The outside investors would expect a competitive return on their money, so many of the completed projects would have to charge fees, taxes or tolls. In an interview, Ms. DeLauro said she would be "looking at a broader base," meaning the bank would finance not just roads and rails, but also telecommunications, water, drainage, green energy and other large-scale works.

But if the projects did not raise enough money, the Treasury might get stuck paying back the investors, a prospect that gave pause to so-called deficit hawks like Mr. Tiberi. In an e-mail last week, he said he agreed the nation's road and communications networks needed to be improved but was concerned about creating another company like Fannie Mae that might need a bailout.

Inside the White House, the idea for a transportation initiative, and in particular an infrastructure bank, is one that the White House chief of staff, Rahm Emanuel, has been promoting. It was not included in the original $787 billion stimulus program because the administration and Congressional Democratic leaders wanted to pass that package as quickly as possible.

There is no shortage of projects in search of money. The problem, analysts say, is that Congress, which would create the bank, is not known for its ability to single out strategic priorities for growth. Instead, it traditionally builds broad support by giving a little something to everybody — Montana, for instance, would get a small amount of Amtrak money in return for its support for improvements along the Northeast corridor.

"We don't prioritize," Mr. Puentes said. "We take this kind of peanut butter approach of spreading investment dollars around very thinly, without targeting them."

Samuel Staley, director of urban growth and land-use policy for the Reason Foundation, a libertarian research group, said the best way to spend money efficiently would be to establish the bank as a revolving loan fund so that money for new projects would not become available until money for previous projects had been repaid.

Mr. Staley expressed concern that in their zeal to spur growth and create jobs, Congress and the Obama administration would not impose such limits.

"With the $800 billion stimulus program, they were literally just dumping money into the economy," he said. "There was little legitimate cost-benefit analysis."

Sheryl Gay Stolberg reported from Milwaukee and Mary Williams Walsh from New York.

Transport Playtime Is Over (Carolina Journal)

September 07, 2010 By John Hood, president of the John Locke Foundation

RALEIGH – To North Carolinians like me who grew up in a state once considered the epitome of rural and small-town life, the opportunities and challenges of urbanization still taking some getting used to.

Having lived in a few months in Los Angeles and a few years in Washington, I've experienced my share of maddening highway gridlock. Visits to other cities across the country have confirmed my dislike of traffic congestion and my preference for life and commuting on a smaller scale.

Only, North Carolina's traffic doesn't compare as favorably as it used to. Indeed, according to the latest national study of state highway performance by David Hartgen and his colleagues at the Reason Foundation, North Carolina ranks very poorly – 42nd – in urban interstate congestion.

You read that right. North Carolina's urban interstates are among the most congested in the United States.

Stretches of I-77 and I-85 around Charlotte, I-40 in the Triangle and Triad, I-95 in the east, and I-26 in the west all feature crippling congestion during rush hours. As Hartgen wrote a while back in a John Locke Foundation study, traffic congestion in North Carolina is projected to more than double over the next quarter-century, with worsening conditions not just in Charlotte, the Triangle, and the Triad but also in smaller cities.

"That increased congestion threatens the state's economic future," he said. "Yet many regions have ignored the problem and propose spending limited transportation funds on ineffective projects that will not likely affect congestion."

In other areas, North Carolina's highway performance has improved somewhat in recent years. But major problems still remain, in both urban and rural areas. Here are some additional facts to keep in mind:

• North Carolina ranks among the worst in the country in the number of narrow highway lanes and in the number of deficient and obsolete bridges.

• Our motor-fuels tax is relatively high by national standards, and there is little public appetite for additional tax hikes.

• North Carolina is proceeding with several tollway projects, but it's not yet clear how the public will respond to them.

Given the magnitude of the problem and the likelihood of tight government budgets over the next few years, North Carolina policymakers will need to make some tough decisions about priorities. We can't afford to indulge pork-barrel considerations or fanciful notions of large numbers of Carolinians commuting to work by foot, bike, or train.

In other words, playtime is over. It's time to get serious.

In yet another JLF study, published earlier this year, Hartgen argued that shifting funds from the 50 least cost-effective building projects could free up $2.5 billion to invest in maintenance or new capacity in high-priority transportation corridors.

Hartgen also argued that North Carolina needs to manage its transportation projects more efficiently, and avoid spending taxes from highway users on non-highway expenditures with limited payoff in safety, mobility, or economic development.

It's a message that public officials and community leaders across our state need to hear, understand, and act on. Perhaps we should put it on the radio during rush hour, when we know they'll have plenty of time to listen.

Small towns won't stand in Triangle rail's way

09.08.10 - 09:23 pm

Communities want in on rail system, but are willing to wait their turns

By Ray Gronberg gronberg@heraldsun.com; 419-6648

DURHAM -- Smaller towns on the western side of the Triangle want rail-based mass transit, but not so badly that they're willing to complicate the latest effort to obtain the federal funding needed to get a system off the ground.

That at any rate was the stance officials from Orange and Durham counties adopted Wednesday, as they pondered Triangle Transit's query about whether it should expand an ongoing "alternatives analysis" that set the groundwork for an application for federal construction subsidies.

Representatives from Carrboro and Hillsborough both said their communities want in on the system.

The ongoing study is looking at a corridor that in Chapel Hill stops at UNC Hospitals and in Durham turns south near the Duke University Medical Center. That leaves out connections to Carrboro and Hillsborough, at least as part of a hoped-for first phase.

Still, "we're supportive of going ahead," Hillsborough Town Board member Eric Hallman told other members of the Durham-Chapel Hill-Carrboro Transportation Advisory Committee.

Carrboro Alderman Lydia Lavelle agreed, adding that officials need to remember the needs of the area's smaller towns as they plan follow-on phases.

Officials said that for now, it's more important to help Triangle Transit and its consultants home in on a section of track that would serve plenty of riders and at the same time be cheap enough to build or use that federal officials would be willing to subsidize it.

For purposes of preparing a grant application, "the winnowing process really has to take effect now," said Durham City Councilman Mike Woodard, the advisory group's chairman.

Wednesday's discussion paralleled a debate going on in Wake County.

There, officials have asked Triangle Transit to have its consultants look at express-rail connections to Wake Forest and Apex, and light-rail links to Garner and the area around the RBC Center and Carter-Finley Stadium.

Triangle Transit officials worry that complying with at least some of those requests would throw the study behind schedule, unnecessarily so given known problems with the Wake towns' rail infrastructure and potential ridership.

But the complicating factor for officials on both sides of the Triangle is that they're really trying to do two things at once.

While the alternatives study is prepping numbers for a subsequent a federal grant application, Triangle Transit and local governments at the same

time are trying to get ready for a referendum next year on a local-option tax to help pay for an expansion of the region's transit network.

As part of the prep work for a referendum, state law requires the governments have to put down on paper their vision for the system, its phasing and its financing.

And while any federal construction subsidies Triangle Transit lands would surely go to the system's backbone, officials also have to plan for expanded bus service and other links for the region's commuters.

The challenge is to make sure the overall plan is inclusive enough to draw voter support, Chapel Hill Mayor Mark Kleinschmidt and Orange County Commissioner Alice Gordon said.

Triangle Transit's consultants intend to hold a round of public workshops for the alternatives study starting next week.

Locally, they'll hold one in Carrboro, at the Carrboro Century Center on North Greensboro Street, on Sept. 16. A session in Durham, downtown at Durham Station, will follow on Sept. 21. Both will run from 4 to 7 p.m.

NCDOT leader promises fewer politics, more results

Megan Sprague, Mooresville Tribune September 3, 2010

A top official of the N.C. Department of Transportation says Gov. Beverly Perdue has successfully taken the “politics out of transportation” in an effort to make the agency more effective.

Jim Trogdon, a retired brigadier general and chief operating officer for DOT, spoke to the Lake Norman Chamber of Commerce last week during its Power Luncheon for state and local officials.

“As the (COO) in the very large business of state government, we are facing the same challenges in this economy that many of you in this room are in your various industries,” Trogdon told the business and government leaders.

“Our department has gone from 14,000 employees to 12,500 over the last year and in this economic climate, we’re doing a lot more work with a lot less to do it with.”

Trogdon said Perdue has instituted a major overhaul in the last two years, which has “been instrumental in changing the way our department does business.”

“She said she wanted to ‘take the politics out of transportation,’” he said. “Our department is now working with community leaders to plan and organize. It’s a data driven system that delivers hard analysis. The direction our funds are going in is extremely critical when the department is dealing with a shortage in money. With our growing population, we have $54 billion dollars worth of critical transportation needs projected for 2015 through 2020 and about $10.5 billion in anticipated revenue.”

NCDOT has a new formula and criteria for prioritizing projects based on numbers derived from crash statistics, congestion and travel time, he said.

“We’re applying the data to 1,100 projects across the state, and evaluating non-highway projects like ferries, railway, bicycles and pedestrians based on the scoring,” Trogdon said.

“Some people aren’t satisfied with the new system, but critics said they wanted data provided and that’s what we’re doing, and we’re giving a realistic picture. Our goal is to deliver 90 to 95 percent of the projects on time and on budget, as opposed to the 50 percent in our previous history.”

Over the next nine months, DOT will be seeking public comment about what communities like and disapprove of so the department can consider it in their upcoming plans, Trogdon said.

“We need to know the best way to spend the money we do have and meet the needs of the citizens,” he said.

As for the Lake Norman area, Trogdon acknowledged its rapid growth.

“The money is just not keeping pace, (but) we are taking strides and making progress,” he said.

“For example the Brawley School Road project. When that two-lane road was built, it was designed for 10,000 cars a day. Now, it’s at over 30,000, and thanks to the American Recovery and Reinvestment Act, the project will be completed by 2013.”

He added that NCDOT is relying on innovative and creative ways to raise the money needed for other projects, such as finishing I-485. Trogdon mentioned that they are looking into toll roads for the state to make up for shortfalls in funding.

“The state’s first toll road is under construction at the Triangle Expressway and it’s a $1 billion dollar project,” he said. “Another is the Monroe bypass in East Mecklenburg with 74 and 485, which if it stays on schedule, will begin construction in December of this year and will open in 2014.”

In the future, Trogdon said alternate means of transportation, such as buses, trains, bikes and pedestrians will be looked at with more consideration and “it’s all about choice.”

“We will be evaluating alternate forms with the same formula,” he said. “Is there space for a bus pullout? Is there room for a sidewalk? Can we add a bike lane? Cars are an important means of transportation but it’s not the only way. We want to make a comprehensive transit system that accommodates diverse needs without negatively impacting the environment or the community.”

Carrboro takes the lead among bike-friendly NC towns

Submitted by Bruce Siceloff, News and Observer on 09/15/2010 - 09:58

Carrboro is North Carolina’s big winner in new ratings of bicycle-friendly communities published by the League of American Bicyclists.

While no North Carolina burg makes the nation's 13 top-ranked “platinum” and “gold” cities for two-wheel friendship, Carrboro is the state’s only representative on the list of 28 “silver” communities.

It's not clear what did Carrboro did to earn this recognition. A league web page outlines desirable town qualities under the headings of “engineering, education, encouragement, enforcement, evaluation.” A press release about bike-friendly communities says:

> Mayors and community leaders are promoting bicycling to improve public health and quality of life while protecting the environment and provide better transportation choices. Bicycle commuting in BFCs has grown by 70 percent over the last eight years.

The fourth “bronze” tier of 117 bike friendliest includes Greensboro, Charlotte, Davidson, Durham, Cary and Chapel Hill. Last year, Carrboro was merely bronze, too.

As an automobile driver who frequently shares Carrboro and Chapel Hill streets with bicyclists, I wish these and other Triangle communities would boost their education and enforcement efforts regarding the little-known state bike safety law that requires cyclists to use headlights visible for 300 feet and rear reflectors visible for 200 feet after dark. (There's an effort in the legislature to add a taillight requirement.)

Too many two-wheelers travel without lights at night. That’s dangerous, and that's against the law.

Cycling group: Durham 'Bicycle Friendly'

09.16.10 - 08:20 pm
From staff reports

DURHAM -- The League of American Bicyclists announced last week that it has honored the city of Durham with its prestigious Bicycle Friendly Community Award at the Bronze level.

"Durham has many great places for cycling, from the American Tobacco Trail and North-South Greenway Trail to many low-traffic neighborhood streets," Mayor Bill Bell said. "We thank the league for recognizing our efforts to improve the quality of life for our residents and provide transportation choices. Our city staff, the North Carolina Department of Transportation and the biking community have worked hard over the past decade to get us to this point."

Bicycle Friendly Communities are designated twice each year. Applicants complete a detailed online form with questions in five key areas: engineering, education, encouragement, enforcement, and evaluation/planning. Local cyclists, national experts, and league staff then review the applications. Durham's application was prepared by its volunteer Bicycle and Pedestrian Advisory Commission and city staff.

According to Alan Dippy, chairman of the Bicycle and Pedestrian Advisory Commission, this national recognition is just the beginning for what lies ahead for Durham.

"This is a tremendous honor for Durham. Increasingly, our residents are opting to ride bicycles, whether for commuting to work or school, running errands, or for recreation and exercise," Dippy said. "This award is a distinctive recognition of Durham's achievements to date in improving bicycle facilities and educating the public about how cars and bikes can safely share our streets. At the same time, the Bronze level

designation will serve as an important benchmark from which we can build on the momentum of these efforts and create a truly bike-friendly Durham."

According to Dippy, the application process is rigorous since as of this round, there are 158 Bicycle Friendly Communities in 43 states, out of more than 400 applicants nationwide. There are four levels of the award -- platinum, gold, silver, and bronze. Durham's designation is valid for four years and will then need to be renewed.

The league is recognizing 18 new Bicycle Friendly Communities and eight renewals in its fall 2010 award cycle. Chapel Hill is also being recognized at the Bronze level, and Carrboro's designation was renewed and upgraded to the Silver level. Other Bicycle Friendly Communities in North Carolina are Cary, Charlotte, Davidson, and Greensboro.

The League of American Bicyclists will present Durham's award along with a highway road sign at a local ceremony in the near future. The league will also provide the city with feedback on how Durham can become even more bicycle-friendly and eventually receive a higher designation. Currently, there are only three platinum cities in the nation: Boulder, Colo.; Davis, Calif.; and Portland, Ore.

For more information on bicycling in Durham, visit www.durhamnc.gov/departments/transportation/bike_and_ped.cfm online. For more information about the Bicycle Friendly Community Program, visit www.bicyclefriendlyamerica.org.

Corridor likely to need $71M for parking

09.19.10 - 10:33 pm

By Ray Gronberg

gronberg@heraldsun.com; 419-6648

DURHAM -- Consultants think a congestion-busting effort in the N.C. 54 corridor between Durham and Chapel Hill will require a big, $71.8 million investment in new park-and-ride lots over the coming 12 years.

Their recommendations, embedded in a special corridor study governments on both sides of the line are reviewing, say the area needs four additional park-and-rides to capture traffic on its way to UNC Chapel Hill.

The biggest and most expensive of those projects would install parking decks on the Chapel Hill side of the U.S. 15-501 corridor, just west of Interstate 40, and at Farrington Road on the Durham end of the N.C. 54 corridor.

Study authors also think officials will have to expand a small park-and-ride at the Streets at Southpoint, and build a surface lot near the Southpoint automall off N.C. 751 just north of I-40.

The idea is by scattering the parking, officials can avoid channeling all the traffic heading toward UNC from Durham, Cary, Raleigh and other points east of Chapel Hill -- roughly a third of all the school's commuters -- into the constricted N.C. 54 corridor.

In theory, people could instead drive just partway, and then transfer to buses or perhaps even a light-rail service to go the rest of the way.

But the proposal as a whole has officials from Durham and UNC voicing qualms, for somewhat different reasons.

Durham County Commissioner Ellen Reckhow has signaled fellow officials she's not sold on the idea of a big, 2,000-space deck at Farrington and N.C. 54, in the so-called "Leigh Village" area, despite city/county land-use policies that call for it to become one of the major hubs in the region's transit network.

"A deck of that size may be out of character in that area," she said, indicating that she thinks the I-40/N.C. 751 or even the South Square area on U.S. 15-501 might be a better place for major park-and-ride construction.

She added that the Leigh Village area seems a poorer bet to her because it wouldn't do much to relieve the congestion that's likely there even if officials upgrade the adjoining N.C. 54/I-40 interchange.

Farrington is also "currently a scenic, relatively rural road," compared to the fast-developing node around the N.C. 751/I-40 interchange, she said, adding that she's not questioning Leigh Village's designation as a potential transit hub.

UNC administrators, in contrast, aren't sold on the idea that a park-and-ride at N.C. 751 is a worthwhile investment.

Associate Vice Chancellor for Campus Services Carolyn Elfland said she's worried that a facility there would be "less attractive" to potential riders than one closer in.

UNC already runs several park-and-rides, all close enough to campus that commuters have only a short bus ride once they get out of their cars.

Working with Chapel Hill Transit to ensure that buses run on short headways, the school has made sure using the existing park-and-ride system is "almost like having parking space at office, it's so close," Elfland said.

A lot as far away as N.C. 751 wouldn't necessarily have that advantage, in part because commuters could have a more difficult time leaving the campus if a family emergency crops up in the middle of the work day, she said.

The Leigh Village area, on the other hand, "has current and future potential" in UNC's eyes because of its designation as a transit hub, Elfland said.

Worries about the issue have prompted officials to organize ad-hoc discussions that likely will include representatives from Durham, Chapel Hill, UNC and the consultancy that authored the corridor study, Durham City Councilman Mike Woodard said.

Durham officials also are eager to sound out UNC's view, so much so that they've scheduled a meeting with Elfland and UNC Hospitals chief planner Mary Beck on Sept. 27.

The consultants, meanwhile, indicated in their report that they don't see the four park-and-rides as mutually exclusive options, as Reckhow and Elfland seemed to. Rather, they argued that all four will be needed, as congestion renders UNC's 1,647-space lot at the Friday Center more and more obsolete.

Triangle Transit proposes 2 light-rail lines

The News and Observer Sunday, September 19, 2010 05:56 AM

After spending most of the past two decades drawing plans for a three-county rail transit network - and then scrapping them - Triangle Transit rolled out a mix of learned lessons and new ideas last week for trains that could help serve and shape heavy regional growth expected over the next 25 years.

Wake, Durham and Orange county residents are being asked at public meetings to evaluate two corridors singled out by engineers as strong candidates for the Triangle's first light-rail train service.

"We're trying to identify the pieces to start with that will deliver the most benefits and that we actually can afford to build," said David King, Triangle Transit's general manager.

In the spring, county commissioners are expected to consider transit plans that could be submitted to the Federal Transit Administration next summer and to voters next fall.

Triangle Transit's first plan to run diesel rail cars from Durham to Raleigh fell apart in 2006, lacking enough projected riders to justify the federal investment. The idea also had weak local political and fiscal support.

The new plan will switch to electric-powered light-rail trains matched with a beefed-up bus network.

Light rail adds options to move trains out of cramped freight railroad corridors and into the roadways as streetcars that might operate much like systems in San Francisco. And that opens up new paths the trains could take in downtown and West Raleigh, and between Chapel Hill and Durham.

Instead of squeezing into a junction in Raleigh called the Boylan Wye - a clogged intersection for Amtrak, freight and planned high-speed passenger trains - Triangle Transit now figures its tracks will climb overhead on a long bridge, and then hit the street.

"The trick is trying to get through the wye," said Martin Stankus, a senior planner for the city of Raleigh. "That's a challenge."

Possible routes through downtown Raleigh include twin tracks down either Harrington or West streets - or one-way tracks running north on Wilmington and south on Salisbury.

A Triangle Transit map of West Raleigh suggests a light-rail route that would take trains to arena events at Carter-Finley Stadium and the RBC Center on Trinity Road in a loop that includes Youth Center Drive and Edwards Mill Road.

Triangle Transit had planned since 1990 to start with a rail line through Research Triangle Park, serving the Triangle's employment hub and connecting both ends of the region. But its new analysis reaffirms what the Federal Transit Administration concluded in 2006 - RTP and its ring of office parks lack the housing density and around-the-clock activity to keep the trains busy.

So, at public meetings last week and this week, Triangle Transit officials and consultants are explaining that the first light-rail trains will not run through the region's suburban center. The two most promising corridors are about 20 miles apart in the western Triangle and Wake County:

Northwest Cary through N.C. State University and downtown to Triangle Town Center in North Raleigh, 18 miles. It rates high in projected rider counts, job and housing density, development potential, and capital costs compared to the number of weekday transit trips.

UNC Hospitals in Chapel Hill to Alston Avenue in downtown Durham, 17 miles. It rates high in rider counts, low-income residents who are more likely to depend on transit, and capital and operating costs. This corridor is rated weak in housing density and development potential.

In a fall 2011 referendum, Triangle voters are expected to consider approving a half-cent sales tax - which would add 5 cents to every taxable $10 purchase - that would cover a large share of new bus and rail costs.

King and Triangle Transit's consultant, URS Corp., figure that local voters and federal officials are most likely to support building the first light-rail lines in parts of these two corridors.

Commuter rail

Triangle Transit is also boosting prospects for a limited kind of region-wide rail service that was not in the cards a few years ago. Commuter trains pulled by standard diesel locomotives are proposed to run from west Durham to the Wake-Johnston county line. These trains would operate on weekday rush hours, every 30 or 60 minutes, and make stops in RTP.

"Commuter rail makes sense as the way to connect Durham and Raleigh in the short and intermediate term," King said.

Link to airport

Triangle Transit is also publicizing a plan sketched by the Raleigh-Durham Airport Authority for an eventual link between RDU and the region's rail transit network. The airport would pay for the plan, which is little more than lines on a map at this point.

It would start with buses and graduate to the rail-based, automated people movers popular at major airports. The transit line would connect the airport to Triangle Metro Center, a proposed rail-bus hub at RTP. It would stop on the way at an RDU rental car center to be built west of Aviation Boulevard.

"The airport authority knows we need to connect to the rail system, and this initially seems like the best plan to do that," said Mindy Hamlin, RDU spokeswoman.

N.C. train stations to get $43.4M in upgrades

Thursday, September 23, 2010, 2:24pm EDT Triangle Business Journal - by Chris Baysden

The North Carolina Department of Transportation's Rail Division will spend $43.4 million to make improvements at nine train stations in the state, including those in Cary, Raleigh and Durham.

The money comes from $545 million in American Recovery and Reinvestment Act funds awarded to the state from the U.S. Department of Transportation's Federal Railroad Administration earlier this year. The money is being used to improve a stretch of the Southeast High Speed Rail corridor between Raleigh and Charlotte, NCDOT said in a written statement.

The following improvements in the Triangle are among those that will be made:

Cary:

• expansion to accommodate full-service Amtrak service including ticketing and baggage handling

• the north boarding platform will be lengthened

• parking will be added

• a video security system will be installed

• a passenger information display system (PIDS) will be added

Capital Yard Maintenance Facility in Raleigh:

• will be improved so that additional train maintenance may be performed more quickly, safely and efficiently

• the existing video security system will be enhanced

Raleigh:

• a video security system will be installed

• a passenger information display system will be installed

Durham:

• a passenger information display system will be installed

The projects in Cary and at the Capital Rail Yard will start construction by early 2011, and should be finished in 2012. The other projects will begin design by early 2011. Those projects must be completed and in service by February 2014, NCDOT said.

Alternatives to scrapped road extension project on table

September 25, 2010
From Herald-Sun staff reports

HILLSBOROUGH -- The Town of Hillsborough is preparing to select a package of alternatives to the scrapped Elizabeth Brady Road extension project that was intended to alleviate traffic through downtown.

An analysis of possible smaller road projects will be presented to the Hillsborough Board of Commissioners during its monthly workshop at 7 p.m. Monday in the Town Barn. The public is welcome to provide feedback on the alternative road projects and which ones should be selected as a package for the N.C. Department of Transportation to build.

Earlier this year, DOT agreed to drop plans to build a bypass that would have connected U.S. 70A with U.S. 70 and St. Mary's Road east of town in one of three routes with multiple lanes. The Town Board and some segments of the community had withdrawn support for the bypass, which some opponents claimed would have significantly affected the natural and social environment of the area and yielded limited improvements in traffic congestion. Advocates complained that the town should not abandon the congestion-alleviating plan after so many years of fighting to get it funded.

Late last year, the board began discussing 11 smaller road projects that could be built in some combination with the $34 million allocated for the bypass and that could similarly or further reduce traffic on Churton Street.

To persuade DOT to reassign the funds earmarked for the Elizabeth Brady Road extension, the package the town chooses must consist of projects that can be constructed quickly and that can be shown to effectively alleviate congestion in the downtown.

The Town Barn is located on the Town Hall campus at 101 E. Orange St. Parking is accessed from East Corbin Street.

Alternatives to Elizabeth Brady Road

September 25, 2010 The Herald-Sun
Alternatives to Elizabeth Brady Road

Following is the draft package of alternative studies and construction projects that could replace the construction of a bypass, as submitted by the Town Commission in November 2009:

1. Update and modernize I-85 interchange 165 on N.C. 86. While this interchange is part of the I-85 widening project, this interchange is critical to improved and safe traffic flow in Hillsborough. This request includes funding for the full reconstruction of the interchange and the integration of bicycle and pedestrian features across the interstate.

2. Update the feasibility study for the widening of South Churton Street (TIP R-2825) to include an assessment of the recommendations in the Churton Street Corridor Plan and the potential impacts of the Waterstone Development. This must include an assessment of the viability of the roundabouts and cross-sections recommended in the Corridor Plan as well as updated development and redevelopment forecasts in the corridor. Funding for the construction of this improvement is also requested as part of the package, including the I-85 interchange reconstruction.

3. Conduct a feasibility study for the construction of Orange Grove Street extension to U.S. 70 Business. This must include an underpass of the railroad as well as bicycle and pedestrian improvements. Funding for the construction of this improvement is also requested as part of the package.

4. Conduct a feasibility study for the alignment of Eno Mountain Road and Mayo Street (TIP U-3436). This route provides in-town and local traffic relief to Churton Street and is referenced in both the Orange Grove Road plan and Churton Street Plan. Funding for the construction of this improvement is also requested as part of the package.

5. Provide additional operational support funding for an in-town circulating bus route (C-4932) for five additional years in a step-down manner to allow the town and county to absorb the cost and provide a quality service with short headways.

6. Assess the viability of designating an alternate route as an N.C. 86 Bypass -- including portions of I-40 and I-85 and the U.S. 70 connector. If this route is viable, funding for necessary signage and any spot safety or small improvements is also included in the package.

7. Enhanced signage east, west, and north of Hillsborough to direct through-traffic to use the U.S. 70 connector and interstates rather than Churton Street. This includes signage in RTP to direction N.C. 86 North traffic to the Durham Freeway, I-85, and U.S. 70 Bypass and includes the study of the improvement as well as installation of the signs.

8. A Downtown Traffic Demand Management and efficiency assessment to include looking at signalization, dedicated left turns, turn lanes, parking and traffic calming to both improve the flow but maintain community character in the historic downtown core. Funding for the construction of this improvement is also requested as part of the package.

9. Assess the impacts and viability of extending U.S. 70 A west to connect with Exchange Park Lane. Funding is only requested for this improvement if the study indicates significant improvements to traffic flows, levels of service and the connection can be made without significant impacts to the community and other plans.

10. Community railroad crossing assessment. In light of plans to straighten a portion of the railroad east of downtown, to double track the route through town, to add commuter rail service, and potentially close crossings, the impacts of these proposals must be studied, the public engaged in the discussion, and a community plan developed for how to best balance all of the interests. This should include a discussion of the Dimmocks Road trestle and its impact on accessibility to Gold Park and Riverwalk. Funding for the construction of these improvements is also requested as part of the package.

11. Assess the condition of the Eno River bridge and railroad bridge on South Churton Street to determine the appropriate replacement schedule and the necessary design to accommodate bicycle and pedestrian improvements. Fund and construct these replacements if appropriate or schedule as needed.

UNC, Durham pleased with meeting on N.C. 54

09.28.10 - 11:50 pm
University has no immediate plans for major development

By Ray Gronberg The Herald Sun

DURHAM -- UNC Chapel Hill and Durham officials say their meeting this week to discuss the N.C. 54 corridor's traffic problems went well, in part by clarifying that the school has no short-term plans for any major development there.

The discussion underscored that UNC administrators' major interest at this point is seeing that N.C. 54 "continues to serve as the primary corridor for getting employees to work," said Durham City Councilman Mike Woodard.

It also suggested that UNC isn't likely to complicate the job of coming up with solutions to the corridor's congestion woes by undertaking a major redevelopment of the area around the Friday Center or a new development on other land along N.C. 54 any time soon.

Associate Vice Chancellor for Campus Services Carolyn Elfland termed that understanding "maybe the biggest outcome" of the meeting, which Woodard pushed for to help Durham officials get a better sense of the university's interests.

"Right now, we have bitten off Carolina North and University Square," Elfland said, referring to a planned satellite campus and downtown redevelopment in Chapel Hill proper.

Given the time and money those will consume, "we're not looking to do any major development in the 54 corridor on either side of the road, on either of our parcels out there," she said. "That's not where our focus is."

The timing of any UNC-led development in the corridor is a key issue for planners who are looking for ways to alleviate the traffic crunch they think is likely to build up in there over the next 25 years.

Aside from a major project's obvious traffic-generating potential, UNC could complicate planners' work if a redevelopment of the area around Friday Center took its existing park-and-ride lot out of play.

But in the wake of Monday's meeting with Elfland and other university officials, Woodard said his "impression is we won't see huge changes at the Friday Center for a number of years."

Elfland added that a draft study of the corridor's traffic issues "fairly overstated" the potential for using the university's Mason Farm tract, the land occupied by the Friday Center, the Finley Golf Course and a number of other facilities.

Much of the tract is so environmentally sensitive that "we would never develop it," she said.

With that clarified, participants in the meeting turned to the details of the solutions consultants are suggesting for the corridor's congestion woes.

UNC's worries on that front concern plans for new park-and-ride lots, and on the study's call for converting some of the key road's intersections into so-called "superstreets" like the one the N.C. Department of Transportation built in Chapel Hill at the intersection of U.S. 15-501 and Erwin Road.

Elfland earlier this month said UNC officials aren't sold on the idea that a park-and-ride as distant from campus as the N.C. 751/Interstate 40 interchange would appeal to the school's commuters.

They're also worried the superstreets -- elongated traffic ovals that limit motorists' left-turn rights -- will cause access problems at facilities like the Friday Center, even for buses.

On those fronts, participants agreed there's need for more research and discussion. That will unfold in the coming weeks.

On both sides, there was "a commitment to get back together and start working through these" issues, Woodard said, adding that he expects the group to reconvene "toward the end of October."

Administrators are hoping the corridor study can be ready for governments in Durham and Orange counties to approve sometime early next year.

Triangle rail likely starts divided

09.29.10 - 11:18 pm

TTA consultants focus on western, eastern corridors

The Herald Sun by Ray Gronberg 09.29.10 - 11:18 pm

DURHAM -- A rail system for Triangle commuters likely will have to start with a pronounced split between the region's western and eastern halves, with a few daily runs along the N.C. Railroad as a supplement to stitch them together.

To further ready the ground for a future application for federal construction subsidies, consultants retained by Triangle Transit intend to focus on two corridors that seem suitable for light-rail systems.

The one serving the western Triangle would run from the UNC Hospitals area in Chapel Hill to the Alston Avenue area in Durham, along the way likely using a combination of the N.C. 54, Interstate 40 and U.S. 15-501 corridors.

For the eastern Triangle, they will ponder a line linking northwest Cary to north Raleigh, from a point near the intersection of Chapel Hill Road and the Northwest Cary Parkway to the area near the Triangle Town Center, where Capital Boulevard meets Interstate 540.

Cross-Triangle commuter- or express-rail traffic would use the N.C. Railroad, likely with peak-hour weekday runs that share the track with the freight and Amtrak trains that already pass through the area.

Consultants figure local governments in that way can move people between Durham and points in eastern Wake County.

The suggested corridors -- which will receive nearly a year's worth of additional scrutiny before this group of consultants is finished -- are a subset of the plans local leaders have embraced for regional transit.

But a paring of some sort is necessary because it's not financially feasible or practical to build a full-fledged system all at once, said Bill Martin, an engineer and principal of Martin/Alexiou/Bryson, one firm helping Triangle Transit with the current study.

The idea would be that as the region continues to grow, local governments would someday knit the rail system together.

But for now, planners have to cope with what amounts to a hollowed-out doughnut hole around RTP that, barring a major change in local land-

use planning, wouldn't generate as many riders as one might think.

With no housing in RTP itself, there's little prospect of seeing any demand for transportation services there outside work hours. And between Umstead Park and RDU there's a big piece of western Wake County near likely transit corridors that's essentially off-limits to development.

Triangle Transit's consultants looked initially at a 57-mile corridor stretching from UNC Hospitals all the way to Wake Forest. They tried to come up with cost and ridership estimates for the whole line, and for 15 variants that included parts of it.

At $3.5 billion in 2010 dollars to build, the entire line is almost certainly more than the region can afford at this point, even with federal subsidies, state aid and revenue from possible local-option sales-tax surcharges.

The segments the consultants want to study more closely are similar in length and potential cost.

The UNC-to-Alston corridor is about 17 miles long and likely would consume about $1.2 billion during construction. The northwest Cary-to-Triangle Town Center run would stretch some 18 miles and take $1.1 billion.

Those cost numbers compare to what the N.C. Turnpike Authority is spending to build a 19-mile toll road between RTP and Holly Springs.

Both potential light-rail corridors see a lot of travel, but consultants assume a system would attract only some people now relying on cars and other means to get around in them.

They figure the two lines would each attract about 6,800 riders a day -- a number local officials suspect could understate potential ridership, given Charlotte's new rail system has proved a bigger hit with riders than officials in that city expected.

But for all that, both lines appear more cost-effective than the Duke Hospital-to-downtown Raleigh line Triangle Transit designed last decade.

That would cost some $1.7 billion these days -- roughly $9 or $10 more per likely trip than either of the cut-down options.

Martin stressed in a meeting with local officials Wednesday that the follow-up work on the two corridors will go into even more detail, as consultants look at routing options within them and think about where to put stations.

A written report also noted that the consultants might pare the lines further, to limit costs and make a funding application more appealing to federal regulators who'd prefer to fund starter routes only 10 to 12 miles long.

In answer to a question from Cary Town Councilwoman Julie Robison, Martin further pointed out that it's possible Triangle Transit would put in for federal support of both lines and the cross-region express service at the same time.

That would open "a very real possibility ... that one project may move further quicker than the others," Martin said.

Engineers could design the Cary-to-Triangle Town Center line more quickly because it would follow part of the route Triangle Transit's old plan had envisioned using, he said.

Carrboro, DOT strike deal on Smith Level Road widening

The Carrboro Citizen Sept 30, 2010 By Kirk Ross, Staff Writer

CARRBORO — If you would have told the Carrboro Board of Aldermen circa 1980 that it would take 30 years before their successors and the state Department of Transportation struck a deal on a plan for improvements to Smith Level Road, you might have gotten a few quizzical looks.

But it did. And now, with an agreement in hand with the town as of Tuesday night's board of alderman meeting, DOT project U-2803 moves into an entirely new phase.

The agreement comes after decades of disagreement between the state and Carrboro over how and how much to widen the road. Carrboro has long held out for bicycle lanes and sidewalks for the heavily traveled road, which is almost shoulderless in places.

Over the years, the project, first officially proposed in 1992, dropped from five lanes to four and last year, in a move that broke the stalemate, down to two lanes with a median. That touched off further negotiations, which yielded a new set of plans.

The final round of discussions, which came after both sides agreed last spring on the bulk of the design, focused in part on the details of tree protection, sidewalk locations and construction plans around the road's retirement and assisted-living centers.

But the biggest hitch by far was over DOT's insistence on eliminating a left turn out of the Berryhill neighborhood, which residents said was essential to prevent too much traffic from being funneled through other streets in the neighborhood.

At Tuesday night's board meeting, DOT's chief engineer for the local district, Mike Mills, indicated that the state had gone as far as it could go. DOT engineers have said repeatedly that while they're agreeing to a two-lane design, they believe a four-lane road will one day be needed.

Asked repeatedly whether there was any way the project could go forward without the median, Mills reply was a consistent "no" – at least not as a road improvement. The state, he said, could remove the project from its list of priorities and the town could start over in seeking funds to do the project strictly as a bicycle and pedestrian improvement project.

Mayor Mark Chilton, credited with helping break the deadlock on the project last year, told residents assembled at the meeting that while he disagreed with the DOT's philosophy, without the median the project would likely never be adequately funded.

He said he did not think maintaining the left turn was a fair trade for losing long-sought bicycle lanes and sidewalks.

The final vote was 6-1, with board member Joal Hall Broun voting against the project.

A hearing of a proposed zoning change for a section of the Ballentine project north of Lake Hogan Farms off Old N.C. 86 also was on Tuesday's agenda.

At the urging of town officials, developer M/I Homes is seeking permission to add further density and a small commercial area to the project, triggering the need for a zoning change.

Members of the town's Northern Transition Area advisory board also asked that the zoning change, which was supported by other advisory boards, be rejected.

And several residents of nearby neighborhoods told the board of aldermen that they were upset over the project, saying it will add to traffic congestion and pack too many residents into the area.

That brought a sharp rebuke from board member Broun, who recalled that when she moved to town 28 years ago the Hogan land and Cates Farm were actual farms.

Referring to the area's moniker – the Northern Transition Area – Broun said, "Transition means what it says it means – transition, not stasis."

The board will continue the public hearing on the zoning change at its Oct. 28 meeting.

In other action, the board agreed to continue looking for alternatives for bicycle and pedestrian traffic on Estes Drive. The board reviewed several proposed routes connecting through to downtown, but did not choose a specific plan.

Several board members noted the difficulty in getting the owners of Estes Park Apartments to enter into discussions on a new route. A fence erected at the complex in 2008 cut off a commonly used path to downtown.

NCDOT: Stimulus-related payroll slips

Triangle Business Journal - by Chris Baysden Wednesday, October 6, 2010, 12:46pm EDT

The number of stimulus-related transportation jobs in the state declined by 8 percent in August, according to data compiled by the North Carolina Department of Transportation.

NCDOT says that 6,806 workers received $5.7 million in payroll during August for 344,782 hours of work. That compares to the 7,362 workers who got $6.2 million for 378,798 hours of work in July.

NCDOT says that 405 transportation stimulus contracts worth $662 million have been awarded in the state. More than half of those, 234, have been completed.

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take it. easy.

September 14, 2010

Councilperson Mike Woodard, Chair
Durham-Chapel Hill Carrboro Transportation Advisory Committee
City of Durham
101 City Hall Plaza
Durham, NC 27701

Dear Councilperson Woodard:

Triangle Transit has appointed Durham City Councilman Howard Clement as its representative on the TAC. Mr. Clement is replacing the seat left vacant by Bill Strom.

Mr. Clement's contact information is:

Howard Clement, III
101 City Hall Plaza
Durham, NC 27701
560-4396 x10272

We thank you for the opportunity to work together to improve transit in our region. If you need additional information do not hesitate to contact me or the Clerk to the Triangle Transit Board Michelle Dawson at mdawson@triangletransit.org or 485-7438.

Best Regards,

Jeff Merritt, Chair
Board of Trustees

Triangle Regional Transit Program

Transitional Analysis Report

REVISED DRAFT

September 24, 2010

Original Draft Dated September 2, 2010

Prepared for: Triangle Transit

Prepared by: URS Team

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APPENDICES

Appendix A - White Paper Study of Commuter Rail to Zebulon

Appendix B – White Paper Study of Commuter Rail to Hillsborough

Appendix C – White Paper Study of Future Extension to Carrboro Implementation Analysis

EXECUTIVE SUMMARY

INTRODUCTION AND PURPOSE

Triangle Transit has commissioned a major study to initiate fixed-guideway transit service within Wake, Durham, and Orange counties of North Carolina. The Triangle Regional Transit Program (TRTP) is a collaborative framework for developing an efficient and sustainable regional transportation system that addresses the Triangle's critical need for improved connectivity and mobility choices while promoting its economic prosperity, job growth, and an enhanced quality of life. While previous transportation plans for the region have recommended the introduction of fixed-guideway transit, this study is significant due to the passage of HB 148 by the North Carolina General Assembly, which authorizes Durham, Orange, and Wake counties to hold referenda that, if passed, would allow each county to levy a ½ percent sales tax increase to fund improvements in public transportation.

The studies being conducted over the next year will recommend which transit corridors should initially be built. Planning work being undertaken includes two phases:

Phase 1: A system-level Transitional Analysis, which is the subject of this report, will define and prioritize up to three transit corridors from the adopted 2035 Joint Long Range Transportation Plan (LRTP) to be studied in further detail in the Phase 2 Alternatives Analysis process. Given the geography of the region, including three counties and two Metropolitan Planning Organizations (MPOs), it is anticipated that one corridor within each of the MPO areas will be carried forward into the Alternatives Analysis process. A third commuter rail corridor spanning the region is possible as an early implementation project, with potential collaboration with the North Carolina Railroad and NCDOT.

Phase 2: Triangle Transit will conduct Alternatives Analysis studies for up to three priority corridors to evaluate and screen alternative alignments, modes and station locations within each corridor. The Alternatives Analysis process will conclude with the selection and MPO adoption of a Locally Preferred Alternative for each of the priority corridors. The Alternatives Analysis process is a requirement of the Federal Transit Administration (FTA) for a fixed-guideway project to be eligible for federal funds.

It is unlikely that all fixed-guideway transit corridors in the LRTP can be implemented in the near-term, even with a sales tax increase. It is expected that corridors not included in the Phase 2 Alternatives Analysis studies would be implemented in later phases. Fixed-guideway transit projects would also be complemented by improvements and expansion to regional and local bus services so that all communities in the region have improved transit access. Improvements to bus service could begin soon after the referendum if voters approve a ½ percent sales tax increase.

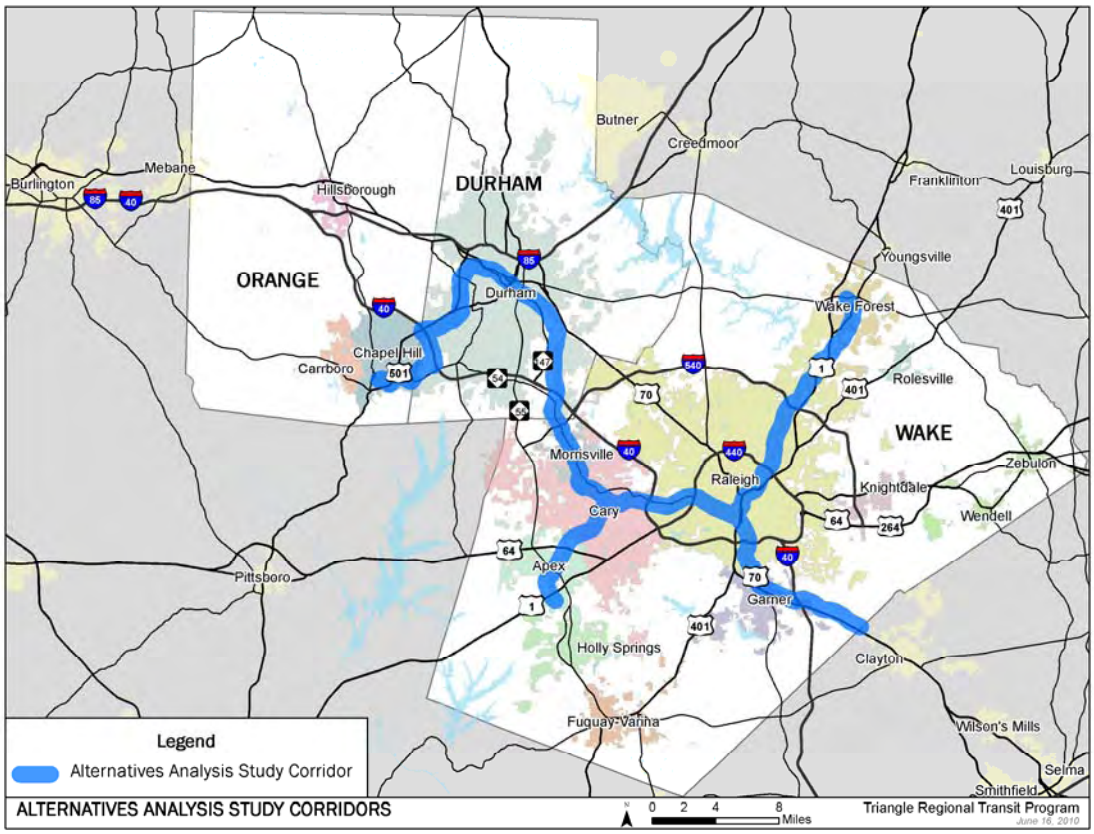
The primary purpose of the Transitional Analysis is to define the corridor(s) for inclusion in the Alternatives Analysis studies. The Transitional Analysis acts as the bridge between the system plan in the LRTP and the more focused and detailed study performed in an Alternatives Analysis.

For the Transitional Analysis, the system plan has been broken down into a set of smaller corridors that have been evaluated in order to recommend a limited number of priority corridors to move forward into the Alternatives Analysis process. This Transitional Analysis applies a set of evaluation criteria and measures to each corridor for evaluation and prioritization of the corridors. For the purposes of this analysis, a corridor consists of a relatively wide band up to one mile wide with major activity centers identified. Examples of activity centers include the Northeast Regional Center (NERC), Downtown Raleigh, NC State Fairgrounds, Cary, Research Triangle Park (RTP), Downtown Durham, and Gateway East. In the detailed Alternatives Analysis, the exact number and locations of stations will be identified, as well as the exact alignment of the planned service, the termini, and the type of vehicles.

CORRIDORS

Using the 2035 Joint LRTP for both the CAMPO and the DCHC-MPO (see Figure ES.1), as well as input from Triangle Transit, both MPO's, and other stakeholders, 12 corridors were identified in Wake County and 6 were identified in Durham and Orange counties.

Figure ES.1 Transitional Analysis Study Corridors



The study corridors were presented to the CAMPO, the DCHC-MPO and to elected officials. The identification of corridors was also widely communicated to various cities, towns, counties, and organizations. The Wake County Technical Committee, the Durham-Orange County Technical Committee, and the Public Involvement Steering Committee, which were established

for this project, were also presented with the corridors. All known stakeholders attended one of these presentations. Comments received from stakeholders have been considered and incorporated into this Transitional Analysis.

EVALUATION CRITERIA

The corridors were evaluated by the consulting team using the following criteria, which were developed in consultation with Triangle Transit, DCHC-MPO and CAMPO. Where applicable, the evaluation year is noted in parentheses.

Mobility

- Number of daily total trips in corridor (2035) (normalized as daily total trips/mile)
- Number of daily transit trips in corridor (2035) (normalized as daily transit trips/mile)
- Transit passenger miles traveled (PMT) for rail (2035)
- Relative peak hour corridor travel times for rail and highway travel (2035)

Socioeconomic

- Population and density within a mile-wide corridor (2005 and 2035)
- Number and density of low-income households within a mile-wide corridor (2000)
- Number and density of minority households within a mile-wide corridor (2000)
- Number and density of jobs within a mile-wide corridor (2005 and 2035)

Land Use

- Public sector/regulatory support - Existing comprehensive plans consistent with the concepts of compact, mixed-used development near public transportation, or transit-oriented development (TOD); allowable densities and flexibility of zoning districts
- Activity centers served (employment, retail, institutions, mixed use, special attractions)
- Development potential – future TOD potential considering potential household and employment density and future growth

Financial

- Total capital cost (2010 dollars)
- Capital cost per mile (2010 dollars)
- Capital cost per weekday transit trip (2010 dollars, 2035 ridership)
- Capital cost per weekday transit passenger mile traveled (2010 dollars, 2035 PMT)
- Total Operating and Maintenance (O&M) cost (2010 dollars)
- O&M cost per weekday transit trip (2010 dollars, 2035 ridership)
- Annual O&M cost per weekday transit passenger mile traveled (2010 dollars, 2035 PMT)

Public Input

Citizens and project stakeholders will be provided an opportunity to review and comment on the evaluation criteria and the draft results of the corridor analysis. This information will be presented at a series of six public workshops that will be held between September 14 and September 23, 2010.

RESULTS

Each of the corridors was evaluated based on the above criteria. This section presents the results of this evaluation for the Wake County corridors and for the corridors in Durham and Orange counties. As stated in Chapter 5, all of the criteria that were evaluated in this study were developed by the consulting team in partnership with Triangle Transit, DCHC-MPO, and CAMPO. All criteria may be useful or informative regarding any given corridor, and as such all results of the analysis have been included in Chapter 6 of this document. However, some criteria do not meaningfully distinguish between separate corridors, and are not included in the summary performance of each corridor. Tables ES.1 and ES.2 summarize the evaluation criteria that were most helpful in distinguishing between corridors.

Wake County

Twelve corridors in Wake County were evaluated and the results can be seen in Table ES.1. A summary of the findings is also presented.

Conclusions

Results of the analysis indicate that Wake Alternatives 9 (from Downtown Cary to the Northeast Regional Center) and 10 (from the State Fairgrounds to the Northeast Regional Center) are the overall highest performers. A summary of the evaluation follows:

- Wake Alternatives 9 and 10 have the highest daily rail trip estimates on a per mile basis, with 394 and 402 rail trips per mile respectively. The comparatively stronger ridership is a reflection of the large concentrations of people living within the vicinity of the corridors and the number of dense employment nodes – including downtown Raleigh, NERC, and Cary – that are served by both corridors.

- The corridor alternatives serving the segment from downtown Raleigh to the NERC have the highest levels of future household and employment densities. These include Wake 8 (Northwest Cary to NERC), Wake 9 (Downtown Cary to NERC), Wake 10 (State Fairgrounds to NERC), and Wake 11 (Downtown Raleigh to NERC).

- The jurisdictions in the region have adopted strong policies supportive of transit-oriented development in the planned transit corridors. This is a direct result of the ongoing comprehensive planning process that incorporates the LRTP into the comprehensive plans for the cities, towns, and counties in the region. The analysis of the land use plans and policies and Zoning by Right illustrate that the potential for higher densities of population, households, and employment is relatively strong in all of the proposed corridor alternatives. It then becomes the issue of identifying the best performing corridors. In an effort to summarize the economic and demographic factors, a Relative Future Density/Growth (RDFG) Factor was formulated and normalized on a per mile

basis. In this analysis, the Wake Alternatives 8 through 11 have the highest factors and Wake 11 performs the best. Wake 7 (TMC to NERC) and the regional corridor, Wake 12 (Duke Medical to Downtown Raleigh), also perform well but have factors just under Wake 8.

- From a cost perspective, Wake Alternatives 9 and 10 are relatively expensive to build when compared to other corridors on a cost per mile basis. Wake Alternatives 9 and 10 would cost $65M per mile and $67M per mile respectively. The higher cost, as compared with other corridors, can be attributed to more expensive infrastructure needs related to limited right-of-way and required infrastructure improvements, particularly in the vicinity of downtown Raleigh. On a per mile basis, longer corridors can spread out the costs associated with these infrastructure upgrades. Unlike other corridors however, Wake Alternative 9, which is 16 miles and Wake Alternative 10, which is 12 miles, are not long enough to spread out the costs of the infrastructure improvements required in the vicinity of downtown Raleigh.

- Although they are higher on a capital cost per mile basis than other corridors, Wake Alternatives 9 and 10 perform relatively well in terms of cost effectiveness due to their strong ridership. The capital cost per transit trip for Wake Alternative 9 is approximately $54 per trip and the capital cost per transit trip for Wake Alternative 10 is approximately $55 per trip.

While Wake Alternatives 9 and 10 are the overall strongest performers among the Wake corridors, Wake Alternative 8, which extends the transit line an additional two miles from downtown Cary to NW Cary, is not significantly far behind in performance. A terminal station in downtown Cary could be problematic due to limited property available for locating an end-of-line park and ride. A relatively short extension to NW Cary, therefore, may improve the feasibility of this corridor by providing more opportunities to locate a park and ride and related transit infrastructure and potentially increasing ridership. Given that this is a high-level screening process and that Wake Alternatives 8 and 11 are not significantly lower performing than Wake Alternatives 9 and 10, consideration should be given to performing the detailed analysis on Wake Alternative 8 which incorporates all of the alignments coincident to Wake Alternatives 9, 10, and 11.

The detailed Alternatives Analysis can fine tune this larger corridor in looking at the most optimal, best-fit initial starter line that may involve cutting back on the alignments at both ends to arrive at the most effective corridor for New Starts funding. This is in recognition of Federal funding capacity and that most starter lines initially constructed are in the 10-12 mile range. Extensions from the initial line would start the full build-out process consistent with funding availability.

Table ES.1 Evaluation Criteria Summary (Wake County)

Study Corridor	Corridor Length (mi) / Total Cost M$ (2010)	Mobility		Socioeconomic				Land Use		Financial			
		Total In Corridor Trips per Mile (2035)	Rail Trips/Mile (2035)	Population Density (2035)	Employment Density (2035)	Low Income Population Density (2000)	Minority Population Density (2000)	Supports Transit Oriented Development, Zoning by Right	Relative Future Density / Growth Factor	Capital Cost (2010)	Capital Cost per Mile (2010 Dollars, 2035 Ridership)	Capital Cost per Weekday Transit Trip (2010 Dollars, 2035 Ridership)	Operating & Maintenance Cost/ Weekday Transit Trip (2010 Dollars, 2035 Ridership)
Wake Alternative 1 (UNC Hospitals to Wake Forest)	59/$3,500	◒	◒	○	○	◒	◒	◒	○	○	●	●	●
Wake Alternative 2 (Triangle Metro Center to Wake Forest)	33/$1,900	◒	○	◒	○	○	○	◒	◒	◒	●	◒	◒
Wake Alternative 3 (Veridea to Wake Forest)	33/$2,000	◒	○	◒	○	○	○	◒	◒	○	●	◒	◒
Wake Alternative 4 (Downtown Cary to Wake Forest)	25/$1,500	◒	○	◒	◒	○	○	◒	◒	◒	●	◒	◒
Wake Alternative 5 (State Fairgrounds to Wake Forest)	20/$1,200	◒	○	◒	◒	○	○	◒	◒	◒	●	○	○
Wake Alternative 6 (Downtown Raleigh to Wake Forest)	17/$1,000	◒	○	◒	◒	○	○	◒	◒	●	◒	○	○
Wake Alternative 7 (Triangle Metro Center to NERC)	24/$1,500	◒	●	◒	◒	○	○	◒	◒	◒	●	●	●
Wake Alternative 8 (Northwest Cary to NERC)	18/$1,100	●	●	●	●	◒	◒	●	●	◒	◒	●	◒
Wake Alternative 9 (Downtown Cary to NERC)	16/$1,000	●	●	●	●	◒	◒	●	●	●	◒	●	●
Wake Alternative 10 (State Fairgrounds to NERC)	11/$780	●	●	●	●	◒	◒	●	●	●	○	●	◒
Wake Alternative 11 (Downtown Raleigh to NERC)	8/$580	●	◒	●	●	◒	◒	●	●	●	○	○	◒
Wake Alternative 12 (Duke Medical to Downtown Raleigh)	29/$1,700	◒	○	◒	◒	◒	◒	◒	◒	◒	●	◒	◒
Summary of Evaluation Criteria and Rankings													
High Performer = ●		>22,060 Trips/Mile	>363.5 Trips/Mile	> 3.9 Households/Acre	>13.3 Jobs/Acre	>0.61 Persons/Acre	>1.61 Persons/Acre	Considers the # of stations and allowable densities within jurisdiction	>0.9	<1052	<$62.0 M/Mile	<$56.9/Trip	<$9.9/Trip
Average Performer = ◒		18,452 - 22,060 Trips/Mile	311.3-363.5 Trips/Mile	2.9 - 3.9 Households/Acre	10.3 - 13.3 Jobs/Acre	0.38 - 0.61 Persons/Acre	1.04 - 1.61 Persons/Acre		>0.5-0.89	1052-1925	$62.0 - $66.3 M/Mile	$56.9-66.4/Trip	$9.9-12.1/Trip
Low Performer = ○		<18,452 Trips/Mile	<311.3 Trips/Mile	<2.9 Households/Acre	<10.3 Jobs/Acre	<0.38 Persons/Acre	<1.04 Persons/Acre		<0.50	>1925	>$66.3 M/Mile	>$66.4/Trip	>$12.1/Trip

Note: The breakpoints for the bins are ±0.5 standard deviations from the mean. Data results are given in greater detail in Chapter 6.

Durham-Orange Counties

Six corridors in Durham and Orange counties were evaluated and the results can be seen in Table ES.2. A summary of the findings follows the table.

Conclusions

Results of the analysis indicate that Durham-Orange Alternatives 4 (from UNC Hospitals to Alston Avenue), 5 (from UNC Hospitals to Gateway) and 6 (from Gateway to Alston Avenue) are the overall highest performers (note that Alternatives 5 and 6 are subsets of Alternative 4). Primary discriminators between the alternatives include mobility, socio-economics and cost-effectiveness, as discussed here:

- Durham-Orange Alternatives 4 and 5 have the highest daily rail trip estimates on a per mile basis, with 394 and 399 rail trips per mile respectively. This primarily reflects the high employment at UNC and UNC Hospitals, Duke University and Duke Medical Center, and downtown Durham. Several significant mixed-use developments also exist or are planned within the corridor.

- Durham-Orange Alternatives 4 and 6, both of which terminate at Alston Avenue, are the most effective at reaching transit-dependent populations.

- The jurisdictions in the region have adopted strong policies supportive of transit-oriented development in the planned transit corridors. This is a direct result of the ongoing comprehensive planning process that incorporates the LRTP into the comprehensive plans for the cities, towns, and counties in the region. The analysis of the land use plans and policies and Zoning by Right illustrate that the potential for higher densities of population, households, and employment is relatively strong in all of the proposed corridor alternatives. It then becomes the issue of identifying the best performing corridors. In an effort to summarize the economic and demographic factors, a Relative Future Density/Growth (RDFG) Factor was formulated and normalized on a per mile basis. In this analysis, DO 6 (Gateway to Alston Avenue) has the highest factor of the Durham-Orange corridors. The regional corridor, DO 2 (Duke Medical to Downtown Raleigh) also performs well, but is just under DO 6 and slightly better than DO 4 (UNC Hospitals to Alston Avenue).

- From a cost perspective, Durham-Orange Alternatives 4 and 5 are relatively more expensive to build compared to other corridors ($68M per mile and $66M per mile respectively). This is because these corridors are primarily on new alignment that requires more right-of-way acquisition and infrastructure improvements than alternative corridors that use existing railroad right-of-way (e.g., Durham-Orange Alternatives 1 and 2).

- Although they are higher on a capital cost per mile basis than other corridors, Durham-Orange Alternatives 4 and 5 perform better in terms of cost effectiveness due to their strong ridership. The capital cost per transit trip for Durham-Orange Alternative 4 and 5 is approximately $55 and $53 per transit trip, respectively.

Durham-Orange Alternative 4 is the combination of Durham-Orange Alternatives 5 and 6, and hence, advancing this longer corridor allows for the most optimal starter line analysis for submission for Federal funding.

Durham-Orange Alternative 2 (from Duke Medical Center to Downtown Raleigh) was average in terms of socio-economic and strong in land-use factors, but not strong in terms of mobility and costs. Cost-effectiveness would improve if costs could be reduced. The ridership may have been low in part because the ridership model assumed light rail-type service rather than commuter rail-type service, which may be more appropriate for this corridor. For this initial study, costs assumed light rail transit, which is significantly more expensive than commuter rail, which uses primarily existing infrastructure. If connecting the region is a high priority over maximizing the potential for federal funds, then consideration should be given to this alternative. However, if federal funds are achieved with the other, better performing corridors as noted above, then full build out towards Wake Forest and Chapel Hill will occur sooner. If these corridors fail to be competitive for federal funds, then the decision can be revisited on which corridor to advance into preliminary engineering. The opportunity for Federal funding will become evident relatively soon after the New Starts submittal in the fall of 2011.

Table ES.2 Evaluation Criteria Summary (Durham-Orange Counties)

Study Corridor	Corridor Length (mi) / Total Cost M$ (2010)	Mobility		Socioeconomic				Land Use		Financial			
		Total In Corridor Trips per Mile (2035)	Rail Trips/Mile (2035)	Population Density (2035)	Employment Density (2035)	Low Income Population Density (2000)	Minority Population Density (2000)	Supports Transit Oriented Development, Zoning by Right	Relative Future Density / Growth Factor	Capital Cost (2010)	Capital Cost per Mile (2010 Dollars, 2035 Ridership)	Capital Cost per Weekday Transit Trip (2010 Dollars, 2035 Ridership)	Operating & Maintenance Cost/ Weekday Transit Trip (2010 Dollars, 2035 Ridership)
Durham-Orange Alternative 1 (UNC Hospitals to Wake Forest)	59/$3,500	◒	◒	○	○	◒	◒	◒	○	○	●	●	●
Durham-Orange Alternative 2 (Duke Medical to Downtown Raleigh)	29/$1,700	◒	○	◒	◒	◒	◒	◒	◒	◒	●	◒	◒
Durham-Orange Alternative 3 (UNC Hospitals to Triangle Metro Center)	26/$1,600	○	◒	○	○	●	●	●	○	◒	◒	◒	◒
Durham-Orange Alternative 4 (UNC Hospitals to Alston Ave)	17/$1,200	○	●	○	◒	●	●	●	◒	◒	○	●	●
Durham-Orange Alternative 5 (UNC Hospitals to Gateway)	7/$470	○	●	○	○	◒	○	◒	○	●	◒	●	◒
Durham-Orange Alternative 6 (Gateway to Alston Ave)	10/$750	●	◒	◒	●	●	●	◒	●	●	○	○	○
Summary of Evaluation Criteria and Rankings													
High Performer = ●		>22,060 Trips/Mile	>363.5 Trips/Mile	> 3.9 Households/Acre	>13.3 Jobs/Acre	>0.61 Persons/Acre	>1.61 Persons/Acre	Considers the # of stations and allowable densities within jurisdiction	>0.9	<1052	<$62.0 M/Mile	<$56.9/Trip	<$9.9/Trip
Average Performer = ◒		18,452 - 22,060 Trips/Mile	311.3-363.5 Trips/Mile	2.9 - 3.9 Households/Acre	10.3 - 13.3 Jobs/Acre	0.38 - 0.61 Persons/Acre	1.04 - 1.61 Persons/Acre		>0.5-0.89	1052-1925	$62.0 - $66.3 M/Mile	$56.9-66.4/Trip	$9.9-12.1/Trip
Low Performer = ○		<18,452 Trips/Mile	<311.3 Trips/Mile	<2.9 Households/Acre	<10.3 Jobs/Acre	<0.38 Persons/Acre	<1.04 Persons/Acre		<0.50	>1925	>$66.3 M/Mile	>$66.4/Trip	>$12.1/Trip

Note: The breakpoints for the bins are ±0.5 standard deviations from the mean. Data results are given in greater detail in Chapter 6.

Regional Corridor

The current LRTP prepared by both the CAMPO and the DCHC-MPO includes a regional rail system that is comprised of both light rail transit (LRT) and commuter rail service, with the majority of the system being LRT, to be implemented in stages. This systems plan includes the provision of LRT service between Raleigh and Durham and between Durham and Chapel Hill. There is an overlap in the LRT plans and the commuter rail plans from downtown Raleigh to the Northeast Regional Center (in the location of Capital Boulevard and I-540). The purpose of the Transitional Analysis is to select which segments or corridors of the LRT system should be implemented first with the full system to be constructed in future phases. It is not practical or financially feasible to construct the entire LRT system as a single project and only the most effective segments or corridors should be initiated first, particularly if funding is to be requested from the Federal Transit Administration (FTA) under the New Starts program.

The Transitional Analysis examined a total of 16 corridors, including those that connected the two MPO regions and those that were entirely within either the CAMPO region or the DCHC-MPO region. The corridor alternatives were evaluated in the context of all day, frequent service that is typical of a LRT system. By contrast, a commuter rail system provides service only during the AM and PM peak period trips using a lower frequency of service (typically every 30-60 minutes). While LRT must operate on exclusive tracks, commuter rail can, and typically does, operate on tracks shared with freight and other intercity passenger rail service. In the Triangle Region, the term “express rail” has been identified to include the combination of existing AMTRAK passenger rail, existing and expanded NCDOT passenger rail service between Raleigh and Charlotte, and the additional commuter rail service during the peak periods.

The initial findings of the Transitional Analysis indicate that the corridor alternatives that operate in Wake County from Cary through downtown Raleigh and to the Northeast Regional Center (NERC) perform the best in terms of ridership, riders per mile, and cost per rider. This set of corridor alternatives is followed in performance by those that operate from UNC Hospitals to downtown Durham. The corridor alternative that connects Durham to Raleigh, passing through the Research Triangle Park, performed below both of the previous sets of alternatives. While the provision of LRT service between Durham and Raleigh is not the most cost-effective alternative for initial implementation, the early connection of these two major areas in the region can be provided by commuter rail or express rail service that can be implemented with lower costs than either of the LRT projects. Future extensions of the LRT systems in Wake and Durham counties would connect the two areas with LRT as identified in the LRTP. The major investments in commuter rail would not be wasted because the tracks could continue to be used by other freight and intercity passenger rail service (including the potential High Speed Rail service) and the vehicles could be moved to extensions of the commuter rail service to the areas on the edges of the region serving the downtowns of Raleigh and Durham.

For these reasons, an additional special Alternatives Analysis study will be prepared that evaluates commuter rail service versus LRT. The LRT service would connect the ends of the two initial LRT systems in Wake and Durham counties versus commuter rail service that extends from downtown Durham to east of Clayton using the existing NCRR alignment. This will allow informed decisions to be made on whether early implementation of commuter rail service is worth the investment. If requested, we could also compare LRT service from Durham to Raleigh against commuter rail service from Durham to Raleigh with the assumption that the Wake County and Durham County LRT systems are not implemented.

Other Considerations

With the analysis of corridor performance, rail transit extensions to the Research Triangle Park, Wake Forest, Apex, and points beyond would not be carried forward for further consideration in the more detailed Alternatives Analysis studies. This does not, however, mean that service to these areas would be eliminated; it simply recognizes that they will be studied in greater detail at a later time. These extensions are truly noteworthy as the system expands, but the purpose of this first set of Alternative Analysis studies is to focus on the most effective corridors for initial transit investment and implementation. This is the formula other cities have used to develop and implement system-wide extensions.

Therefore, for those areas of the region that are not directly considered for initial detailed study in the Alternatives Analysis, additional studies have either been conducted or are recommended as follows:

- Extension of LRT to Garner: Technical memorandum detailing the future extension of the rail transit service from Raleigh to Garner.

- Extensions of commuter rail to Wake Forest and Apex: Technical memoranda analyzing implementation of commuter rail service to Wake Forest and Apex. (This has been suggested by CAMPO as a viable alternative). Considerations could include the following: termini, freight track alignments, operations, and cost.

- Extension of commuter rail service to Hillsborough and Zebulon: There have been requests to include extensions to both Hillsborough and to Zebulon in the study. The purpose of the Transitional Analysis is to determine the priority corridors for early implementation, but not preclude future extensions. White papers further discussing these two extensions are included as Appendix A and B.

- Extension to Carrboro: Project stakeholders from the municipality of Carrboro, Orange County and the DCHC-MPO, as well as citizens from Carrboro have indicated an interest in studying a rail transit connection to Carrboro. Per stakeholder comments, a draft white paper technical study providing an overview of the strategic issues that need addressing to extend rail transit to Carrboro was prepared and is presented in Appendix C.

When completed, the memoranda will be included as Appendices to this Transitional Analysis before it is finalized. These memoranda, along with the results of the Alternatives Analysis process can be used by both the CAMPO and the DCHC-MPO as input to the updates of their respective long range transportation plans.

NEXT STEPS

On September 29, 2010 there will be a special joint meeting of the Durham-Chapel Hill-Carrboro MPO and the Capital Area MPO to review and comment on the corridors for study in the Alternatives Analysis.

CHAPTER 1 INTRODUCTION

Triangle Transit has commissioned a major study to initiate fixed-guideway transit service within Wake, Durham, and Orange counties. The Triangle Regional Transit Program (TRTP) is a collaborative framework for developing an efficient and sustainable regional transportation system that addresses the Triangle's critical need for improved connectivity and mobility choices while promoting its economic prosperity, job growth, and an enhanced quality of life. While previous transportation plans for the region have recommended the introduction of fixed-guideway transit, this study is significant due to the passage of HB 148 by the North Carolina General Assembly, which authorizes Durham, Orange, and Wake counties to hold referendums that, if passed, would allow each county to levy a ½ percent sales tax increase to fund improvements in public transportation.

1.1 STUDY PROCESS

The studies being conducted over the next year will recommend which transit corridors should initially be built. Planning work being undertaken includes two phases:

Phase 1: A system-level Transitional Analysis, which is the subject of this report, will define and prioritize up to three transit corridors from the adopted 2035 Joint Long Range Transportation Plan (LRTP) to be studied in further detail in the Phase 2 Alternatives Analysis process. Given the geography of the region, including three counties and two Metropolitan Planning Organizations (MPOs), it is anticipated that one corridor within each of the MPO areas will be carried forward into the Alternatives Analysis process. A third commuter rail corridor spanning the region is possible as an early implementation project, with potential collaboration with the North Carolina Railroad and NCDOT.

Phase 2: Triangle Transit will conduct Alternatives Analysis studies for up to three priority corridors to evaluate and screen alternative alignments, modes and station locations within each corridor. The Alternatives Analysis process will conclude with the selection and MPO adoption of a Locally Preferred Alternative for each of the priority corridors. The Alternatives Analysis process is a requirement of the Federal Transit Administration (FTA) for a fixed-guideway project to be eligible for federal funds.

It is unlikely that all fixed-guideway transit corridors in the LRTP can be implemented in the near-term, even with a sales tax increase. It is expected that corridors not included in the Phase 2 Alternatives Analysis studies would be implemented in later phases. Fixed-guideway transit projects would also be complemented by improvements and expansion to regional and local bus services so that all communities in the region have improved transit access. Improvements to bus service could begin soon after the referendum if voters approve a ½ percent sales tax increase.

1.2 PUBLIC AND STAKEHOLDER INVOLVEMENT

Triangle Transit has developed a comprehensive Public Involvement Plan (PIP) for the project development process. The PIP details how the public and stakeholders will be involved in project development, including:

- **Public Workshops -** Three series of public workshops are planned throughout the project's duration in localities throughout the region (six workshops will be held in each of the workshop series). The first set of workshops was held at the end of June and beginning of July 2010, the second was in September 2010, and the third set of workshops is planned for February 2011.

- **Technical and Steering Committees –** A Public Involvement Steering Committee comprised of representatives from the MPOs, Durham, Orange, and Wake counties, and the municipalities of Raleigh, Durham, Chapel Hill, and Cary was formed to guide the public involvement process. The Steering Committee also includes representatives from RDU International Airport, Research Triangle Foundation (RTP), transit agencies, and transit supportive interest groups. Three technical committees, Durham-Orange, Wake, and Raleigh Wye, were formed to inform and receive input on design issues in the respective areas of interest. The technical committees are comprised of representatives from MPOs, the NC Department of Transportation, county and municipal agencies, and universities.

- **MPO Coordination -** The Technical Advisory Committees (TAC) and the Technical Coordinating Committees (TCC) of each of the two MPOs are functioning as the technical and policy committees for the project. These committees will be consulted on a regular basis to provide feedback and input on project development.

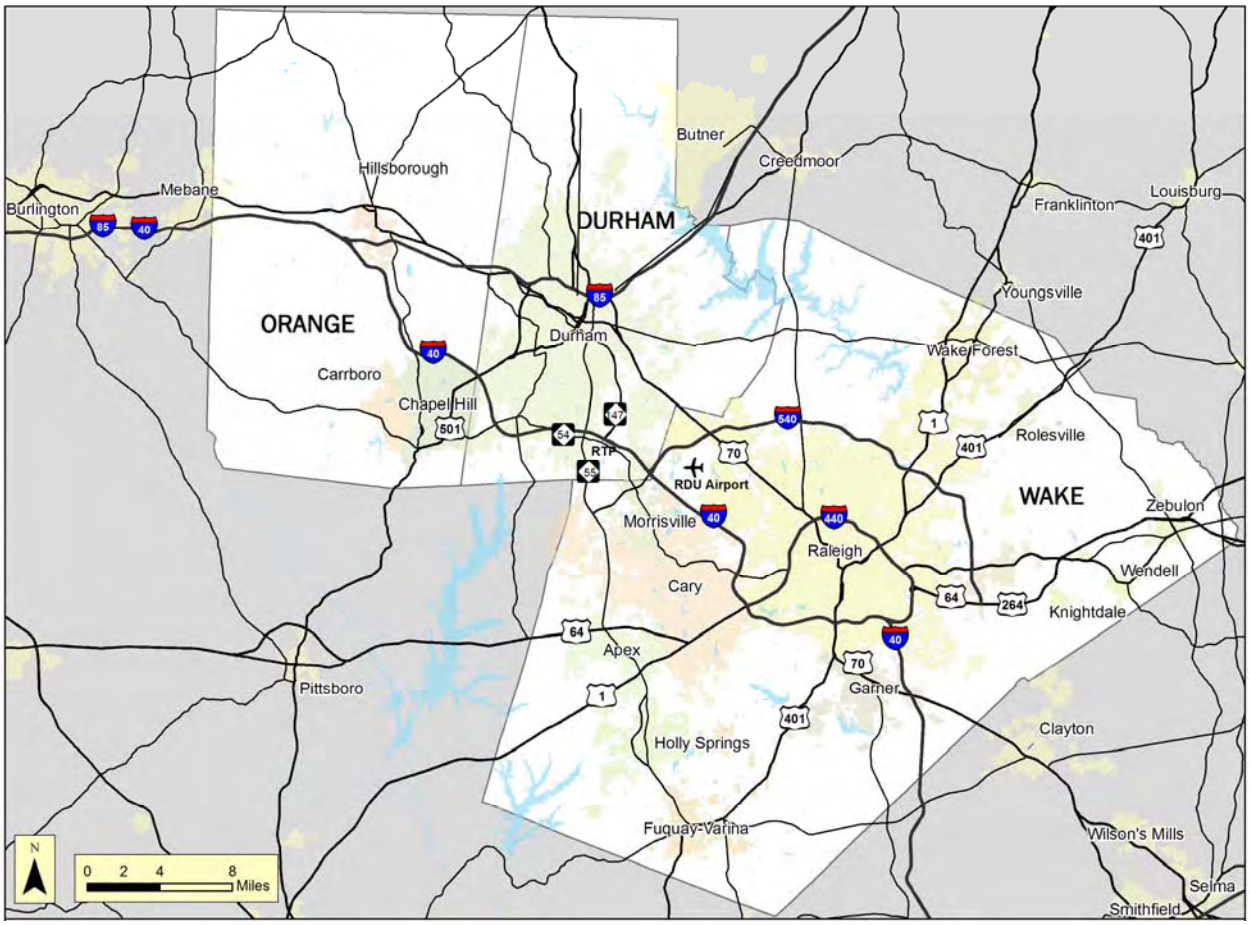
- **Elected Officials Coordination -** A group comprised of the mayors of the region's four largest cities, County Commissioners of the region's three counties, representatives of the region's two MPOs, and the chair of the Triangle Transit Board of Trustees meet on a regular basis to consult, collect information, provide feedback, and input on project development.

- **Other Outreach -** The public will have many ways to gather information and provide input on the project outside of the public workshops, including through the project website (www.ourtransitfuture.com), a call-in number (800-816-7817), an e-mail inbox dedicated to the project (info@ourtransitfuture.com), and a mailing address (PO Box 530, Morrisville, NC 27560).

1.3 BACKGROUND

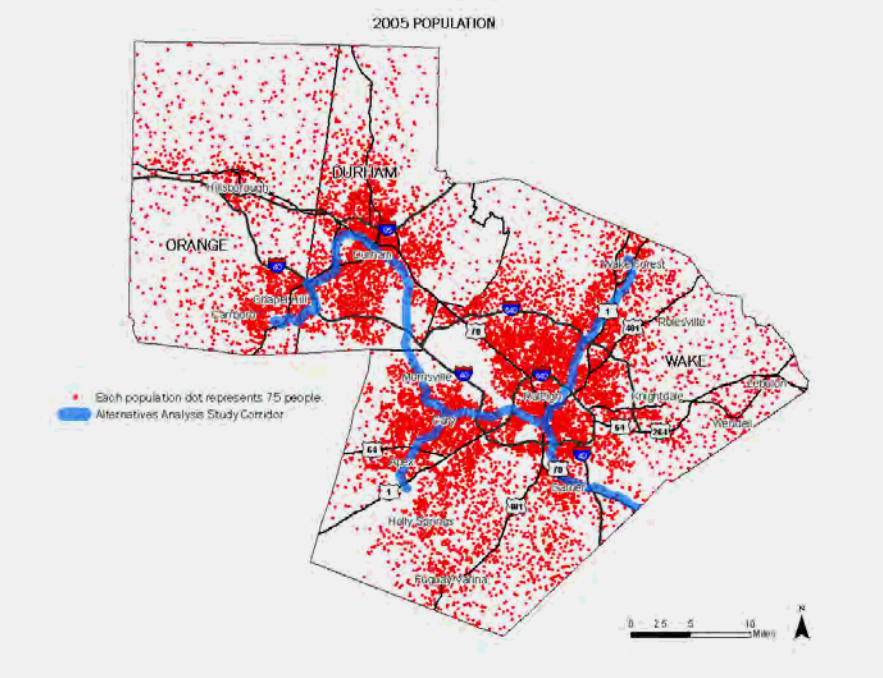
The Triangle Region is unique and complex, with a polycentric urban pattern that includes several sizeable downtowns, four major universities, three major medical centers, and many satellite communities, with travel and economic patterns that link them to the region's core counties of Durham, Orange and Wake (see Figure 1.1). Raleigh-Durham International Airport (RDU) and the Research Triangle Park (RTP) draw traffic to the center of the region.

Figure 1.1 The Triangle Region



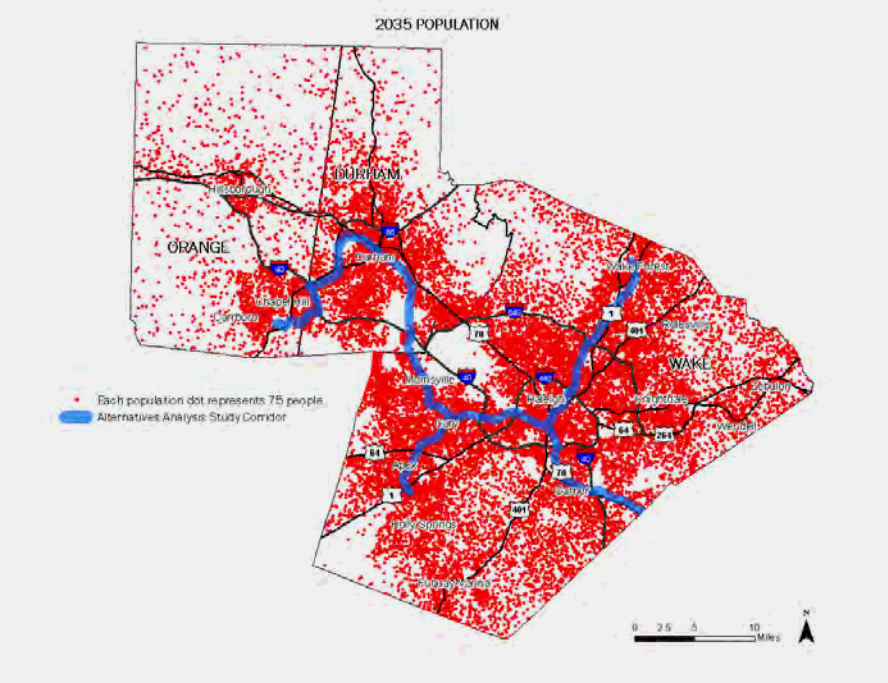
The Triangle Region has experienced tremendous growth over the last few decades. The region is now home to 1.5 million people, and the population is expected to increase to 2.5 million people by 2035, as illustrated in Figures 1.2 and 1.3. While this growth has yielded many benefits to residents and visitors, it has also strained the region's transportation system. High levels of congestion are now common-place and are anticipated to worsen with time. Significantly increasing highway capacity, in order to accommodate the surge in travel demand, is not sustainable and is no longer an option for environmental, financial, and community reasons. Many elected officials and the general public have come to recognize that a multi-modal transportation system, including improved transit service, is needed if the Triangle is to continue to attract quality jobs and maintain the high quality of life it now enjoys.

Figure 1.2 Triangle Region 2005 Population



Source: Triangle Region Travel Demand Model

Figure 1.3 Triangle Region Projected Population (2035)



Source: Triangle Region Travel Demand Model

CHAPTER 2 RELATIONSHIP TO PREVIOUS PLANS AND INITIATIVES

Planning for fixed-guideway transit in the Triangle Region began twenty years ago and a number of transit studies have been conducted to advance major transit investments in the area. The Phase 1 Transitional Analysis and Phase 2 Alternatives Analysis studies build on these previous plans and initiatives, as described below.

2.1 REGIONAL RAIL PROJECT

The most advanced planning to date was the Regional Rail Project. In 1998, the FTA authorized Preliminary Engineering (PE) and preparation of an Environmental Impact Statement (EIS) for the Regional Rail Project.

The Regional Rail Project planned for the Triangle Region included 35 miles of separate double track and 16 stations, extending from Duke Medical Center through Durham, Morrisville, Cary, Raleigh and terminating at Spring Forest Road in north Raleigh. The proposed vehicle was an FRA compliant Diesel Multiple Unit (DMU) technology operating in existing freight corridors [North Carolina Railroad (NCRR) and CSX]. The Final EIS and Preliminary Engineering were concluded in 2003, with the FTA issuing the environmental Record of Decision (ROD), and subsequently authorizing Triangle Transit to enter the Final Design phase in February 2003.

Midway through the Final Design phase, construction cost estimates dramatically increased and ridership modeling did not reach a level of maturity that would meet the FTA criteria for funding. As a result, the project was scaled back to a 28 mile, 12 station alignment in an attempt to maintain the desired cost-effectiveness for the project. The revised alignment did not include the segment between Duke Medical Center and 9th Street in Durham and the segment north of the Government Center in downtown Raleigh. After numerous attempts to right-size the project, it became apparent that the project would not qualify for a federal Full Funding Grant Agreement (FFGA), and there was not sufficient local funding available to support the project.

Based on the inability to meet FTA's revised project cost-effectiveness and issues with the overall financial plan, Triangle Transit withdrew the Regional Rail Project from the FTA New Starts program in August 2006.

2.2 REGIONAL TRANSIT VISION PLAN

In early 2007, in anticipation of the preparation of the Triangle Region's LRTP, a Special Transit Advisory Commission (STAC) was convened to make recommendations on the future of regional transit in the Triangle. This was a cooperative regional effort of a broad-based citizen group with representatives from throughout the region. In addition to providing the basis for the plan ultimately adopted by the region's two MPOs, the group also considered additional corridors within and beyond the Triangle (including extending service to Raleigh Durham International Airport, commuter rail to Hillsborough and farther west, Fayetteville to the south, and other locations). The conclusion was that these corridors are not immediate priorities for the region as they have poor ridership potential, are dependent on a core system, and are not affordable in the near term in absence of such a core system.

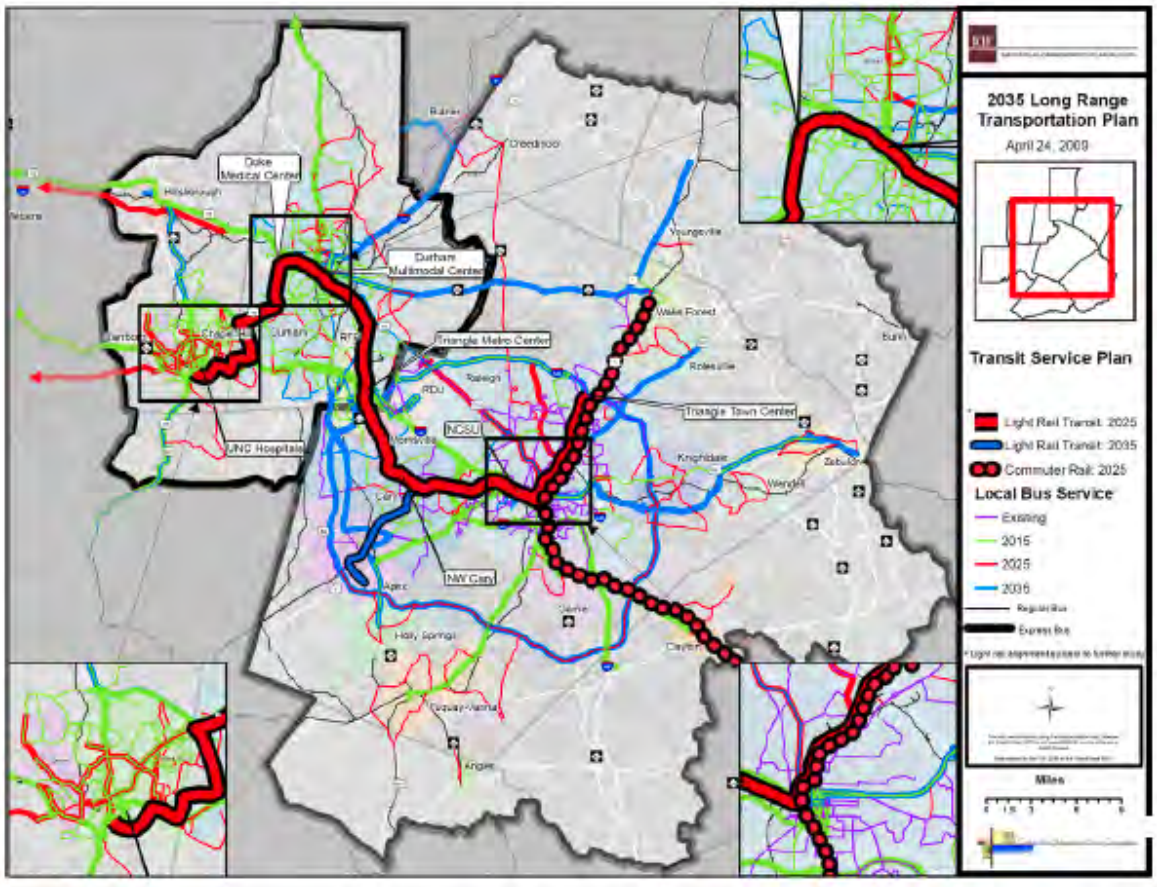
The STAC evaluated updated planning data in a series of 16 meetings over 13 months. Their recommendations to the MPOs included enhanced bus service, local circulators, and 53 miles of fixed-guideway projects. The STAC also recommended that the region pursue a ½ percent

sales tax local funding option in order to advance the implementation of these major transit capital investments. The STAC reported their findings in the Regional Transit Vision Plan, published in May 2008. This became the baseline for the transit element of the MPO's Joint 2035 LRTP.

2.3 JOINT LONG RANGE TRANSPORTATION PLAN

The current transit plan is one element of the LRTP prepared by the region's two MPOs. This joint LRTP was adopted by the Durham-Chapel Hill-Carrboro MPO, representing Durham and Orange counties, on May 13, 2009, and by the Capital Area MPO, representing Wake County, on May 20, 2009. The MPOs' plan has identified a phased implementation of the adopted plan through 2035, but this implementation is not based on detailed analysis or funding availability. Fixed-guideway and bus transit service from the 2035 LRTP is shown below in Figure 2.1.

Figure 2.1 2035 Joint LRTP Transit Service Plan



2.4 NC HOUSE BILL 148

In August of 2009, the NC Legislature passed House Bill 148 that established the Congestion Relief and Intermodal 21st Century Transportation Fund, enabling the five counties in North Carolina with the highest rate of population growth (including the Triangle) to hold referenda for a local ½ percent sales tax option to help fund local public transportation projects. Annual vehicle registrations may also be increased up to $10 to fund such projects without a referendum.

CHAPTER 3 TRANSITIONAL ANALYSIS PROCESS

The primary purpose of the Transitional Analysis is to define the corridor(s) for inclusion in the Alternatives Analysis studies. The starting point for defining corridors is the adopted LRTPs of the region's two MPOs. In this region, the two MPOs have adopted a joint LRTP, and the transit element of that LRTP is considered the system plan for transit in the region. The Transitional Analysis acts as the bridge between the system plan in the LRTP and the more focused and detailed study performed in an Alternatives Analysis.

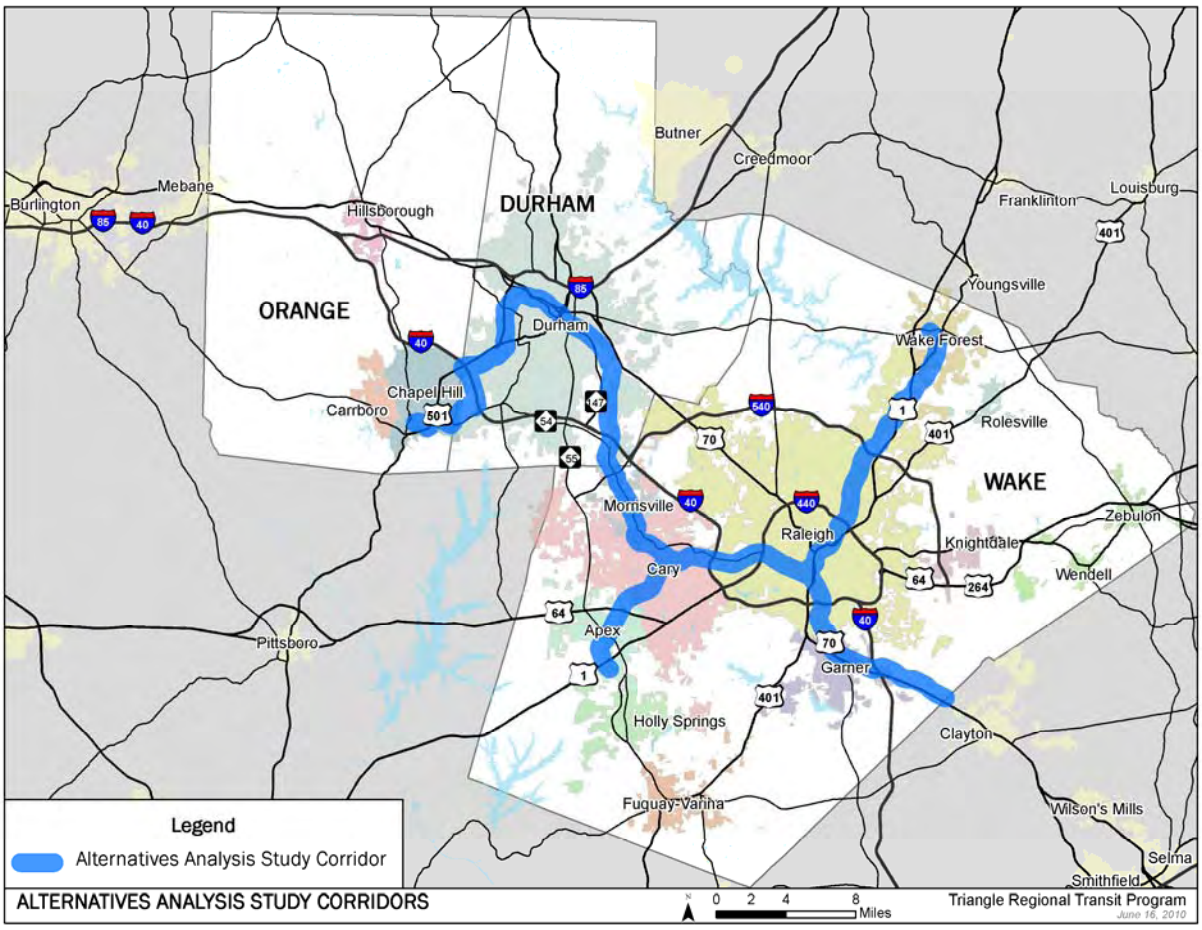
The current LRTP for each MPO contains a rail system plan (shown in Figure 2.1 with planned bus service) that extends from Wake Forest to downtown Raleigh, Cary, the RTP, downtown Durham, Duke Medical Center, Gateway East (Orange/Durham County line), Leigh Village, and the UNC Hospitals. Additional corridors extend from downtown Raleigh to Clayton and from Cary through Apex to the proposed Veridea development located south of US 1 and west of NC 55.

For the Transitional Analysis, the system plan has been broken down into a set of smaller corridors that have been evaluated in order to recommend a limited number of priority corridors to move forward into the Alternatives Analysis process. This Transitional Analysis applies a set of evaluation criteria and measures to each corridor for evaluation and prioritization of the corridors. For the purposes of this analysis, a corridor consists of a relatively wide band up to one mile wide with major activity centers identified. Examples of activity centers include the Northeast Regional Center (NERC), downtown Raleigh, NC State Fairgrounds, Cary, Research Triangle Park (RTP), downtown Durham, and Gateway East. In the detailed Alternatives Analysis, the exact number and locations of stations will be identified, as well as the exact alignment of the planned service, the termini, and the type of vehicles.

CHAPTER 4 CORRIDORS CONSIDERED

This section describes the eighteen corridors that were evaluated in this study. Using the 2035 Joint LRTP for both the Capital Area MPO and the Durham-Chapel Hill-Carrboro MPO (see Figure 4.1) as well as input from Triangle Transit, both MPO's, and other stakeholders, eighteen corridors were created for screening: twelve for Wake County, six for Durham and Orange counties, and 1 commuter rail-style corridor alternative for Durham and Wake counties. This corridor, which extends from the Johnston County line to the vicinity of Hillandale Road in Durham, is not evaluated in this Transitional Analysis. The entire corridor will be studied in a subsequent Alternative Analysis, comparing both light rail and commuter rail technologies. A region-wide corridor (Wake 1 and Durham-Orange 1) and a corridor from Duke Medical Center to Downtown Raleigh (Wake 12 and Durham-Orange 2) are included as both Wake Alternatives and Durham-Orange Alternatives for comparative analysis, though the corridors differ only by nomenclature. The study corridors were presented to CAMPO, DCHC-MPO and to elected officials. The identification of corridors was also widely communicated to various cities, towns, counties, and organizations. The Wake County Technical Committee, the Durham-Orange County Technical Committee, and the Public Involvement Steering Committee, which were established for this project, were also presented with the corridors. All known stakeholders attended one of these presentations. Comments received from stakeholders have been considered and incorporated into this Transitional Analysis.

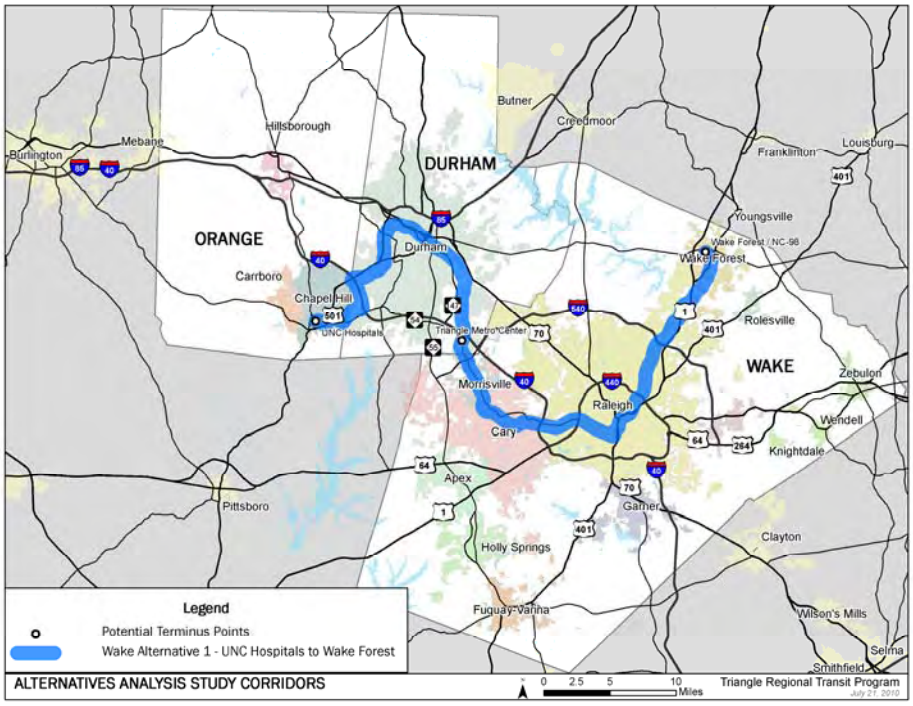
Figure 4.1 Transitional Analysis Study Corridors (Derived from 2035 LRTP)



4.1 WAKE CORRIDOR ALTERNATIVES

4.1.1 WAKE ALTERNATIVE 1 – UNC HOSPITALS TO WAKE FOREST

Figure 4.2 Wake Alternative 1 – UNC Hospitals to Wake Forest



This 59 mile corridor extends from UNC Hospitals in Chapel Hill north to Durham, then south through the Research Triangle Park to Morrisville, Cary, and Raleigh before turning north to Wake Forest. This corridor would serve the region's four largest cities, the Research Triangle Park, and the region's major research universities. This corridor assumes the construction of rail transit in Durham and Orange counties, from UNC Hospitals to the Triangle Metro Center (TMC), and is used as a baseline comparison to the other Wake alternatives.

<u>Activity Centers</u>

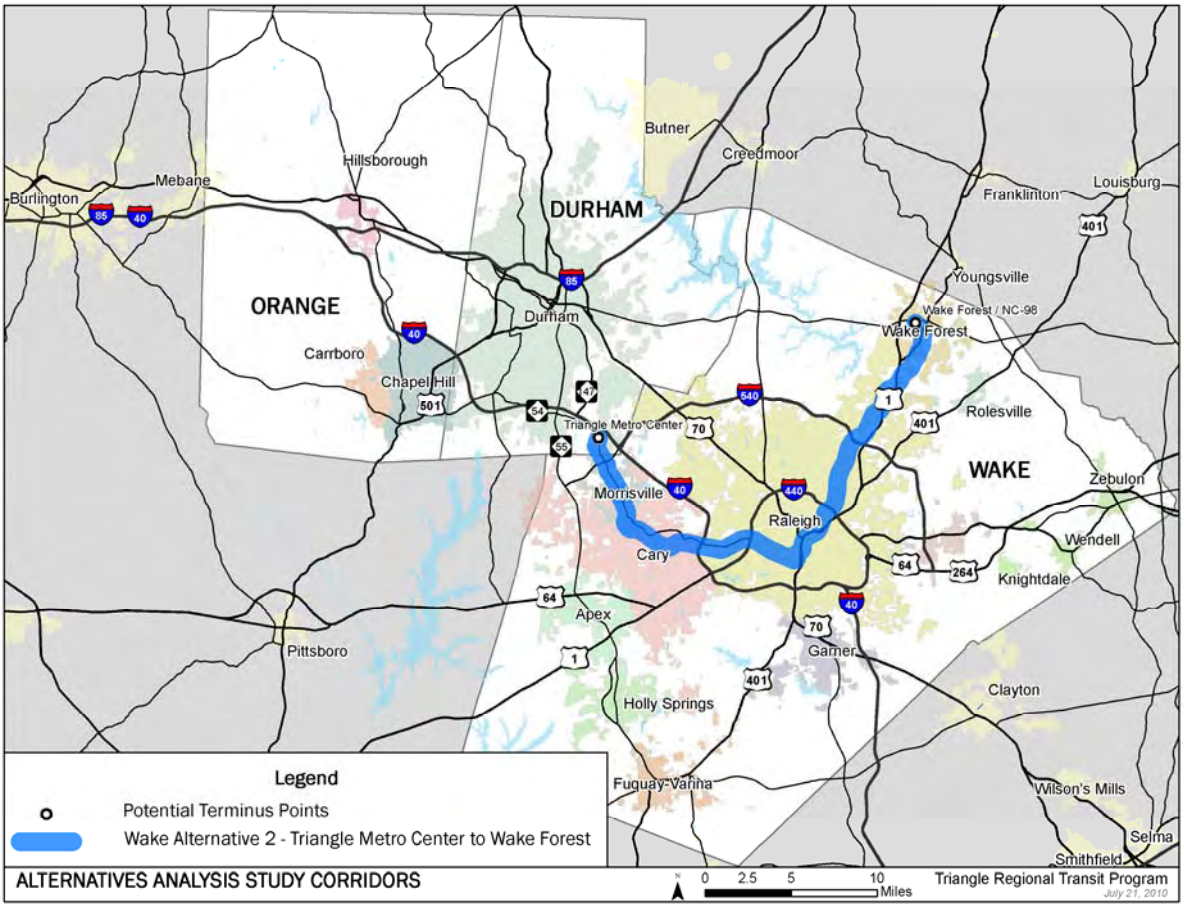
- Urban and Town Centers: Downtowns of Chapel Hill, Durham, Cary, Raleigh, and Wake Forest
- Colleges and Universities: UNC, Duke University, NC Central University, Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: UNC Hospitals, the NC 54 Corridor (including Glenn Lennox, East 54, UNC's Friday Center, Meadowmont, and Leigh Village), Development around I-40 and US 15-501 (including Gateway East, Patterson Place, and South Square), Duke Hospitals, Research Triangle Park, State Fairgrounds Complex, State Government Offices, and the Northeast Regional Center

<u>Bus Transit Integration</u>

- Corridor served by CAT, Wolfline, C-Tran, DATA, Chapel Hill Transit, and Triangle Transit

4.1.2 WAKE ALTERNATIVE 2 – TRIANGLE METRO CENTER TO WAKE FOREST

Figure 4.3 Wake Alternative 2 – Triangle Metro Center to Wake Forest



This 33 mile corridor extends from the Triangle Metro Center adjacent to I-40 and Miami Blvd south to Cary before heading east to downtown Raleigh, then turning north and traveling through North Raleigh to downtown Wake Forest. This corridor assumes a complete build-out of rail transit from the Research Triangle Park to Wake Forest. This alternative does not include or assume a rail connection to Durham.

<u>Activity Centers</u>

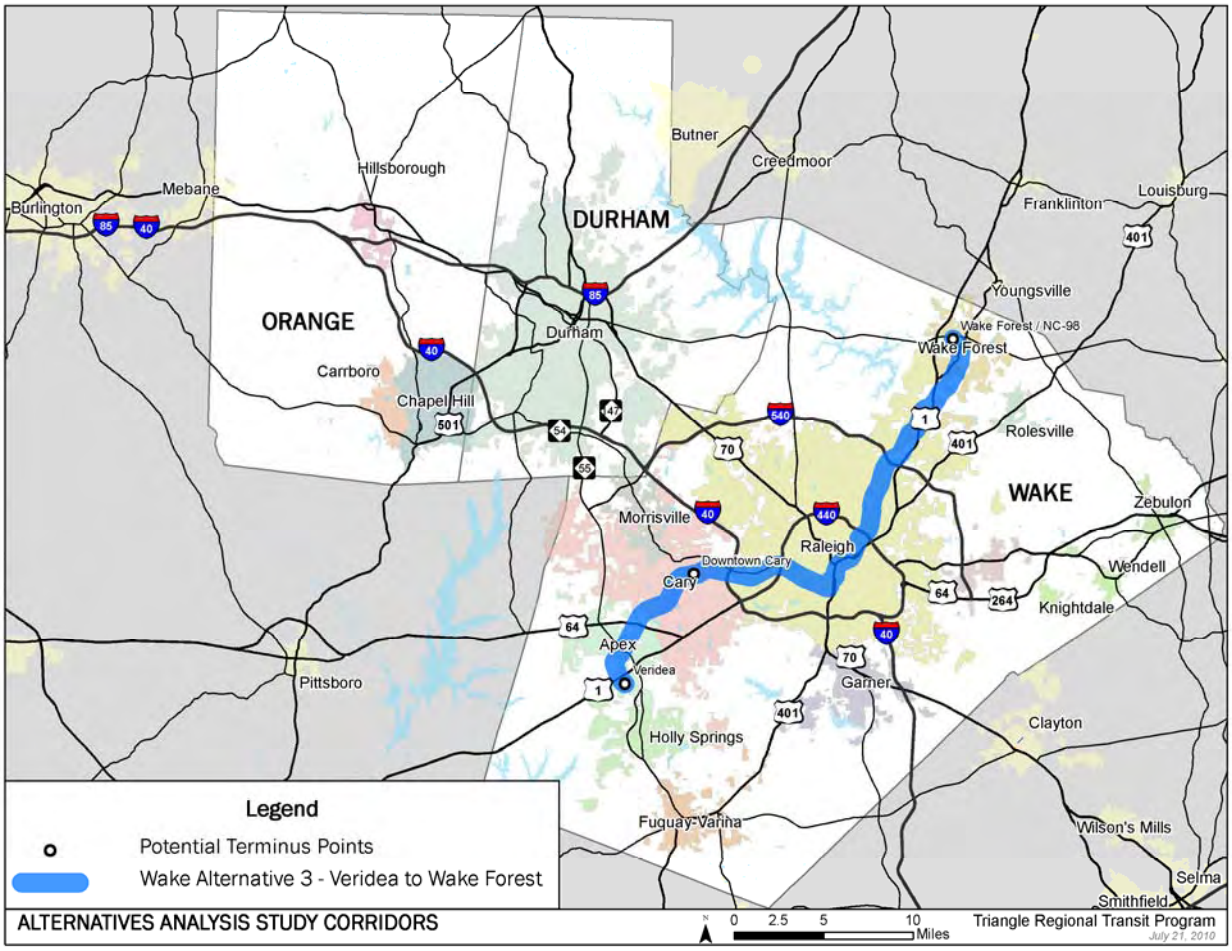
- Urban and Town Centers: Downtowns of Cary, Raleigh, and Wake Forest
- Colleges and Universities: Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: Research Triangle Park, State Fairgrounds Complex, State Government Offices, and the Northeast Regional Center

<u>Bus Transit Integration</u>

- Corridor served by CAT, Wolfline, C-Tran, and Triangle Transit

4.1.3 WAKE ALTERNATIVE 3 – VERIDEA TO WAKE FOREST

Figure 4.4 Wake Alternative 3 – Veridea to Wake Forest



This 33 mile corridor serves Apex, Cary, Raleigh, and Wake Forest. This corridor extends from Veridea (a proposed mixed-use development south of central Apex) to Apex, Cary, Raleigh, and Wake Forest.

Activity Centers

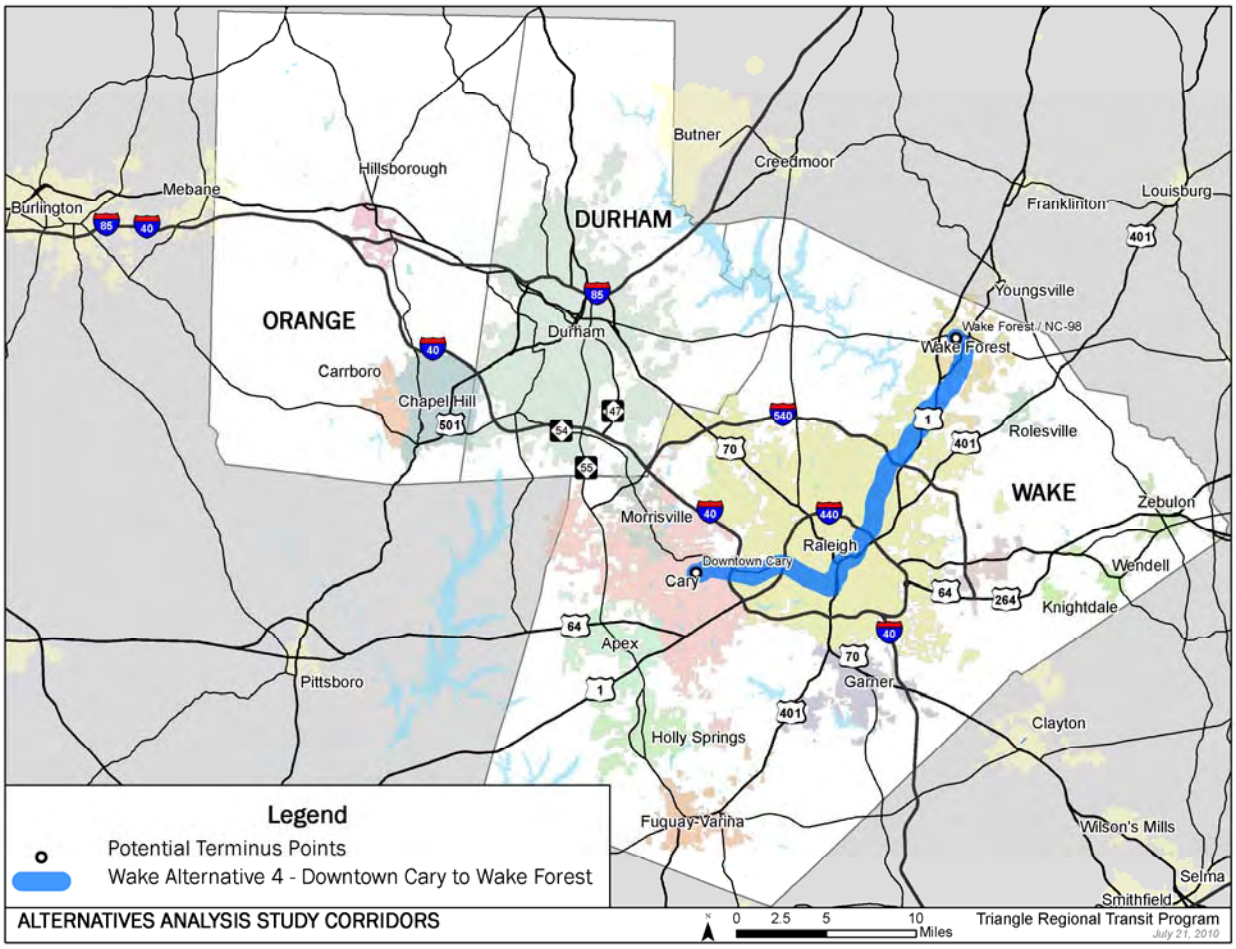
- Urban and Town Centers: Downtowns of Apex, Cary, Raleigh, and Wake Forest
- Colleges and Universities: Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: The State Fairgrounds Complex, State Government Offices, and the Northeast Regional Center

Bus Transit Integration

- Corridor served by CAT, Wolfline, C-Tran, and Triangle Transit

4.1.4 WAKE ALTERNATIVE 4 – DOWNTOWN CARY TO WAKE FOREST

Figure 4.5 Wake Alternative 4 – Downtown Cary to Wake Forest



This 25 mile corridor extends east from downtown Cary to downtown Raleigh before heading north through the Northeast Regional Center to Wake Forest.

Activity Centers

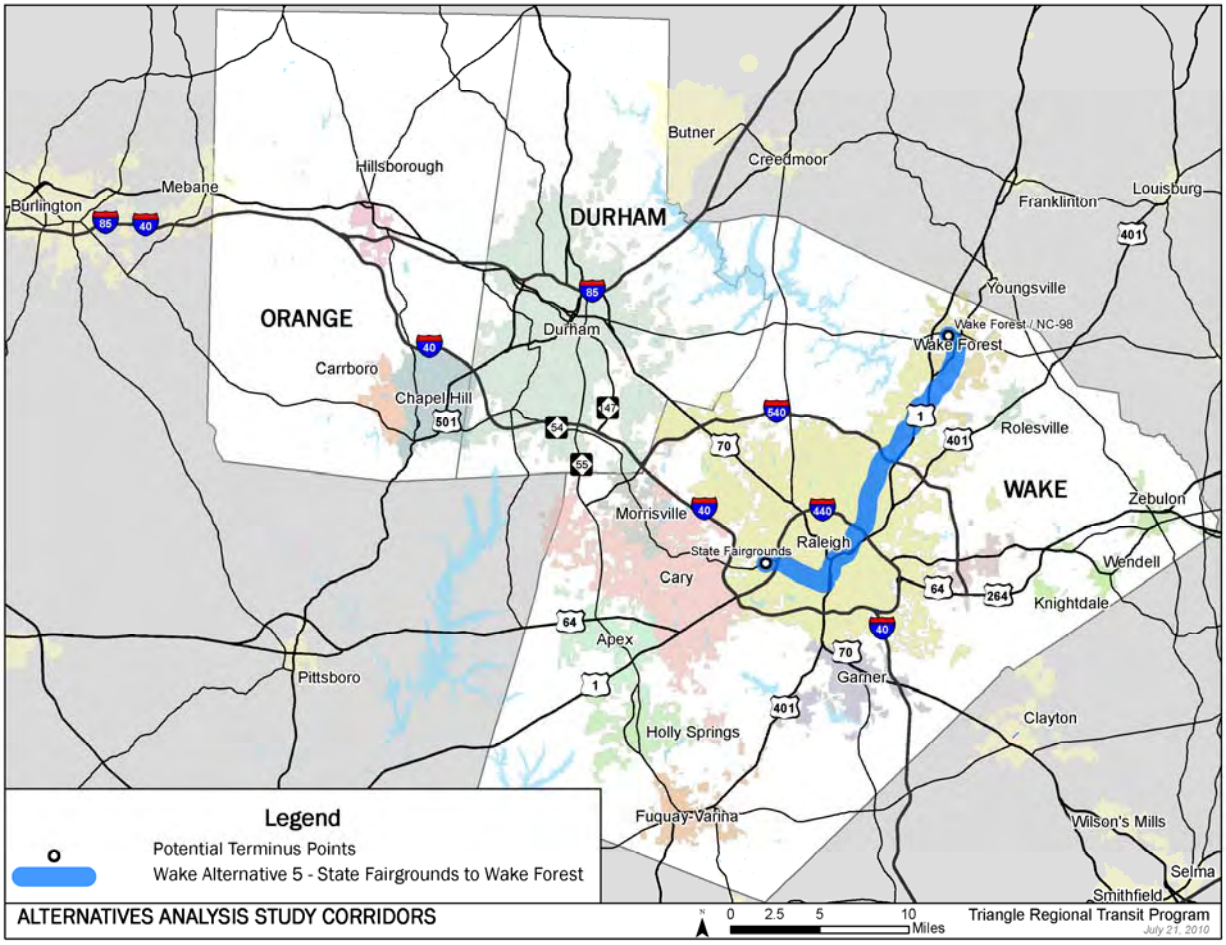
- Urban and Town Centers: Downtowns of Cary, Raleigh, and Wake Forest
- Colleges and Universities: Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: The State Fairgrounds Complex, State Government Offices, and the Northeast Regional Center

Bus Transit Integration

- Corridor served by CAT, Wolfline, C-Tran, and Triangle Transit

4.1.5 WAKE ALTERNATIVE 5 – STATE FAIRGROUNDS TO WAKE FOREST

Figure 4.6 Wake Alternative 5 – State Fairgrounds to Wake Forest



This 20 mile corridor extends from the State Fairgrounds in West Raleigh through downtown Raleigh, then north to Wake Forest.

Activity Centers

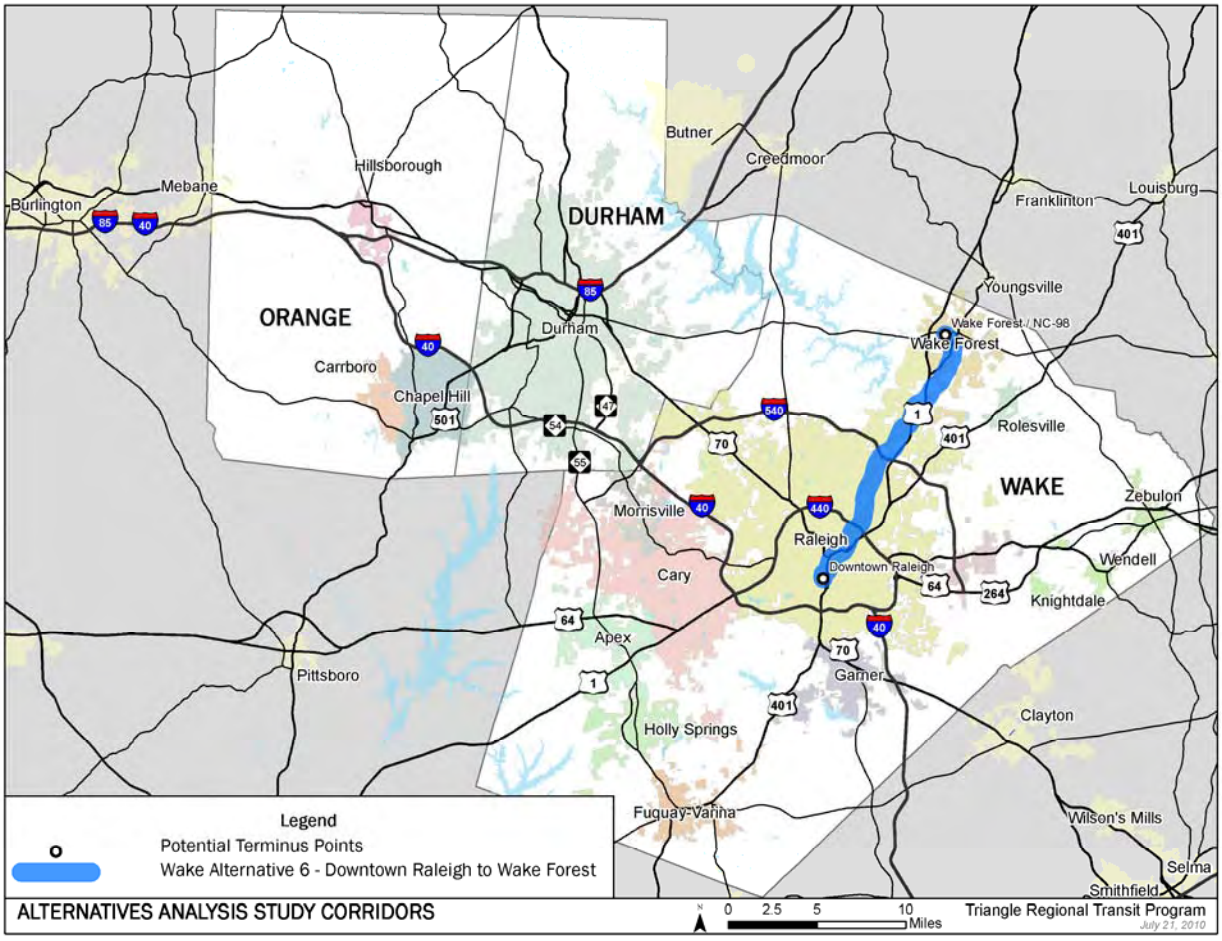
- Urban and Town Centers: Downtowns of Raleigh and Wake Forest
- Colleges and Universities: Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: The State Fairgrounds Complex, State Government Offices, and the Northeast Regional Center

Bus Transit Integration

- Corridor served by CAT, Wolfline, and Triangle Transit

4.1.6 WAKE ALTERNATIVE 6 – DOWNTOWN RALEIGH TO WAKE FOREST

Figure 4.7 Wake Alternative 6 – Downtown Raleigh to Wake Forest



This 17 mile Corridor extends from downtown Raleigh through the Northeast Regional Center (NERC), then North to Wake Forest.

Activity Centers

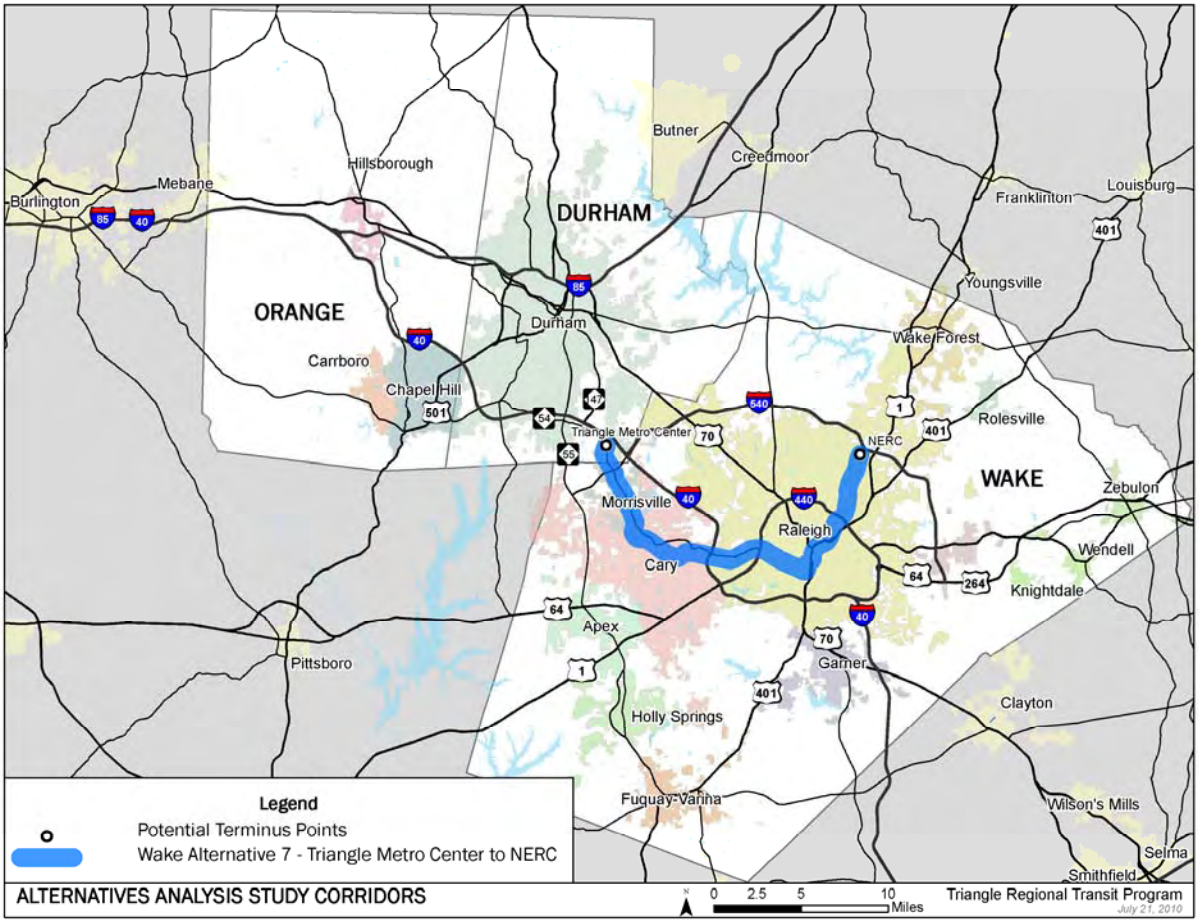
- Urban and Town Centers: Downtowns of Raleigh and Wake Forest
- Colleges and Universities: Shaw University and Peace College
- Suburban Employment Areas and Special Activity Centers: State Government Offices and the Northeast Regional Center

Bus Transit Integration

- Corridor served by CAT and Triangle Transit

4.1.7 WAKE ALTERNATIVE 7 – TRIANGLE METRO CENTER TO NORTHEAST REGIONAL CENTER (NERC)

Figure 4.8 Wake Alternative 7 – Triangle Metro Center to Northeast Regional Center (NERC)



This 24 mile corridor extends from the Triangle Metro Center in the Research Triangle Park (RTP), south through downtown Cary and downtown Raleigh, turning north to the Northeast Regional Center adjacent to I-540.

Activity Centers

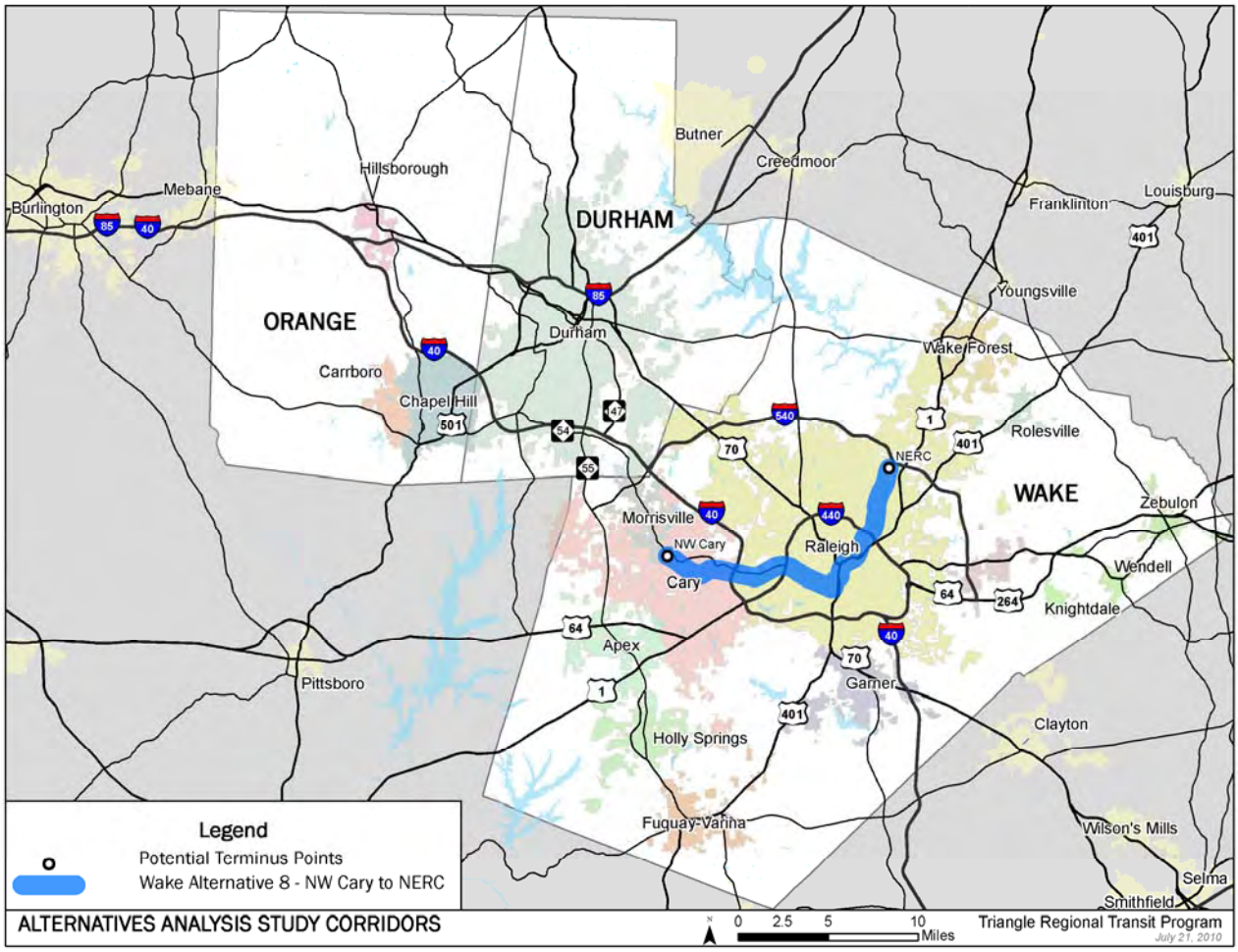
- Urban and Town Centers: Downtowns of Cary and Raleigh
- Colleges and Universities: Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: RTP, the State Fairgrounds Complex, State Government Offices, and the Northeast Regional Center.

Bus Transit Integration

- Corridor served by CAT, C-Tran, Wolfline, and Triangle Transit

4.1.8 WAKE ALTERNATIVE 8 – NORTHWEST CARY TO NORTHEAST REGIONAL CENTER (NERC)

Figure 4.9 Wake Alternative 8 – Northwest Cary to Northeast Regional Center (NERC)



This 18 mile corridor extends from Northwest Cary through downtown Cary and Raleigh to the Northeast Regional Center adjacent to I-540.

Activity Centers

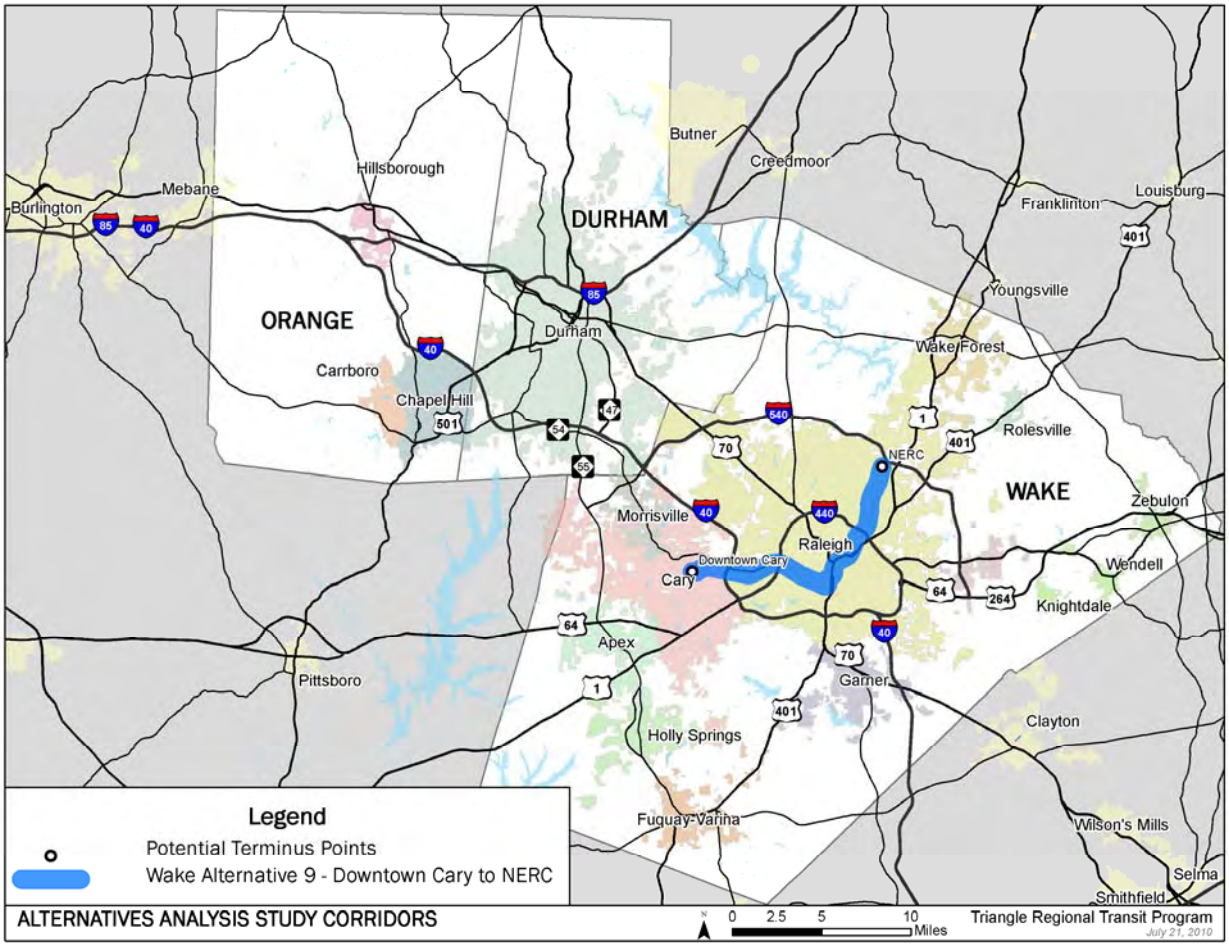
- Urban and Town Centers: Downtowns of Cary and Raleigh
- Colleges and Universities: Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: The State Fairgrounds Complex, State Government Offices, and the Northeast Regional Center

Bus Transit Integration

- Corridor served by CAT, Wolfline, C-Tran, and Triangle Transit

4.1.9 WAKE ALTERNATIVE 9 – DOWNTOWN CARY TO NORTHEAST REGIONAL CENTER (NERC)

Figure 4.10 Wake Alternative 9 – Downtown Cary to Northeast Regional Center (NERC)



This 16 mile corridor extends from downtown Cary to downtown Raleigh, then to the Northeast Regional Center adjacent to I-540.

Activity Centers

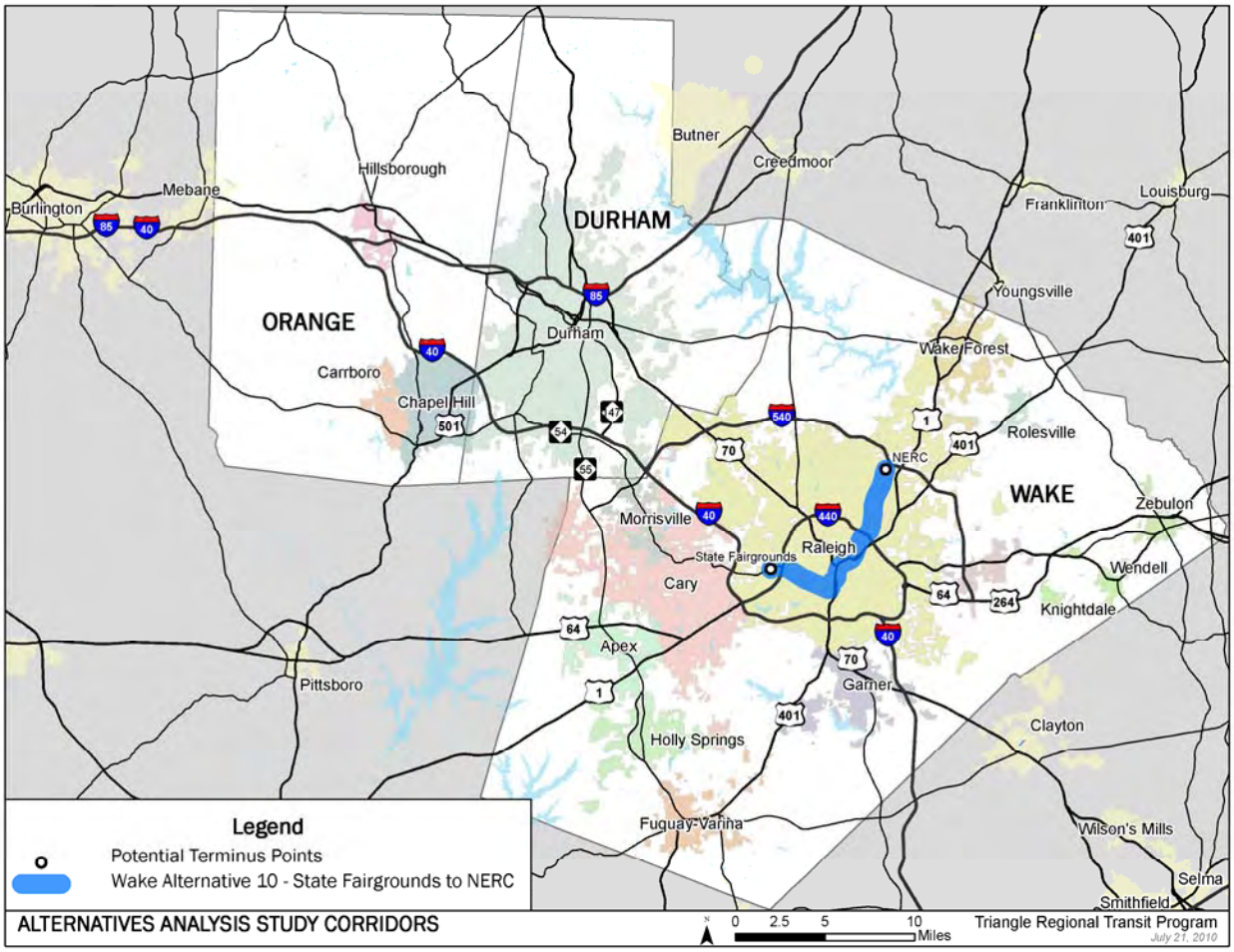
- Urban and Town Centers: Downtown Cary and Raleigh
- Colleges and Universities: Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: The State Fairgrounds Complex, State Government Offices, and the Northeast Regional Center

Bus Transit Integration

- Corridor served by CAT, Wolfline, C-Tran, and Triangle Transit

4.1.10 WAKE ALTERNATIVE 10 – STATE FAIRGROUNDS TO NORTHEAST REGIONAL CENTER (NERC)

Figure 4.11 Wake Alternative 10 – State Fairgrounds to Northeast Regional Center (NERC)



This 11 mile corridor extends from the State Fairgrounds through NC State University and downtown Raleigh before turning north to the Northeast Regional Center adjacent to I-540.

Activity Centers

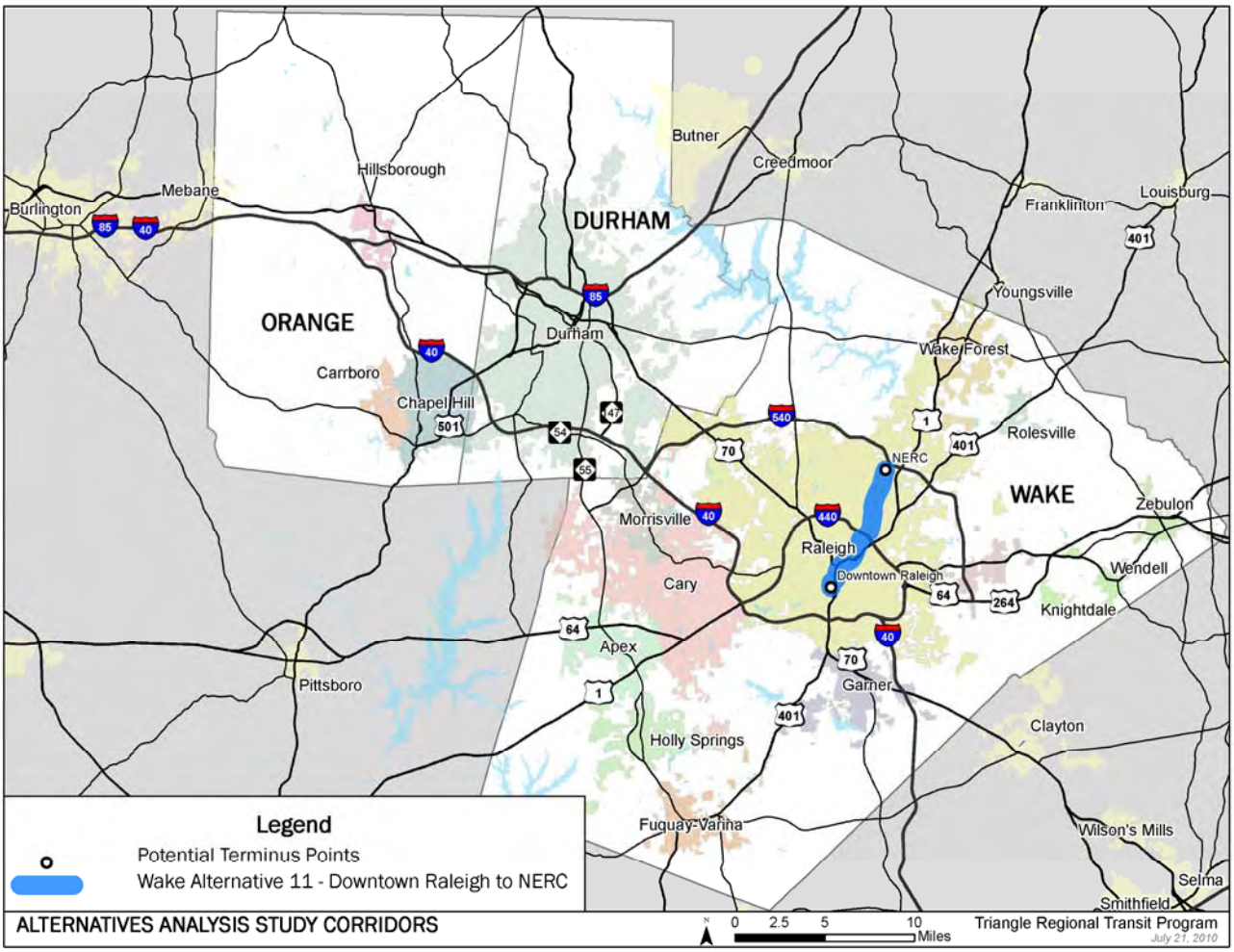
- Urban and Town Centers: Downtown Raleigh
- Colleges and Universities: Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: The State Fairgrounds Complex, State Government Offices, and the Northeast Regional Center

Bus Transit Integration

- Corridor served by CAT, Wolfline, and Triangle Transit

4.1.11 WAKE ALTERNATIVE 11 – DOWNTOWN RALEIGH TO NORTHEAST REGIONAL CENTER (NERC)

Figure 4.12 Wake Alternative 11 – Downtown Raleigh to Northeast Regional Center (NERC)



This 8 mile corridor extends from downtown Raleigh through North Raleigh to the Northeast Regional Center adjacent to I-540.

Activity Centers

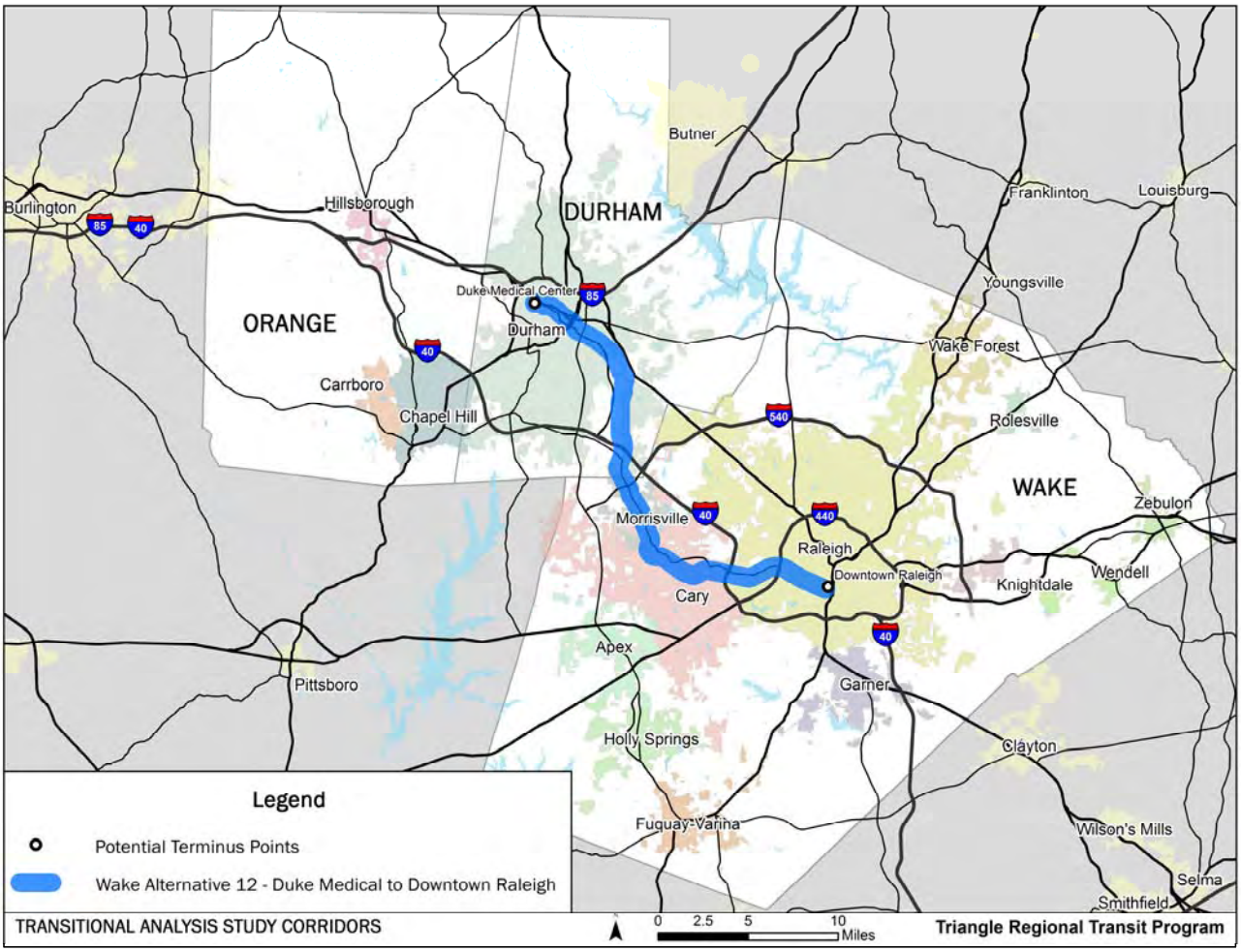
- Urban and Town Centers: Downtown Raleigh
- Colleges and Universities: Shaw University and Peace College
- Suburban Employment Areas and Special Activity Centers: State Government Offices and the Northeast Regional Center

Bus Transit Integration

- Corridor served by CAT and Triangle Transit

4.1.12 WAKE ALTERNATIVE 12 – DUKE MEDICAL TO DOWNTOWN RALEIGH

Figure 4.13 Wake Alternative 12 – Duke Medical to Downtown Raleigh



This 29 mile corridor extends from Duke Hospitals and Duke University through downtown Durham and south through the Research Triangle Park to downtown Cary before turning east to downtown Raleigh. This corridor assumes the construction of rail transit within Wake County from Raleigh to the Research Triangle Park.

Activity Centers

- Urban and Town Centers: Downtowns of Durham, Cary, and Raleigh
- Colleges and Universities: Duke University, NC Central University, Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: Duke Hospitals, Research Triangle Park, State Fairgrounds Complex, and State Government Offices

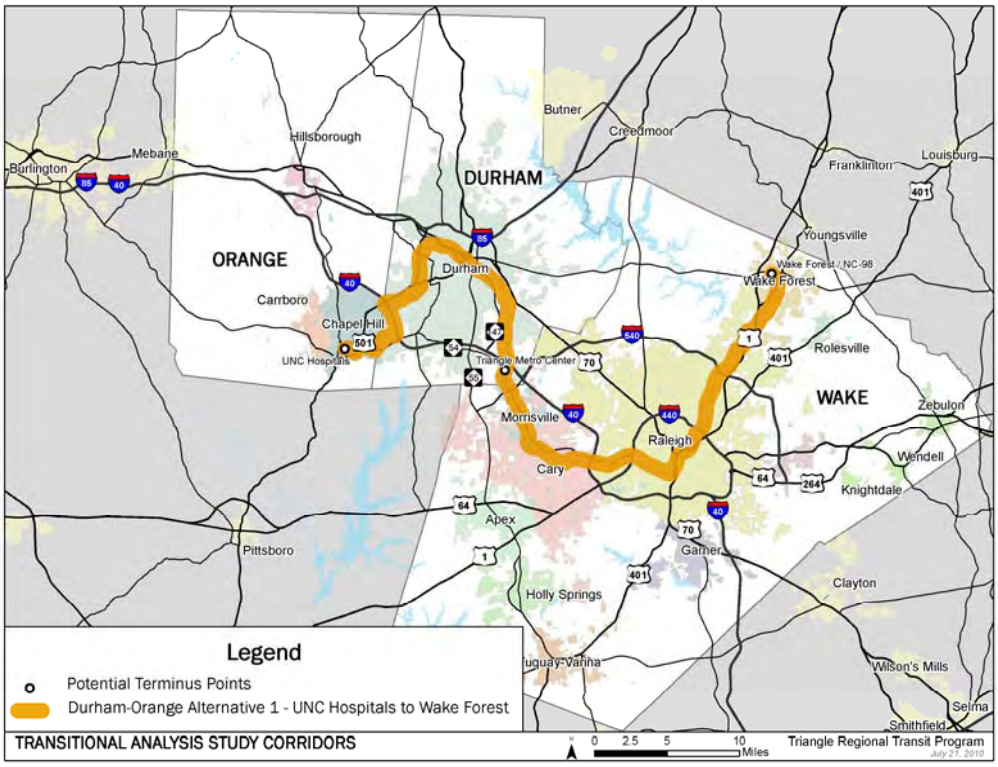
Bus Transit Integration

- Corridor is served by DATA, CAT, Wolfline, C-Tran, and Triangle Transit

4.2 DURHAM-ORANGE CORRIDOR ALTERNATIVES

4.2.1 DURHAM-ORANGE ALTERNATIVE 1 – UNC HOSPITALS TO WAKE FOREST

Figure 4.14 Durham-Orange Alternative 1 – UNC Hospitals to Wake Forest



This 59 mile corridor extends from UNC Hospitals in Chapel Hill north to Durham, then south through the Research Triangle Park, Morrisville, Cary, and Raleigh before turning north through Raleigh to Wake Forest. This corridor would serve the region's four largest cities, the Research Triangle Park, and the region's major research universities. This corridor assumes the construction of rail transit within Wake County from Wake Forest to the Triangle Metro Center and is used as a baseline comparison to the other Durham-Orange alternatives.

Activity Centers

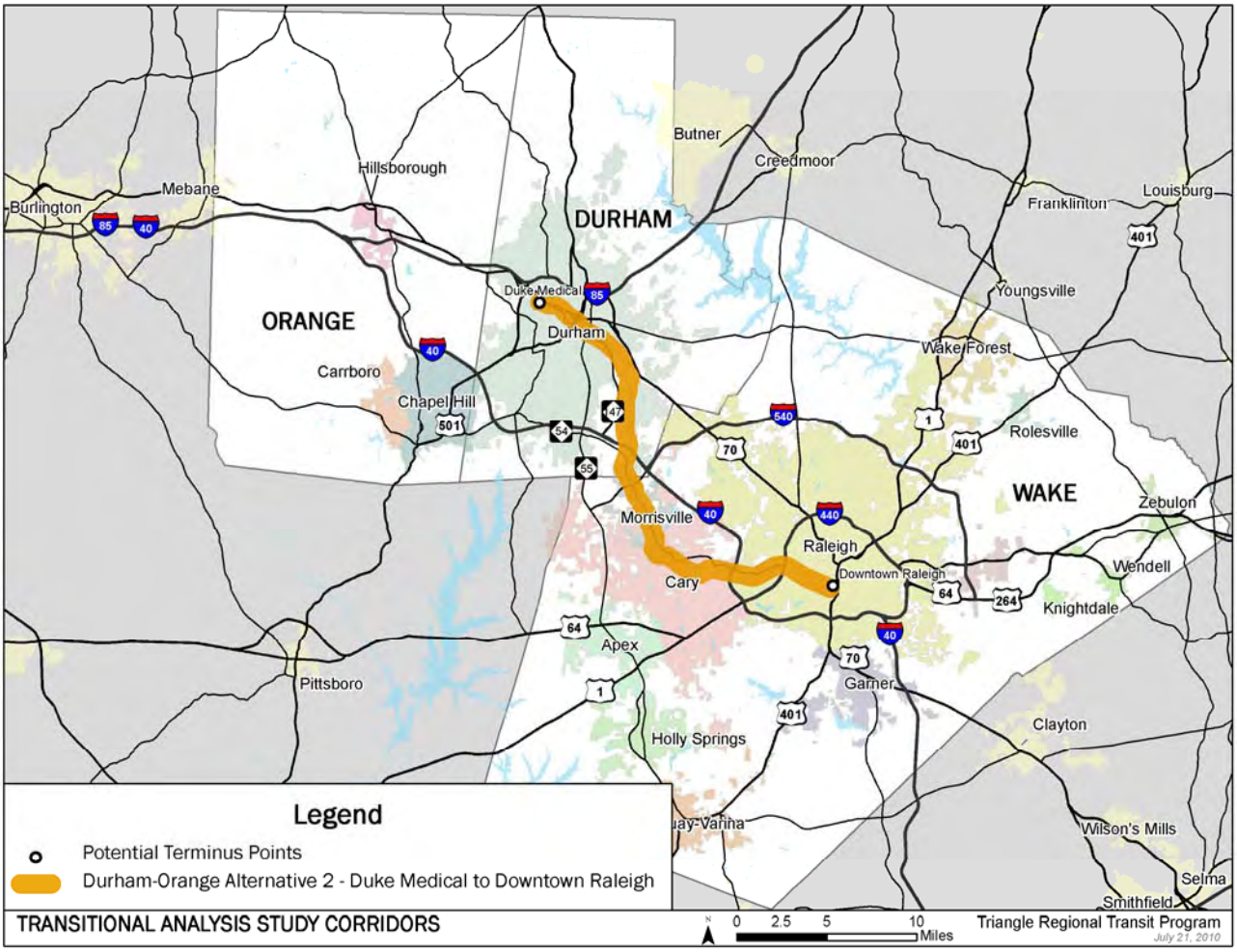
- Urban and Town Centers: Downtowns of Chapel Hill, Durham, Cary, Raleigh, and Wake Forest
- Colleges and Universities: UNC Chapel Hill, Duke University, NC Central University, Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: UNC Hospitals, the NC 54 Corridor (including Glenn Lennox, East 54, UNC's Friday Center, Meadowmont, and Leigh Village), Development around I-40 and US 15-501 (including Gateway East, Patterson Place, and South Square), Duke Hospitals, Research Triangle Park, State Fairgrounds Complex, State Government Offices, and the Northeast Regional Center

Bus Transit Integration

- Corridor served by Chapel Hill Transit, DATA, C-Tran, Wolfline, CAT, and Triangle Transit

4.2.2 DURHAM-ORANGE ALTERNATIVE 2 – DUKE MEDICAL TO DOWNTOWN RALEIGH

Figure 4.15 Durham-Orange Alternative 2 – Duke Medical to Downtown Raleigh



This 29 mile corridor extends from Duke Hospitals and Duke University through downtown Durham and south through the Research Triangle Park to downtown Cary before turning east to downtown Raleigh. This corridor assumes the construction of rail transit within Wake County from Raleigh to the Research Triangle Park.

Activity Centers

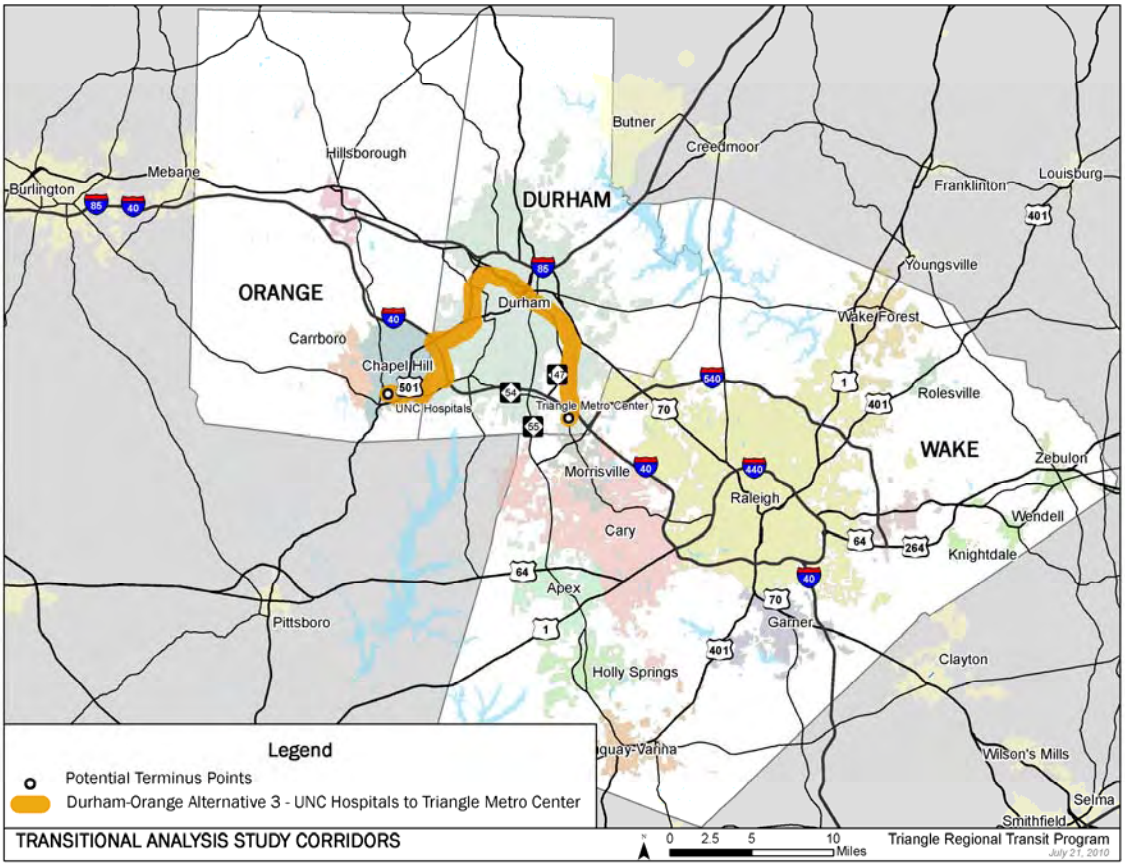
- Urban and Town Centers: Downtowns of Durham, Cary, and Raleigh
- Colleges and Universities: Duke University, NC Central University, Meredith College, NC State University, Shaw University, and Peace College
- Suburban Employment Areas and Special Activity Centers: Duke Hospitals, Research Triangle Park, State Fairgrounds Complex, and State Government Offices

Bus Transit Integration

- Corridor served by DATA, CAT, Wolfline, C-Tran, and Triangle Transit

4.2.3 DURHAM-ORANGE ALTERNATIVE 3 – UNC HOSPITALS TO TRIANGLE METRO CENTER

Figure 4.16 Durham-Orange Alternative 3 – UNC Hospitals to Triangle Metro Center



This 26 mile corridor extends from UNC Hospitals east to NC 54, then North through Duke University to downtown Durham and south to the Research Triangle Park. This corridor represents a complete build-out of the LRTP rail component within Durham and Orange counties, without a connection to Wake County.

Activity Centers

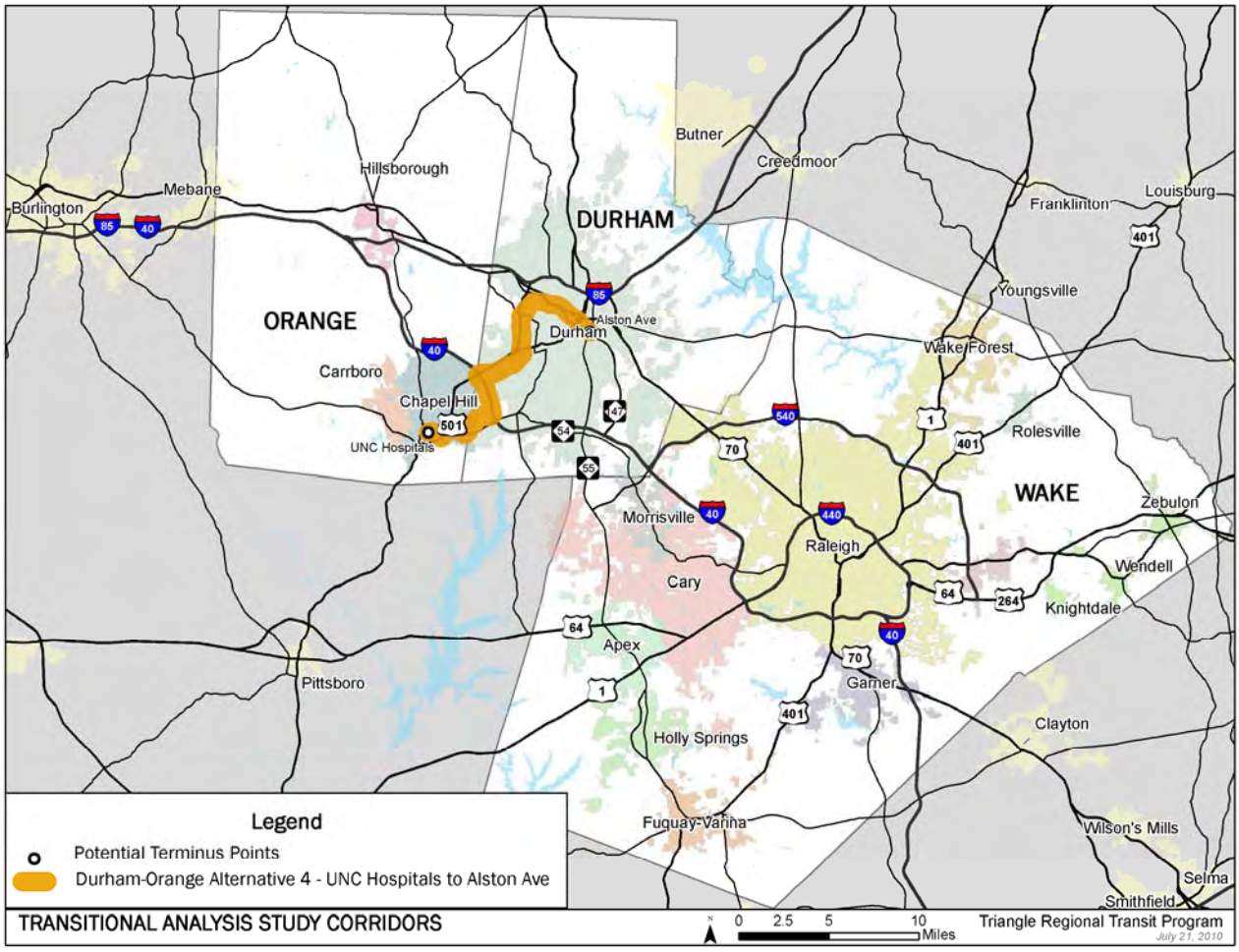
- Urban and Town Centers: Downtowns of Chapel Hill and Durham
- Colleges and Universities: UNC Chapel Hill, Duke University, and NC Central University
- Suburban Employment Areas and Special Activity Centers: UNC Hospitals, the NC 54 Corridor (including Glenn Lennox, East 54, UNC's Friday Center, Meadowmont, and Leigh Village), Development around I-40 and US 15-501 (including Gateway East, Patterson Place, and South Square), Duke Hospitals, and the Research Triangle Park

Bus Transit Integration

- Corridor served by Chapel Hill Transit, DATA, and Triangle Transit

4.2.4 DURHAM-ORANGE ALTERNATIVE 4 – UNC HOSPITALS TO ALSTON AVENUE

Figure 4.17 Durham-Orange Alternative 4 – UNC Hospitals to Alston Avenue



This 17 mile corridor extends from UNC Hospitals through the NC 54 corridor, Duke University Hospitals, and downtown Durham to Alston Avenue.

Activity Centers

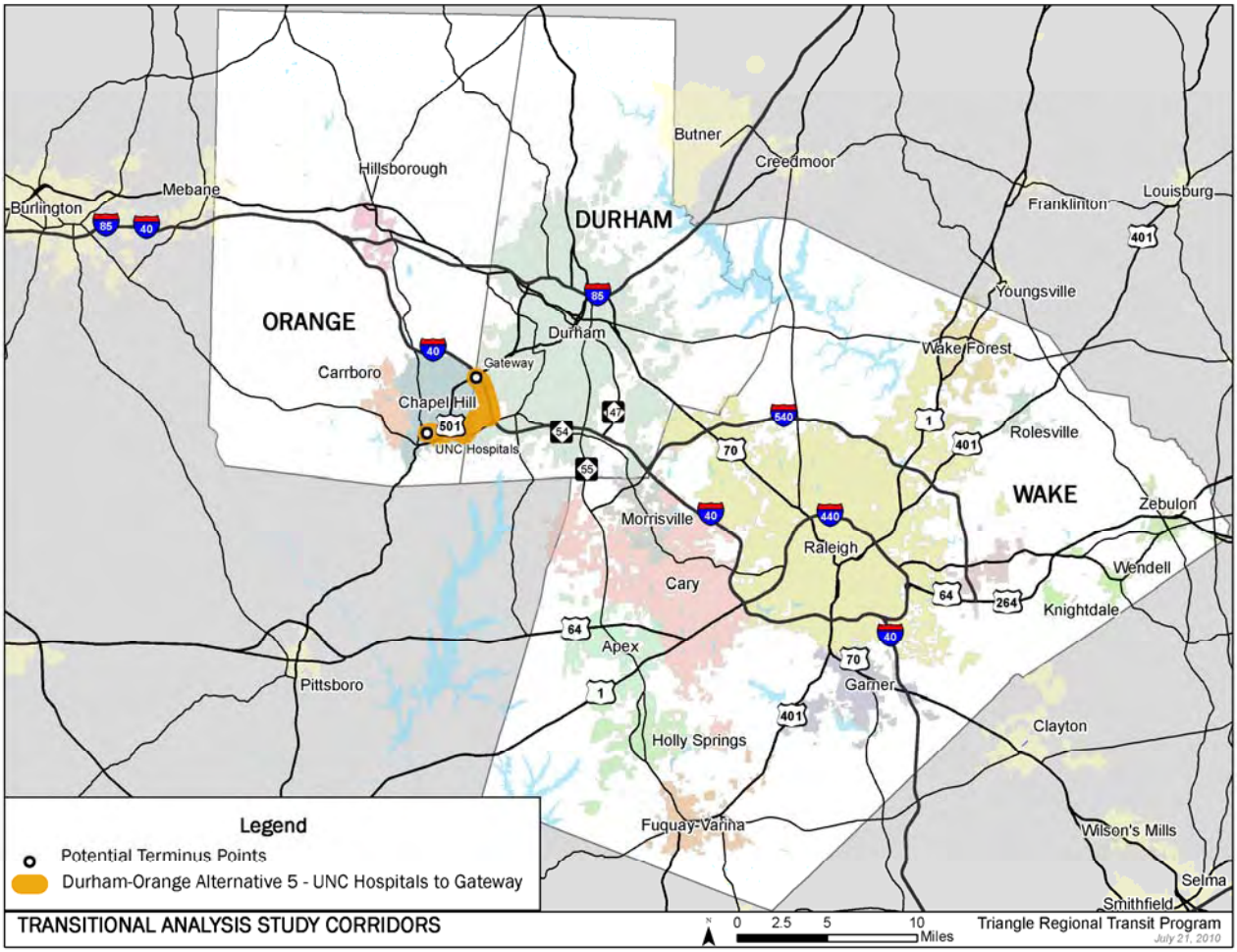
- Urban and Town Centers: Downtowns of Chapel Hill and Durham
- Colleges and Universities: UNC Chapel Hill, Duke University, and NC Central University
- Suburban Employment Areas and Special Activity Centers: UNC Hospitals, the NC 54 Corridor (including Glenn Lennox, East 54, UNC's Friday Center, Meadowmont, and Leigh Village), Development around I-40 and US 15-501 (including Gateway East, Patterson Place, and South Square), and Duke Hospitals

Bus Transit Integration

- Corridor served by Chapel Hill Transit, DATA, and Triangle Transit

4.2.5 DURHAM-ORANGE ALTERNATIVE 5 – UNC HOSPITALS TO GATEWAY

Figure 4.18 Durham-Orange Alternative 5 – UNC Hospitals to Gateway



This 7 mile corridor extends east from UNC Hospitals along the NC 54 corridor then north to the US 15/501 and I-40 interchange at the Gateway developments.

Activity Centers

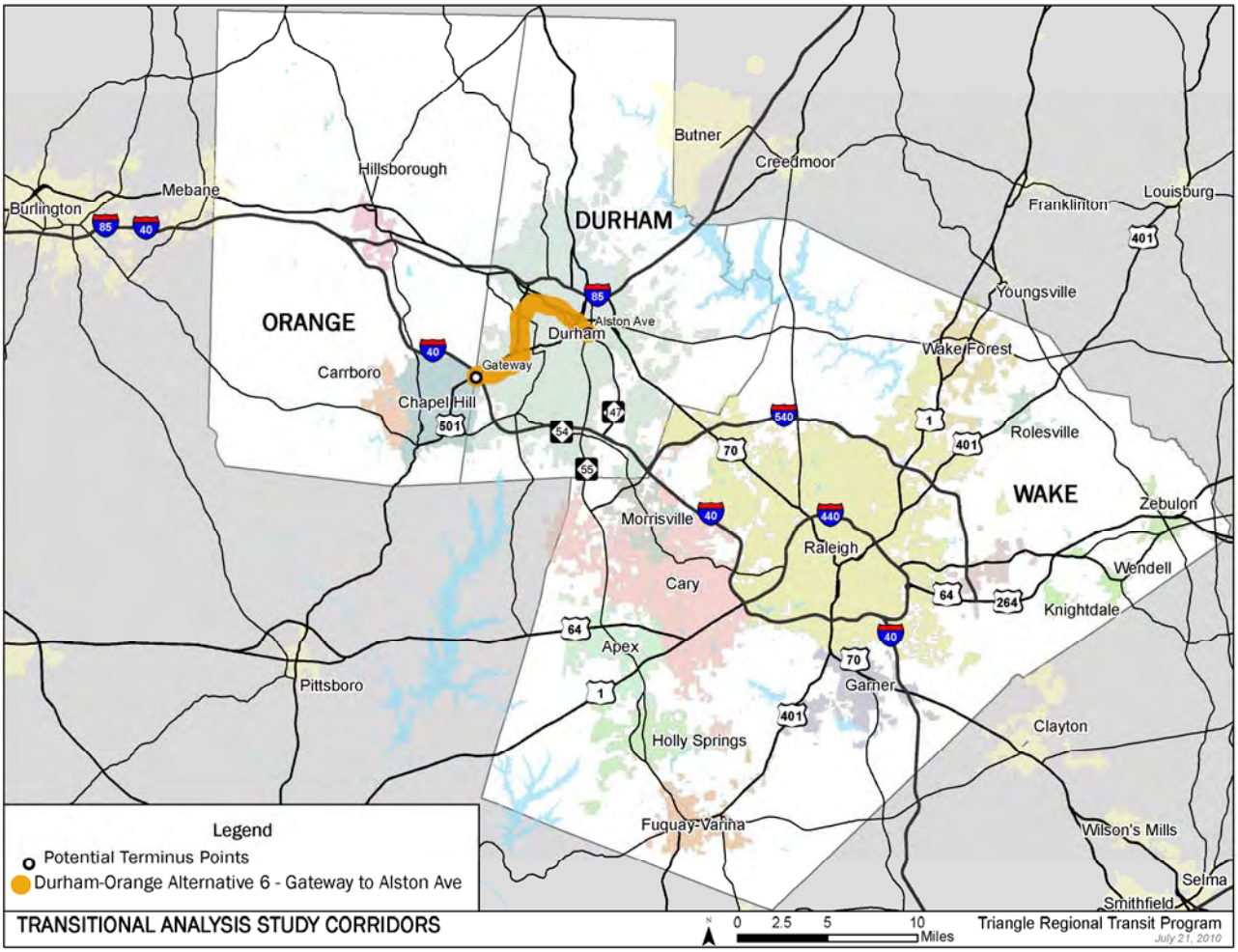
- Urban and Town Centers: Downtown Chapel Hill
- Colleges and Universities: UNC Chapel Hill
- Suburban Employment Areas and Special Activity Centers: UNC Hospitals, the NC 54 Corridor (including Glenn Lennox, East 54, UNC's Friday Center, Meadowmont, and Leigh Village), and Gateway East

Bus Transit Integration

- Corridor served by Chapel Hill Transit, DATA, and Triangle Transit

4.2.6 DURHAM-ORANGE ALTERNATIVE 6 – GATEWAY TO ALSTON AVENUE

Figure 4.19 Durham-Orange Alternative 6 – Gateway to Alston Avenue



This 10 mile corridor extends from the I-40 and US 15/501 interchange north through Duke University to downtown Durham and Alston Avenue.

Activity Centers

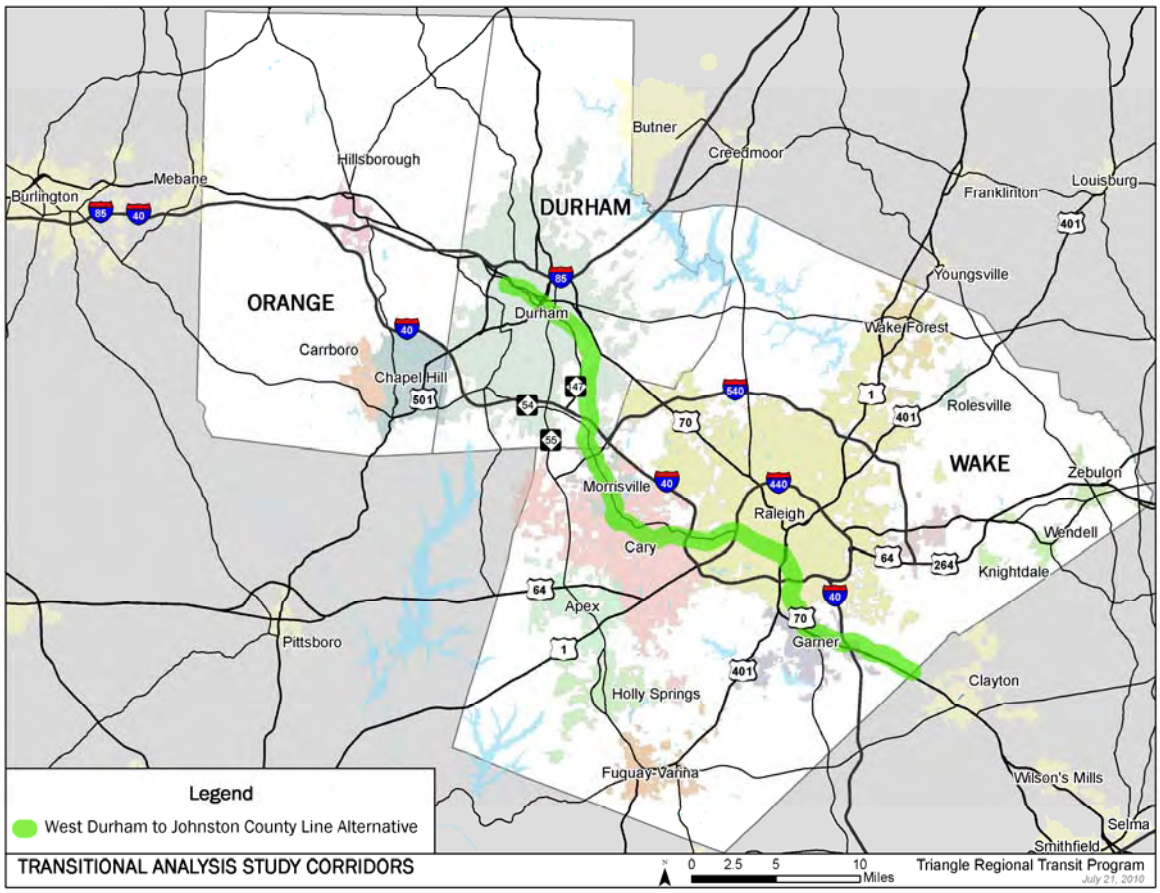
- Urban and Town Centers: Downtown Durham
- Colleges and Universities: Duke University and NC Central University
- Suburban Employment Areas and Special Activity Centers: Development around I-40 and US 15-501 (including Gateway East, Patterson Place, and South Square) and Duke Hospitals

Bus Transit Integration

- Corridor served by Chapel Hill Transit, DATA, and Triangle Transit

4.3 REGIONAL CORRIDOR ALTERNATIVE – WEST DURHAM TO JOHNSTON COUNTY LINE

Figure 4.20 Regional Corridor Alternative – West Durham to Johnston County Line



This 40 mile corridor would consist of commuter rail-type service operating along the NCRR corridor from West Durham to the Wake-Johnston County line. This service would run at peak hours Monday through Friday only with the intent of serving work-based trips to and from the Research Triangle Park as well as Raleigh and Durham.

Activity Centers

- Urban and Town Centers: Downtowns of Durham, Cary, and Raleigh
- Colleges and Universities: Duke University, NC Central University, Meredith College, NC State University, Shaw University and Peace College
- Suburban Employment Areas and Special Activity Centers: Duke Hospitals, Research Triangle Park, the State Fairgrounds Complex, and State Government Offices

Bus Transit Integration

- Corridor served by DATA, CAT, Wolfline, C-Tran, and Triangle Transit

CHAPTER 5 CORRIDOR EVALUATION CRITERIA

The corridors described in Chapter 4 were evaluated by the consulting team using the following criteria, which were developed in consultation with Triangle Transit, DCHC-MPO and CAMPO. Where applicable, the evaluation year is noted in parentheses.

5.1 MOBILITY

- Number of daily total trips in corridor (2035) (normalized as daily transit trips/mile)
- Number of daily transit trips in corridor (2035) (normalized as daily transit trips/mile)
- Transit passenger miles traveled (PMT) for rail (2035)
- Relative peak hour corridor travel times for rail and highway travel (2035)

5.2 SOCIOECONOMIC

- Population and density within a mile-wide corridor (2005 and 2035)
- Number and density of low-income households within a mile-wide corridor (2000)
- Number and density of minority households within a mile-wide corridor (2000)
- Number and density of jobs within a mile-wide corridor (2005 and 2035)

5.3 LAND USE

- Public sector/regulatory support - Existing comprehensive plans consistent with the concepts of compact, mixed-used development near public transportation, or transit-oriented development (TOD); allowable densities and flexibility of zoning districts
- Activity centers served (employment, retail, institutions, mixed use, special attractions)
- Development potential – future TOD potential considering potential household and employment density and future growth.

5.4 FINANCIAL

- Total capital cost (2010 Dollars)
- Capital cost per mile (2010 Dollars)
- Capital cost per weekday transit trip (2010 Dollars, 2035 Ridership)
- Capital cost per weekday transit passenger mile traveled (2010 Dollars, 2035 PMT)
- Total Operating and Maintenance (O&M) cost (2010 Dollars)
- O&M cost per weekday transit trip (2010 Dollars, 2035 Ridership)
- Annual O&M cost per weekday transit passenger mile traveled (2010 Dollars, 2035 PMT)

5.5 PUBLIC INPUT

Citizens and project stakeholders will be provided an opportunity to review and comment on the evaluation criteria and the draft results of the corridor analysis. This information will be presented at a series of six public workshops that will be held between September 14 and September 23, 2010.

CHAPTER 6 SCREENING OF CORRIDORS AND SELECTION OF PRIORITY CORRIDORS

6.1 MOBILITY

The Triangle Regional Model (TRM) is a four-step model that utilizes socio-economic data aggregated at a Traffic Analysis Zone (TAZ) geography to estimate travel demand. For this analysis, the TRM was used to estimate future travel demand within each of the study corridors for the year 2035, given all-day, frequent service. The four mobility criteria used to evaluate each corridor are: number of daily person trips in each corridor; number of daily rail transit trips in each corridor; rail transit passenger miles traveled (PMT); and the peak hour corridor travel times for rail and highway travel.

6.1.1 PERSON TRIPS IN CORRIDOR

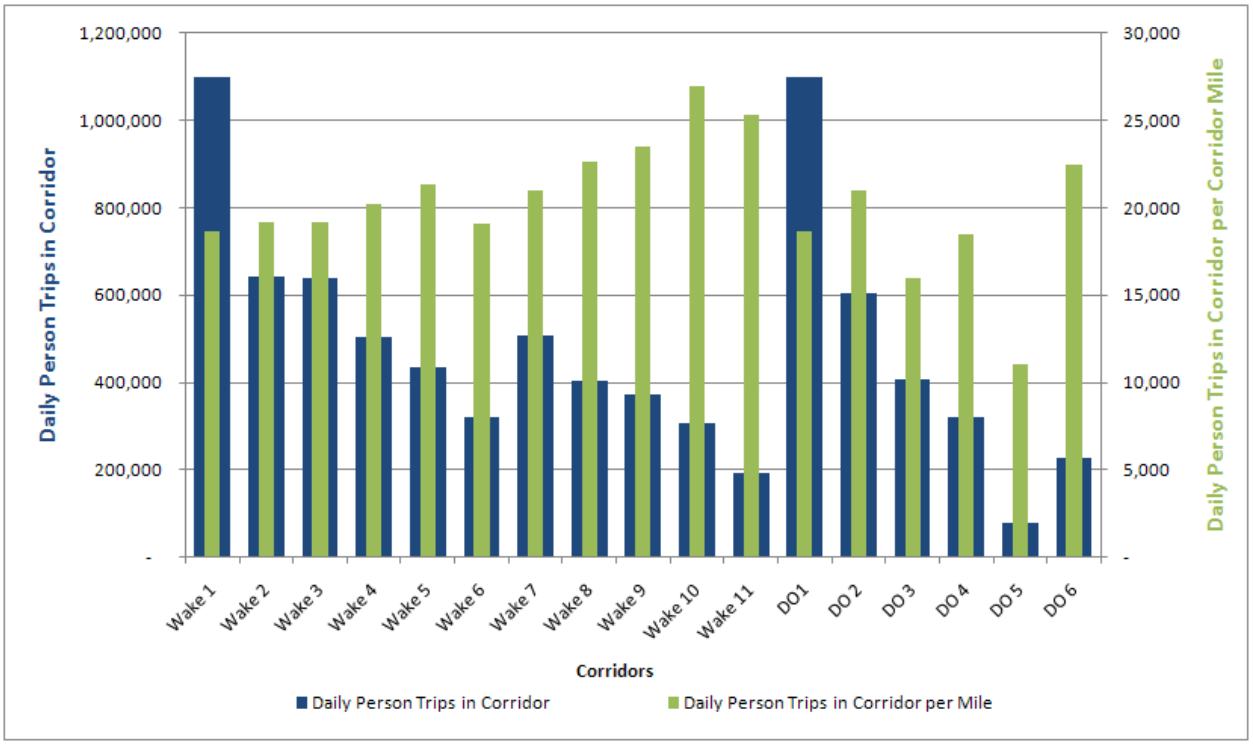
The number of total daily person trips in each corridor represents the level of travel activity within each corridor, which can be used to make relative comparisons regarding the potential for rail transit ridership in each corridor. Total daily person trips include all trips made within the corridor for all purposes and by all travel modes. For the purpose of this analysis, the corridors are defined as all Traffic Analysis Zones (TAZs) that are partially or wholly within a mile-wide corridor centered on the rail alignment used for the TRM. The four corridors with the highest daily person trips per mile of modeled rail are W8 through W11, which are most focused around NCSU and downtown Raleigh.

Table 6.1 Daily Person Trips in Corridor (2035)

Corridors	Termini	Length (Miles)	Daily Person Trips in Corridor (2035)	Daily Person Trips in Corridor per Mile (2035)
Wake 1	UNC Hospitals - Wake Forest	59	1,098,547	18,653
Wake 2	TMC - Wake Forest	33	640,569	19,209
Wake 3	Veridea - Wake Forest	33	639,723	19,162
Wake 4	Downtown Cary - Wake Forest	25	503,279	20,172
Wake 5	State Fairgrounds - Wake Forest	20	435,784	21,299
Wake 6	Downtown Raleigh - Wake Forest	17	319,810	19,110
Wake 7	TMC - NERC	24	508,823	20,946
Wake 8	NW Cary - NERC	18	403,853	**22,602**
Wake 9	Downtown Cary - NERC	16	373,236	**23,484**
Wake 10	State Fairgrounds - NERC	11	307,082	**26,927**
Wake 11	Downtown Raleigh - NERC	8	194,093	**25,275**
Wake 12	Duke Medical - Downtown Raleigh	29	604,028	21,024
DO1	UNC Hospitals - Wake Forest	59	1,098,547	18,653
DO 2	Duke Medical - Downtown Raleigh	29	604,028	21,024
DO 3	UNC Hospitals - TMC	26	407,259	15,942
DO 4	UNC Hospitals - Alston Ave	17	319,870	18,439
DO 5	UNC Hospitals - Gateway	7	79,935	11,030
DO 6	Gateway - Alston Ave	10	226,526	22,429

Note: The data listed in emboldened red are top performers for each respective evaluation criterion.

Figure 6.1 Daily Person Trips in Corridor (2035)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

6.1.2 RAIL TRIPS IN CORRIDOR

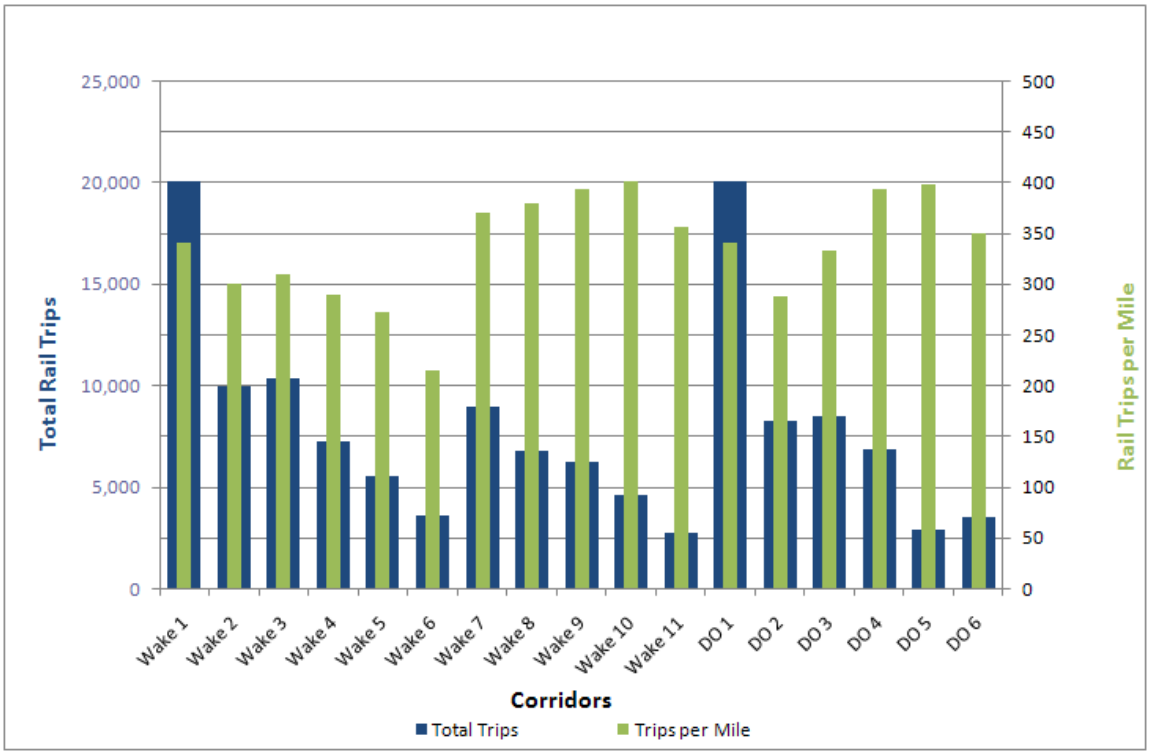
Potential rail station locations were used in the TRM to estimate the demand for rail travel in each corridor. The three corridors with the highest daily rail trip estimates are the longest corridors, as shown in Table 6.2. Thus, the number of daily rail trips per mile is a more informative measure for comparing corridors, as the number of trips is normalized by length. The four corridors with the highest trips per mile are: the State Fairgrounds to the NERC (W10); UNC Hospitals to Gateway (DO5); UNC Hospitals to Alston Avenue (DO4); and Downtown Cary to the NERC (W9), as shown in Table 6.2 and on Figure 6.2.

Table 6.2 Daily Rail Transit Total Trips and Trips per Mile (2035)

Corridors	Termini	Length (Miles)	Rail Trips (2035)	Rail Trips per Mile (2035)
Wake 1	UNC Hospitals - Wake Forest	59	20,105	341
Wake 2	TMC - Wake Forest	33	10,010	300
Wake 3	Veridea - Wake Forest	33	10,325	309
Wake 4	Downtown Cary - Wake Forest	25	7,236	290
Wake 5	State Fairgrounds - Wake Forest	20	5,562	272
Wake 6	Downtown Raleigh - Wake Forest	17	3,611	216
Wake 7	TMC - NERC	24	8,986	370
Wake 8	NW Cary - NERC	18	6,791	380
Wake 9	Downtown Cary - NERC	16	6,257	**394**
Wake 10	State Fairgrounds - NERC	11	4,586	**402**
Wake 11	Downtown Raleigh - NERC	8	2,732	356
Wake 12	Duke Medical - Downtown Raleigh	29	8,288	288
DO 1	UNC Hospitals - Wake Forest	59	20,105	341
DO 2	Duke Medical - Downtown Raleigh	29	8,288	288
DO 3	UNC Hospitals - TMC	26	8,491	332
DO 4	UNC Hospitals - Alston Ave	17	6,831	**394**
DO 5	UNC Hospitals - Gateway	7	2,889	**399**
DO 6	Gateway - Alston Ave	10	3,541	351

Note: The data listed in emboldened red are top performers for each respective evaluation criterion.

Figure 6.2 Daily Rail Transit Total Trips and Trips per Mile (2035)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

6.1.3 Rail Passenger Miles

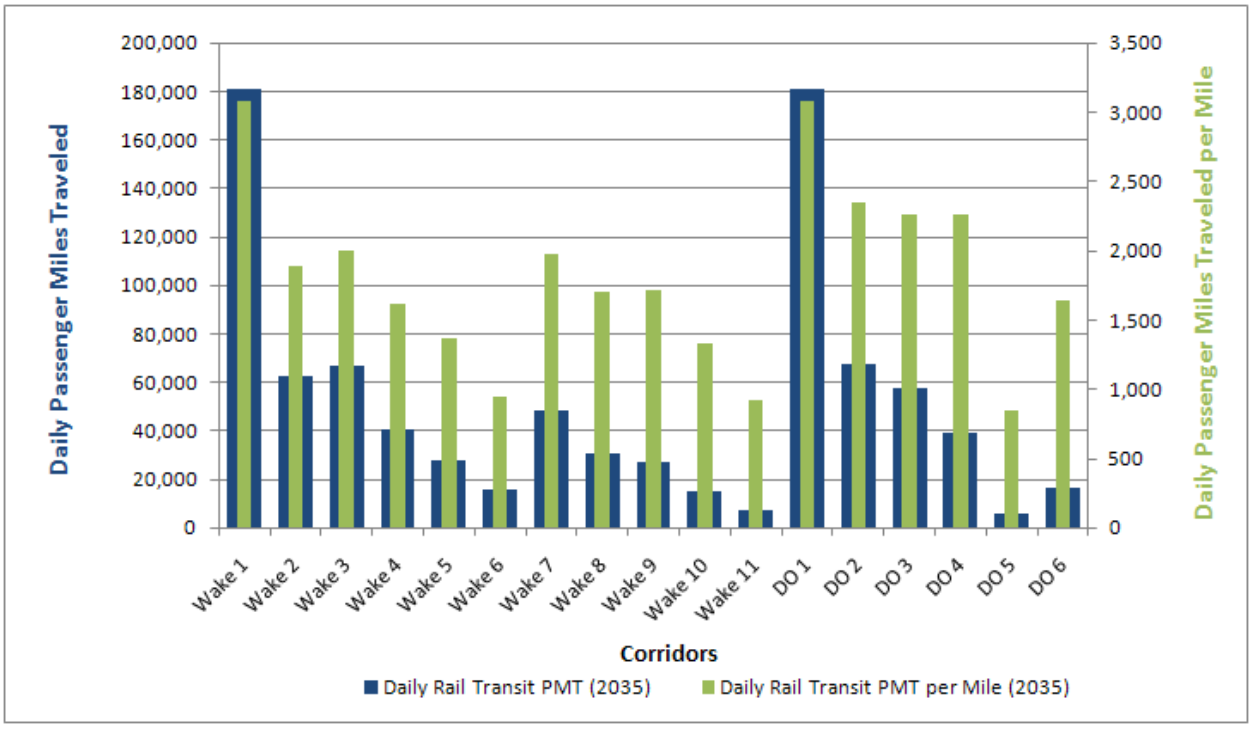
The number of daily rail passenger miles traveled (PMTs) estimated for each corridor provides some indication of the potential for reducing private vehicle miles traveled (VMTs) on roadways. The four corridors with the highest PMTs coincide with the longest corridors, as shown in Table 6.3.

Table 6.3 Rail Transit Passenger Miles Traveled (2035)

Corridors	Termini	Length (Miles)	Rail Transit PMT (2035)	Rail Transit PMT per Mile(2035)
Wake 1	UNC Hospitals - Wake Forest	59	**181,253**	**3,078**
Wake 2	TMC - Wake Forest	33	**62,886**	1,886
Wake 3	Veridea - Wake Forest	33	**66,950**	**2,005**
Wake 4	Downtown Cary - Wake Forest	25	40,353	1,617
Wake 5	State Fairgrounds - Wake Forest	20	27,913	1,364
Wake 6	Downtown Raleigh - Wake Forest	17	15,856	947
Wake 7	TMC - NERC	24	48,160	1,983
Wake 8	NW Cary - NERC	18	30,389	1,701
Wake 9	Downtown Cary - NERC	16	27,195	1,711
Wake 10	State Fairgrounds - NERC	11	15,155	1,329
Wake 11	Downtown Raleigh - NERC	8	7,056	919
Wake 12	Duke Medical - Downtown Raleigh	29	**67,600**	**2,353**
DO 1	UNC Hospitals - Wake Forest	59	**181,253**	**3,078**
DO 2	Duke Medical - Downtown Raleigh	29	**67,600**	**2,353**
DO 3	UNC Hospitals - TMC	26	57,691	**2,258**
DO 4	UNC Hospitals - Alston Ave	17	39,173	**2,258**
DO 5	UNC Hospitals - Gateway	7	6,126	845
DO 6	Gateway - Alston Ave	10	16,555	1,639

Note: The data listed in emboldened red are top performers for each respective evaluation criterion.

Figure 6.3 Rail Transit Passenger Miles Traveled (2035)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

6.1.4 PEAK HOUR CORRIDOR TRAVEL TIMES

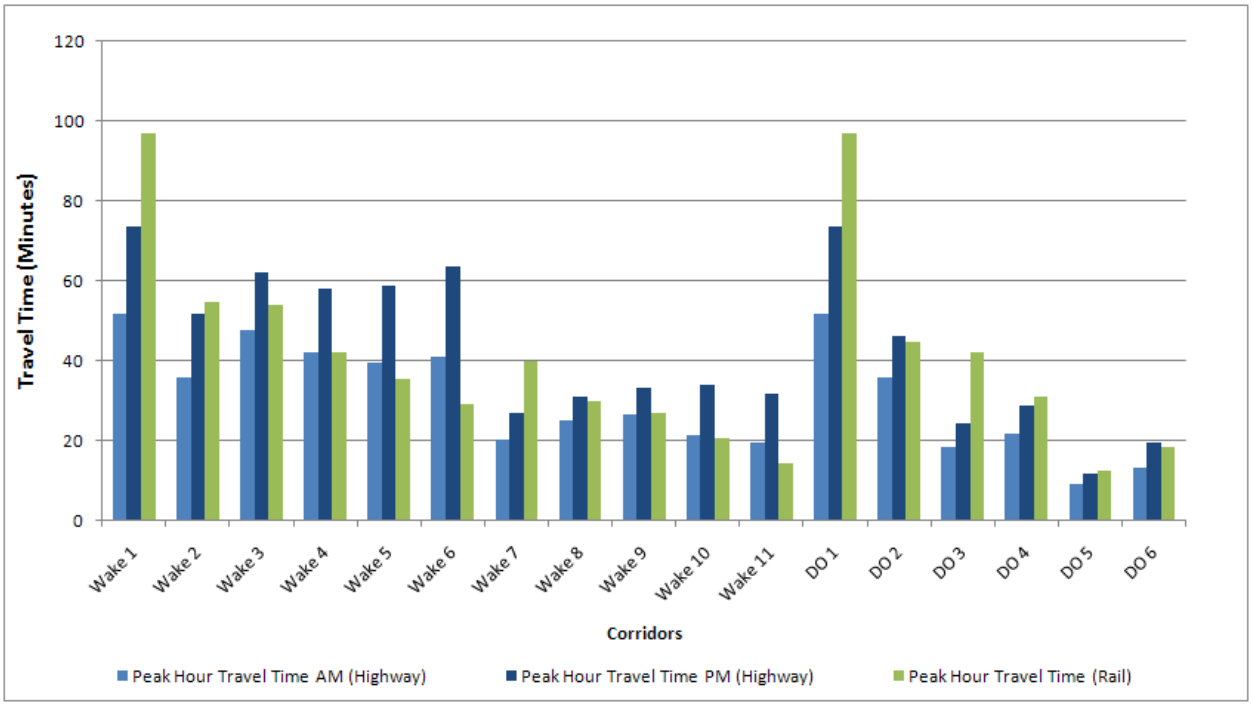
The peak hour travel time between the termini of each corridor was calculated for rail and highway travel to provide a relative comparison between corridors, as shown in Table 6.4 and on Figure 6.4. This measure provides an indication of travel time benefit for rail (if any) when traveling the entire length of the corridor. The travel time benefit is a function of speed and distance traveled, and as such the more circuitous corridors demonstrate less rail benefit since an automobile provides a more direct route, i.e. shorter travel distance. However, this criterion still provides a baseline for travel time comparison. The four corridors that provide the greatest rail travel time benefit between termini are: Downtown Raleigh to Wake Forest (W6); Downtown Raleigh to NERC (W11); State Fairgrounds to Wake Forest (W5); and State Fairgrounds to NERC (W10).

Table 6.4 Peak Hour Travel Times (2035)

Corridors	Termini	Length (Miles)	Peak Hour Travel Time (Rail)	Peak Hour Travel Time AM (Roadway)	Percent Travel Time Savings (AM)	Peak Hour Travel Time PM (Roadway)	Percent Travel Time Savings (PM)
Wake 1	UNC Hospitals - Wake Forest	59	97	52	-87%	74	-32%
Wake 2	TMC - Wake Forest	33	55	36	-52%	52	-6%
Wake 3	Veridea - Wake Forest	33	54	48	-14%	62	13%
Wake 4	Downtown Cary - Wake Forest	25	42	42	1%	58	28%
Wake 5	State Fairgrounds - Wake Forest	20	36	39	**10%**	59	**39%**
Wake 6	Downtown Raleigh - Wake Forest	17	29	41	**29%**	64	**54%**
Wake 7	TMC - NERC	24	40	20	-96%	27	-48%
Wake 8	NW Cary - NERC	18	30	25	-20%	31	4%
Wake 9	Downtown Cary - NERC	16	27	27	-2%	33	19%
Wake 10	State Fairgrounds - NERC	11	21	21	**3%**	34	**39%**
Wake 11	Downtown Raleigh - NERC	8	14	20	**27%**	32	**55%**
Wake 12	Duke Medical - Downtown Raleigh	29	45	36	-25%	46	3%
DO 1	UNC Hospitals - Wake Forest	59	97	52	-87%	74	-32%
DO 2	Duke Medical - Downtown Raleigh	29	45	36	-25%	46	3%
DO 3	UNC Hospitals - TMC	26	42	18	-127%	24	-72%
DO 4	UNC Hospitals - Alston Ave	17	31	22	-43%	29	-7%
DO 5	UNC Hospitals - Gateway	7	12	9	-37%	12	-5%
DO 6	Gateway - Alston Ave	10	18	13	-38%	20	6%

Note: The data listed in emboldened red are top performers for each respective evaluation criterion.

Figure 6.4 Peak Hour Travel Times (2035)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

6.1.5 SUMMARY OF MOBILITY

When looking at all of the mobility measures, it is clear that total corridor trips, total rail trips and rail passenger trips are the highest in the corridors with the longest length. However, when the corridors are further examined using trips per mile, a different picture emerges. All of the measures that are based on passenger miles traveled are highly related to the overall project length and using these measures, the highest performing corridors are those that are the longest in length. The measures that use trips per mile provide the best means to select the most cost effective corridor for initial implementation.

The corridors that perform the best in terms of rail trips per mile are: Wake 9 (Downtown Cary to NERC); Wake10 (State Fairgrounds to NERC); DO 4 (UNC Hospitals to Alston Avenue); DO 5 (UNC Hospitals to Gateway). All of these corridors have approximately 400 rail trips per mile. The regional corridor, DO2/Wake 12 (Duke Medical to Downtown Raleigh) performs at a lower level with less than 300 rail trips per mile.

The corridor travel time measure is less clear in the distinction of the corridors. The purpose of this measure is to see where the corridors are where rail travel time can be competitive with the highway travel time during the peak periods where congestion is expected to occur on the highway system. Many of the longer corridors, Wake 2 (Wake Forest to TMC), for example, is a long "L" shaped corridor and the end-to-end highway trip would not follow the rail alignment, cannot be fairly evaluated by this measure. However, there are several corridor segments where the evaluation is meaningful. The corridor where rail travel time is most competitive with highway times is the north Raleigh corridor segment from downtown Raleigh to both Wake Forest (Wake 5 and Wake 6) and the NERC (Wake 10 and Wake 11) with the rail travel time having as much as a 50% travel time savings over the highway system during the PM peak period. This is logical in that this corridor is one of the most congested highway corridors in the region with major arterials and no major highway improvements planned.

The next best performing corridor by this measure is the regional corridor (DO 2/Wake 12 (Duke Medical to Downtown Raleigh) with the rail travel time during the PM peak period being essentially the same as the highway travel time. This is understandable given that I-40 parallels the corridor that is the most congested highway in the region with congestion delays occurring during both the AM and PM peak periods. The corridors between Durham and Orange County, DO 4 (UNC Hospitals to Alston Avenue), DO 5 (UNC Hospitals to Gateway), and DO6 (Gateway to Alston Avenue) also perform well with PM rail times only slightly higher than the highway travel times.

For these reasons, Wake 9 (Downtown Cary to NERC), Wake10 (State Fairgrounds to NERC), DO 4 (UNC Hospitals to Alston Avenue) and DO 5 (UNC Hospitals to Gateway) all perform best relative to the other corridors in terms of the broad mobility measure.

6.2 SOCIOECONOMIC

As an additional gauge of potential rail ridership in each corridor, an analysis of population, employment, and income was conducted using socio-economic data aggregated at a Traffic Analysis Zone (TAZ) geography for years 2005 and 2035. Similarly, most recent available data from the U.S. Census (2000), aggregated at a Census Block Group (BG) geography, was used to determine the number and density of low-income and minority persons within each corridor. For this analysis, low-income individuals are defined as persons in a household that are below poverty level, based on the following definition from the U.S. Census Bureau: "Families and

persons are classified as below poverty level if their total family income or unrelated individual income was less than the poverty threshold specified for the applicable family size, age of householder, and number of related children under 18 present." The number and density of low-income and minority persons can be an informative indicator of potential ridership, as many among these populations are considered "transit dependent." That is, their access to private transportation modes, such as the automobile, is limited.

6.2.1 POPULATION

The four corridors with the highest population and number of households in 2005 are the longest corridors, as shown in Table 6.5. Thus, household density (households/acre) is a more appropriate measure for comparing corridors, as the number of households is normalized by area. In 2005, downtown Durham and downtown Raleigh had the highest household densities of the entire corridor study area, as shown on Figure 6.5. As a result, the corridors concisely focused on these two areas, including DO6, W11, DO4, W9, W10, and W8 had the highest household densities among all of the corridors. From 2005 to 2035, the highest percentage growth is projected between downtown Raleigh and the Northeast Regional Center (NERC). As a result, by 2035 corridors W8, W9, W10, and W11 are projected to have the highest household densities among all of the corridors.

Table 6.5 Population Characteristics (2000 and 2035)

Corridors	Termini	Length (Miles)	Population			Households			Density (Households/Acre)		
			2005	2035	% Change	2005	2035	% Change	2005	2035	% Change
Wake 1	UNC Hospitals - Wake Forest	59	124,467	274,667	121%	39,906	100,333	151%	1.06	2.66	151%
Wake 2	TMC - Wake Forest	33	70,822	178,991	153%	22,037	66,973	204%	1.01	3.08	204%
Wake 3	Veridea - Wake Forest	33	77,005	189,116	146%	24,138	70,633	193%	1.11	3.24	193%
Wake 4	Downtown Cary - Wake Forest	25	60,719	150,618	148%	18,071	55,596	208%	1.10	3.39	208%
Wake 5	State Fairgrounds - Wake Forest	20	50,627	126,797	150%	14,054	45,881	226%	1.04	3.40	**226%**
Wake 6	Downtown Raleigh - Wake Forest	17	29,535	95,836	224%	12,240	39,886	226%	1.10	3.57	226%
Wake 7	TMC - NERC	24	61,234	158,274	158%	18,499	58,842	218%	1.16	3.69	218%
Wake 8	NW Cary - NERC	18	54,667	139,059	154%	15,964	51,257	221%	1.35	**4.32**	221%
Wake 9	Downtown Cary - NERC	16	51,131	129,901	154%	14,533	47,465	227%	**1.37**	**4.48**	**227%**
Wake 10	State Fairgrounds - NERC	11	41,039	106,080	158%	10,516	37,750	259%	1.36	**4.88**	**259%**
Wake 11	Downtown Raleigh - NERC	8	19,947	75,119	277%	8,703	31,755	265%	**1.61**	**5.89**	**265%**
Wake 12	Duke Medical - Downtown Raleigh	29	69,494	167,516	141%	19,487	58,788	202%	1.04	3.13	202%
DO 1	UNC Hospitals - Wake Forest	59	124,467	274,667	121%	39,906	100,333	151%	1.06	2.66	151%
DO 2	Duke Medical - Downtown Raleigh	29	69,494	167,516	141%	19,487	58,788	202%	1.04	3.13	202%
DO 3	UNC Hospitals - TMC	26	53,681	98,891	84%	17,884	34,590	93%	1.09	2.10	93%
DO 4	UNC Hospitals - Alston Ave	17	48,497	84,113	73%	15,847	28,897	82%	**1.41**	2.57	82%
DO 5	UNC Hospitals - Gateway	7	15,783	30,374	92%	3,691	8,663	135%	0.75	1.75	135%
DO 6	Gateway - Alston Ave	10	34,769	57,756	66%	12,961	22,095	70%	**1.88**	3.21	70%

Note: The data listed in emboldened red are top performers for each respective evaluation criterion.

Figure 6.5 2005 Household Density (Households per Acre)

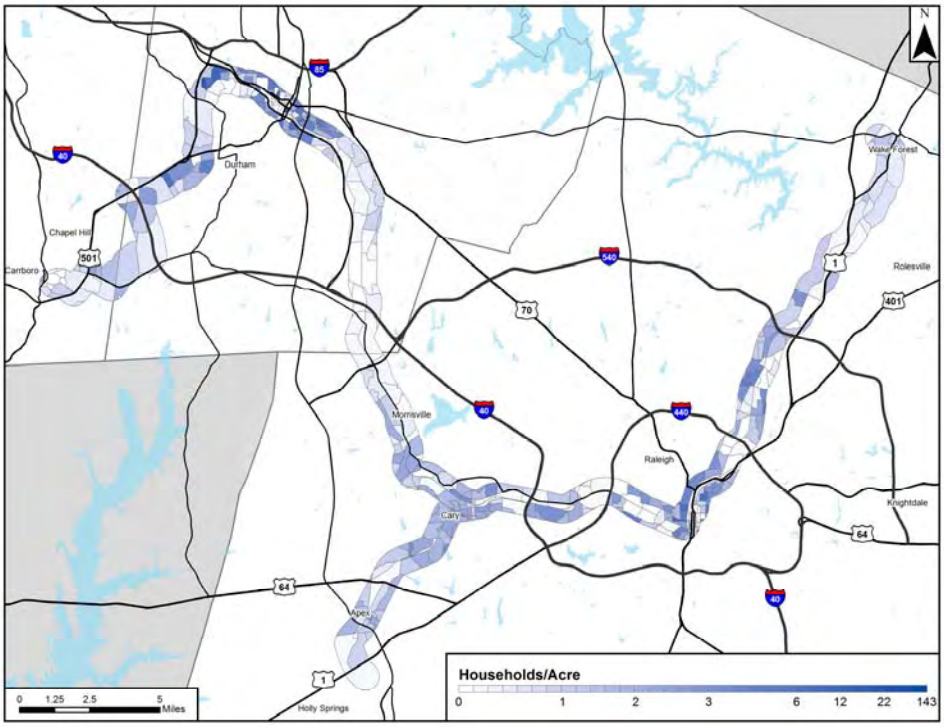


Figure 6.6 2035 Household Density (Households per Acre)

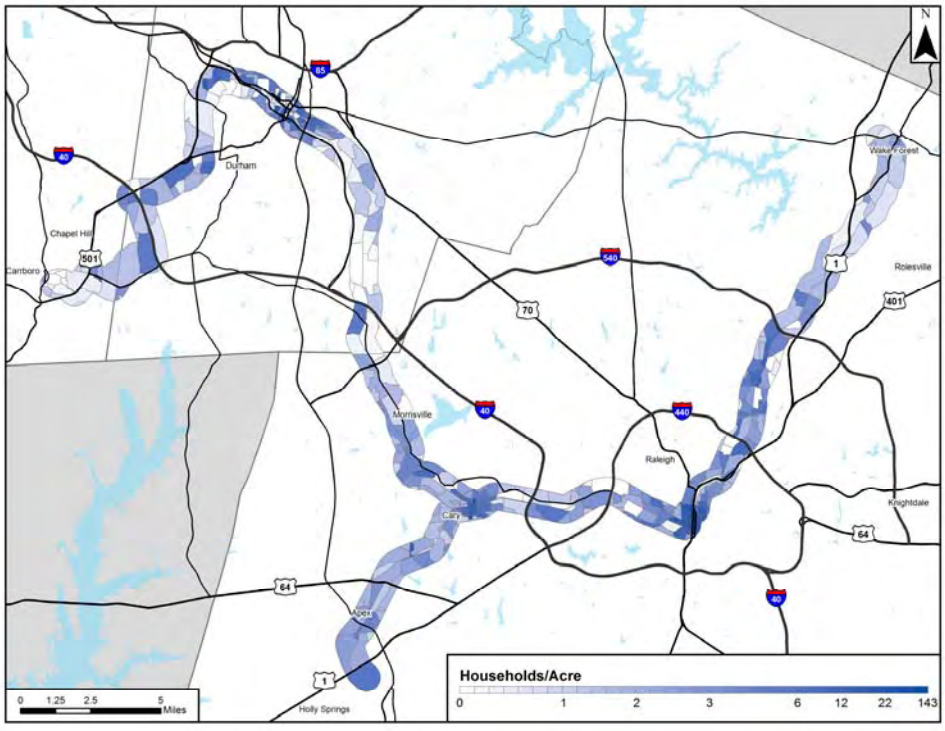
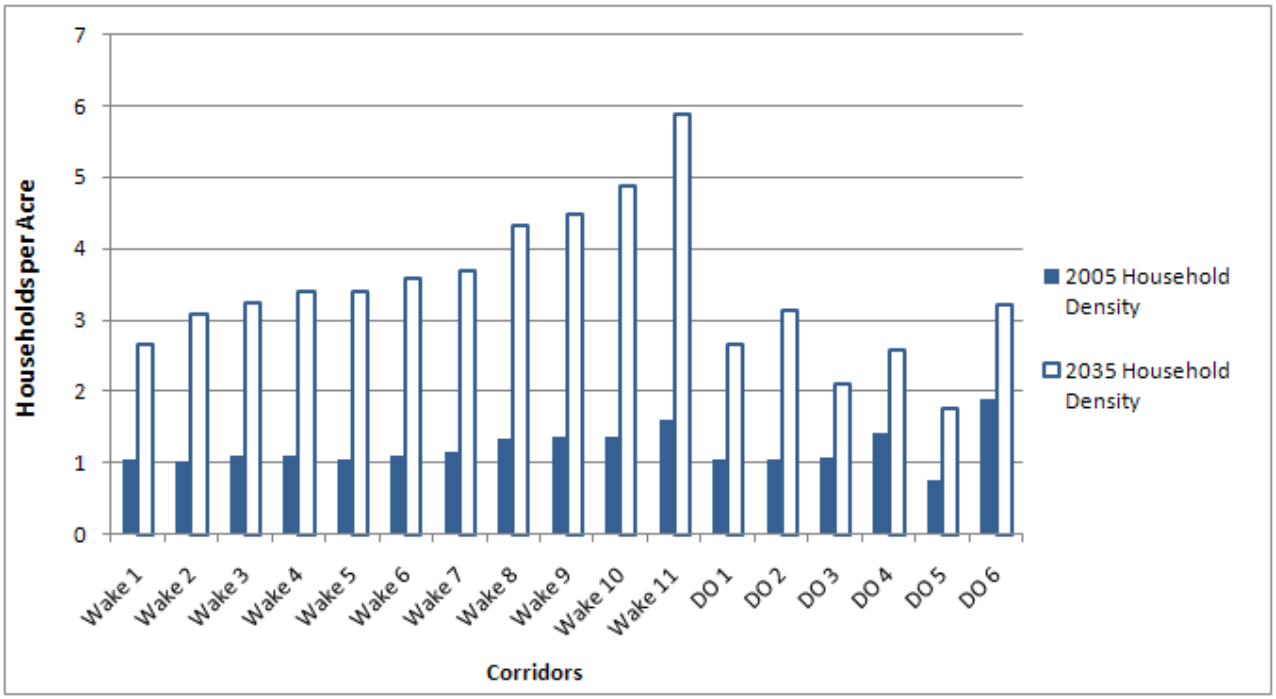


Figure 6.7 Household Density by Corridor (Households per Acre)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

6.2.2 EMPLOYMENT

As with population, employment density is more appropriate than absolute employment numbers for comparing employment between the study corridors, as the corridors differ greatly in length and area. In 2005, the three corridors most centered on downtown Raleigh (W9, W10, and W11) and the corridor from Gateway to Alston Avenue (DO6) had the highest employment density (employees/acre) among the study corridors, as shown in Table 6.6 and on Figure 6.8. In 2035, these same four corridors are projected to remain highest in employment density, despite the highest percentage growth in the corridors: from TMC to Wake Forest (W2); downtown Raleigh Wake Forest (W6); UNC Hospitals to Alston Avenue (DO4); and UNC Hospitals to Gateway (DO5).

Table 6.6 Employment Characteristics (2005 and 2035)

Corridors	Termini	Length (Miles)	Total Employment			Employment Density (Employees/Acre)		
			2005	2035	% Change	2005	2035	% Change
Wake 1	UNC Hospitals - Wake Forest	59	191,673	361,061	88%	5.1	9.6	88%
Wake 2	TMC - Wake Forest	33	106,579	207,024	94%	4.9	9.5	**94%**
Wake 3	Veridea - Wake Forest	33	99,095	190,746	92%	4.6	8.8	92%
Wake 4	Downtown Cary - Wake Forest	25	93,451	170,486	82%	5.7	10.4	82%
Wake 5	State Fairgrounds - Wake Forest	20	85,718	150,969	76%	6.3	11.2	76%
Wake 6	Downtown Raleigh - Wake Forest	17	61,897	120,126	94%	5.5	10.8	**94%**
Wake 7	TMC - NERC	24	101,124	187,575	85%	6.3	11.8	85%
Wake 8	NW Cary - NERC	18	90,466	159,174	76%	7.6	13.4	76%
Wake 9	Downtown Cary - NERC	16	87,997	151,037	72%	**8.3**	**14.2**	72%
Wake 10	State Fairgrounds - NERC	11	80,264	131,520	64%	**10.4**	**17.0**	64%
Wake 11	Downtown Raleigh - NERC	8	56,443	100,678	78%	**10.5**	**18.7**	78%
Wake 12	Duke Medical - Downtown Raleigh	29	127,830	234,467	83%	6.8	12.5	83%
DO 1	UNC Hospitals - Wake Forest	59	191,673	361,061	88%	5.1	9.6	88%
DO 2	Duke Medical - Downtown Raleigh	29	127,830	234,467	83%	6.8	12.5	83%
DO 3	UNC Hospitals - TMC	26	88,340	158,426	79%	5.4	9.6	79%
DO 4	UNC Hospitals - Alston Ave	17	67,392	131,286	95%	6.0	11.7	**95%**
DO 5	UNC Hospitals - Gateway	7	17,988	38,131	112%	3.6	7.7	**112%**
DO 6	Gateway - Alston Ave	10	52,619	99,574	89%	**7.6**	**14.4**	89%

Note: The data listed in emboldened red are top performers for each respective evaluation criterion.

Figure 6.8 2005 Employment Density (Employees per Acre)

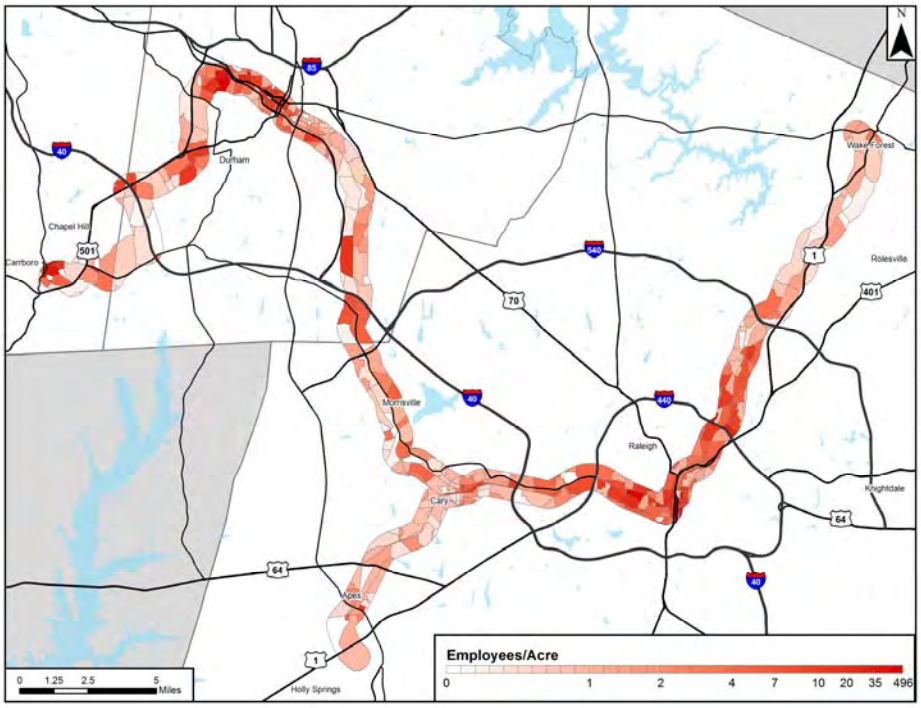


Figure 6.9 2035 Employment Density (Employees per Acre)

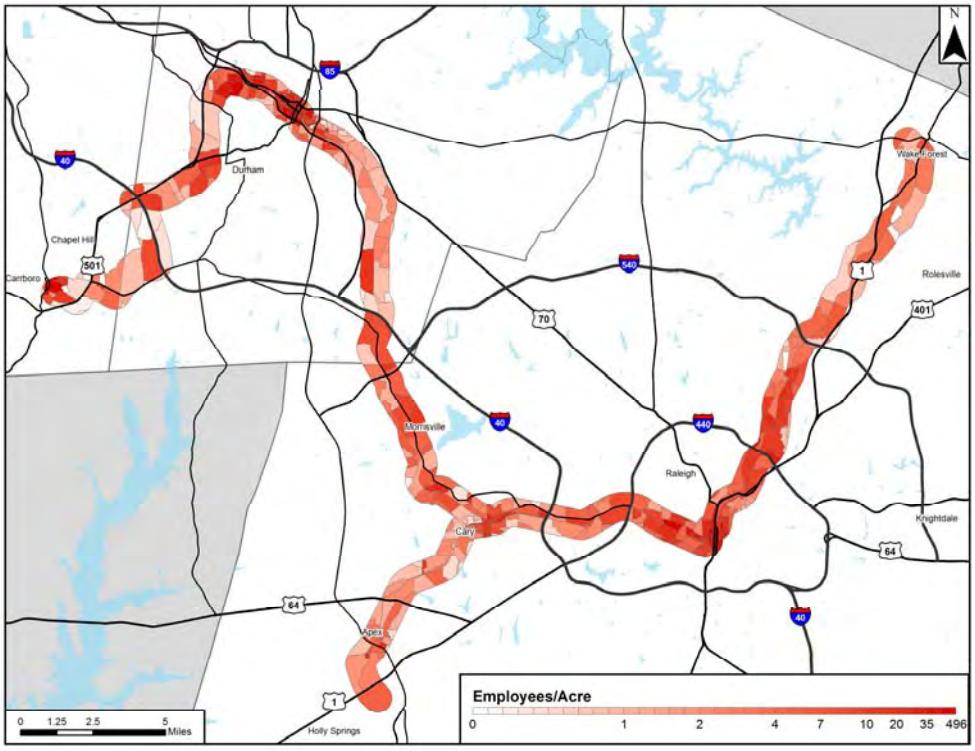
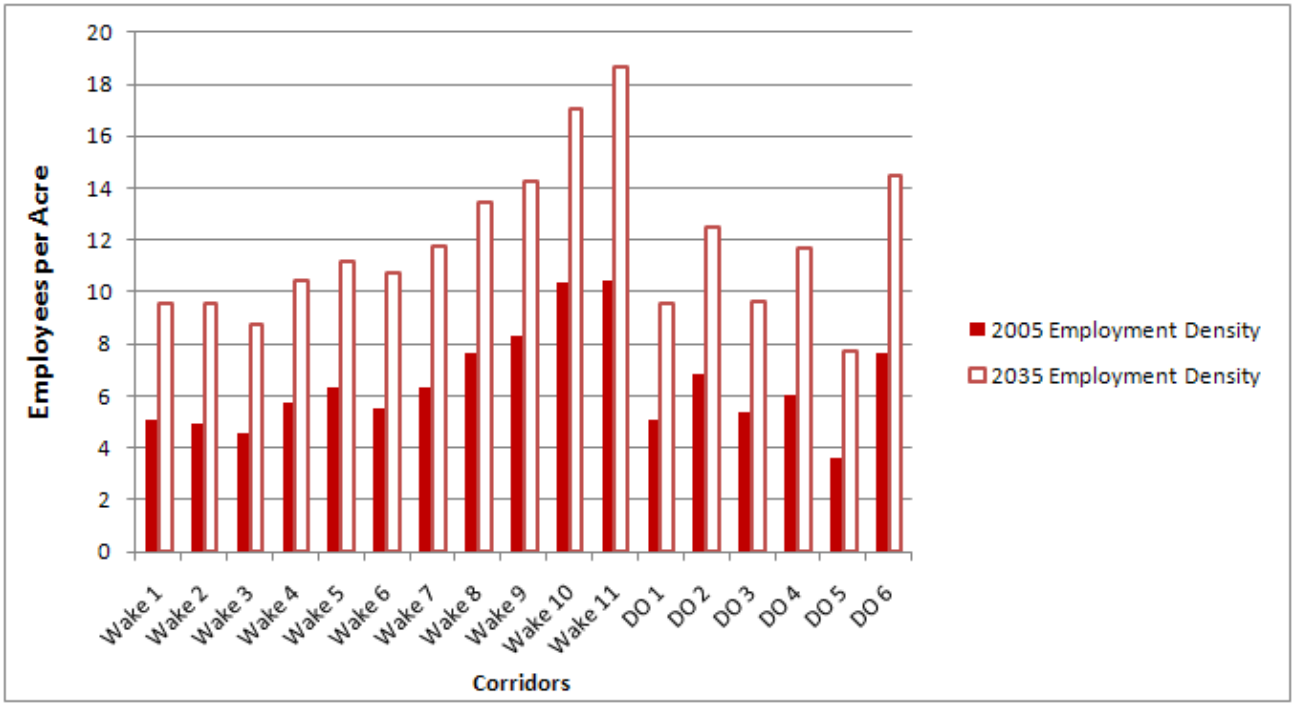


Figure 6.10 2005 and 2035 Employment Density by Corridor (Employees per Acre)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

6.2.3 INCOME

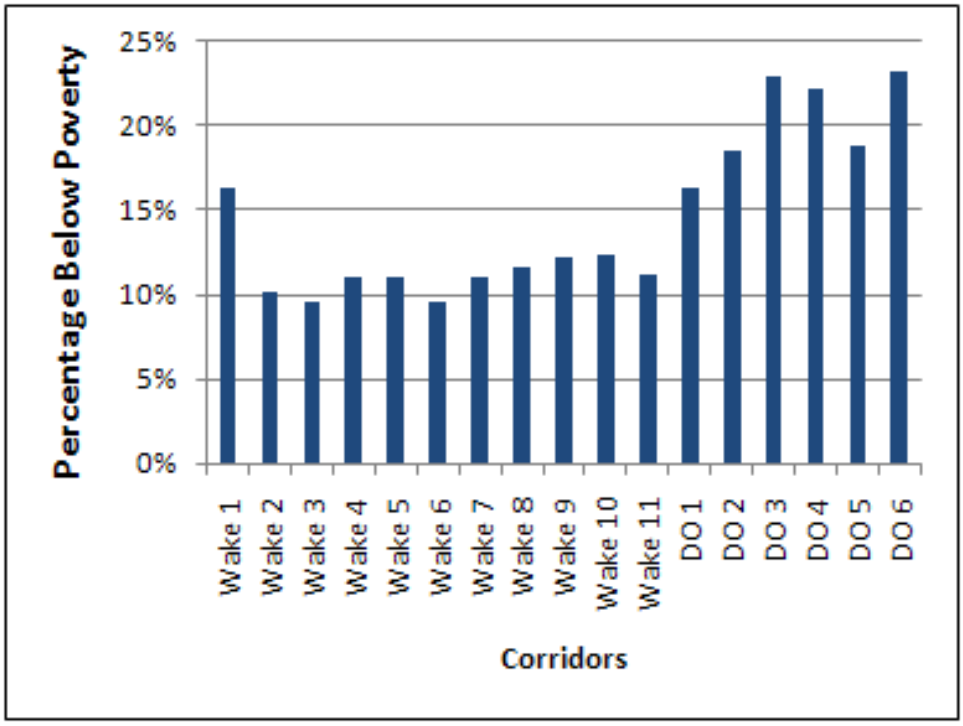
Comparison of income levels alone is not a good indicator of corridor performance however the comparison of 2005 data and 2035 projections is useful in identifying income trends that may be relevant to trends in poverty. Among all of the study corridors, the corridor between Gateway in Chapel Hill and Alston Avenue in Durham (DO6) had the highest percentage of the population below the poverty level in 2000, the lowest mean income in 2005, and is projected to have the lowest mean income in 2035. Corridors DO2, DO3, and DO4 were also among the four lowest mean incomes in both 2005 and 2035, as shown in Table 6.7. All four of these corridors include the section between Erwin/Morreene Roads and Alston Avenue, which has the most severe levels of poverty among the entire study area, as shown on Figure 6.13. Interestingly, the corridor from UNC Hospitals to Gateway (DO5) had the highest mean income in 2005 by a margin of nearly 30% over the next highest corridor, but ranked among the top four highest corridors in terms of percentage below poverty in 2000. This is likely explained by the large UNC student population within this corridor, with little or no income.

Table 6.7 Income Characteristics

Corridors	Termini	Length (Miles)	Mean Income			Below Poverty	% Below Poverty	Poverty Density (Persons per Acre)
			2005	2035	% Change	2000	2000	2000
Wake 1	UNC Hospitals - Wake Forest	59	$54,852	$56,258	3%	17,472	16%	0.46
Wake 2	TMC - Wake Forest	33	$61,991	$58,959	-5%	5,770	10%	0.27
Wake 3	Veridea - Wake Forest	33	$64,059	$61,092	-5%	5,986	10%	0.27
Wake 4	Downtown Cary - Wake Forest	25	$58,867	$57,711	-2%	5,470	11%	0.33
Wake 5	State Fairgrounds - Wake Forest	20	$57,969	$57,632	-1%	4,303	11%	0.32
Wake 6	Downtown Raleigh - Wake Forest	17	$59,238	$58,741	-1%	2,726	10%	0.24
Wake 7	TMC - NERC	24	$60,186	$57,848	-4%	5,398	11%	0.34
Wake 8	NW Cary - NERC	18	$58,091	$57,307	-1%	5,296	12%	0.45
Wake 9	Downtown Cary - NERC	16	$55,809	$56,121	1%	5,098	12%	0.48
Wake 10	State Fairgrounds - NERC	11	$53,442	$55,616	4%	3,931	12%	0.51
Wake 11	Downtown Raleigh - NERC	8	$54,283	$56,628	4%	2,354	11%	0.44
Wake 12	Duke Medical - Downtown Raleigh	29	$50,613	$53,042	5%	10,596	18%	**0.56**
DO 1	UNC Hospitals - Wake Forest	59	$54,852	$56,258	3%	17,472	16%	0.46
DO 2	Duke Medical - Downtown Raleigh	29	$50,613	$53,042	5%	10,596	18%	**0.56**
DO 3	UNC Hospitals - TMC	26	$46,067	$50,084	9%	11,705	**23%**	**0.71**
DO 4	UNC Hospitals - Alston Ave	17	$46,989	$52,030	11%	10,015	**22%**	**0.89**
DO 5	UNC Hospitals - Gateway	7	$82,011	$80,635	-2%	2,437	**19%**	0.49
DO 6	Gateway - Alston Ave	10	$37,502	$41,063	9%	7,660	**23%**	**1.11**

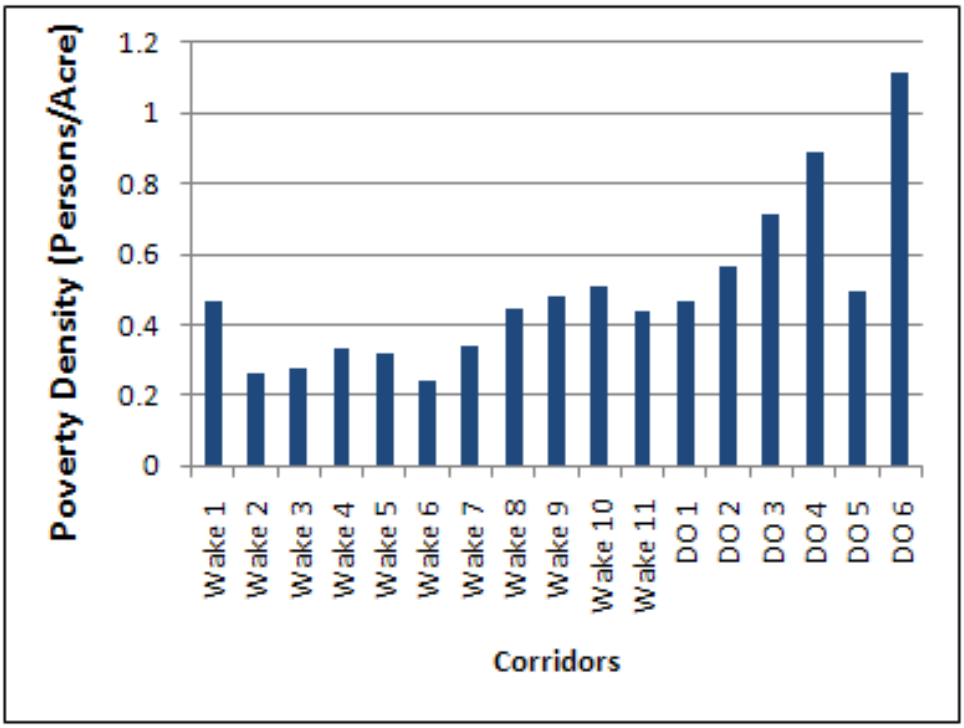
Note: The data listed in emboldened red are top performers for each respective evaluation criterion.

Figure 6.11 Percent Below Poverty Level (2000)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

Figure 6.12 Density of Persons Below Poverty Level (2000)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

Figure 6.13 2000 Poverty Density (Persons per Acre)

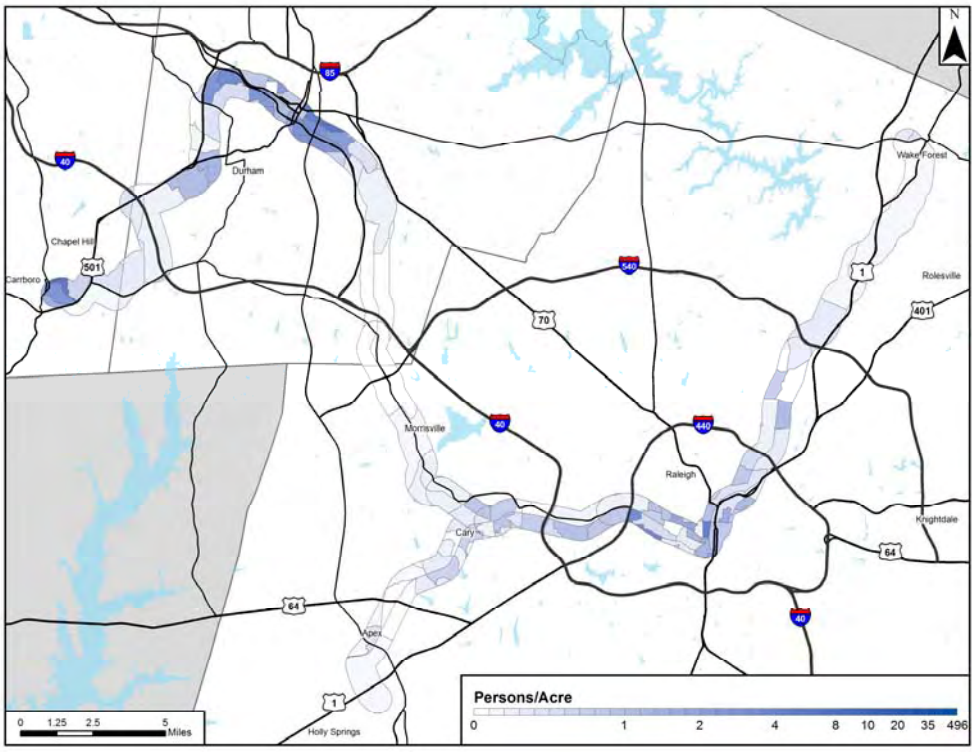
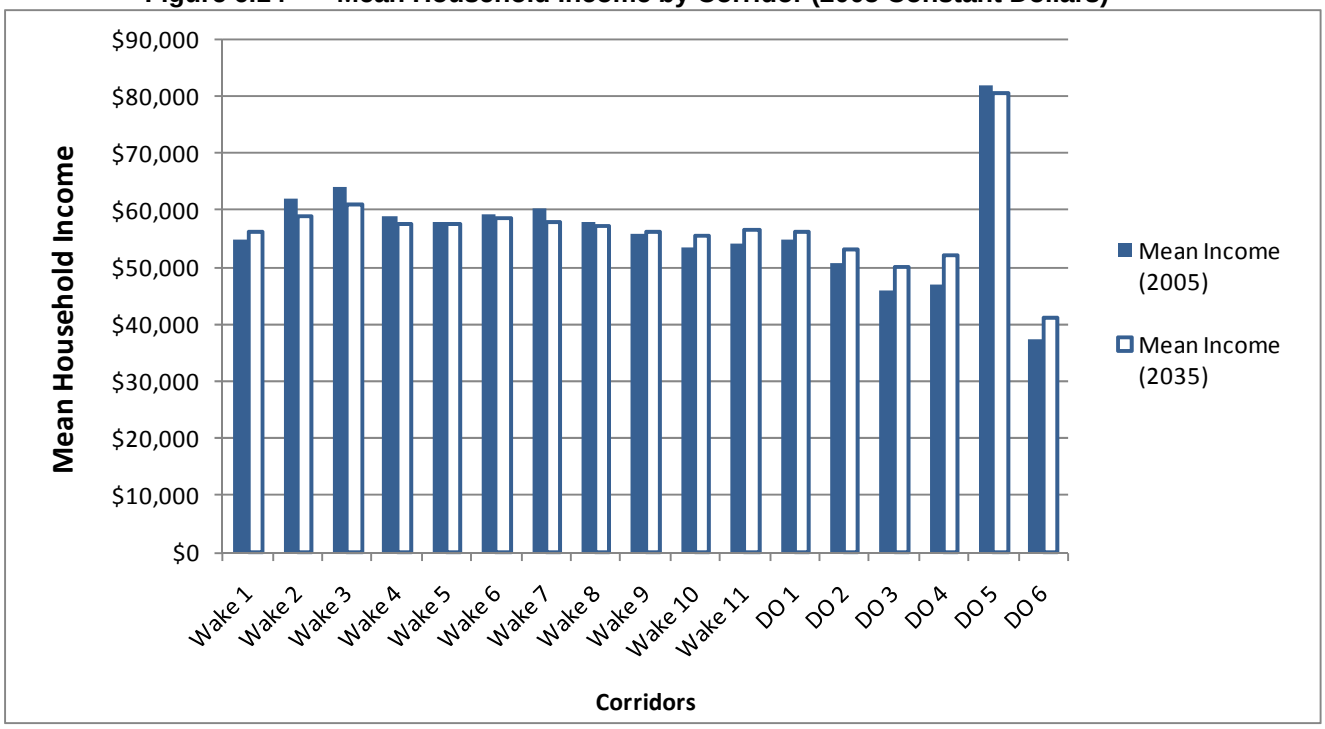


Figure 6.14 Mean Household Income by Corridor (2005 Constant Dollars)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

6.2.4 MINORITY POPULATION

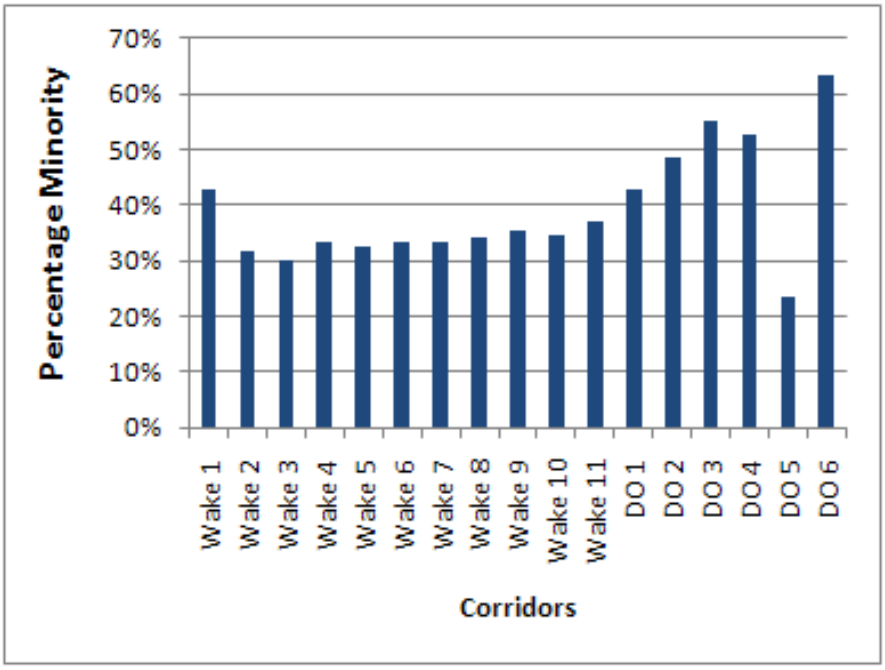
Among all of the study corridors, the corridor between Gateway in Chapel Hill and Alston Avenue in Durham (DO6) had the highest percentage minority population in 2000. Corridors DO2, DO3, and DO4 were also among the four corridors with the highest percentage minority population, as shown in Table 6.8. All four of these corridors include the section between Erwin/Morreene Roads and Alston Avenue, which has the highest minority population density among the entire study area. Figures 6.15 and 6.16, respectively, graphically show percent minority population and density by corridor. Figure 17 shows minority population density within the overall study corridor

Table 6.8 Minority Population (2000)

Corridors	Termini	Length (Miles)	Minority	% Minority	Minority Density (Persons per Acre)
			2000	2000	2000
Wake 1	UNC Hospitals - Wake Forest	59	46,165	43%	1.22
Wake 2	TMC - Wake Forest	33	18,010	32%	0.83
Wake 3	Veridea - Wake Forest	33	18,937	30%	0.87
Wake 4	Downtown Cary - Wake Forest	25	16,509	33%	1.01
Wake 5	State Fairgrounds - Wake Forest	20	12,694	32%	0.94
Wake 6	Downtown Raleigh - Wake Forest	17	9,434	33%	0.84
Wake 7	TMC - NERC	24	7,761	37%	1.44
Wake 8	NW Cary - NERC	18	16,337	33%	1.02
Wake 9	Downtown Cary - NERC	16	15,670	34%	1.32
Wake 10	State Fairgrounds - NERC	11	14,835	35%	1.40
Wake 11	Downtown Raleigh - NERC	8	11,021	35%	1.43
Wake 12	Duke Medical - Downtown Raleigh	29	27,794	**48%**	**1.48**
DO 1	UNC Hospitals - Wake Forest	59	46,165	43%	1.22
DO 2	Duke Medical - Downtown Raleigh	29	27,794	**48%**	**1.48**
DO 3	UNC Hospitals - TMC	26	28,184	**55%**	**1.71**
DO 4	UNC Hospitals - Alston Ave	17	23,827	**53%**	**2.12**
DO 5	UNC Hospitals - Gateway	7	3,067	24%	0.62
DO 6	Gateway - Alston Ave	10	20,989	**64%**	**3.05**

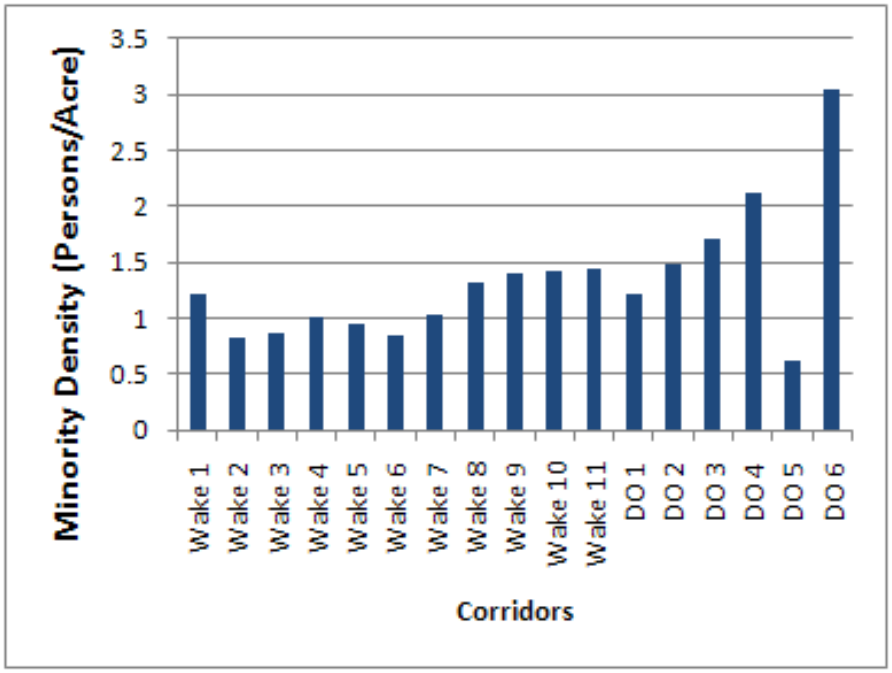
Note: The data listed in emboldened red are top performers for each respective evaluation criterion.

Figure 6.15 Percentage Minority (2000)



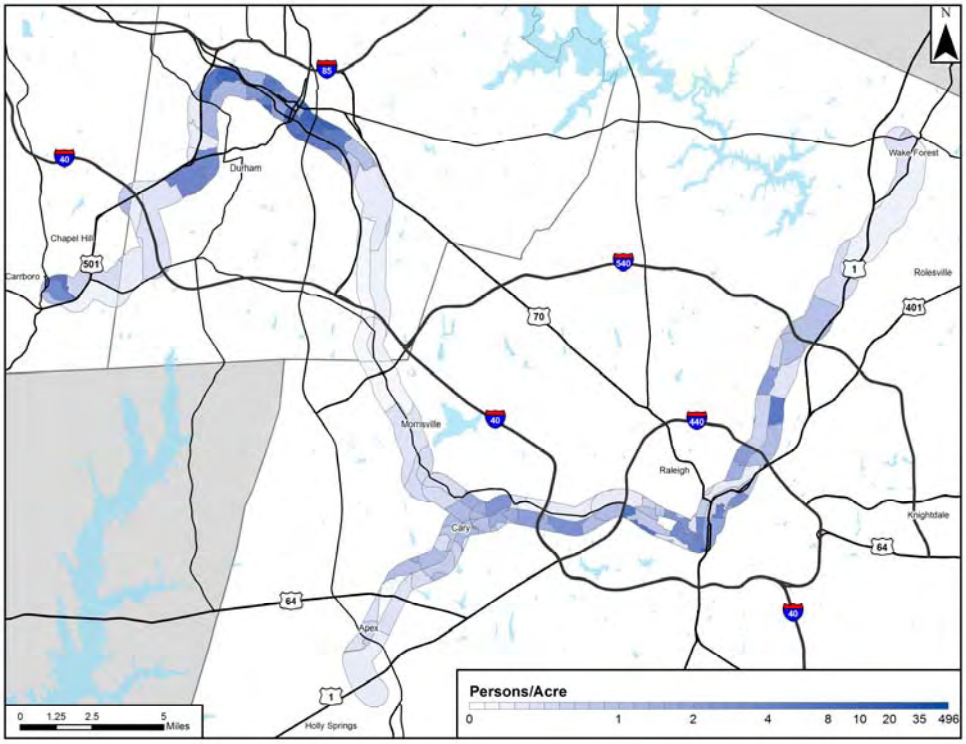
Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

Figure 6.16 Minority Population Density (2000)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

Figure 6.17 2000 Minority Population Density (Persons per Acre)



6.2.5 SUMMARY OF SOCIOECONOMIC CRITERIA

One of the most significant indicators of transit demand is the amount and density of population and employment served by the service. The more trip makers that live, work, and have other trip destinations within close proximity of the service, particularly fixed guideway service, the higher the likelihood of taking transit. The probability of taking transit decreases as the distance from the service increases and potential riders must use additional modes of access (park and ride, feeder bus, and distribution systems). These higher levels of population and employment density occur predominately in the city center areas.

The corridor alternatives serving the segment from downtown Raleigh to the NERC have the highest levels of future household and employment densities. These include Wake 8 (Northwest Cary to NERC), Wake 9 (Downtown Cary to NERC), Wake 10 (State Fairgrounds to NERC), and Wake 11 (Downtown Raleigh to NERC). The Durham Orange corridors that service the central area of downtown Durham have the highest levels of future households and employment densities. These include DO 6 (Gateway to Alston Avenue) and DO 2/Wake 12 (Duke Medical to Downtown Raleigh). While performing well relative to the Durham Orange corridors, the regional corridor of DO2/Wake 12 household and employment values are largely driven by the ends of the corridor in the downtowns of Durham and Raleigh. The central portion of the corridor largely passing through the Research Triangle Park has relatively low levels of household and employment densities. While the Research Triangle Park has high levels of employment, the actual density of employment is low, due to the large area of the Research Triangle Park. It should be noted that the major university student populations living on campus in dormitories are not included in the household summaries but are accounted for in the ridership estimations through the regional travel demand model.

Since the regional transit system must also provide service to the lower income residents that are likely to be dependent on public transit service, an important measure is the areas of low income or with the dominance of households with income below the poverty level. For all of the corridor areas, the area of east Durham has the highest levels of low income households and the highest numbers of households that are below the poverty levels. This same area also has the highest concentration of minority households, a factor that is important in the selection of the priority corridors. These corridors include DO 6 (Gateway to Alston Avenue), DO 3 (UNC Hospitals to Triangle Metro Center), and DO 4 (UNC Hospitals to Alston Avenue).

6.3 LAND USE

Focusing on forming a stronger link between land use and transportation in order to maximize use of existing and future transportation facilities and reducing demand for new infrastructure is integral to sustainable growth and economic development. This is especially true in the Triangle Region where the historical development pattern has been of low density suburban sprawl. A strong transit system combined with effective land use policies and development regulations is integral to organizing and guiding the projected growth and development toward higher densities along transportation corridors.

The land use analysis presented in this Transitional Analysis follows a broad spectrum approach that is appropriate for evaluation of corridor segments without consideration of specific station locations. A much more rigorous and detailed analysis of land use, transit-oriented development (TOD), and potential for joint development opportunities will occur during Alternatives Analysis, after the preferred corridors have been selected. This will allow for a focused analysis of each preferred corridor where detailed land use analysis will be critical to evaluating alignments and determining station locations.

An analysis of land use within approximately ½ mile from the centerline of the proposed transit corridors was conducted to determine the degree to which current, proposed, and potential development patterns are supportive of transit. To help inform this analysis, interviews and/or correspondence with planning staff from most local jurisdictions and agencies were conducted to elicit information on the future development/redevelopment potential of affected land within their respective jurisdictions. Additionally, the most recent comprehensive and/or transportation plans for each jurisdiction were carefully reviewed.

The land use analysis for the 18 corridors was based on the following three key criteria:

- Public sector/regulatory support
    - Existing comprehensive plans consistent with the concepts of compact, mixed-used development near public transportation, or TOD
    - Allowable densities and flexibility of zoning districts
- Activity centers served
    - Urban centers, including the region's three primary centers (Raleigh, Durham, and Chapel Hill): central business districts
    - Major activity centers, including: colleges and universities (identifying the region's two largest – UNC and NCSU), and suburban employment centers
    - Other special activity centers: fairgrounds, arenas, hospitals

- Development potential
    - Existing (2005) and Projected (2035) Transportation Analysis Zone for household and employment, including absolute and percentage growth over the timeframe
    - Transportation Analysis Zone projected (2035) household and employment density
    - A Relative Future Density/Growth Factor that combined an evaluation of future (2035) household and employment density and growth (2005-2035) relative to the corridor miles provided

6.3.1 PUBLIC SECTOR/REGULATORY SUPPORT FOR TRANSIT-ORIENTED DEVELOPMENT

All of the jurisdictions within the Triangle Regional Transit Program acknowledge and recognize the potential for passenger rail service and the implications for TOD in their most recent long range plans. The jurisdictions vary, however, in the degree to which they allow higher densities and the degree to which they have adopted provisions to facilitate higher densities or have a history of implementing more compact development. Additional communication with planning staff in these jurisdictions confirms their respective commitments to TOD around transit stations in particular and corridors in general, and their intent to ensure land use regulations are transit supportive. In selected cases, provisions have been made to prepare TOD supportive small area plans in the event a transit station should locate within a certain jurisdiction.

In addition to TOD supportive jurisdictional policies, the area's institutional private sector has, to varying degrees, policies that are transit supportive, particularly for employees. Many workers in downtown Raleigh, Durham, and Chapel Hill must pay for parking which encourages more transit use. Parking is provided, however, in suburban employment centers, such as Research Triangle Park.

The major universities and associated medical centers have policies which require commuters wanting to drive and park on the campus to purchase a parking permit, and offer financial or other incentives for using transit or other alternative forms of transportation for commuting. The University of North Carolina at Chapel Hill, North Carolina State University and Duke University all have such policies. UNC-Chapel Hill also has limited the number of parking spaces, so that many employees cannot obtain a permit. Parking for commuting students also is very limited. While many commuters use a combination of park and ride and transit to reach the campus, many others use local or regional transit directly from their homes. For example, at UNC just over 60 percent of all employees drive alone and park on the campus, a much lower ratio than other employment sites in the region. Over 16 percent use transit today, many times the ratio for other locations in the Triangle Region.

These policies are additional to the host municipality TOD policies and actions. The impact of these policies is generally not well captured in the transit ridership projections which are underestimated by the regional travel forecasting model for these locations. The model also does not account for restrictions in parking supply, such as at UNC. That results in likely more transit use and likely more transit supportive development. Therefore, the corridors that have larger urban centers, such as downtown Raleigh- Durham and Chapel Hill and serve the larger universities (UNC and NCSU) are more likely to encourage more transit supportive land use.

While all jurisdictions have adopted transit supportive land use policies, Table 6.9 indentifies relevant jurisdictions where a TOD Overlay Zone is specifically provided for in the zoning

ordinance, or a high density flexible district that acknowledges the potential for a transit station and transit supportive development. Zoning by Right indicates the highest amount of currently allowable densities by rezoning code (with the exception of those allowed by small area plans and TOD overlays). Density of Zoning by Right is identified as Low, Medium, or High, under the following criteria:

Low: < 15 units per acre or approximate equivalent of 0.4 FAR (FAR = Sq. Ft. of building/Sq. Ft. of land area)
Medium: 15 to 50 units per acre or approximately 0.4 to 1.5 FAR
High: > 50 units per acre or approximately a 1.5 FAR

Table 6.9 TOD Zoning Summary by Jurisdiction

Planning Jurisdiction	TOD Overlay Zone	High Density Mixed Use District	Density of Zoning by Right
Town of Wake Forest		X	Low
City of Raleigh	X		High
Town of Cary		X	Medium
Town of Apex		X	Low
Town of Morrisville		X	Low
City of Durham/ Durham County		X	High
Town of Chapel Hill	X		Medium
Wake County		X	Low

The proposed 18 corridors pass through varying numbers of jurisdictions and serve multiple transit stations. Table 6.10 identifies high, medium or low alternatives based on the number of stations served within the various jurisdictions, factoring in their currently allowable densities and using the criteria presented above. Alternatives identified as having high densities of Zoning-By-Right contain higher numbers of stations within jurisdictions with the highest allowable densities at this time (Raleigh and Durham).

Table 6.10 TOD Zoning Summary by Alternative Corridor

Alternatives	Termini	Stations	Density of Zoning by Right
Wake 1	UNC Hospitals - Wake Forest	38	Medium
Wake 2	TMC - Wake Forest	20	Medium
Wake 3	Veridea - Wake Forest	20	Medium
Wake 4	Downtown Cary - Wake Forest	15	Medium
Wake 5	State Fairgrounds - Wake Forest	13	Medium
Wake 6	Downtown Raleigh - Wake Forest	11	Medium
Wake 7	NERC - TMC	16	Medium
Wake 8	NW Cary - NERC	12	High
Wake 9	Downtown Cary - NERC	11	High
Wake 10	State Fairgrounds - NERC	9	High
Wake 11	Downtown Raleigh - NERC	7	High
Wake 12	Duke Medical - Downtown Raleigh	16	Medium
DO 1	UNC Hospitals - Wake Forest	38	Medium
DO 2	Duke Medical - Downtown Raleigh	16	Medium
DO 3	UNC Hospitals - TMC	19	High
DO 4	UNC Hospitals - Alston Ave	17	High
DO 5	UNC Hospitals - Gateway	7	Medium
DO 6	Gateway - Alston Ave	11	Medium

Table 6.11 is a short synopsis of TOD-related policies contained in comprehensive plans and zoning documents by jurisdiction.

Table 6.11 TOD Support from Comprehensive Land Use and/or Transportation Plans

Planning Jurisdiction	Local Land Use	Allowable Residential Densities by Zoning	Allowable Non-Residential Densities by Zoning
Town of Wake Forest	"Promote future transit plans by encouraging transit-supportive design features in areas targeted (true compact mixed-use developments) for transit services such as likely station sites."[1]	Zoning Ordinannce provides a Traditional Neighborhood Zone, minimum development size is 60 acres. Density is determined at Master Plan approval, **building heights cannot exceed 4 stories**. Maximum allowable densitiy under conventional R-8 zoning is **10 DU's/acre**	Zoning Ordinance provides a Historic Core (RA-HC) Zone that accommodates commercial, office, and residential uses. **Maximum height is 4 stories up to 60'. Minimum setbacks are 0 feet (maximum front setback of 5 feet).**
City of Raleigh	"Highest density should occur...within close proximity to transit stations."[2] "Promote transit-oriented development around planned transit stations through appropriate development regulation, education, station area planning, public-private partnerships, and regional cooperation."[3]	Zoning Ordinance provides for a Transit Oriented Development Overlay District (TODOD) that concentrates high density residential development and support services and establishes a broad mix of land uses. Small area plans can be prepared for Transit Station Areas. Downtown Overlay District allows up to **320 DU's/acre.**	Zoning Ordinance provides for an Office and Institution-1 Zone with a maximum FAR of 1.0. The FAR of the Office and Institution-1 Zone may be increased in areas subject to the Downtown Overlay District at the approval of the Planning Commission. The Zoning Ordinance also provides for a Trasit Oriented Development Overlay District, the minimum FAR of which is that of the applciable adopted transit station area plan.
Town of Cary	"Support multi-modal travel by facilitating imaginative planning for the Town's two station areas on the Triangle Transit Authority light rail line - focusing development at nodes instead of strip commercial development."[4]	New Land Development Ordinance allows for a High Intensity Mixed Use District (H-MXD): **50 DU's/acre, 90' building height**	Land Development Ordinance provides for a Town Center District, which includes an Office and Institution Subdistrict. Maximum height in this subdistrict is 90'. No minimum setbacks for this subdistrict.
Town of Apex	Apex Comprehensive Plan acknowledges the TTA regional rail transit system and the plan for a transit station in Apex.	Zoning Ordinance provides for a Major Employment Center District (MEC-CZ) which encourages development of a flexible mix of uses promotes and expands opportunities for public transportation. Max. residential density in High Density Multifamily District is **14 DU's/acre.**	Unified Development Ordinance provides for an Office & Institution Zone, which provides for a maximum height of 60' and minimum setbacks (front, side and rear) of 20'. Maximum built-upon area varies from 65 to 70% based on use.
Town of Morrisville	The Morrisville Land Use Plan has provisions for TOD at the proposed McCrimmon Parkway Station.	Zoning Ordinance provides for a Mixed Use District to accommodate the development of a fully designed project that may incorporate a range of use and provide substantial flexibility from development statndards of conventional districts. Max. residential density in conventional districts is **8 DU's/acre.**	Zoning Ordinance provides for a Mixed Use District for which there is no maximum height or minimum setbacks. General Business District allows for building heights of 50' with setbacks ranging from 10 to 30 (side to front).
City of Durham/ Durham County	"Development in Suburban Transit Areas shall...ensure that, at build-out, minimum required densities in a transit-supportive form shall be achieved."[6]	Durham 2020 Comprehensive Plan allows for a Residential Multifamily Compact Neighborhood (RM-CN): **80 DU's/acre, 145' building height**	Zoning Ordinance provides for a General Office and Institutional District which allows for moderate to high intensity employment and community service activities. Minimum front and rear setbacks are 35' and side setback minimum of 8'. Maximum height of 90' with 50' side yards. Zoning Ordinance provides for a Central Business District for which there are no minimum setbacks nor height requirements.
Town of Chapel Hill	"a fixed guideway stop...should be combined with other civic, governmental, or mixed-use developments to provide alternatives to the use of the automobile and to enhance the pedestrian-oriented environment."[7]	Zoning Ordinance provides for a Transit Oriented Development District. Highest alloawble residential density in conventional districts is **15 DU's/acre and 0.5 FAR.**	Zoning Ordinance provides for a 0.5 FAR in the Transit Oriented Development District.
Wake County	"The Board of Commissioners...endorsed an action agenda for regional public transportation, which included proposals to change land use patterns to support public transportation."[9]	Zoning Ordinance provides for three flexible districts, Planned Development (PD), Classic Mixed-Use (CMU), and Residential Mixed-Use (RMU). Highest allowable residential density in Zoning Ordinance provides for **4.35 DU's/acre.**	Zoning Ordinance provides for a General Business District (GB) for which there is no maximum height, no maximum impervious coverage, and no setbacks when abutting railroad (if not abutting railroad, setbacks are 25' for side and rear and 50' for front and corner).
Orange County	"Coordinate the location of higher intensity / high density residential and non-residential developments with existing or planned locations of public transportation..." "Coordinate land use patterns to facilitate the expanded use of non-auto modes of trave	Highest allowable residential density in Zoning Ordinance provides for **14 DU's/acre, maximum building height is 45'.**	Zoning Ordinance provides for General Commercial-IV (GC-4) Zone, for which there is a maximum height of 45' and no minimum setbacks, and a maximum FAR of 0.566 for planned development and 0.492 for non-planned development.

In terms of support of public policies, all of the jurisdictions provide strong policy support for TOD. The City of Raleigh allows higher density by right than the other jurisdictions with 320 dwelling units per acre in their Downtown Overlay District, followed by Durham which allows 80 dwelling units per acre and 145-foot building heights in a residential multi-family compact neighborhood. Cary and Chapel Hill offer a more mid-range density by right (15 to 50 units per acre approximately a 0.4 to 1.5 FAR). Wake Forest, Wake County, Orange County, Morrisville and Apex offer a lower density by right. Corridor alternatives that have the highest proportion of potential station areas in jurisdictions allowing higher density could be considered as currently providing more transit supportive policies.

6.3.2 ACTIVITY CENTERS SERVED

Activity centers are areas with mixed or multiple land uses or unique facilities that generate and attract person trips. The total number of activity centers served provides a less meaningful comparison because the size and type of those centers varies greatly. For the purposes of this analysis, activity centers are grouped into three major categories with an emphasis on identifying those activity centers of the most transit land use supportive character (pedestrian environment, compact development, limited parking, etc), and largest scale (employees, students, activity generators and attractors, etc):

- Urban Centers
    - Comprised of the urban cores, or downtowns. Downtowns are typified by their relatively high concentrations of employment and a daytime population that commutes into and out of the urban core on a daily basis, five days a week. They are, by their very nature, transit-friendly.
    - The primary urban cores that anchor the region are the downtowns of Raleigh, Durham, and Chapel Hill.
    - Secondary urban cores (in terms of employees, households and activity generators) are the town centers of Wake Forest, Cary and Apex.
- Major Activity Centers
    - Colleges and universities, include: NC State (NCSU), UNC, Duke, NC Central, Meredith College, Shaw University, and Peace College. They are also, by their nature, transit-friendly with a compact, pedestrian-friendly environment, limited parking, and a large number of transit dependent students.
    - The three largest institutions and complexes in this group are NC State University with approximately 31,000 students and 8,000 faculty and staff, and UNC at Chapel Hill and University Hospital with approximately 29,000 students and 7,000 faculty and staff, and Duke University and University Medical facilities with approximately 13,000 students and 1,800 faculty and staff. It is estimated that over half of the students commute to classes at each university.
    - Suburban employment nodes and corridors are generally less transit-friendly in terms of density, pedestrian character, parking provided, and design. These include: Research Triangle Park (RTP), North East Regional Center (NERC), State Government Center, NC 54 Corridor, Gateway, East 54, Glenn Lennox, Meadowmont, Leigh Village, and I-40.

- Special Activity Centers
  - Hospitals: UNC, Duke, Veterans Affairs which are highly concentrated employment centers.
  - Event centers: State Fairgrounds, Carter Finley Stadium, RBC Center, Durham Bulls Athletic Park which vary greatly in terms of attendance and number of event days.
- Primary Transit Supportive Activity Centers — These six centers comprise the urban cores of Raleigh, Durham, and Chapel Hill. Also included are NCSU, the combined Duke University campus and hospital complex, and the combined UNC campus and hospital complex. In all three cases the student and employee populations exceed 30,000, with UNC exceeding 50,000.

Table 6.12 shows the number of activity centers within each of the 18 proposed transit route alternatives by category, and an identification of the number of the Transit Supportive Primary Activity Centers (downtown Raleigh, Durham, and Chapel Hill and UNC, NCSU and Duke) served by a given corridor.

The Wake 1 and Durham/Orange (DO) 1 alternatives serve all 18 identified activity centers and the six primary transit supportive activity centers, and would be considered high performers under this criterion. Alternatives that serve three to four of the primary transit supportive alternative centers would be considered medium performers, and those that serve one to two would be considered low performers, under this criterion.

Table 6.12 Activity Centers within Transit Alternatives

Alternatives	Termini	Urban Centers	Major Activity	Special Activity	Total	Primary Activity*
Wake 1	UNC Hospitals - Wake Forest	5	11	6	22	6
Wake 2	TMC - Wake Forest	3	6	3	12	2
Wake 3	Veridea - Wake Forest	4	5	3	12	2
Wake 4	Downtown Cary - Wake Forest	3	5	3	11	2
Wake 5	State Fairgrounds - Wake Forest	2	4	3	9	2
Wake 6	Downtown Raleigh - Wake Forest	2	5	3	10	2
Wake 7	TMC - NERC	2	6	3	11	2
Wake 8	NW Cary - NERC	2	5	3	10	2
Wake 9	Downtown Cary - NERC	2	5	3	10	2
Wake 10	State Fairgrounds - NERC	1	5	3	9	2
Wake 11	Downtown Raleigh - NERC	1	5	0	6	1
Wake 12	Duke Medical - Downtown Raleigh	3	8	5	12	4
DO 1	UNC Hospitals - Wake Forest	5	11	6	22	6
DO 2	Duke Medical - Downtown Raleigh	3	8	5	16	4
DO 3	UNC Hospitals - TMC	2	6	3	11	4
DO 4	UNC Hospitals - Alston Ave	2	5	3	10	4
DO 5	UNC Hospitals - Gateway	1	3	1	5	2
DO 6	Gateway - Alston Ave	1	3	2	6	2
Mean		2.44	5.89	3.22	11.33	3.19

**Primary transit supportive activity centers: Downtown Raleigh, Durham, Chapel Hill, NCSU, Duke U & Medical, UNC & Medical*

6.3.3 FUTURE TRANSIT-ORIENTED DEVELOPMENT (TOD) POTENTIAL

A series of factors were utilized to identify future TOD potential for each corridor alternative by focusing on existing and projected household and employment data and the growth in households and employment. Potential for new TOD is a function of the density of households and employment in the corridor alternative and the growth that is projected. A Relative Future Density/Growth (RFDG) factor was formulated and normalized on a per mile basis to summarize the density and growth factors and adjust for the general level of transit investment required and land area involved.

Table 6.13 and 6.14 respectively show existing and future households and employment by corridor alternative, as well as the projected absolute and percentage growth by corridor alternative. All of these factors have been indexed against the corridor alternative generating the highest households, employment or change in households and employment over the projection period. This measures how each corridor alternative services existing or future households and employment and the absolute or relative change through 2035.

Table 6.15 displays the 2035 projected household and employment densities for the corridor alternatives, plus the estimated number of proposed stations and miles for each corridor alternative.

Table 6.16 calculates a Relative Future Density/Growth (RFDG) Factor for each corridor alternative. This factor combines the prior density factors with the projected growth in households and employment and adjusts for the number of corridor miles. This is a combination of future density and projected growth served relative to the transit investment required and geographic area involved. Subsequent detailed station area and policy analysis would be needed to establish the ability to effectuate and concentrate more transit sensitive development.

Relative Future Density/Growth (RFDG) Factor is a function of projected employment and household density in 2035, projected increases in households and employment from 2005 to 2035, and the number of miles in each alternative. Projection data is taken from the Transportation Analysis Zone data as provided by CAMPO and DCHCMPO. The factor is derived by the following formula:

$$\frac{(\text{2035 Household Density} + \text{2035 Employment Density}) \times (\Delta\text{Households} + \Delta\text{Employment}) / 100{,}000}{\text{Corridor Miles}}$$

Higher densities and growth concentrated within a shorter transit corridor result in a higher factor.

The RFDG Factor is a measure of future density and future growth potential for specific corridors based on current projections for absorbing net new households and employment. Actual growth within specific corridors could be greater or more concentrated if more aggressive TOD policies are adopted and transit stations come into being. RFDG factors exceeding 0.9 would be considered high under this criterion, factors between 0.50 and 0.89 would be considered medium, and factors less than 0.50 would be considered low.

Table 6.13 Existing and Projected Households and Household Alternative Growth by Corridor

Alternatives	Termini	2005 Households	2035 Households	Increase in Households	% HH Increase
Wake 1	UNC Hospitals - Wake Forest	39,906	100,333	60,427	151%
Wake 2	TMC - Wake Forest	22,037	66,973	44,936	204%
Wake 3	Veridea - Wake Forest	24,138	70,633	46,494	193%
Wake 4	Downtown Cary - Wake Forest	18,071	55,596	37,526	208%
Wake 5	State Fairgrounds - Wake Forest	14,054	45,881	31,828	226%
Wake 6	Downtown Raleigh - Wake Forest	12,240	39,886	27,646	226%
Wake 7	TMC - NERC	18,499	58,842	40,343	218%
Wake 8	NW Cary - NERC	15,964	51,257	35,293	221%
Wake 9	Downtown Cary - NERC	14,533	47,465	32,932	227%
Wake 10	State Fairgrounds - NERC	10,516	37,750	27,234	259%
Wake 11	Downtown Raleigh - NERC	8,703	31,755	23,052	265%
Wake 12	Duke Medical - Downtown Raleigh	19,487	58,788	39,301	202%
DO 1	UNC Hospitals - Wake Forest	39,906	100,333	60,427	151%
DO 2	Duke Medical - Downtown Raleigh	19,487	58,788	39,301	202%
DO 3	UNC Hospitals - TMC	17,884	34,590	16,705	93%
DO 4	UNC Hospitals - Alston Ave	15,847	28,897	13,049	82%
DO 5	UNC Hospitals - Gateway	3,691	8,663	4,973	135%
DO 6	Gateway - Alston Ave	12,961	22,095	9,134	70%
Mean		**18,218**	**51,029**	**32,811**	**185%**

Table 6.14 Existing and Projected Employment and Employment Alternative Growth by Corridor

Alternatives	Termini	2005 Employment	2035 Employment	Increase in Emp.	% Emp. Increase
Wake 1	UNC Hospitals - Wake Forest	191,673	361,061	169,388	88%
Wake 2	TMC - Wake Forest	106,579	207,024	100,445	94%
Wake 3	Veridea - Wake Forest	99,095	190,746	91,651	92%
Wake 4	Downtown Cary - Wake Forest	93,451	170,486	77,035	82%
Wake 5	State Fairgrounds - Wake Forest	85,718	150,969	65,251	76%
Wake 6	Downtown Raleigh - Wake Forest	61,897	120,126	58,229	94%
Wake 7	TMC - NERC	101,124	187,575	86,451	85%
Wake 8	NW Cary - NERC	90,466	159,174	68,708	76%
Wake 9	Downtown Cary - NERC	87,997	151,037	63,040	72%
Wake 10	State Fairgrounds - NERC	80,264	131,520	51,256	64%
Wake 11	Downtown Raleigh - NERC	56,443	100,678	44,235	78%
Wake 12	Duke Medical - Downtown Raleigh	127,830	234,467	106,637	83%
DO 1	UNC Hospitals - Wake Forest	191,673	361,061	169,388	88%
DO 2	Duke Medical - Downtown Raleigh	127,830	234,467	106,637	83%
DO 3	UNC Hospitals - TMC	88,340	158,476	70,136	79%
DO 4	UNC Hospitals - Alston Ave	67,392	131,286	63,894	95%
DO 5	UNC Hospitals - Gateway	17,988	38,131	20,143	112%
DO 6	Gateway - Alston Ave	52,619	99,574	46,955	89%
Mean		**96,021**	**177,103**	81,082	85%

Table 6.15 Projected Household and Employment Densities (2035)

Alternatives	Termini	Household Density[1]	Employment Density[2]	Combined Density
Wake 1	UNC Hospitals - Wake Forest	2.7	9.6	12.26
Wake 2	TMC - Wake Forest	3.1	9.5	12.59
Wake 3	Veridea - Wake Forest	3.2	8.8	12.04
Wake 4	Downtown Cary - Wake Forest	3.4	10.4	13.78
Wake 5	State Fairgrounds - Wake Forest	3.4	11.2	14.60
Wake 6	Downtown Raleigh - Wake Forest	3.6	10.8	14.37
Wake 7	TMC - NERC	3.7	11.8	15.49
Wake 8	NW Cary - NERC	4.3	13.4	17.70
Wake 9	Downtown Cary - NERC	4.5	14.2	18.69
Wake 10	State Fairgrounds - NERC	4.9	17.0	21.84
Wake 11	Downtown Raleigh - NERC	5.9	18.7	24.59
Wake 12	Duke Medical - Downtown Raleigh	3.1	12.5	15.63
DO 1	UNC Hospitals - Wake Forest	2.7	9.6	12.26
DO 2	Duke Medical - Downtown Raleigh	3.1	12.5	15.63
DO 3	UNC Hospitals - TMC	2.1	9.6	11.70
DO 4	UNC Hospitals - Alston Ave	2.6	11.7	14.27
DO 5	UNC Hospitals - Gateway	1.8	7.7	9.45
DO 6	Gateway - Alston Ave	3.2	14.4	17.61

[1]households/acre, [2]employees/acre

Table 6.16 Relative Future Density/Growth Factor by Transit Corridor Alternative

Alternatives	Termini	Combined Density	Combined Δ↑ HH & Emp.	Corridor Miles	RFDG Factor
Wake 1	UNC Hospitals - Wake Forest	12.26	229,815	59	0.48
Wake 2	TMC - Wake Forest	12.59	145,381	33	0.55
Wake 3	Veridea - Wake Forest	12.04	138,145	33	0.50
Wake 4	Downtown Cary - Wake Forest	13.78	114,561	25	0.63
Wake 5	State Fairgrounds - Wake Forest	14.60	97,079	20	0.71
Wake 6	Downtown Raleigh - Wake Forest	14.37	85,875	17	0.73
Wake 7	TMC - NERC	15.49	126,794	24	0.82
Wake 8	NW Cary - NERC	17.70	104,001	18	1.02
Wake 9	Downtown Cary - NERC	18.69	95,972	16	1.12
Wake 10	State Fairgrounds - NERC	21.84	78,490	11	1.56
Wake 11	Downtown Raleigh - NERC	24.59	67,287	8	2.07
Wake 12	Duke Medical - Downtown Raleigh	15.63	145,938	29	0.79
DO 1	UNC Hospitals - Wake Forest	12.26	229,815	59	0.48
DO 2	Duke Medical - Downtown Raleigh	15.63	145,938	29	0.79
DO 3	UNC Hospitals - TMC	11.70	86,841	26	0.39
DO 4	UNC Hospitals - Alston Ave	14.27	76,943	17	0.65
DO 5	UNC Hospitals - Gateway	9.45	25,116	7	0.34
DO 6	Gateway - Alston Ave	17.61	56,089	10	0.98

6.3.4 SUMMARY OF LAND USE

As noted, the jurisdictions in the region have adopted strong policies supportive of transit-oriented development in the planned transit corridors. This is a direct result of the ongoing comprehensive planning process that incorporates LRTPs into the comprehensive plans for the cities, towns, and counties in the region. The analysis of the land use plans and policies and Zoning by Right illustrate that the potential for higher densities of population, households, and employment is relatively strong in all of the proposed corridor alternatives. It then becomes the issue of identifying the best group of high performing corridors. This is currently based primarily on the existing allowed density and the history of facilitating high density development.

The activity center measure differentiates corridors that connect the greatest number of the region's largest and most transit-friendly activity centers: downtowns of Raleigh, Durham, Chapel Hill, and the area's three largest educational/medical centers (UNC, NCSU, and Duke).

To identify the better performing corridors, a series of economic and demographic factors were utilized focusing on existing and projected household and employment data and the growth in households and employment by corridor. In addition, future density and relative future density/growth factors were examined. Potential for new transit-oriented development is a function of the 2035 density of households and employment in the corridor and the growth that is projected.

In an effort to summarize the economic and demographic factors, a Relative Future Density/Growth (RDFG) Factor was formulated and normalized on a per mile basis. In this analysis, the Wake Alternatives 8 through11 have the highest factors and Wake 11 performs the best. Wake 7 (TMC to NERC) and the regional corridor, Wake 12 (Duke Medical to Downtown Raleigh), also perform well but have factors just under Wake 8. For the Durham-Orange corridors, DO 6 (Gateway to Alston Avenue) has the highest factor of the Durham-Orange corridors. The regional corridor, DO 2 (Duke Medical to Downtown Raleigh) also performs well but is just under DO 6 and slightly better than DO 4 (UNC Hospitals to Alston Avenue).

6.4 FINANCIAL

An analysis of the capital costs as well as the operating and maintenance costs was conducted in order to determine the most cost-effective corridor segments in the overall rail plan. All costs are given in 2010 dollars. Ridership data is based on 2035 projections from the TRM.

6.4.1 CAPITAL COSTS

Total capital cost provides a basic assessment of the overall capital cost of each corridor. Among the 18 study corridors, the segments traveling from UNC Hospitals to Wake Forest (W1 and DO1) had the highest overall capital cost, as shown in Table 6.15. This is not surprising, as these two alternatives are the longest corridors under consideration. Likewise, the study corridor extending from UNC Hospitals to Gateway (DO5) had the lowest overall capital cost. The capital costs presented are in 2010 dollars and are fully loaded costs including: construction, maintenance facilities, right-of-way, and a 30 percent allocated contingency (design/estimating contingency), a 30 percent allocation for engineering, administrative, and construction management cost; and a 5 percent unallocated contingency (construction contingency).

Table 6.17 Capital Costs (2010 Dollars)

Corridors	Termini	Length[1] (Miles)	Total Capital Cost (M$)	Capital Cost per Mile (M$)	Capital Cost[2] per Weekday Rail Trip ($)	Capital Cost[2] per Weekday Passenger Mile ($)
Wake 1	UNC Hospitals - Wake Forest	57	$ 3,500	**$61**	$56	**$6**
Wake 2	TMC - Wake Forest	32	$ 1,900	**$59**	$62	$10
Wake 3	Veridea - Wake Forest	32	$ 2,000	$62	$61	**$9**
Wake 4	Downtown Cary - Wake Forest	24	$ 1,500	$63	$66	$12
Wake 5	State Fairgrounds - Wake Forest	20	$ 1,200	$61	$70	$14
Wake 6	Downtown Raleigh - Wake Forest	16	$ 1,000	$64	$90	$21
Wake 7	TMC - NERC	24	$ 1,500	$61	**$53**	$10
Wake 8	NW Cary - NERC	18	$ 1,100	$62	**$54**	$12
Wake 9	Downtown Cary - NERC	16	$ 1,000	$62	**$54**	$12
Wake 10	State Fairgrounds - NERC	12	$ 780	$66	$55	$17
Wake 11	Downtown Raleigh - NERC	8	$ 580	$74	$69	$27
Wake 12	Duke Medical - Downtown Raleigh	28	$ 1,700	**$60**	$65	**$8**
DO1	UNC Hospitals - Wake Forest	57	$ 3,500	**$61**	$56	**$6**
DO 2	Duke Medical - Downtown Raleigh	28	$ 1,700	**$60**	$65	**$8**
DO 3	UNC Hospitals - TMC	25	$ 1,600	$64	$61	**$9**
DO 4	UNC Hospitals - Alston Ave	17	$ 1,200	$69	$55	$10
DO 5	UNC Hospitals - Gateway	7	$ 470	$66	**$53**	$25
DO 6	Gateway - Alston Ave	10	$ 750	$74	$68	$15

1 Corridor lengths differ slightly from previous analysis sections due to rounding and design detail used for cost projections.

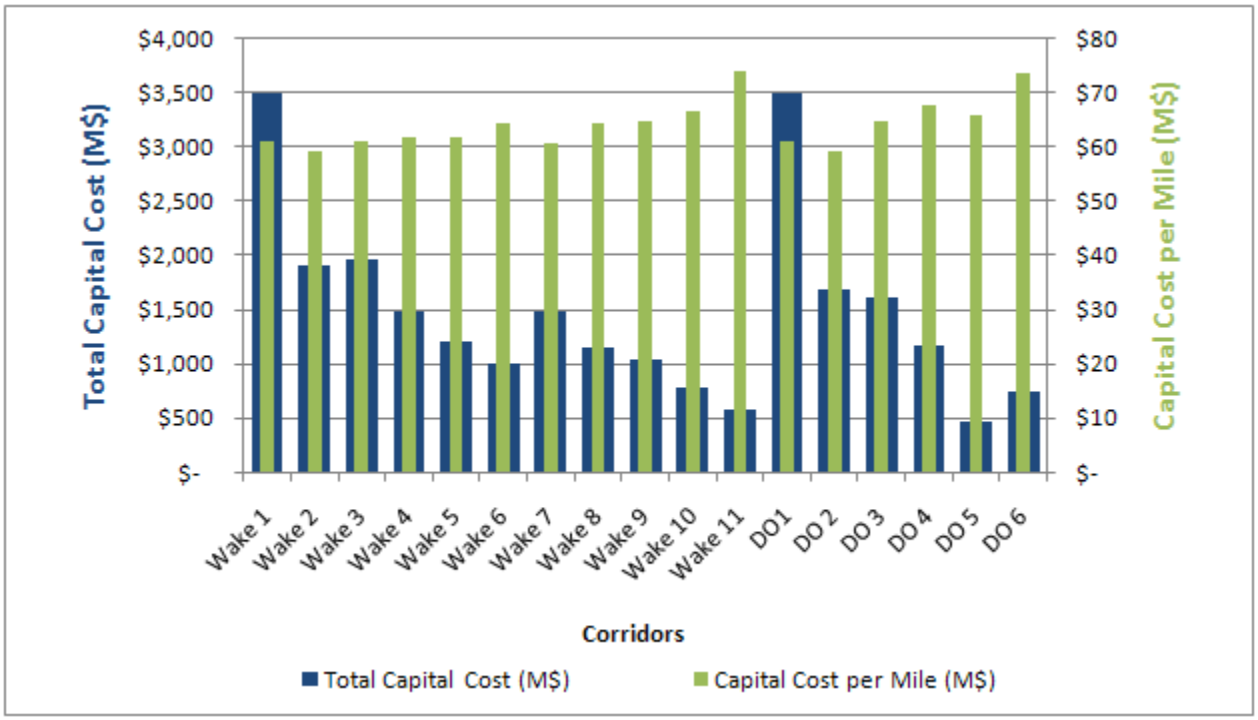
2 Annual amortized capital cost and annual weekday rail trips/PMTs

Note: The data listed in emboldened red are top performers for each respective evaluation criterion.

Capital Cost per Mile

The total capital cost per mile provides a good indication of capital costs while controlling for the disparate lengths of each corridor. Among the 18 study corridors, the alternatives extending from the Triangle Metro Center to Wake Forest (W2), Veridea to Wake Forest (W3), TMC to NERC (W7), and Duke Medical to Downtown Raleigh (DO2) had the lowest capital cost per mile, as shown on Figure 6.18. The study corridors extending from Downtown Raleigh to NERC (W11) and Gateway to Alston Ave (DO6) had the highest capital cost per mile, as shown on Figure 6.18.

Figure 6.18 Capital Cost per Mile (2010 Dollars)

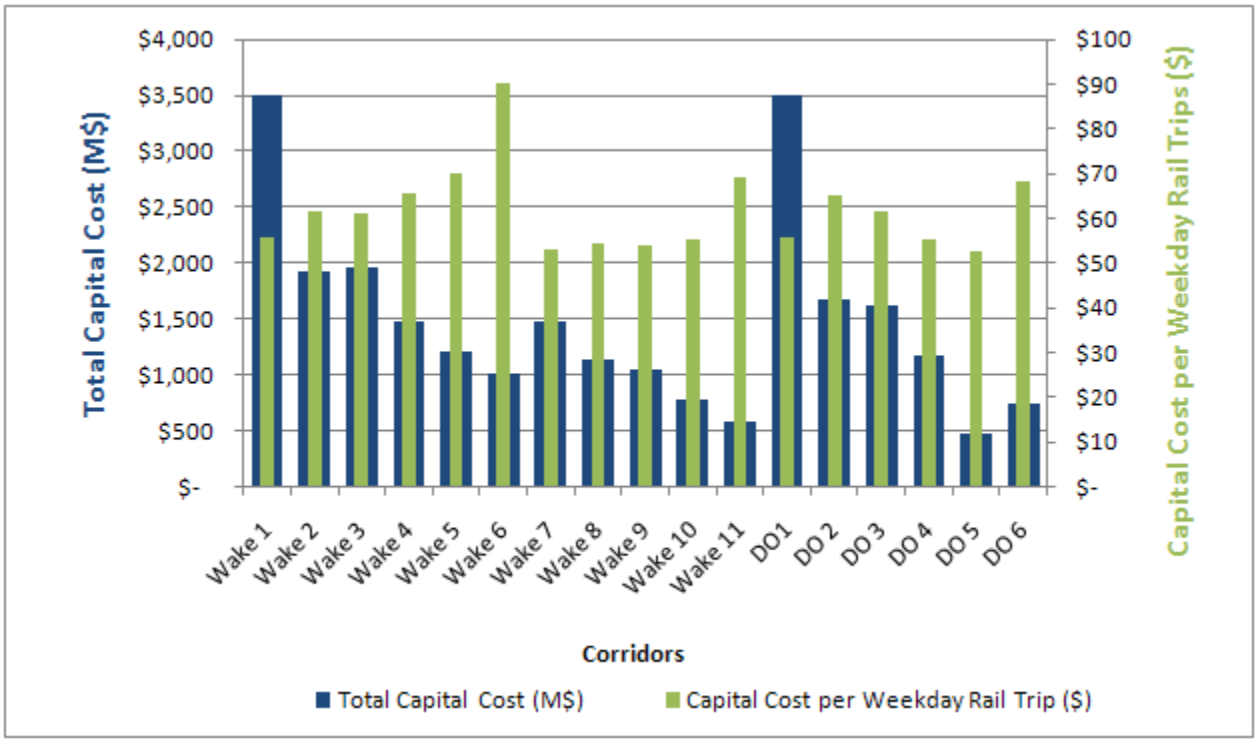


Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

Capital Cost per Weekday Rail Trip

Capital cost per weekday rail trip is an important measure of cost effectiveness, allowing an evaluation of both ridership and capital cost. Annual capital costs were calculated by amortizing total capital costs over the useful life of each capital expense according to FTA guidelines. Among the 18 study corridors, the alternatives extending from western Wake County to NERC (W7, W8, and W9) and the alternative extending from UNC Hospitals to Gateway (DO5) had the lowest annual capital cost per weekday rail trip. Likewise, the study corridors extending from the State Fairgrounds and Downtown Raleigh to Wake Forest (W5 and W6) as well as the corridor extending from Gateway to Alston Ave (DO6) had the highest annual capital cost per weekday rail trip.

Figure 6.19 Capital Cost per Trip (2010 Dollars)

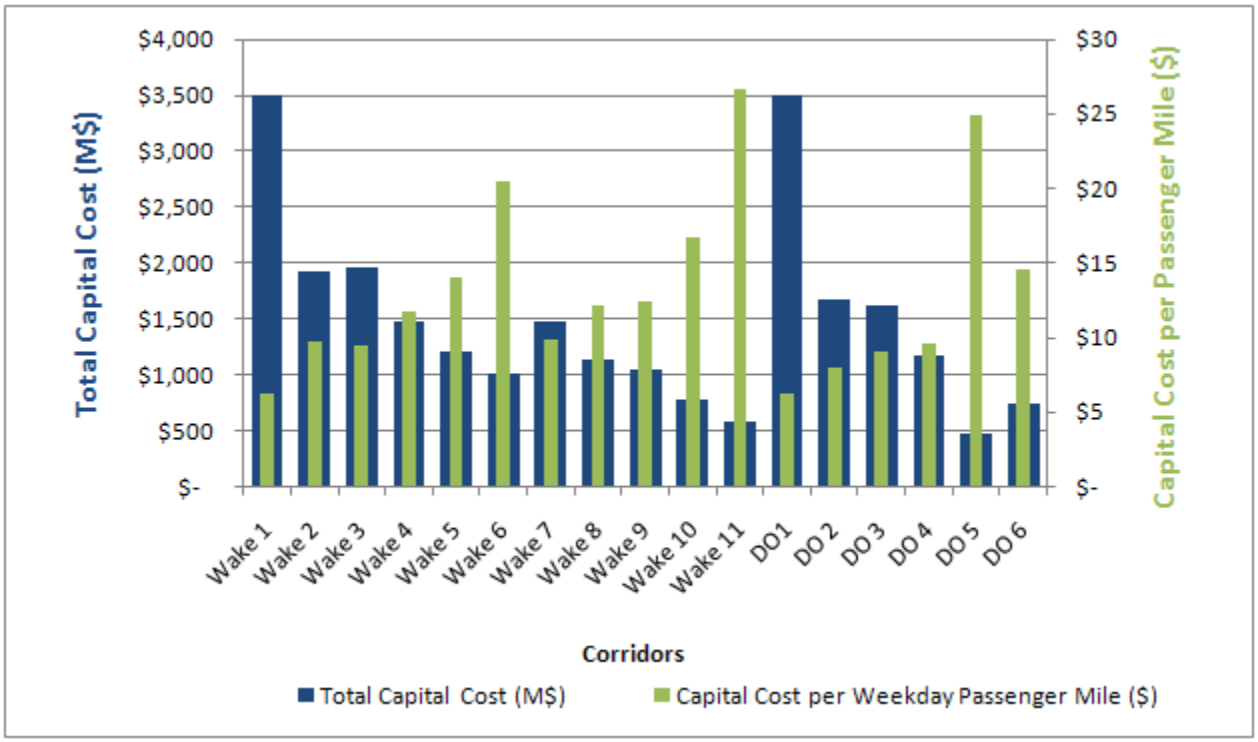


Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

Capital Cost per Weekday Rail Passenger Mile Traveled

This criterion allows an evaluation of cost vs. ridership while controlling for the lengths of passenger trips. Annual capital costs were calculated by amortizing total capital costs over the useful life of each capital expense according to FTA guidelines. Among the 18 study corridors, the alternatives extending from UNC Hospitals to Wake Forest (W1 and DO1), Duke Medical to Downtown Raleigh (DO2), and UNC Hospitals to Triangle Metro Center (DO3) had the lowest annual capital cost per rail mile traveled. The study corridors extending from UNC Hospitals to Gateway (DO5) and Downtown Raleigh to NERC (W11) had the highest annual capital cost per rail passenger mile traveled.

Figure 6.20 Capital Cost per Passenger Mile Traveled (2010 Dollars)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

6.4.2 Operating and Maintenance (O&M) Costs

This criterion provides a basic evaluation of each corridor's annual operating and maintenance costs. Among the 18 study corridors, the alternatives extending from UNC Hospitals to Gateway (DO5), Downtown Raleigh to NERC (DO11), Gateway to Alston Ave (DO6), and the State Fairgrounds to NERC (W10) had the lowest overall operating and maintenance costs, as shown in Table 6.16. The study corridors extending from UNC Hospitals to Wake Forest (W1 and DO1) had the highest overall O&M costs.

Table 6.18 Operating and Maintenance Costs (2010 Dollars)

Corridors	Termini	Length[1] (Miles)	O&M Cost per Year (M$)	Annual O&M Cost per Trip ($)	Annual O&M Cost per Passenger Mile ($)
Wake 1	UNC Hospitals - Wake Forest	57	$46	**$9**	**$1**
Wake 2	TMC - Wake Forest	32	$28	$11	$2
Wake 3	Veridea - Wake Forest	32	$28	**$11**	**$2**
Wake 4	Downtown Cary - Wake Forest	24	$21	$12	$2
Wake 5	State Fairgrounds - Wake Forest	20	$17	$13	$2
Wake 6	Downtown Raleigh - Wake Forest	16	$16	$18	$4
Wake 7	TMC - NERC	24	$22	$10	$2
Wake 8	NW Cary - NERC	18	$17	$10	$2
Wake 9	Downtown Cary - NERC	16	$13	**$9**	$2
Wake 10	State Fairgrounds - NERC	12	$11	$10	$3
Wake 11	Downtown Raleigh - NERC	8	$8	$12	$5
Wake 12	Duke Medical - Downtown Raleigh	28	$24	$12	**$1**
DO1	UNC Hospitals - Wake Forest	57	$46	**$9**	**$1**
DO 2	Duke Medical - Downtown Raleigh	28	$24	$12	**$1**
DO 3	UNC Hospitals - TMC	25	$22	$10	**$2**
DO 4	UNC Hospitals - Alston Ave	17	$16	**$9**	$2
DO 5	UNC Hospitals - Gateway	7	$8	$11	$5
DO 6	Gateway - Alston Ave	10	$11	$13	$3

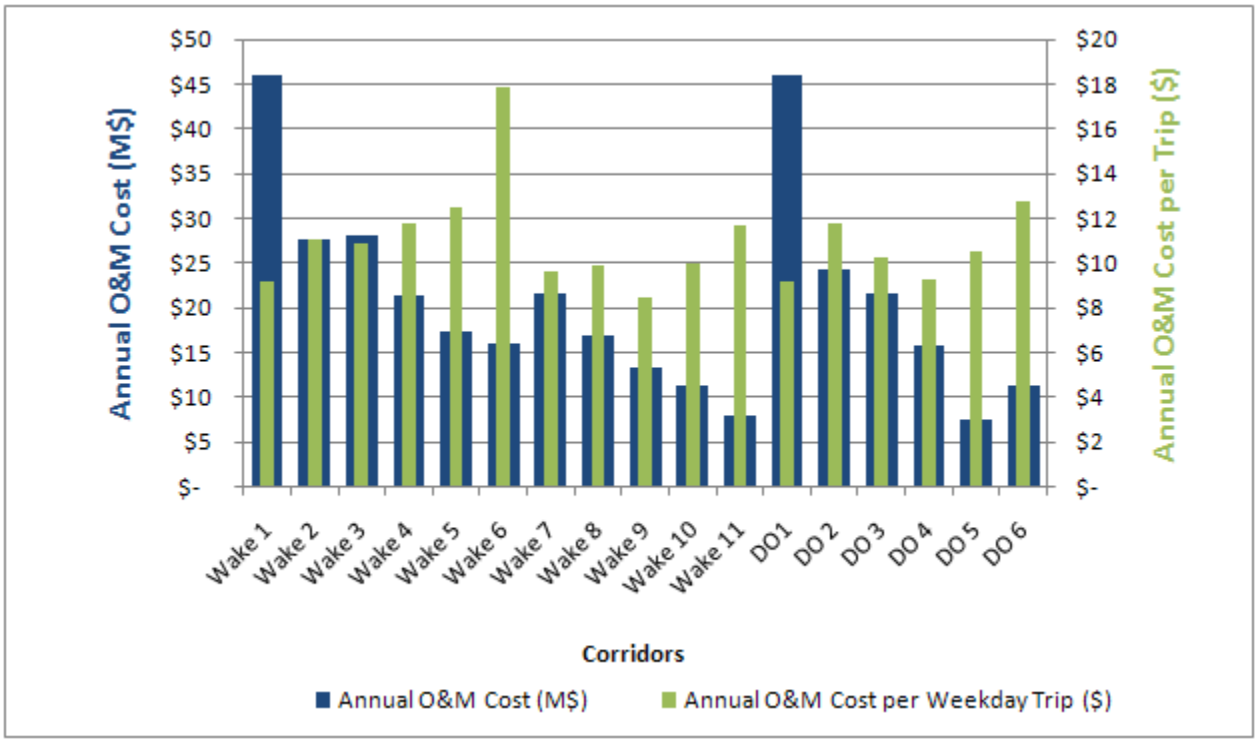
1 Corridor lengths differ slightly from previous analysis sections due to rounding and design detail used for cost projections.

Note: The data listed in emboldened red are top performers for each respective evaluation criterion.

Annual Operating and Maintenance Cost per Weekday Rail Trip

As with section 6.4.3, this criterion is an important measure of cost effectiveness, providing an evaluation of ridership vs. the annual cost necessary to operate and maintain each study corridor. Among the 18 study corridors, the alternatives extending from Downtown Cary to NERC (W9), UNC Hospitals to Wake Forest (W1 and DO1), and UNC Hospitals to Alston Ave (DO4) had the lowest O&M cost per rail trip. The study corridors extending from Downtown Raleigh to Wake Forest (W6) and Gateway to Alston Ave (DO6) had the highest O&M cost per rail trip.

Figure 6.21 Operating and Maintenance Cost per Rail Trip (2010 Dollars)

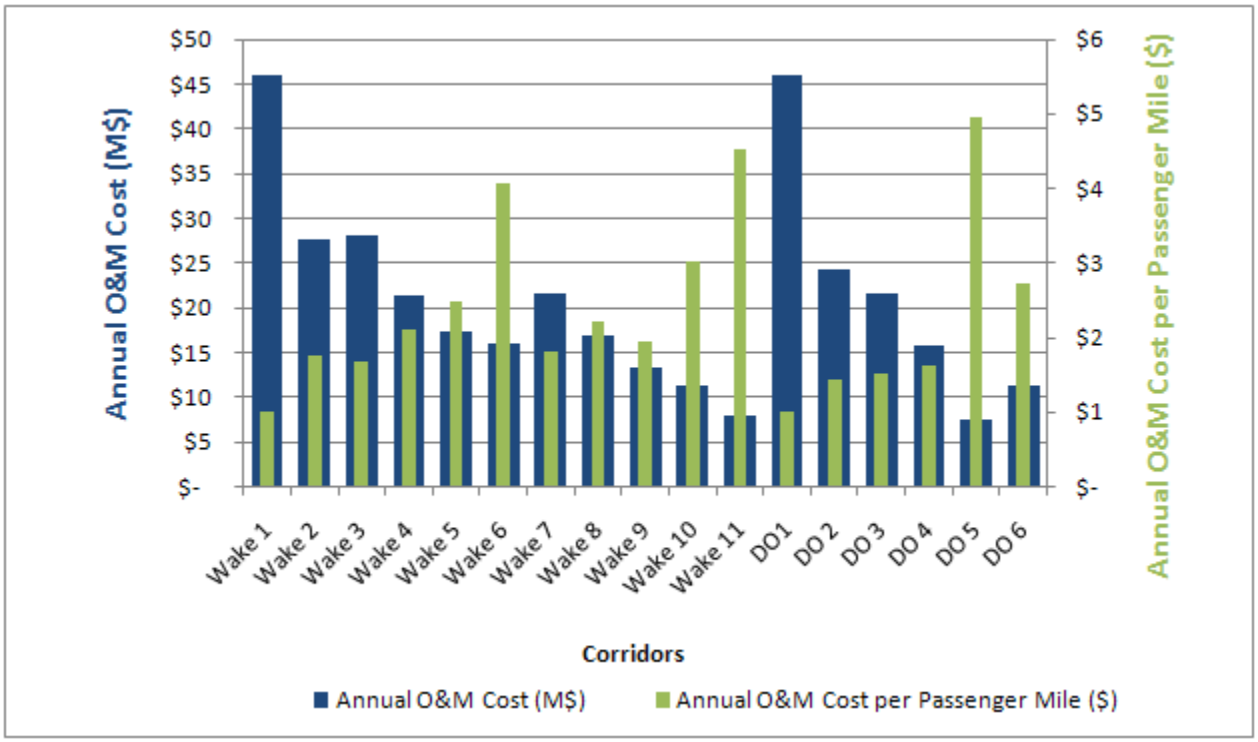


Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

Annual Operating and Maintenance Cost per Weekday Rail Passenger Mile Traveled

This criterion allows an evaluation of cost vs. ridership while controlling for the lengths of passenger trips. Among the 18 study corridors, the alternatives extending from UNC Hospitals to Wake Forest (W1 and DO1), Duke Medical to Downtown Raleigh (DO2), and UNC Hospitals to Triangle Metro Center (DO3) had the lowest O&M cost per rail passenger mile traveled. The study corridors extending from UNC Hospitals to Gateway (DO5) and Downtown Raleigh to NERC (W11) had the highest O&M cost per rail passenger mile traveled.

Figure 6.22 Operating and Maintenance Cost per Passenger Mile Traveled (2010 Dollars)



Note: Wake 12 is not presented in the Chart as it is the same as DO 2, which is presented.

6.4.3 SUMMARY OF FINANCIAL CRITERIA

As with the ridership measures, the capital and operating costs are directly related to overall project length. The longest corridor alternatives have the highest costs. Additionally the highest capital costs occur in the more built up urban areas with the segment from downtown Raleigh to I-440 in the Highwoods area having the highest costs due to both structures and retaining walls. Since all corridors in Wake County include this segment, the longer the corridor, the more these high costs are averaged out over the longer project length with lower capital costs in the suburban, less developed areas.

One of the most useful measures for project cost effectiveness is capital costs per rider. This is computed on an annual basis with daily weekday ridership expanded to annual ridership and capital costs amortized to an annual basis. Using this measure, the most cost effective corridor alternatives in terms of cost per rider are: Wake 7 (Triangle Metro Center to NERC); Wake 8 (Northwest Cary to NERC); Wake 9 (Downtown Cary to NERC); and Wake 10 (State Fairgrounds to NERC) in Wake County, and DO 4 (UNC Hospitals to Alston Avenue); and DO 5 (UNC Hospitals to Gateway) in Durham Orange counties.

The operating and maintenance cost is primarily impacted by the length of the project, the frequency of service, and the station spacing. At this stage of analysis, the same operating characteristics in terms of speeds and headways were assumed to be the same for all alternatives. While there is less distinction between the alternatives in terms of annual operating and maintenance costs per rider than with the capital costs, there are some corridor alternatives that perform marginally better. The majority of the corridors have operating and maintenance costs ranging from $9-$11 per rider with Wake 9 (Downtown Cary to NERC) and

DO4 (UNC Hospitals to Alston Avenue) having the lowest rate of $9 per rider. It should be noted that the longest corridor, DO 2/Wake 12 (UNC Hospitals to Wake Forest) also has the lower rate of $9 per rider.

CHAPTER 7 SELECTION OF PRIORITY CORRIDORS

7.1 PURPOSE

The purpose of the Transitional Analysis document is to identify two priority corridors (one in Wake County and one in Durham-Orange counties) to study in more detail in the Alternatives Analysis. The corridors identified and described in Chapter 4 were analyzed, evaluating mobility, socio-economic conditions, land use, and costs. The results of the analysis are described in Chapter 6. Citizens and project stakeholders will be provided an opportunity to review and comment on the evaluation criteria and the draft results of the corridor analysis. This information will be presented at a series of six public workshops that will be held between September 14 and September 23, 2010.

This chapter summarizes the highest performing corridors in Wake and Durham-Orange Counties and recommends two priority corridors to carry forward to the Alternatives Analysis, based solely on the technical analysis performed.

It is recommended that the regional alternative described in Chapter 4, from West Durham to the Johnston County line, be studied further for a possible commuter rail style service.

Each of the corridors was evaluated based on these stated criteria. This section presents the results of this evaluation for the Wake County corridors and for the corridors in Durham and Orange counties. As stated in Chapter 5, all of the evaluation criteria that were evaluated in this study were developed by the consulting team in partnership with Triangle Transit, DCHC-MPO, and CAMPO. All criteria may be useful or informative regarding any given corridor, and as such all results of the analysis have been included in Chapter 6 of this document. However, some criteria do not meaningfully distinguish between separate corridors, and are not included in the summary performance of each corridor. Tables ES.1 and ES.2 summarize the evaluation criteria that were most helpful in distinguishing between corridors.

7.2 WAKE COUNTY

Twelve corridors in Wake County were evaluated, the results of which can be seen in Table 7.1. A summary of the findings and a recommendation are provided below.

7.2.1 MOBILITY

As indicated in Table 7.1, Wake Alternatives 9 and 10 have the highest performance in terms of rail trips per mile.

7.2.2 SOCIOECONOMIC

As indicated in Table 7.1, Wake Alternatives 8, 9, 10, and 11 have the highest population density in 2035. Wake Alternatives 9, 10, and 11 have the highest employment density in 2035. From 2000 U.S. Census data, Wake Alternatives 1, 4, 5, 7, 8, 9, 10, and 11 had the highest density of persons below the poverty level. Similarly, Wake Alternatives 1, 4, 7, 8, 9, 10, and 11 had the highest density of minority persons.

7.2.3 LAND USE

As indicated in Table 7.1, an evaluation of support for transit-oriented development showed good performance levels for Wake Alternatives with Wake 8 through11 performing the best. For Relative Future Density/Growth (RDFG) Factor, Wake Alternatives 8 through 11 had the highest factors and performed the best.

7.2.4 FINANCIAL

As indicated in Table 7.1, an evaluation of capital cost per mile showed the highest performance for Wake Alternatives 1, 2, 3, 4, 5, and 7. An evaluation of capital cost per weekday trip resulted in the highest performance for Wake Alternatives 1, 7, 8, 9, and 10. Similarly, an evaluation of operating and maintenance cost per weekday transit trip resulted in the highest performance for Wake Alternatives 1, 7, 8, 9, and 10.

7.2.5 CONCLUSIONS

Results of the analysis indicate that Wake Alternatives 9 (from downtown Cary to the Northeast Regional Center) and 10 (from the State Fairgrounds to the Northeast Regional Center) are the overall highest performers. A summary of the evaluation follows:

- Wake Alternatives 9 and 10 have the highest daily rail trip estimates on a per mile basis, with 394 and 402 rail trips per mile respectively. The comparatively stronger ridership is a reflection of the large concentrations of people living within the vicinity of the corridors and the number of dense employment nodes – including downtown Raleigh, NERC, and Cary – that are served by both corridors.

- The corridor alternatives serving the segment from downtown Raleigh to the NERC have the highest levels of future household and employment densities. These include Wake 8 (Northwest Cary to NERC), Wake 9 (Downtown Cary to NERC), Wake 10 (State Fairgrounds to NERC), and Wake 11 (Downtown Raleigh to NERC).

- The jurisdictions in the region have adopted strong policies supportive of transit-oriented development in the planned transit corridors. This is a direct result of the ongoing comprehensive planning process that incorporates the LRTPs into the comprehensive plans for the cities, towns, and counties in the region. The analysis of the land use plans and policies and Zoning by Right illustrate that the potential for higher densities of population, households, and employment is relatively strong in all of the proposed corridor alternatives. It then becomes the issue of identifying the best performing corridors. In an effort to summarize the economic and demographic factors, a Relative Future Density/Growth (RDFG) Factor was formulated and normalized on a per mile basis. In this analysis, the Wake Alternatives 8 through 11 have the highest factors and Wake 11 performs the best. Wake 7 (TMC to NERC) and the regional corridor, Wake 12 (Duke Medical to Downtown Raleigh), also perform well but have factors just under Wake 8.

Table 7.1 Evaluation Criteria Summary (Wake County)

Study Corridor	Corridor Length (mi) / Total Cost M$ (2010)	Mobility		Socioeconomic				Land Use		Financial			
		Total In Corridor Trips per Mile (2035)	Rail Trips/Mile (2035)	Population Density (2035)	Employment Density (2035)	Low Income Population Density (2000)	Minority Population Density (2000)	Supports Transit Oriented Development, Zoning by Right	Relative Future Density / Growth Factor	Capital Cost (2010)	Capital Cost per Mile (2010 Dollars, 2035 Ridership)	Capital Cost per Weekday Transit Trip (2010 Dollars, 2035 Ridership)	Operating & Maintenance Cost/ Weekday Transit Trip (2010 Dollars, 2035 Ridership)
Wake Alternative 1 (UNC Hospitals to Wake Forest)	59/$3,500	◒	◒	○	○	◒	◒	◒	○	○	●	●	●
Wake Alternative 2 (Triangle Metro Center to Wake Forest)	33/$1,900	◒	○	◒	○	○	○	◒	◒	◒	●	◒	◒
Wake Alternative 3 (Veridea to Wake Forest)	33/$2,000	◒	○	◒	○	○	○	◒	◒	○	●	◒	◒
Wake Alternative 4 (Downtown Cary to Wake Forest)	25/$1,500	◒	○	◒	◒	○	○	◒	◒	◒	●	◒	◒
Wake Alternative 5 (State Fairgrounds to Wake Forest)	20/$1,200	◒	○	◒	◒	○	○	◒	◒	◒	●	○	○
Wake Alternative 6 (Downtown Raleigh to Wake Forest)	17/$1,000	◒	○	◒	◒	○	○	◒	◒	●	◒	○	○
Wake Alternative 7 (Triangle Metro Center to NERC)	24/$1,500	◒	●	◒	◒	○	○	◒	◒	◒	●	●	●
Wake Alternative 8 (Northwest Cary to NERC)	18/$1,100	●	●	●	●	◒	◒	●	●	◒	◒	●	◒
Wake Alternative 9 (Downtown Cary to NERC)	16/$1,000	●	●	●	●	◒	◒	●	●	●	◒	●	●
Wake Alternative 10 (State Fairgrounds to NERC)	11/$780	●	●	●	●	◒	◒	●	●	●	○	●	◒
Wake Alternative 11 (Downtown Raleigh to NERC)	8/$580	●	◒	●	●	◒	◒	●	●	●	○	○	◒
Wake Alternative 12 (Duke Medical to Downtown Raleigh)	29/$1,700	◒	○	◒	◒	◒	◒	◒	◒	◒	●	◒	◒
Summary of Evaluation Criteria and Rankings													
High Performer = ●		>22,060 Trips/Mile	>363.5 Trips/Mile	> 3.9 Households/Acre	>13.3 Jobs/Acre	>0.61 Persons/Acre	>1.61 Persons/Acre	Considers the # of stations and allowable densities within jurisdiction	>0.9	<1052	<$62.0 M/Mile	<$56.9/Trip	<$9.9/Trip
Average Performer = ◒		18,452 - 22,060 Trips/Mile	311.3-363.5 Trips/Mile	2.9 - 3.9 Households/Acre	10.3 - 13.3 Jobs/Acre	0.38 - 0.61 Persons/Acre	1.04 - 1.61 Persons/Acre		>0.5-0.89	1052-1925	$62.0 - $66.3 M/Mile	$56.9-66.4/Trip	$9.9-12.1/Trip
Low Performer = ○		<18,452 Trips/Mile	<311.3 Trips/Mile	<2.9 Households/Acre	<10.3 Jobs/Acre	<0.38 Persons/Acre	<1.04 Persons/Acre		<0.50	>1925	>$66.3 M/Mile	>$66.4/Trip	>$12.1/Trip

Note: The breakpoints for the bins are ±0.5 standard deviations from the mean. Data results are given in greater detail in Chapter 6.

- From a cost perspective, Wake Alternatives 9 and 10 are relatively expensive to build when compared to other corridors on a cost per mile basis. Wake Alternatives 9 and 10 would cost $65M per mile and $67M per mile respectively. The higher cost, as compared with other corridors, can be attributed to more expensive infrastructure needs related to limited right-of-way and required infrastructure improvements, particularly in the vicinity of downtown Raleigh. On a per mile basis, longer corridors can spread out the costs associated with these infrastructure upgrades. Unlike other corridors however, Wake Alternative 9, which is 16 miles and Wake Alternative 10, which is 12 miles, are not long enough to spread out the costs of the infrastructure improvements required in the vicinity of downtown Raleigh.

- Although they are higher on a capital cost per mile basis than other corridors, Wake Alternatives 9 and 10 perform relatively well in terms of cost effectiveness due to their strong ridership. The capital cost per transit trip for Wake Alternative 9 is approximately $54 per trip and the capital cost per transit trip for Wake Alternative 10 is approximately $55 per trip.

While Wake Alternatives 9 and 10 are the overall strongest performers among the Wake corridors, Wake Alternative 8, which extends the transit line an additional two miles from downtown Cary to NW Cary, is not significantly far behind in performance. A terminal station in downtown Cary could be problematic due to limited property available for locating an end-of-line park and ride. A relatively short extension to NW Cary, therefore, may improve the feasibility of this corridor by providing more opportunities to locate a park and ride and related transit infrastructure and potentially increasing ridership. Given that this is a high-level screening process and that Wake Alternatives 8 and 11 are not significantly lower performing than Wake Alternatives 9 and 10, consideration should be given to performing the detailed analysis on Wake Alternative 8 which incorporates all of the alignments coincident to Wake Alternatives 9, 10, and 11.

The detailed Alternatives Analysis can fine tune this larger corridor in looking at the most optimal, best-fit initial starter line that may involve cutting back on the alignments at both ends to arrive at the most effective corridor for New Starts funding. This is in recognition of Federal funding capacity and that most starter lines initially constructed are in the 10-12 mile range. Extensions from the initial line would start the full build-out process consistent with funding availability.

Preliminary Technical Recommendation: Given these considerations, it is initially recommended that Wake Alternative 8, which travels between Northwest Cary and the Northeast Regional Center, be advanced to a detailed Alternatives Analysis.

7.3 DURHAM-ORANGE COUNTIES

The project team evaluated a total of six corridors in Durham and Orange counties, the results of which can be seen in Table 7.2. A summary of the findings and a recommendation are provided below.

7.3.1 MOBILITY

As indicated in Table 7.2, an evaluation of total rail trips per mile resulted in the highest performance for Durham-Orange Alternatives 4 and 5.

7.3.2 SOCIOECONOMIC

As indicated in Table 7.2, an evaluation of population density in 2035 resulted in the highest performance for Durham-Orange 6. An evaluation of employment density in 2035 resulted in the highest performance of Durham-Orange Alternative 6. Durham-Orange Alternatives 3, 4, and 6 demonstrated the highest levels of density for persons below the poverty level and density of minority persons.

7.3.3 LAND USE

As indicated in Table 7.1, an evaluation of support for transit-oriented development showed that all corridors had good performance levels with DO 3 and 4 performing the best. For Relative Future Density/Growth (RDFG) Factor, DO 1, 3, and 5 performed low and DO 2, and 4 had good performance levels and DO 6 performed the best.

7.3.4 FINANCIAL

As indicated in Table 7.2, an evaluation of capital cost per mile resulted in the highest performance for Durham-Orange Alternatives 1 and 2. An evaluation of capital cost per weekday trip resulted in the highest performance for Durham-Orange Alternatives 4 and 5. An evaluation of operating and maintenance costs per weekday transit trip resulted in the highest performance for Durham-Orange Alternatives 1 and 4.

7.3.5 CONCLUSIONS

Results of the analysis indicate that Durham-Orange Alternatives 4 (from UNC Hospitals to Alston Avenue), 5 (from UNC Hospitals to Gateway) and 6 (from Gateway to Alston Avenue) are the overall highest performers (note that Alternatives 5 and 6 are subsets of Alternative 4). Primary discriminators between the alternatives include mobility, socio-economics and cost-effectiveness, as discussed here:

- Durham-Orange Alternatives 4 and 5 have the highest daily rail trip estimates on a per mile basis, with 394 and 399 rail trips per mile respectively. This primarily reflects the high employment at UNC and UNC Hospitals, Duke University and Duke Medical Center, and downtown Durham. Several significant mixed-use developments also exist or are planned within the corridor.

- Durham-Orange Alternatives 4 and 6, both of which terminate at Alston Avenue, are the most effective at reaching transit-dependent populations.

Table 7.2 Evaluation Criteria Summary (Durham-Orange Counties)

Study Corridor	Corridor Length (mi) / Total Cost M$ (2010)	Mobility		Socioeconomic				Land Use		Financial			
		Total In Corridor Trips per Mile (2035)	Rail Trips/Mile (2035)	Population Density (2035)	Employment Density (2035)	Low Income Population Density (2000)	Minority Population Density (2000)	Supports Transit Oriented Development, Zoning by Right	Relative Future Density / Growth Factor	Capital Cost (2010)	Capital Cost per Mile (2010 Dollars, 2035 Ridership)	Capital Cost per Weekday Transit Trip (2010 Dollars, 2035 Ridership)	Operating & Maintenance Cost/ Weekday Transit Trip (2010 Dollars, 2035 Ridership)
Durham-Orange Alternative 1 (UNC Hospitals to Wake Forest)	59/$3,500												
Durham-Orange Alternative 2 (Duke Medical to Downtown Raleigh)	29/$1,700												
Durham-Orange Alternative 3 (UNC Hospitals to Triangle Metro Center)	26/$1,600												
Durham-Orange Alternative 4 (UNC Hospitals to Alston Ave)	17/$1,200												
Durham-Orange Alternative 5 (UNC Hospitals to Gateway)	7/$470												
Durham-Orange Alternative 6 (Gateway to Alston Ave)	10/$750												
Summary of Evaluation Criteria and Rankings													
High Performer =		>22,060 Trips/Mile	>363.5 Trips/Mile	> 3.9 Households/Acre	>13.3 Jobs/Acre	>0.61 Persons/Acre	>1.61 Persons/Acre	Considers the # of stations and allowable densities within jurisdiction	>0.9	<1052	<$62.0 M/Mile	<$56.9/Trip	<$9.9/Trip
Average Performer =		18,452 - 22,060 Trips/Mile	311.3-363.5 Trips/Mile	2.9 - 3.9 Households/Acre	10.3 - 13.3 Jobs/Acre	0.38 - 0.61 Persons/Acre	1.04 - 1.61 Persons/Acre		>0.5-0.89	1052-1925	$62.0 - $66.3 M/Mile	$56.9-66.4/Trip	$9.9-12.1/Trip
Low Performer =		<18,452 Trips/Mile	<311.3 Trips/Mile	<2.9 Households/Acre	<10.3 Jobs/Acre	<0.38 Persons/Acre	<1.04 Persons/Acre		<0.50	>1925	>$66.3 M/Mile	>$66.4/Trip	>$12.1/Trip

Note: The breakpoints for the bins are ±0.5 standard deviations from the mean. Data results are given in greater detail in Chapter 6.

- The jurisdictions in the region have adopted strong policies supportive of transit-oriented development in the planned transit corridors. This is a direct result of the ongoing comprehensive planning process that incorporates the LRTPs into the comprehensive plans for the cities, towns, and counties in the region. The analysis of the land use plans and policies and Zoning by Right illustrate that the potential for higher densities of population, households, and employment is relatively strong in all of the proposed corridor alternatives. It then becomes the issue of identifying the best performing corridors. In an effort to summarize the economic and demographic factors, a Relative Future Density/Growth (RDFG) Factor was formulated and normalized on a per mile basis. In this analysis, DO 6 (Gateway to Alston Avenue) has the highest factor of the Durham-Orange corridors. The regional corridor, DO 2 (Duke Medical to Downtown Raleigh) also performs well but is just under DO 6 and slightly better than DO 4 (UNC Hospitals to Alston Avenue).

- From a cost perspective, Durham-Orange Alternatives 4 and 5 are relatively more expensive to build compared to other corridors ($68M per mile and $66M per mile respectively). This is because these corridors are primarily on new alignment that requires more right-of-way acquisition and infrastructure improvements than alternative corridors that use existing railroad right-of-way (e.g., Durham-Orange Alternatives 1 and 2).

- Although they are higher on a capital cost per mile basis than other corridors, Durham-Orange Alternatives 4 and 5 perform better in terms of cost effectiveness due to their strong ridership. The capital cost per transit trip for Durham-Orange Alternative 4 and 5 is approximately $55 and $53 per transit trip, respectively.

Durham-Orange Alternative 4 is the combination of Durham-Orange Alternatives 5 and 6, and hence advancing this longer corridor allows for the most optimal starter line analysis for submission for Federal funding.

Preliminary Technical Recommendation: Since Durham-Orange Alternative 4 is the combination of Durham-Orange Alternatives 5 and 6, it is recommended that Durham-Orange Alternative 4 be advanced to a detailed Alternatives Analysis.

Durham-Orange Alternative 2 (from Duke Medical Center to Downtown Raleigh) was average in terms of socio-economic and strong in land-use factors, but not strong in terms of mobility and costs. Cost-effectiveness would improve if costs could be reduced. The ridership may have been low in part because the ridership model assumed light rail-type service rather than commuter rail-type service, which may be more appropriate for this corridor. For this initial study, costs assumed light rail transit, which is significantly more expensive than commuter rail, which uses primarily existing infrastructure. If connecting the region is a high priority over maximizing the potential for federal funds, then consideration should be given to this alternative. However, if federal funds are achieved with the other, better performing corridors as noted above, then full build out towards Wake Forest and Chapel Hill will occur sooner. If these corridors fail to be competitive for federal funds, then the decision can be revisited on which corridor to advance into preliminary engineering. The opportunity for Federal funding will become evident relatively soon after the New Starts submittal in the fall of 2011.

7.4 REGIONAL CORRIDOR

The current LRTP prepared by both CAMPO and DCHC MPO includes a regional rail system that is comprised of both light rail transit (LRT) and commuter rail service, with the majority of the system being LRT, to be implemented in stages. This systems plan includes the provision

of LRT service between Raleigh and Durham and between Durham and Chapel Hill. There is an overlap in the LRT plans and the commuter rail plans from downtown Raleigh to the Northeast Regional Center (in the location of Capital Boulevard and I-540). The purpose of the Transitional Analysis is to select which segments or corridors of the LRT system should be implemented first with the full system to be constructed in future phases. It is not practical or financially feasible to construct the entire LRT system as a single project and only the most effective segments or corridors should be initiated first, particularly if funding is to be requested from the Federal Transit Administration (FTA) under the New Starts program.

The Transitional Analysis examined a total of 16 corridors, including those that connected the two MPO regions and those that were entirely within either the CAMPO region or the DCHC-MPO region. The corridor alternatives were evaluated in the context of all day, frequent service that is typical of a LRT system. By contrast, a commuter rail system provides service only during the AM and PM peak period trips using a lower frequency of service (typically every 30-60 minutes). While LRT must operate on exclusive tracks, commuter rail can, and typically does, operate on tracks shared with freight and other intercity passenger rail service. In the Triangle Region, the term “express rail” has been identified to include the combination of existing AMTRAK passenger rail, existing and expanded NCDOT passenger rail service between Raleigh and Charlotte, and the additional commuter rail service during the peak periods.

The initial findings of the Transitional Analysis indicate that the corridor alternatives that operate in Wake County from Cary through downtown Raleigh and to the Northeast Regional Center (NERC) perform the best in terms of ridership, riders per mile, and cost per rider. This set of corridor alternatives is followed in performance by those that operate from UNC Hospitals to downtown Durham. The corridor alternative that connects Durham to Raleigh, passing through the Research Triangle Park, performed below both of the previous sets of alternatives. While the provision of LRT service between Durham and Raleigh is not the most cost-effective alternative for initial implementation, the early connection of these two major areas in the region can be provided by commuter rail or express rail service that can be implemented with lower costs than either of the LRT projects. Future extensions of the LRT systems in Wake and Durham counties would connect the two areas with LRT as identified in the LRTP. The major investments in commuter rail would not be wasted because the tracks could continue to be used by other freight and intercity passenger rail service (including the potential High Speed Rail service) and the vehicles could be moved to extensions of the commuter rail service to the areas on the edges of the region serving the downtowns of Raleigh and Durham.

For these reasons, an additional special Alternatives Analysis study will be prepared that evaluates commuter rail service versus LRT. The LRT service would connect the ends of the two initial LRT systems in Wake and Durham counties versus commuter rail service that extends from downtown Durham to east of Clayton using the existing NCRR alignment. This will allow informed decisions to be made on whether early implementation of commuter rail service is worth the investment. If requested, we could also compare LRT service from Durham to Raleigh against commuter rail service from Durham to Raleigh with the assumption that the Wake County and Durham county LRT systems are not implemented.

7.5 OTHER CONSIDERATIONS

With the analysis of corridor performance, rail transit extensions to the Research Triangle Park, Wake Forest, Apex, and points beyond would not be carried forward for further consideration in the more detailed Alternatives Analysis studies. This does not, however, mean that service to

these areas would be eliminated; it simply recognizes that they will be studied in greater detail at a later time. These extensions are truly noteworthy as the system expands, but the purpose of this first set of Alternative Analysis studies is to focus on the most effective corridors for initial transit investment and implementation. This is the formula other cities have used to develop and implement system-wide extensions.

Therefore, for those areas of the region that are not directly considered for initial detailed study in the Alternatives Analysis, additional studies have either been conducted or are recommended as follows:

- Extension of LRT to Garner: Technical memorandum detailing the future extension of the rail transit service from Raleigh to Garner.

- Extensions of commuter rail to Wake Forest and Apex: Technical memoranda analyzing implementation of commuter rail service to Wake Forest and Apex. (This has been suggested by CAMPO as a viable alternative). Considerations could include the following: termini, freight track alignments, operations, and cost.

- Extension of commuter rail service to Hillsborough and Zebulon: There have been requests to include extensions to both Hillsborough and to Zebulon in the study. The purpose of the Transitional Analysis is to determine the priority corridors for early implementation, but not preclude future extensions. White papers further discussing these two extensions are included as Appendix A and B.

- Extension to Carrboro: Project stakeholders from the municipality of Carrboro, Orange County and the DCHC-MPO, as well as citizens from Carrboro have indicated an interest in studying a rail transit connection to Carrboro. Per stakeholder comments, a draft white paper technical study providing an overview of the strategic issues that need addressing to extend rail transit to Carrboro was prepared and is presented in Appendix C.

When completed, the memoranda will be included as Appendices to this Transitional Analysis before it is finalized. These memoranda, along with the results of the Alternatives Analysis process can be used by both the Capital Area MPO and the Durham-Chapel Hill- Carrboro MPO as input to the updates of their respective long range transportation plans.

7.6 NEXT STEPS

On September 29, 2010 there will be a special joint meeting of the Durham-Chapel Hill-Carrboro MPO and the Capital Area MPO to review and comment on the corridors for study in the Alternatives Analysis.

APPENDICES

Appendix A

White Paper Study of Commuter Rail to Zebulon

MARTIN ALEXIOU BRYSON

Memorandum

Transportation Planning
Traffic Engineering

To:	Greg Northcutt, Triangle Transit
From:	George Alexiou, PE
Date:	June 9, 2010
Subject:	Raleigh to Eastern Wake County Corridor Rail Service

This memo provides an explanation for not including the eastern Wake County rail corridor as part of the alternatives analysis studies currently being conducted by Triangle Transit in anticipation of a ½ cent sales tax referendum for funding transit improvements in the Triangle region. The potential for passenger rail service in the Raleigh to East Wake County corridor has been considered since 2001, with the creation of the Eastrans Commuter Rail Alliance by the Town of Knightdale as part of its Comprehensive Plan Update process. Since 2001, two additional studies have analyzed the potential viability of this corridor for passenger rail service.

Eastrans Study

In 2003, the Town of Knightdale commissioned a feasibility study for passenger rail service along two corridors, one between Raleigh and Wilson and the other between Raleigh and Goldsboro. This study, called the Eastrans Commuter Rail Feasibility Study (Eastrans Study), included an analysis of the costs and feasibility of providing passenger rail service from Raleigh to Zebulon. However, no ridership projections were done as part of the study, as it was outside of the scope of work. Based primarily on cost, the study concluded that rail service may be feasible and further study was warranted, and that in order to move the project forward, it would need to be included in the Long Range Transportation Plan for the Triangle Region.

STAC Process

The Raleigh to Zebulon corridor was evaluated by the Special Transit Advisory Commission (STAC), a cooperative regional effort of leaders appointed in 2007 by the Capital Area Metropolitan Planning Organization (CAMPO) and the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC) to develop a Regional Transit Vision Plan. This Plan would be the basis for the transit component of the Long Range Transportation Plan. The Raleigh to Zebulon corridor was one of 16 corridors evaluated in terms of feasibility and potential ridership (see Figure 1). Summary findings for all corridors are shown in Table 1. The study determined that the Raleigh to Zebulon corridor did not rank in the top four among the study corridors for any of the studied measures, which included: transit intensity, total daily trips, in-corridor daily trips, in-corridor daily trips per acre, and in-corridor daily trips among households most likely to use transit. Only corridors ranked among the top four were included in the Vision Plan. Based on 2035 projections using the Triangle Regional Model, the number of in-corridor trips per acre is not expected to increase to a level supportive of rail transit (see Figure 2).

Long Range Transportation Plan

The 2035 Long Range Transportation Plan (LRTP) for the region's two MPOs was updated and released in May 2009. The LRTP is a federally-mandated process and document that is used for important transportation investment and programming decisions. Only projects that appear in a Long Range Transportation Plan may be included for funding in the Transportation Improvement Program which is the mechanism for all major funding. Comments from public and private transportation providers were solicited throughout the planning process, and a 42-day public comment period was provided for the proposed plan in accordance with the Public Involvement Procedures adopted by the MPOs.

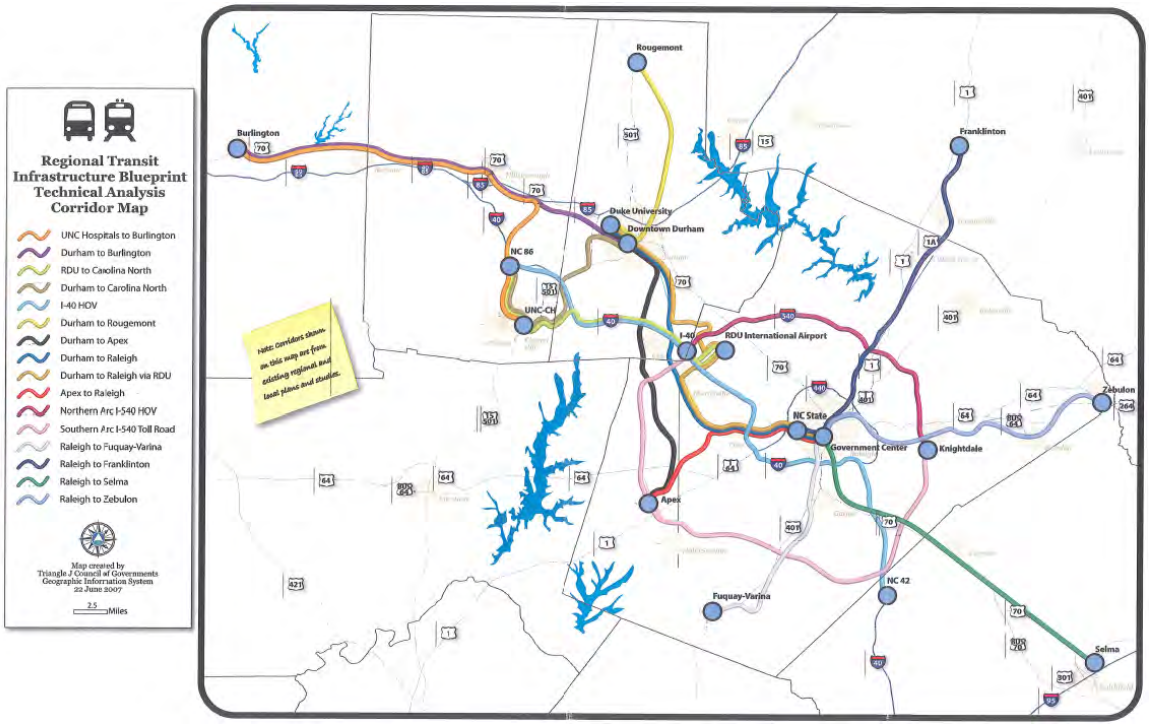
Development of the LRTP took into account the STAC recommendations, and considered rail service in the Raleigh to Zebulon corridor as one of the options for Wake County. However, after analysis, the corridor was not included in the 2035 LRTP (see Figure 3).

Future Studies

Not being included for analysis in the current Triangle Transit study does not imply that the Raleigh to Zebulon corridor has been rejected from future consideration. It is likely that it will continue to be studied for feasibility and addition to a future LRTP. The corridors that are included in the current LRTP are those that have been determined to have a higher feasibility rating and thus a higher chance of receiving funding and being successful in the near-term. Funding constraints simply do not allow all potential rail corridors in the region to be implemented between now and 2035. Recognizing the future potential of the corridor for passenger rail service, the LRTP resolves that the corridor right-of way be preserved for this purpose.

However, both the STAC Vision Plan and 2035 LRTP show improved bus service in the corridor. If the ½ cent sales tax referendum to support transit is successful, express and other forms of bus service can be implemented in the corridor before rail service begins in any of the other corridors. In addition, the City of Raleigh has commenced improvements to enhance bus service in the New Bern Avenue corridor between downtown Raleigh and the WakeMed Raleigh Campus.

Figure 1 STAC Study Corridors



Source: STAC Regional Transit Vision Plan Meeting Notes, July 2007

Table 1 STAC Corridor Statistics

Socioeconomic and Travel Markets Data -- 2035				Travel Market Data								Socioeconomic Data		
	Corridor (Corridors shown in red rank in the top four for one or more transportation measures among the 18 full corridors)	Corridor Length (miles)	Acres in Corridor Travel Market Places	Total Trips		In-Corridor Trips				Strata 1&2 In-Corridor Trips		Dwelling Units	Jobs	Activity Intensity Measure
				Daily Trips	Trips/ Acre	Daily Trips	Trips/ Acre	Trips/ Mile	if 2% on transit	Daily Trips	Trips/ Acre			
1	Durham to Apex	25	46,016	1,000,000	21	490,000	11	20,000	9,800	110,000	2	88,000	204,000	3
2A	Durham to Raleigh via rail line	28	39,261	1,100,000	29	590,000	15	21,000	11,800	200,000	5	73,000	345,000	5
2B	Durham to Raleigh via busway	28	37,838	1,000,000	26	510,000	14	18,000	10,200	180,000	5	60,000	296,000	4
3	Durham to Raleigh via US 70	23	37,333	1,000,000	27	460,000	12	20,000	9,200	120,000	3	91,000	227,000	4
4	Durham to Burlington	33	47,802	400,000	8	240,000	5	7,000	4,800	70,000	2	30,000	105,000	1
5	Durham to Chapel Hill	21	22,152	800,000	34	450,000	20	21,000	9,000	140,000	6	57,000	175,000	5
6	Durham to North Durham	19	31,816	400,000	13	210,000	6	11,000	4,200	80,000	2	34,000	100,000	2
7	I-40 HOV	46	89,358	1,000,000	12	360,000	4	8,000	7,200	60,000	1	100,000	203,000	2
8	Northern Arc I-540	26	43,154	600,000	14	170,000	4	6,000	3,400	20,000	0	63,000	95,000	2
9	Raleigh to Apex	17	25,215	800,000	32	330,000	13	19,000	6,600	100,000	4	64,000	148,000	4
10	Raleigh to Franklinton	28	83,568	1,100,000	14	650,000	8	23,000	13,000	140,000	2	94,000	222,000	2
11	Raleigh to Fuquay-Varina	21	45,429	600,000	13	280,000	6	13,000	5,600	60,000	1	60,000	107,000	2
12	Raleigh to Selma	29	42,191	500,000	13	250,000	6	9,000	5,000	50,000	1	52,000	110,000	2
13	Raleigh to Zebulon	27	56,745	900,000	16	430,000	8	16,000	8,600	80,000	1	94,000	161,000	3
14	Chapel Hill to RDU via Metro Center	27	32,357	600,000	18	300,000	9	11,000	6,000	80,000	2	44,000	150,000	3
15	Southern Arc NC-540	44	91,220	1,100,000	12	400,000	4	9,000	8,000	40,000	0	110,000	161,000	2
16	Pittsboro to Chapel Hill	24	75,238	600,000	7	370,000	5	15,000	7,400	60,000	1	56,000	80,000	1
17	Chapel Hill to Burlington	37	56,116	400,000	7	240,000	4	7,000	4,800	50,000	1	34,000	77,000	1
Corridor Segments and Combinations														
10.1	Raleigh to I-540 US1 Sub-Corridor	10	16,297	700,000	45	380,000	23	38,000	7,600	110,000	7	49,000	174,000	6
10.2	Cary to Raleigh to I-540 via US1	17	23,641	900,000	38	440,000	19	24,000	8,800	130,000	5	65,000	208,000	5
2A.1	Durham to Metro Center	11	18,037	400,000	23	220,000	12	20,000	4,400	80,000	5	26,000	155,000	4
2A.2	Raleigh to Metro Center	17	27,775	800,000	28	360,000	13	21,000	7,200	110,000	4	51,000	227,000	4
5.1	Chapel Hill to Patterson Place	13	13,430	400,000	29	450,000	33	34,000	9,000	60,000	4	30,000	77,000	4
5.2	Durham to Patterson Place	8	8,773	300,000	38	180,000	21	23,000	3,600	70,000	8	22,000	99,000	6
	Totals for Region covered by Model:		1,676,800	10,700,000								1,100,000	1,330,000	

Notes:

1. In-corridor trips are trips that both begin and end within the corridor.
2. Peak trips are trips made between 6-10 am and 3-7 pm.
3. Strata 1&2 trips are trips made by households without cars and by low-income households with cars.
4. The activity intensity measure is based on the 1997 TTA Station Area Development Guidelines and is derived from Activity Levels 2 and 3 in the Station Area Classification System, where about 3.2 jobs are the equivalent of one dwelling unit in "supporting walk-to-transit" terms. It is calculated by the equation: ((dwelling units + (jobs/3.2))/acres. The activity intensity measure for a corridor as a whole is only valuable in comparing the relative intensity of activity among corridors, not for whether or not fixed guideway transit may be feasible in any particular corridor, since activity thresholds only have meaning when applied to the ½ mile walk radius around a station area.
5. Values are subject to change based on data reviews, revised socioeconomic estimates and changes to the regional travel demand model
6. Indicators for sections of a corridor may differ significantly from indicators for a corridor as a whole.
7. Corridors to Burlington and Selma include only data for the portions of these corridors within the boundaries of the Triangle Regional Travel Demand Model.

Source: STAC Regional Transit Vision Plan, May 2008

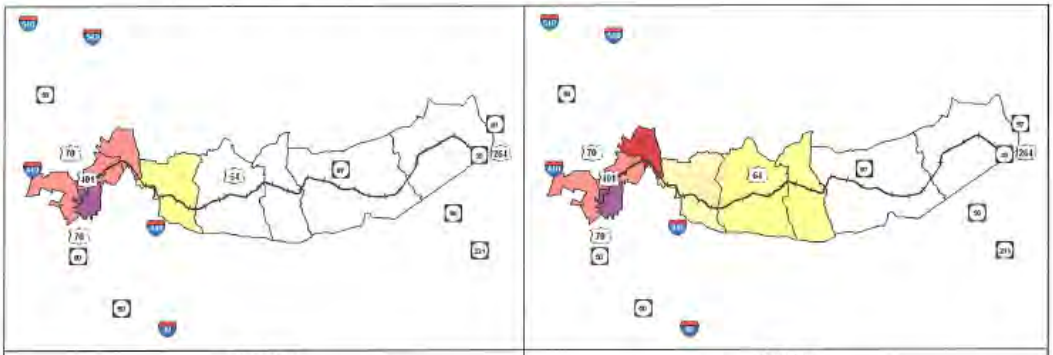
Figure 2 Raleigh to Zebulon Corridor Statistics

Transit Infrastructure Blueprint Technical Analysis

Examining Land Use, Travel Markets and Costs

Raleigh to Zebulon –27 miles

This document summarizes travel in the Travel Market Places along the corridor for the 2005 "base year" and for 2035; the results are from the Triangle Regional Transportation Model. This information is preliminary and subject to change.



2005	2035
.6 million total daily trips	1.2 million total daily trips
60,000 in-corridor daily trips	430,000 in-corridor daily trips
1 in-corridor trips per acre	7.5 in-corridor trips per acre
40,000 in-corridor strata 1 & 2 daily trips	90,000 in-corridor strata 1 & 2 daily trips
0.7 in-corridor strata 1 & 2 trips per acre	1.6 in-corridor strata 1 & 2 trips per acre

- In-corridor trips are trips that both begin and end in the corridor.
- Strata 1 & 2 trips are trips made by households without cars and low-income households with cars.

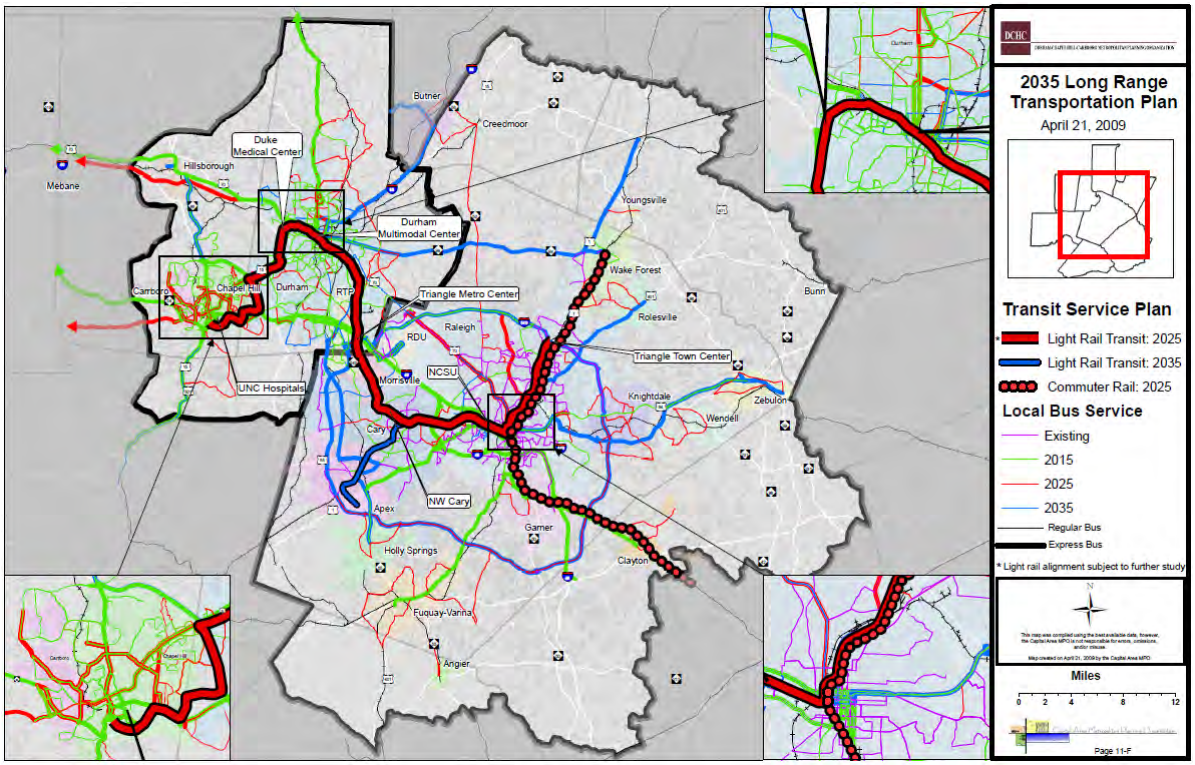
Colors show the number of total daily trips per acre for the Travel Market Places in the corridor:

- < 10 trips/acre
- 10-15 trips/acre
- 15-20 trips/acre
- 20-35 trips/acre
- 25-50 trips/acre
- 50-100 trips/acre
- > 100 trips/acre

Total daily trips in the Triangle: 2005 -- 5.5 million; 2035 -- 10.7 million (forecast).

Source: STAC Regional Transit Vision Plan Meeting Notes, July 2007

Figure 3 LRTP Transit Map



Source: CAMPO/DCHC 2035 LRTP, May 2009

Appendix B

White Paper Study of Commuter Rail to Hillsborough

MARTIN ALEXIOU BRYSON

Memorandum

Transportation Planning
Traffic Engineering

To:	Greg Northcutt, Triangle Transit
From:	George Alexiou, PE
Date:	June 25, 2010
Subject:	Durham to Hillsborough Corridor Rail Service

This memo provides an explanation for not including the Durham to Hillsborough rail corridor as part of the alternatives analysis studies currently being conducted by Triangle Transit in anticipation of a ½ percent sales tax referendum for funding transit improvements in the Triangle region. Several studies have analyzed the potential viability of the Durham to Hillsborough corridor for passenger rail service.

STAC Process

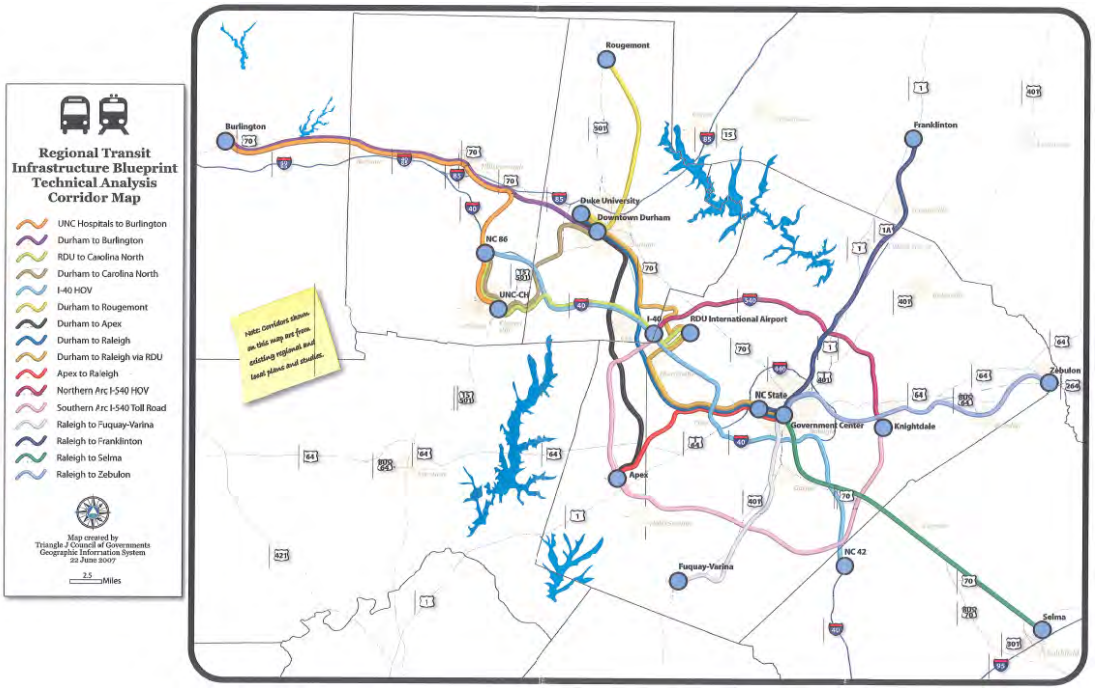
The Durham to Hillsborough corridor was evaluated by the Special Transit Advisory Commission (STAC), a cooperative regional effort of leaders appointed in 2007 by the Capital Area Metropolitan Planning Organization (CAMPO) and the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC) to develop a Regional Transit Vision Plan. This Plan would be the basis for the transit component of the Long Range Transportation Plan. The Durham to Hillsborough corridor was evaluated as part of the Durham to Burlington corridor study, one of 16 corridors evaluated in terms of feasibility and potential ridership (see Figure 1). Summary findings for all corridors are shown in Table 1. The study determined that the Durham to Burlington corridor did not rank in the top four among the study corridors for any of the studied measures, which included: transit intensity, total daily trips, in-corridor daily trips, in-corridor daily trips per acre, and in-corridor daily trips among households most likely to use transit. Only corridors ranked among the top four were included in the Vision Plan. Based on 2035 projections using the Triangle Regional Model, the number of in-corridor trips per acre is not expected to increase to a level supportive of rail transit (see Figure 2).

Long Range Transportation Plan

The 2035 Long Range Transportation Plan (LRTP) for the region's two MPOs was updated and released in May 2009. The LRTP is a federally-mandated process and document that is used for important transportation investment and programming decisions. Only projects that appear in a Long Range Transportation Plan may be included for funding in the Transportation Improvement Program which is the mechanism for all major funding. Comments from public and private transportation providers were solicited throughout the planning process, and a 42-day public comment period was provided for the proposed plan in accordance with the Public Involvement Procedures adopted by the MPOs.

Development of the LRTP took into account the STAC recommendations, and considered rail service from Durham to Hillsborough as one of the options for Durham and Orange Counties. However, after analysis, the corridor was not included in the 2035 LRTP (see Figure 3).

Figure 1 STAC Study Corridors



Source: STAC Regional Transit Vision Plan Meeting Notes, July 2007

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				Daily Trips	Trips/ Acre	Daily Trips	Trips/ Acre	Trips/ Mile	if 2% on transit	Daily Trips	Trips/ Acre			
1	Durham to Apex	25	46,016	1,000,000	21	490,000	11	20,000	9,800	110,000	2	88,000	204,000	3
2A	Durham to Raleigh via rail line	28	39,261	1,100,000	29	590,000	15	21,000	11,800	200,000	5	73,000	345,000	5
2B	Durham to Raleigh via busway	28	37,838	1,000,000	26	510,000	14	18,000	10,200	180,000	5	60,000	296,000	4
3	Durham to Raleigh via US 70	23	37,333	1,000,000	27	460,000	12	20,000	9,200	120,000	3	91,000	227,000	4
4	Durham to Burlington	33	47,802	400,000	8	240,000	5	7,000	4,800	70,000	2	30,000	105,000	1
5	Durham to Chapel Hill	21	22,152	800,000	34	450,000	20	21,000	9,000	140,000	6	57,000	175,000	5
6	Durham to North Durham	19	31,816	400,000	13	210,000	6	11,000	4,200	80,000	2	34,000	100,000	2
7	I-40 HOV	46	89,358	1,000,000	12	360,000	4	8,000	7,200	60,000	1	100,000	203,000	2
8	Northern Arc I-540	26	43,154	600,000	14	170,000	4	6,000	3,400	20,000	0	63,000	95,000	2
9	Raleigh to Apex	17	25,215	800,000	32	330,000	13	19,000	6,600	100,000	4	64,000	148,000	4
10	Raleigh to Franklinton	28	83,568	1,100,000	14	650,000	8	23,000	13,000	140,000	2	94,000	222,000	2
11	Raleigh to Fuquay-Varina	21	45,429	600,000	13	280,000	6	13,000	5,600	60,000	1	60,000	107,000	2
12	Raleigh to Selma	29	42,191	500,000	13	250,000	6	9,000	5,000	50,000	1	52,000	110,000	2
13	Raleigh to Zebulon	27	56,745	900,000	16	430,000	8	16,000	8,600	80,000	1	94,000	161,000	3
14	Chapel Hill to RDU via Metro Center	27	32,357	600,000	18	300,000	9	11,000	6,000	80,000	2	44,000	150,000	3
15	Southern Arc NC-540	44	91,220	1,100,000	12	400,000	4	9,000	8,000	40,000	0	110,000	161,000	2
16	Pittsboro to Chapel Hill	24	75,238	600,000	7	370,000	5	15,000	7,400	60,000	1	56,000	80,000	1
17	Chapel Hill to Burlington	37	56,116	400,000	7	240,000	4	7,000	4,800	50,000	1	34,000	77,000	1
Corridor Segments and Combinations														
10.1	Raleigh to I-540 US1 Sub-Corridor	10	16,297	700,000	45	380,000	23	38,000	7,600	110,000	7	49,000	174,000	6
10.2	Cary to Raleigh to I-540 via US1	17	23,641	900,000	38	440,000	19	24,000	8,800	130,000	5	65,000	208,000	5
2A.1	Durham to Metro Center	11	18,037	400,000	23	220,000	12	20,000	4,400	80,000	5	26,000	155,000	4
2A.2	Raleigh to Metro Center	17	27,775	800,000	28	360,000	13	21,000	7,200	110,000	4	51,000	227,000	4
5.1	Chapel Hill to Patterson Place	13	13,430	400,000	29	450,000	33	34,000	9,000	60,000	4	30,000	77,000	4
5.2	Durham to Patterson Place	8	8,773	300,000	38	180,000	21	23,000	3,600	70,000	8	22,000	99,000	6
	Totals for Region covered by Model:		1,676,800	10,700,000								1,100,000	1,330,000	

Notes:

1. In-corridor trips are trips that both begin and end within the corridor.
2. Peak trips are trips made between 6-10 am and 3-7 pm.
3. Strata 1&2 trips are trips made by households without cars and by low-income households with cars.
4. The activity intensity measure is based on the 1997 TTA Station Area Development Guidelines and is derived from Activity Levels 2 and 3 in the Station Area Classification System, where about 3.2 jobs are the equivalent of one dwelling unit in "supporting walk-to-transit" terms. It is calculated by the equation: ((dwelling units + (jobs/3.2))/acres. The activity intensity measure for a corridor as a whole is only valuable in comparing the relative intensity of activity among corridors, not for whether or not fixed guideway transit may be feasible in any particular corridor, since activity thresholds only have meaning when applied to the ½ mile walk radius around a station area.
5. Values are subject to change based on data reviews, revised socioeconomic estimates and changes to the regional travel demand model
6. Indicators for sections of a corridor may differ significantly from indicators for a corridor as a whole.
7. Corridors to Burlington and Selma include only data for the portions of these corridors within the boundaries of the Triangle Regional Travel Demand Model.

Source: STAC Regional Transit Vision Plan, May 2008

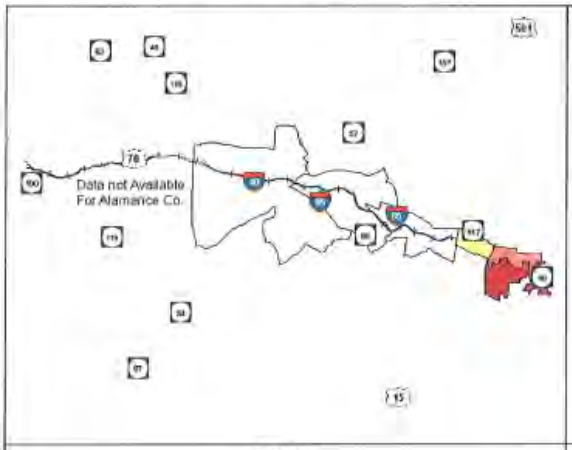
Figure 2 Durham to Burlington Corridor Statistics

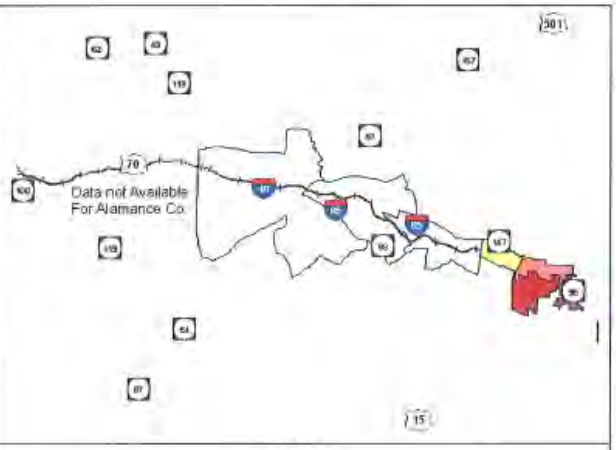
Transit Infrastructure Blueprint Technical Analysis

Examining Land Use, Travel Markets and Costs

Durham to Burlington – 33 miles

This document summarizes travel in the Travel Market Places along the corridor for the 2005 "base year" and for 2035; the results are from the Triangle Regional Transportation Model. This information is preliminary and subject to change.





2005	2035
.4 million total daily trips	.7 million total daily trips
150,000 in-corridor daily trips	240,000 in-corridor daily trips
3.1 in-corridor trips per acre	5.1 in-corridor trips per acre
40,000 in-corridor strata 1 & 2 daily trips	70,000 in-corridor strata 1 & 2 daily trips
.8 in-corridor strata 1 & 2 trips per acre	1.5 in-corridor strata 1 & 2 trips per acre

- In-corridor trips are trips that both begin and end in the corridor.
- Strata 1 & 2 trips are trips made by households without cars and low-income households with cars.

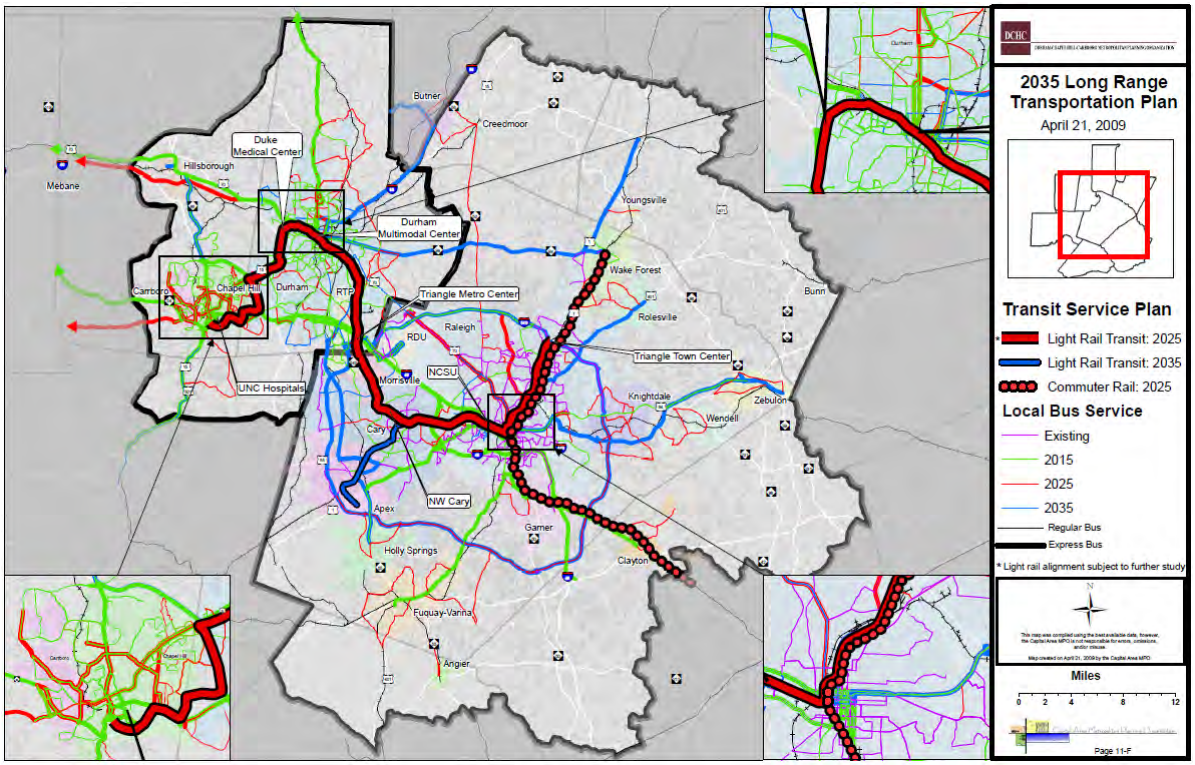
Colors show the number of total daily trips per acre for the Travel Market Places in the corridor:

- < 10 trips/acre
- 10-15 trips/acre
- 15-20 trips/acre
- 20-35 trips/acre
- 25-50 trips/acre
- 50-100 trips/acre
- > 100 trips/acre

Total daily trips in the Triangle: 2005 -- 5.5 million; 2035 -- 10.7 million (forecast).

Source: STAC Regional Transit Vision Plan Meeting Notes, July 2007

Figure 3 LRTP Transit Map



Source: CAMPO/DCHC 2035 LRTP, May 2009

NCRR Ridership Study

The North Carolina Railroad (NCRR) published a report in May 2010 with the results of a study that examined potential passenger demand for commuter rail service between Greensboro and Goldsboro along the NCRR corridor, which included the corridor segment between Durham and Hillsborough. Four model years were analyzed (2009, 2012, 2017, and 2022) to determine daily volume and daily boardings at each station. The segment between Durham and Hillsborough is shown highlighted in Figures 4 and 5. Figure 4 shows the total daily segment volume for this corridor, with low ridership volume that declines between subsequent future model years. Figure 5 shows total daily boardings for this corridor in 2017 and 2022 model years, with boardings much lower for these three stops than most other stops along the full study corridor.

Figure 4 Total Daily Segment Volume (each direction)

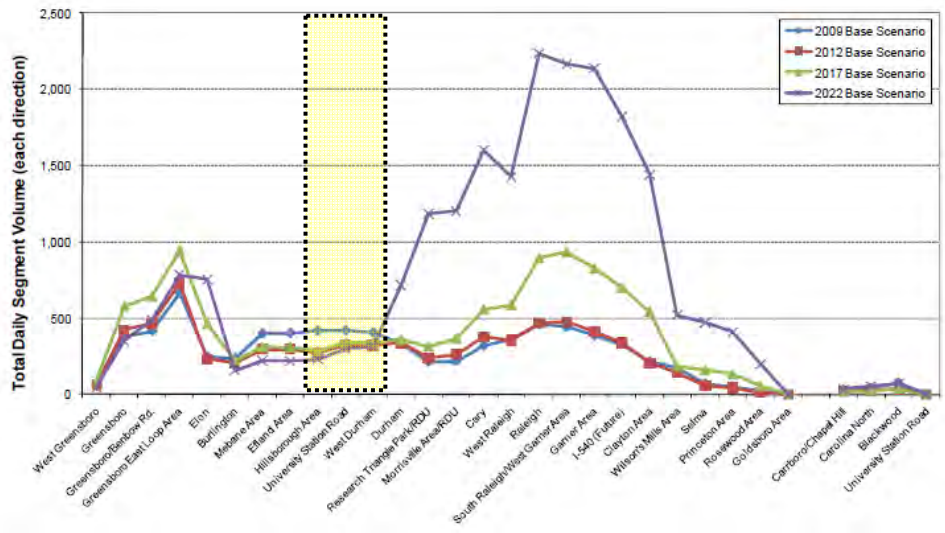
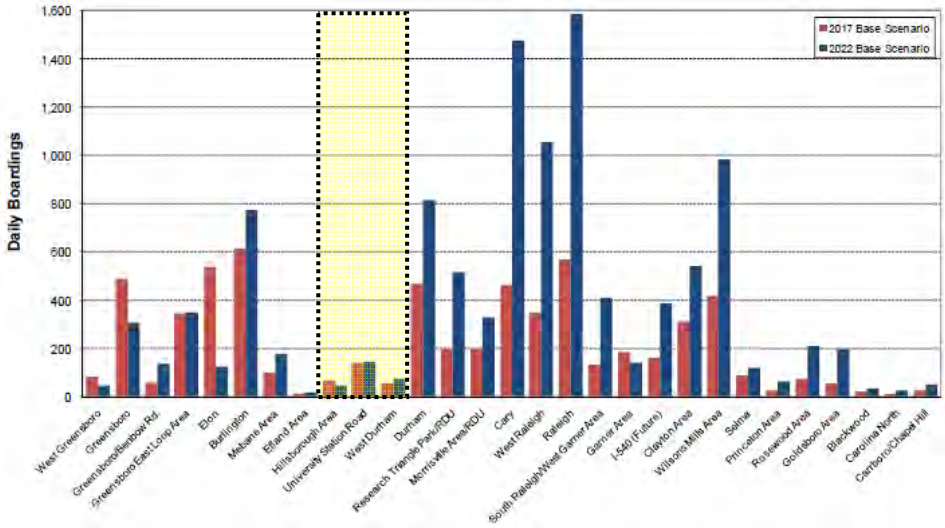


Figure 5 Total Daily Boardings



Source: NCRR Commuter Rail Ridership & Market Study, May 2010

Future Studies

Not being included for analysis in the current Triangle Transit study does not imply that the Durham to Hillsborough corridor has been rejected from future consideration. It is likely that it will continue to be studied for feasibility and addition to a future LRTP. The corridors that are included in the current LRTP are those that have been determined to have a higher feasibility rating and thus a higher chance of receiving funding and being successful in the near-term. Funding constraints simply do not allow all potential rail corridors in the region to be implemented between now and 2035. Recognizing the future potential of the corridor for passenger rail service, the LRTP resolves that the corridor right-of way be preserved for this purpose.

However, both the STAC Vision Plan and 2035 LRTP show improved bus service in the corridor. If the ½ percent sales tax referendum to support transit is successful, express and other forms of bus service can be implemented in the corridor before rail service begins in any of the other corridors.

Appendix C

White Paper Study of Future Extension to Carrboro
Implementation Analysis

TRIANGLE REGIONAL TRANSIT PROGRAM

Future Extension to Carrboro Implementation Analysis

Strategic Issues and Possible Alignments

September 24, 2010

BACKGROUND

During the first round of public meetings for the Triangle Regional Transit Program in the summer of 2010, the town of Carrboro was the most frequently mentioned municipality among statements of interest for rail extensions beyond the corridors specified in the adopted 2035 LRTP. Additionally, the Carrboro Board of Aldermen also passed a resolution requesting that the Alternatives Analysis process assess the feasibility of extending rail from UNC Hospital to Carrboro.

Further comments from DCHC TAC members at the September 2010 TAC meeting indicated that while the TAC did not recommend expanding the Alternatives Analysis to include Carrboro in this phase of the analysis, that the Town of Carrboro has gone on record numerous times in support of examining how to bring rail to Carrboro, and that a document providing an overview of the strategic issues that need addressing to extend rail to Carrboro would be welcome and appreciated by citizens, elected officials, and members of the DCHC TAC.

This document attempts to provide a high-level view of those issues, and provide a foundation of knowledge upon which the feasibility of rail to Carrboro can be explored in greater detail in the future.

CURRENT RECOMMENDATION FOR RAIL IN ORANGE COUNTY

As the Transitional Analysis portion of the Alternatives Analysis comes to a close, the technical team is recommending that the corridor from Alston Avenue in Durham to UNC Hospital in Chapel Hill be advanced to the next stage of analysis for detailed study. This detailed study phase will compare the performance of Bus Rapid Transit, Light Rail Transit, Traffic System Management (TSM) alternative, and a “No Build” option in the corridor. This paper assumes that any rail connection to Carrboro will be made as an extension of an initial light rail investment that terminates near UNC Hospital.

KEY STRATEGIC ISSUES

In considering how rail could be extended from UNC Hospital to Carrboro, several key issues need to be addressed. Those issues are:

- What is the most technically feasible way to extend rail past UNC Hospital?
- Where will rail vehicles run between UNC Hospital and Carrboro, and where might stations be placed?
- How will trains reverse direction if Carrboro becomes an end-of-line station?
- How will trains interact with and impact traffic if they run in the street?
- How would an extension to Carrboro be funded?
- What actions need to be taken to further advance planning for rail to Carrboro?

EXTENDING PAST UNC HOSPITAL

If rail is to be extended past UNC Hospital to points north and west, the primary transportation corridor that can fulfill this need is the Pittsboro St/Columbia St pair of roads.

Could light rail cut through the UNC campus instead of using city streets to go north and west? While perhaps technically possible, it would be challenging to move across campus without impacting buildings and other important activities, such as emergency vehicle access to UNC Hospital. Different turning movements for light rail may also be fatally flawed for alignments that cut across campus. Most importantly, UNC has a campus master plan which plans for significant uses in terms of buildings and public spaces to be developed between existing and current buildings under construction.

An in-depth study of alignment alternatives from UNC west and north could explore the tradeoffs of using campus land between UNC Hospital and South Rd to begin moving north and west from the hospital, but this analysis suggests that street-running should be the default approach, with other alignment approaches compared to street-running for cost:benefit analysis.

Light rail trains successfully operate in streets in other cities in the US and abroad, either in their own exclusive lane or in mixed traffic (streetcar operation) with cars, trucks and buses. Figure 1 below shows light rail in Minneapolis, MN in the center of the street operating bidirectionally. (where cars are not allowed to drive on the tracks) Cars drive in the same direction of the train on either side. Figure 2 shows mixed-traffic running (where cars CAN drive on the tracks) in San Francisco.

Figure 1. Center of Street Light Rail Operations in Minneapolis

Figure 2. Mixed Traffic Light Rail Operations in San Francisco, CA

Photo Courtesy of Peter Ehrlich

The current proposed alignment and station options for initial study in the region's Alternatives Analysis identify two primary potential locations for a UNC Hospital station, which are shown as green and blue platforms in Figure 3 below.

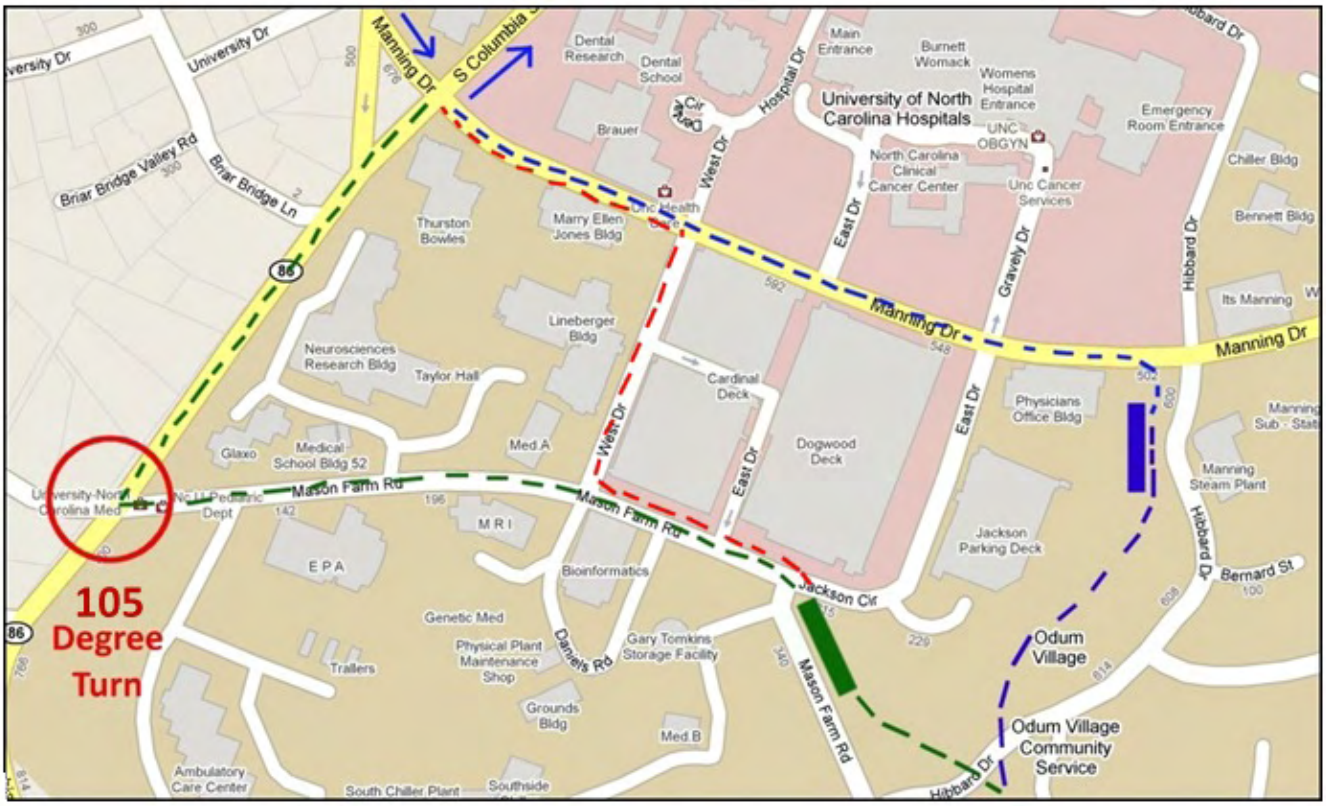
Possible routes north and west from these stations include:

- Mason Farm Rd from Hibbard to South Columbia Street (see Figure 3, green dotted line)
- Mason Farm Rd. from Hibbard to West St to Manning Drive (Figure 3, red dotted line)
- Manning Drive from Hibbard to the South Columbia/Pittsboro/Manning intersection. (Figure 3, blue dotted line).

Given the limitations of right of way of Columbia Street, Pittsboro Street, Franklin Street and Manning Drive, is it envisioned that the light rail extension will operate in mixed traffic thereby not removing any of the existing travel lanes. The light rail will obey all existing traffic signals with no preemption. How to optimize the signal timing is typically something that is investigated in the design phase.

In assessing these two potential alignments, a key constraint is the potential 105-degree turn from Mason Farm Rd onto South Columbia Street. A train's minimum turning radius is preferably kept to 100 feet. Such a radius would severely cut off the corner of the intersection. This turn also has some grade issues. Running in the street typically prohibits the use of superelevation (where the outside rail is higher than the inside rail in a curve) for the tracks, and instead street running employs a flat surface. Both Mason Farm Rd and South Columbia St. slope toward the intersection of the two streets. Introduction of a flat track surface would introduce two grade breaks in each street. If the tracks were superelevated for this sharp curve, the cross section would be in the opposite slope of the street grade compounding this problem. This geometry is an issue for both the rail and street traffic.

Figure 3. Potential Light Rail paths proceeding North and West from UNC Hospital Station Locations



Additional detailed analysis will be needed to further assess either the Manning or Mason Farm alternative.

UNIVERSITY CONCERNS WITH MANNING DRIVE

In meetings with UNC representatives, campus officials voiced particular concerns regarding the following issues:

- Impacts on Pedestrian Bridges over Manning Drive
- Utility impacts under the street
- Emergency Vehicle access to the hospital
- Overall traffic levels on Manning Drive

A brief discussion of each follows.

Discussion: Pedestrian Bridges Over Manning Drive from Parking Decks

Within the area immediately in front of UNC Hospital's main entrance, there are three pedestrian overpasses that lead from the south side of Manning Drive to the hospital complex on the north side. On-site investigations by URS engineering staff indicated that street-running light rail vehicles will not interfere with the three bridges during construction and operations because URS had them surveyed and they are over 16 feet high, which provides the needed clearance for light rail.

Discussion: Utilities

If light rail were to do any street running in the vicinity of UNC Hospital, tracks would likely be embedded in the street. Standard practice for embedded track anticipates a concrete slab encapsulating the rail and this slab is 15 to 18 inches in depth.

There is typically no impact since the distributed axle load of a light rail vehicle is comparable to the axle load distribution of a HS-20 truck. This has been demonstrated on numerous other street running light rail projects.

Detailed information on the location and depth of utilities in the hospital area, above and below streets, and in-between buildings, would help staff determine what, if any impacts may occur on utilities during light rail construction and operations.

Discussion: Emergency Vehicles

Access for ambulances and other emergency vehicles is a critical issue for any hospital complex. Whereas many locations in a city need to plan for comparatively rare use by emergency vehicles, at UNC Hospital their presence is a constant and daily part of hospital operations.

The emergency room is located on Emergency Room Drive, which extends north from the Hibbard/Manning intersection. According to emergency room staff onsite, this is the road ALL ambulances use to bring patients to UNC Hospital.

Figure 4. UNC Emergency Room Access Rd

Movements of trains in and out of Manning Drive from a station adjacent to Hibbard Drive would need to be managed carefully to maximize the speed and safety of vehicles getting to the Emergency Room. Other transit properties such as Houston have installed light rail signal pre-emption for emergency vehicles using OPTICON technology, which recognizes the strobe lights on modern ambulances, fire and police vehicles and gives those vehicles priority over train movements. These technologies could be explored for local application, and should be examined in greater detail in an additional study.

Discussion: Overall Traffic Congestion On Manning Drive

In a July 2010 meeting, University officials raised concerns that light rail trains running on Manning Drive would increase the level of traffic congestion in front of UNC Hospital and some of its key entrances. While adding trains to the mix of street traffic will certainly introduce a new mobility element for pedestrians, cyclists, bus operators and motorists to negotiate, it is not clear whether or not adding rail service to Manning Drive would increase traffic congestion or reduce it.

Prior estimates indicate that a light rail installation bringing 6 trains per hour to the hospital from the Friday Center could replace 24 to 30 peak period buses per hour currently operated by Chapel Hill Transit and Triangle Transit. The additional capacity of the trains may also divert more motorists who currently drive and park near the hospital to transit.

A detailed traffic impact study that includes assumptions and projections about mode shifts from bus and car to rail would be needed to address this concern at an appropriate level of analysis.

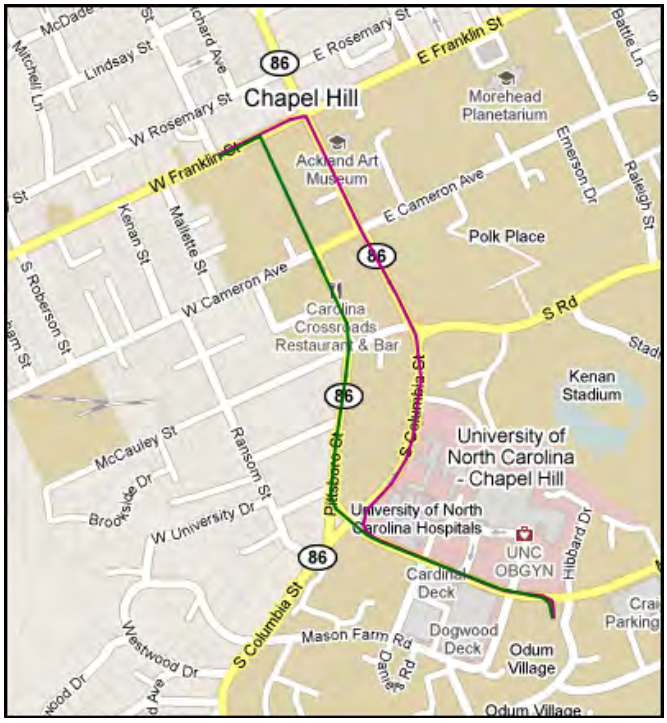
POSSIBLE PATHS FOR TRAINS FROM UNC HOSPITAL TO CARRBORO

Assuming light rail trains can move forth from the hospital area, this analysis assumes that trains would travel north on S. Columbia Street, and south on Pittsboro St. The recently released downtown Chapel Hill development framework indicates a possible extension of Pittsboro St through to Franklin Street. If this came to happen, light rail could take advantage of this development.

Figure 4. Downtown Chapel Hill Framework Proposal to Extend Pittsboro Street

With the proposed street extensions envisioned above, light rail could get to downtown Chapel Hill using the purple line in Figure 5 for westbound travel, and the green line for eastbound travel.

Figure 5. UNC Hospital to Downtown Chapel Hill – Potential Concept



This alignment allows for "tail tracks" to store trains up to 2 cars in length in the center of the street in the block of West Franklin St between Church St and the extended Pittsboro St. If financial or other considerations only made it possible to get to downtown Chapel Hill in an interim phase before reaching downtown Carrboro, this would be one way to provide end-of-line capacity to have trains layover in the less-busy midday or be ready for early morning departures.

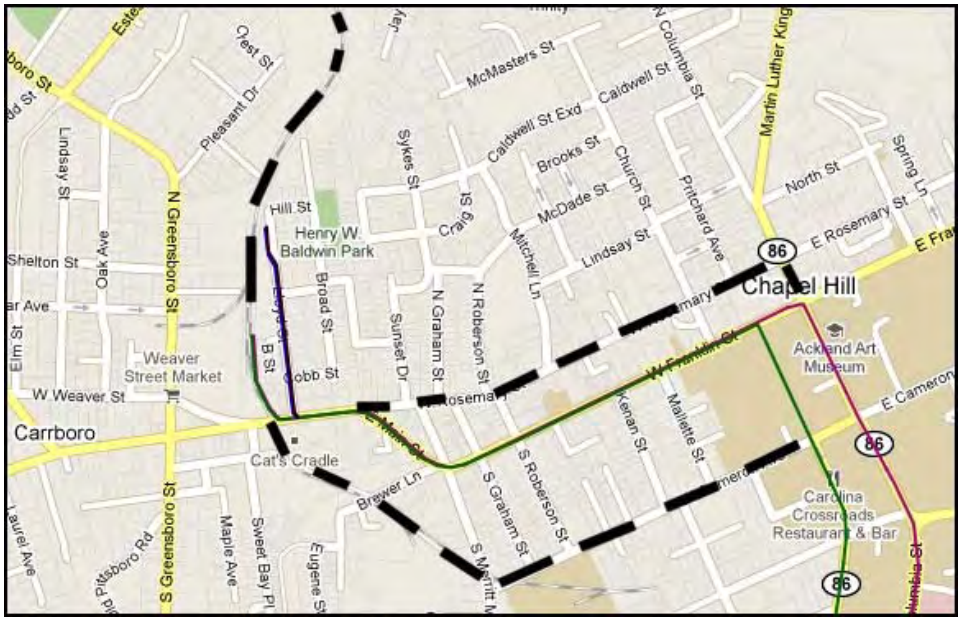
For downtown Chapel Hill, the north/westbound station could be placed in front of the Ackland Art Museum on the side of South Columbia Street, and the south/eastbound station could be placed on the eastern side of a redeveloped University Square parcel on the side of the Pittsboro street extension.

Once in downtown Chapel Hill, the environment is such that if you can get an automobile to downtown Carrboro and back, you can probably get a train to downtown Carrboro and back—though how to do that will take careful and thoughtful planning and detailed study.

Figure 6 on the next page demonstrates how this alignment could proceed west to downtown Carrboro via West Franklin Street, operating in a manner similar to the Minneapolis train shown in Figure 1. (Franklin St is wider than the street in MN) Once reaching Main St in Carrboro, the train would operate more like the Portland example in Figure 2 until it returned to the rail corridor behind Harris Teeter.

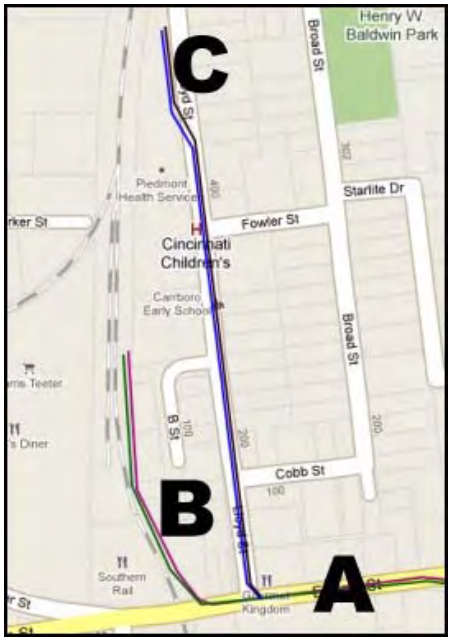
Other possible routings that could be explored in detail include the black dotted lines in Figure 6, which utilize Cameron Avenue and the University rail spur/Libba Cotton bikeway, or utilize Rosemary Street.

Figure 6. Downtown Chapel Hill to Downtown Carrboro – Potential Concept



Within downtown Carrboro, a station location will need to be found. Figure 7 shows two possible ways to get from Main Street in Carrboro into the University Railroad corridor to then travel on to Carolina North. Three potential station sites, A, B, and C are identified. Each has benefits and drawbacks in terms of access for pedestrians, impact on adjacent buildings from station or track elements, and potential for ridership.

Figure 7. Downtown Carrboro Station Locations and Rail Corridor Access



REVERSING TRAINS

If light rail is extended to Carrboro, and not on to Carolina North at the same time, then there will need to be infrastructure near the Carrboro station that allows for storage of a trainset or two, called "tail tracks." In most end-of-line stations, these tail tracks are just after the end station. Since midday trains are stored on these tracks, the tail track cannot be located in a street if the light rail is operating as a streetcar through that street segment. Hence, tail tracks would need to be located off-street with a signalized transition in and out of the street.

Unlike the tail tracks described for Franklin Street earlier in this document, it is more difficult to find a location in downtown Carrboro for tail tracks that are not adjacent to the existing rail corridor. This means that the best location for tail tracks may be on the east side of the University railroad tracks and west of Lloyd St if an eventual extension to Carolina North is to be held open as a possibility.

On the other hand, if the rail segment to Carolina North opened at the same time as the segment to Carrboro, it would remove the need to place tail tracks in or near downtown Carrboro, and train switching and storage could be managed closer to Carolina North, simplifying some train management in and near downtown.

TRAINS AND TRAFFIC

In an ideal world, we would be able to deploy trains to Carrboro and avoid all interactions with motor vehicle traffic, but the urban geography of Carrboro and Chapel Hill makes this challenging, and elevated track and tunneling come at a cost likely to render the project financially infeasible. Therefore, an extension to Carrboro will probably involve some interactions between trains and cars.

However, light rail trains and cars coexist successfully in many other US cities, with millions of annual miles of safe operation, despite the likelihood of conflicts between trains and cars being higher than in a rail-only operating environment. The federal government's *Transit Cooperative Research Program Report 17: Integration of Light Rail Transit Into City Streets* provides a detailed analysis of best practices in how trains, buses, pedestrians, cyclists and cars can coexist safely and successfully.

FUNDING

Currently, there is no rail extension specified to Carrboro in the fiscally constrained 2035 Long Range Transportation Plan for the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization. Rail to Carrboro and Carolina North was included in previous plans (2025,2030) but was removed in order to match planned investments to available revenue projected for the 2005-2035 timeframe.

The fixed guideway transit investment chosen by the MPO in the spring of 2011 will likely be funded by a mix of federal, state, and local funds, with the Orange County half-cent sales tax specified in House Bill 148 representing the primary revenue source to fund major transit capital projects.

While it would be speculative at best to try to specify ways to fund an extension to Carrboro, it is reasonable to suggest that the mix of funding opportunities available for rail transit to UNC Hospital would also be available in similar percentages to extend to Carrboro if a successful line were up and running by the early to mid-2020s.

ACTION STEPS

To consider extending light rail or other higher-order transit from UNC Hospital to Carrboro in the future, the next steps may include:

- Establishing that the design a first segment of rail to UNC Hospital will not preclude extensions to Downtown Chapel Hill, Downtown Carrboro, and Carolina North
- Identifying a schedule and resources for a more detailed study of the opportunities and constraints that exist in extending rail to Carrboro
- Conduct a corridor or feasibility study examining these or other potential rail extension alternatives that might best connect Downtown Chapel Hill, the UNC Main Campus, Carrboro, and Carolina North with the proposed first phase of light rail at UNC Hospital
- Consider inclusion of any rail extensions in Orange County in the fiscally constrained 2040 DCHC LRTP