

## Section 5

# APPENDICES





## APPENDIX A - GLOSSARY

**Box culvert:** A type of culvert used by NCDOT. The two types of box culverts found in NCDOT Right of Way are Reinforced Concrete and Aluminum. All box culverts require headwalls typically made of concrete or metal, and some may be three-sided (bottomless) due to environmental or constructability reasons, such as fish passage or bedrock.<sup>49</sup> Box culverts provide an opportunity for wildlife to travel through the structure rather than on the roadway.

**Bridge:** A structure 20 feet in length or more constructed to span over roadways, other bridges (flyovers), streams, wetlands, railroads, or any condition which requires a grade separation.<sup>50</sup>

**Comprehensive Transportation Plan (CTP):** Developed and adopted by both the DCHC MPO and North Carolina Department of Transportation (NCDOT), the CTP is a long-range, multimodal transportation plan that shows the future plans and projects for the major highways, intersections, bus transit, passenger rail, bicycle and pedestrian, and other transportation facilities. The CTP shows expected new facilities and whether there are planned improvements for current facilities. The CTP is not fiscally constrained.<sup>51</sup>

**Connectivity (landscape, habitat, or ecological connectivity, landscape permeability):** The degree to which the landscape facilitates or impedes movement of organisms or processes.<sup>52</sup> The extent to which a species or population can move among landscape elements in a mosaic of habitats. This necessitates linkages among individuals, species, communities, and ecosystems at appropriate spatial and temporal scales. Corridors are one means of achieving connectivity.<sup>53</sup> A measure of the ability of organisms, gametes, and propagules to move among separated patches of suitable habitat. Ideally, corridors serve to facilitate connectivity over time and can operate at a range of spatial scales.<sup>54</sup>

**Conservation planning:** The process that occurs when a group of stakeholders consider the status of an area's natural environment and identify goals and strategies for conserving the area's natural heritage and biological diversity.<sup>55</sup>

**Corridor (landscape, habitat, or wildlife corridor):** Avenues along which wide-ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and threatened species can be replenished from other areas (The Ninth US Circuit Court of Appeals 1997 in Walker and Craighead 1997). Any space that facilitates the movement of populations, individuals, gametes or propagules, and plant parts capable of vegetative reproduction in a matter of minutes, hours, or over multiple generations of a species. Corridors may encompass altered or natural areas of vegetation and provide connectivity that allows biota to spread or move among habitat fragments through areas otherwise devoid of preferred habitat. Landscape elements that function as corridors may also serve multiple other purposes, providing aesthetic amenities, ecosystem service values, cultural heritage protection, and recreational opportunities.<sup>56</sup>

**Culvert:** A metal, concrete, or plastic structure that conveys runoff surface water underneath a road, railroad, driveway, or any other obstruction to the natural flow of water rather than a storm drain system. Common types of culverts include round pipes, pipe arches, and box culverts, which may include multiple culverts or a combination of different sizes, types, and elevations at the same location.<sup>57</sup> Culverts provide an opportunity for wildlife to travel through the structure rather than on the roadway.

**Ecosystem:** An ecosystem is a community of living organisms (plants, animals, and microbes) in conjunction with the nonliving components of their environment (air, water, and mineral soil), interacting as a system. It is a system of environmental conditions, habitats, natural communities, and species that interact.<sup>58</sup>

**Ecosystem services:** The benefits people obtain, directly or indirectly, from ecosystems. These include provisioning services such as food, water, timber, and fiber; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling. The human species, while buffered against environmental changes by culture and technology, is fundamentally dependent on the flow of ecosystem services.<sup>59</sup>

**Flashing beacon (warning sign):** A flashing beacon is a highway traffic signal with one or more signal sections that operates in a flashing mode. It can provide traffic control when used as an intersection control beacon or it can provide warning when used in other applications.<sup>60</sup>

**Habitat:** The physical features (such as topography, geology, stream flow) and biological characteristics (such as vegetation cover and other species) needed to provide food, shelter, and reproductive needs of animal or plant species.<sup>61</sup>

**Habitat fragmentation:** The breaking up of previously continuous habitat (or ecosystem) into spatially separated and smaller parcels. Habitat fragmentation results from human land use associated with forestry, agriculture, and settlement, but can also be caused by natural disturbances like wildfire, wind, or flooding. Suburban and rural development commonly changes patterns of habitat fragmentation of natural forests, grasslands, wetlands, and coastal areas as a result of adding fences, roads, houses, landscaping, and other development activities.<sup>62</sup>

**Habitat patch:** A relatively homogeneous type of habitat that is spatially separated from other similar habitat and differs from its surroundings.<sup>63</sup> A discrete area of contiguous habitat, often above a size threshold representing the habitat needs of an organism or species, or the functional needs of a natural community.

**Habitat-corridor network:** A connected set of discrete habitat patches and corridors between them.<sup>64</sup>

**Landscape bridge:** The largest type of wildlife crossing structure designed exclusively for wildlife, not human use. These structures are between 230 to 330 feet in length, are primarily intended to offer continued movement over highways for a variety of wildlife of all sizes, and they incorporate vegetation and habitat elements to encourage use by wildlife.<sup>65</sup>

**Landscape connectivity:** The degree to which the landscape facilitates wildlife movement and other ecological flows.<sup>66</sup>

**Manual on Uniform Traffic Control Devices (MUTCD):** A document issued by the Federal Highway Administration of the United States Department of Transportation to specify the standards by which traffic signs, road surface markings, and signals are designed, installed, and used.

**Metropolitan Transportation Plan (MTP):** The MTP is a fiscally constrained, federally-required long-range transportation plan that identifies how metropolitan areas will manage and operate a multi-modal transportation system (including transit, highway, bicycle, pedestrian, and accessible transportation) to meet the region's economic, transportation, development and sustainability goals – among others – for a 20+-year planning horizon.<sup>67</sup> As a practical matter, the MTP is important because projects to be submitted into the prioritization process for possible state and federal funding must come from the MTP, and local governments use the MTP to reserve right-of-way for future highway and rail transit projects.<sup>68</sup>

**Movement barrier:** A physical object or environmental condition that obstructs or prohibits animal movement from one part of the landscape to another.<sup>69</sup>

**Passage bench (wildlife crossing counter measure):** A gravel-surface path that is incorporated into bridge riprap that provides wildlife with continued travel underneath a bridge. Typically built under bridges that are along waterways, this wildlife crossing counter measure is intended to reduce the likelihood of wildlife traveling across roadways and into vehicular traffic.<sup>70</sup>

**Passive warning signs:** Passive traffic control systems, consisting of signs and pavement markings only, identify and direct attention to the location of a grade crossing and advise road users to reduce their speed or stop at the grade crossing as necessary in order to yield to any rail traffic occupying, or approaching and in proximity to, the grade crossing. Signs and markings regulate, warn, and guide the road users so that they, as well as LRT vehicle operators on mixed-use alignments, can take appropriate action when approaching a grade crossing.<sup>71</sup>

**Retrofit (wildlife crossing countermeasure):** An action to existing infrastructure (bridge, culvert, etc.) that helps to encourage wildlife movement and thus makes the existing infrastructure functional for wildlife connectivity.<sup>72</sup>

**Resilience:** The ability to retain essential processes in the face of disturbances or expected shifts in ambient conditions; ecosystem resilience provides the ability to support native diversity.<sup>73</sup>

**Riprap:** Riprap is a layer of large stones that protects soil from erosion in areas of high or concentrated flows. It is especially useful for armoring channel and ditch banks, among other features.<sup>74</sup> Since riprap can pose an obstacle for wildlife underneath bridges, remediation has been done that repositions riprap along banks and hills to create a gravel path for wildlife travel referred to as a wildlife bench.

**Road ecology:** The subject of ecological investigation building on the mounting evidence that roads are having dramatic effects on ecosystem components, processes and structures, and that the causes of these effects are as much related to engineering as to land use planning and transportation policy. Road ecology is rooted in ecology, geography, engineering and planning.<sup>75</sup>

**Round pipe:** The most common type of culvert used within the NCDOT Right of Way. Sizes begin at 15 inches and continue from 18 to 144 inches in half foot increments.<sup>76</sup> Round pipes, depending on the size, can provide an opportunity for wildlife to travel through the structure rather than on the roadway.

**Wetland:** Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.<sup>77</sup>

**Wildlife crossing (wildlife road crossing, wildlife crossing structure):** A structure that allows wildlife to pass over or under a roadway without crossing the flow of traffic, reconnecting severed habitat and reducing wildlife-vehicle collisions.<sup>78</sup>

**Wildlife guard:** “Wildlife guards – essentially larger versions of the cattleguards used in ranch country – consist of a grate of rounded metal bars installed at road grade (and tied into fencing on either side), strong enough to support passing vehicles, but difficult for hooved animals to safely navigate.”<sup>79</sup>

**Wildlife overpass:** The second largest type of wildlife crossing structure designed exclusively for wildlife (next to the landscape bridge), not human use. These structures are between 130 to 230 feet in length, are primarily intended to offer continued movement over highways for a variety of wildlife of all sizes, and they incorporate vegetation and habitat elements to encourage use by wildlife.<sup>80</sup>



## APPENDIX B - ACRONYMS

The following is a list of acronyms, and their complete terms used in this plan.

Acronym	Term
AADT	Annual average daily traffic
AVC	Animal-vehicle crash
AWDT	Average weekday traffic
CTP	Comprehensive Transportation Plan
CTT	Core Technical Team
DCHC MPO	Durham-Chapel Hill-Carrboro Metropolitan Planning Organization
FHWA	Federal Highway Administration
GIS	Geographic information system(s)
MTP	Metropolitan Transportation Plan
MUTCD	Manual on Uniform Traffic Control Devices
NCDNCR	North Carolina Department of Natural and Cultural Resources
NCWRC	North Carolina Wildlife Resources Commission
NCDOT	North Carolina Department of Transportation
ROW	Right-of-way
STIP	State Transportation Improvement Program
TCCTW	Triangle Connectivity Collaborative Transportation Workgroup
UNNH	Upper Neuse New Hope
USACE	United States Army Corps of Engineers
WN	Wildlands Network
WVC	Wildlife-vehicle collision

## APPENDIX C - WILDLIFE AFFECTED BY CROSSINGS IN THE DCHC MPO PLANNING AREA

The following list of wildlife was researched and retrieved from the North Carolina Wildlife Resources Commission at <https://www.ncwildlife.org/wildlife-habitat/species>.

Name	Scientific Name	Size	Species
American Toad	<i>Bufo (Anaxyrus) americanus</i>	Small	Amphibian
Bullfrog	<i>Rana catesbeiana</i>	Small	Amphibian
Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>	Small	Amphibian
Cricket Frogs (Northern and Southern)	<i>Acris crepitans</i>	Small	Amphibian
Dwarf Salamander	<i>Eurycea quadridigitata</i>	Small	Amphibian
Eastern Newt	<i>Notophthalmus viridescens</i>	Small	Amphibian
Eastern Narrowmouth Toad	<i>Gastrophryne carolinensis</i>	Small	Amphibian
Eastern Spadefoot	<i>Scaphiopus holbrookii</i>	Small	Amphibian
Four-toed Salamander	<i>Hemidactylium scutatum</i>	Small	Amphibian
Fowler's Toad	<i>Bufo (Anaxyrus) fowleri</i>	Small	Amphibian
Green Frog	<i>Rana clamitans</i>	Small	Amphibian
Green Tree Frog	<i>Hyla cinera</i>	Small	Amphibian
Marbled Salamander	<i>Ambystoma opacum</i>	Small	Amphibian
Mud Salamander	<i>Pseudotriton montanus</i>	Small	Amphibian
Northern Dusky Salamander	<i>Desmognathus fuscus</i>	Small	Amphibian
Pickerel Frog	<i>Rana palustris</i>	Small	Amphibian
Red-backed Salamander	<i>Plethodon cinereus</i>	Small	Amphibian
Red Salamander	<i>Pseudotriton ruber</i>	Small	Amphibian
Slimy Salamander	<i>Plethodon cylindraceus</i>	Small	Amphibian
Southern Leopard Frog	<i>Rana sphenoccephala</i>	Small	Amphibian
Southern Two-lined Salamander	<i>Eurycea cirrigera</i>	Small	Amphibian
Spotted Salamander	<i>Ambystoma maculatum</i>	Small	Amphibian
Spring Peeper	<i>Pseudacris crucifer</i>	Small	Amphibian
Three-lined Salamander	<i>Eurycea guttolineata</i>	Small	Amphibian
Upland Chorus Frog	<i>Pseudacris feriarum</i>	Small	Amphibian
Hoary Bat	<i>Lasiurus cinereus</i>	Small	Bat
Little Brown Bat	<i>Myotis lucifugus</i>	Small	Bat
Seminole Bat	<i>Lasiurus seminolus</i>	Small	Bat
Tricolored Bat	<i>Perimyotis subflavus</i>	Small	Bat
Canada Goose	<i>Branta canadensis</i>	Small	Bird
Eastern Wild Turkey	<i>Meleagris gallopavo</i>	Medium	Bird
Turkey Vulture	<i>Cathartes aura</i>	Medium	Bird
Beaver	<i>Castor canadensis</i>	Small	Mammal
Eastern Chipmunk	<i>Tamias striatus striatus</i>	Small	Mammal
Eastern Cottontail	<i>Sylvilagus floridanus</i>	Small	Mammal
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>	Small	Mammal
Fox Squirrel	<i>Sciurus niger vulpinus</i>	Small	Mammal
Groundhog	<i>Marmota monax</i>	Small	Mammal
Long-tailed Weasel	<i>Mustela frenata</i>	Small	Mammal
Marsh Rabbit	<i>Sylvilagus palustris</i>	Small	Mammal
Mink	<i>Mustela vison</i>	Small	Mammal



Muskrat	<i>Ondatra zibethicus</i>	Small	Mammal
Nine-banded Armadillo	<i>Dasypus novemcinctus</i>	Small	Mammal
Nutria	<i>Myocaster coypus bonariensis</i>	Small	Mammal
Raccoon	<i>Procyon lotor</i>	Small	Mammal
Southern Flying Squirrel	<i>Glaucomys volans</i>	Small	Mammal
Striped Skunk	<i>Mephitis mephitis</i>	Small	Mammal
Virginia Opossum	<i>Didelphis virginiana</i>	Small	Mammal
Bobcat	<i>Lynx rufus</i>	Medium	Mammal
Coyote	<i>Canis latrans</i>	Medium	Mammal
Feral Swine	<i>Sus scrofa</i>	Medium	Mammal
Gray Fox	<i>Urocyon cinereoargenteus</i>	Medium	Mammal
North American River Otter	<i>Lontra canadensis</i>	Medium	Mammal
Red Fox	<i>Vulpes vulpes</i>	Medium	Mammal
White-tailed Deer	<i>Odocoileus virginianus</i>	Large	Mammal
Broad-headed Skink	<i>Plestiodon laticeps</i>	Small	Reptile
Brown Snake	<i>Storeria dekayi</i>	Small	Reptile
Common Musk Turtle	<i>Sternotherus odoratus</i>	Small	Reptile
Common Snapping Turtle	<i>Chelydra serpentina</i>	Small	Reptile
Copperhead	<i>Agkistrodon contortrix</i>	Small	Reptile
Corn Snake	<i>Elaphe guttata</i>	Small	Reptile
Eastern Box Turtle	<i>Terrapene carolina carolina</i>	Small	Reptile
Eastern Fence Lizard	<i>Sceloporus undulatus</i>	Small	Reptile
Eastern Garter Snake	<i>Thamnophis sirtalis sirtalis</i>	Small	Reptile
Eastern Hognose Snake	<i>Heterodon platirhinos</i>	Small	Reptile
Eastern Kingsnake	<i>Lampropeltis getula</i>	Small	Reptile
Eastern Milksnake	<i>Lampropeltis triangulum triangulum</i>	Small	Reptile
Eastern Mud Turtle	<i>Kinosternon subrubrum</i>	Small	Reptile
Eastern Painted Turtle	<i>Chrysemys picta picta</i>	Small	Reptile
Eastern Ribbon Snake	<i>Thamnophis sauritus</i>	Small	Reptile
Five-lined Skink	<i>Eumeces (Plestiodon) fasciatus</i>	Small	Reptile
Green Anole	<i>Anolis carolinensis</i>	Small	Reptile
Ground Skink	<i>Scincella lateralis</i>	Small	Reptile
Mole Kingsnake	<i>Lampropeltis rhombomaculata</i>	Small	Reptile
Northern Watersnake	<i>Nerodia sipedon</i>	Small	Reptile
Queen Snake	<i>Regina septemvittata</i>	Small	Reptile
Racer	<i>Coluber constrictor</i>	Small	Reptile
Rat Snake	<i>Elaphe obsoleta</i>	Small	Reptile
Red-bellied Snake	<i>Storeria occipitomaculata</i>	Small	Reptile
Red-bellied Watersnake	<i>Nerodia erythrogaster</i>	Small	Reptile
Ring-necked Snake	<i>Diadophis punctatus</i>	Small	Reptile
River Cooter	<i>Pseudemys concinna</i>	Small	Reptile
Rough Earth Snake	<i>Haldea striatula</i>	Small	Reptile
Rough Green Snake	<i>Opheodrys aestivus</i>	Small	Reptile
Scarlet Kingsnake	<i>Lampropeltis elapsoides</i>	Small	Reptile
Scarlet Snake	<i>Cemophora coccinea</i>	Small	Reptile
Six-lined Racerunner	<i>Cnemidophorus sexlineatus</i>	Small	Reptile
Slender Glass Lizard	<i>Ophisaurus attenuatus</i>	Small	Reptile
Smooth Earth Snake	<i>Virginia valeriae</i>	Small	Reptile
Southeastern Five-lined Skink	<i>Plestiodon inexpectatus</i>	Small	Reptile
Southeastern Crowned Snake	<i>Tantilla coronata</i>	Small	Reptile

Spotted Turtle	<i>Clemmys guttata</i>	Small	Reptile
Striped Mud Turtle	<i>Kinosternon baurii</i>	Small	Reptile
Timber Rattlesnake	<i>Crotalus horridus</i>	Small	Reptile
Yellow-bellied Slider	<i>Trachemys scripta</i>	Small	Reptile



## APPENDIX D - WILDLIFE CROSSING SITE ASSESSMENT FORM

DCHC MPO staff and Triangle Connectivity Collaborative Transportation Workgroup members utilized a Wildlife Crossing Site Assessment Form for use during onsite assessments. This form was developed in partnership with the North Carolina Wildlife Resources Commission for the MPO's planning process.

WILDLIFE CROSSING SITE ASSESSMENT FORM	
<b>Name of Reviewer:</b>	
<b>Date of Site Assessment:</b>	
<b>Site Name:</b>	
	<b>Assessment Description</b>
<b>1</b>	<b>What is the existing crossing structure code found in the NCDOT Structure Locations GIS database?</b>
<b>2</b>	<b>Corridor IDs (and priority level) associated with this potential crossing site in the Upper Neuse-New Hope Landscape Analysis dataset.</b>
<b>3</b>	<b>What is the creek name that is intersected by the structure?</b>
<b>4</b>	<b>Provide useful directions for finding the crossing (example: Johnston Mill Nature Preserve - Mt Sinai Access; Off Old NC 86 in Hillsborough).</b>
<b>5</b>	<b>Please take a photo of the structure that depicts the general aspect of the crossing, and others as you feel are necessary to help communicate the challenge. Full name of the photo used for ID.</b>
	Was a photo taken? Yes / No (circle one)
<b>6</b>	<b>What type of crossing is this? <u>Bridge</u>: a deck supported by abutments (or stream banks); <u>Culvert</u>: a structure buried under some amount of fill; <u>Pipe</u>: a cylinder culvert, typically metal; <u>Other</u>: railroads, fords, or other crossing types.</b>
	Bridge / Culvert / Pipe / Other (circle one)
<b>7</b>	<b>What is the width of the underpass? <u>Large</u>: over 60 ft wide with 8 ft vertical clearance; <u>medium</u>: less than 60 ft but more than 4 feet wide; <u>small</u>: less than 4ft/48 inch diameter</b>
	<i>[May be able to input information from NCDOT's NBS data regarding structure size then confirm that information during site visit]</i> Large / Medium / Small (circle one)
<b>8</b>	<b>How many cells / openings are there for the bridges or culvert structures?</b>

9	<b>Provide a comparison of the substrate (e.g., rock, gravel, sand) inside the structure and the substrate in the natural, undisturbed stream channel.</b>
	None / Comparable / Contrasting / Not Appropriate / Unknown (circle one)
10	<b>Barriers associated with the crossing. Indicate all that apply: riprap, debris / sediment / rock, deformation, free fall, fencing, dry, standing water, other -- or none.</b>
11	<b>Is there a continuous dry stream bank through at least one side of the structure?</b>
	Yes / No / Unknown / (circle one)
12	<b>If a culvert, can you see through to the other side of the structure?</b>
	Yes / No / Unknown / N/A (circle one)
13	<b>If a culvert, is dry passage tied into the bank at each end?</b>
	Yes / No / Only one side / Unknown / N/A (circle one)
14	<b>Is there is evidence of road kills at the date of the assessment?</b>
	Yes / No / Unknown (circle one)
15	<b>Is there evidence of wildlife using the crossing at the date of the assessment?</b>
	Yes / No / Unknown (circle one)
16	<b>Identify key species along corridor/crossing.</b>
	<i>This may have to be researched after the site assessment unless there is evidence or is in existing GIS data.</i>
17	<b>Provide comments about any aspect of the overall crossing that warrants additional information. What do you see as the main problem with the crossing, and what do you see should be implemented to correct the problem?</b>
18	<b>List any known property owners of land adjacent to the crossing.</b>
19	<b>Is there a greenway or potential for a future greenway trail?</b>
	Existing greenway / Yes, potential presence / No (circle one)



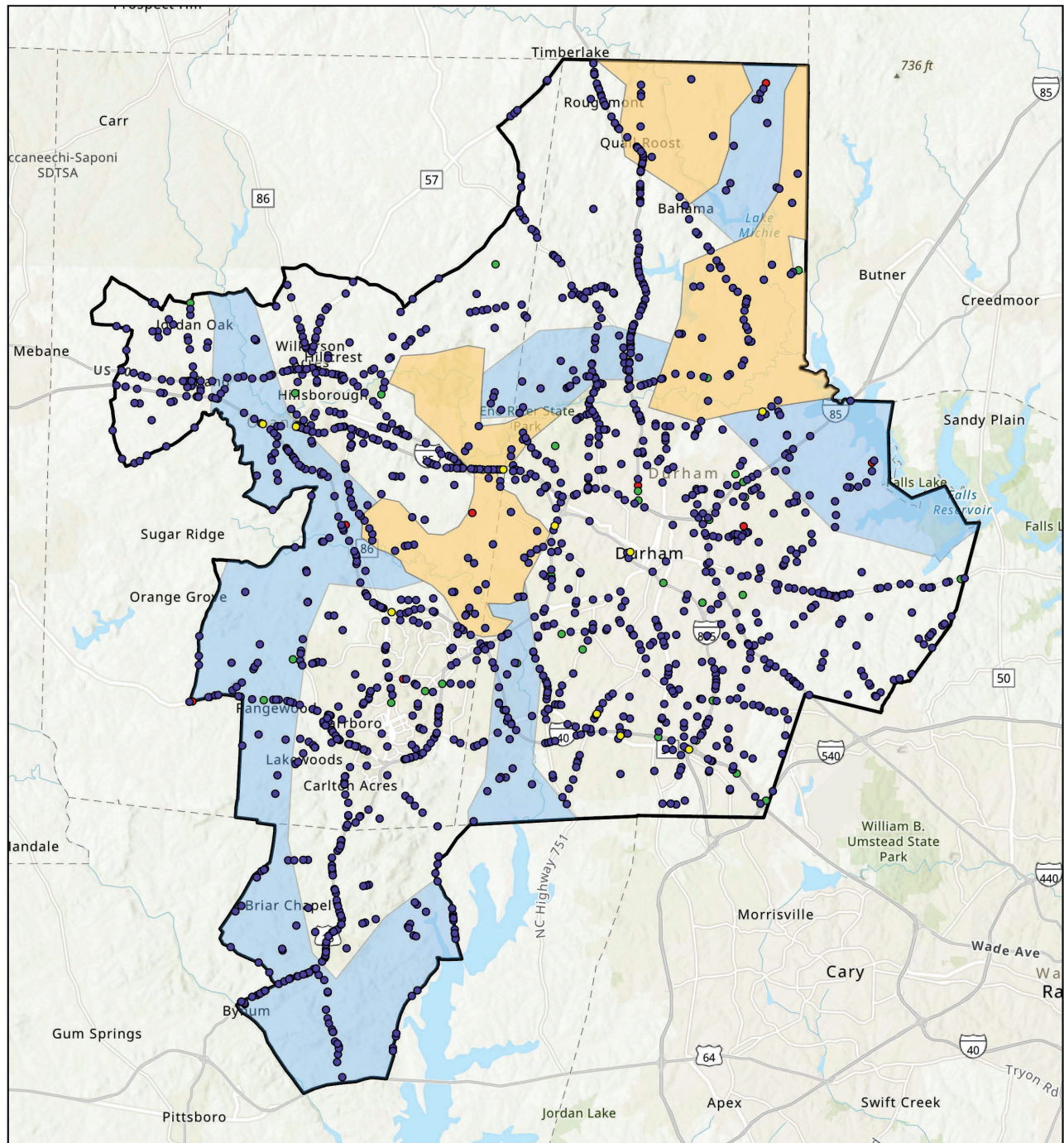
## APPENDIX E - WILDLIFE CROSSING PROJECT SHEET DESCRIPTIONS

Each project sheet describes elements associated with the wildlife crossing site that helps guide the wildlife crossing countermeasures for consideration. The following is a description of each element.

<b>Location ID</b>	Unique number assigned by the MPO to identify the project.
<b>Date of Site Visit</b>	Date that a site assessment was conducted.
<b>Jurisdiction</b>	The jurisdiction that the site resides in.
<b>Coordinates</b>	GPS coordinates of the site.
<b>NCDOT Crossing/Structure Code</b>	Unique number/code assigned by NCDOT to identify a structure (bridge, culvert, etc.).
<b>Existing Structure Type</b>	The type of structure being assessed at the site.
<b>Preferred Scenario</b>	The preferred recommendation for a site to reduce WVCs and allow wildlife to travel under/through a structure.
<b>Alternate Scenario</b>	An alternate recommendation to the preferred scenario for a site to reduce WVCs and allow wildlife to travel under/through a structure.
<b>Property Owner Type</b>	Public or private ownership. Provides insight into feasibility of implementing wildlife crossing solutions at a given site.
<b>Natural/Managed Lands</b>	Each crossing site was reviewed for adjacent natural and managed lands. Natural and managed lands can help create effective wildlife crossing sites due the protected wildlife habitat that they provide.
<b>Existing Plan Alignment</b>	Name of MPO, state or local plan that includes projects that align with the wildlife crossing site.
<b>AADT (2019)</b>	The average annual daily traffic count in 2019 of the road that crosses the site. AADT was analyzed to help determine the likelihood of a WVC.
<b>AADT (2021)</b>	The average annual daily traffic count in 2021 of the road that crosses the site. AADT was analyzed to help determine the likelihood of a WVC.
<b>Projected AWDT</b>	The average weekday traffic of the road that crosses the site. AWDT was analyzed to help determine the likelihood of a WVC.
<b>Speed Limit</b>	The speed limit of the road that aligns with the site was analyzed to help determine driver reaction time and the likelihood of a WVC.
<b>Reported Wildlife-Vehicle Collisions (2018-2022) (1-mile -buffer)</b>	NCDOT's reported WVC data was analyzed for each site using a 1-mile buffer. Each reported WVC was then analyzed for the type of crash/injury type, and the comprehensive crash cost estimate by crash/injury type was totaled to determine the estimated cost these WVCs caused.
<b>Likely WVCs within 1-mile buffer (based on VDOT study revealing 8.5 times more WVCs are occurring than what DOT reports show)</b>	This section details the potential impact of likely WVCs at the site location. Using NCDOT's reported WVC data as a starting point, each crash and estimate was multiplied by 8.5 to coincide with Virginia DOT's study findings that WVCs are likely occurring 8.5 times more often than what law enforcement reports and DOTs show.

## APPENDIX F - MAP OF REPORTED WILDLIFE-VEHICLE CRASHES IN THE DCHC MPO PLANNING AREA (2018-2022, NCDOT)

Each point on this layer does not indicate a single reported crash, as some points represent more than one crash event.



### Legend

- Wildlife Cores
- Wildlife Corridors
- MPO Boundary

Reported WVCs 2018-2022  
by Severity:

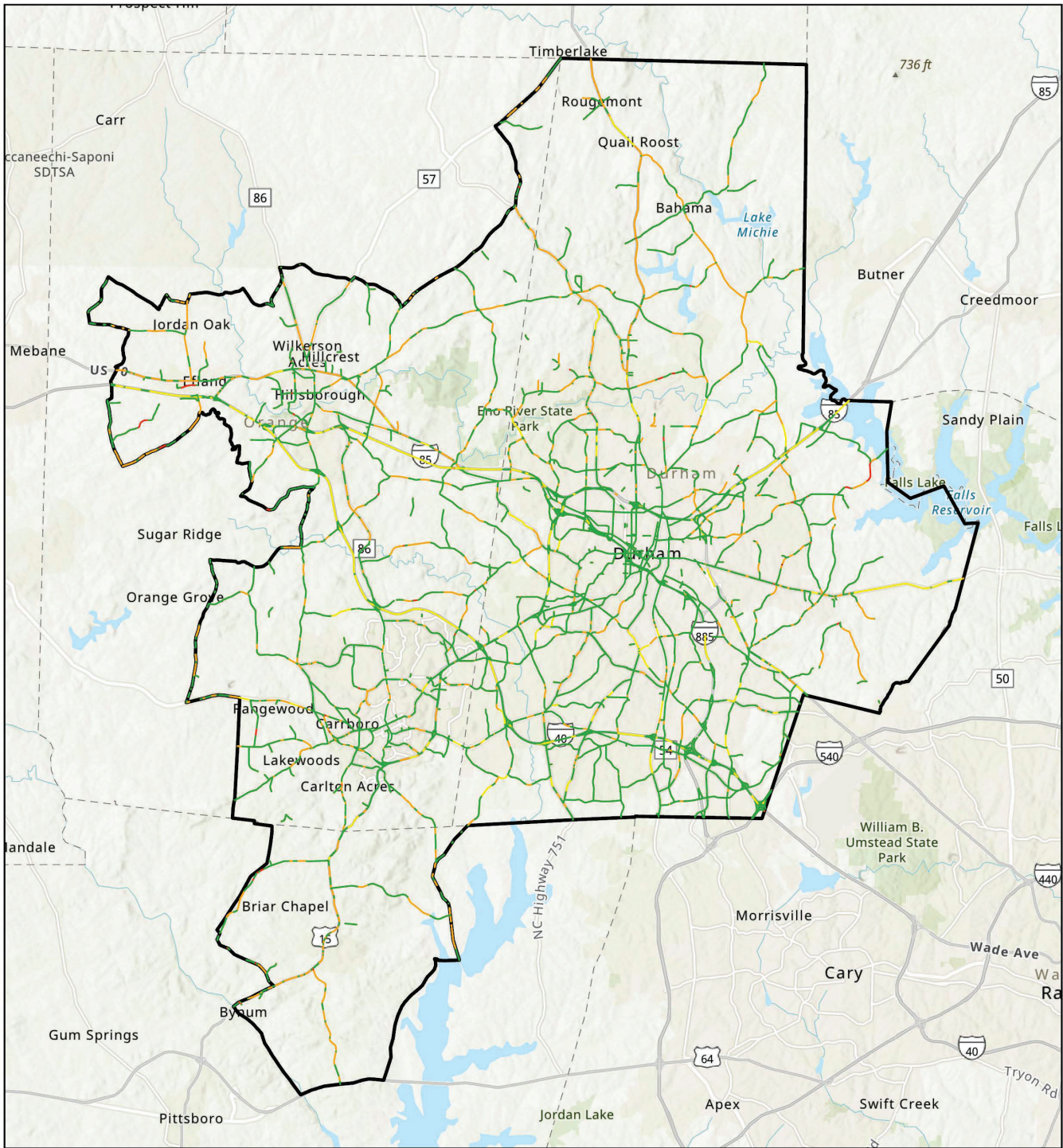
- B Type Injury (evident)
- C Type Injury (possible)
- O No Injury
- Unknown Injury Status
- <all other values>



0 2.5 5 7.5 10 Miles



APPENDIX G - MAP OF CURRENT WILDLIFE-VEHICLE CRASH RATE  
IN THE DCHC MPO PLANNING AREA



Legend

MPO Boundary

Current WVC Rate

Very Low

Low

Moderate

High

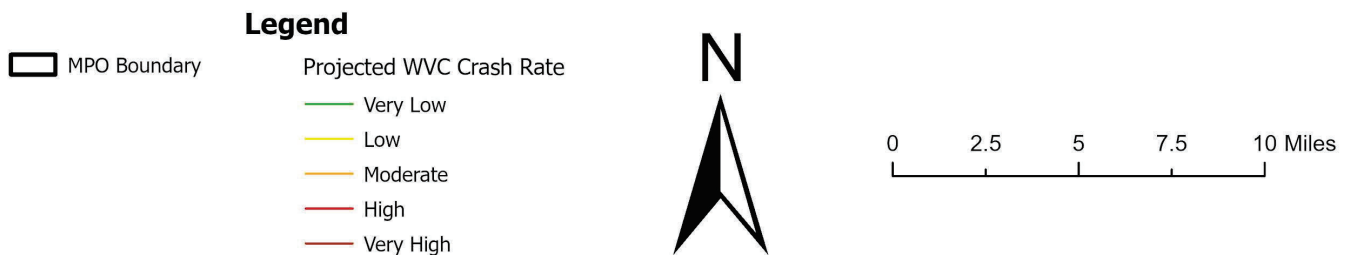
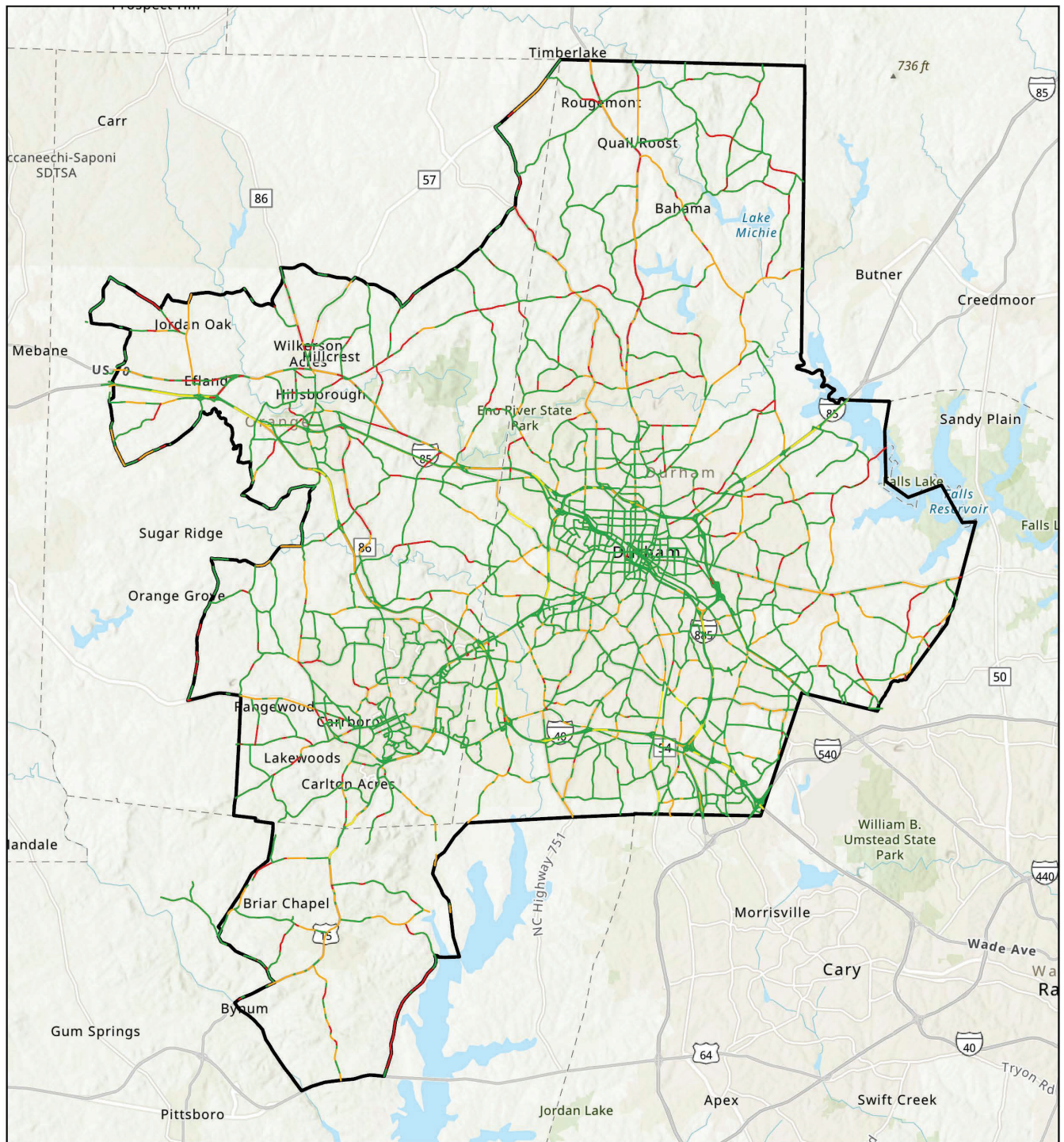
Very High



0 2.5 5 7.5 10 Miles

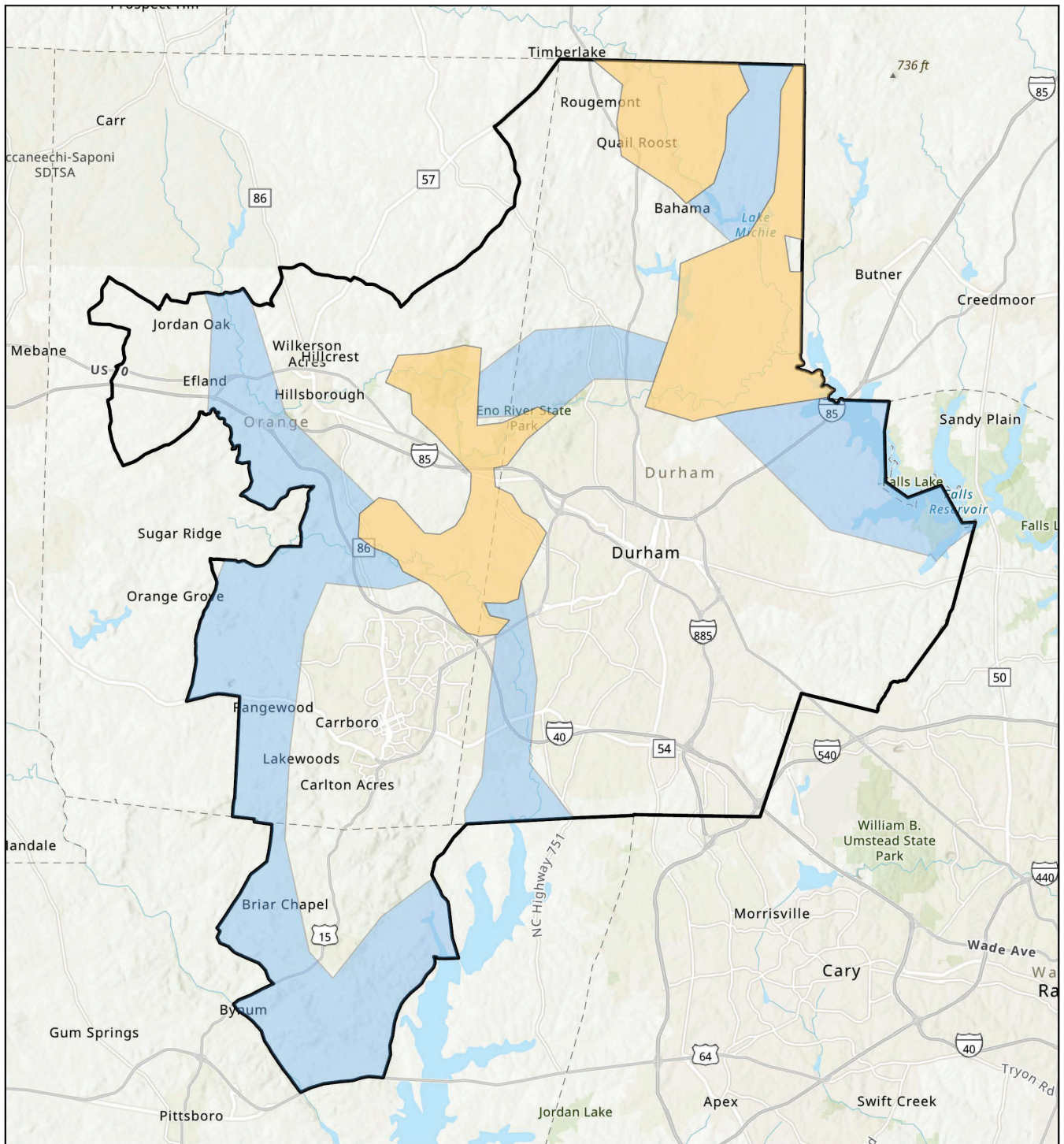


# APPENDIX H - MAP OF PROJECTED WILDLIFE-VEHICLE CRASH RATE IN THE DCHC MPO PLANNING AREA





# APPENDIX I - MAP OF WILDLIFE CORES AND CORRIDORS IN THE DCHC MPO PLANNING AREA



## Legend

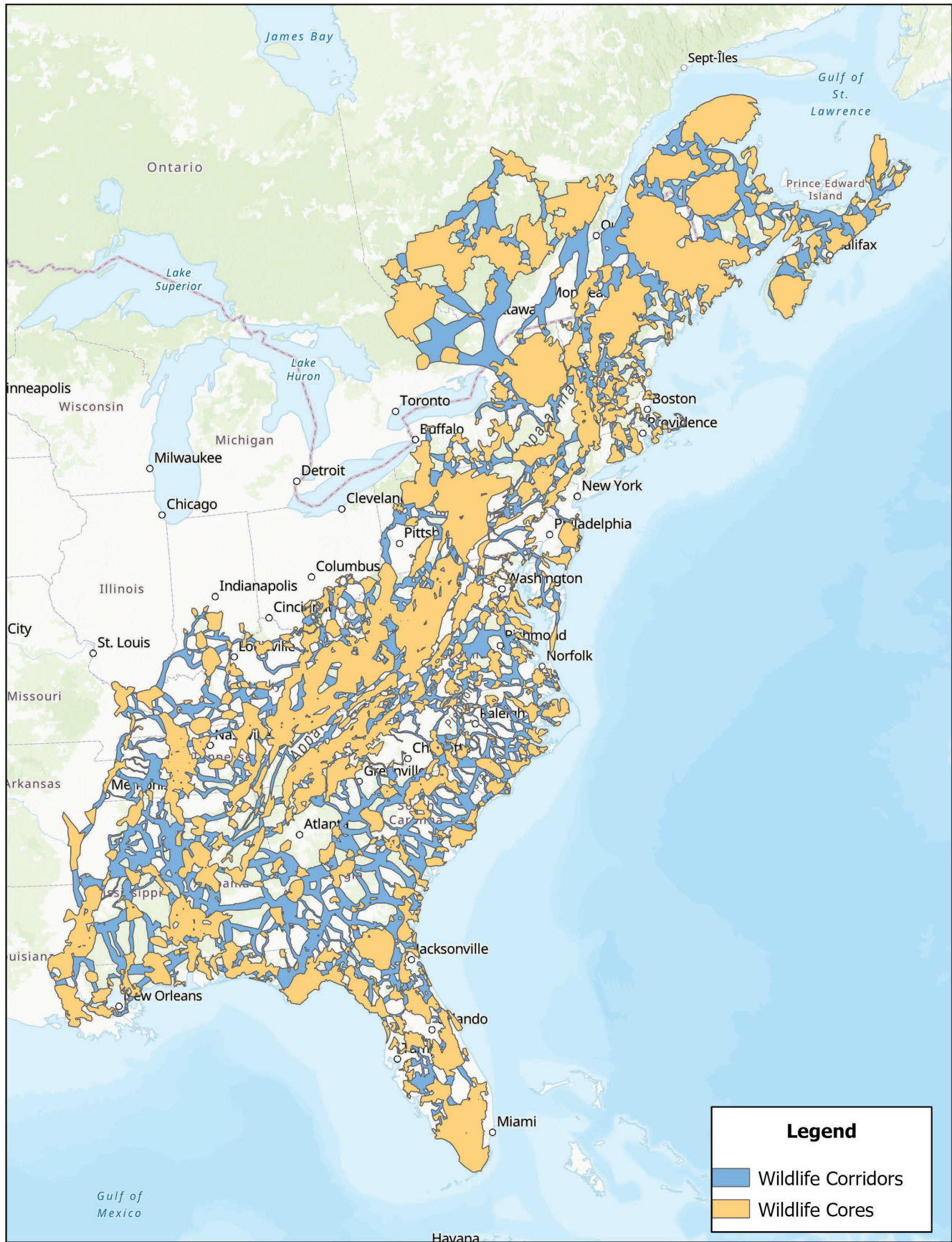
- Wildlife Corridors
- Wildlife Cores
- MPO Boundary



0 2.5 5 7.5 10 Miles

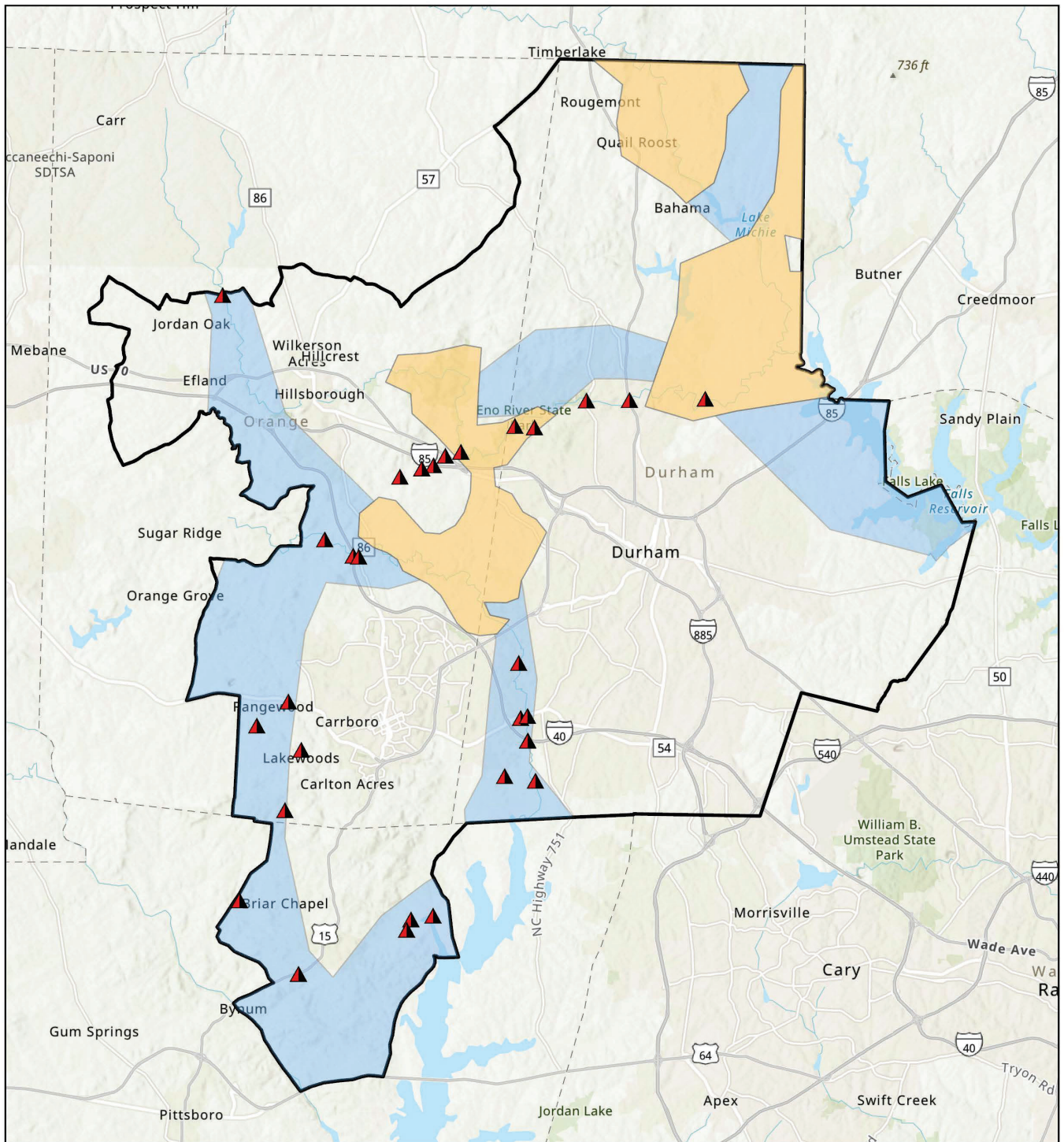


## APPENDIX J - MAP OF WILDLIFE CORES AND CORRIDORS IN THE EASTERN SEABOARD





# APPENDIX K - MAP OF WILDLIFE CROSSING PROJECTS IN THE DCHC MPO PLANNING AREA



## Legend

- Wildlife Corridors
- Wildlife Cores
- MPO Boundary
- Project Sites



0 2.5 5 7.5 10 Miles

## APPENDIX L - WILDLIFE INFRASTRUCTURE FUNDING OPPORTUNITIES WITHIN THE INFRASTRUCTURE INVESTMENT & JOBS ACT FOR NORTH CAROLINA

### Wildlife Infrastructure Funding Opportunities within the Infrastructure Investment & Jobs Act

Prepared by Renee Callahan, ARC Solutions, [info@arc-solutions.org](mailto:info@arc-solutions.org)

















Program Name	Amount† (FY22-26)	Eligible applicants					New, Expanded, Existing	Process	Federal Share (%)	Eligible wildlife-related activities
		FLMA	Tribe	State DOT	MPO	Local Gov't				
More information about notice and application timing is available in the companion funding calendar: <a href="https://tinyurl.com/ARC-funding-calendar">tinyurl.com/ARC-funding-calendar</a>										
<a href="#">Wildlife Crossings Pilot Program</a> <a href="#">🔗</a> (23 USC § 171)	\$350M	✓	✓	✓	✓	✓	New	<div>DG</div> <div>Due 9/4/24</div>	Typically 80%; up to 90% for projects on Interstates	Projects to reduce wildlife-vehicle collisions and improve terrestrial/aquatic connectivity, including construction and non-construction projects, involving planning, research, outreach, and feasibility analyses
<a href="#">INFRA</a> <a href="#">🔗</a> (23 USC § 117)	\$8B	✓ <sup>1</sup>	✓	✓	✓ <sup>3</sup>	✓	Expanded	DG	INFRA award may be used for up to 60% of project costs	Wildlife crossing projects
<a href="#">Rebuilding American Infrastructure with Sustainability &amp; Equity</a> <a href="#">🔗</a> (49 USC § 6702)	\$7.5B		✓	✓	✓	✓	Existing	DG	Typically 80%; except rural, disadvantaged, or persistent poverty areas	Wildlife-related highway and bridge projects eligible under Title 23 USC programs, plus projects to improve aquatic connectivity by replacing or rehabilitating culverts or preventing stormwater runoff
<a href="#">Rural Surface Transportation Grant Program</a> <a href="#">🔗</a> (23 USC § 173)	\$2B		✓	✓	✓ <sup>4</sup>	✓	New	DG	Typically 80%, except ADHS, DASP projects	Wildlife-related projects in Rural Areas otherwise eligible under the Surface Transportation Block Grant Program, Tribal Transportation Program, and Highway Safety Improvement Program
<a href="#">National Culvert Removal, Replacement &amp; Restoration Program</a> <a href="#">🔗</a> (49 USC § 6703)	\$1B		✓	✓		✓	New	<div>DG</div> <div>Due 9/23/24</div>	Up to 80% for State/Local; up to 100% for Tribes	Projects to replace, remove, or repair culverts or weirs to restore anadromous fish passage, including infrastructure to facilitate fish passage around or over weirs, or weir improvements
Bridge Investment Program (23 USC § 124)	\$12.5B	✓	✓	✓	✓ <sup>3</sup>	✓	New	<div>DG</div> <div>All NOFOs are open!</div>	Typically up to 50% for Large Bridges; up to 80% for Small Bridges; up to 90% for Off-System Bridges	Up to 5% annually may go to projects to replace or rehabilitate culverts to improve flood control and habitat connectivity for aquatic species; environmental mitigation is also an eligible expense during bridge construction / reconstruction
<a href="#">Bridge</a> <a href="#">🔗</a>								<div>Due 11/1/24</div>		
<a href="#">Large Bridge</a> <a href="#">🔗</a>								<div>Due 8/1/24</div>		
<a href="#">Planning</a> <a href="#">🔗</a>								<div>Due 10/01/24</div>		
<a href="#">Tribal Transportation Program Safety Fund</a> <a href="#">🔗</a> (23 USC § 202(e))	\$120M		✓				Existing	<div>DG</div> <div>Re-opening 10/1/24</div>	Up to 100%	Adding or retrofitting structures or other measures to eliminate or reduce wildlife-vehicle collisions
<a href="#">Nationally Significant Federal Lands &amp; Tribal Projects Program</a> <a href="#">🔗</a> (FAST 1123(c))	\$275M	✓	✓	✓ <sup>2</sup>	✓ <sup>2</sup>	✓ <sup>2</sup>	Existing	<div>DG</div> <div>Expected Summer '24</div>	Up to 90% for Federal Lands, 100% for Tribal	Same as Federal Lands Transportation Program, Federal Lands Access Program, and Tribal Transportation Program
<a href="#">PROTECT</a> <a href="#">🔗</a> (23 USC § 176)	\$1.4B	✓ <sup>1</sup>	✓	✓	✓	✓	New	<div>DG</div> <div>Expected Summer '24</div>	Typically 80%, up to 100% for Federal /Tribal	<b>Wildlife infrastructure is not expressly eligible</b> ; funding may be used for improved infrastructure resiliency via “protective features” or “natural infrastructure,” which may co-benefit aquatic and/or terrestrial connectivity
<a href="#">Roadside Pollinator Program</a> <a href="#">🔗</a> (23 USC § 332)	\$10M (\$3M in FY23)	✓	✓	✓			New	<div>DG</div> <div>Extended! Due 7/18/24</div>	Up to 100%	Pollinator-friendly activities on roadsides and highway rights-of-way, including planting and seeding native grasses and wildflowers, including milkweed

Suggested citation: Callahan, R. (2024). *Wildlife Infrastructure Funding Opportunities within the Infrastructure Investment & Jobs Act*. Summary prepared on behalf of ARC Solutions, NPCA, Wildlands Network. Bozeman, MT.

Updated June 25, 2024

ARC



Program Name	Amount (FY22-FY26) <sup>†</sup>	Eligible recipients					New, Expanded, Existing	Process	Federal Share (%)	Eligible wildlife-related activities
		FLMA	Trib e	State DOT	MPO	Local Gov't				
<u>PROTECT</u>  (23 USC § 176) <a href="#">NC FY24 = \$38.9M</a> 	\$7.3B	✓ <sup>1</sup>	✓	✓	✓	✓	New	State FA	Typically 80%, up to 100% for Federal /Tribal	Wildlife infrastructure is not expressly eligible; PROTECT does fund improved infrastructure resiliency via “protective features” such as increasing the size or number of culverts, which may improve aquatic and/or terrestrial connectivity
<u>Bridge Formula Program</u>  (IIJA § 11108(a)(2)(A)) <a href="#">NC FY24 = \$98.7M</a> 	\$27.5B		✓	✓		✓	New	State FA	Same as 23 USC § 120; plus up to 100% for OSB	Wildlife mitigation appears to be an eligible expense during bridge reconstruction / construction, given expanded definition of “construction”
<u>Highway Safety Improvement Program</u>  (23 USC § 148) <a href="#">NC FY24 = \$80.4M</a> 	\$15.6B	✓	✓	✓	✓	✓	Existing	State FA	Up to 90%, with statutory exceptions	Adding or retrofitting structures or other measures to eliminate or reduce wildlife-vehicle collisions
<u>Surface Transportation Block Grant Program</u>  (23 USC § 133) <a href="#">NC FY24 = \$334.7M</a>  <a href="#">Durham FY24 = \$6,985,798</a> 	\$64.8B (excluding TAP)		✓	✓	✓	✓	Expanded	State FA	Typically 80%, except Interstate projects (90%) & certain states	Construction, addition or retrofitting of wildlife crossings plus projects and strategies to reduce wildlife-vehicle collisions, including project-related planning, design, construction, monitoring, and preventative maintenance
<u>Transportation Alternatives Program (TAP)</u>  (23 USC § 133(h)) <a href="#">NC FY24 TA set-aside= \$41M</a>  <a href="#">Durham FY24 = \$880,906</a> 	\$7.2B		✓	✓ <sup>2</sup>	✓	✓	Existing	State FG	Typically 80%, except in certain states	Environmental mitigation to reduce vehicle-caused wildlife mortality or to restore or maintain connectivity among terrestrial or aquatic habitats
<u>Federal Lands Access Program</u>  (23 USC § 204) <a href="#">NC per FY = \$2.6M</a> 	\$1.5B		✓	✓		✓	Existing	State FG	Up to 100%	Environmental mitigation to improve public safety and reduce vehicle-caused wildlife mortality while improving or maintaining habitat connectivity
<u>Federal Lands Transportation Program</u>  (23 USC § 203)	\$2.2B	✓					Expanded	Federal FA	Up to 100%	Environmental mitigation to improve public safety and reduce vehicle-caused wildlife mortality while maintaining habitat connectivity; or to mitigate damage to wildlife, aquatic organism passage, habitat, and ecosystem connectivity including constructing, replacing, maintaining, or removing culverts and bridges
<u>Tribal Transportation Program (TTP)</u>  (23 USC § 202)	\$3B		✓				Existing	Tribal FA	Up to 100%	Environmental mitigation to improve public safety and reduce vehicle-caused wildlife mortality while maintaining habitat connectivity; or to mitigate damage to wildlife, aquatic organism passage, habitat, and ecosystem connectivity including constructing, replacing, maintaining, or removing culverts and bridges
View the most recent version by visiting <a href="#">arc-solutions.org</a> or email <a href="mailto:info@arc-solutions.org">info@arc-solutions.org</a> to subscribe to updates.										
<b>LEGEND</b>										
<sup>1</sup> Applying jointly with one or more States <sup>2</sup> If requested or sponsored by another eligible entity <sup>3</sup> If the MPO has a population of greater than 200,000 <sup>4</sup> MPOs may apply for eligible Rural projects within the MPO that are outside of an Urban Area <sup>†</sup> Except as noted, FY22-26 total amounts do not reflect additional General Fund appropriations after FY22. <sup>‡</sup> Formula allocation is distributed to States only. MPOs/tribes/local governments are eligible recipients for PROTECT Discretionary Grant funds. FLMAs can apply jointly with a State or group of States.								<b>Process:</b> Discretionary Grant (DG) - distributed at the national level; Formula Allocation (FA); Formula Grant (FG)		
<b>Green:</b> A Notice of Funding Opportunity (NOFO) is open and applications are being accepted until the deadline. Click on the program name to view an <i>At-A-Glance</i> summary of eligibility requirements. <b>Orange:</b> NOFO is expected in Spring 2024. <b>Yellow:</b> NOFO is expected in Summer 2024.								<b>Eligible Applicants:</b> Federal Land Management Agency (FLMA); Department of Transportation (DOT); Metropolitan Planning Organization (MPO); Local Government (Gov't)		
<b>Sources:</b> <a href="#">Infrastructure Investment &amp; Jobs Act</a> ; <a href="#">FHWA Bipartisan Infrastructure Law</a> ; <a href="#">FHWA Funding</a> ; <a href="#">FHWA HSIF</a> ; <a href="#">White House Guidebook</a> ; <a href="#">USDOT Upcoming NOFOs</a> ; <a href="#">FHWA Competitive Grant Funding Matrix</a>										
<p><b>This guidance chart was prepared by Renee Callahan on behalf of ARC Solutions, National Parks Conservation Association, and Wildlands Network.</b></p> <p><i>Special thanks to Tony Cady, Colorado Department of Transportation, for his assistance in developing this chart.</i></p> <p>ARC Solutions is a not-for-profit partnership whose mission is to identify and promote leading-edge solutions to improve human safety, wildlife mobility and long-term landscape connectivity.</p> <p>ARC is fiscally sponsored by <i>Social and Environmental Entrepreneurs</i>. <b>Contact:</b> Renee Callahan (<a href="mailto:rcallahan@arc-solutions.org">rcallahan@arc-solutions.org</a>).</p> <p>National Parks Conservation Association is a non-profit organization whose mission is to protect and enhance America's National Park System for present and future generations. <b>Contact:</b> Bart Melton (<a href="mailto:bmelton@npca.org">bmelton@npca.org</a>).</p> <p>Wildlands Network is a non-profit organization whose mission is to reconnect, restore and rewild North America so that life—in all its diversity—can thrive. <b>Contact:</b> Erin Sito (<a href="mailto:e.sito@wildlandsnetwork.org">e.sito@wildlandsnetwork.org</a>).</p>										



## APPENDIX M - WILDLIFE CROSSING PUBLIC ENGAGEMENT SURVEY (PAPER VERSION)

### DCHC MPO WILDLIFE CROSSING PLANNING STUDY SURVEY

The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization's Wildlife Crossings Planning Study is an MPO-led initiative with a goal of improving roadway safety by eliminating wildlife-vehicle crashes. This study and plan will recommend transportation improvements in the MPO planning area that prioritize safety, eliminate crash-related impacts, and help protect the natural environment.

#### **Summary of Wildlife-Vehicle Crashes**

Roads are a serious conflict point between wildlife and vehicles. North Carolina had over 20,000 reported wildlife-vehicle crashes in 2022 alone, which resulted in a crash cost estimate of \$486 million dollars (NCDOT). However, the actual number of crashes is believed to be at least five times higher based on underreporting.

Wildlife-vehicle crashes are a significant safety issue in the MPO's planning area. Out of the 100 counties in North Carolina, the MPO's counties rank in the top third of highest reported crashes (Chatham ranks 21, Orange ranks 30, and Durham ranks 35). Between 2020-2022, these three counties had a combined crash cost estimate of almost \$75 million dollars. DCHC MPO's plan recommends projects to eliminate wildlife-vehicle crashes in its planning area and their associated costs.

**1. Prior to learning about the MPO's wildlife crossing study, how familiar were you with wildlife crossing countermeasures and wildlife-vehicle crash impacts?**

☐

Very familiar

☐

Somewhat familiar

☐

Not familiar

**2. Please indicate what materials you reviewed, and/or events attended before taking this survey.**

**Check all that apply:**

☐

MPO Draft Wildlife Crossings Plan

☐

DCHC MPO public engagement virtual event

☐

DCHC MPO public engagement in-person event

☐

DCHC MPO Wildlife Crossing Study project website

☐

Other \_\_\_\_\_

**3. Please share the reasons why you feel incorporating wildlife crossing solutions within our transportation network is important or not important. Check all that apply:**

☐

Wildlife well-being and connectivity

☐

Costs associated with wildlife-vehicle crashes (medical, repair, etc.)

☐

Reduction in vehicle crashes

☐

I do not feel that incorporating wildlife crossings solutions within our transportation network is important.

☐

Other \_\_\_\_\_

**4. Your experience with roadway safety and wildlife-vehicle crashes are important. Please consider sharing your experience(s) with us.**

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**5. Do you have additional feedback or comments about the draft plan?**

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## OPTIONAL QUESTIONS

1. What is your household zip code? \_\_\_\_\_

2. Which race/ethnicity best describes you? (Please choose one)

- ☐ Asian or Pacific Islander   ☐ Black or African American   ☐ Hispanic or Latino   ☐ Multiracial or Biracial  
☐ Native American or Alaskan   ☐ White or Caucasian   ☐ Other \_\_\_\_\_

3. What is your gender identity?

- ☐ Female   ☐ Male   ☐ Non-binary/non-confirming   ☐ Transgender   ☐ Prefer not to say

4. I speak, read, and write English well.

- ☐ Yes   ☐ No

5. What is your age group?

- ☐ 17 years or younger   ☐ 18-24   ☐ 25-64   ☐ 65+

6. Is your total household income equal to or above \$49,160 per year?

- ☐ Yes   ☐ No

7. Five (5) or more people live in my household.

- ☐ Yes   ☐ No

8. I am or am considered to be disabled.

- ☐ Yes   ☐ No

9. My household has zero cars.

- ☐ Yes   ☐ No

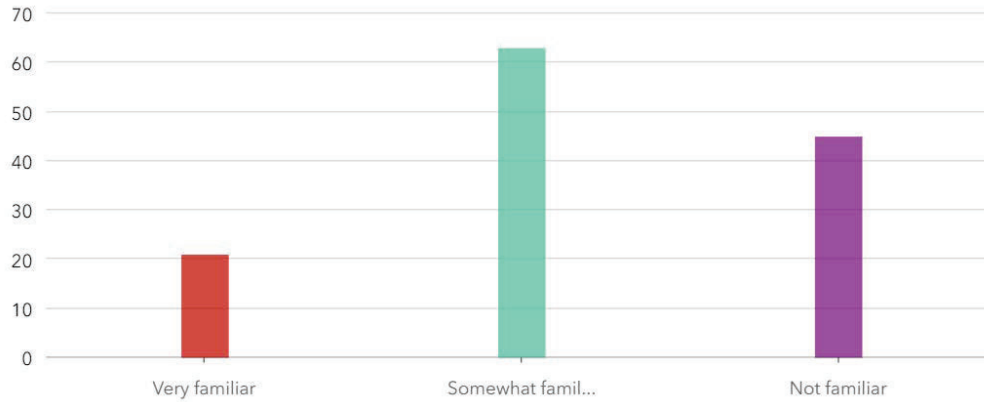
10. Would you like to receive our e-newsletter?

Please share your email if you would like to be added to the MPO's contact list

\_\_\_\_\_

## APPENDIX N - WILDLIFE CROSSING PUBLIC ENGAGEMENT RESULTS

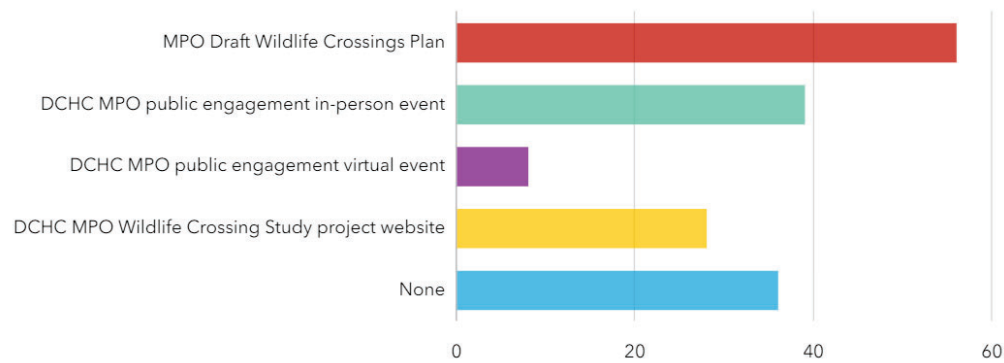
### 1. Prior to learning about the MPO's wildlife crossing study, how familiar were you with wildlife crossing countermeasures and wildlife-vehicle crash impacts?



Answers	Count	Percentage
Very familiar	21	16.28%
Somewhat familiar	63	48.84%
Not familiar	45	34.88%

Answered: 129 Skipped: 0

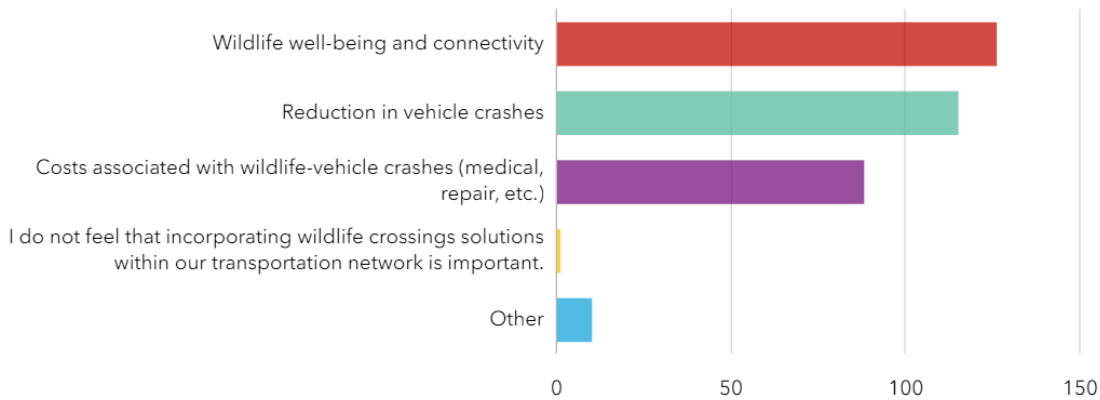
### 2. Please indicate what materials you reviewed, and/or events attended before taking this survey. Check all that apply:



Answers	Count	Percentage
MPO Draft Wildlife Crossings Plan	56	43.41%
DCHC MPO public engagement in-person event	39	30.23%
DCHC MPO public engagement virtual event	8	6.2%
DCHC MPO Wildlife Crossing Study project website	28	21.71%
None	36	27.91%

Answered: 128 Skipped: 1

**3. Please share the reasons why you feel incorporating wildlife crossing solutions within our transportation network is important or not important. Check all that apply:**



Answers	Count	Percentage
Wildlife well-being and connectivity	126	97.67%
Reduction in vehicle crashes	115	89.15%
Costs associated with wildlife-vehicle crashes (medical, repair, etc.)	88	68.22%
I do not feel that incorporating wildlife crossings solutions within our transportation network is important.	1	0.78%
Other	10	7.75%

Answered: 129 Skipped: 0

**Additional reasons submitted as part of this question:**

- Driver safety
- Healthy environment for humans and all organisms requires systems thinking and action. Thriving wildlife is an ecosystem service that provides significant economic benefits.
- Traffic is more congested, and people are speeding and weaving in and out of traffic. There isn't a safe way for wildlife to cross.
- STOP CLEAR CUTTING!!! STOP REWARDING PEOPLE FOR KILLING FORESTS!!! STOP DEVELOPERS!!!! GIVE TAX BREAKS TO PEOPLE WHO SAVE TREES AND FORESTS!!!!
- Loss of biodiversity through decline in wildlife populations
- some of these crossings could also be used by people to get across to trails that cross busy roads
- Prioritizing life is essential.
- Need to internalize high costs of wildlife collisions into construction to minimize them up front.

**4. Your experience with roadway safety and wildlife-vehicle crashes are important. Please consider sharing your experience(s) with us.**

*Public comments provided during the planning process are reflected as originally provided. All names or identifiers have been removed to protect the privacy of individuals.*

We live in northern Orange County and have had near misses with deer, etc. often.
We have run into deer, as have man people I know. Last year I helped rescue a turtle that had been hit crossing 54 at the Waterfowl Impoundment and put it back in the woods.
We drive cautiously to avoid deer casualties, especially around dawn and dusk. Despite our best efforts, a deer that lagged behind the herd hit our van, wandered off hurt. It cost us a four-figure amount to fix the damage. No winners in this story – thanks for your work to keep everyone safe!
Vehicle wreck 2023, deer.
South ellerbee Creek goes through a culvert under Washington Street right next to I-85. There's no easy terrestrial crossing of Washington unless you go right along the exit for North Duke Street. There are extensive wetlands on either side. I've seen several large animals cross at this point and because the road is so wide people drive much faster than the 35 mph speed limit there. It's also a blind Hill and curve.
Small birds, groundhogs, raccoons and opossums, etc. are something I see commonly hit and are likely unreported. There is a bridge with an underpass near me (NC 54) that is small, blocked, and unused. Much small roadkill nearby. It is meant to connect the northeast creek.
Several years ago we were driving eastbound on I-85 west of Greensboro in heavy traffic at night. This was the section that is several lanes wide. Traffic was very heavy. Some car ahead of us had hit a young deer, which was in the road and we couldn't avoid it. We drove over it, which was frightening. We were lucky that there was only cosmetic damage to the car. We live in the Raleigh area, and regularly see dead wildlife (racoons, squirrels, cats, etc.) in the road. I would like to see more natural crossings to reduce deaths and injuries to animals, and I would also like to see local governments remove dead animals from the road and shoulders.
Our family has been involved in a few wildlife-vehicle crashes. It is devastating. We are huge animal/wildlife lovers and are anguished at the unnecessary and traumatic loss of life (from turtles, snakes, to raccoons, opossums and deer, etc.). It's a horrific way to die and leaves many young animals orphaned and also at risk of death. In one crash, we also sustained a 'totaled' vehicle, requiring purchase of another car.
One car crash at night due to a deer jumping in front of the car – car had to be replaced



My husband hit a deer on Hillandale Road in Durham and his nearly new car was totaled.
My husband and a deer collided a few years ago on Umstead Road in north Durham. The deer was killed; my husband was fine; the truck was damaged. Any good ideas to minimize these accidents are worth pursuing.
My family members have hit animals in the past, both locally and living in other states. It is emotionally jarring even without vehicle damage or human injury. However one of our cars was totaled after hitting a deer on an interstate in Wisconsin. My family member was lucky to survive. Most of the wildlife do not survive collisions, and I'm all for making safer passages for them. We lived near Barbee Chapel Rd at Spring Meadow Dr (near the Orange Cty/Durham Cty line), and soooo many animals died on that curve in Barbee Chapel. It's near the Far-rington Rd. project. Maybe some speed traps would help there!
My brother and husband have both hit deer. I may have hit raccoons. I saw squirrels and a cat get hit. My cat was hit when I was a kid. It hurts to think about. Every life is precious (human and animal). Please do everything you can.
Living in N Durham, I've had several near misses with deer on main roads, and I have witnessed many deceased squirrels, opossums, and family pets sadly along the way
Killed a deer in 1986 after I-40 was extended in CH.
I've had several near misses and one traumatic instance of hitting a raccoon while drive. While the raccoon did not cause damage to the car, it took a very unpleasant experience that I hope to never repeat. I also have significant concern with hitting larger animals that could cause harm to my vehicle or myself, in addition to the animal.
I've been in near-crashes many times! A big concern for my family.
It's heartbreaking to see the aftermath of wildlife-vehicle crashes!
It's always distressing to see a wild animal needlessly injured or killed by a vehicle.
It makes me very sad to see deceased wildlife and feel it deserves more attention. Thanks for doing this!
It has hurt my heart to see animals such as turtles, deer, and others wounded by vehicles. I once witnessed a grieving squirrel crying for hours beside a dead squirrel that I assume was its mate.
In Carrboro and Chapel Hill we are impacted primarily by the significant deer population. I encounter deer in the roadway while driving and biking daily, often several times a day. I and family members have been impacted by vehicle strikes. They are traumatic and costly.
I've had many near-misses. This is important!

I think this is great and long overdue. I live on a road in Carrboro where the speed limit is 20mph. Yet vehicle speed plus heavy traffic means I see dead animals on my street every day and many single-vehicle accidents. I personally witnessed a one-month old fawn be hit and killed by a driver in the middle of a clear sunny afternoon. Even roads with traffic 35mph and under are hazardous, but the proposals in the plan are a great start.

I TELL EVERYONE THAT PEOPLE HAVE TO WATCH OUT FOR ANIMALS. DO NOT DRIVE LIKE YOU ARE THE ONLY ENTITY IN THIS WORLD. DO NOT TAIL GATE. GO SLOWER AT NIGHT. STOP FOR TURTLES AND HELP THEM ACROSS. STOP BEING SELFISH ABOMINATIONS UPON THIS PLANET.

I stop to move turtles or help injured animals, it is so sad to see our state's wildlife injured on the road.

I see endless numbers of animals/wildlife killed on the roads. Heartbreaking.

I live in south Durham near the USACOE wildlife impoundment areas near New Hope Creek and Third Fork Creek. I see the evidence of wildlife-vehicle crashes often and it's very hard to see.

I live in a rural area of Orange County teeming with wildlife. When I drive, I'm white-knuckled watching for deer that waiting to jump out in front of my car and kill me. I wish that the sensors on my car would register them, but they seem to be oblivious to deer coming from the sides of the road. I also walk a lot on country roads, and am saddened to see so many dead animals that have been struck by cars. I especially hate that some people run over them (especially herps) on purpose. I record wildlife fatalities through iNaturalist for projects such as Wildlife Crossings, GLOBAL Roadkill Observations and Dead Herps.

I live beside a creek. My road crosses over it. I cannot begin to count the number of dead animals I've seen over the 35 years I've lived here. Everything from deer, of course, to possums, raccoons, skunks, barred owls (!), black vultures, box turtles, mud turtles, snapping turtles, black snakes, water snakes myriad frogs and toad -- it is heart-breaking.

I have not personally experienced any serious wildlife-vehicle crashes in North Carolina, but I have witnessed many roadkill deer, racoons, possums, turtles, and other animals. It's heart-wrenching to see and think about the wildlife killed by cars, and I can only imagine how harrowing it must be to be a driver who hits an animal.

I have never hit a deer but I see dead deer every day and it makes me very sad.

I have hit and killed a fawn, and have nearly hit deer many times. My husband has also hit a deer causing major damage to his car and killing the deer. We want to avoid the dangers and costs posed by wildlife crashes and we also want to preserve the lives of local wildlife as much as possible. We strongly support efforts aimed at providing safe movement and migration routes for wildlife and have hoped for measures that promote these things for many years.

I have had the unfortunate experience of hitting a deer that suddenly ran across the road in front of my vehicle. It caused damage to my vehicle, but I was more distressed at killing the deer. I am also one of the people you see pulling off the road (when safe to do so) to help turtles cross the road. However, I have seen cars intentionally run over turtles and snakes crossing a road when they could have easily and safely avoided running them over. Our wildlife camera captured images of a Bobcat until someone provided a photo of a dead Bobcat by the side of US 15-501 less than a mile away from the Haw River. I always wondered if that explained why the Bobcat images suddenly disappeared.

I have had 2 significant vehicle deer encounters, as well as many, many near hits. I would like to see the wildlife crossing plan implemented throughout the DCHC area. Thank you.

I have experienced multiple wildlife collisions while driving, and it is always a sad, scary, and gruesome experience, for me and especially for any children riding in the car. I also work in wildlife rehabilitation, and have seen the aftermath of so many wildlife collisions. Turtles, opossums, deer, squirrels, and raptors are frequent victims. I applaud the work that you are doing, and hope that we can reduce collisions with all of these species and build a more harmonious future for the triangle.

I have been lucky that a deer only grazed our car, but I am crushed that it may have been wounded. As Durham allows more deforestation and construction to foster growth, every road nearby is littered with dead animals fleeing the area.

I have been in a crash where a deer was hit and killed and another incident where a pheasant was killed. It is an unhappy experience and the sooner we protect these sharers of the land and environment the happier I will be. Too long coming. Glad you are finding recovery act funds to do it

I hate seeing squashed turtles.

I had 2 collisions with deer near Githens middle school and consider myself to be a careful driver who drives infrequently. What are the odds of that?! Both were somewhat traumatic as they involved death of animals and costs were incurred in both to repair my vehicles (thousands of dollars). Fortunately, I was able to pull over and no other cars were involved. In Finland, I noticed many interventions to allow for continuous pathways for animals. Honestly, I am bewildered that this idea is not part of the infrastructure and also bewildered that the light rail plan failed. Less cars seems safer and cleaner for all of us.

I am often anxious driving because I worry about hitting animals, especially at dawn and dusk. Investing more in wildlife crossings would address some of my concerns.

I always stop to move turtles off the road and do so in the safest way possible. One time a guy in a huge pickup swerved around me and smashed the turtle on purpose before I could get to it.

Husband had car accident with deer. Avoid crushing turtles and help them on their way ( same direction they are heading) where possible but sadly can't help if the turtle is on a busy road

Driving home to Carrboro from Pittsboro in fall 2009, a large buck came running out of a treed area near an apartment complex and crashed into my Scion. The deer was badly injured but after a while limped into the woods and responding officers had to follow it to dispatch it. Repairing the car required leaving it at a body shop for a week. My husband and I were lucky not to be hurt, but it was very sad to see the buck suffering. I was very happy when the wildlife passage was created in 15-501 for New Hope Creek. Before then, it was horrifying to see all the animals killed trying to cross the highway there. Also near Southpoint, built through a floodplain.o

As a teenager in the car with family, we struck a deer crossing road at dusk.

A deer totaled our car, and herself. It isn't a safety issue but I am so pleased that this plan is being considered to allow smaller wildlife a safe crossing. I've seen too many people intentionally swerve to kill turtles.

A deer ran into the side of my car several years ago on Cole Mill Road at I-85. It caused \$2,500 in damage. I recognize the need for wildlife crossings. However, the deer in particular are everywhere in Durham. I'm not sure how you can narrow down a few locations for crossings.

• A white-tail deer suddenly jumped on hood of car at night. • Fawns hidden among the tall grasses on the shoulder suddenly jumped into the road. • My toddler and I were stopped in one lane while someone was moving a large snapping turtle off the road. [Pond was located on one side of the road and forested area on the other side.] Both lanes of traffic were stopped in the removal process. In my rear view mirror, I saw a car going very fast over a slight hill behind my stopped car. To avoid rear-ending my car, he had to swerve off the road and onto the shoulder. He flew passed my car. We all could have been seriously harmed—even the person with the turtle.

##### **5. Do you have additional feedback or comments about the draft plan?**

*Public comments provided during the planning process are reflected as originally provided. All names or identifiers have been removed to protect the privacy of individuals.*

When I'm driving and see a lot of animal bodies on the side of the road, it sets me on edge. Even though I haven't hit anything large, the fear is there, and knowing I was driving along a route that was minimizing vehicle strikes would definitely put me more at ease.

With the growth in our area, wildlife collisions are only going to increase as animals attempt to traverse a changing landscape. We need to provide connective corridors between large natural areas for our own human health (natural eco-system services, mental health (walking trails, wildlife viewing, etc), and for wildlife benefit - keeping common species common and protecting the food web.

We need to respect existing wildlife corridors and not pave them.



Signs of wildlife crossing is very important and helpful. Well lit areas need to be implemented.
Wildlife more prone to vehicle impacts when hunted (skittish) and would prioritize those areas
Wildlife and their mobility corridors need protection which ultimately protects citizens and minimizes crashes.
We used to live in Colorado where these changes were already implemented and they work. I've also seen these same plans used in Canada and they have worked there for decades. Let's do this here. I-85 in particular this is an issue. I feel like it's just a matter of time before my vehicle is impacted by wildlife and I want myself and the wildlife to be safe. My brother hit an elk in Wyoming and the damage is unbelievable and awful.
We have all been involved in wildlife vehicle collisions. It would be wonderful to avoid this for both humans and animals alike.
There are so many places on our roads where wildlife routinely tries to cross- providing safe alternative paths is absolutely necessary for conservation purposes as well as traveler safety.
The more we protect our wildlife, the more we protect ourselves. Drivers who avoid hitting wildlife are likely to hurt themselves and others, which is why it's so important to remove these interactions as much as possible.
Stories are sad and scary when one hits a deer on interstates after someone else hit it first in the dark.
So many smashed KILLED box turtles and other water turtles. on all our roads...even rural roads. When you have a wetlands on one side of a road and then another wet area on the other, then you see multiple dead turtles especially small ones spring and summer. More under road crossings are needed and sloped ditches leading to these passage ways. Roadside ditch depth and slope are important to avoid trapping turtles and to be able to "guide" them to a under road culvert or other. Please Check with A Turtle for Every Log and the Turtle Rescue Team at NCSU Vet school to get their ideas on location, type etc. of safe passage ways that keep turtles off the roads.
So many deer dangerously crossing the roads in our area. Lots of roadkill including turtles, snakes, opossums, gray foxes etc.
Professional environmental scientist' I understand the importance of this work.
Please have wildlife crossings! It's so important for living peacefully with nature. It's also much safer for us and our families!
People drive too fast and are distracted. People don't always see or look for road hazards, including wildlife

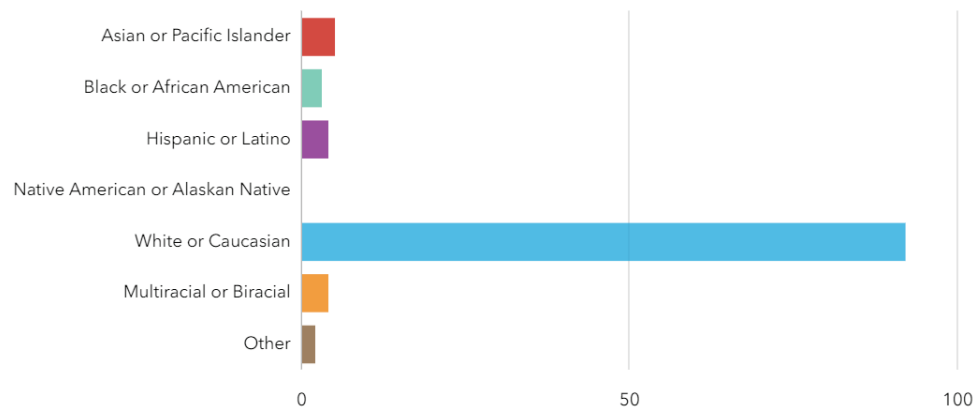
Offering a cost effective way for wildlife to cross public roadways (including and especially interstate bi-ways) is both a safe and humanitarian way to improve the lives of humans and wildlife. This survey is a first step and speaking for Western North Carolina residents this discussion is much needed and overdue. (Review I40 & I26 wildlife vehicle crash statistics)
No personal accidents. But see then results very often
Need for all safe drivers and respect on all roads to eliminate any dangers.
n/a
I've been so happy about the 15-501/New Hope Creek overpass ever since it happened, and [name withheld] told me about it. I have practically been holding my breath to see other sites be improved with the same purpose. It is crucially important to make these corridor connections for the wildlife. Knock on wood, I've not yet had a collision in my 36 years living in NC. I used to live on Phils Creek near Old Greensboro Highway, and now am just west of the Cane Creek Reservoir on Mebane Oaks Road, on what we call Caterpillar Creek. I've taught environmental classes at UNC and Elon U, and have included information about corridors with examples from other places of some beautiful crossings in my lectures.
I'm all about protecting wildlife. Roads/bridges and other human-made forms of moving vehicles has a devastating effect on wildlife, not just death. We as a human species who cares about creatures other than ourselves owe it to wildlife to create safe passage where we've blocked that over decades. Not just for large four-leggeds, but also smaller wildlife such as salamanders, frogs, toads and so forth. Wild Virginia has take the lead on this topic and done some fantastic work. Follow their lead (and I'm not from VA, just really impressed with their devotion and respect for the well being of wildlife. Here in NC, not so much. Sad.
If we can leave more areas wooded when developing new sites, I bet it would reduce crossings too. It makes me so sad to watch NC bulldoze our richly biodiverse areas. It also helps to have lights facing down for migratory birds (even better- off in migration season).
I'm a fan of P-22, the beloved LA resident cougar who died in a vehicle crash. LA and other localities are building wildlife crossings like bridges, to protect wildlife from cars. If California can do it, so can N Carolina: let's follow their lead, and learn from their experience.
I think that this plan is a good start. It is thorough, well written and well researched. It appears that many stakeholders have been contacted. I especially like the maps, wildlife table and the list of references that are also noted in the text.
I think it's important that these upgraded crossings can be multiuse - I've seen people running across the Guess Rd/Eno river (continuation of trails), and at the Oxford Rd/Eno crossing (from Pennys Bend to Mountains to sea trail). An added benefit!
I have thankfully not been involved in a major wildlife crash.

I am thrilled to see this effort in Durham, Orange and Chatham Counties. As a regular cyclist and motorist, it is clear to me how many animal collisions (large and small) regularly occur. It is my hope that these projects are implemented to increase the safety of humans and wildlife.

**6. What is your household zip code?**

Zip Code	Responses	Zip Code	Responses
27516	15	28732	2
27713	11	27243	1
27517	10	27295	1
27510	8	27503	1
27705	8	27519	1
27312	6	27526	1
27707	6	27572	1
27701	5	27587	1
27704	5	27609	1
27278	5	27612	1
27523	3	28203	1
27302	2	28214	1
27514	2	28376	1
27703	2	28739	1
27712	2	30307	1

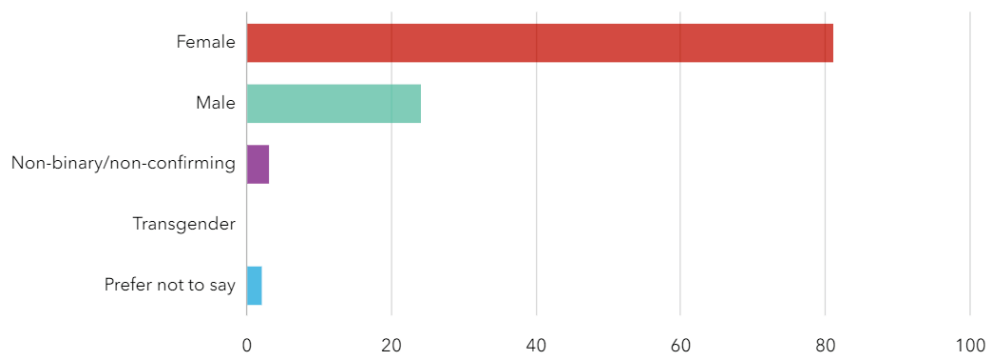
## 7. Which race/ethnicity best describes you? (Please choose one)



Answers	Count	Percentage
Asian or Pacific Islander	5	3.88%
Black or African American	3	2.33%
Hispanic or Latino	4	3.1%
Native American or Alaskan Native	0	0%
White or Caucasian	92	71.32%
Multiracial or Biracial	4	3.1%
Other	2	1.55%

Answered: 110 Skipped: 19

## 8. What is your gender identity?

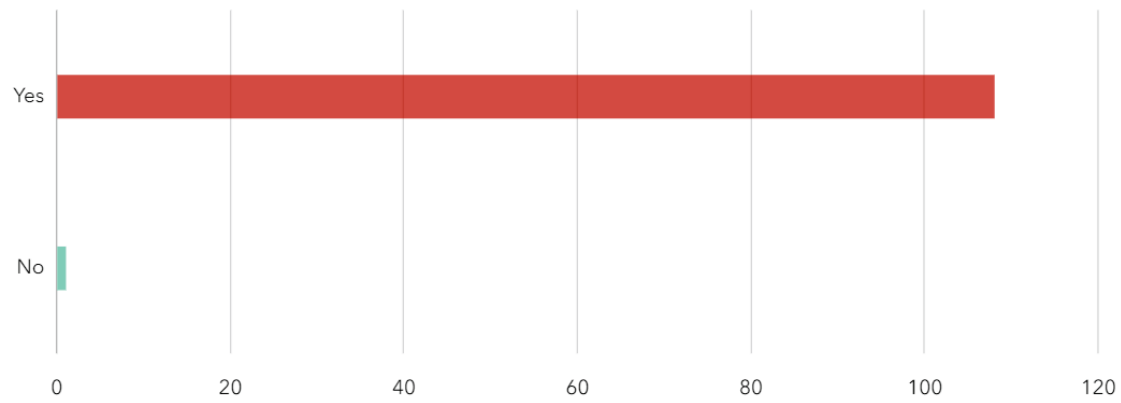


Answers	Count	Percentage
Female	81	62.79%
Male	24	18.6%
Non-binary/non-confirming	3	2.33%
Transgender	0	0%
Prefer not to say	2	1.55%

Answered: 110 Skipped: 19



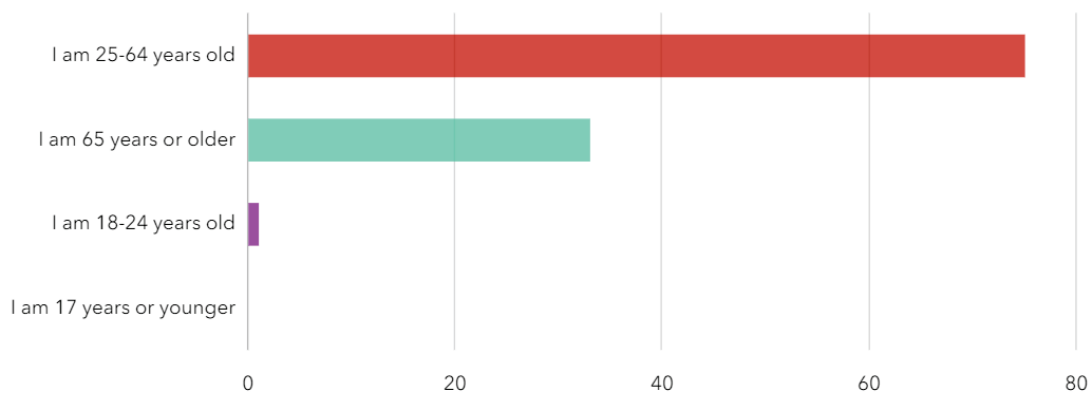
## 9. I speak, read, and write English well.



Answers	Count	Percentage
Yes	108	83.72%
No	1	0.78%

Answered: 109 Skipped: 20

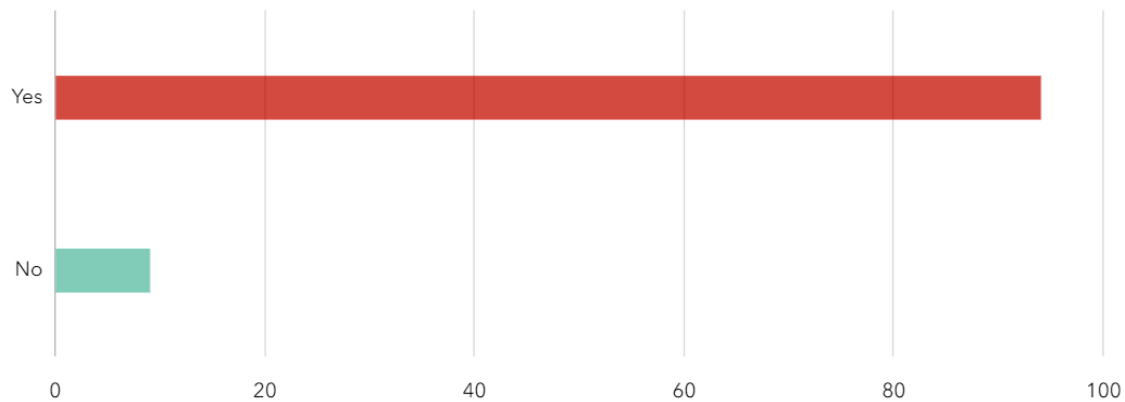
## 10. What is your age group?



Answers	Count	Percentage
I am 25-64 years old	75	58.14%
I am 65 years or older	33	25.58%
I am 18-24 years old	1	0.78%
I am 17 years or younger	0	0%

Answered: 109 Skipped: 20

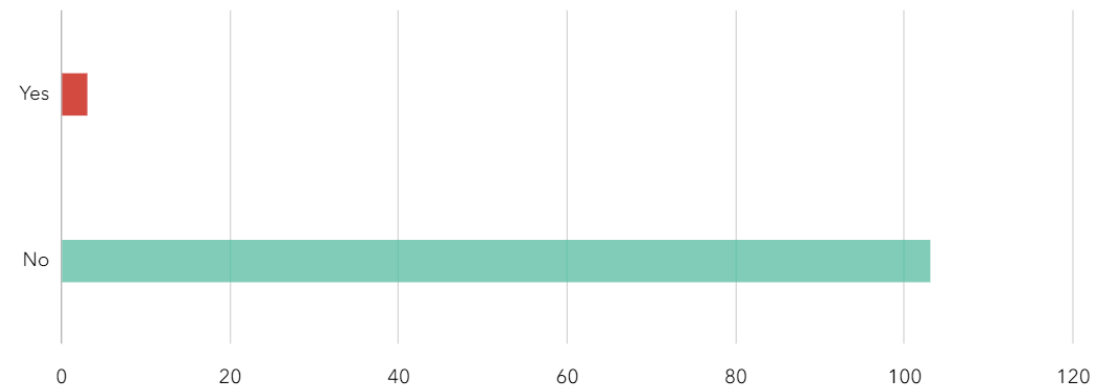
### 11. Is your total household income equal to or above \$49,160 per year?



Answers	Count	Percentage
Yes	94	72.87%
No	9	6.98%

Answered: 103 Skipped: 26

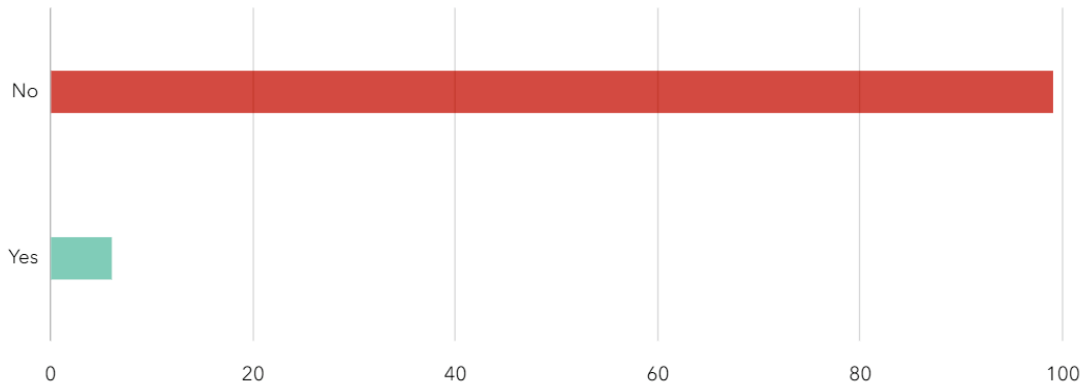
### 12. Five (5) or more people live in my household



Answers	Count	Percentage
Yes	3	2.33%
No	103	79.84%

Answered: 106 Skipped: 23

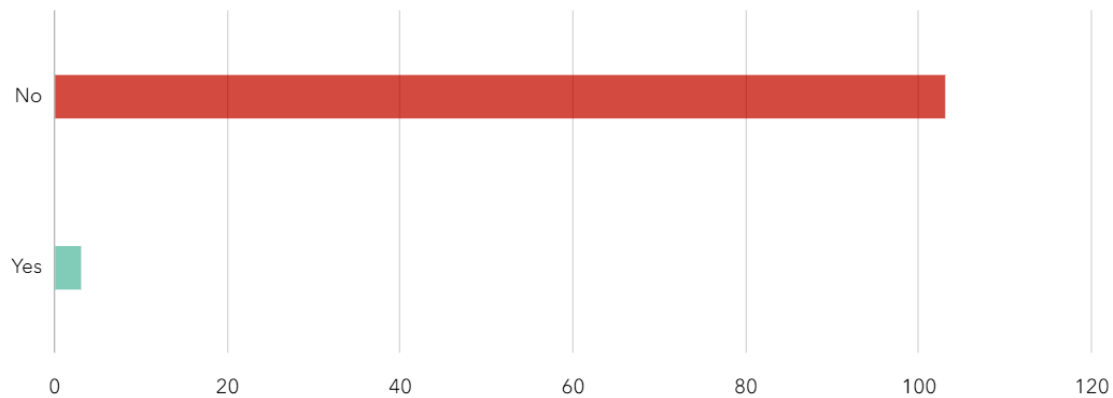
### 13. I am or am considered to be disabled.



Answers	Count	Percentage
No	99	76.74%
Yes	6	4.65%

Answered: 105 Skipped: 24

### 14. My household has zero cars.



Answers	Count	Percentage
No	103	79.84%
Yes	3	2.33%

Answered: 106 Skipped: 23