

DCHC MPO Comprehensive Transportation Plan

Comments from Boards, Commissions, Councils and Agencies

Background

The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) released a draft Comprehensive Transportation Plan (CTP) for public comment from December 14, 2016 through February 24, 2017. This document presents the official comments of the various boards, commissions, councils and staff of the local governments in the DCHC MPO planning area, and those of a statewide agency. Note that there is a separate document that compiles the public comments that were received through email and comment forms.

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January 18, 2017

Durham City Council
101 City Hall Plaza
Durham, NC 27701

Durham Board of County Commissioners
200 East Main Street
Durham, NC 27701

Dear Mayor Bell and Members of the City Council, and Chair Jacobs and Members of the Durham Board of County Commissioners:

The Comprehensive Transportation Plan (CTP) is a fantastic opportunity to envision the bicycle and pedestrian network of the future in Durham. While the time horizon for this plan is 30+ years into the future and there is no fiscal constraint applied to the CTP, it is hugely important to ensure that this plan reflects Durham's preferred future network; this plan should, in effect, function as a blueprint for a comprehensive, cohesive, and comfortable network that supports the option to safely bike and walk to any destination in the County.

With this in mind, the Durham Bicycle and Pedestrian Advisory Commission (BPAC) reviewed this plan in detail and would like to provide both general and specific comments for your, and the Durham Chapel Hill Carrboro Metropolitan Planning Organization's review. Our general comments are as follows:

- In the bicycle and pedestrian project tables, the BPAC would like to see a baseline 5' bicycle lane rather than a 4' bicycle lane. Five foot bicycle lanes provide greater comfort and safety for bicyclists and are the standard width for most bicycle lanes across the City of Durham.
- On all County roads of 45 mph speed limits or greater, the BPAC would like to see some level of bicycle amenity, e.g. bikes lanes or paved shoulders, as opposed to wide outside lanes. High speed rural roads are particularly dangerous for bicyclists as any bicycle-vehicle crashes are likely to result in a serious injury or death to the bicyclist. Providing dedicated space for bicyclists would result in a much safer environment for both bicyclists and vehicles.
- In relation to the previous point, the BPAC would like to eliminate cross-sections 4C and 5A from use in the DCHC MPO CTP. These cross-sections allow wide outside lanes (4C) and program five-lane sections of road, which present conflicts with turning movements for bicycles and are difficult to cross for pedestrians (5A).
- At the edge of urban areas, the BPAC views bicycle lanes as a more appropriate treatment on some of the routes that are currently listed as paved shoulder and requests appropriate routes be changed from "paved shoulder" to "bicycle lane."
- Finally, the BPAC would like to see a partnership between the City of Durham and Durham County to build and maintain sidewalks in areas outside of the city limits. Currently many streets at the edges of the urban area meander in and out of the city limits. With recently enacted changes to annexation laws, many areas are not likely to become part of the city anytime soon. This partnership will help to ensure that gaps near schools and other destinations can be closed.

In addition to these general comments, the BPAC has identified specific project needs, including the following subset. Other specific comments will be provided by City of Durham staff.

- Bike lanes on Slater Road between Emperor Boulevard and the Wake Co. line.
- Bike lanes on Randolph Road between Pickett Road and Erwin Road.
- Bike lanes or paved shoulders on Cornwallis Road between Erwin Road and the Orange Co. line.
- Bike lanes on Fifteenth Street between Erwin Road and Main Street.
- If Pickett Road between Trinity School and Erwin Road is closed to motor vehicle traffic, the current bike lane designation should be replaced with a multi-use path designation.
- Multi-use path connecting Main Street and Duke University Campus utilizing the railroad spur and bridge over NC 147 that is no longer used for rail deliveries to the University.
- Add existing and proposed bike lanes that are part of the Del Webb development in Durham.

BPAC appreciates the opportunity to provide feedback on the CTP and appreciates your consideration of our comments. We look forward to continuing our productive discussions with you in the future.

Sincerely,

A handwritten signature in black ink that reads "Max Bushell". The signature is written in a cursive, slightly slanted style.

Max Bushell
Chair, Durham Bicycle and Pedestrian Advisory Commission

Cc: Andy Henry, DCHC MPO Senior Transportation Planner
Dale McKeel, DCHC MPO Bicycle and Pedestrian Coordinator
Bryan Poole, City of Durham Transportation Planner II, Bicycle and Pedestrian

MEMORANDUM

TO: Mayor and Town Council

FROM: Kayla Seibel, Planner I
Mary Jane Nirdlinger, Executive Director, Office of Planning & Sustainability
Ben Hitchings, Director of Planning and Development Services

DATE: January 30, 2017

SUBJECT: DCHC MPO Draft Comprehensive Transportation Plan

INTRODUCTION

This memorandum is to share questions and comments from the Chapel Hill public forum on the Draft Comprehensive Transportation Plan on January 19th, 2017 and the Transportation and Connectivity Advisory Board's recommendations for the Council's Consideration.

The Comprehensive Transportation Plan (CTP) is a long range multimodal transportation plan. During the CTP process, the area's future transportation needs are determined, and recommendations are provided for a 25-30 year time frame. This plan is a joint effort between the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) and the North Carolina Department of Transportation (NCDOT).

STAFF RECOMMENDATION

We recommend that the Transportation and Connectivity Board's recommendation and comments be forwarded to the DCHC MPO Board for their consideration prior to adoption of the CTP. We also recommend that Council Members communicate additional comments and feedback to the Mayor, as the Town's MPO Board member, so she can provide them to the DCHC MPO Board when they consider adopting the draft CTP on March 8, 2017.

BACKGROUND

The Comprehensive Transportation Plan incorporates adopted local plans from municipalities and agencies throughout the region. The Comprehensive Transportation Plan identifies future transportation needs within the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO). The DCHC MPO planning area includes Durham, Orange and northern Chatham County. The Plan also proposes transportation improvements intended to address congestion and maintain regional mobility. **The Comprehensive Transportation Plan is required**

by the North Carolina Department of Transportation and the recommendations are not constrained based on anticipated future funding from local, state or federal sources.

DISCUSSION

On January 19, 2017, Durham-Chapel Hill-Carrboro Metropolitan Planning Organization staff conducted a public forum to present the draft CTP, answer questions, and collect comments from the public. There were about 25 members of the public at this meeting. The Transportation and Connectivity Advisory Board was present at the meeting and have compiled their thoughts and recommendations in the next section.

Public Forum Common Questions

- Is the CTP a general document? Does it outline types of improvements?
Staff note: The CTP references NCDOT Complete Streets cross sections in the tables for highway projects. However, in any transportation project, the ultimate improvement recommendations will be determined during the NEPA study, alternatives analysis, design, and public involvement steps. More information can be found [here](#).
- What is the process to add projects to the CTP?
Staff note: The CTP reflects all transportation projects in locally adopted plans. A Deficiency Analysis using the Triangle Regional Model was performed to understand which corridors will be facing traffic congestion by the year 2040. The public input period for the CTP is also another opportunity for projects to be considered as part of the CTP. More information about the Deficiency Analysis process and methods can be found [here](#).
- Who develops the alternative plans for each improvement?
Staff note: Alternatives analysis is typically conducted during the feasibility stage of a transportation project. Before engineering designs are drawn, different alternative improvements are evaluated to determine a recommended improvement. This analysis is typically performed by the engineering team assigned to the programmed project.

Corridors where sidewalks should be designated as “needs improvement.”

- Purefoy Dr.
- Weaver Dairy Road between MLK and Erwin Rd.
- Erwin Rd. between Chip Oaks Dive and 15-501
- Colony Woods Dr. between Ephesus Church Rd. and Fountain Ridge Rd.
- Estes Dr. across from University Mall
- Farmington Rd. between 15-501 and 54
- Ridge Road

DO-LRT Questions

*Staff note: The following questions and comments were heard during the public forum and appeared to be of great concern so they have been recorded for future reference. **It is important to note that the Comprehensive Transportation Plan does not provide detailed information on projects.***

- What is the cost per mile of the light rail transit and bus rapid transit?
- I am concerned that the Durham-Orange Light Rail Transit (DO-LRT) project is going to deplete funds from bicycle and pedestrian projects.
- I am concerned about the safety and time savings of the at-grade crossings for the DO-LRT on NC 54.
- Why is the Light Rail included in the Comprehensive Transportation Plan if it is struggling with funding?

Staff note: *The DO-LRT is included in the CTP because it is consistent with locally adopted plans. In this instance, the DO-LRT was adopted by the Orange County Commissioners as part of the [2012 Orange County Bus and Rail Investment Plan](#).*

ADVISORY BOARD RECOMMENDATION

The Transportation and Connectivity Advisory Board reviewed the draft CTP at their December 6, 2016 meeting, attended the January 19, 2017 public forum, and discussed the draft CTP at their January 24, 2017 meeting. The Board provided the following comments and recommendations:

- The Transportation and Connectivity Advisory Board supports the goals of the Comprehensive Transportation Plan. They Board sees the importance in planning for future transportation projects and identifying corridors for improvement. However, given the magnitude of the document and details of each project, the Board cannot fully endorse the CTP and every project listed. The Board felt that they did not have an opportunity to review each project in the CTP. There may be missing projects in the sidewalk, bicycle, and transit networks yet to be identified. The Board would like to see overall coverage and connectivity for bicycle, pedestrian, and transit projects in Chapel Hill. They also feel it is important that each project considers a Complete Streets model to ensure that all streets in Chapel Hill are multi modal, safe, and connected. Board members will pass along individual feedback and comments on specific projects to the Metropolitan Planning Organization during the public comment period.

INFORMATION

On December 14, 2016, the DCHC MPO released the Draft Comprehensive Transportation Plan for public comment through February 24, 2017. Please follow the link below to review the draft materials and submit comments to:

Andy Henry, DCHC MPO, andrew.henry@durhamnc.gov , (919) 560-4366 ext. 36419
Julie Bollinger, NCDOT, jbollinger@ncdot.gov , (919) 707- 0900

Review interactive maps, plan process, and previous presentations here:

- [Draft Comprehensive Transportation Plan](#)

Alternatively, you can directly access PDF maps, tables, and narrative summaries here:

- [NCDOT direct link to CTP maps and tables](#)

COMMENTS ON THE DCHC MPO CTP

ORANGE COUNTY BOARD OF COUNTY COMMISSIONERS COMMENTS

- Refine Minimum Project Statements
 - I-85 (I-40 to Durham County Line) – Revise to state that congestion already exists
 - South Churton Street – provide vehicle count
 - Eno Mountain Road/Mayo Street/Orange Grove Road Intersection – revise to include information about development on the corner (townhouses); also refer to Collins Ridge
 - Eubanks Road – make mention of Duke Forest for conservation purposes
 - NC 54 (Old Fayetteville Road to Bethel Hickory Church Road) – remove mention of NC 54 widening
 - NC 86 – Add mention of bus service on NC 86 north to Cedar Grove
- Differentiate between New NC 86 and Old NC 86. specifically in relation to the I-40 Widening project. The Hillsborough exit is Old NC 86.
- Mark Hillsborough Winding Bypass as bypass route.
- Clarify West Hillsborough Bypass route and potential as a signed bypass.
- Mark Waterstone Boulevard as Southern Hillsborough Bypass.
- Confirm widening project on South Columbia Street.
- Confirm which rail crossings in Hillsborough are to be closed and which are to remain open.

ORANGE UNIFIED TRANSPORTATION BOARD COMMENTS

– THESE COMMENTS ARE A SUMMARY OF THE OUTBOARD'S COMMENTS. COMPLETE COMMENTS ARE PROVIDED LATER IN THIS DOCUMENT.

- Consider adding a project to address congestion on South Churton Street through Downtown Hillsborough.
 - Explore an eastern bypass route including improvements along US 70A, Lawrence Road, and Baldwin Road.
 - Explore a western bypass route including improvements along Oakdale Drive, Orange Grove Road, Eno Mountain Road, Dimmocks Mill Road, and W Hill Ave.
- Consider alternative methods for reducing traffic congestion as opposed to roadway widening, such as congestion charging schemes, dynamic tolling, reserved bus and carpool lanes, and additional bicycle and walking facilities.
- Bolin Creek Greenway isn't on the CTP and should be added.
- Shoulders should be added to rural roads which are heavily traveled by cyclists, or on rural roads in general.

- Add separated multi-use path along Old NC 86 between Carrboro (Hillsborough Road) and Hillsborough (Eno River).
- Lower speed limit on North Greensboro Street in Carrboro from Estes Drive Extension to East Main Street.
- Extend bicycle lanes on Rosemary Street from Roberson Street to Main Street and Main Street to Weaver Street in Carrboro.

COMMENTS FROM THE ORANGE COUNTY PLANNING DIRECTOR

- Extend Eubanks Road to Albert Road at intersection of Union Grove Church Road.
- Replace LRT project with “Fixed Guideway Transit”, so that both BRT or LRT are accommodated

OUTBOARD CHAIR COMMENTS

Comments on the Comprehensive Transportation Plan for the DCHC-MPO

GENERAL

In looking over the recommendations of the CTP, it appears the presumption is that the best way to deal with motor vehicle traffic congestion is by adding more road capacity. While more capacity relieves congestion temporarily, it also attracts more vehicles. If **more cars on the road is NOT the solution being sought**, either from an air quality viewpoint or as a sustainability view, then other ways of dealing with congestion should be explored.

Has NCDOT looked at other methods of finding relief for crowded roads? Congestion charges (which limit traffic in crowded areas), dynamic tolling (which can encourage people to drive outside rush hours, lanes reserved for buses or carpools (which can discourage personal driving and improve traffic flow), and bike facilities and pedestrian facilities (that encourage the use of alternative forms of transportation) are all options to look at before adding traffic lanes.

Another reason to look to other solutions is the problem of cost. Adding lanes—especially to interstate highways—is an extremely costly road “improvement.” Congestion charges or dynamic tolling, on the other hand, collect money.

NCDOT’s Mission, according to its website, is: *Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina.* It says nothing about one mode of travel being more important than another, but by having a scoring system that scores highly when adding travel lanes not designated for buses or high-occupancy vehicles, it seems to be giving single occupancy vehicles and their drivers an advantage over other modes of transport, thereby promoting their use. Would not the mission of the NCDOT be easier to achieve if there were fewer cars on the roads?

One more consideration: maintenance. NCDOT already has over 80,000 miles of roadways they must maintain. The maintenance of these roads is important but again, it is costly, and, time-consuming. Bridge maintenance is also crucial and needs to be prioritized. We have roads that are behind on maintenance now, adding more pavement will only add more dollars and more maintenance.

When roads are re-paved, resist the urge to widen the car lanes, and instead add wide shoulders that can serve more than one purpose (eg., safe pull-off for a disabled car, space for an emergency vehicle, or a space for bikes to use)

Please consider the addition of road lanes for car capacity only after all other options are explored. If additional lanes are necessary, they should be prioritized for HOV and Bus travel.

ORANGE COUNTY Staff

OLD 86

Old NC 86 from Hillsborough to the Carrboro Town Limits is identified as “needing bike lanes and safety improvements,” which are described as 4’ shoulders. Old 86 offers a beautiful scenic connector between Carrboro and Hillsborough. It could be a wonderful cycling experience, but in its current state, it is not safe for bike or pedestrian travel. That is a shame, because there is a school located near Old 86 at Eubanks, there is Twin Creeks Park, and Blackwood Farm Park is just down New Hope Church Road. In addition, there are attractions in both towns that would serve as destinations for those visiting our communities.

Adding 4’ biking shoulders to Old 86 would only serve the most confident cyclists. However, a separated bikeway or greenway that would stretch from Carrboro to Hillsborough would serve a larger purpose. It would provide a cycling attraction and destination that would not only serve the growing developments in Hillsborough and Carrboro, but it would also bring bicycling tourism and tourism dollars into Orange County. It would give the less confident cyclists as well as cycling families a way to travel between the two towns, both for recreation and for transportation. Many articles exist about money brought in by bicycle tourism. It brings \$133 billion annually into the outdoor recreation economy. The North Carolina Outer Banks have realized \$60 million a year from its \$6 million dollars in original bicycle facility investment.

Please evaluate this road for the possibility of a separated multi-use path for the reasons stated above.

CARRBORO

NORTH GREENSBORO ST. (SR 1772) FROM ESTES DRIVE EXTENSION TO EAST MAIN ST. (SR1010)

The intersection at Estes Drive Extension and N. Greensboro is scheduled to receive an improvement (TIP U-5846). The speed limit in the commercial district is 20 mph. It would be good to lower the speed limit from the commercial district all the way to the North Greensboro-Estes Drive intersection. This is an area of heavy pedestrian activity and contains a large curve, a hill, bus stops and crosswalks.

EAST MAIN ST FROM ROBERSON ST. TO ROSEMARY ST., and ROSEMARY ST. FROM MAIN ST. TO THE CARRBORO TOWN LIMITS

Recently, the Town of Chapel Hill added bike lanes along Rosemary St. Unfortunately, the bike lanes end at the Carrboro Town limits. It would be good to extend those bike lanes from the Carrboro Town limit on Rosemary to Main St., and then along Main St. from Rosemary to Weaver St. This could be achieved with removal of one of the lanes on Main St and with better signaling. Please consider adding this to the CTP.

A motion was made by Alderman Slade, seconded by Alderman Seils, that this resolution be approved:

A RESOLUTION AUTHORIZING THE SUBMITTAL OF RECOMMENDATIONS ON THE
DCHC-MPO COMPREHENSIVE TRANSPORTATION PLAN

WHEREAS, the state of North Carolina mandated that all MPOs create a Comprehensive Transportation Plan (CTP) to address future needs; and

WHEREAS, the draft DCHC-MPO CTP includes highway, transit, bicycle, and pedestrian recommendations for the Town of Carrboro; and

WHEREAS, projects submitted through the SPOT prioritization process are expected to come from an adopted CTP.

NOW, THEREFORE, BE IT RESOLVED by the Carrboro Board of Aldermen that the Board authorizes that the following comments be conveyed on behalf of the Town:

- 1) The Carrboro Board of Aldermen supports transit improvements and is cognizant of citizen concerns relating to the increasing costs for the Durham-Orange Light Rail Transit project and the North-South Corridor Bus Rapid Transit project, as well as the potential need to reallocate funding for other transportation projects such as bike and pedestrian improvements, which may provide more direct benefit to Carrboro residents. Timely dissemination of updates relating to both the cost and scheduling of these projects will be critical to their success moving forward. Enhanced feeder bus services and access improvements, including direct access, that will enable Carrboro residents to utilize these transit projects to the same extent as their neighbors will likewise be essential.
- 2) Consider maximizing high occupancy vehicle lanes (HOV) as a managed use for the I-40 expansion.
- 3) Future transit proposals should explore and better articulate the pros and cons of bus rapid transit and light rail, taking into account cost, infrastructure, flexibility, route design and other relevant factors.
- 4) A direct transit connection from Carrboro/Chapel Hill to RDU Airport is highly desired.
- 5) The Town is pleased to see that the draft CTP is, in general, consistent with Carrboro's policy of widening road corridors to accommodate bike/ped improvements rather than vehicular travel.
- 6) The Board reiterates its preference to accommodate anticipated capacity needs on NC 54 west through intersection improvements rather than a substantial widening that would be inconsistent with the land use policies along the corridor.
- 7) The Board reiterates its support for expanded bus service frequency and expanded nighttime and weekend service.

8) Change the cross-section of E. Main Street from Rosemary Street to Weaver and Roberson Streets to show two vehicle travel lanes, a center turn lane, and protected bike lanes. The current highway CTP shows that the current cross-section is adequate for the 2040 capacity. The bike and multi-use CTP shows the Campus to Campus Connector along E. Main Street from Roberson Street to Lloyd Street as the only improvement.

9) Change the cross-section of Hillsborough Road from W. Main Street to N. Greensboro Street to show narrower vehicle travel lanes and protected bike lanes. This roadway is heavily traveled by cyclists and pedestrians, including many children going to and from Carrboro Elementary School. The current highway CTP shows that the current cross-section is more than adequate for the 2040 volume. In fact, the Volume over Capacity is only 0.3 (4000 vehicles for a capacity of 11,600). This indicates that there is plenty of roadway here to dedicate to bicycles.

10) Add an off-road multi-use path from Carrboro to Hillsborough along Old 86 and/or make other improvements to this road to improve the safety of cyclists and drivers.

This the 21st day of February 2017.

The motion carried by the following vote:

Aye: Alderman Gist, Alderman Slade, Alderman Chaney, Alderman Seils, Mayor Lavelle and Alderman Johnson

Absent: Alderman Haven-O'Donnell,

I, Catherine Dorando, Town Clerk for the Town of Carrboro, NC do hereby certify that the foregoing is a true and correct copy of a resolution adopted by the Carrboro Board of Aldermen.



Catherine Dorando
Town Clerk

Andrew Henry
City of Durham
101 City Hall Plaza
Durham, NC 27701

February 21, 2017

Dear Mr. Henry,

Thank you for the opportunity to review and provide comments on the Draft of the *Comprehensive Transportation Plan* for the Durham-Chapel Hill-Carrboro MPO. The NC Wildlife Resources Commission (NCWRC) reviews transportation plans to provide recommendations on ways to reduce impacts of roads and development on fish and wildlife populations. Habitat loss and fragmentation are the top threats to most of our state's wildlife species; impacts on wildlife populations can be reduced by identifying sensitive natural areas and species ahead of major road projects and incorporating protection for these natural resources into plans and policies. The NCWRC also works closely with NCDOT to provide technical assistance on road projects that impact wildlife habitat. The following recommendations are non-regulatory and are intended to assist decision makers in proactively minimizing adverse impacts to wildlife resources.

Highway Improvements

Roads are barriers to many of our wildlife species, causing significant mortality and isolating populations across the landscape. Maintaining connectivity within and between wildlife populations is vital to the health of the species and individual populations. Large species, which tend to have larger roaming territories, also present a safety concern for the traveling public when they cross a road. Roads can also drive further development along the corridor, which will destroy, degrade, and further fragment wildlife habitats. Impacts on wildlife populations can be reduced by avoiding building or widening roads through sensitive natural areas and large, connected acreages of mixed hardwood and pine forests. Table 1 lists proposed new roads that are in the vicinity of designated Natural Heritage Natural Areas, which are the most ecologically sensitive areas known to occur in the region. Most of these are within a larger landscape context of large unfragmented forest blocks. It is the recommendation of NCWRC to avoid building roads through Natural Heritage Natural Areas and areas where there are still large, connected blocks of habitat.

Table 1: New roads that are in the vicinity of Natural Heritage Natural Areas

Name	From	To
Angier Ave Extension	US 70	Northern Durham Parkway
Northern Durham Parkway	US 70	Flat River Dr
Crown Pkwy/Roche Dr	Roche Dr	Winnifred Dr
Hopson Rd Extension	NC 55	Grandale Dr

SW Durham Dr	US 15-501	Mt. Moriah Rd
New Hope Commons Dr Ext	New Hope Commons Dr	Eastowne Dr
Carver St. Ext (East)	Old Oxford Rd	Danube Ln
Snow Hill Rd	Snow Valley Rd	Old Oxford Hwy
SW Durham Dr	NC 54	George King Rd

Road widening projects can also further fragment habitat, the following road widening projects on existing roads will impact Natural Heritage Natural Areas. The NCWRC recommends to avoid widening these roads where they are intersecting these important natural areas.

Table 2: Road widenings that intersect Natural Heritage Natural Areas

Name	From	To
NC 98 (Wake Forest Hwy)	Wake County Line	Nichols Farm Rd
I-85/US 15	Granville County Line	Red Mill Rd
NC 751 Hwy	Erwin Rd	US 15-501
NC 54	I-40	NC 751
Olive Branch Rd	Carpenter Pond Rd.	Wake Forest Hwy
US 501 (Roxboro Rd)	N Duke St	Infinity Rd
SW Durham Dr	George King Rd	Ephesus Church Rd
Erwin Rd.	Sage Rd	Whitfield Rd
I-40	NC 86	New Hope Church Rd.
I-40	NC 86	US 15-501
US 70	N Churton St	US 70A
US 70	I-85/US 70 Connector	West Hill Ave N

Wildlife Crossing Structures

When roads cannot be avoided in these areas, wildlife crossing structures can help wildlife safely cross under or over roads. Wildlife crossing structures are also helpful in preventing collisions with wildlife, and reducing associated injuries, deaths, and vehicle repair costs. The NC Department of Transportation (NCDOT) will consider building wildlife crossing structures if land on either side of the road is permanently conserved. Wildlife crossings should be provided, when appropriate, in the form of bridges, overpasses, or underpasses to reduce habitat fragmentation. For more information on engineering considerations and design standards needed to benefit wildlife, please see:

<http://www.wildlifeandroads.org/decisionguide/>

Impacts on Streams and Wetlands

Roads also have a degrading impact on aquatic wildlife habitat in streams and wetlands. Like all impervious surfaces, run-off from roads leads to increased sediment loads that destroy spawning habitats, suffocate eggs, and clog the gills of aquatic species. Table 3 is a list of proposed new roads and widenings that will impact streams and/or wetlands. We encourage the use of Low Impact Development (LID) techniques and other important measures to minimize negative impacts from roads and development. Information on Low Impact Development practices and measures can be found at www.lowimpactdevelopment.org, <http://water.epa.gov/polwaste/green/>, and <http://www.stormwatercenter.net/>. NCWRC's Guidance Memorandum to Address and Mitigate Secondary and Cumulative Impacts to Aquatic and Terrestrial Wildlife Resources and Water Quality (http://www.ncwildlife.org/Portals/0/Conserving/documents/2002_GuidanceMemorandumforSecondaryandCumulativeImpacts.pdf) is another useful resource for learning more about reducing impacts to

our wildlife. Local authorities and NCDOT should work together to develop strategies that prevent further degradation of area streams, improve water quality, and ensure proper management of secondary growth.

Table 3. Proposed new roads and widenings that have intersections with streams and/or wetlands.

Name	From	To
Red Mill Rd realignment	Red Mill Rd	Red Mill Rd
Old Oxford Connector	Dearbon Dr	Old Oxford Rd/Thompson Rd
Northern Durham Parkway	Glenn Rd	Old Oxford Rd
Hebron Rd Extension	Hebron Rd	N Roxboro/Wellington Dr
Snow Hill Rd	N Roxboro Rd (US 501 N)	Snow Valley Rd
Alston Ave Extension	Holloway St	Old Oxford Rd/N Roxboro St
Glover Rd Extension	US 70	Angier Av
Riddle Rd. Extension	Ellis Rd	Glove Rd
Angier Ave Extension	US 70	Northern Durham Parkway
Northern Durham Parkway	US 70	Flat River Dr
Northern Durham Parkway	N Mineral Springs Rd	Glenn School Rd
Midland Terrace Extension	E Geer St	NC 98
Lynn Rd Extension	Lynn Rd	US 70
Ellis-Glover Connector	Ellis Rd	Glover
Carr Rd Extension	US 70	Angier Av
Patriot Dr Extension	S Miami Blvd	Globe Rd
Crown Pkwy/Roche Dr	Roche Dr	Winnifred Dr
Hopson Rd Extension	NC 55	Grandale Dr
Briggs Av (Extension)	Riddle Rd	Ed Cook Rd
NC 751	S Roxboro St	Woodcroft Pkwy
Roxboro St Ext (South)	S Roxboro	E Cornwallis Rd
SW Durham Dr	US 15-501	Mt. Moriah Rd
SW Durham Dr	George King Rd	Ephesus Church Rd
Farrington Rd Realignment	Farrington Rd	NC 54
New Hope Commons Dr Ext	New Hope Commons Dr	Eastowne Dr
Carver St. Ext (East)	Old Oxford Rd	Danube Ln
Carpenter Pond Rd.	Leesville Rd	Olive Branch Rd
East End Connector/US 70 BYP	Pleasant Dr	Cheek Rd
Andrews Store Rd.	Manns Chapel Rd.	US 15-501
Big Woods Rd	Jack Bennet Rd	Gallup Rd
Estes Dr Ext	N Greensboro St	Seawell School Road
Estes Dr Ext	MLK Jr Blvd	Seawell School Road
Eubanks Rd.	MLK Jr Blvd	Rogers Rd.
Erwin Rd.	Sage Rd	Whitfield Rd
Farrington Point Rd	Old Farrington Rd	Lystra Rd
Homestead Rd	Rogers Rd	Old NC 86
Lake Hogan Farm Rd Ext	Lake Hogan Farm Rd	Eubanks Rd

Orange Grove. Connector	Orange Grove Rd	US 70Bus
New Collector Rd	Orange Grove Rd Ext	Becketts Ridge Dr
Freeland Memorial Dr Extension	S Churton St	New Collector Rd
Brier Creek Pkwy Extension	T.W. Alexander Dr	Andrews Chapel Rd
SW Durham Dr	NC 54	George King Rd
O'Kelly Chapel Rd	Cary Town Limits	Yates Store Rd
Yates Store Road Extension	Yates Store Road	Wake Road

Bridges

If any of the projects listed in Table 3 will have opportunities to build bridges or improve existing bridges, our standard recommendations for bridge projects are as follows:

- We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.
- The natural dimension, pattern, and profile of the waterway above and below the crossing should not be modified by widening the channel or changing the depth of the waterway.
- Bridge deck drains should not discharge directly into the stream.
- Live concrete should not be allowed to contact the water in or entering into the stream.
- If possible, bridge supports (bents) should not be placed in the stream.
- If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes soil disturbance.
- A clear bank (riprap free) area of at least 10 feet should remain on each side of the stream underneath the bridge.
- Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.
- Temporary or permanent herbaceous native vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.
- All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.
- Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.
- Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.
- During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.
- In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the

approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with native grasses and planted with native tree species. Tall fescue should not be used in riparian areas. If the area that is reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be used as wetland mitigation for the subject project or other projects in the watershed.

- If culvert installation is being considered, conduct subsurface investigations prior to structure design to determine design options and constraints and to ensure that wildlife passage issues are addressed.

If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used:

- The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream end to restrict or divert flow to the base flow barrel. Silled barrels should be filled with sediment so as not to cause mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics the existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, the base flow barrel should provide a continuum of water depth and channel width without substantial modifications of velocity.
- If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.
- Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.
- Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineered boulders or structures should be professionally designed, sized, and installed.

Greenways

Greenways provide an opportunity for wildlife corridor protection through developed land uses. To gain maximum wildlife habitat benefits from greenways, we recommend the following measures for all greenways:

- Greenways should be maintained as natural areas which are at least 150' wide. This corridor width will provide an adequate travel corridor for many wildlife species and may increase opportunities for observation of a greater diversity of wildlife.
- Greenways should minimize impacts to the natural areas that they pass through by keeping pathways towards the edges of natural areas and away from streams.
- NCWRC prefers porous pavement over asphalt, as it facilitates stormwater infiltration rather than direct runoff.
- We strongly recommend maintaining a minimum 100-foot undisturbed, native, forested buffer along perennial streams, and a 50-foot buffer along intermittent streams and a 50-foot buffer around wetlands.

These measures will reduce impacts to aquatic and terrestrial wildlife resources, water quality, and aquatic habitats within and downstream of the project.

Thank you for the opportunity to provide comments on the DCHC MPO Comprehensive Transportation Plan. The NCWRC supports the DCHC MPO in its efforts to plan for transportation projects that protect our natural areas for our declining wildlife species. If I can be of further assistance, please contact me at 919-707-0054.

Thank you for your time and consideration,

A handwritten signature in blue ink, appearing to read "Brooke Massa".

Brooke Massa
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NC Wildlife Resources Commission
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