



Lake Norman Bike Route

November 13, 2006

Financial support provided by the Duke Energy
Foundation and the Lake Norman Rural Planning
Organization



Plan Developed by
Centralina Council of Governments



For additional copies of this plan, please call 704-688-6501

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Executive Summary

Project Overview

The Lake Norman Bike Route (LNBR) is a regional bicycle circuit encompassing Lake Norman in the Southern Piedmont area of North Carolina. In addition to providing a continuous spine around Lake Norman, the LNBR also comprises a network of bicycling excursion routes throughout the Lake area. The four-county Lake Norman Bike Route is similar to other regional routes already designated by the North Carolina Department of Transportation (NCDOT) Division of Bicycle and Pedestrian Transportation. These regional and cross-state routes generally parallel the major highways, but offer a safer, less traveled alternative than the busy, major roads.

History

Impetus

The Lake Norman Bike Route (LNBR) began as a concept of former NCDOT Board of Transportation member Frank Johnson. Mr. Johnson's original concept map for the Route was completed in March 18, 2003 and posted on the NCDOT website.

Partners

Centralina Council of Governments created the Lake Norman Bike Route plan with the help of funding from the Duke Foundation and the Lake Norman Rural Planning Organization. These two organizations together provided a combined total of \$10,250 for the development of the Plan.

Steering Committee

Centralina COG contacted a broad range of organizations concerned with the Lake Norman region. Those interested became part of the LNBR Steering Committee. Its membership comprises representatives of local, regional, state and federal planning, transportation and recreation agencies, as well as concerned citizens.

Plan Objective- *To develop a bicycle route and supporting text with sufficient information for use by state, regional, and local agencies to aid in implementation of the route.*

The document is intended to provide background to the development of the Lake Norman Bike Route Plan, and to provide a list of strategies and resources for turning this plan into a reality. As various agencies, organizations, and disciplines affected by this route are made aware of the plan, many of the recommended improvements can be finalized and implemented as a part of scheduled and future road improvements and land development. Otherwise, if attempts are made to retrofit the Route improvements after development has already occurred and roads have been widened, not only do the costs increase dramatically, but also some improvements may no longer be possible. The LNBR Plan is intended for use by the NCDOT, Metropolitan and Rural Planning Organizations, land use-regulating agencies, recreation and open space agencies, and other affected agencies to help coordinate their activities in

implementing the recommended improvements in an efficient and cost-effective manner. This plan, and the plan development process, can be used as a template for multi-jurisdictional bike routes in other parts of the state. A sample resolution for affected counties and municipalities to adopt is included in this document.

Route Description

The Lake Norman Bike Route is a 125-mile comprehensive system of arterial, collector, and local roads that combine to provide all categories of bicyclists the opportunity to travel more safely and enjoyably about Lake Norman. In its complete form, the Route includes a main spine completely encircling Lake Norman, and a network of branching excursions along the Lake utilizing utility easements, rights-of-way, and public land. Both the spine, and the subsidiary routes, promote recreation, transportation, and tourism in the four-county Lake Norman area. As implementation of the complete LNBR network is pursued, the existing roads identified for inclusion in the route, with the recommended improvements, are currently sufficient to provide for a range of activities and users. Four maps are included in this report:

1. The entire LNBR network
2. The portion of the Route appropriate for inclusion in NCDOT Comprehensive Transportation Plan (CTP) updates
3. Recommended road improvements
4. Routes categorized by Likely users

Target Audience

The Implementation Strategies section of this report identifies a range of actions and policies needed to implement the entire Route, with its array of arterial, collector, and local roads surrounding Lake Norman. Some of these roads, primarily NC highways, are scheduled for widening in the near future. Other roads, primarily collector roads, will require future improvements as current and projected residential development cause congestion and safety issues. Still other roads, primarily local residential roads, will never be widened. NCDOT can reference this document in future road widenings, maintenance and resurfacing projects to provide the recommended bicycle facilities or through the driveway permit application process. Local land use development regulations can require road improvements as a part of subdivision or zoning regulations to address areas where the Lake Norman Bike Route utilizes collector roads. Recreation and open space preservation agencies can utilize this document to identify greenway connections and recreation destinations along the route to enhance the overall network while preserving the intent of the plan. This list of recommended strategies are by no means exhaustive; any agency or organization is urged to implement the route by appropriate methods where opportunities present themselves.

Steering Committee

The LNBR Steering Committee, known as the Steering Committee throughout the document, was formed from interested parties representing various concerns of the

Name	Office
Brad Dyer	Lincoln County Planning, LNRPO
Chris Bauer	Mooresville Transportation Planner
Don Bartell	Iredell Transportation Board
Harry Johnson	Char/Meck Bike Advisory Committee
John Cock	Urban Planner
Ken Tippet	CDOT Bicycle Program Manager
Larry Hyde	NC Parks & Recreation
Mark Stafford	NCDOT Division 12 Engineering
Mary George	Catawba County Planning
Richard McHargue	Iredell County Planning
Vicki Taylor	Catawba-Wataree Coalition
Frank Johnson	Former NCDOT Board of Transportation Member
Barry Whitesides	Iredell County Addressing

Lake Norman region. The Steering Committee met three times between August 2005 and June 2006. At these meetings the Steering Committee reviewed maps of local conditions, identified likely users, recommended improvements, and confirmed the Route. Several members of the Steering Committee, as well as volunteer cyclists, rode the entire route in November 2005 to collect information regarding the current road conditions, appropriateness for inclusion in the Route, needed improvements, local attractions, and likely users. This information was recorded in a Geographic Information System (GIS) and presented at the January 12, 2006 Steering Committee meeting. The individual members of the Committee and their affiliations are listed below.

Peer Review

The Steering Committee, at their January 12, 2006 meeting, directed Centralina COG to solicit comments from affected transportation planning agencies. The COG sent out maps of the draft route and recommended improvements to the Unifour and Lake Norman Rural Planning Organizations, the Mecklenburg-Union Metropolitan Planning Organization, NCDOT Bicycle and Pedestrian Transportation Division, and NCDOT Transportation Planning Branch. Comments were received from all agencies and were presented to the Steering Committee at their June 26, 2006 meeting. All comments were considered and many were directly included in the plan and maps.

Definitions

Facility Types

Note: All images and drawings are from NCDOT Division of Pedestrian and Bicycle Transportation

Shared-Use Path

A pathway physically separated from motor vehicle traffic, and can either be within the highway right-of-way or within an independent right-of-way and easements. Multi-use pathways include bicycle paths, rail to trails or other facilities built for bicycle and pedestrian traffic. These travel surfaces are ten feet wide, with two-foot shoulders on either side.

Total facility width is 20 feet.

(Source:

http://www.ncdot.org/transit/bicycle/projects/project_types/Multi_Use_Pathways2.pdf)



Image 1

RECOMMENDED TYPICAL SECTION OF 10-FT ASPHALT PATHWAY With 2-Ft Select Material Shoulder

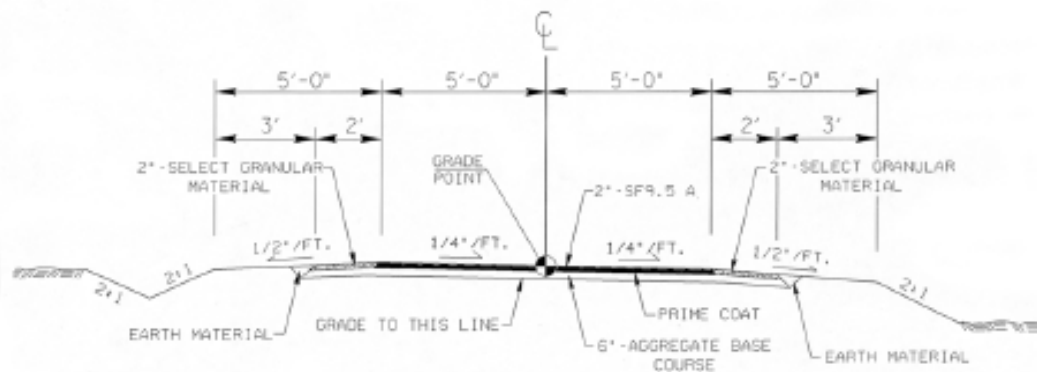


Figure 1

Bicycle Route

A system of routes designated along roads and by signage. These routes are designated by the agency having authority over the roadways included in the route, typically the NCDOT along the LNBR.

(Source:

http://www.ncdot.org/transit/bicycle/projects/project_types/Signed_Bike_Routes.pdf)



Image 2

Striped Bicycle Lane

A portion of a roadway reserved for preferential or exclusive use by bicycles through striping, signing, and pavement markings at least four feet wide, not including concrete gutter pan. (Source: http://www.ncdot.org/transit/bicycle/projects/project_types/Bike_Lanes.pdf)



Image 3

BICYCLE LANES ON COLLECTOR STREETS

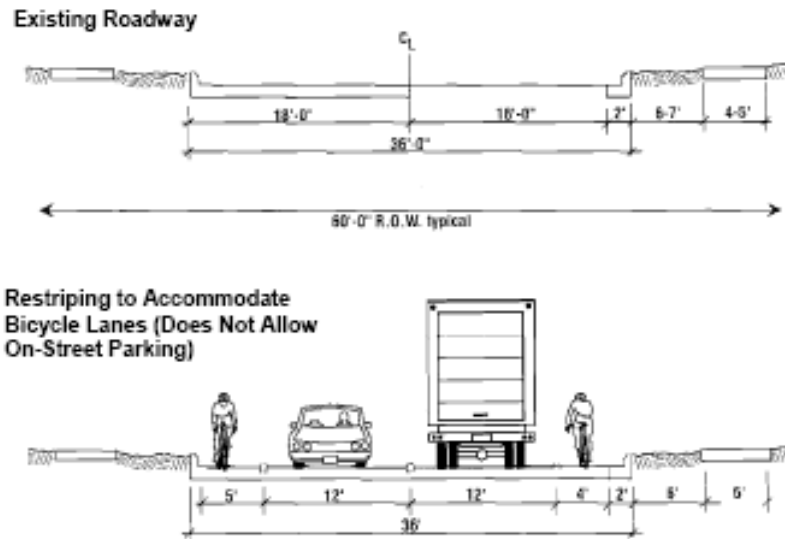


Figure 2

Wide Outside Lane

The through lane closest to the curb and gutter of a roadway. Dedicated right turn only lanes are not used for wide outside lanes.

Wide outside lanes allow motorists to move safely past slower moving bicyclists without changing lanes. They are effective on both four-lane median divided and four-lane with a center turn lane roadways, as shown on the following page. (Source:



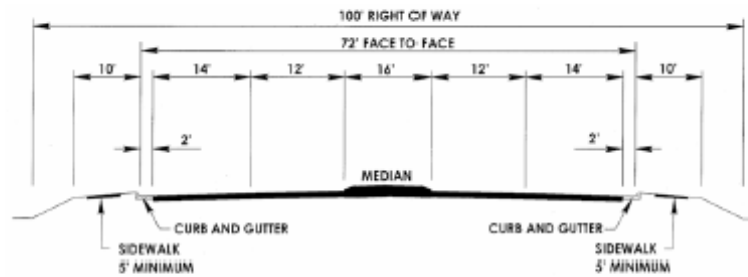
Image 4

http://www.ncdot.org/transit/bicycle/projects/project_types/Wide_Outside_Lanes.pdf)

WIDE CURB LANES

4-LANE MEDIAN DIVIDED TYPICAL SECTION

With Wide Outside Lanes



5-LANE TYPICAL SECTION

With Wide Outside Lanes

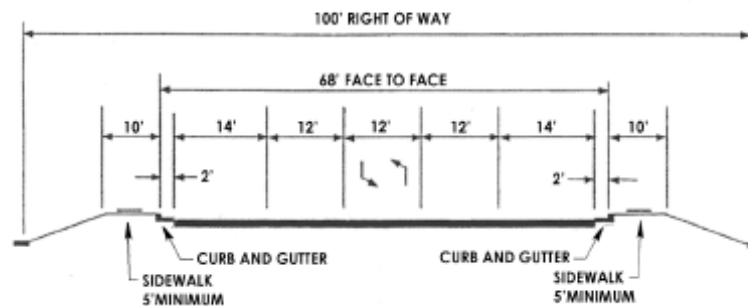


Figure 3

Paved Shoulder

A paved shoulder refers to the part of the highway that is adjacent to the regularly traveled portion of the highway and is on the same level as the highway. A wide paved shoulder refers to additional pavement width of at least 4' that has been added to an existing roadway in order

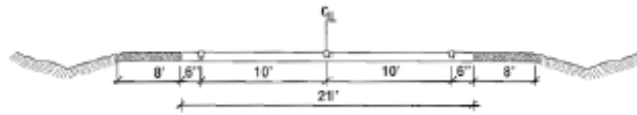


Image 5

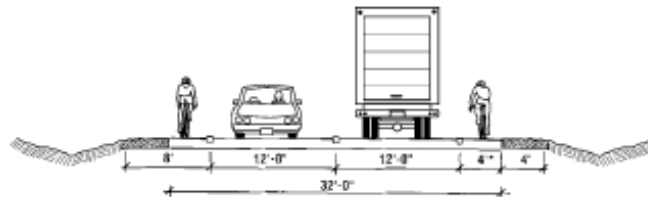
to more safely accommodate bicycles. At a minimum, a two-foot paved shoulder should be included in the construction of new highways and the upgrade of existing highways. The shoulder must be at least four-feet wide to be classified as a striped bike lane with a bicycle logo installed on the lane. (Source: http://www.ncdot.org/transit/bicycle/projects/project_types/Wide_Paved_Shoulders.pdf)

WIDE PAVED SHOULDERS

Existing Roadway



Roadway Retrofitted with 4-Ft Paved Shoulders



* If speeds are higher than 40 mph, shoulder widths greater than 4' are recommended.

Figure 4

Mixed-Use Development

A site that combines several different functions in an integrated manner, such as residential space above a commercial establishment or an entire development combining commercial, residential and public accommodations.

Route Types

Overall Route

The entire Lake Norman Bike Route covers approximately 125 miles across four counties. The route includes multi-lane roads carrying over 20,000 vehicles per day and minor residential cul-de-sac roads carrying less than 100 vehicles per day. The route was originally intended to follow lightly traveled residential roads along Lake Norman, and connect less-traveled roads through bridges and non-vehicular corridors. While much of the approved route still reflects this intent, there is a primary continuous spine to the overall route along existing roads, such as NC 150 and NC 73. Local routes are served by this spine. The overall route is intended to serve several distinct types of bicycle trips:

- Long-distance experienced recreation (Long-distance)
- Short-distance novice recreation (Local)
- Short-distance vehicle-substitution (Urban)

Long-Distance Routes

Long-distance routes primarily follow the spine of the overall network, and follow NC highways and long sections of collector and local roads that serve as connectors with the NC highways or offer a loop along Lake Norman. These segments are typically recommended for bicycle lanes, shoulders, or wide outside lanes.

Local Routes (or Excursion Route)

Local routes exist primarily within the network of roads in neighborhoods along Lake Norman. They are predominantly local residential roads and do not carry significant amounts of traffic. These segments are typically recommended for signage only, and traffic calming where necessary.

Urban Routes (or Vehicle Substitution)

Urban routes primarily follow NC highways serving mixed-use and higher-density development. These routes offer bicyclists and local residents the opportunity to travel by bicycle to daily activities, trips that previously would have been made by automobile. Such segments are typically recommended for dedicated shared-use purpose paths, although bicycle lanes or wide outside lanes are still recommended on the road itself. Such paths are recommended as a part of adjacent greenway or recreation plans, developed by local municipality or county. This is due to the higher speeds of long-distance bicyclists and potential for collisions with pedestrians, skateboards, persons walking pets, slower bicyclists, and other potential hazards to more experienced bicyclists.

User Groups

Overall Description

The Lake Norman Bike Route is intended to serve a variety of users within its overall network. The route includes scenic sections overlooking Lake Norman, rural roads lined with working farms, historic downtowns, burgeoning commercial and employment centers, recreation resources, schools. The Route is designed to connect origins and destinations.

Long-Distance Users

Long-distance users are defined as experienced bicyclists traveling in excess of five miles at a constant high rate of speed. These bicyclists value long stretches of road with few curb cuts or turning movements. Their needs are best met by wide outside lanes, paved shoulder, or dedicated bicycle lanes.

Families/ Novices

Families and novices are defined as relatively inexperienced bicyclists traveling less than five miles at a low rate of speed. These bicyclists typically value scenic views and recreation destinations, such as parks. Their needs are best met by low-volume, low-speed residential roads with signage, and, where necessary, traffic calming. In more urban areas these users' needs are best met with dedicated shared-use lanes. Please note that children should be properly supervised when bicycling on roadways.

Utilitarian Users

Utilitarian users are defined as those bicyclists making trips that would otherwise be made in a motorized vehicle. These bicyclists have a wide range of expertise. They are typically found in more urban areas where there is a higher-density mix of origins and destinations, such as schools, parks, transit stops, offices, and retail. This group's needs are best met through dedicated multi-purpose paths, although more experienced bicyclists may be able to complete these trips on a striped bicycle lane, wide outside lane, or even a paved shoulder.

Improvements

Striped Bicycle Lanes

Striped bicycle lanes are recommended as a part of multi-lane widenings, such as NC 150, or along existing roads where land is being developed or redeveloped. In such instances local land use-regulating agencies are encouraged to require such improvements as a part of the site plan or subdivision review process.

Wide Outside Lanes

Wide outside lanes are recommended where existing multi-lane roads will not be widened in the foreseeable future and the opportunity exists to reduce the width of inside travel lanes and/or the median to allow the outside travel lanes to be widened.

The ideal width for outside lanes would be 14 feet of usable asphalt, exclusive of the gutter pan.

Paved Shoulders

On two-lane roads, the NCDOT is encouraged to add four-foot shoulders on the outside of the striped travel lanes for accommodating bicyclists, although a two-foot paved shoulder is acceptable in constrained areas. This measure will also reduce shoulder maintenance and improve vehicular safety. These modifications would typically be done as a part of scheduled resurfacing or lane repainting, or be required by the local land-use regulating agency as a part of the site plan or subdivision review process.

Multi-Purpose Paths

Multi-purpose paths are recommended as complementary facilities near the route. These paths should connect to the route and encourage additional users from nearby greenways and trails. In the case of land development, local land-use regulating agencies are encouraged to require such improvements as a part of the site plan or subdivision review process. Such paths can also be located on utility corridors or easements, typically associated with electricity, water or sewer lines. There must be sufficient room available to accommodate the 20-foot width, which includes 10 feet of travel surface, and two-foot gravel shoulders on either side.

Signage

Two types of signs are recommended for the Lake Norman Bike Route: a traditional “Share The Road” sign and a “Lake Norman Bike Route” label, possibly with the logo from the front of this report used on the label. These signs should be placed along all sections of the route, consistent with NCDOT guidelines. In certain locations it may be appropriate to stencil the route name onto striped bike lanes. Signage should also note spine routes versus excursion routes, with local communities encouraged to name individual excursion routes. The two affected RPOs and one affected MPO are encouraged to coordinate with the local NCDOT district offices to coordinate signage installation.

Traffic-Calming

Traffic calming is recommended on local residential roads where signage alone is not sufficient to provide an adequate margin of safety for bicyclists. Traffic calming strategies such as speed tables (on municipal roads only) and chicanes (series of narrowings or curb extensions that alternate from one side of the street to the other forming S-shaped curves) must be coordinated with the NCDOT, or in the instance of locally-maintained roads, the appropriate municipality.

Areas of Special Concern

There are identified areas of special concern along the route that merit additional focus and focused improvements. These include high-traffic areas, commercial strips, and bridges. Specific areas include NC 150 in Mooresville, NC 73, and the bridges over Lake Norman along NC 150 and NC 73. Planners and design engineers should keep these issues in mind as road improvements are made to such areas. Experienced

cyclists would likely be the only group capable of using such sections of the route until improvements are made.

Recommended Connections

The route includes several proposed bridge crossings and road connections to create attractive loops along Lake Norman and convenient connections between identified origins and destinations in more built-up portions of the area. Where bridge crossings are recommended, the connection would be made across short sections of Lake Norman. The NCDOT bridge reuse program is recommended as a potential resource to utilize functionally obsolete bridges for pedestrian and bicycle traffic. Where road connections are recommended, local land permitting agencies are encouraged to require connection as a part of future development plans, either as a road or multi-purpose path on a dedicated easement.

Consistency with Existing Plans

The Lake Norman Bike Route affects several long-range transportation plans. The Lake Norman Bike Route is referenced in the recently adopted Lincoln County Comprehensive Transportation Plan (CTP) and with the spine route is considered in the Iredell County CTP). The LNBR is consistent with the Mecklenburg County Bicycle Transportation Plan, Mooresville Downtown Master Plan, Mooresville Pedestrian Plan, Mooresville Comprehensive Parks and Recreation Master Plan, and the NC 73 Transportation and Land Use Corridor Plan. The LNBR “spine” has been sent to the Transportation Planning Branch of the NCDOT for inclusion in any future update of the CTPs. The Mecklenburg-Union MPO, Unifour RPO and Lake Norman RPO have each endorsed the overall route and recommended improvements, and this document has been submitted to the Bicycle and Pedestrian Transportation Division of the NCDOT for reference when reviewing plans for road projects in the Lake Norman area.

Implementation Resources

Each of the agencies and programs listed below may choose to implement portions of the LNBR through funding projects or approving policies that support the overall Route. Each of the agencies is encouraged to proactively coordinate activities to maximize the benefits of projects and policies along Lake Norman and along the LNBR. The affected RPOs, MPO, and supporting local governments should stay vigilant in reviewing new development and road plans near the route for potential implementation.

Statewide

NCDOT

Transportation Improvement Program (TIP): This is the formal, multi-year funding process for transportation projects in North Carolina. Segments of the route could be included in the TIP for implementation. Local RPOs and MPOs

prioritize projects for inclusion in the TIP, which is then updated on a two-year schedule.

Bicycle and Pedestrian TIP: The NCDOT allocates \$6 million per year for independent bicycle and pedestrian improvements in the state. These projects are awarded on a competitive basis. Funds are eligible for shared-use paths off DOT right-of-way.

Incidental Projects: As NCDOT designs or develops individual highway or bridge projects along the proposed route; LNBR recommended improvements should be referenced. Local communities should also reference this plan when reviewing documents on projects along the Route.

Enhancement Program: The next call for projects is in 2008.

CMAQ: Congestion Mitigation and Air Quality (CMAQ) is an EPA program that currently designates \$20 million annually to North Carolina to fund programs and projects designed to improve air quality and reduce congestion, without adding single-occupant vehicle capacity to the transportation system. All of the road improvements recommended for the LNBR are eligible CMAQ projects. Currently three planning organizations in the Lake Norman area receive CMAQ funds. They are listed below with their approximate annual allocations as of 2006.

1. Mecklenburg-Union Metropolitan Planning Organization (MUMPO) \$3,500,000
2. Lake Norman Rural Planning Organization (LNRPO) \$700,000
3. Unifour Rural Planning Organization \$75,000.

Road Resurfacing: The NCDOT should consider restriping multi-lane roads on the LNBR with a wide outside lane (WOL), as appropriate. The NCDOT should consider repaving two-lane roads with a minimum two-foot paved shoulder for vehicular safety, improved maintenance, in addition to providing an improved bicycling facility. These improvements are recommended as a part of a regular road maintenance schedule.

Signage: Bicycle route signage is installed by the local NCDOT District Office. Where the districts do not have resources to purchase additional signage, the Bicycle and Pedestrian Transportation Division may be able to assist with purchasing signage. This would have to be a request to the Division and must fit specified criteria for installation.

Safe Routes To School (SRTS): The SRTS program is funded under SAFETEA-LU, and provides approximately \$15 million over five years for improvements within two miles of elementary and middle schools. No local match is required, although individual grant awards are limited to approximately \$200,000. These grants can pay for pedestrian and bicycle facilities and intersection improvements.

The funds can also be used for education and enforcement efforts. The target population for these activities must be children in kindergarten through 8th grade.

North Carolina Department of Environment and Natural Resources (NCDENR):

NCDENR administers two grant programs designed to fund planning and implementation of recreation projects, such as multi-purpose trails through the Parks and Recreation Trust Fund (PARTF) and Land and Water Conservation Fund (LWCF). LWCF applicants may receive a maximum of \$250,000 per project from NCDENR, and PARTF applicants may receive a maximum of \$500,000, per project, from NCDENR. Both LWCF and PARTF grants require a dollar-for-dollar match, or 50 percent.

Regional

Metropolitan Planning Organizations (MPO) and Rural Planning Organizations (RPO):

The entire LNBR rests within one MPO and two RPOs. Each of these organizations performs transportation planning activities such as researching and prioritizing local transportation needs in consultation with the NCDOT and local officials. These organizations also serve as forums for transportation needs in the area, and may choose to identify projects from the LNBR to submit to the NCDOT for inclusion in the TIP.

Councils of Government (COG):

The LNBR rests within two Councils of Government regions, Western Piedmont Council of Governments and Centralina Council of Governments. Each of these organizations are involved in the Lake Norman area through transportation planning as staff to the RPOs, as well as, general land use planning. These two COGs may choose to assist local governments in implementing sections of the LNBR as a part of traditional planning activities.

Lake Norman Marine Commission (LNMC):

As defined by the North Carolina 1969 State Statute, the LNMC is responsible for taking appropriate responsibility for Lake Norman and its shoreline area for all matters relating to or affecting public recreation and water safety. The LNMC may choose to support activities and policies that will help implement the LNBR.

Open Preservation Organizations

Catawba Lands Conservancy:

The Conservancy is a non-profit land trust devoted to the permanent protection of land, water and wildlife habitat through a variety of conservation strategies such as easements, purchase, and donations. Landowners who conserve their property are often able to take advantage of tax benefits including a federal income tax deduction, state income tax credit, a reduction in estate taxes or potential property

tax alleviation. The Conservancy may choose to target open space acquisition along the LNBR to preserve scenic views of Lake Norman or other important natural resources along the Route.

Trust for Public Land (TPL):

TPL is a national, nonprofit, land conservation organization that conserves land as parks, community gardens, historic sites, rural lands, and other natural places, for the purpose of ensuring livable communities for future generations. TPL is devoted to the preservation of land critical to maintaining clean drinking water and to the protection of the natural beauty of coasts and waterways. The TPL helps design and promote public funding programs that support conservation. It helps states, counties, and municipalities, create and pass legislation and mount ballot measures that generate new funds for conservation. TPL's national research team provides analysis and recommends a funding strategy that results in measures aligned with public priorities. The TPL may choose to target open space acquisition along the LNBR to preserve scenic views of Lake Norman and other important natural resources along the Route.

Local

Cities and Counties:

The LNBR directly affects four counties and five municipalities. Each of the communities may choose to update their zoning and/or subdivision ordinances to require improvements to roads impacted by the LNBR as a part of their site plan and/or subdivision ordinances. In addition they may require dedication of additional Right-of-Way as a part of the site development process.

Resource Sites

General Bicycling Information, www.bikinginfo.org

Parks and Recreation Trust Fund, www.partf.net

Land and Water Conservation Fund, www.ils.unc.edu/parkproject/lwcf/apply.html

Mecklenburg Union Metropolitan Planning Organization, www.mumppo.org

Lake Norman Rural Planning Organization, www.lakenormanrpo.org

Unifour Rural Planning Organization, trans.wpcog.org/default.asp

Centralina Council of Governments, www.centralina.org

Western Piedmont Council of Governments, www.wpcog.org

North Carolina Department of Transportation, www.ncdot.org

North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation, www.ncdot.org/transit/bicycle

Catawba Lands Conservancy, <http://www.catawbalands.org/>

Trust for Public Land, www.tpl.org/tier2_kad.cfm?folder_id=3129

Safe Routes to School, www.safety.fhwa.dot.gov/saferoutes

Sample Municipal Resolution for Endorsement of Lake Norman Bike Route

A RESOLUTION FOR ENDORSEMENT OF THE LAKE NORMAN BIKE ROUTE

WHEREAS, the Transportation Advisory Committee (TAC) of the duly recognized transportation planning policy board representing _____ has approved the Lake Norman Bike Route; and

WHEREAS, the community recognizes a need to promote alternative modes of travel to reduce congestion, promote recreation, and increase safety for existing bicyclists and motorists; and

WHEREAS, the Lake Norman Bike Route and its supporting text were developed with input to reflect local conditions and preferences; and

WHEREAS, _____ will consider implementation of the Lake Norman Bike Route through the recommended implementation strategies as listed in the plan text.

NOW, THEREFORE BE IT RESOLVED that _____ endorses the Lake Norman Bike Route on this, the _____ day of _____, 200__.

A motion was made by _____ and seconded by _____ for adoption of the resolution, and upon being put to a vote was duly adopted, on this, the _____ day of _____, 200__.

Chairman

Clerk to Council
