

# HIGHWAYS AND ROADWAYS

***Specific highway recommendations in the Greater Hickory MPO and the surrounding Unifour RPO areas can be found in Charts A-D in the Appendix C.***

## **Overview of Transportation Planning in the Hickory Area**

The Greater Hickory MPO is located in the foothills of western North Carolina about 30 miles north of Gastonia, 50 miles northwest of Charlotte, 70 miles west of Winston-Salem and 75 miles east of Asheville. The MPO planning area, which is defined as the area expected to be urbanized by the end of the planning period (2040), is approximately 764 square miles covering portions of Alexander, Burke, Caldwell and Catawba counties. There are twenty-three municipalities in the MPO planning area in addition to the four county governments: Brookford, Cahah's Mountain, Catawba, Cedar Rock, Claremont, Connelly Springs, Conover, Drexel, Gamewell, Glen Alpine, Granite Falls, Hickory, Hildebran, Hudson, Lenoir, Long View, Maiden, Morganton, Newton, Rhodhiss, Rutherford College, Sawmills, and Valdese.

The Hickory area has a long history of transportation planning. Prior to North Carolina enacting legislation (General Statute 136-66) in 1959 establishing the development and adoption of thoroughfare plans within North Carolina, the Hickory Planning Board published a report in 1949, "Hickory Looks Ahead, Preliminary Steps Toward a Major Street Plan". In 1959 and 1960, a three volume regional land development plan was prepared for the tri-city region of Hickory, Newton, and Conover. A "sketch" thoroughfare plan was prepared for the City of Hickory as part of this study. In September, 1962, the City of Hickory and the NCDOT entered into a contract to develop a comprehensive thoroughfare plan for the Hickory-Long View-Brookford area. This study included the development of mathematical models to predict travel desires to the year 1985. This study resulted in a thoroughfare plan for the area entitled "Thoroughfare Plan, Hickory-Brookford-Long View, March 1, 1966". This plan served the Hickory area from 1966 to May 13, 1983 with only one revision that was approved by the City of Hickory on April 21, 1970. In 1981, due to continuous growth in the area, a new study using a mathematical model was undertaken. A new thoroughfare plan was adopted: "Thoroughfare Plan, Hickory-Brookford-Long View, 1983. As a result of the 1980 Census the Hickory-Newton-Conover area was designated as an urbanized area (area having at least 50,000 persons living in a contiguous urban environment). The new designation required that the comprehensive transportation planning process as promoted by federal regulations be developed. By June, 1982 the Hickory-Newton-Conover Metropolitan Planning Organization (MPO) was operative. A new Hickory-Newton-Conover study started in earnest in the summer of 1984 and adopted for the area in 1986. This plan was then updated and approved in 1996. The MPO's model was developed in TRANPLAN for the 1996 update. As a result of Census 2000, the MPO urban area grew from 65,000 to over 180,000 people. The MPO's name was also changed after the 2000 Census to the "Greater Hickory MPO". The long-range transportation plan (LRTP) for the area was updated. Another change for the region was the EPA (Environmental Protection Agency) designation of Catawba County as a non-attainment area for Particulate Matter (PM 2.5) in 2005 but received attainment status in 2012. The TRANPLAN model was updated for the 2005 LRTP update with a 2002 base year and a 2030 horizon year. By Census 2010 the population of the urbanized area exceeded 200,000.

## **Model Summary for this Update**

In 2003 a new update was started. It was decided that TransCAD would be the model platform for this update for the MPO area. As part of this update, the MPO established a new Traffic Analysis Zone (TAZ) structure within the new Metropolitan Area Boundary (MAB). These zones were updated again after the 2010 Census. The base year for the new model is 2011 with a horizon year of 2040. The remainder of Alexander, Catawba, Caldwell, and Burke counties not modeled was covered by the NCDOT rural spreadsheet.

The new Hickory/Unifour model follows the traditional four-step modeling process: trip generation, trip distribution, mode split, and trip assignment. The new model forecasts average weekday travel conditions (not peak or off-peak periods). A cross-classification trip production process and a regression based trip attraction process are used. Total person trips are generated. There are six primary trip purposes: home-based work, home-based shopping, home-based other, non-home-based, external, and truck. For trip distribution, a traditional gravity model is used. Commercial vehicle trips are treated as a separate trip purpose with commercial vehicle-specific trip generation and distribution parameters. Vehicle trips are assigned using a combination of equilibrium and all-or-nothing assignments, depending on the trip purpose.

The transportation road network has been developed to represent all regionally and locally significant roads in the study area. Significance was measured in terms of functional classification, average daily traffic, and connection within the transportation system. The modeled network was also influenced by zone structure. More details of the travel demand model can be found in the “Hickory/Unifour Travel Demand Model” prepared by NCDOT and Kimley-Horn and Associates, Inc; in 2013.

The North Carolina Department of Transportation has undertaken a major process improvement with the goal of integrating the long range transportation planning process with the project development process. In North Carolina the long range transportation planning process is called the Comprehensive Transportation Planning process and leads to the development of Comprehensive Transportation Plans (CTP). In MPOs, federally required Long Range Transportation Plans (LRTP) are the fiscally constrained subsets of a CTP. In the development of the CTP, consideration is given to all transportation modes including: street systems; transit alternatives; and bicycle, rail, pedestrian, and operating strategies.

## **Recommended Improvements**

### **Regionally Significant Projects**

Several recommended improvements offer advantages to the entire four county region. Also, many of the regionally significant projects are part of the North Carolina Strategic Highway Corridors. The North Carolina Department of Transportation, in collaboration with the Department of Commerce and Department of Environment and Natural Resources created the *Strategic Highway Corridors* (SHC) initiative. The SHC initiative represents a timely effort to protect and maximize the mobility and connectivity on a core set of highway corridors throughout North Carolina, while promoting environmental stewardship through maximizing the use of existing facilities to the extent possible, and fostering economic prosperity through the quick and efficient movement of people and goods. Each Corridor represents an opportunity for NCDOT, partnering agencies, and other stakeholders to consider a long-term vision, consistency in decision-making, land use partnerships, and overarching design and operational changes.

The primary purpose of the Strategic Highway Corridors initiative is to provide a network of high-speed, safe, reliable highways throughout North Carolina. Initially, a set of criteria was developed to guide the Corridor selection process. These criteria focused on mobility, connectivity to activity centers, and connectivity to interstates, interstate relief routes, major hurricane evacuation routes, and corridors that are part of a national or statewide highway system. Activity centers include urban areas with a population of 20,000 or greater, state seaports, major airports, major intermodal terminals, major military installations, University of North Carolina system campuses, trauma centers, and major tourist attractions. Input from public forums and from members of the North Carolina Board of Transportation (BOT) and NCDOT Operations staff has also been instrumental in further refining and improving this concept. The result is a long-range highway planning vision for the state, illustrated by a vision map with the proposed facility types and documented as a set of recommended Corridors. The 5400 miles of designated Strategic Highway Corridors, which include existing and proposed interstates, account for only 7% of the State's Highway System, but carry 45% of the traffic. There are several facilities within Alexander, Burke, Caldwell and Catawba Counties that are part of the SHC: I-40, US 321, NC 16, NC 18 and NC 150.

The Strategic Highway Corridors concept was adopted by the North Carolina Board of Transportation on September 2, 2004, as a part of North Carolina's Long-Range, Multimodal Statewide Transportation Plan. Following adoption, a formal policy statement on the initiative was endorsed by the Departments of Commerce, Environment and Natural Resources, Transportation, and the Governor's Office.

The Comprehensive Transportation Plan will incorporate the long-term vision of each Corridor.

- Projects along Corridors will be developed in a manner to achieve the long-term vision and goals of the initiative.
- From the local jurisdictions, consistent and compatible land use decisions are needed to support the goals of the initiative.
- Managing development along the Corridors is essential for achieving the long-term vision for each facility. Tools, techniques, and strategies will be identified for protecting the Corridors, such as the use of access management.
- All driveway permits and traffic signal requests along the Corridors will be carefully examined for consistency with the long-term vision for the corridor. Driveway consolidation and sharing will be highly encouraged, and alternative solutions to traffic signals will be sought.

#### **Greater Hickory MPO and Unifour RPO facilities on the Strategic Highway Corridor Vision**

**Plan:** NC 16 (upgrade to expressway and some new location south of I-40 and upgrade to boulevard north of I-40), NC 150 (RPO area – upgrade to boulevard); I-40 (Freeway); US 321 (upgrade to expressway north of I-40); and NC 18 (upgrade to boulevard).

#### **Interstate-40**

This interstate is a major east-west facility through the Greater Hickory MPO area. I-40 is a part of the National Highway System, the backbone of the country's freeway system that serves the interstate and inter-regional travel between major population centers. It connects the state of North Carolina from the ports of Wilmington through the Blue Ridge Mountains and into Tennessee. I-40 is important to interstate commerce, as well as travel and tourism, which form the lifeblood of many towns in the North Carolina mountains. I-40 is currently a 4-lane freeway. Traffic projections indicate that I-40 through the MPO will be over capacity by 2035 and is recommended to be widened to 6-lanes. I-40 is programmed

in the TIP for pavement rehabilitation, bridge and safety improvements, which are listed as Projects I-801, I-910, I-906, I-3302, I-5143, I-5401, I-5212 and I-5213.

The nearest parallel facility, US 70, serves as a business route through the planning area and lacks the capacity that serves longer distance, free-flowing travel. Because of the industry located in the northern part of the planning area, a large percentage of heavy trucks comprise the total amount of traffic.

The intersection with Lenoir Rhyne Blvd (SR 1007) should be reconfigured to have a modified clover configuration. Currently, traffic going north on Lenoir Rhyne Blvd and wishing to go west on I-40 can back up almost to US 70 leading to congestion near the US 70/Lenoir Rhyne Blvd intersection. Adding a clover loop to the northeast quadrant of the I-40 interchange would eliminate this left turn movement.

NCDOT should further evaluate the remaining unimproved interchanges in Burke County in consideration of the high cost of right-of-way acquisition and other recommendations from the Highway Design Section of NCDOT.

***The eleven interchanges identified in the Burke County I-40 Corridor Plan for priority improvements are listed below:***

Exit 119 – Ranked 9 by Priority Need

Fix the sharp curve on the ramp in the northwest quadrant on the interchange.

Exit 118 – Ranked 6 by Priority Need

The two-way traffic on the ramp from Curley's Fish Camp Road needs to be redirected. The two-way traffic on the ramp does not meet State or Federal design standards.

Exit 116 – Ranked 3 by Priority Need

The interchange needs to be redesigned. At minimum, the eastbound deceleration lane needs to be extended. The bridge is also substandard and needs to be replaced. The Greater Hickory MPO has requested a feasibility study to be done on this interchange.

Exit 113 – Ranked 7 by Priority Need

Fashion Avenue needs to be redirected from the ramp of I-40. The two-way traffic on the ramp does not meet State or Federal design standards. The bridge needs improvement and the sight distance problem needs to be addressed on the southwest ramp.

Exit 112 – Ranked 8 by Priority Need

Dirt Road on the interchange ramp that leads to an existing flea market needs to be closed and the access for the flea market should be redirected.

Exit 111 (I-5008) – Ranked 1 by Priority Need

Exit 111 needs to be redesigned for safety reasons because none of the ramps meet State or Federal design standards. The recommended design is to revise the interchange to a diamond configuration.

Exit 107 – Ranked 2 by Priority Need

Interchange 107 needs to be redesigned for safety reasons because some of the ramps do not meet State or Federal design standards. The right-of-way needs to be reserved for future ramp extensions. Local governments may need to require additional setbacks immediately for development near the interchange. The Greater Hickory MPO has requested a feasibility study to be done on this interchange.

Exit 106 – Ranked 12 by Priority Need

This interchange’s design appears to be adequate, but should be evaluated by NCDOT.

Exit 105 – Ranked 14 by Priority Need

Interchange improvements are currently under construction STIP (U-2550B).

Exit 104 – Ranked 13 by Priority Need

Interchange improvements are currently under construction STIP (U-2551).

Exit 103 (I-5009)– Ranked 4 by Priority Need

The bridge is too short and not wide enough to accommodate the traffic. It is difficult to access and exit I-40. On the westbound exit, there are times when the traffic backs up onto I-40 creating dangerous conditions. These deficiencies need to be addressed. A feasibility study on Burkemont Avenue and I-40 has been completed and includes this interchange. Interchange improvements are currently in the STIP (I-5009).

Exit 100 - Ranked 5 by Priority Need

The two-way traffic on the interstate ramp from TEVES on the southeast ramp and the two-way traffic from Reep Drive on the northeast ramp need to be redirected. The ramps do not meet State or Federal design standards.

Exit 98 – Ranked 10 by Priority Need

This interchange’s design appears to be adequate, but should be evaluated by NCDOT.

Exit 96 – Ranked 11 by Priority Need

This interchange’s design appears to be adequate, but should be evaluated by NCDOT.

Exit 94 – Ranked 15 by Priority Need

This interchange has recently been rebuilt and is not recommended for any improvements.

**US 64**

This arterial provides major travel service for the Unifour area. It is not part of the North Carolina Strategic Highway Corridors. The northern section links Lenoir to Taylorsville in Alexander County while the southern section links Lenoir to Morganton in Burke County. A majority of US 64 is 2 lanes except for a section in Lenoir, Gamewell and Morganton where the cross-section is 5 lanes. Currently, traffic is heaviest on the section between Lenoir and Gamewell and the section south of Fleming Drive in Morganton. By the design year, traffic volume will approach the capacity on most of the 2-lane section between Lenoir and Morganton. The section of US 64 between Lenoir and Morganton that runs concurrently with NC 18 is in the TIP for widening to multi-lanes. It is listed as Project R-2549. No funds have been allocated in the STIP for this project.

Also, US 64 (Lenoir Road, Avery Avenue, and Burkemont Avenue) is a major north-south radial through the City of Morganton which provides access to I-40, Western Piedmont Community College, the North Carolina School for the Deaf, the Morganton loop system and the heart of the CBD. In recent years, US 64 south of I-40 has become a center for commercial and retail development. This development has significantly increased the traffic volumes and turning movements in this vicinity resulting in a negative impact to the traffic carrying capacity of US 64 south. US 64 is recommended to be widened to a 4-lane divided facility from the Morganton City Limits south of I-40 to the McDowell County line,. The interchange with I-40 is project I-5009 in the STIP and is programmed for improvements. No funds have been allocated at this time.

## **US 64/NC 18**

See US 64

## **US 70**

While not a part of the North Carolina Strategic Highway Corridors, this east-west arterial traverses the entire Greater Hickory MPO planning area paralleling I-40. It serves the CBDs of smaller towns like Glen Alpine, Valdese, Rutherford College, Connelly Springs, Hildebran, Long View and Claremont and links them to larger urban area of Morganton, Hickory and Conover. It also serves as an alternative route to I-40 in emergency situations when portions of I-40 must be closed. Each weekday, this facility carries a substantial number of heavy trucks, residential and commercial traffic. It is traveled heavily by residents and those who work along this facility. There is currently a substantial amount of dense commercial development either existing or planned within the corridor including small businesses, service facilities, and industry. Daily traffic volumes vary along the corridor but the heaviest areas are located in the vicinity of Valley Hills Mall in Hickory and, to a lesser extent, the CBDs of the towns it crosses. US 70 near Valley Hills Mall and near Rutherford College will be over capacity by 2020. By 2030 US 70 through Connelly Springs will be over capacity and by 2040 the portion through Valdese will be at capacity. In addition, since the Valdese General Hospital is located on a route adjacent to this corridor and may use US 70 as an emergency route, this facility's smooth operation is crucial to the well being of the area residents.

It is possible that an increase in residential development in the Lake James area may affect travel patterns. For this reason, Burke County should limit access along this roadway through subdivision regulations and building setbacks.

If portions of US 70 are not widened at some point, excessive congestion and delays will occur along the facility resulting in increased air pollution due to the stop-and-start conditions along the roadway. Safety conditions along the roadway will also be compromised due to the high number and closeness of vehicles in the traffic stream.

## **US 321**

This highway is a major north-south facility serving the Western Piedmont area of North Carolina. It connects the Charlotte/Gastonia urban area to the major furniture and textile industrial area of Hickory/Lenoir and to the tourist areas of Blowing Rock and the Blue Ridge Parkway before it crosses into Tennessee. In the Greater Hickory MPO, US 321 provides a critical connection between the Hickory urban area and other towns in Caldwell County such as Lenoir, Hudson, Sawmills and Granite Falls. In certain sections of this highway, the daily traffic volume will be over capacity by 2020. Other sections will be over capacity by 2030 and 2040.

Currently, the portion of US 321 from US 70 in Catawba County to US 64/NC 18 in Lenoir is programmed in the TIP for improvements and widening. It is listed as Project U-4700 (A, B & C). It also includes B-4450 which is the widening of the bridge over the Catawba River to 6-lanes. Right-of-way money is allocated in the 2012-2018 STIP. Previously, the intersection at US 321 and US 64/NC 18 in Lenoir was programmed in the STIP to be upgraded to an interchange but is not currently listed in the STIP.

It is critical to preserve the remaining integrity of US 321 by strictly limiting any further direct commercial access onto this facility.

### **NC 16**

NC 16 is a major north-south radial serving the Newton-Conover area as well as eastern Catawba County. It also serves as a valuable link to the Charlotte urban area and Alexander County. It also serves as a valuable link to the Charlotte urban area and Alexander County. It is recommended that a 4-lane divided boulevard with a grass median be constructed from the section north of I-40 to C&B Farm Road. The remainder of NC 16 from Catawba River to the Wilkes County is recommended to be upgraded (R-2403).

The existing cross-section of NC 16 varies from 2 to 3 lanes with a short segment in the downtown of Newton as a one-way pair. NC 16 merges with NC 10 from this one-way pair they split in southeastern Newton (for more discussion on this section, see NC 10 under Catawba County).

The STIP recommends that NC 16 be to be widened to a mixture of 4- and 5-lane divided boulevards. The first segment from the Newton-Conover East Loop to SR 1895 (Tower Road) is listed as TIP Project R-3100 (A&B). The segment from SR 1895 to Lincoln County, TIP Project R-2206 has been completed.

### **NC 18**

Similar to US 64, NC 18 also provides travel service in the Caldwell/Burke County area. This arterial is a part of the Strategic Highway Corridors connecting the Caldwell/Burke County area to Wilkesboro on the north and Shelby on the south. High traffic volumes are located in the vicinity of Lenoir and Morganton and some of the 2-lane section will be over capacity by the 2040. Contributing to the attractiveness of this route is the direct link it provides between I-40 and the Morganton CBD, as well as the location of several major employers along this facility. Although some improvements have been made to NC 18, the remaining 2-lane sections are expected to exceed the facility's current capacity by the planning year. As development along this corridor increases, the character of the facility may deteriorate more quickly. This change will be due primarily to increasing residential growth in this area and commercial growth near Morganton. It is recommended that NC 18 should be widened to four lanes with some 5-lane sections in commercial areas as needed. Improvements to NC 18 included improvements to the interchange 105 at I-40 and which is currently under construction.

### **NC 127**

NC 127 is a major north-south radial serving the Hickory-Brookford-Mountain View area and is one of only two major crossings over Lake Hickory from Alexander County, making it a critical link for the travel between the Counties. The existing cross-section of NC 127 varies from 2-3 lanes south of Zion Church Road to 5 lanes through Brookford (SR 1008) and 4-5 lanes in Hickory. The cross-section narrows back down to 2 lanes in the area north of Cloninger Mill Road (SR 1400). Currently, traffic volume is reaching capacity at the 2 lanes section through Mountain View and north of Cloninger Road. The problem will increase in the future as the traffic volume increases. Several recommendations are suggested to ease these traffic problems. On the north side, it is recommended that NC 127 be widened to a 4 lanes divided boulevard with grass median from Cloninger Road to SR 1156 (Richey Road) in Alexander County. This recommendation is included in the TIP as Project R-3603 (R-3603A is in the MPO area, and 3603B from SR 1156 to SR 6490).

On the south side, NC 127 is recommended to be widened to a 4-lane divided boulevard with a grass median from Zion Church Road Huffman Farm and then extend to NC 10. This recommendation is included in the TIP as Project U-2530. Neither TIP Project R-3603 nor U-2530 are currently funded.

## **NC 150**

NC 150 is a major east-west route between Shelby, Lincolnton, and Mooresville (I-77). A small portion of NC 150 goes through the southeast corner of Catawba County. NC 150 is recommended to be widened from 2-lanes to multi-lanes from NC 16 in Catawba County to I-77 (R-2307). Currently, it is unfunded in the STIP.

## **NC 181**

This route traverses the northern part of Burke County and provides access to the Pisgah National Forest and a number of recreational areas. It is also the most direct route to the Blue Ridge Parkway from Morganton. Portions of NC 181 were approved as a NC Scenic Byway as part of the Pisgah Loop Scenic Byway. The facility is designated as a bicycle route and is part of the Mountain-to-Sea and the Piedmont Spur trails. Because of the mountainous terrain of this facility, there is some concern about trucks traveling along this route. The need for more truck turnouts and run-away ramps has been identified.

In Morganton, NC 181 (North Green Street) serves primarily residential traffic into the CBD. East of Bost Road commercial development to the north and industrial to the south are the primary users of the facility. This route is expected to be over capacity by 2030. It is recommended to widen NC 181 from SR 1414 (St. Mary's Church Rd) to the Morganton ETJ.

**McDonald Parkway (also known as Eastside Thoroughfare) – See under Catawba County**

**Newton and Conover Loop – See under Catawba County**

**Southeast Boulevard (US321/US64/NC18 Connector) – See under Caldwell County**

***The remainder of recommendations in the Greater Hickory MPO area will be broken down by counties. If a facility is in more than one county, it will be listed under each county.***

## **Alexander County**

### **Grace Chapel Road (SR 1751) to NC 127 Connector (Caldwell-Alexander Counties)**

Previous TIP Project R-2918. Connector linking Grace Chapel Road (SR 1751) in Caldwell County to NC 127 in Alexander County with some new location and using Icard Dam Road and Hubbard Road.

## **Burke County**

### **Bouchelle Street Extension**

Providing an extension between the existing Bouchelle Street and Fleming Drive will help alleviate congestion on the one-way traffic pairs in downtown Morganton. This connection will also open up this portion of the downtown area for redevelopment.

### **Causby Road Extension (SR 1147) (R-2814)**

This extension is recommended to provide improved access between Glen Alpine and I-40. The land between US 70, through the center of Glen Alpine and I-40, has been identified for future expansion of



industrial development. This project is needed to provide access for this future development to both US 70 and I-40.

#### **Eldred Street and Laurel Street (SR 1545)**

Eldred Street is the main north-south facility through the Town of Valdese. It provides one of only three connections to I-40 in the planning area. It is heavily traveled by residents, as well as trucks that use this route to travel from the northern industrial section of Valdese (especially Lovelady Road) to I-40. Currently, Eldred Street does not meet NCDOT standards.

There is currently a substantial amount of commercial development in this area including gas stations, restaurants, shops and offices. In addition, long-term land use plans indicate further industrial development in the north. Eldred Street (portion is a city street) is the main link between I-40, Lovelady Road and US 70. Since there are no existing parallel facilities to accommodate this growth, the intersection and Eldred Street will need to be improved. Improvements to the Eldred Street/US 70/Laurel Street area will improve the flow of traffic on US 70 by reducing the amount of traffic using Laurel Street.

It is recommended to upgrade Eldred Street to a two-lane facility meeting State standards (12' lanes) between Laurel Street and US 70, and closing off Laurel Street with a cul-de-sac. Also, it is recommended to upgrade Eldred Street to a three-lane facility between I-40 and US 70. These improvements are needed to accommodate existing and future traffic growth.

#### **Lovelady Road (SR 1546) and Tomlinson Loop (SR 1613)**

As part of the Northeast Burke County Corridor, it is recommended to extend Lovelady Road from its intersection with Laurel Street to the Tomlinson Loop. This is currently an unfunded project. This improvement would give the municipalities a continuous northern route both throughout the planning area and east to Hickory.

#### **Malcolm Boulevard (SR 1001)**

Malcolm Boulevard is the primary north-south facility from the northern part of the planning area to I-40. This facility carries a substantial number of heavy trucks from the northern industrial section of the planning area to US 70 and I-40. This facility also serves local traffic as the main north-south corridor through Rutherford College and Connelly Springs.

Malcolm Boulevard is heavily traveled by both residents in Rutherford College and Connelly Springs. Traffic volumes are increasing due to residential and commercial growth along this facility. In addition, there is dense commercial development near US 70. There are no existing parallel facilities to accommodate this growth. In addition, since the Valdese General Hospital is located in this corridor, this facility's smooth operation is crucial to the well being of the residents. Traffic volumes on Malcolm Boulevard are anticipated to greatly exceed the current capacity of the roadway. Constructing a new location route to handle the anticipated traffic increases in this area would disrupt the existing residential and commercial development.

It is recommended that Malcolm Boulevard be widened to a 4-lane divided facility from US 70 to the Catawba River.

#### **Meytre Avenue (SR 1576)**

Meytre Avenue is an important link in the northern east-west travel through Valdese. It is a two-lane facility carrying mainly residential traffic. Due to the growing traffic volumes on US 70, Meytre Avenue is quickly becoming an alternate east-west corridor for industrial truck traffic generated by the northern

industrial park located on Lovelady Road. This type of development is expected to continue. Widening this facility is not feasible because of the commercial and industrial development along US 70 and the existing on-street parking. This recommendation, along with the Lovelady Road Extension (previous TIP Project R-2824), will give the municipalities a continuous northern route to Hickory and the Hickory Regional Airport.

Although the current traffic volume does not exceed the capacity of the roadway, improving and extending Meytre Avenue will alleviate some of the congestion problems along US 70. The realignment project will connect two existing major facilities to provide a continuous route by which travelers can access any of the major routes in the eastern and western parts of the planning area.

It is recommended that the intersection of Meytre Avenue and Lovelady Road be realigned at the intersection of Laurel Street. It is also recommended to upgrade Meytre Avenue from Laurel Street to Church Street and extend Meytre Avenue to intersection with SR 1535 (Oakland Ave.).

### **Morganton Connectors**

#### **Eastern Connector**

This connector will serve travel between US 70 East, Sterling Street (NC 18) and Enola Road making travel more direct and substantially reducing congestion on US 70. This project will provide quicker and more direct access to Grace Hospital. Travel between the residential areas north and south of US 70 and along Bethel Road and employment centers along Sterling Street and Enola Road will also be improved. The section of I-40 between Sterling Street and Enola Road operates much like a connector route, especially during peak periods. The primary role of an interstate facility is to serve through and regional traffic. By extending the Eastern Connector to Enola Road, the traffic congestion along I-40 should be greatly reduced by providing a viable alternative for local travel.

#### **Western Connector**

Currently, the City of Morganton has no adequate facility for north-south traffic movements. The primary employment base in this area is industrial and a high concentration of this employment is located to the west of the CBD. In addition to the truck traffic generated by these locations, workers from outside the immediate area travel through Morganton to reach these destinations. Additional industrial development along US 70 would be served by this facility through improved access to I-40.

A western connector is also needed in Morganton to provide relief to the streets of the CBD where widening is not feasible or desirable. Additionally, the construction of a Western Connector will improve access from the residential development in northwest Morganton to I-40, NC 18 North and US 64 South.

An additional interchange along I-40 would provide relief to the US 64 interchange currently experiencing congestion and safety issues.

#### **Southern Connector**

By improving existing two-lane roadways and the connection between them, an efficient connector can be provided between I-40 West, US 64 South and I-40 East. This will improve travel in the southern portion of the area and alleviate traffic congestion on I-40 through Morganton.

### **The Northeast Burke County Corridor**

This 2-lane corridor is comprised of Lovelady Road, Rhodhiss Road, Oak Ridge Church Road, Hickory Regional Airport Road (SR 1546, SR 1611, SR 1614, SR 1653 and SR 1625) and was identified as previous TIP Project R-2920. Along with previous TIP Project R-2824, the Lovelady Road Extension,

this facility will give Burke County a continuous northern route that connects the Valdese and Rutherford College area to Hickory and the Hickory Airport.

#### **Old NC 10 (Icard-Hildebran) (SR 1761)**

This 2-lane thoroughfare meanders around I-40 and intersects the interstate at two locations in the Hildebran and Icard areas. It provides a connector to I-40 and serves the developments along its corridor. Traffic volumes in the design year are moderate on this road except for the section at the I-40 interchange. It is recommended that this section be widened to three lanes.

#### **Powell Avenue (SR 1729)**

Powell Avenue should be extended from its intersection with Tunnel Drive to US 70 at Enon Road. This improvement is needed as an alternate route through the southern portion of Valdese to alleviate additional congestion along US 70. US 70 is the principal arterial through the planning area and traffic volumes are expected to increase well beyond this facility's current capacity. Widening US 70 is not a feasible alternative due to historic structures located along this section of the facility.

#### **Rhodhiss Road (SR 1611)**

This major thoroughfare is located at the northwestern fringe of the planning area. It facilitates travel between the Rhodhiss-Granite Falls urban area and the western planning area. As one of a few lake crossings in Burke County, this facility also functions as an important route for north-south travel between eastern Burke and southern Caldwell Counties. It is recommended that Rhodhiss Road be widened to multi-lanes.

#### **Stonebridge Drive Extension (Previous STIP U-3436)**

The Stonebridge Drive Extension will provide an intermediate loop system between Fleming Drive (US 70 Bypass) and Sterling Street (NC 18). This loop system will allow traffic to bypass the congested intersection of Fleming Drive and Sterling Street. It will also provide relief to the congestion on Sterling Street.

This project is important for maintaining safe and efficient traffic flows in and around Morganton. Of vital importance will be quicker and more direct access to Grace Hospital, which provides regional medical care. The extension will also improve safety at the intersection of Fleming Drive and Sterling Street by providing an alternative route to access I-40 and employment centers in south Morganton.

#### **39<sup>th</sup> Street NW (SR 1647) and Connector (Long View)**

This 2-lane thoroughfare is located in eastern Burke County. It terminates at First Avenue SW in Long View on the south and SR 1611 (28<sup>th</sup> Ave NE) on the north. This facility functions as a radial providing service between Rhodhiss and Long View. Travel on this road is light with the heaviest volume on the south end. The proposed connector between 39<sup>th</sup> Street NW and SR 1655 (34<sup>th</sup> Ave Dr NE) is to improve the safety on 39<sup>th</sup> Street NW and increase the travel efficiency between Long View and the northeastern part of the planning area. Travel on 39<sup>th</sup> Street NW and its extension is expected to remain at the present level. A 2-lane cross-section is recommended for the connection.

#### **Tex's Fish Camp Road SR 1627) and Extension (Hildebran)**

This major thoroughfare connects the Hildebran-Rhodhiss Road to I-40 via SR 1768 (Gurleys Fish Camp Road). The existing design of SR 1768 creates some difficulty for the travel along this corridor. On the north end, together with SR 1627, this road forms a dog-legged intersection at US 70 creating a problem

for the left turn movement. On the south end, SR 1768 connects directly to the northwest ramp of I-40, which would create an unsafe connection that is not recommended by the American Association of State Highway Transportation Officials (AASHTO). The proposed SR 1627 extension will eliminate both of these situations. The recommended cross-section for the extension is two lanes. No improvement is recommended for SR 1627.

### **Woodlawn Drive (SR 1602 and portion Town Street)**

Malcolm Boulevard is the main north-south route through the Town of Rutherford College and the eastern part of the planning area. In order to maintain the only entrance to Valdese General Hospital (on Malcolm Boulevard) in the event of an emergency, it is impossible to shut down Malcolm Boulevard for public events. For safety reasons, it is recommended to improve the horizontal alignment of Woodlawn Drive. The extension of Woodlawn Drive will alleviate some congestion on Malcolm Boulevard.

Rutherford College desires to extend Woodlawn Drive from its northern terminus to its intersection with the proposed new location section of Lovelady Road (SR 1546, and previous STIP Project R-2824). The extension of Woodlawn Drive will provide an alternate north-south facility to Malcolm Boulevard.

## **Caldwell County**

### **Collettsville Road (NC 90)**

TIP Projects R-4061 and R-2622 provide needed improvements to roadway width, geometry and pavement. R-4061 includes NC 90 between Valway Road and John's River Road. R-2622 paves the unpaved section of NC 90 between Bridge #10 and SR 1420 (Edgemont Road).

### **Connelly Springs Road (SR 1001)**

The improved section of Connelly Springs Road from Southwest Boulevard to US 321-A is now open to traffic and has changed traffic patterns in the vicinity. STIP Project U-2211 is a continuation of Connelly Springs Road as a 5-lane facility from US 321-A (Main Street) to Hibriten Drive (SR 1178) with a new interchange at US 321 (Hickory Boulevard) is now under construction. The section of Connelly Springs Road from Southwest Boulevard (SR 1933) to the Catawba River is currently a 2-lane facility. The entire section of Connelly Springs Road between Southwest Boulevard and the Catawba River will exceed its present capacity in the horizon year. It is recommended that this section be widened to 4-lane median divided facility. Previous STIP Project R-3430 addresses these improvements.

### **Crump Road Realignment (SR 1929)**

The Crump Road realignment is part of a series of recommendations to improve the connectivity between US 64/NC 18 to US 321 as well as the towns of Granite Falls, Cahah's Mountain and Hudson. The realignment is recommended on the section of road between west of Clarks Chapel Road and Orchard Drive and is proposed as a 2-lane facility.

### **Dry Ponds Road (SR 1115) to Pinewood Road (SR 1109) Connector**

It is recommended that a 2-lane major thoroughfare be constructed connecting Dry Ponds Road with Pinewood Road. This connection would provide for better connectivity between US 321-A and US 321 and would also work in conjunction with the Pinewood Road Extension on the east side of Hickory Boulevard.

### **Duke Street (SR 1106) to US 321-A Connector**

It is recommended that a 2-lane minor thoroughfare be constructed connecting Duke Street with Main Street (US 321-A). This connector would serve development along Duke Street as well as the Town of Rhodhiss providing better access to US 321-A and US 321.

### **Falls Avenue (SR 1107)**

The section of Falls Avenue between Main Street (US 321-A) and Hickory Boulevard (US 321) is a 2-lane facility 34 feet in width. It is recommended that this section of Falls Avenue be widened to a 3-lane facility 33-36 feet in width to meet future demands. This recommendation will accommodate the left turning traffic accessing the many commercial and residential driveways along this section of road and help to better handle the projected traffic. Previous STIP Project R-2619 calls for this section of Falls Avenue to be widened to multi-lanes and for modifications to the interchange at US 321 (Hickory Blvd). The US-321 Feasibility Study FS #9911C also calls for modifications to this interchange.

### **Grace Chapel Road (SR 1751)**

Grace Chapel Road is a 2-lane major thoroughfare 20-22 feet in width. Previous STIP Project R-3614 calls for improving the two existing lanes of Grace Chapel Road from Hickory Boulevard (US 321) to a point east of SR 1870 (Musket Drive) and to reserve an additional two lanes of right-of-way for a future multi-lane project. An additional route should be constructed on new location and to connect with NC 127 in Catawba County requiring a new bridge over the Catawba River.

### **Grace Chapel Road (SR 1751) to NC 127 in Alexander County Connector**

Previous STIP Project R-2918. Connector linking Grace Chapel Road (SR 1751) in Caldwell County to NC 127 in Alexander County with some new location and using Icard Dam Road and Hubbard Road.

### **Harper Avenue**

The section of road between Hickory Boulevard (US 321) and Morganton Blvd (US 64/NC 18) is a 6-lane section 64 feet in width. This short section of road facilitates turning moves both north and south onto US 321, south onto Morganton Blvd as well as into two commercial driveways. The road serves though movements east onto Wilkesboro Blvd and west on Harper Ave into the Lenoir Central Business District. It is recommended to improve the three-lane section from US64/NC 18 to Norwood Avenue.

### **Hospital Avenue to Pennell Street Connector**

It is recommended that a 2-lane minor thoroughfare be constructed connecting Hospital Avenue with Pennell Street. This connector would remove the offset intersection with Seehorn Street. It would also provide better connectivity from Powell Road to Blowing Rock Boulevard (US 321) and access to the Caldwell County Public Library. Access onto US 321 at this location will be more critical in the future considering the plans to build an interchange at US 64 and US 321. The interchange will require full control of access along US 321 from Smith's Crossroads north to the driveway with Kmart.

### **Lower Creek Drive Realignment**

It is recommended that Lower Creek Drive be realigned from Eastover Circle to Wilkesboro Boulevard and aligned with the new signalized intersection at Hibriten Drive. This realignment will remove the offset intersection with Hibriten Drive and provide for a much safer movement for accessing both

Wilkesboro Boulevard and Hibriten Drive and will also increase the traffic carrying capacity of Wilkesboro Boulevard between Lower Creek Drive and Hibriten Drive.

#### **Main Street (US 321-A) Granite Falls**

The section of Main Street (US 321-A) through Granite Falls is a 2-lane facility varying from 20 to 50 feet in width. Main Street runs parallel to US-321 and tends to have more local traffic than through traffic. During peak times of the day Main Street experiences congestion as traffic from both directions needs to turn left to access the commercial developments. Previous STIP Project U-2543 recommends that Main Street be widened to a 3-lane facility with a left turn lane between Falls Avenue (SR 1107) and Hardwood Drive.

#### **Main Street (US 321-A) Sawmills**

The section of Main Street (US 321-A) from Hardwood Drive to the Little Gunpowder Creek is a 2-lane facility 24 feet in width. For the same reasons as outlined for Granite Falls, it is recommended that this section of Main Street also be widened to a three-lane facility. TIP Project U-2543 calls for this section of US 321-A to be widened to multi-lanes.

#### **Main Street (US 321-A) Hudson**

The section of Main Street (US 321-A) in Hudson is both a 2- and 3-lane facility varying between 22 and 39 feet in width. For the same reasons outlined above, it is recommended that this section of Main Street also be widened to a 3-lane facility. Previous STIP Project U-2543 calls for this section of US 321-A to be widened to multi-lanes.

#### **McLean Drive (US 321-A)**

The section of McLean Drive between Norwood Street and Hickory Boulevard (US 321) is a 2-lane facility 20 feet wide. Due to the new McLean Drive extension, the projected traffic volumes and commercial and residential driveways, it is recommended that McLean Drive be widened to a 3-lane facility. Reconfiguration of intersection of McLean Drive and Norwood Street to create “T” intersection. Norwood Street from Swanson Road to McLean Drive is a 2-lane facility 22 feet wide. For the same reasons mentioned above, it is recommended that this section of Norwood Street be improved. Previous STIP Project U-2543 calls for this section of Norwood Street to be upgraded.

#### **Morganton Road (US 64/NC 18)**

Morganton Road is both a 5-lane and 2-lane facility between the Burke County line and Beacher Anderson Road. The section of road between the Burke County line and Sunset Trail is currently a 2-lane facility 24 feet in width. It is recommended that this section of Morganton Road be widened to five lanes. US 64/ NC 18 the main artery between Morganton and Lenoir. North of Lenoir, NC 18 extends to North Wilkesboro. South of Morganton, US 64 extends to the Rutherfordton area. TIP Project R-2549 calls for US 64/NC 18 to be widened to multi-lanes from north of Morganton to the existing 5-lane section in Gamewell.

#### **Myers Road (SR 1754) Extension**

It is recommended that a 2-lane major thoroughfare be constructed connecting Myers Road with Hickory Boulevard. This recommendation is a part of an overall recommendation to provide better connectivity around Granite Falls east of US 321. This connector would serve the development occurring in

southeast Caldwell County and relieve southbound traffic congestion at the Falls Ave/US 321 interchange.

#### **Orchard Drive (SR 1146) to Pleasant Hill Road (SR 1159) Connector**

The Orchard Drive connector is one of a series of recommendations which will improve the connectivity of US 64/NC 18 and US 321 as well as the towns of Granite Falls, Cahah's Mountain and Hudson. The connector would link Orchard Drive at Connelly Springs Road to Pleasant Hill Road and is proposed as a 2-lane facility.

#### **Pine Mountain Road (SR 1952/1809) Realignment**

The Pine Mountain Road realignment with US 321 is recommended to improve the overall road geometry and safety. The realigned section is proposed as a 2-lane facility. The road would realign Pine Mountain Road west of Meadowood Street to US 321.

#### **Pinewood Road (SR 1109) Extension**

It is recommended that a 2-lane major thoroughfare be constructed connecting Pinewood Road at Dudley Shoals Road with Wyke Road. This recommendation is a part of an overall recommendation to provide a northern connector for Granite Falls.

#### **Rocky Road (SR 1143) to Crump Road (SR 1929) Connector**

The Rocky Road Connector is one of a series of recommendations which will improve the connectivity of US 64/NC 18 and US 321 as well as the towns of Granite Falls, Cahah's Mountain and Hudson. The connector would link Rocky Road at Miller Hill Road to Crump Road and is proposed as a 2-lane facility.

#### **Southwest Boulevard (SR 1933) Continuation to NC 18**

It is recommended that a 2-lane major thoroughfare be constructed connecting Southwest Boulevard with NC 18. This connection would be a route around the eastern side of Lenoir. This route would provide connectivity between Hickory Boulevard (US 321) and Wilkesboro Boulevard. The topography on the eastern side of Lenoir is mountainous and any new roads would carry a steep grade. The grade of a road dictates both its speed and facility type. For this reason, a new road in this vicinity should not be designed as a high-speed facility or one similar to the standards of the current Southwest Boulevard (SR 1933).

#### **Southeast Boulevard (US321/US64/NC18 Connector)**

It is recommended that a 4-lane divided facility be constructed connecting US 321 with US64/NC18. This connector would work in conjunction with existing roads to provide a continuous route between US 64/NC 18 and US 321.

#### **Spruce Street Extension**

It is recommended that a 2-lane minor thoroughfare be constructed to extend Spruce Street at Pennton Avenue to Delwood Drive at Harrisburg Drive. The extension would serve as a north-south radial route and would help alleviate traffic on Norwood Street (US 321-A) which will reach its capacity to handle traffic in the design year.

## **Catawba County**

### **Burris Road and Extensions (SR 1746)**

This 2-lane road serves the industrial area in eastern Newton. Currently, this facility terminates at Travis Road (SR 1734). Extending this facility to Heart Drive (SR 1929) will provide a much-needed connector for traveling between Newton and the City of Claremont. This connection will especially benefit the local commuters by providing an efficient alternative for travel between the residential areas in Claremont and the industrial center in eastern Newton. Second, the facility will allow for future development in the area. A rural 2-lane road is recommended.

### **Catawba Street Extension (Claremont)**

Catawba Street currently terminates at Claremont Road. This 2-lane road should be extended to South Oxford Road. The proposed extension will provide a connector between Catawba Street and the industrial area in southern Claremont.

### **Catawba Valley Boulevard and Extension (Hickory-Newton)**

Catawba Valley Boulevard is located on the south side of the Valley Hills Mall extending from Robinson Road (SR 1146) to Startown Road (SR 1005). This 5-lane facility serves major commercial and residential developments and provides a connecting service between Startown Road and Robinson Road.

The proposed extension will connect Catawba Valley Boulevard to Twentieth Street in Newton and create a major east-west facility paralleling US 70. Due to the anticipated high growth on US 70, future travel demands are expected to increase exponentially causing major congestion problems along this facility. The proposed road will also create an efficient route to link Hickory and Newton. A 4-lane divided boulevard with a grass median is recommended west of Fairgrove Church Road. East of Fairgrove Church Road, a 2-lane rural cross-section is recommended.

\* In the previous plan (Greater Hickory Urban Area Transportation Plan – Technical Update #2) the alignment of Catawba Valley Blvd Ext. was located further north and went through the CVCC Campus.

### **Center Street (Hickory)**

This 2-lane minor thoroughfare is located in downtown Hickory and extends from US 70 to Eighth Avenue NW. This facility serves the adjacent residential communities and provides service for north-south crosstown travel. Currently, travel on this facility is moderate. By the horizon year, the traffic volumes on the section between the Second/Third Avenue NE and First/Second Avenue SE one-way pairs are expected to increase beyond the practical capacity limit of this road. To accommodate the future traffic, it is recommended that this section be widened to three lanes.

### **Claremont Loop**

This loop will reduce the future travel pressure from downtown Claremont by diverting through traffic from this area. This 2-lane loop system is comprised of two existing and three new roads. The existing Centennial Boulevard and its recently completed extension to US 70 make up the north and northeast part of the Loop. The other existing route is Keisler Road (SR 1731), which forms the southern part of the Loop.

The extension of Keisler Road to the east and north connecting to US 70 will cross both Claremont Road and Catawba Street to create the southeast part of the Loop. The southwest part of the Loop consists of Heart Drive (SR 1929) and the northern segment of the proposed Burris Road Extension.



Finally, the extension of Centennial Boulevard to the west and south connecting to Heart Drive at US 70 will make up the northwest part of the Loop.

### **Clement Boulevard Extension and SR 1653 Widening**

Clement Boulevard Extension, in conjunction with the widening of SR 1653 (Airport-Rhodhiss Road), forms a major east-west facility providing service for commuter traffic in the northwestern part of the planning area. It also provides safe and efficient access to the Hickory Regional Airport. The majority of traffic on this facility is traveling to the employment centers in Long View and Hickory. With the high projected growth in commercial and industrial growth in eastern Burke County, especially around the airport area, this facility will also provide important access to these areas.

Clement Boulevard should be extended westward to SR 1653 at a location approximately 2,000 feet north of the SR 1653 and SR 1625 (9<sup>th</sup> Ave Dr NW) intersection. A 4-lane divided boulevard with a grass median is recommended. It is also recommended that SR 1653 be widened west of the proposed extension to accommodate future travel growth. The Clement Boulevard Extension is a part of the TIP Project R-2920.

### **Cloninger Mill Road-Kool Park Road (SR 1400) and Section House Road (SR 1491)**

This facility provides a major travel service for the traffic in the northeastern part of the planning area extending from NC 127 in northern Hickory to US 70-A in Conover. The northern section of Section House Road should be realigned to improve the offset intersection at Springs Road. This facility will provide an efficient route for traveling between northern Hickory and I-40 by bypassing Conover's CBD via the proposed Newton-Conover North Loop and US 70-A. Second, via the proposed Conover-Startown Road Extension and the Newton-Conover Loop, this facility will also serve as a valuable link commuters between the residential area in northern Hickory and the major industrial centers in Conover and Newton.

Although no traffic problems currently exist, the future traffic volume is expected to more than double. To accommodate the projected traffic, it is recommended that this facility be widened to a 4-lane divided boulevard with a grass median.

\* In the previous plan (Greater Hickory Urban Area Transportation Plan – Technical Update #2) the alignment of Section House Road was located slightly further west.

### **Conover-Startown Road (SR 1149) and Extension**

Currently, this 2-lane facility serves western Newton by providing a connection between Startown Road and US 70. The proposed extension to Section House Road will facilitate the travel between the anticipated residential growth in western Newton and the Conover West Industrial Park off of US 70 as well as other industrial centers off of US 70-A in Conover. In addition, the combination of this facility with the Section House Road-Kool Park Road-Cloninger Mill Road will form a major north-south corridor serving the entire central part of the planning area. A multi-lane cross-section is recommended.

### **County Home Road and Extension**

The northern section of County Home Road and its extension to Section House Road will link the proposed Fairgrove Church Road Extension to Springs Road. This road will provide a connection between NC 16 and the central part of the planning area. It will also provide an efficient route for residents in the northern planning area to access the employment center in west Conover and the commercial area along Fairgrove Church Road. The recommended cross-section for the proposed

extension is two lanes. A left turn lane at the intersection of County Home Road and Springs Road is also recommended.

### **Eighth Avenue (Maiden)**

With a connection north to Old Mill Road, Eighth Avenue provides a continuous north/south crosstown route.

### **8<sup>th</sup> Avenue NW and Extension (Long View)**

This 2-lane thoroughfare extends from First Avenue NW to Eighth Avenue NW in northern Long View. This current facility serves the housing development along the corridor and provides a connector service from Long View to US 321 and the Hickory Regional Airport via Clement Boulevard. 8<sup>th</sup> Avenue NW and its extension are a part of a project called the Northwest Loop (Previous STIP U-2528), a series of widening to multi-lanes and new location improvements that extend from I-40 in southern Long View to Clement Boulevard.

### **Emmanuel Church Road (SR 1732) and Extensions**

This major thoroughfare provides service between NC 10 and the major industrial center in eastern Newton and Conover. Traffic problems are currently being experienced in the vicinity of the Emmanuel Church Road, McLin Creek Road and SR 1739 (Emmanuel Church Rd) juncture. High anticipated growth in the area will further deteriorate the traffic condition on Emmanuel Church Road.

Several improvements are recommended for this facility. Emmanuel Church Road should be extended westward to connect to the proposed Newton-Conover East Loop. Second, the geometry at the Emmanuel Church Road, McLin Creek Road and SR 1739 intersection should be modified by realigning SR 1739 to connect to McLin Creek Road. Finally, the section of Emmanuel Church Road between this intersection and NC 10 should be widened to multi-lanes. These improvements will maximize the efficiency of this facility, allowing it to serve future traffic at a more acceptable level. A 2-lane extension to the south connecting Emmanuel Church Road to SR 1804 (Bethnay Church Rd) is also recommended. This extension will create a continuous north-south facility serving the area east of Newton and Conover.

### **Fairgrove Church Road and Extensions**

Functioning as a major north-south facility, this project (Previous STIP U-2529) will provide a major service between the southeast and the northwest sections of the planning area. As part of the loop system around Newton and Conover, Fairgrove Church Road and its extensions will provide a safe and efficient route for through and truck trips to reach other major routes in the planning area. Currently, traffic must zigzag through a number of discontinuous routes in the Newton area to reach these destinations. The southern extension of the project also will play an important role in the future growth of the City of Newton. This improvement will open up landlocked properties on the west of the city. This facility is expected to carry a mixture of travel, mainly internal and external-internal trips.

It is recommended that Fairgrove Church Road be extended northward to Section House Road and southward to NC 10 in Newton. The extensions are recommended to have a 4-lane divided boulevard with a grass median. The existing 3-lane section of Fairgrove Church Road should be widened to multi-lanes.

### **First Street in Conover (SR 1007)**

This major thoroughfare serves crosstown travel in the City of Conover. It connects the industrial area off US 70-A to downtown Conover. The existing cross-section of this facility varies from two to three lanes on the section north of NC 16 to four lanes in the downtown area. Traffic congestion currently occurs on this road during peak hours. Recommended improvements like the Newton-Conover Loop and Conover-Startown Extension will provide some relief for First Street in the future; however, traffic on this facility will remain high. It is recommended that First Street be widened to multi-lanes. It is also recommended that the five-point intersection in downtown Conover be modified by connecting Second Avenue NE to NC 16 at a location north of the intersection. This improvement will simplify the turning movements at this intersection hence improving the traffic flow on both First Street and NC 16.

### **First Avenue SW (Hickory & Long View)**

This east-west major thoroughfare parallels US 70 on the north. It serves the travel between Hickory, Long View and Hildebran. In Hickory, this facility becomes the northern leg of the First-Second Avenue SW one-way pair. Currently, no traffic problems are experienced on this facility. In the future, traffic on the section between the one-way pair and US 70 is expected to exceed the road's capacity. It is recommended that this section of First Avenue SW be widened to three lanes. No improvement is recommended for the one-way section.

### **Fourth Avenue Drive NW - County Home Road (SR 1484) - Rifle Range Road (SR 1846)**

Rifle Range Road currently terminates at County Home Road. It is recommended that the southern half of County Home Road be realigned to connect to Rifle Range Road. This linkage will create a major north-south facility serving the travel flow from Springs Road to downtown Conover.

### **Fourth Street SW, NW and Extension**

This north-south facility is located in the Hickory CBD and extends from NC 127 to US 70. This facility links crosstown travel between northern residential suburbs and the commercial areas along US 70 and southern suburb to the commercial developments along NC 127 in northern Hickory. In addition, this facility also serves a mixture of development ranging from residential on the northern section to government offices and commercial businesses in the downtown and southern Hickory. The existing cross-section of this facility varies from two to four lanes.

Although present travel conditions are generally good, the projected future traffic is expected to result in deteriorating travel conditions. To avert this problem, the section of Fourth Street between First Avenue NW and US 70 should be widened to five lanes. On the section north of First Avenue NW, adding a left turn lane at the major intersections is recommended.

Note: The City of Hickory prefers a 4-lane divided boulevard cross-section due to existing land-use constraints. If the City's preference is to be constructed, a special cross-section with a narrower lane and median will need to be designed.

### **Frazier Drive and Extension (Claremont)**

Frazier Drive is located in south section of the Claremont downtown area extends from Claremont Road to South Oxford Road. Currently, this 2-lane facility provides connecting service between Claremont Road and the industrial area off South Oxford Road. The proposed Frazier Drive Extension is recommended to straighten the sharp curve on the western end of the road and extend service to the industrial area off Penny Road. A 2-lane cross-section is recommended for the extension.

### **Grace Chapel Road (SR 1751)**

This 2-lane thoroughfare presently serves southern Caldwell County and stretches from the northern boundary of the Hickory-Newton-Conover planning area to US 321. As rapid residential, industrial, and commercial growth continues in southern Caldwell County, especially in the area east of US 321, future travel pressure will greatly increase for Grace Chapel Road, which is the only major route in the area. As part of the NC 127 and US 321 Connector improvement, the southern section of Grace Chapel Road (south of the extension) will be widened to a 4-lane divided boulevard with a grass median. This improvement will be enough to accommodate traffic through the design year.

Projected traffic on the northern section of Grace Chapel Road is generally within its practical capacity limit except for a short section between SR 1757 (Sunset Beach Road) and Icard Ferry Road Extension. Widening this section to three lanes is necessary. The existing right-of-way should be sufficient to handle this improvement.

### **Icard Ferry Road Extension and Grace Chapel Road Widening (NC 127 and US 321 Connector)**

A new route from US 321 to NC 127, 2 lanes on a 4-lane right-of-way with some new location from 29<sup>th</sup> Ave. Dr. NW in Hickory to Grace Chapel Road in Caldwell County is part of this loop. This connector is located in the northern fringe of the planning area. The combination of this connector and SR 1143 (Sandy Ford Rd) will be a major east-west thoroughfare in Caldwell and Catawba counties. It was previously listed as U-3614 but is no longer in the STIP. This facility will mainly serve the anticipated residential developments in the northern periphery of Lake Hickory, connecting them to Granite Falls and US 321 on the west and NC 127 in northern Hickory on the east. A cross-section of 2 lanes is recommended for the SR 1757 (Hurricane Hill Rd) -SR 1756 (Icard Dam Rd) connector. It includes a bridge over the Catawba River.

With its lakefront and good access to the employment centers in both Hickory and Caldwell County, southern Caldwell County has become extremely popular for new housing developments. This trend is expected to continue as the City of Hickory extends water and sewer service to the area. Similar housing growth is also expected in northern Hickory, east of Lake Hickory. The proposed Icard Ferry Road Extension will satisfy demand of both lakefront communities by providing an efficient travel between Hickory and Caldwell County.

### **Keisler Road and Extension (Newton)**

This 2-lane facility is located in the industrial area in eastern Newton. Currently, it is a dead-end road serving the industrial sites along its corridor. The proposed extension of this facility will create a continuous east-west facility connecting Keisler Road to US 70 on the west and SR 1731 (Keisler Dairy Road) on the east. This facility will provide a connecting service for the travel between the industrial area and other major thoroughfares such as Emmanuel Church Road, NC 10 and US 70. It will also open up land in eastern Newton for development. A 2-lane cross-section is recommended for the extension.

### **Kelly Road and Extension**

Kelly Road extends from Heart Drive to Claremont Road (SR 1722) in southern Claremont. This 2-lane facility serves the industrial/manufacturing developments along the corridor and provides a connector for travel in southern Claremont. The proposed Kelly Road Extension will extend from Claremont Road to the proposed Claremont East Loop. The combination of Kelly Road and its extension will form a continuous east-west facility in southern Claremont serving the existing and future

industrial/manufacturing development in the area. In addition, this facility will provide connecting service for travel between the proposed East and West Claremont Loop.

### **Lap Road (SR 1760)**

Improve and extend Lap Road from Rock Barn Road to NC 16. Lap Road already provides access to industrial property near I-40 and with the extension from Rock Barn Road to NC 16 can create a parallel access road with I-40 that can serve additional commercial property and create a connector that can remove traffic from I-40.

### **Lenoir-Rhyne Boulevard (SR 1534/SR 2205)**

This major thoroughfare provides a major connection service between northern Hickory and the regional commercial center along the I-40/US 70 corridor. It connects to Eighth Street NE on the north end and the south end terminates at US 70. Lenoir-Rhyne Boulevard has a 5-lane cross-section between Tate Boulevard and US 70. North of Tate Boulevard, the road has recently been widened to 4-lanes. This section is currently being widened to five lanes as a part of TIP Project U-2306. Development along this corridor is mostly commercial and considerable congestion currently occurs during peak hours, especially at the southern end. The proposed McDonald Parkway will take some travel pressure off Lenoir-Rhyne Boulevard by providing an additional connection to I-40 and US 70. With strong commercial development projected along this corridor and a continuation of high demand in travel between northern Hickory and the I-40/US 70 corridor, traffic on Lenoir-Rhyne Boulevard is expected to gradually build up to capacity.

Although widening would be the best solution to improve the level of service on this road, However, it does not appear to be a viable option considering the high cost to purchase additional right-of-way and the detrimental impact to the commercial developments along the corridor. Adequate space is available to add a loop to the northeast quadrant of the I-40 interchange. This addition will improve northbound travel, thus eliminating the need for a protected left turn phase at the northern exit ramp traffic signal. The "saved" green time can be added to the through movement on Lenoir-Rhyne Boulevard, increasing the service capability of the facility. Other improvements such as signal coordination, adding acceleration and deceleration lanes where right-of-way is available and other traffic control measures should be implemented.

### **Maiden Loop System**

#### Southern Loop

This facility would connect Salem Church Road at South Main Avenue to South Island Ford Road. This connection is intended to provide an additional east-west crosstown route to help relieve congestion on East Main Street. The recommended cross-section is two lanes.

#### West Loop

This facility provides a connection from US 321 to Salem Church Road. The recommended cross-section is two lanes.

#### East Loop

This facility would connect Water Plant Road to Old Park Road via extensions of Williams Street and H. E. Propst Road to provide a continuous route on the east side of Maiden. The recommended cross-section is two lanes.

### **McDonald Parkway (also known as Eastside Thoroughfare)**

The combination of this recommended major thoroughfare and the proposed NC127 & US 321 Connector and Grace Chapel Road will provide a valuable loop system that serves the northern and western sectors of the City of Hickory. McDonald Parkway comprises 29<sup>th</sup> Avenue NE and 29<sup>th</sup> Avenue Drive NE from NC 127 to Springs Road. From this point, the facility extends southward on a new route which crosses the proposed Northern Crosstown, Highland Avenue, Sweetwater Road and I-40 before connecting to Startown Road at US 70. The City of Hickory prefers a 4-lane divided boulevard cross-section. If the City's preference is to be constructed, a special cross-section with a narrower lane and median will need to be designed for the 29<sup>th</sup> Avenue NE, 29<sup>th</sup> Avenue Drive NE portion (NC 127 to Springs Road).

In addition to relieving the traffic from the downtown Hickory, this facility will also improve home-to-work travel between the major residential area in northern Hickory and the industrial area around Highland Avenue/Tate Boulevard and the commercial area along US 70.

### **McKay Road (SR 2014) and Extension (Newton)**

This minor thoroughfare links SR 2013 (Sigmon Dairy Rd) to US 321 in the southern fringe of the planning area. The extension of this facility will connect to Smyre Farm Road (SR 1884) to create a major east-west facility serving the residential communities in southern Newton. A cross-section of two lanes is recommended for the extension.

### **NC 10**

NC 10 is a major radial that serves the southern part of the planning area. Development along the corridor is sparse except for the section through downtown Newton where it serves a mixture of residential and commercial businesses.

The downtown Newton section has been experiencing extreme pressure created by a few factors. First, as a merged facility (NC 16 merges onto NC 10 at this section), traffic volume on this section has been heavy. The second factor is the high number of trucks that use the facility. Coupling with the poor design of the facility itself, these factors have made travel through this section of NC 10 very dangerous, especially during peak hours.

Except for the section east of NC 16, travel pressure on the rest of NC 10 is expected to increase dramatically due to high growth rate along NC 10 corridor. The completed US 321 freeway south of US 70 has relieved some pressure on NC 16, especially truck trips, which also improved the section of NC 10 through Newton. The proposed Newton-Conover Loop will further reduce the travel demand on this section by diverting trips away from NC 10 and NC 16. It is recommended that the section of NC 10 between NC 16 and US 321 Business maintain its current configuration due to impact widening would have on the existing community. On the section of NC 10 between US 321 Business and the US 321 freeway, traffic volumes are expected to exceed capacity for a 2-lane road. Widening to a cross-section of a 4-lane divided boulevard with a grass median is recommended for this section.

### **Newton-Conover Loop System**

This recommended loop system encircles the entire Newton and Conover urban area. It facilitates travel between suburban areas by connecting the radials before they converge to both cities' Central Business Districts. Through and regional travel will certainly benefit by being able to circumvent the busy downtown areas. Most of the proposed construction of the Newton-Conover Loop System will be on new route; however, some existing local streets will also be incorporated. The recommended cross-section for the Loop is a 4-lane divided boulevard with a grass median. For the benefit of discussion, the Loop has been divided into four parts: North, East, South and West.

### Northern Portion

This part of the Loop extends from Twelfth Avenue Drive NE (SR 1441) to NC 16 in Conover to serve the northern part of the City of Conover. The North Loop is a part of the TIP Project U-2531. A portion of this loop is also a part of the North Crosstown Loop.

### Eastern Portion

This part of the Loop serves the eastern part of the Newton-Conover urban area from NC 16 South in Newton to NC 16 North in Conover. This facility will remove a considerable amount of through and truck traffic from the downtowns of both Newton and Conover, which will reduce the travel demand on the road system in these areas. The Loop is particularly important to the City of Newton because it opens up the landlocked properties on the eastern part of the City for new development. It also provides the only major entrance to the City from I-40. This portion has been completed.

### Southern Portion

This part of the Loop is included in TIP Project U-3450 and extends from NC 16 South to NC 10 in southern Newton. It comprises two new location sections and two existing sections of East "P" Street and East "P" Street Extension between NC 16 and Saint James Church Road. The Newton-Conover South Loop serves traffic that enters the Newton-Conover area from the south, connecting them to the East and West Loop. This facility also provides access service for the projected developments in southern Newton especially the industrial area between US 321 and Saint James Church Road. The Newton-Conover South Loop is programmed as TIP Project U-3450.

### Western Portion

This part of the Loop extends from NC 10 in Newton to the proposed Newton-Conover North Loop. It consists of three sections: 1) NC 10 in Newton to Fairgrove Church Road; 2) Fairgrove Church Road itself; and 3) the extension from Fairgrove Church Road to the North Loop. This project is the main part of the TIP Project U-2529.

### **Ninth Street SW (Hickory)**

This 2-lane minor thoroughfare extends from US 70 to the Second/Third Avenue NW one-way pair in downtown Hickory. It provides service for the north-south crosstown traffic as well as serving the residential communities along the corridor. It is recommended that Ninth Street SW be widened to three lanes.

### **North Crosstown Loop**

Currently, Highland Avenue is the only major continuous east-west thoroughfare serving the northern Hickory-Newton-Conover planning area. The rapid growth in housing and employment and the high demand for inter-city travel between Hickory, Newton and Conover will cause a dramatic deterioration in travel service on this corridor. The Northern Crosstown is proposed to provide travel relief for Highland Avenue and to open up the land in the northern planning area for new development.

The eastern extension from Twelfth Avenue Drive NE is also the northern part of the proposed Newton-Conover Loop. The linkage of Northern Corridor, the Newton-Conover Loop, the proposed Southern Corridor and 33<sup>rd</sup> Street in Long View will form a loop for the entire planning area. This system will provide a safe and efficient alternative route to serve suburban travel as well as the inter-city travel.

The recommended Northern Crosstown consists of three parts. The first part is the widening of Twelfth Avenue Drive NE (SR 1441) to a 4-lane divided boulevard with a grass median. The other two parts consist of the extensions from Twelfth Avenue Drive NE. The east extension terminates at NC 16 in Conover and the west extension terminates at NC 127 in Hickory. The recommended cross-section for the extensions is also a 4-lane divided boulevard with a grass median. The Northern Crosstown is programmed as previous STIP project U-2531.

#### **Old Lenoir Road (SR 1314)**

This major thoroughfare functions as a radial providing service between US 321 and northern Hickory (via Twelfth Avenue NW), downtown Hickory and the industrial area in eastern Hickory. A realignment of Geitner Road (12<sup>th</sup> Avenue NW) at Old Lenoir Road to connect with the Clement Blvd Extension will aid congestion problems on Old Lenoir Road in this area.

#### **Oxford Street (SR 1715)**

This 2-lane facility extends from US 70 in downtown Claremont to Rock Barn Road. It functions as a north-south radial providing the only connection to I-40 from the Claremont area. By the design year, the travel on the southern section expected to more than double. To accommodate this traffic, it is recommended that this section of Oxford Street is widened to multi-lanes. No improvement is necessary for the section north of I-40.

#### **Robinson Road (SR 1146)**

This major thoroughfare functions as a north-south radial for the central section of the planning area. Except for a 5-lane section between Catawba Valley Boulevard and US 70, the existing cross-section on this facility is two lanes. Considerable growth in housing and commercial is expected in the area served by this corridor. The most critical section is located north of the proposed Southern Corridor. It is recommended that this section be widened to a 4-lane boulevard with a grass median.

#### **Robinson Road Extension**

This new 2-lane road extends southward from a location approximately 2000 feet north of NC 10. Paralleling Startown Road, this facility will connect back to the existing West Maiden Road at a location just west of the West Maiden/Startown Road intersection. This facility was proposed to provide continuity and to add capacity for the travel in the area. When complete, the Robinson Road Extension will provide the missing link for a continuous travel between the Catawba Boulevard/Valley Hills regional commercial center of Hickory and the Town of Maiden. The route will provide additional capacity to disburse the traffic that will be generated from the anticipated growth in the area east of US 321 freeway.

#### **Rock Barn Road (SR 1709)**

This major thoroughfare extends from First Street in Conover to Oxford School Road (SR 1006). It functions as a radial for the City of Conover providing service between the City and the northeast section of the planning area. The section south of I-40 is especially important to the City. It provides a vital link between the interstate and downtown as well as the industrial facilities in the south and eastern Conover. Traffic increase is highest in the southern section especially between the proposed Newton-Conover Loop and I-40. It is recommended that this segment of Rock Barn Road be widened to multi-lanes.



### **Rock Barn Road - Claremont West Loop Connector**

This proposed extension would provide a connector between Claremont and Conover. This proposed 2-lane facility will connect the northwest corner of the Loop to Rock Barn Road at a location between McLin Creek Road and the I-40 interchange.

### **Rocky Ford Road and US 321**

Construct new interchange at US Highway 321 and Rocky Ford Road to accommodate industrial traffic, especially from the Blackburn Landfill/Eco-Complex. Improvements to Rocky Ford Road which includes realignment of the road and a new bridge over the South Fork Catawba River.

### **Sandy Ford Road (SR 1143)**

As one of only two crossings over the Henry Fork River, this major thoroughfare provides a valuable service for the east-west travel in the southern part of the planning area. It links three major north-south thoroughfares: Startown Road, Robinson Road and SR 1008 (Zion Church Road). Currently, there is a grade-separation at Sandy Ford Road and the US 321 freeway. However, right-of-way for a future interchange has been preserved at the intersection of these roads. Growth in development along the corridor of Sandy Ford Road is expected to be medium to high due to the availability of public water and proximity to the US 321 Freeway. Although no traffic capacity problem is anticipated for this road, adding a left turn lane is recommended at the intersection with Robinson Road and Startown Road. This measure will improve safety and help the future traffic flow on Sandy Ford Road by preventing the potential traffic queue at these intersections.

### **Second Avenue NW and Extension (Hickory-Long View)**

This east-west major thoroughfare provides service for travel in the Hickory and Long View urban areas. On the west end, it terminates at SR 1653 and turns into the eastbound leg of the Second/Third Avenue one-way pair in downtown Hickory. The existing cross-section of Second Avenue NW ranges from two to four lanes. The 4-lane section extends from US 321 to 30<sup>th</sup> Street Place NW. Mixed development exists along this facility. Intense commercial and industrial development occupy the section west of downtown Hickory while a mixture of residential, commercial and office uses exist along the one-way pair section. In addition to serving these developments, Second Avenue NW provides a valuable service for travel in the northeast section of the planning area. It links eastern Burke County to Long View and downtown Hickory and connects these urban areas to Hickory Regional Airport just north of the facility.

Current travel on Second Avenue NW is moderate with the highest traffic volume on the section west of US 321. Travel pressure on this facility will increase greatly during the planning period due to high development growth anticipated for this area. To ease potential traffic problems, Second Avenue NW should be extended westward to Mount Harmony Church Road at SR 1627. This extension will serve new growth in eastern Burke County and provides a continuous east-west facility serving commuter traffic in the northeast part of the planning area. A multi-lane cross-section is recommended.

### **Second/Third Avenue NW one-way pair**

This one-way pair system is located in downtown Hickory and serves a mixture of development including businesses, offices, governmental institutions and housing. It also functions as a major crosstown facility between eastern Caldwell County, Burke County, Long View, downtown Hickory and eastern Hickory. Due to the lack of an efficient system serving east-west travel in northwest Hickory, especially traffic to and from US 321, the Second/Third Avenue NW one-way pair will continue to be used as a surrogate route. With the expected rapid growth in both housing and employment in northern Hickory and southern Caldwell County, the east-west travel in northwest is expected to increase.

The Second/Third Avenue NW one-way pair is expected to shoulder a large portion of this increased traffic. The future travel demand on this one-way pair will exceed the practical capacity of this system. Adding lanes is not feasible due to the detrimental impact on the housing communities and businesses and the high cost to purchase right-of-way. Therefore, other remedies such as signal optimization, adding acceleration/deceleration lanes where right-of-way is available and other traffic control measures will help to ease the traffic congestion. Nonetheless, difficult travel conditions are expected in the design year unless there is another facility to share the travel burden with the Second/Third Avenue NW one-way pair.

### **Seventeenth Street SW (Hickory)**

This minor thoroughfare parallels US 321 extending from US 70 to Ninth Avenue and serves a mixture of residential and industrial development in western Hickory. As travel conditions on US 321 worsens, more traffic is expected to use this facility as an alternate route to reach US 70 and I-40. To accommodate the future volume, it is recommended that the section between Second Avenue SW and US 70 be widened to three lanes.

### **Sixteenth Street NE and Extension (Hickory)**

This 2-lane thoroughfare is located in northern Hickory. It terminates at Sandy Ridge Road on the north end and Springs Road on the south end. The combination of Sixteenth Street NE and Sandy Ridge Road forms a major north-south facility connecting northern Hickory to the industrial area off Highland Avenue in east Hickory. With high growth anticipated for northern Hickory, travel on Sixteenth Street NE is expected to deteriorate. To ease the potential traffic problem on this facility, Sixteen Street NE should be extended southward connecting to Tenth Avenue SE at Lenoir-Rhyne Boulevard (multi-lane cross-section). Sixteenth Street NE should also be widened to multi-lanes. These improvements will create a new north-south road system delivering trips from northern Hickory directly to the industrial area and the commercial area off Lenoir-Rhyne Boulevard.

### **Sixth Street Extension**

Extend Sixth Street from the existing location south of Catawba Valley Blvd to the Southern Corridor near the River Road Interchange of US 321.

\* In the previous plan (Greater Hickory Urban Area Transportation Plan – Technical Update #2) Sixth Street Ext. was not included. This project was added at the request of the City of Hickory.

### **South Main Avenue (Maiden)**

This facility will function as an important connection between Carolina Avenue and US 321. Widening this facility will provide traffic relief on Main Street. The recommended cross-section is four lanes with the connector to US 321 as a 2-lane facility.

### **South Oxford Road and Extension (Claremont)**

This minor thoroughfare extends from US 70 to Frazier Drive on the south side of downtown Claremont. Currently, this 2-lane facility's main function is to serve the industrial development along the corridor and to provide a connector to US 70. The proposed extension will connect South Oxford Road to SR 1731 (Keisler Dairy Rd) in southern Claremont. The addition of this extension will create a continuous north-south facility serving the future industrial and residential development in the area. A 2-lane cross-section is recommended for the extension.

### **Southern Corridor**

Currently, NC 10 is the only major thoroughfare that serves the southern part of Hickory and Newton. This 2-lane highway mostly provides for travel to and from the City of Newton. The Southern Corridor has been proposed to serve the area between the NC 10 and US 70/ I-40 corridors connecting four future growth areas in the region -- western Newton, River Road/US 321 interchange, Mountain View and southern Brookford. The link between this project, the Newton-Conover Loop, the Northern Crosstown and Hildebran-Shelby Road (SR 1206)/Costner Road (SR 1780) would form an east-west system in the planning area. This system will facilitate the suburban travel as well as the inter-city travel between Hickory, Newton, Conover, Long View and eastern Burke County.

The recommended Southern Corridor extends from the City of Newton (NC 16 Business) on the east to the Exit 119 in Burke County on the west. The corridor consists of the widening of Settlemyre Bridge Road (SR 1165), River Road at the US 321 South interchange, Bethel Church Road (SR 1176) and Hildebran-Shelby Road (SR 1206)/Costner Road (SR 1780). Between these roads are the new location segments. The recommended cross-section for this project is a 4-lane divided boulevard with a grass median. The Southern Corridor is needed to serve the future travel in the southern part of the planning area. The Southern Corridor is programmed as previous STIP Project U-2532.

\*In the previous plan (Greater Hickory Urban Area Transportation Plan – Technical Update #2) the Southern Corridor connected to Exit 121 and 33<sup>rd</sup> Street in Long View. The alignment in Mtn. View also was further north and went through the Waterford Subdivision and Olde School Subdivision.

Also the alignment has been adjusted slightly north at NC 127.

### **Springs Road (SR 1453)**

This major thoroughfare functions as a radial for the northeast part of the planning area. In addition to providing service between NC 16 and Hickory, this facility also serves the traffic generated from the strip commercial and housing developments along the corridor. Minor traffic problems are currently experienced on the 5-lane section. Traffic on this section will be maintained at the same level in the design year as a result of several key improvements, including McDonald Parkway and the Sixteenth Street NE Extension. On the other hand, traffic on the 2-lane section, extending from SR 1504 (Thomasville Rd) to NC 16 will increase to a level that is more than the capacity of the 2-lane road. Thus, it is recommended that this section of Springs Road be widened to a 4-lane divided boulevard with a grass median.

### **Startown Road (SR 1005)**

This major north-south thoroughfare serves travel in the southern part of the planning area. It provides a connection to the regional commercial center off US 70 and the developments along its corridor. Except for congestion on the northern end, no traffic problem currently exists on this facility. The link with the proposed McDonald Parkway, which connects to Startown Road at US 70, will create a north-south system providing service for travel between the southern part of planning area and the core industrial and business districts in eastern and northern Hickory. Traffic on Startown Road is expected to increase to a level that is well beyond the practical capacity of this 2-lane facility. It is recommended that the section of Startown Road between NC 10 to US 70 be widened to a 4-lane divided boulevard with a grass median.

### **SR 1318 and Extension (Hickory) (39<sup>th</sup> Avenue Drive)**

This 2-lane facility extends from Icard Ferry Road to NC 127 in northern Hickory. It serves the housing communities in the Lake Hickory area. The proposed extension will connect SR 1318 to NC 127 at

Cloninger Mill Road providing a link to southern Caldwell County via Icard Ferry Road Extension. A 2-lane cross-section is recommended for the extension.

#### **SR 1806 (Yount Road), SR 1807 and Extensions**

Both of these facilities terminate at Claremont Road in the eastern fringe of the planning area. They provide a connecting service between southern Catawba County and the planning area and the housing development along their corridors. The proposed extensions will connect these routes to the Emmanuel Church Road Extension, improving the service between southern Catawba County and the industrial development in eastern Newton. A cross-section of two lanes is recommended.

#### **SR 1810 (Providence Mill Road)**

Improvements at the Providence Mill Road (SR 1810), East Main Street Intersection (US 321-B).

#### **Sweetwater Road (SR 1468) and Extension**

This 2-lane facility extends from Highland Avenue to US 70. It functions as a radial, linking the US 70 corridor to the industrial area in eastern Hickory. Mixed development along this corridor ranges from industrial/manufacturing on the north end to residential on the south end. The recommended extension on the southern end will connect Sweetwater Road to SR 1148 at Startown Road. The combination of Sweetwater Road, its extension and SR 1148 will create a north-south facility between the southern section of the planning area and eastern Hickory. A cross-section of three lanes is recommended for the proposed extension.

#### **Tenth Street Place and Extension (Conover)**

Tenth Street Place is located in northern Conover and extends from NC 16 to County Home Road (SR 1484). The combination of this facility and its proposed extension to Fairgrove Church Road will create an east-west road serving the northern corridor of I-40. A cross-section of 2 lanes is recommended.

#### **Thirteenth Avenue Drive SE and Extension (Hickory)**

This 2-lane minor thoroughfare extends from Tenth Avenue Drive SE to Lenoir-Rhyne Boulevard. The proposed extension runs along the corridor sandwiched between I-40 and US 70 extending from Lenoir-Rhyne Boulevard to Fairgrove Church Road. The more important reason for this extension is to create a parallel facility that can share the future traffic burden with US 70. Travel on US 70 will continue to be increased due to a significant growth in commercial development along its corridor. A secondary benefit is to provide service for the land on the north side of the US 70 corridor. A cross-section of three lanes is recommended for the extension.

#### **33<sup>rd</sup> Street SW - Thirty Fourth Street NW (Long View) (Northwest Loop)**

Thirty-Third Street SW extends from I-40 to Main Street in Long View. At this location, it connects to 34<sup>th</sup> Street NW through a dog-leg intersection. Currently, there is no connection between 33<sup>rd</sup> Street SW and I-40. Both streets have a 2-lane cross section. This facility functions as a radial serving the travel between Long View and the southwest sector of the planning area.

Several improvements are recommended to improve the travel flow and expected future increase on this facility. The relatively new interchange with I-40 has improved traffic flow in this area. This addition provided a much-needed connection between the industrial center in northern Long View and I-40. The offset intersection at Main Street should be eliminated by realigning 33<sup>rd</sup> Street SW directly to 34<sup>th</sup> Street NW. This improvement will provide continuity for travel on these facilities as well as increasing the

safety for traffic turning at the intersection. Second, both 33<sup>rd</sup> and 34<sup>th</sup> Streets should be widened to 5 lanes to provide the needed capacity for future traffic. Thirty-Third Street SW and 34<sup>th</sup> Street NW are a part of a project called the Northwest Loop (U-2528), a series of widening and new location improvements that extend from I-40 in southern Long View to Clement Boulevard.

#### **Twelfth Avenue NW (Geitner Road) - Sixth Street NW - Sixteenth Avenue NW**

The combination of these three roads currently functions as a de-facto loop serving travel in northwest Hickory. In addition to serving the adjacent residential developments, this facility also creates a primary route between northern Hickory and US 321. The section of Twelfth Avenue NW has experienced some traffic problems during the peak hour. Travel pressure on this facility will increase to an acute level by the design year.

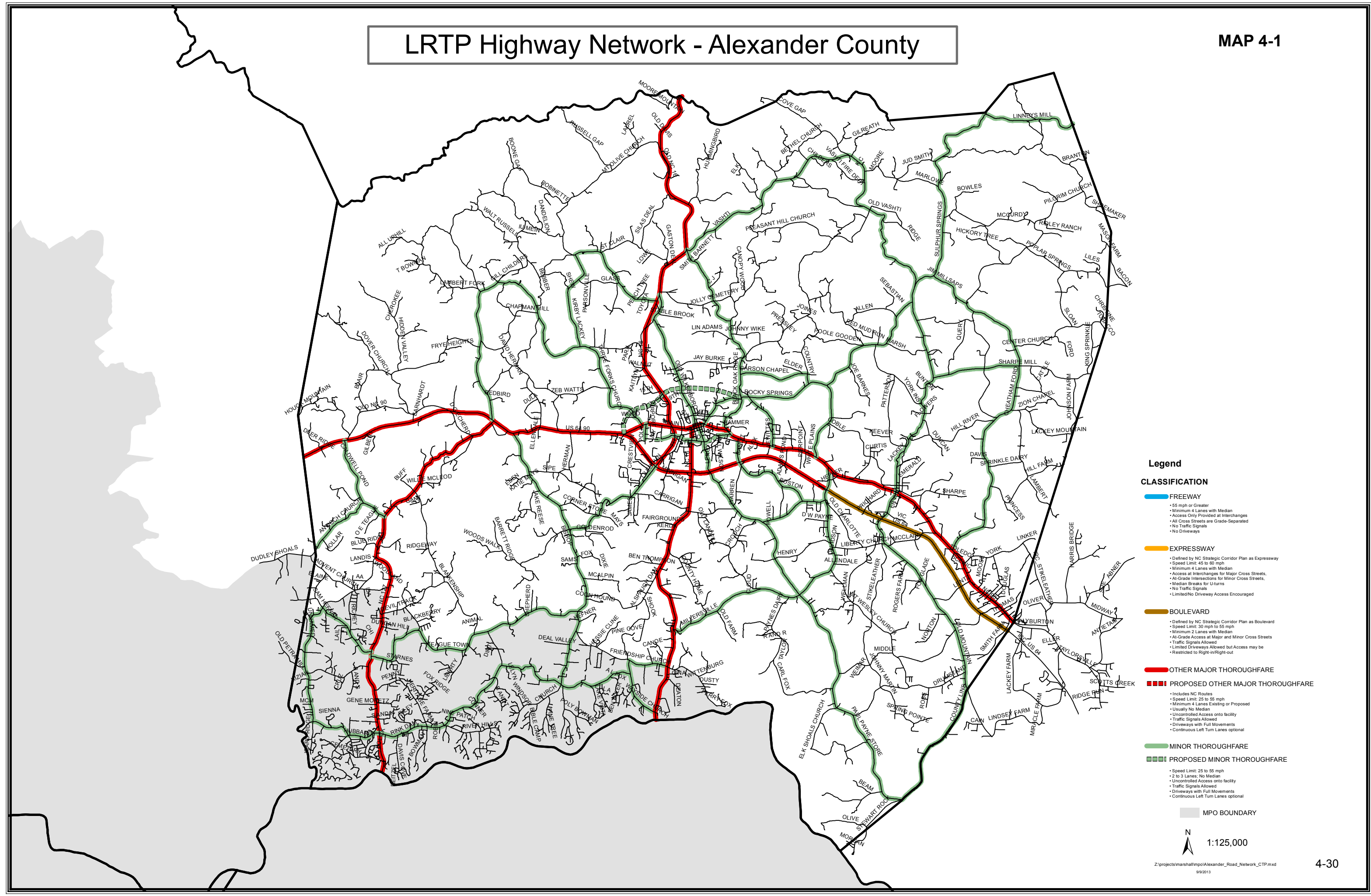
The combination of widening Twelfth Avenue NW and extending it to NC 127 is recommended to improve future travel in the area. It has been recommended in past plans but due to continued opposition of citizens who live in the affected area, it has not been included in this update. But it should be noted that without this improvement, traffic flow will continue to be difficult.

#### **West A Street and Extensions (Newton)**

This facility extends from Conover-Startown Road to Coulter Avenue in eastern Newton. It provides for crosstown travel in Newton and serves a mixture of development along the corridor. The proposed eastern extension will connect West A Street to NC 16. The western extension will connect the facility to Conover-Startown Road. The combination of West A Street and its extensions will create a continuous east-west facility serving the Newton area and connect the major thoroughfares in the area. It will also create opportunities for growth in western Newton area. A cross-section of 2 lanes is recommended for the extensions.

\* In the previous plan (Greater Hickory Urban Area Transportation Plan – Technical Update #2) West A Street Extension continued across Milton Street to Startown Road on the west side and connected with First Street Ext. on the east side.

# L RTP Highway Network - Alexander County



- Legend**
- CLASSIFICATION**
- **FREEWAY**
    - 55 mph or Greater
    - Minimum 4 Lanes with Median
    - Access Only Provided at Interchanges
    - All Cross Streets are Grade-Separated
    - No Traffic Signals
    - No Driveways
  - **EXPRESSWAY**
    - Defined by NC Strategic Corridor Plan as Expressway
    - Speed Limit: 45 to 60 mph
    - Minimum 4 Lanes with Median
    - Access at Interchanges for Major Cross Streets,
    - At-Grade Intersections for Minor Cross Streets,
    - Median Breaks for U-turns
    - No Traffic Signals
    - Limited/No Driveway Access Encouraged
  - **BOULEVARD**
    - Defined by NC Strategic Corridor Plan as Boulevard
    - Speed Limit: 30 mph to 55 mph
    - Minimum 2 Lanes with Median
    - At-Grade Access at Major and Minor Cross Streets
    - Traffic Signals Allowed
    - Limited Driveways Allowed but Access may be
    - Restricted to Right-in/Right-out
  - **OTHER MAJOR THOROUGHFARE**
  - **PROPOSED OTHER MAJOR THOROUGHFARE**
    - Includes NC Routes
    - Speed Limit: 25 to 55 mph
    - Minimum 4 Lanes Existing or Proposed
    - Usually No Median
    - Uncontrolled Access onto facility
    - Traffic Signals Allowed
    - Driveways with Full Movements
    - Continuous Left Turn Lanes optional
  - **MINOR THOROUGHFARE**
  - **PROPOSED MINOR THOROUGHFARE**
    - Speed Limit: 25 to 55 mph
    - 2 to 3 Lanes, No Median
    - Uncontrolled Access onto facility
    - Traffic Signals Allowed
    - Driveways with Full Movements
    - Continuous Left Turn Lanes optional

MPO BOUNDARY

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# L RTP Highway Network - Burke County

MAP 4-2

## Legend

### CLASSIFICATION

- **FREEWAY**
  - 55 mph or Greater
  - Minimum 4 Lanes with Median
  - Access Only Provided at Interchanges
  - All Cross Streets are Grade-Separated
  - No Traffic Signals
  - No Driveways
- **EXPRESSWAY**
  - Defined by NC Strategic Corridor Plan as Expressway
  - Speed Limit: 45 to 60 mph
  - Minimum 4 Lanes with Median
  - Access at Interchanges for Major Cross Streets.
  - At-Grade Intersections for Minor Cross Streets.
  - Median Breaks for U-turns
  - No Traffic Signals
  - Limited/No Driveway Access Encouraged
- **BOULEVARD**
  - Defined by NC Strategic Corridor Plan as Boulevard
  - Speed Limit: 30 mph to 55 mph
  - Minimum 2 Lanes with Median
  - At-Grade Access at Major and Minor Cross Streets
  - Traffic Signals Allowed
  - Limited Driveways Allowed but Access may be Restricted to Right-in/Right-out
- **OTHER MAJOR THOROUGHFARE**
  - Includes NC Routes
  - Speed Limit: 25 to 55 mph
  - Minimum 4 Lanes Existing or Proposed
  - Usually No Median
  - Uncontrolled Access onto facility
  - Traffic Signals Allowed
  - Driveways with Full Movements
  - Continuous Left Turn Lanes optional
- - - **PROPOSED OTHER MAJOR THOROUGHFARE**
  - Includes NC Routes
  - Speed Limit: 25 to 55 mph
  - Minimum 4 Lanes Existing or Proposed
  - Usually No Median
  - Uncontrolled Access onto facility
  - Traffic Signals Allowed
  - Driveways with Full Movements
  - Continuous Left Turn Lanes optional
- **MINOR THOROUGHFARE**
  - Speed Limit: 25 to 55 mph
  - 2 to 3 Lanes, No Median
  - Uncontrolled Access onto facility
  - Traffic Signals Allowed
  - Driveways with Full Movements
  - Continuous Left Turn Lanes optional
- - - **PROPOSED MINOR THOROUGHFARE**
  - Speed Limit: 25 to 55 mph
  - 2 to 3 Lanes, No Median
  - Uncontrolled Access onto facility
  - Traffic Signals Allowed
  - Driveways with Full Movements
  - Continuous Left Turn Lanes optional
- **PROPOSED INTERCHANGE IMPROVEMENTS**

■ MPO BOUNDARY



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# L RTP Highway Network - Caldwell County

MAP 4-3

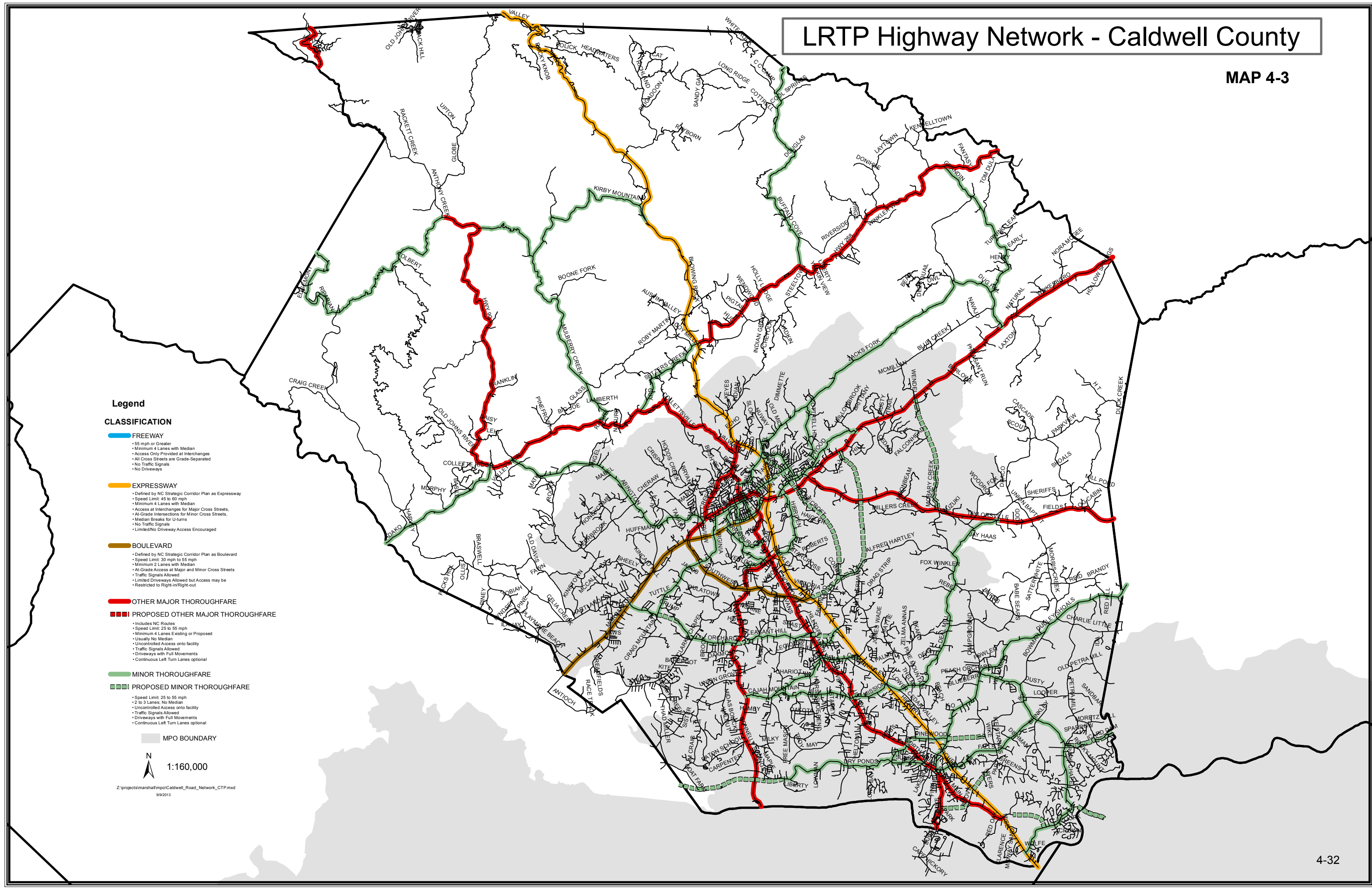
## Legend

### CLASSIFICATION

- **FREEWAY**
  - 55 mph or Greater
  - Minimum 4 Lanes with Median
  - Access Only Provided at Interchanges
  - All Cross Streets are Grade-Separated
  - No Traffic Signals
  - No Driveways
- **EXPRESSWAY**
  - Defined by NC Strategic Corridor Plan as Expressway
  - Speed Limit: 45 to 60 mph
  - Minimum 4 Lanes with Median
  - Access at Interchanges for Major Cross Streets
  - At-Grade Intersections for Minor Cross Streets
  - Median Breaks for U-turns
  - No Traffic Signals
  - Limited/No Driveway Access Encouraged
- **BOULEVARD**
  - Defined by NC Strategic Corridor Plan as Boulevard
  - Speed Limit: 30 mph to 55 mph
  - Minimum 2 Lanes with Median
  - At-Grade Access at Major and Minor Cross Streets
  - Traffic Signals Allowed
  - Limited Driveways Allowed but Access may be Restricted to Right-in/Right-out
- **OTHER MAJOR THOROUGHFARE**
- - - **PROPOSED OTHER MAJOR THOROUGHFARE**
  - Includes NC Routes
  - Speed Limit: 25 to 55 mph
  - Minimum 4 Lanes Existing or Proposed
  - Usually No Median
  - Uncontrolled Access onto facility
  - Traffic Signals Allowed
  - Driveways with Full Movements
  - Continuous Left Turn Lanes optional
- **MINOR THOROUGHFARE**
- - - **PROPOSED MINOR THOROUGHFARE**
  - Speed Limit: 25 to 55 mph
  - 2 to 3 Lanes; No Median
  - Uncontrolled Access onto facility
  - Traffic Signals Allowed
  - Driveways with Full Movements
  - Continuous Left Turn Lanes optional
- MPO BOUNDARY**

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9/9/2013





# L RTP Highway Network - Catawba County

## Legend

### CLASSIFICATION

- **FREEWAY**
  - 55 mph or Greater
  - Minimum 4 Lanes with Median
  - Access Only Provided at Interchanges
  - All Cross Streets are Grade-Separated
  - No Traffic Signals
  - No Driveways
  
- **EXPRESSWAY**
  - Defined by NC Strategic Corridor Plan as Expressway
  - Speed Limit: 45 to 60 mph
  - Minimum 4 Lanes with Median
  - Access at Interchanges for Major Cross Streets.
  - At-Grade Intersections for Minor Cross Streets.
  - Median Breaks for U-turns
  - No Traffic Signals
  - Limited/No Driveway Access Encouraged
  
- **BOULEVARD**
  - Defined by NC Strategic Corridor Plan as Boulevard
  - Speed Limit: 30 mph to 55 mph
  - Minimum 2 Lanes with Median
  - At-Grade Access at Major and Minor Cross Streets
  - Traffic Signals Allowed
  - Limited Driveways Allowed but Access may be Restricted to Right-in/Right-out
  
- **OTHER MAJOR THOROUGHFARE**
  - Includes NC Routes
  - Speed Limit: 25 to 55 mph
  - Minimum 4 Lanes Existing or Proposed
  - Usually No Median
  - Uncontrolled Access onto facility
  - Traffic Signals Allowed
  - Driveways with Full Movements
  - Continuous Left Turn Lanes optional
  
- **MINOR THOROUGHFARE**
  - Speed Limit: 25 to 55 mph
  - 2 to 3 Lanes, No Median
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  - Driveways with Full Movements
  - Continuous Left Turn Lanes optional
  
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  - Traffic Signals Allowed
  - Driveways with Full Movements
  - Continuous Left Turn Lanes optional
  
- - - **PROPOSED MINOR THOROUGHFARE**
  - Speed Limit: 25 to 55 mph
  - 2 to 3 Lanes, No Median
  - Uncontrolled Access onto facility
  - Traffic Signals Allowed
  - Driveways with Full Movements
  - Continuous Left Turn Lanes optional
  
- PROPOSED INTERCHANGE**

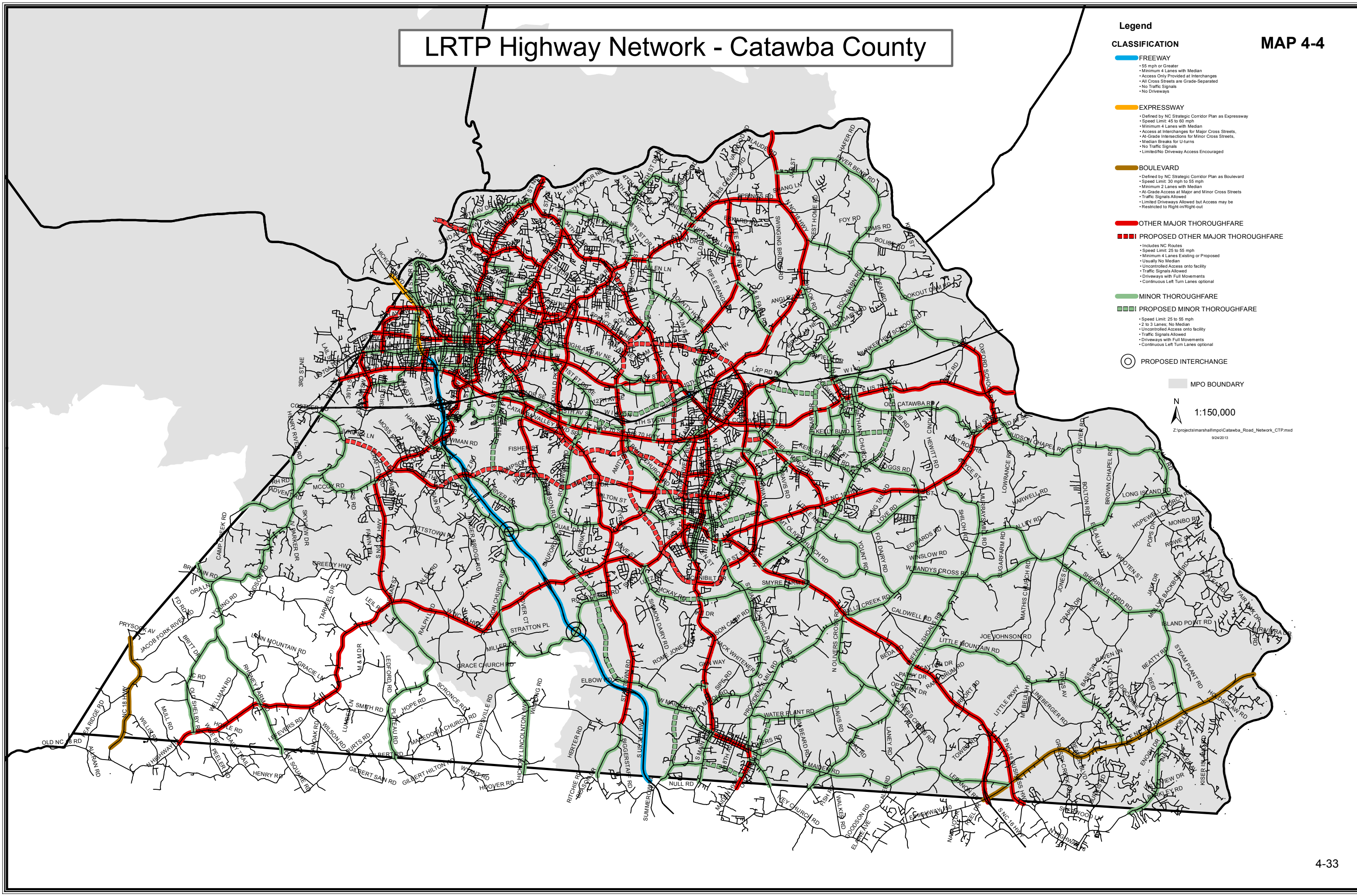
**MAP 4-4**

MPO BOUNDARY



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# FREIGHT

## Introduction

Freight transportation plays a vital role in the economic health of a region. It is how all types of goods flow into and out of an area and how American households have commodities available to meet their needs. The necessity for freight transportation follows economic activity and the geographic distribution of population. In the South, our population has seen a dramatic thirty-seven percent (37%) increase from 1990 to 2012. Our Gross Domestic Product (GDP) in the South has increased two hundred nineteen percent (219%) in that same time period. These percentages are the highest of any region in the United States. Prior to the recent economic downturn, the long-term trend forecasted the National GDP to grow by forty-one percent (41%) by 2018.

<b>Table 5-1</b>					
<b>Annual Population Estimates and Regional Economic Accounts</b>					
<b>Regional US Resident Population (thousands)</b>	<b>1990</b>	<b>2000</b>	<b>2010</b>	<b>2012</b>	<b>Percent Change 1990-2012</b>
<b>Northeast</b>	50,828	53,668	55,317	55,761	10%
<b>Midwest</b>	59,670	64,497	66,927	67,316	13%
<b>South</b>	85,454	100,568	114,556	117,257	37%
<b>West</b>	52,837	63,462	71,946	73,579	39%

Source: US Department of Commerce, Census Bureau *Statistical Abstract of the US*, and US Department of Commerce, Census Bureau, Population Division, Annual Population Estimates, 2012

<b>Table 5-2</b>					
<b>GDP Change 1980-2011 By Region</b>					
<b>Regional US GDP (millions)</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>2011</b>	<b>Percent Change 1980-2011</b>
<b>Northeast</b>	\$1,107,283	\$1,604,121	\$2,077,436	\$3,511,240	217%
<b>Midwest</b>	\$1,262,917	\$1,566,939	\$2,174,719	\$3,058,634	142%
<b>South</b>	\$1,608,531	\$2,220,755	\$3,212,076	\$5,131,355	219%
<b>West</b>	\$1,075,817	\$1,602,514	\$2,284,873	\$3,279,789	205%

Source: US Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, 2011

The movement of goods is not isolated to one town, county, state or region. With the interconnectivity of the national, regional and local transportation network, cargo can be shipped all over the country with relative efficiency. This also means that freight transportation issues in one area can directly impact other areas, both geographically and economically. Therefore, the

GHMPO Long Range Transportation Plan takes a regional approach to developing an integrated framework for how our region plans for freight.

The movement of freight has been an important factor for this region because of the rich manufacturing history of the Greater Hickory Metro area. Historically, this region was known for furniture and textile manufacturing with fiber optic cable becoming important in the 1990s. Getting raw materials into the manufacturing centers and then shipping finished products to their destination has been a priority of the region's transportation network. As the region shifts from a traditional textile and furniture manufacturing economy to a more service-based economy, freight transportation remains an extremely important part of our transportation network. This means retail stores need a reliable road infrastructure to accommodate receiving their inventory. Our area's goals for freight:

- Create a safe and coordinated transportation system for the movement of goods within and through the GHMPO Planning Area;
- Work with stakeholder to ensure efficiency of the system for freight movement;
- Minimize negative impacts associated with the regional movement of goods, especially related to congestion and air quality issues.

## **The Importance of Freight**

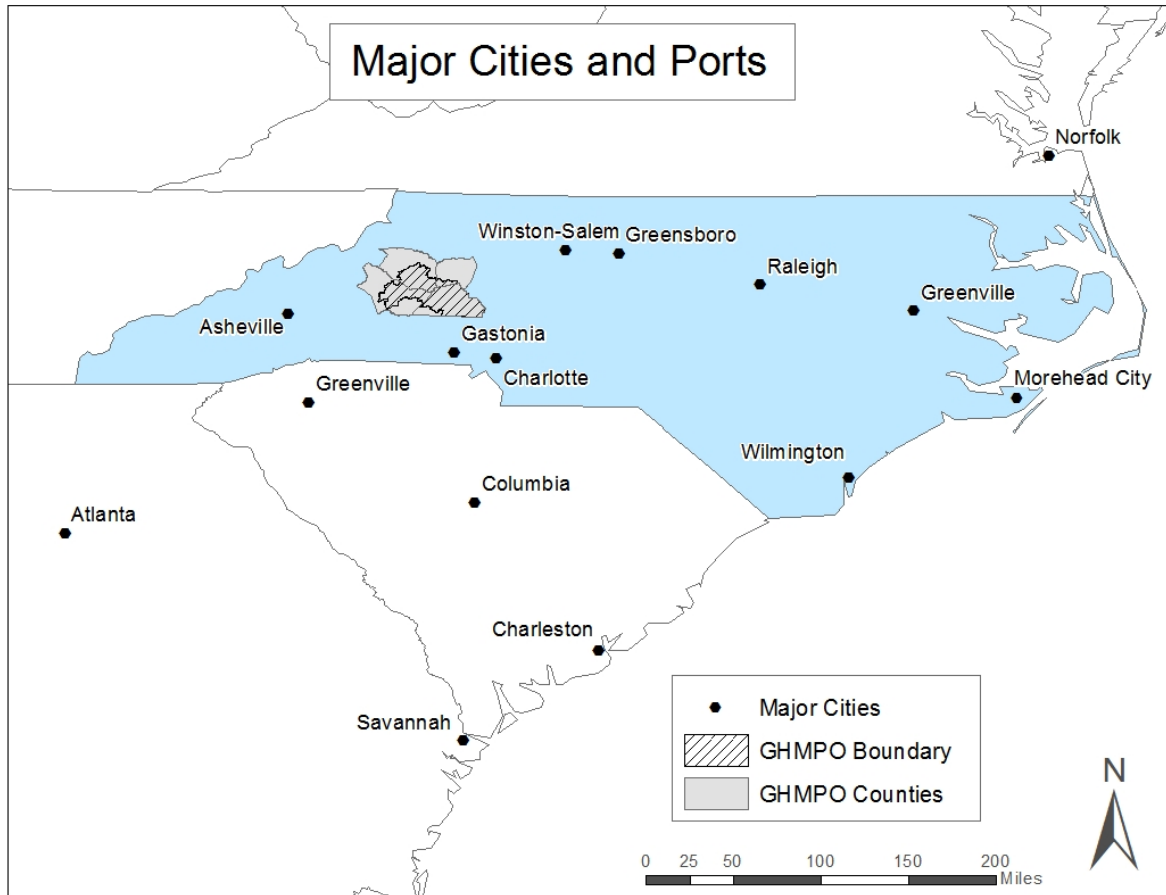
The freight transportation network is a major factor in the economic development of an area. To most people, the trucks and trains that move goods are just an annoyance on the freeway or an impediment to getting across town; they do not realize the impact that freight transportation can have on our quality of life. Manufacturers and retailers must transport their goods, so that we consumers have a variety of products available for our use.

Manufacturers need an efficient and reliable network to receive raw materials and to ship out their end products in a timely fashion. A delay in receiving the raw materials can interrupt production and postpone of delivery of finished goods. This delay can affect a company's total cost and bottom line.

Retailers also need a well-organized freight transportation system as they move away from traditional warehouses for storing their inventories. Goods are now stored in the tractor trailers and railcars on the nation's highways and railroads. The emergence of this "just-in-time" inventory has been profitable for retailers because the cost of a transportation fleet is less expensive than retaining the real estate for warehousing across the country. The general reliability of our national transportation network has also aided this transition. As this practice grows, so will the amount of freight shipped through this system and the reliability of our system will be a major issue for new and expanding businesses.

Freight moves by air, rail, ships, highways and pipelines. Although the GHMPO is not located near a water port, our area does import and export goods through regional ports. Our air freight is also limited due to the loss of a commercial airline in this area. The majority of the freight into, out of and through our area is transported by highways and railways. Interstate 40, an east to west route through the GHMPO, connects this region with Statesville and Winston-Salem to the east and Asheville to the west. US Highway 70 parallels Interstate 40 and is "Main Street" for many towns in this region. US Highway 321 is the major north/south thoroughfare; this highway ties the Hickory area to Boone/Blowing Rock to the north and Interstate 85 and Charlotte to the south. The main railway in the GHMPO, a Norfolk Southern line from Salisbury to Asheville, parallels US Highway 70.

**Map 5-1  
Major North Carolina Cities and Ports**



## Overall Rail and Highway Trends

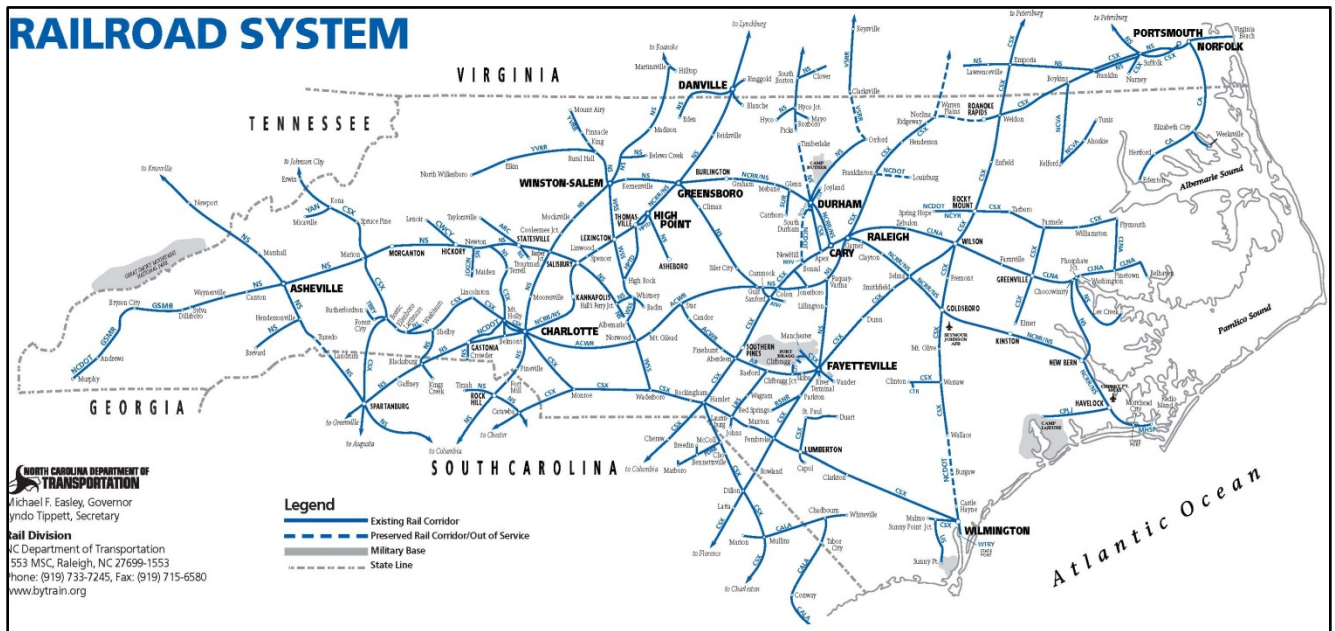
In 2010, the United States shipped seventy percent (70%) of the all freight, domestic, imports and exports by rail and highways. Of the total 18,313 million tons of freight, trucks carried 12,490 million tons and trains moved 1,776 million tons. These two modes of shipping work in sync to distribute raw materials and finished goods. Railroads are typically used for goods that are heavy or that require large volumes, such as agriculture products, automobiles and coal. Trains use the 140,000 mile rail network to move 43% of the freight between urban areas. The US Chamber of Commerce predicts that demand for freight trains will double over the next 25 years.

In 2005, the highways carried 82% of America's freight based on value. Trucks are used to transport time-sensitive products, finished goods and manufacturing products, such as groceries, completed garments and electronic parts. Truck freight is also expected to double nation-wide in the next 10 years, surpassing 400 million vehicle miles traveled. The consistency and predictability of the transportation will grow in importance as freight increases because of our "just-in-time" retail philosophy.

## North Carolina Rail

North Carolina is served by two Class I railroads, CSX and Norfolk Southern. Class I railroads have annual revenues of more than \$253.7 million. There are nearly 2600 miles of track maintained by these two rail companies in North Carolina plus 317 miles kept by North Carolina Railroad (NCRR). Our state also has 782 miles consisting of 23 short line railroads. The highest volumes of rail freight use CSX lines connecting Charlotte to the port of Wilmington, the Norfolk Southern Lines traveling from Charlotte through Greensboro to Raleigh and a north-south oriented CSX line in the eastern part of the state that parallels Interstate 95. In 2011, North Carolina railroads moved over 93.5 million tons of freight in, out and around the state. Half of all rail freight that reaches its destination in North Carolina is carrying coal. For rail freight that originates in the state, nearly 28% is comprised of some type of chemicals (American Railroad Association, US Freight Railroad Industry Snapshot by State)

Map 5-2  
North Carolina Railroad System



competition has caused many manufacturers to move facilities overseas, or to become unprofitable and close down completely. Most manufacturing companies still operating in the area are transitioning toward greater mechanical proficiency and productivity with fewer employees.

Out of necessity, the region is pursuing a variety of industries to reinvigorate its economy. The Google Data Center in Lenoir and the Target Distribution Center in Newton are two examples of non-traditional industries that have recently located in the GHMPO area. As more diverse industries are courted to locate in our area, the transportation resources will become increasingly important to the economic development of our region.

## Rail Freight

The Greater Hickory Metro area is served by a secondary main line of the Norfolk Southern Class I rail line. This 139 mile line runs from Salisbury to Asheville. In Salisbury, this line intersects with the corridor that connects Charlotte to Morehead City. Coal is the principal on-line commodity on this medium traffic railway. There is no passenger service on the line at this time. Several local governments have formed the Western NC Passenger Rail Task Force to lobby for passenger service on the railway. Improvements and upgrades would have to be made for the GHMPO Norfolk Southern rail line to accommodate passenger trains. These improvements would also allow for a greater capacity of freight trains on the secondary main line.

The Caldwell Railroad Commission owns a 22-mile rail line that connects the Norfolk Southern line in Hickory to the north side of the City of Lenoir. Caldwell County bought this line in the early 1990s when Norfolk-Southern wanted to close this line. This short line is managed by Caldwell County Railroad Company. It helps to support manufacturing industries. Below is a chart of current railroad users:

<b>Company</b>	<b># Rail cars/year</b>
Boone Lumber	18
New River Building Supply	30
ShurTape	70
Pregis	85
Sealed Air	150

Caldwell County and its municipalities are currently working to expand the use of the railroad. In 2007, Caldwell County and the City of Lenoir undertook the creation of a trans-load facility. When Google opened a data center in Lenoir, the site for the facility was located on a property that was transected by the rail line. For security reasons, Google did not want trains moving through the property. The main user of the rail line, Sealed Air, was north of the Google property and would be severely impacted if they lost train service. To solve this problem, Caldwell County and the City of Lenoir opted to create a trans-load facility south of the Google property. The trans-load facility moves freight off the trains onto trucks for delivery. The project combined local funds with grants from NCDOT, NC Department of Commerce and the Appalachian Regional Commission.

The trans-load facility contains three sets of tracks with lifts and room to unload freight to trucks at the present time (see picture on page 6-6). Caldwell County's Economic Development Commission is actively looking to attract businesses and industries to use the trans-load facility to its fullest potential. They are evaluating potential expansion of the trans-load to make it a more significant asset for recruiting and retaining businesses. When expanded, the facility will be an asset not only to Caldwell County but to the entire region of the GHMPO. The Caldwell Railroad Commission is dedicated to increasing the use of rail to move freight since it will have a positive impact on highway safety and air quality by reducing the number of trucks needed to move freight in the area.

The Alexander Railroad is another short-line that serves this region. It connects Taylorsville to the Norfolk-Southern rail line in Statesville and is important to the economic health of Alexander County. Paragon Films is the largest customer in Taylorsville served by the rail. They

receive plastic pellets by rail for their products. Liberty Reload, a small distribution center in the Alexander Industrial Park, also is a major user of the railroad.

**Figure 5-1**  
**Caldwell County Trans-load Facility**



### **Air Freight**

The Hickory Regional Airport is located immediately adjacent to US 321 and less than four miles from the interchange of US 321 and Interstate 40. This public airport is owned and operated by the City of Hickory. Air freight in the Hickory Metro area has declined in the past several years. There was a decrease of air freight in 2000 when the Hickory area saw significant losses of the manufacturing industry. In 2006, commercial passenger service ceased at the Hickory Regional airport. This decreased the amount of freight that was transported into and out of the area in the cargo holds of passenger planes.

Presently, a minimal amount of freight comes through the Hickory Regional Airport even though it is poised to be a large contributor to the freight movement in the area. There is capacity to build warehousing facilities on the airport property and property adjacent to the airport. The airport can handle airplanes the size of 737s, 737-300s and DC 9s. It also has the infrastructure, such as a forklift and ramp, to load/unload freight cargo and to service planes. The City of Hickory created a task force to increase the use of this airport to support economic development. Their report, submitted in October 2006, identified a need for more marketing of the airport since there are significant assets at this airport that are absent at airports in surrounding counties.

### **Foreign Trade Zones**

In 2000, local officials applied for the expansion of the Foreign Trade Zone #57, headquartered in Charlotte (grantee is the Charlotte Regional Partnership), into the Western Piedmont region. Having regional foreign trade zones allows local businesses to reduce tariffs on international imports or exports. On July 29, 2002, the United States Foreign Trade Board approved the

Hickory Metro expansion of Foreign Trade Zone (FTZ) #57, establishing two sites in Burke County, a site in Caldwell County, a site in Alexander County and several sites in Catawba County. On the whole, the designated sites occupied well-positioned industrial parks in the region, with the hope of securing potential users in the future.

However, through September 1, 2009, only one site had been activated for FTZ use. Employing a minor boundary modification with acreage from the Hickory Regional Airport/Lakepark site, the region's first foreign trade zone site was activated for and is currently operated by "general purpose" user, Consolidation Services. Consolidation Services has fully utilized the FTZ in the past four years, as they have successfully worked with a wide array of customers, storing and shipping their products to market.

Since only one site, the Hickory Regional Airport/Lakepark site, had been activated, the other FTZ sites in the Hickory Metro region lost their designation as of September 1, 2009. This does not completely eliminate the possibility of Foreign Trade Zone activation in the region in the near or long term future, but it does eliminate at least the physical designation of sites originally approved in 2002.

<b>Table 5-2</b> <b>GHMPO Major Freight Generating Facilities</b> <b>(Facilities larger than 100,000 sq. ft)</b>		
<b>Company Name</b>	<b>Location</b>	<b>Primary Business</b>
CommScope	Catawba	Manufacturing
Shurtape	Catawba	Wholesale/Distribution
CertainTeed	Claremont	Manufacturing
Centro	Claremont	Manufacturing
CommScope	Claremont	Manufacturing
Draka/Prysmian	Claremont	Manufacturing
Advance Pierre	Claremont	Manufacturing
Poppelmann Plastics	Claremont	Manufacturing
Rock-Tenn	Claremont	Manufacturing
Williams-Sonoma	Claremont	Manufacturing/Distribution
Armacell	Conover	Manufacturing
Zenith Global Logistics	Conover	Wholesale/Distribution
Carpenter Company	Conover	Manufacturing
Classic Leather	Conover	Manufacturing
Hanes Industries	Conover	Manufacturing
Hickory Printing Solutions	Conover	Manufacturing/HQ
Hickory Springs	Conover	Manufacturing
Idealtalia	Conover	Manufacturing/Distribution



Interstate Foam	Conover	Manufacturing
Kroehler Furniture	Conover	Manufacturing
LaneVenture	Conover	Manufacturing
Leathercraft	Conover	Manufacturing
Lee Industries	Conover	Manufacturing/HQ
McCreary Modern	Conover	Manufacturing
Rock-Tenn	Conover	Manufacturing
Southern Furniture	Conover	Manufacturing
Vanguard Furniture	Conover	Manufacturing
Wesley Hall Furniture	Conover	Manufacturing
Baker Furniture	Hickory	Wholesale/Distribution
Carolina Container	Longview	Manufacturing
Catawba Sox	Hickory	Manufacturing
Century Furniture	Hickory	Manufacturing
Consolidation Services	Hickory	Wholesale/Distribution
Corning Cable Systems	Hickory	Manufacturing
CR Lane Furniture	Hickory	Manufacturing
Fed-Ex Ground	Hickory	Distribution
Fill-Pac	Hickory	Wholesale/Distribution
HBF	Hickory	Manufacturing
Hickory Chair	Hickory	Manufacturing
Klingspor Abrasives	Hickory	Manufacturing
Hickory White Furniture	Hickory	Manufacturing
Sherrill Furniture	Hickory	Manufacturing
Sunbelt Furniture Express	Hickory	Distribution
IFH	Hickory	Wholesale/Distribution
MDI	Hickory	Wholesale/Distribution
Plastic Packaging	Hickory	Manufacturing
Profile Products	Hickory	Wholesale/Distribution
Quaker Furniture/Studio Q	Hickory	Manufacturing
Robert Abbey	Hickory	Manufacturing
Shurtape	Hickory	Manufacturing
Snyder Paper	Hickory	Distribution
Tailored Chemical	Hickory	Manufacturing
Turbotec Products	Hickory	Manufacturing/HQ

Carolina Container	Maiden	Manufacturing
Delta Apparel	Maiden	Manufacturing
Ethan Allen	Maiden	Manufacturing
Excel Commercial Seating	Maiden	Manufacturing
GKN Driveline	Maiden	Manufacturing
Lawrence Lumber Co.	Maiden	Wholesale/Distribution
von Drehle Corp.	Maiden	Wholesale/Distribution
Bassett Furniture	Newton	Manufacturing
CommScope	Newton	Manufacturing
Flowers Foods	Newton	Manufacturing
General Dynamics	Newton	Manufacturing
Goldtoe Moretz	Newton	Wholesale/Distribution
HT Hackney	Newton	Wholesale/Distribution
Lee Industries	Newton	Manufacturing
McCreary Modern	Newton	Manufacturing
Sarstedt	Newton	Manufacturing
Special Metals	Newton	Manufacturing
Technibilt	Newton	Manufacturing
International Paper	Newton	Manufacturing
Tufco Technologies	Newton	Manufacturing
ZF Lemforder	Newton	Manufacturing
Target Corporation	Newton	Wholesale/Distribution
Drexel Heritage	Longview	Manufacturing
Century Chair	Longview	Manufacturing
Drexel Furniture	Burke County	Wholesale/Distribution
E. J. Victor Furniture	Morganton	Wholesale/Distribution
Adden Furniture	Hildebran	Wholesale/Distribution
SGL Carbon	Morganton	Manufacturing
MFG	Burke County	Manufacturing
Sypris	Morganton	Manufacturing
Viscotec	Morganton	Manufacturing
Leviton	Morganton	Manufacturing
PCA	Morganton	Manufacturing
Case Farms	Morganton	Manufacturing
American Roller Bearing	Morganton	Manufacturing

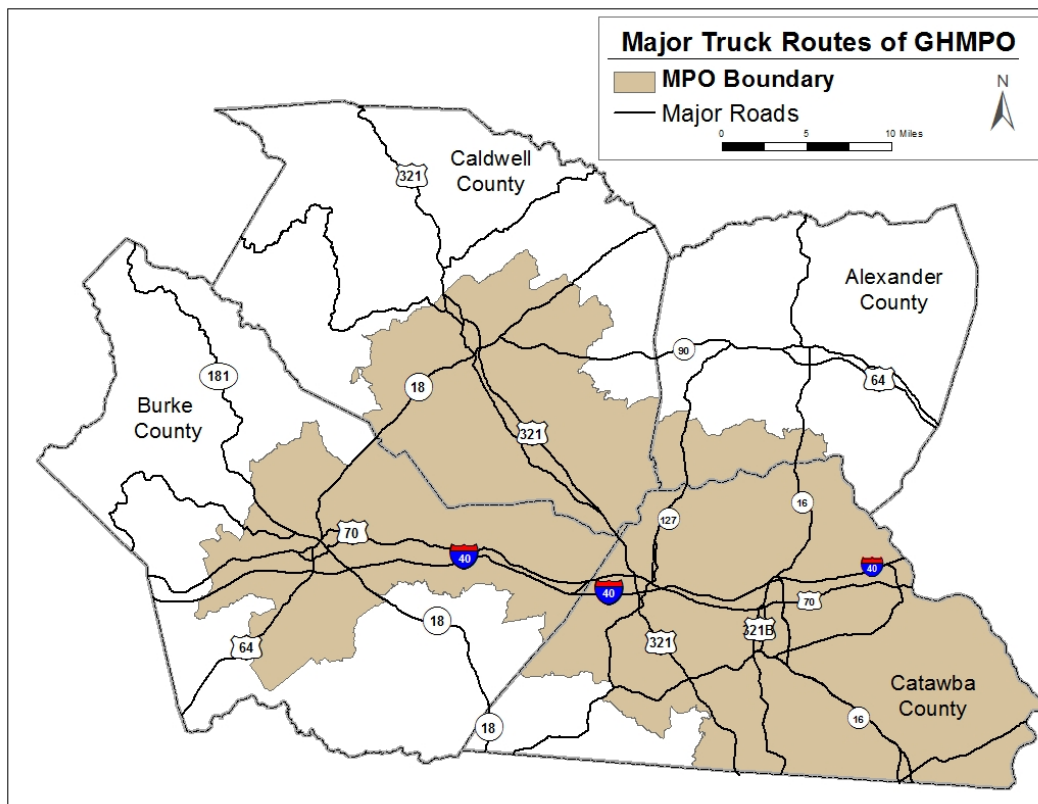
Baker Furniture	Burke County	Manufacturing
BSN Medical	Rutherford College	Manufacturing
Caterpillar	Morganton	Manufacturing
Continental Environmental	Morganton	Manufacturing
Inks/Siegwerk	Morganton	Manufacturing
Ferguson Copeland	Morganton	Manufacturing
Geiger	Hildebran	Manufacturing
Gerresheimer Glass	Morganton	Manufacturing
Ice River Springs	Morganton	Manufacturing
SAFT	Valdese	Manufacturing
Valdese Weavers	Valdese	Manufacturing
Woodbury Lumber	Lenoir	Manufacturing
Chris's Home Builders	Lenoir	Wholesale/ Distribution
Robinson Lumber	Lenoir	Manufacturing
Construction Attachments	Lenoir	Manufacturing
Caldwell Freight Lines	Lenoir	Distribution
Bemis	Lenoir	Manufacturing
UPS	Lenoir	Distribution
Thomasville Furniture	Lenoir	Manufacturing
Bernhardt Furniture	Lenoir	Manufacturing
Broyhill Furniture	Lenoir	Manufacturing
Kincaid Furniture	Hudson	Manufacturing
Sunbelt Furniture Express	Caldwell County	Distribution
Onmi Supply	Lenoir	Manufacturing
Sealed Air	Lenoir	Manufacturing
NEPTCO	Granite Falls	Manufacturing
McGee Crating	Lenoir	Manufacturing
Timberwolf Wood Products	Hudson	Manufacturing
Carolina Bas-Pac	Hudson	Manufacturing
Google	Lenoir	Data Center
H. Parsons	Lenoir	Manufacturing
Woodbury Lumber	Lenoir	Wholesale/Distribution

(Data gathered from municipal and county staff)

## Roadway Network

The roadways in the Greater Hickory MPO area are currently able to support truck freight transportation. This is the mode used by most commercial facilities to move goods into and out of our region (see Map 5-3 “Major Truck Routes of GHMPO” below). Interstate 40 is a major truck route passing through Catawba and Burke Counties and the main east-west transportation corridor used by trucks and passenger vehicles. US Highway 321 is the major north-south corridor and is the primary truck route into Caldwell County. I-40 and US 321 intersect in southwest Hickory. North of this interchange, US 321 is a four-lane highway with numerous traffic lights, intersections and driveways. South of the interchange, US 321 is a limited-access freeway to Gastonia and Interstate 85.

**Map 5-3  
Major Truck Routes of the GHMPO**



US Highway 70 parallels I-40 through most of the GHMPO. During road construction or traffic accidents on I-40, US 70 is an alternate route. This is also “Main Street” for several of the local municipalities. NC Highway 127 runs north/south through the City of Hickory, connecting US 64/NC 90 and NC 10 and providing access to I-40 and US 321. NC 16 travels through north-south through central Catawba County, including the cities of Conover and Newton with an interchange at I-40. This is a major throughfare into Alexander County and Taylorsville. Another route used by trucks, US 64/NC 18, travels southwest from the City of Lenoir to the City of Morganton. This thoroughfare has access to I-40 as well. Other thoroughfares, such as Connelly Springs Road in Caldwell County and McDonald Parkway in Catawba County, are often used by trucks to avoid high traffic volumes, but the major truck

routes are I-40, US 321 and the NC Highways listed above. Information on commercial motor vehicle incidents on these routes is located in Appendix A.

### **Freight Stakeholder Participation**

On February 19, 2013, GHMPO staff attended the local “Traffic Club.” The Traffic Club consists of a broad spectrum of local and regional freight stakeholders. This includes second and third party logistic companies, trucking companies, furniture companies, food distributors, and truck servicers. Staff made a brief presentation about the Long Range Transportation Plan and distributed a survey. This survey was also available on Survey Monkey and the link was emailed to the all of the Traffic Club members. A second email was sent out two weeks later asking for input. Unfortunately there were only 5 responses to this survey representing only 3 different companies. Cargo Transporters had three respondents. They handle second party logistics and are the seconded largest trucking company in NC. From this survey we learned the following:

- all three companies have been in operation longer than 20 years;
- two companies employ more than 55 people;
- two companies only ship by truck and none ship to seaports;
- one company uses an inland port;
- two companies’ inbound and outbound trucks travel more than 251 miles;
- I-40 and US 321 are the most used routes in this area;
- NC 127 is most often avoided.

As far as improvements in the region, the respondents would like to see improved highway ramps, rest areas, truck parking areas and intermodal rail facilities.

There was greater stakeholder participation in 2008. Listed below are outstanding items from that round of surveys and meetings:

- Interstate 40 needs to be widened to six lanes from Exit 126 to Exit 123, the interchange with US 321;
- Traffic flow problems will occur on US 321 when the new bridges will be built over Lake Hickory during the widening of US 321 to 6 lanes;
- An east-west thoroughfare in the northern part of Hickory is needed;
- A rail lift facility in the area is needed to consolidate shipments out of the area into Charleston and Savannah; and
- Getting passenger train service from Salisbury to Asheville should be a high priority for the region.

### **Freight Transportation Improvement Projects**

Most truck routes are on the Transportation Improvement Plan to be upgraded or have just recently been improved. I-40 was recently resurfaced through Catawba and Burke counties. US

321 is planned to be widened to 6 lanes from US 70 in Hickory to US 64/NC 90 in Lenoir, including a new bridge over Lake Hickory. Two I-40 interchanges in Burke County are in the process of being upgraded. The City of Hickory has plans to synchronize traffic lights on NC 127 to allow more efficient flow of traffic during high volume times.

### **Highway Recommendations**

To facilitate truck movement in our region, truck routes should be designated along the major freight corridors. These routes should avoid streets and roads that are not designed for heavy truck traffic. Signs should be posted to notify drivers of the designated routes for their use. Street design elements for freight trucks should be considered when truck routes are improved or new streets are created, especially in industrial parks and manufacturing areas. At a minimum, these elements should include:

- Ample lane width – 12 feet minimum;
- Turning radii – 25 feet minimum;
- Separation from pedestrian facilities and bicycle lanes, for example with 5 foot planting strips.

As our region attempts to attract new types of industry, our transportation network could be an important feature if improvements are made to keep vehicles circulating on the two main thoroughfares, Interstate 40 and US 321. These improvements include:

- Working with NCDOT to prioritize improvements to insufficient Interstate 40 interchanges;
- Synchronizing traffic light timing on major freight routes at high volume times to reduce noise and air pollution, especially within city limits;
- Ensuring new industrial and manufacturing areas have sufficient access to arterials;
- Encouraging municipalities to incorporate the above design criteria into their street design requirements, especially in industrial areas and on truck routes;
- Working with NCDOT to provide traffic relief and alternate routes prior to bridge construction on US 321;
- Reviewing these ideas periodically with the freight stakeholders, such as manufacturers, trucking companies and municipal officials, to ensure projects are beneficial for stakeholders.

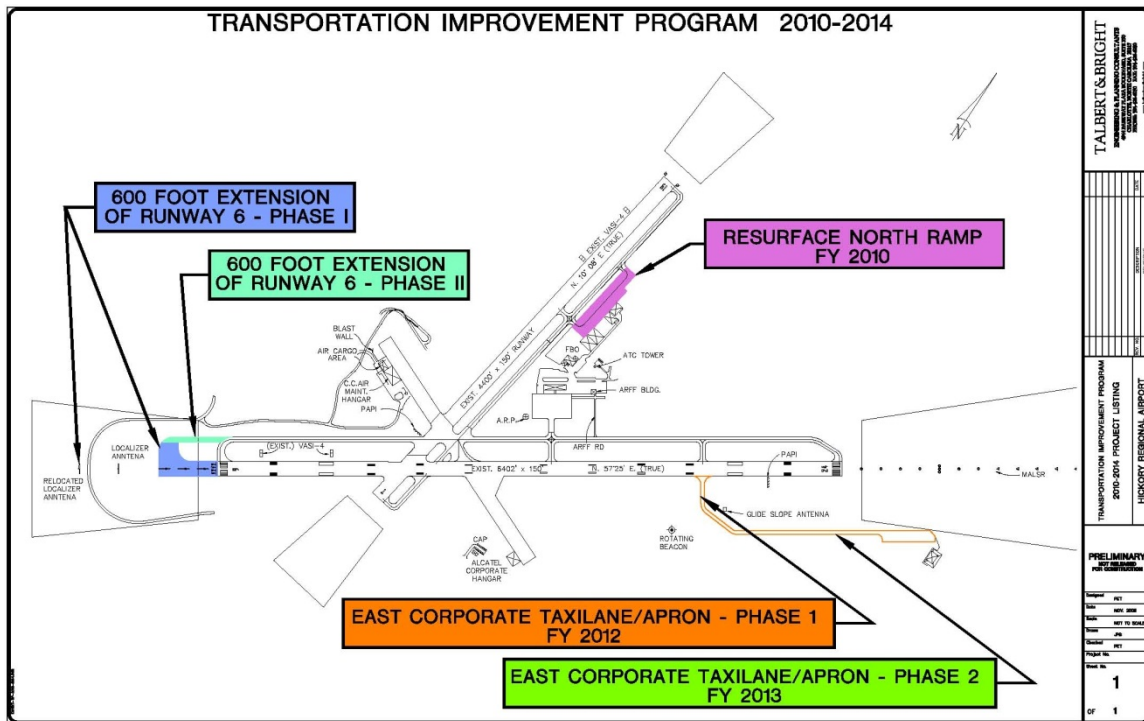
### **Air Freight Recommendations**

The GHMPO supports the recommendations made by the Hickory Regional Airport Task Force in their October 2006 report. Those recommendations are:

- The City of Hickory should continue its attempts to regain commercial air service even though that service is unlikely to return in the current economic situation;
- Continue funding to staff the airport's control tower; and
- The facility be expanded, specifically runways should be lengthened to accommodate a greater variety of planes.

Increased capacity for air freight and passenger planes can help economic development in the area. If the physical capacity of the airport is increased, more freight companies (such as FedEx and UPS) may use the airport and local manufacturers could ship or receive goods. Below is a rendering of the recommended improvements to the airport.

**Figure 5-2**  
**Hickory Airport Improvement Program**



**Rail Freight Recommendations**

Moving freight by rail is safe and efficient. Increasing the rail cargo in our area can decrease air pollution by reducing the number of trucks on our roadways. By taking more trucks off the highway, the chance of truck crashes is reduced and passenger vehicle safety is increased. The GHMPO anticipates a national shift to greater utilization of rail to move freight as emissions and safety issues become subject to more federal regulation. The GHMPO recommendations for rail freight are:

- To expand the use of railways to transport more freight in the GHMPO;
- To encourage local Economic Development Commissions to pursue industries that could benefit from our rail capacity;
- To increase the use to the Caldwell County Railway and the Caldwell County Trans-load facility for goods entering and exiting this area;
- To support the expansion of the Trans-load facility which incorporates multi-modes of freight transport; and

- To urge the NCDOT Rail Division to restore passenger rail service on the existing line from Salisbury to Asheville.

## **Conclusion**

As this latest national economic situation continues to unfold, the GHMPO region needs to be well-equipped to make the best possible decisions to maintain the quality of life the citizens have come to expect. Unlike other areas of North Carolina and the Southeast, the GHMPO area has not recovered from the economic disruption from 2000 and now has to weather this latest disturbance. This area is moving forward by trying to attract a wide variety of industries and businesses. The transportation system needs to be malleable as it takes on new opportunities, but there still needs to be a safe and reliable network to get goods to the industries and retail items to citizens. These recommendations for freight address immediate needs and offer a course to plan for a diversified economic future.



# PUBLIC TRANSPORTATION

## Introduction

Public transportation is a vital element of the total transportation services provided within a metropolitan area. Not only does public transportation provide options to senior citizens, those without vehicles, and those who are physically or economically disadvantaged, but it is an efficient, low cost, high capacity means of moving people through a densely traveled corridor. The ability to provide a transportation alternative for those living in high-density areas is as important as for those living in low density or rural areas. The Unifour area has a regional transit authority serving Alexander, Burke, Caldwell and Catawba Counties. Western Piedmont Regional Transit Authority (WPRTA) operating as Greenway Public Transportation began operations in July 2008 with the intent of improving transportation alternatives regionally.

## Background

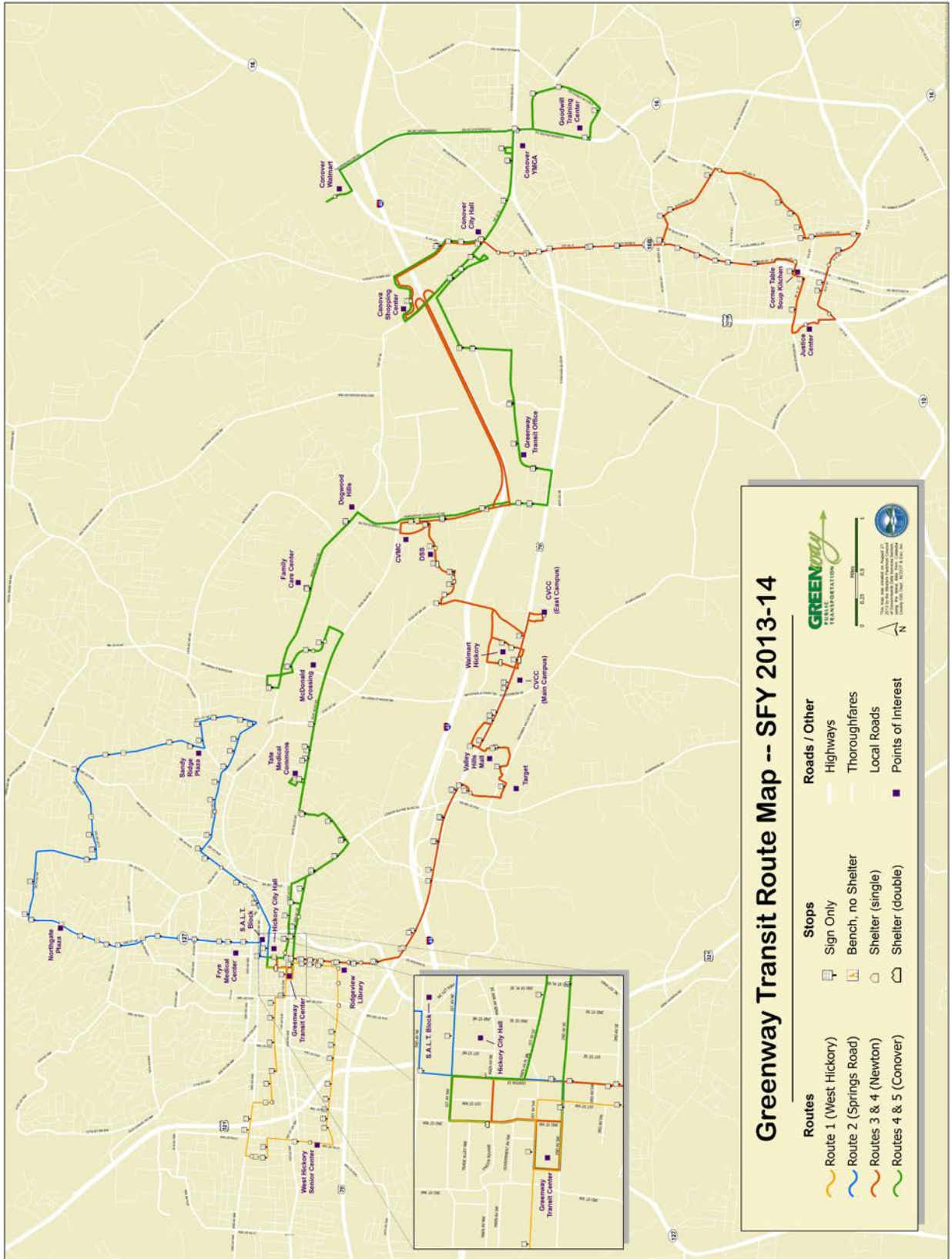
Consolidation of public transportation operations for Alexander, Burke, Caldwell and Catawba Counties to form the Western Piedmont Regional Transit Authority (WPRTA) took place in July 2008. Before this consolidation, community transportation was provided separately by each county. In Alexander County, community transportation was provided by Alexander County Transportation (ACT); in Burke County, services were provided by the Burke County Transit Administration (BCTA); in Caldwell County, services were provided by the Caldwell County Area Transit System (CCATS); and in Catawba County, services were provided by the Piedmont Wagon Transit System (PWTS). The only areas of the four counties that had fixed route transit were the Catawba County Cities of Hickory, Newton and Conover (provided by PWTS).

Officials in Alexander, Burke, Caldwell and Catawba counties along with the municipalities of Hickory, Newton and Conover passed resolutions to create the Western Piedmont Regional Transit Authority. The organization was the first regional public transportation authority with consolidated multi-county, urban-rural transit service in the state.

The following four service providers were consolidated:

- Alexander County – community transportation provided by Alexander County Transportation, a county-operated system.
- Burke County – community transportation provided by Burke County Transit Administration Inc., a nonprofit agency.
- Caldwell County - community transportation provided by Caldwell County Area Transit System Inc., a nonprofit agency.
- Catawba County – Piedmont Wagon Transit System, operated by the City of Hickory, which provides community transportation to county residents and fixed-route service for the cities of Hickory, Newton and Conover (Map 6-1).

Map 6-1: Greenway Transit Urban Fixed-route Services (Hickory, Newton and Conover)



## **Mission Statement and Goals**

The mission of the Western Piedmont Regional Transit Authority (WPRTA) is to develop and maintain an effective, efficient, and safe system of public transportation services within Alexander, Burke, Caldwell and Catawba Counties which is responsive to the mobility needs of the region.

Transportation services provided shall be designed to maintain and encourage the use of public transportation and shall contribute to the economic vitality of the community, the conservation of natural resources and the protection of the environment.

The goals of WPRTA are as follows:

1. Provide cost effective transportation services which optimize the utilization of personnel, vehicles and other resources.
2. Provide transportation services which meet the mobility needs of the community, within available financial resources.
3. Develop funding options which assure the continued stable operation of transportation services at a public subsidy level acceptable to the community.
4. Develop policies which assure, as much as possible, that transit services are designed and operated to encourage maximum use by the community. Service should be provided first in areas where the greatest potential for use exists.
5. Promote the use of public transportation services within the community. This includes both providing adequate and up-to-date information on available services and aggressively marketing the transit system.
6. Expand public transportation to new areas of the community as demand estimates and population densities indicate that service will be sufficiently utilized within established service standards.

### **Currently Available Public Transportation Services Offered by WPRTA**

- Urban fixed-route transit services in the Hickory, Newton and Conover area illustrated in Figure 6-1.
- ADA (Americans with Disabilities Act) complementary paratransit service.
- Limited rural and urban general demand response service in each of the four counties.
- Non-emergency medical transportation for seniors and the general public.
- Human service agency transportation for the following programs:
  - DSS (Department of Social Services) employment transportation programs in Alexander, Burke, and Catawba Counties: This program is designed to fix cars, purchase drivers' insurance or buy down rides. Demand generally exceeds funding.
  - DSS Employment transportation in Caldwell County using ROAP funds
  - DSS Medicaid transportation program
  - Vocational Rehabilitation
  - Burke Literacy
  - Caldwell Family Resource Center
  - Burke Council on Alcoholism
  - Adult Day Care

- Developmentally Disabled groups
- Home and Community Care Block Grant Programs that service elderly passengers
- General and Medical demand response transportation.
- Private transportation providers operate in Burke County, providing trips brokered by WPRTA.

**Other Public Human Service Transportation Providers**

- Catawba County Department of Social Services
- Caldwell County Department of Social Services

**Private Transportation Providers**

- Ace Cab
- City Cab
- Diamond Cab
- Handi-Care Inc.
- Dixie Cab
- Yellow Cab
- Medivan Transportation
- Burke Christian Tours
- Catawba Valley Medical
- Medical Transportation
- Caldwell Opportunities
- Specialty Transportation
- Newton Yellow Cab

**Human Services Transportation Plan**

**SAFETEA-LU**

In August 2005, the President signed legislation consistent with this recommendation to reauthorize Federal public transportation and Federal highway programs that contained provisions to establish a coordinated human services transportation planning process. This legislation, the Safe, Affordable, Flexible, Efficient Transportation Equity Act, A Legacy for Users (SAFETEA-LU), created a requirement that a locally developed, coordinated public transit/human service planning process and an initial plan be developed by 2007 as a condition of receiving funding for certain programs directed at meeting the needs of older individuals, persons with disabilities and low-income persons. The plan must be developed through a process that includes representatives of public, private and non-profit transportation providers and public, private and non-profit human service providers and participation by the public.

Effective in 2008, the Federal Transit Administration is required a coordinated plan of local transit services in order to apply for funds from the Elderly and Disabled Individuals Transportation Program (FTA Section 5310) and New Freedom Program (FTA Section 5317).

**MAP-21**

In June 2012, Congress enacted a new two-year federal surface transportation authorization, Moving Ahead for Progress in the 21st Century (MAP-21), which retained all of the coordinated planning provisions of SAFETEA-LU. Under MAP-21, JARC and New Freedom are eliminated

as stand-alone programs, and the Section 5310 and New Freedom Programs are consolidated under Section 5310 into a single program (Grants for the Enhanced Mobility of Seniors and Individuals with Disabilities), which provides for a mix of capital and operating funding for projects. This is the only funding program with coordinated planning requirements under MAP-21, beginning with Fiscal Year 2013 and currently authorized through FY 2014.

At the current time FTA has yet to update its guidance concerning administration of the new consolidated Section 5310 Program, but the legislation itself provides three requirements for recipients. These requirements would apply to NCDOT Public Transportation Division in distributing any Section 5310 funds for which it might serve as designated as recipient under MAP-21:

- That projects selected are “included in a locally developed, coordinated public transit-human services transportation plan”;
- That the coordinated plan “was developed and approved through a process that included participation by seniors, individuals with disabilities, representatives of public, private, and nonprofit transportation and human service providers, and other members of the public”; and
- That “to the maximum extent feasible, the services funded ... will be coordinated with transportation services assisted by other Federal departments and agencies,” including recipients of grants from the Department of Health and Human Services.

Under MAP-21, only Section 5310 funds are subject to the coordinated-planning requirement. Sixty percent of funds for this program are allocated by a population-based formula to large urbanized areas (See 49 U.S.C. Section 5310 (e)(2) / MAP-21 Section 20009).

#### General Program Information

##### *Transportation for Elderly Persons and Persons with Disabilities (5310)*

This program (49 U.S.C. 5310) provides formula funding to States for the purpose of assisting private nonprofit groups in meeting the transportation needs of the elderly and persons with disabilities. Funds are apportioned based on each State’s share of population for these groups of people.

The goal of these funds is to provide transportation services that meet the special needs of elderly persons and persons with disabilities for whom mass transportation services are unavailable, insufficient or inappropriate.

Funds can be used for the purchase of vehicles and related capital equipment and for operating costs. North Carolina is one of seven states approved to use up to one-third (1/3) of its annual apportionment of Section 5310 funds for operating costs. The Federal share of eligible capital costs may not exceed 80 percent of the net cost of the activity unless the capital cost is an ADA vehicle and then the Federal share cannot exceed 83 percent. The Federal share of eligible operating costs may not exceed 50 percent of the net cost.

Examples of eligible Elderly and Disabled Program projects include, but are not limited to:

- Buses and vans
- Radios and communication equipment
- Vehicle shelters
- Wheelchair lifts

- Computer hardware and software
- Transit related Intelligent Transportation Systems (ITS) or other technology
- Mobility Management Activities

### *New Freedom Program*

The New Freedom Program grew out of the New Freedom Initiative introduced by the Bush Administration under *Executive Order 13217*, “Community-Based Alternatives for Individuals with Disabilities,” on June 18, 2001. The Order states: “The United States is committed to community-based alternatives for individuals with disabilities and recognizes that such services advance the best interests of the United States” and calls upon the Federal government to assist States and localities to swiftly implement the decision of the United States Supreme Court in *Olmstead v. L.C.*

Executive Order 13217 directed six Federal agencies, including the Departments of Justice, Health and Human Services, Education, Labor, Housing and Urban Development and the Social Security Administration to “evaluate the policies, programs, statutes and regulations of their respective agencies to determine whether any should be revised or modified to improve the availability of community-based services for qualified individuals with disabilities.” The Departments of Transportation and Veterans Affairs, the Small Business Administration, and the Office of Personnel Management, though not named in the Executive Order, also joined in the implementation effort. Together, these agencies formed the Interagency Council on Community Living under the leadership of the DHHS.

Individuals who are without transportation face different challenges in accessing services depending on whether they live in urban, rural or suburban areas. The geographic dispersion of these populations also creates challenges for human service programs hoping to deliver transportation for their passengers.

Over the years, in response to these challenges, Federal, State and local governments and community-based organizations created specialized programs to meet particular transportation needs. At the Federal level alone, there are at least 62 separate programs, administered by eight Federal departments, and even more agencies, that provide special transportation services to individuals with disabilities, older adults, and people with low incomes. Most of these are human service programs that fund limited transportation services to provide eligible participants with access to particular services, such as job training, health care, senior centers or rehabilitation programs.

President Bush included funds for the New Freedom Program in the annual budget request to Congress since FY 2003; however, it was not until the enactment of SAFETEA-LU that funding was authorized by Congress. Funding was first appropriated for the transportation provision in Fiscal Year 2006. The New Freedom Program is intended to fill the gaps between human service and public transportation services previously available and to facilitate the integration of individuals with disabilities into the workforce and full participation in the community. Similar to the Section 5316 program, Section 5317 funds are allocated by formula to States for areas with populations below 200,000 persons, and to designated recipients for areas with populations of 200,000 persons and above.

## **Transportation Needs of Special Populations**

### **Population and Land Use**

The 2010 Census indicated that the population in the four-county area was 365,497 people, up 6.8 percent over the 2000 population of 342,142 people. State demographers have estimated that the rate of growth will slow over the next 20- year period, estimating that the 2020 population will be 374,131 (1.1% over the ten-year period), and the 2030 population will be 381,447 (2.0% over the ten-year period). Alexander and Catawba Counties are predicted to grow at a faster rate than Burke and Caldwell Counties.

Growth in the region has been affected by the closure of several major manufacturing plants in the area over the last ten years. The furniture and textile industries, which have historically been major employers in the region, have moved several facilities out of the country. The retail and service sectors are growing in the region and these sectors have replaced some of the lost manufacturing employment.

### **Urbanized Area**

There is a Census-designated Urbanized Area in the Western Piedmont area. This Urbanized Area is somewhat unusual, as the population density found in some areas within its boundaries would not suggest an “urban” designation. The area has this designation because there are several small municipalities with contiguous borders that combine to have a population that is characterized as “urban” (212,195 people, as of the 2010 Census). There is also a significant level of commuting between jurisdictions, which is one of the determinants that the Census uses in its formula to designate urbanized areas. The urbanized area is significant for this project, as the Federal Transit Administration (FTA) allocates public transit funding to specific urbanized areas.

### **Population Density**

The mean population density of the region is 223.2 people per square mile, with Catawba County having the most concentrated population (387.1 people per square mile) and Alexander County having the least concentrated population (143.1 people per square mile). Burke County has a density of 179.3 persons per square mile and Caldwell has density of 176.1 persons per square mile. Population density is an important demographic feature to study when planning transit services. Generally speaking, fixed-route transit can only be supported in areas with 1,500-2,000 people per square mile or more. Areas with lower densities call for more targeted services, such as deviated fixed-route or demand-response services. The current fixed-route service area exhibits areas of fixed-route density, as do areas of Lenoir and Morganton.

### **Likely Transit Destinations**

Transit destinations can be defined as typical locations where transit riders would need to travel to on a regular basis, such as employment sites, medical service sites, social service centers, shopping centers, and major educational centers. In Alexander, Burke, and Caldwell Counties, these destinations are generally concentrated in the County seats of Taylorsville, Morganton, and Lenoir, respectively. The only significant deviation from this pattern is Caldwell Community College and Technical Institute, which is located in Hudson. In Catawba County, these destinations are primarily located in Hickory, Newton, and Conover.

### **Employment Travel Patterns**

Employment travel patterns based on the 2010 American Community Survey were compiled and analyzed by the WPCOG in 2012. This analysis showed that Catawba County is a significant employment destination for the three other study counties. These data provide another opportunity for the regionalization of public transit services. The following commuting patterns were indicated in the WPCOG analysis:

- From Alexander County – 4,223 commuters to Catawba County
- From Burke County – 5,600 commuters to Catawba County
- From Caldwell County – 6,079 commuters to Catawba County

### **Demographics Indicating Transit Needs**

The need for transportation services in an area is a function of the demographic and economic characteristics of the population, their access to alternative forms of transportation (personally-owned cars and trucks) and their physical and mental abilities to operate a vehicle.

Need is a relative concept, rather than an absolute one, and so an examination of need must provide for a comparison between areas or population groupings. It may not include a figure for the number of trips “needed” by the population in that area or group, because such a figure is inherently subjective and dependent upon the definition of need. “Need” is likely to be much larger than “demand,” which is the number of trips likely to be taken at a particular fare and service level.

Accordingly, this analysis uses 2010 Census data and American Community Survey data to present relative need in the study area. Relative need is calculated by ranking each Census Block Group with regard to the density and the percentage of the population in each of the following groups:

- Elderly persons 60-64 years of age
- Elderly persons 65 years of age and above
- Persons with disabilities, non-institutional, aged 18-64
- Persons with incomes below the poverty level
- Households with no vehicle available for use

This information is analyzed in two ways. The density of persons in each of these categories has been ranked, and the rankings summed to provide an overall ranking for each Block Group in the four counties. The high need areas in terms of people displaying transportation dependent characteristics are located in the Hickory area, Newton, part of Conover, part of Maiden, in the US 321-A corridor between Granite Falls and Lenoir, the northwest quadrant of Lenoir, in Morganton, along the US 70 Corridor in the vicinity of Valdese, along the Burke County/Catawba County border (north of Interstate 40), and in Taylorsville.

A similar analysis is performed using the same data, but calculating the percentage of the population in each of the categories for each block group, and then ranking the percentages and summing the rankings to produce an overall ranking of the percentages. This is done to determine if areas that have small populations might also have a high percentage of that population in need of transportation services. This analysis shows a somewhat different pattern, with more of the rural areas showing needs, as would be expected. There are several areas that exhibit high transit needs based on the density and the percentage analyses, and these are: Morganton, Valdese, the northwest quadrant of Lenoir, along the Burke County/Catawba County border (north of Interstate 40), areas along the US 321-A Corridor between Granite



Falls and Lenoir, portions of the Cities of Hickory, Newton, and Conover, Taylorsville and Maiden.

### **Demand for Rural General Public Transportation**

Qualitative information gathered for the regional study indicated that there is a lack of community transportation services to address general public needs. While WPRTA receives RGP funds from the State and provides limited services using these funds, there is not a sufficient level of unrestricted funds to provide a significant level of rural general public transportation.

In order to try to quantify the unmet need for general public transportation for the “Western Piedmont Regional Transit Authority Implementation Plan,” a model was used to predict the number of general public trips that could be expected given a particular level of service. The factors in the model include senior population, people with disabilities, population residing in families with income below poverty, vehicle miles of service available and size of County. For vehicle miles of service available, the most recent total miles for each of the four previously operating systems were used.

This model was only designed for rural areas, thus the WPRTA fixed-route service area was not included. The model predicted that there is a significant level of unmet demand for rural general public transportation in the region.

### **Public Transportation Coordinated Plan**

In July 2009, the North Carolina Department of Transportation (NCDOT), the Western Piedmont Regional Transit Authority (WPRTA), the Western Piedmont Council of Governments, and interested stakeholders, developed a regional coordinated plan that met the requirements of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and the Federal Coordinating Council on Access and Mobility (CCAM). This plan was developed for the Counties of Alexander, Burke, Caldwell, and Catawba, including the Cities of Hickory, Newton and Conover. The region includes the Census-designated Hickory Urbanized Area.

The development and content of this locally-developed coordinated plan is intended to be specific to the needs and issues of each region. This coordinated plan was developed to address intra- and inter-regional needs and issues, and in a manner that allowed the providers, concurrent with regional Long Range Transportation Plan (LRTP) updates, to directly update the regional coordinated plan. Further, the coordinated plan was developed in a manner that allows the WPRTA and WPCOG to adapt and expand the plan to incorporate programs and initiatives specific to the region.

Three specific areas of need were addressed in the plan:

1. Transportations Needs of Individuals with Disabilities, Older Adults and People with Low Incomes
2. Current Transportation Services and Resources
3. Unmet Transportation Needs

As a result of this locally coordinated plan priorities, strategies and projects were developed for the Hickory Urbanized Area.

## **Recommended Strategies, Potential Projects and Implementation Priorities**

### **Recommended Strategies and Potential Projects**

Recommended strategies and potential projects were derived from four major sources: the 2008 WPRTA Implementation Plan, the Coordinated Planning Workshop held on December 17, 2008, the Western Piedmont Local Coordinated Public Transportation Plan Update and the Coordinated Planning Workshop held on March 26, 2013. This section documents these strategies and projects.

### **WPRTA Implementation Plan**

While the WPRTA Implementation Plan was not primarily a service planning study, some logical service expansion ideas were discussed during development of the Plan. These concepts are based on the configuration of the urbanized area, coupled with the current demand for human service agency-based trips. The funding flexibility currently permitted for Federal Section 5307 transit providers in small urban areas would allow the introduction of deviated fixed-route services in the two urbanized corridors that do not currently have regular route service. Human service agency-based trips can be provided along these routes and the revenues derived from the agencies can be used as local match for the federal funds.

These corridors include the Lenoir to Hickory Corridor along US 321-A and the Morganton to Hickory Corridor along US 70. These corridor routes would have a fixed schedule with specific pick-up points, with some additional time added to the schedule for deviations. In order to make this service cost effective, it is proposed that these routes be based on the current human service agency demand for service in these corridors, with the current human service riders scheduled on these routes.

Other new services that could be developed in the region were cited in the 2008 Regional Plan and were discussed at a Coordinated Planning Workshop, including the following:

- Corridor service from Taylorsville to Hickory (NC 16 and NC 127)
- Corridor service from Taylorsville to Statesville (US 64 and NC 90)
- Circulator service in Morganton
- Circulator service in Lenoir
- Additional specific employment transportation service with extended hours/days of service
- Additional rural general public demand response/other modes of service delivery
- Additional human service contractual trips
- Additional urban general public demand response/other modes of service delivery
- Additional group type trips to support senior and disabled transportation to destinations such as congregate meals, group shopping, dialysis and more

### **Implementation Priorities**

In addition to identifying the region's transportation needs and what activities to coordinate, the Local Coordinated Plan Steering Committee also considered its priorities and how to implement them. It was important that the Western Piedmont Council of Governments (WPCOG) agree to be the lead agency given its flexibility and its ability to provide structure and institutional support on behalf of the local community.

As indicated by the facilitators at a planning workshop, one goal of the planning process was to examine public transportation services provided within Alexander, Burke, Caldwell and Catawba Counties. The needs and activities identified by the Steering Committee in terms of their priorities demand certain actions essential in the implementation of the Local Coordinated Public Transportation Plan. Therefore, it is important to place these actions in a strategic order. For example, actions that require little funding should be part of the first phase of implementation. Others may require more time to implement because they require Federal and State participation.

## **Priorities**

### WPRTA Education and Outreach

In an effort to meet some of the identified priorities, it is necessary to provide information and coordination on how best to address these needs. Interested stakeholders such as the Departments of Social Services and, Exodus House, Centro Latino, faith based organizations should be proactively involved in the process. . Local businesses are also important. The implementation of the new fixed route service in Taylorsville is the successful outcome of WPRTA education and outreach efforts with the elected officials of the town.

### Increased funding opportunities

The WPCOG can guide discussions among the Steering Committee members to develop a common message regarding the need to enhance human service transportation in the region and to identify specific methods to communicate these needs to decision makers. For example, it may prove helpful to develop fact sheets and other educational materials to inform local Boards of Commissioners and City and Town Councils of regional human service coordination goals, including the need for additional funding. It could also be beneficial to coordinate visits to elected officials to present the materials in person. A long-term strategy could also consist of identifying and seeking future opportunities, with the potential for a dedicated funding to support human service transportation and programs.

Some grant programs, such as Transportation for Elderly Persons and Persons with Disabilities (Sections 5310), Job Access and Reverse Commute Program (Section 5316) and the New Freedom Program (Section 5317) , may also be available to assist in implementing programs to support the region's coordination goals. The WPRTA should seek out such opportunities and prepare grant applications.

- Shared Agency Funding

Transportation funds are received by a multitude of human service agencies located within the service area. Developing better communication and coordination of this funding would maximize the availability of funding to the community. Referral of clients to other appropriate agencies for transportation funding is important for optimization of all available transportation funds.

- Opportunities for vehicle sharing

WPRTA and the WPCOG can develop guidelines to implement vehicle sharing among community-based organizations where practical. Because of its complexity, it will involve written agreements. A number of organizations own vehicles that are not operated in maximum service and could be available to others who either have no vehicle or need an additional vehicle to supplement their fleet at peak periods. Insurance, maintenance and

fees or in-kind payments will be some of the issues that would need to be addressed. The WPRTA could create a network of providers through its website, where they could learn which agencies may have vehicles available during evenings and weekends that could be used by human service agencies for their clients' activities.

- Establish guidelines for joint driver training

Several human service agencies in the region own their own vehicles. The WPRTA provides training for its drivers. One can envision that combining resources to offer joint training could have several advantages:

- An interchangeable pool of drivers for agency participants, who may need back-up drivers from time to time;
- Consistent quality assurance of drivers who have been through the training; and
- Less redundancy in training, now performed by individual agencies, which may gain them time for other tasks more critical to their core mission.

WPRTA, with its driver training infrastructure in place, could take the initial step in drafting guidelines for a joint driver training program.

- Evaluation and Review of Programs

The WPCOG and WPRTA will be responsible for collecting data and monitoring the coordination activities. The resulting information should be compared to the expectations developed as a short-term strategy. It is also important to document a more qualitative assessment of coordination activities to assess barriers that may have prevented successful program implementation, lessons learned or strategies that have been proven especially effective. The results of this evaluation should be shared with relevant stakeholder groups and future work should be modified to meet revised expectations.

### **Western Piedmont Local Coordinated Plan**

Development and content of locally-developed coordinated plans are intended to be specific to the needs and issues of each region. This coordinated plan was developed to address intra- and inter-regional needs and issues, and in a manner that allowed the providers, concurrent with regional Long Range Transportation Plan (LRTP) updates, to directly update the regional coordinated plan. The Local Coordinated Plan addressed three main issues.

#### Promoting Transportation Equity

While "transportation-disadvantaged" most obviously describes the physically impaired, it also can include those with mental disabilities, the elderly, as well as those who, because of personal or family economic circumstances, are unable to afford and maintain reliable personal transportation.

In order for these populations to enjoy the independent living and full participation in society, it is critical that they are provided transportation suited to meet their needs. Such options are as diverse as the populations they serve and the travel needs those populations have. This range of services may include public transit fixed-route service, specialized demand response, paratransit, ridesharing, taxi cabs and volunteer drivers. The trip purpose itself can vary from access to employment, medical care, childcare, education, recreation and social visits, among many others.

### Managing Resources Efficiently

The cooperation that comes from a coordinated effort can serve to develop strategies that will address gaps in coverage as well as eliminate duplication of service. When possible, it can also allow for the sharing of resources.

The resultant increase of efficiency and economies of scale can lower operating costs for many transportation providers. This is an important benefit given the often low resources and funding available. More importantly, coordination can increase the quality of life to those most in need of transportation by providing improved service at lower costs.

### Creating Economic Development Opportunities

Improving special needs transportation can create access to employment, job training, shopping, and other services for those who otherwise may not have such opportunities. Achieving the goals of the coordinated plan may therefore serve to promote self-sufficiency and equal opportunity for employment of individuals thereby contributing to the economic health of the entire community.

### **Western North Carolina Rail**

In March 2001, the NCDOT Rail Division adopted a phased plan to extend passenger rail service from Salisbury to Asheville and western North Carolina. The plan includes renovating or building train stations that incorporate other community uses. Current budgetary constraints have prompted the NCDOT to delay the return of passenger rail service to western North Carolina. Several local governments along the rail line have formed the Western NC Passenger Rail Task Force to promote passenger service on the railway. Improvements and upgrades would have to be made for the existing Norfolk Southern rail line to accommodate passenger trains.

# BICYCLE AND PEDESTRIAN

## Introduction

Inclusion of bicycling and walking as important parts of a region’s transportation system is beneficial in many ways. These non-motorized transportation modes can create vibrant communities while improving public health, boosting local economies and lessening the environmental impacts of travel.

## Current Conditions

### Built Environment

Ongoing research into how to measure the built environment has led to websites such as “Walk Score” ([www.walkscore.com](http://www.walkscore.com)) which provides easy access to quick analysis for people looking to locate walkable cities and towns. The website uses a scale that ranges from 0, described as “Car-Dependent,” to 100 which is a “Walker’s Paradise.” According to the website, each of the major cities that comprise the Greater Hickory MPO receive scores that qualify them as “car-dependent,” describing them as having “a few amenities within walking distance.” Currently there is no tool to measure how easy it is to bicycle within the metro region.

### Commuting Patterns

The majority of commuters in the metro area commute by private automobile. As shown in Table 7-1, bicycling and walking comprise only 1.3% of commuting modes. Just focusing on bicycling alone, the metro area is even with the state percentage of 0.2%, but is lower than the national average of 0.5% (U.S. Census; America Community Survey 2007-2011).

<b>Mode</b>	<b>Total</b>	<b>Percent</b>
Car, truck, or van	150,216	94.8%
Public transportation (excluding taxicab)	317	0.2%
Walked	1,743	1.1%
Bicycle	317	0.2%
Taxicab, motorcycle, or other means	1,268	0.8%
Worked at home	4,595	2.9%
<b>Total (workers 16 years and over)</b>	<b>158,456</b>	<b>100%</b>

### Local Planning Efforts

Several counties, municipalities, and recreational facilities have developed plans that support bicycling and/or walking. Table 7-2 highlights these plans from in and around the Metro Hickory area.

<b>Table 7-2 Local Planning Efforts</b>		
<b>Plan Title</b>	<b>Year Adopted</b>	<b>Sponsoring Local Government</b>
Granite Falls Pedestrian Plan	2011	Granite Falls
Carolina Thread Trail Master Plan	2010	Catawba County
Lake Norman Bicycle Route	2010	Catawba County
Urban Corridor SAP	2009	Burke County
Mission 2030 Master Plan	2009	Morganton
Rutherford College Comprehensive Plan	2009	Rutherford College
Hildebran Pedestrian Plan	2009	Hildebran
Alexander County Comprehensive Plan	2008	Alexander County
Conover Pedestrian Plan	2008	Conover
Conover Parks Master Plan	2008	Conover
Connelly Springs Sidewalk Plan	2008	Connelly Springs
Hudson Land Development Plan	2008	Hudson
Catawba County Parks Master Plan	2007	Catawba County
Catawba County UDO	2007	Catawba County
Greater Hickory Recreation/Tourism Plan	2006	Region
Lake James SAP Phase II	2005	Burke County
Long View Land Development Plan	2005	Long View
Hickory Greenway Master Plan	2005	Hickory
Connelly Springs Land Development Plan	2005	Connelly Springs
Town of Catawba Sidewalk Plan	2005	Catawba
Town of Maiden Pedestrian Plan	2005	Maiden
Taylorsville Sidewalk Plan	2004	Taylorsville
Conover Comprehensive Plan	2003	Conover
Town of Claremont Sidewalk Plan	2003	Claremont
Lake James SAP Phase I	2002	Burke County
Burke County Strategic Plan	2002	Burke County
Comprehensive Parks & Recreation Plan	2000	Burke County
Horizons: Land Development Plan	1999	Granite Falls
Newton Comprehensive Plan	1988	Newton

### **Statewide Planning Efforts**

The Division of Bicycle and Pedestrian Transportation of the North Carolina Department of Transportation is in the final stages of creating a statewide master plan focused exclusively on bicycling and pedestrian planning. North Carolina's first plan titled WalkBike NC includes a vision, goals and strategies for improving walking and bicycling for residents and visitors. The plan identifies current conditions for walking and bicycling in North Carolina and serves as a policy guide for state agencies, local governments and private sector interests to develop a transportation system that safely and efficiently accommodates walking and bicycling.

## **The Benefits of Bicycling and Walking**

In recent years, there have been an increasing number of studies which highlight the benefits of pursuing active transportation choices such as bicycling and walking. Municipalities across the United States and the South are implementing strategies to provide facilities and services that support bicycling and walking, out of their obligations to citizens to promote health, safety and welfare.

### **Health Benefits**

A growing number of studies show that the designs of our communities—including neighborhoods, towns, transportation systems, parks, trails and other public recreational facilities—affect people’s ability to reach the recommended daily 30 minutes of moderately intense physical activity.

According to the Centers for Disease Control and Prevention (CDC), “physical inactivity causes numerous physical and mental health problems, is responsible for an estimated 200,000 deaths per year, and contributes to the obesity epidemic.” (Raleigh Bicycle Plan). The CDC also determined that improving or creating places where citizens can be active could result in a 25 percent increase in the number of people who exercise at least three times a week (Raleigh Bicycle Plan).

Active transportation is especially important for older adults, who makes up a significant part of the population as the Baby Boomers are aging. Some health conditions which commonly affect older adults can be prevented or managed such as coronary heart disease, stroke, type 2 diabetes, depression and some types of cancer.

### **Regional Economic Benefits**

Research has found when communities accommodate bicycle and pedestrian transportation, there are numerous economic benefits. In regards to real estate, a study from 2002 found that trails and greenways were found to rank high on the list of desired community amenities. Another study from National Association of Realtors and the National Association of Home Builders indicated a positive connection between trails and higher property values.

From the tourism perspective, bicyclists can add value to local economies. Research conducted in the Outer Banks of North Carolina found that bicycling has the approximate annual impact of \$60 million. Broken down, that equals 1,407 jobs supported by 40,800 visitors for whom bicycling was an important reason for vacationing in the area. According to the study, the return on investment was nine times higher than what was earlier figured as reported by the North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation.

### **Personal Financial Benefits**

According to information provided by the Pedestrian and Bicycle Information Center, the household economic benefits of bicycling and walking are found on multiple levels, the most important of which is cost savings. The cost to operate an automobile is factored to be approximately \$8,220 per year compared to only \$308 annually needed for a bicycle.

Within the Greater Hickory area, the average annual cost per household for transportation is \$14,930.28. As a percentage, the amount equals roughly 1/3 of a household income according to the Housing and Transportation Affordability Index (2013). Specific percentages are found in Table 7-3.



Table 7-3 Percent of Household Income Spent on Transportation	
Area	Percent
Hickory Metro	37.2%
Alexander	39.4%
Burke	37.8%
Caldwell	37.6%
Catawba	36.1%

Research has shown that forty percent of trips are within two miles of home (National Household Travel Survey). Further research has shown that taking at least one four-mile round trip by a non-motorized mode of transportation would save approximately 2 billion gallons of fuel or \$7.3 billion annually, assuming gasoline cost of \$4 per gallon (Sierra Club).

Persons who might not choose to bicycle or walk to work or errands can still benefit economically. Congestion is an ongoing issue in many metropolitan areas, both large and small. A study titled “Business Impacts of Charlotte Travel Congestion” and released in 2007 examined the cost of congestion in the Charlotte metro region. The study found that in 2005, congestion had a total impact of \$484 million on the economy and an estimated \$968 per worker in lost productivity.

**Environmental Benefits**

Research has shown that if people use less motorized transportation and more active transportation, there is a reduction in the measurable amount of air pollutants that are emitted into the atmosphere. Other environmental benefits include a reduction in noise levels within neighborhoods and less discharge of automobile-related fluids into lakes and streams. Trails and greenways also benefit the environment by safeguarding ecologically sensitive areas, protecting large areas of plants that clean the air of pollutants, and creating a buffer zone for water-bodies.

**Existing Facilities**

Bicycle and pedestrian system amenities in the GHMPO are primarily focused in the center business districts of specific cities and towns. As shown on the “Bike, Pedestrian, Greenway Network Maps” of Alexander, Burke, Caldwell and Catawba Counties, the pedestrian network in the region is lacking connectivity (Maps 7-10 through 7-13). Many of the municipalities’ pedestrian networks do not have adequate connectivity for a safe walking environment and some towns lack sidewalks completely. There are a limited number of designated bicycle routes; these are primarily located in the City of Morganton. Existing greenways are generally short segments located in municipalities or recreational areas and primarily used for exercise and recreation.

Some existing bicycle and pedestrian routes represent safe, user-friendly design. Examples include separating the walker from the roadway using curbing and planting strips, increased lighting for safety, and bicycle lanes painted on roadways. Many bicycle and pedestrian paths are not user-friendly and discourage use. Lack of designated crosswalks, broken and uneven pavement, and inadequate signage are examples of poor design.

### **Carolina Thread Trail**

In September 2009, Catawba County received a planning grant to develop a Carolina Thread Trail (CTT) Master Plan to include all jurisdictions in the county. Specifically, the goals of the planning process were to have the county and cities work together to develop a plan that identified trail corridors, designated the backbone of the network as the Carolina Thread Trail, and outlined an action plan for implementing prioritized segments of the Thread.

The plan, developed by a 32-member Steering Committee, utilizing public input, was adopted by Catawba County and its seven municipalities in late 2010. The recommended CTT route represents 126 miles of trails connecting destinations throughout the county. These routes are depicted as a ¼ mile-wide swath since actual trail alignment will depend upon existing conditions, availability of land, rights-of-way, landowner interest, and future opportunities. Also included in the plan are 112 miles of secondary routes which are alternative CTT routes or trails providing additional connectivity. In developing the Plan, the County met with the adjoining counties in the Unifour region to ensure connectivity to current or future trail projects in their jurisdictions. Approximately 56,500 people, over 1/3 of the county's population, live within ½ mile of the proposed Thread Trail network. Many of the county's priority destinations are within a ¼ mile distance, including 90% of the town centers, 100% of the historic districts, 50% of the colleges and universities, and 75% of the identified agricultural tourism sites. The Thread Trail route utilizes a broad mix of corridor types to provide a diverse experience:

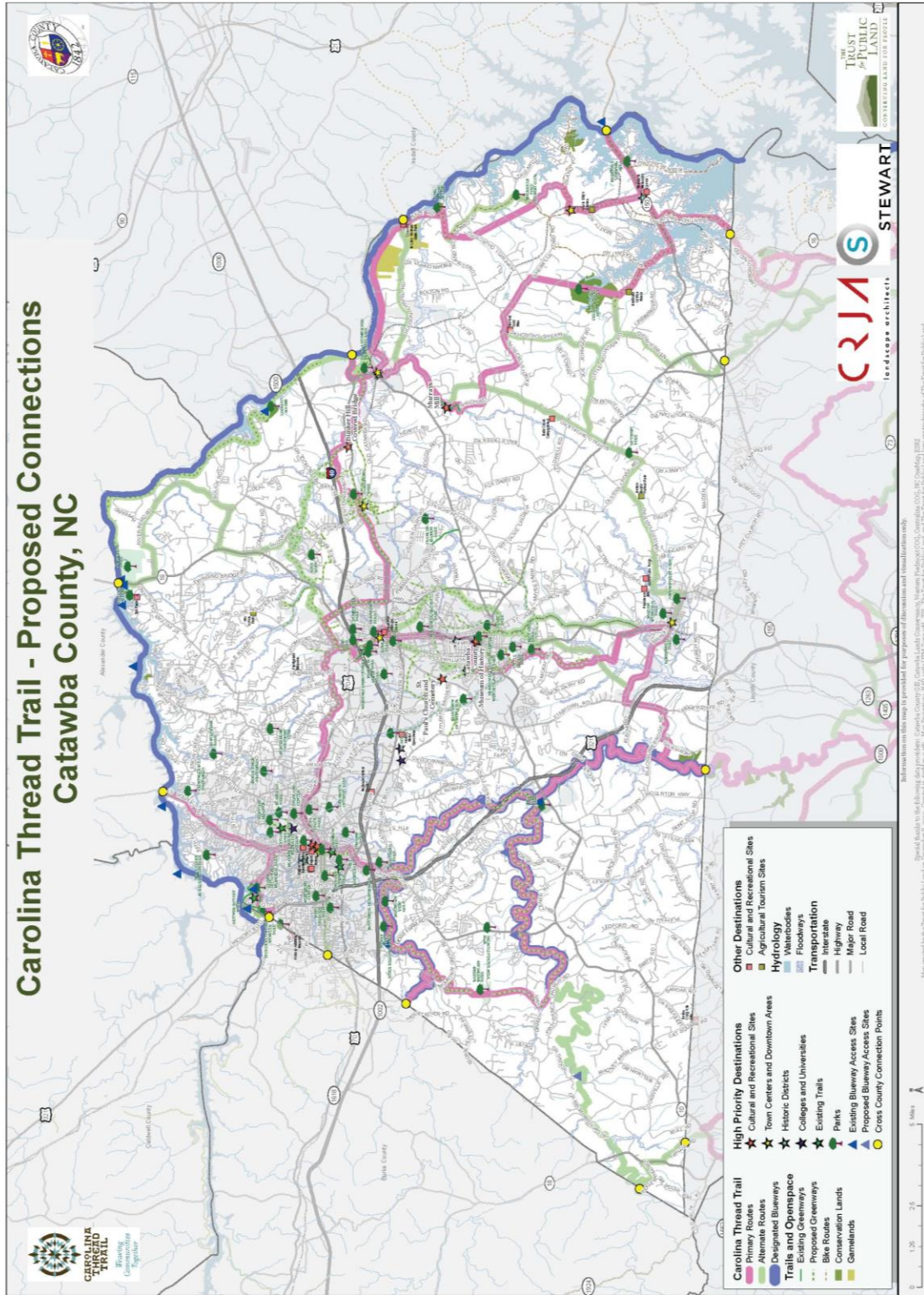
- Riparian (river) corridors (45%)
- Road rights-of-way (23%)
- Sidewalks (21%)
- Utility easements (5%)
- Miscellaneous corridors (3%)
- Existing greenway trails (3%)

Since adoption of the plan, a countywide Greenway Trails Advisory Committee was formed to begin implementation of the CTT Plan. To date, the committee has prepared a brochure on the CTT network in the county, conducted a signing day event for trails in Hickory, Conover, Newton and Catawba County, and is working with CTT on signage for sidewalk networks in the municipalities. Catawba County also has secured a CTT acquisition grant for land adjacent to Bunker Hill Covered Bridge (one of the top destinations on the CTT route) and will be constructing a .4 mile greenway segment along Lyle Creek in late 2013. The City of Conover has also secured CTT funding for land acquisition to construct a segment of the Lyle Creek greenway according to the Catawba County Planning, Parks, & Development Department.

On March 28<sup>th</sup>, 2013, The Unifour Rural Planning Organization's Transportation Advisory Committee passed a resolution supporting the accommodation of bicycle and pedestrian facilities along NC 150. The inclusion of bicycle and pedestrian facilities into the NC 150 widening project is important to the CTT as it serves as one of its primary routes in southeastern Catawba County. The Lake Norman Bicycle Route will also benefit from friendly and safe bicycle and pedestrian facilities along NC 150.

# Map 7-1

## Carolina Thread Trail – Catawba County Proposed Connections

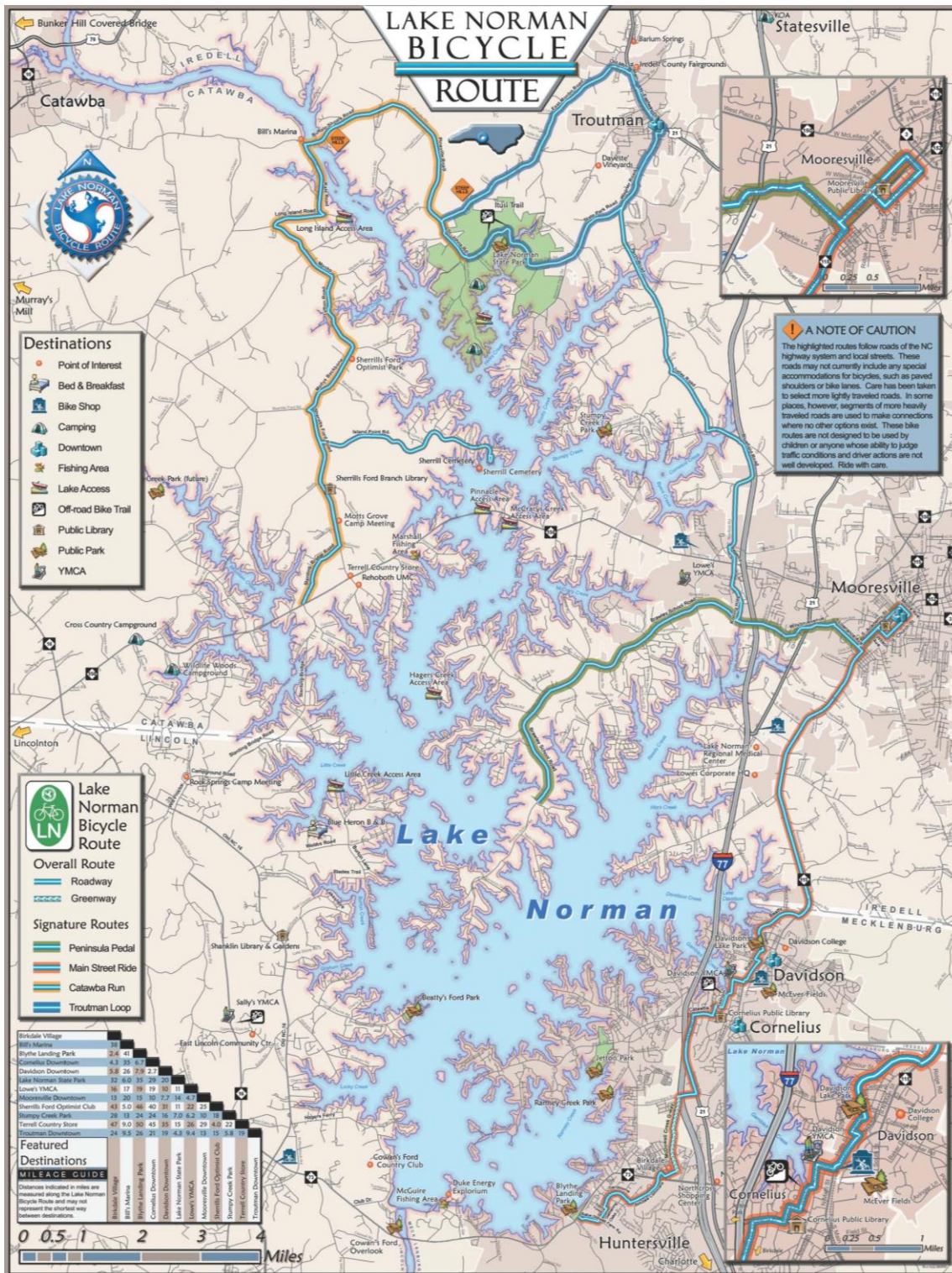


### **Lake Norman Bicycle Route**

Lake Norman Bicycle Route (Map is the first regional bicycle plan approved in the State by NCDOT. The planning process brought together the four counties surrounding Lake Norman, and their municipalities, to develop a connected bicycle route for all levels of users. The adopted Lake Norman Regional Bicycle Route includes 52 segments which were evaluated to define an initial route and an ultimate route. The initial route includes the segments that can be completed in the short-term. In all, the initial route is 89 miles long with 3 miles of off-road trail segments. The ultimate route is the ideal route that will eventually be possible and will be 117 miles long with 16 miles of off-road segments. After designating the route, the plan identified the priority for the route's 52 segments to be implemented based upon nine variables such as safety, linking residents to destinations, demand, scenic view and cost-effectiveness.

Relative to Catawba County, the LNBR Plan identifies 15.6 miles of initial route and 32.3 miles of ultimate route, which is broken up into 11 segments. The route is primarily planned for on-road facilities with a short off-road multi-use path proposed adjacent to Island Point Road. Of the 11 segments in the county, four ranked as a medium priority and seven as a low priority, primarily due to safety and cost effectiveness of widening existing roads. Included in the plan is a Catawba County signature route, referred to as the "Catawba Run." The "Catawba Run" traverses the western shore of Lake Norman from Hudson Chapel Road to Sherrills Ford Road and Slanting Bridge Road. This route connects to Iredell County at the upper end of the lake and forms a north/northwest rural excursion around Lake Norman. This route has been signed as the Lake Norman Bicycle Route for bicycle riders to enjoy.

## Map 7-2 Lake Norman Bicycle Route



### **The Over Mountain Victory Trail**

The Over Mountain Victory Trail through Virginia, Tennessee, North Carolina, and South Carolina retraces the route of patriot militia as they tracked down the British during the Revolutionary War. The two forces eventually met and fought resulting in a patriot victory at the Battle of Kings Mountain. When completed, the trail will be a 330 mile non-motorized route for hiking, horseback riding and bicycling. Portions of the trail are already in place, with four designated sections in the region. The completed sections include the 1 mile Patterson School Over Mountain Trail in Caldwell County, a 4.1 mile segment known as trail #308-road #1238 in the Pisgah National Forest (Burke County), a 1 mile trail in the 1780 Development (Burke County), and 5 miles of the Catawba River Greenway in the City of Morganton. The Over Mountain Victory Trail is proposed to connect to the Carolina Thread Trail, the Appalachian Trail, Caldwell Pathways network, and the Mountains-to-Sea Trail.

### **Mountains-to-Sea Trail**

The Mountains-to-Sea Trail (MST) stretches 1,000 miles from Clingmans Dome in the Great Smokey Mountains to Jockey's Ridge on the Outer Banks. Currently, more than 500 miles of the footpath are built. With temporary connectors on back roads and state bicycle routes, people can now hike across the state. When completed, the route will pass through 37 counties containing about 40 percent of the state's population. The trail is used by people out for an afternoon stroll as well as those planning to hike the trail from one end of the state to another. Approximately 36 proposed miles of the MST are found within Burke and Caldwell counties (Friends of the Mountains-to-Sea Trail).

### **Caldwell County Pathways**

The non-profit organization Caldwell Pathways is dedicated to the planning and development of multi-use trails in Caldwell County. Caldwell Pathways completed a master plan in October of 2004, and portions of the trails proposed in the master plan have been constructed. Major trails and corridors included in the plan are the City of Lenoir's Greenway, the Yadkin River corridor, and Johns River corridor. Connections to the Over Mountain Victory Trail, Carolina Thread Trail, and Mountains-to-Sea Trail are proposed.

## **Objectives and Policies**

### **Objective**

The objective of bicycle and pedestrian transportation in the GHMPO is to create a safe, effective bikeway/sidewalk/greenway network that is integrated to the transportation system, links together resources and destinations, provides an alternative to automobile travel, increases recreational opportunities, advances healthy lifestyles, and enhances the quality of life in the Greater Hickory Area.

### **Policies**

The recommended policies to achieve the stated objective are to:

- Provide a pedestrian and bicycle system that is a safe alternative means of transportation, allows greater access to public transit, supports recreational opportunities and includes off-road trails and greenways.
- Develop a transportation system that integrates pedestrian and bicycle modes of transportation with motor vehicle transportation and encourages the use of walking and bicycling as alternative modes.

- Develop a continuous, direct, safe and coordinated system of regional bicycle facilities in the GHMPO Planning Area.
- Provide a pedestrian and bicycle system that is connected inter-regionally, for example the Carolina Thread Trail.
- Promote, through public education, the environmental, health, and economic benefits of walking and bicycling as practical modes of transportation.
- Develop a regional bicycle and pedestrian system that establishes links between activity centers, public transit, schools, parks, and other major destinations.
- Recommend that when new roads are proposed or when existing roads are widened, design plans include land on each side of the road of sufficient width to safely accommodate bicycle and pedestrian facilities.
- Encourage the delineation of safe pedestrian ways and bicycle routes, emphasizing separation from vehicular areas.
- Recommend the installation of signage when bicycle routes or pedestrian ways are integrated with roads, so that bicyclists, pedestrians, and motorists will be made aware of each other.

## **Recommendations**

In order to improve bicycling and walking within the Hickory metro, energy will need to be focused on efforts in five specific areas, based on focus areas used by both the Bicycle Friendly Community and Walk Friendly Community programs to evaluate efforts to enhance and improve active transportation.

### **Engineering**

When citizens think of their community as bicycle or pedestrian friendly, they might first think of the existing infrastructure and how accommodating and safe it is. Engineering can encompass everything from striping roadways to provide clear crosswalks, bicycle lanes, and shared-lane marking “sharrows” to the design of pedestrian- and bicycle-only bridges and greenways. Whichever type of engineering is chosen for a particular project, the final product needs to be safe, easy to use, and clear in its purpose.

### **Education**

Educated drivers, bicyclists, and pedestrians lead to safer modes of transportation. In addition, improving the existing bicycle and pedestrian facilities will increase safety and reduce crashes. During the five year period from 2003 to 2007, there were 269 crashes involving pedestrians in Alexander, Burke, Caldwell, and Catawba Counties; a total of 29 fatalities resulted from those crashes. There were 81 crashes involving bicyclists that occurred in the four counties during the five year period from 2003 to 2007 resulting in 4 fatalities according to the North Carolina Department of Transportation’s Safety Division. A full listing of crashes from 2000 to 2012 can be found in tables 7-4 and 7-5.

**Table 7-4  
Bicycle Crashes**

County	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Alexander	1	0	3	0	2	0	1	0	0	0	1	0	0	8
Burke	3	12	5	5	0	4	5	7	5	6	6	1	1	60
Caldwell	4	5	5	2	6	2	6	6	6	1	4	2	7	56
Catawba	15	15	4	13	9	9	11	12	10	16	19	9	4	146

**Table 7-5  
Pedestrian Crashes**

County	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Alexander	3	3	2	4	4	0	0	4	2	4	3	0	2	31
Burke	18	21	17	18	15	14	11	19	17	15	9	7	11	192
Caldwell	17	19	11	15	23	26	12	21	18	17	16	15	6	216
Catawba	44	37	33	43	44	34	52	37	37	54	57	18	31	521

Education and awareness are key factors in achieving the goals of the bicycle and pedestrian element. According to state law, a bicyclist is considered a vehicle operator and should not be treated as a pedestrian unless the bicycle is being pushed. Drivers need to be aware of cyclists and learn to share the road just as if a bicycle were another motor vehicle on the road. Cyclists need to be educated on the rules of the road. Many accidents involving bicyclists can be attributed to cyclists not following rules such as riding on the wrong side of road and disregarding traffic control devices. Adequate street lighting and enhanced signage, markings, and crosswalks will help the automobile driver become aware of cyclists and pedestrians.

**Enforcement**

With a greater number of bicycle and pedestrian users expected in the future, a number of enforcement improvements are recommended to improve safety.

- Law enforcement officials should be knowledgeable of bicycle and pedestrian laws in the state and carry NCDOT’s “A Guide to Bicycle and Pedestrian Laws.”
- Develop and use targeted enforcement strategies which would focus on speeding, not yielding to bicycle and pedestrians, automobiles parking on bicycle lanes, and drivers failing to pass bicyclist in a safe manner. Targeted Enforcement can also include focusing on unsafe behavior by bicyclists and pedestrians themselves.
- Within cities, place police on bicycles and start trail patrol programs run by volunteers.
- Create an enforcement hotline for users of bicycle and pedestrian networks.
- Train law enforcement officials in accurate accident reporting of bicycle and pedestrian crashes involving automobiles.



## **Encouragement**

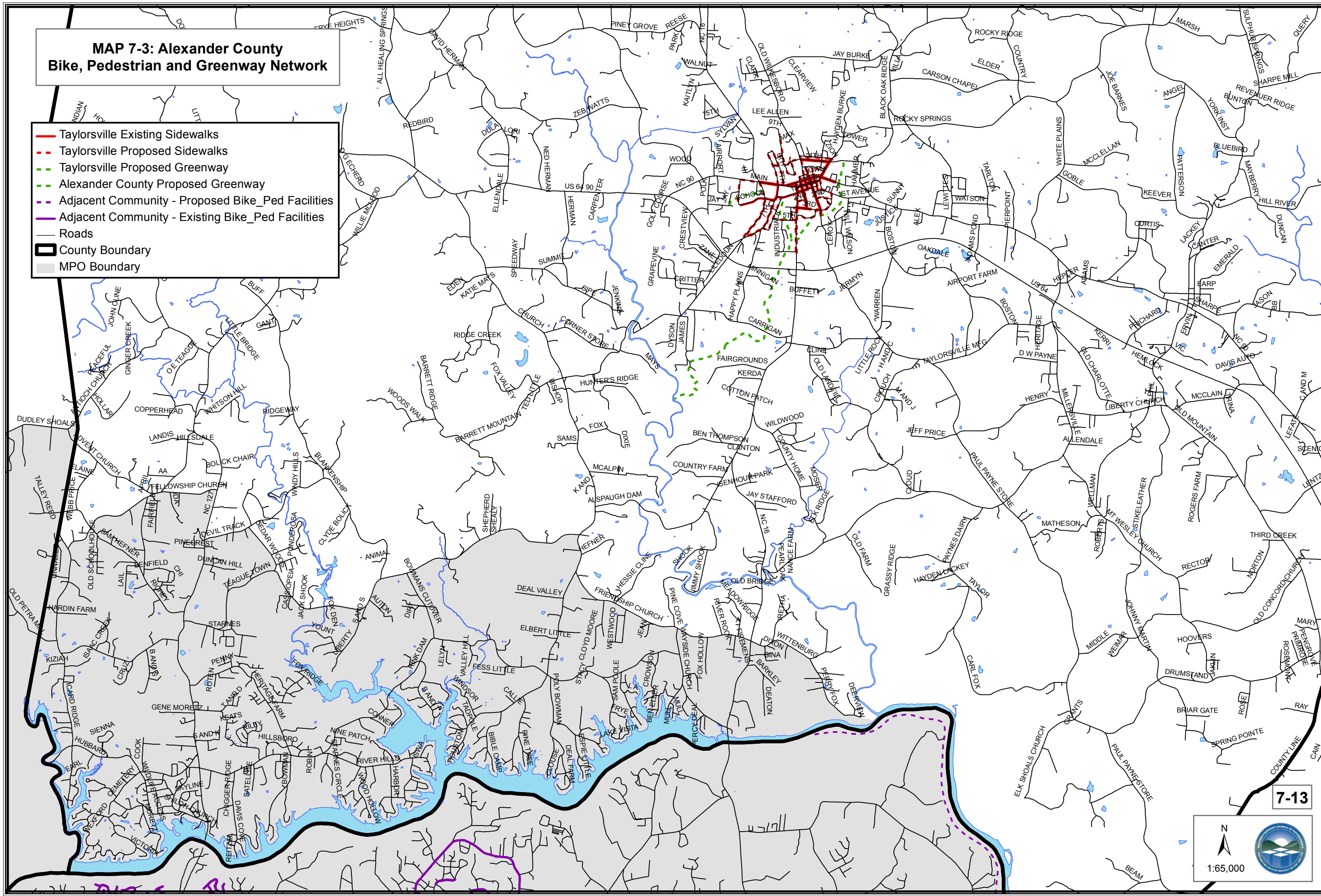
A number of programs have been used, both statewide and nationally, to encourage the use of bicycling and walking as viable modes of transportation. Programs can include events, program and facility advancements, and incentives. All of these events should be promoted using a wide range of media such as television, newspaper, website, local organizations, neighborhood associations, public schools, and universities.

A sample of potential encouragement programs could include:

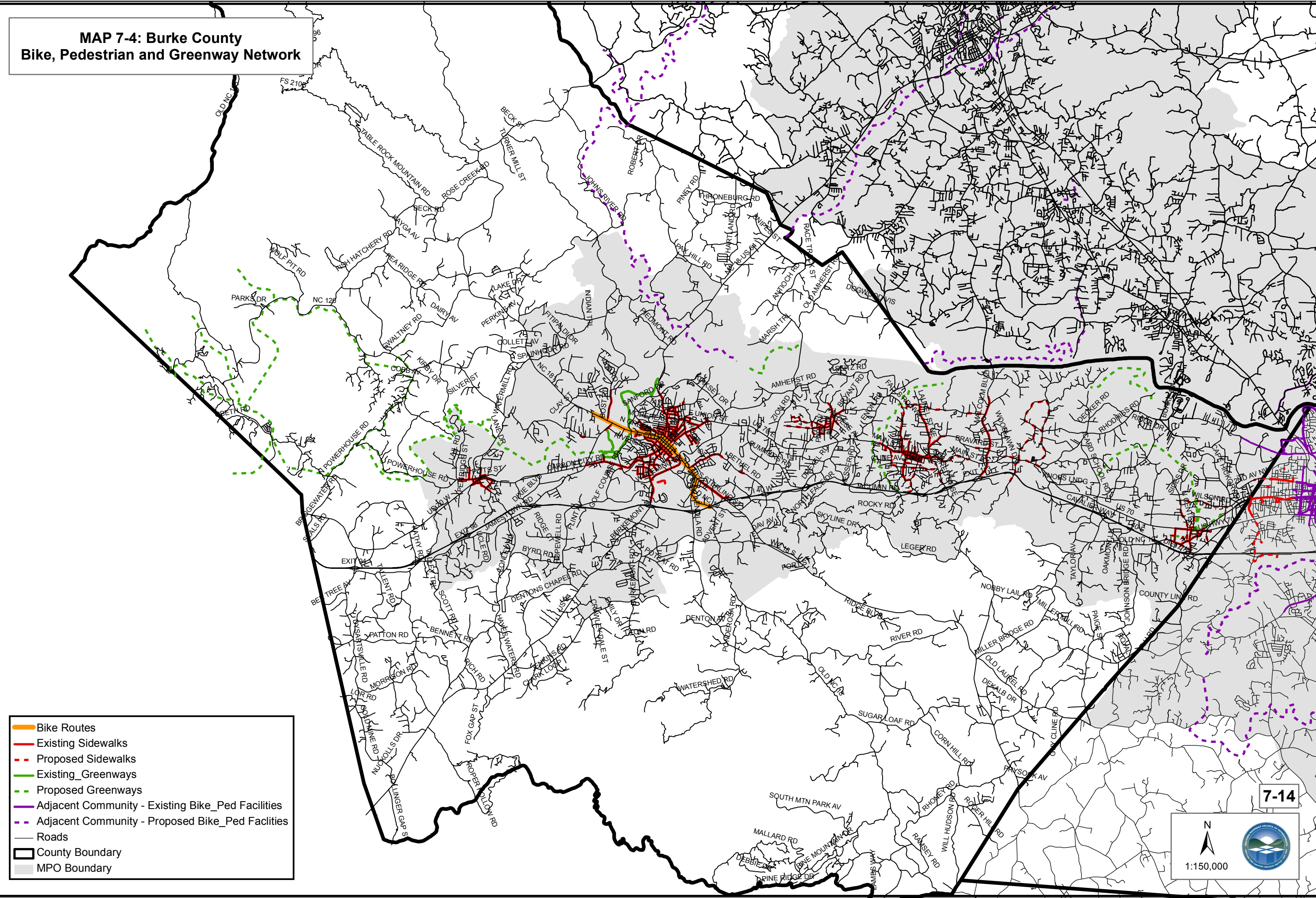
- Events
  - Awareness days
  - National Bike Month Promotion
  - Bicycle and Walk to Work Day/International Car Free Day
  - Annual/Regular Commuter Events
  - Bicycling and Walking for Health Events
- Program and Facility Improvements/Advancements
  - Safe Routes to Schools
  - Walk a Child to School in North Carolina
  - Production and distribution of a bicycle map
  - Signed bicycle routes
  - Special Higher Education-Based Programs
  - Pedestrian, Bicycle, and Transit Wayfinding Plan
  - Transportation Demand Management strategies
- Incentives
  - Energy/fuel savings program
  - Active living by design
  - Youth activities
  - Helmet promotions
  - Guided tours and interpretive trails
  - Bicycling, walking, running, and outdoor clubs

# MAP 7-3: Alexander County Bike, Pedestrian and Greenway Network

- Taylorsville Existing Sidewalks
- - - Taylorsville Proposed Sidewalks
- - - Taylorsville Proposed Greenway
- - - Alexander County Proposed Greenway
- - - Adjacent Community - Proposed Bike\_Ped Facilities
- Adjacent Community - Existing Bike\_Ped Facilities
- Roads
- County Boundary
- MPO Boundary

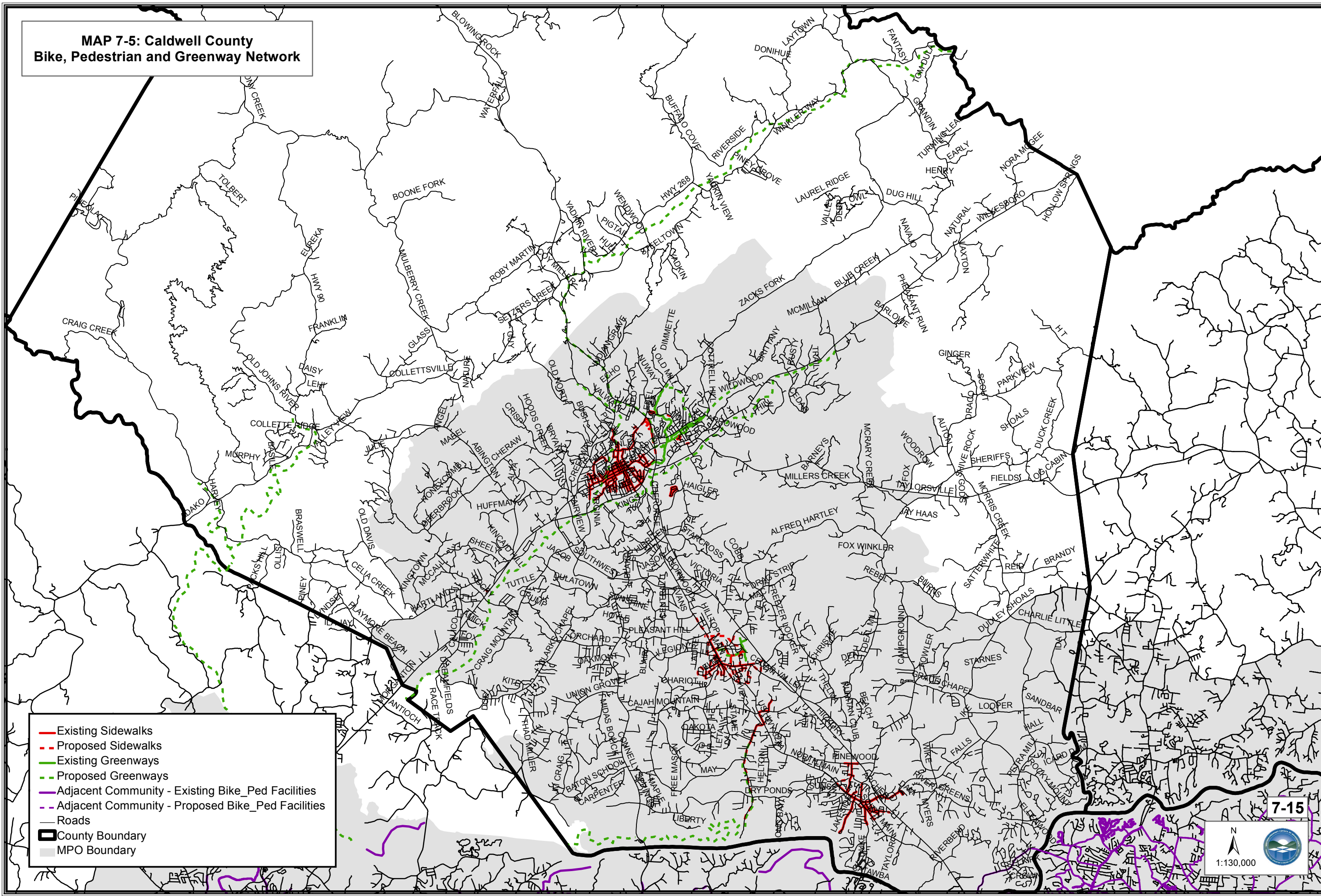


**MAP 7-4: Burke County  
Bike, Pedestrian and Greenway Network**



- Bike Routes
- Existing Sidewalks
- - - Proposed Sidewalks
- Existing Greenways
- - - Proposed Greenways
- Adjacent Community - Existing Bike\_Ped Facilities
- - - Adjacent Community - Proposed Bike\_Ped Facilities
- Roads
- County Boundary
- MPO Boundary

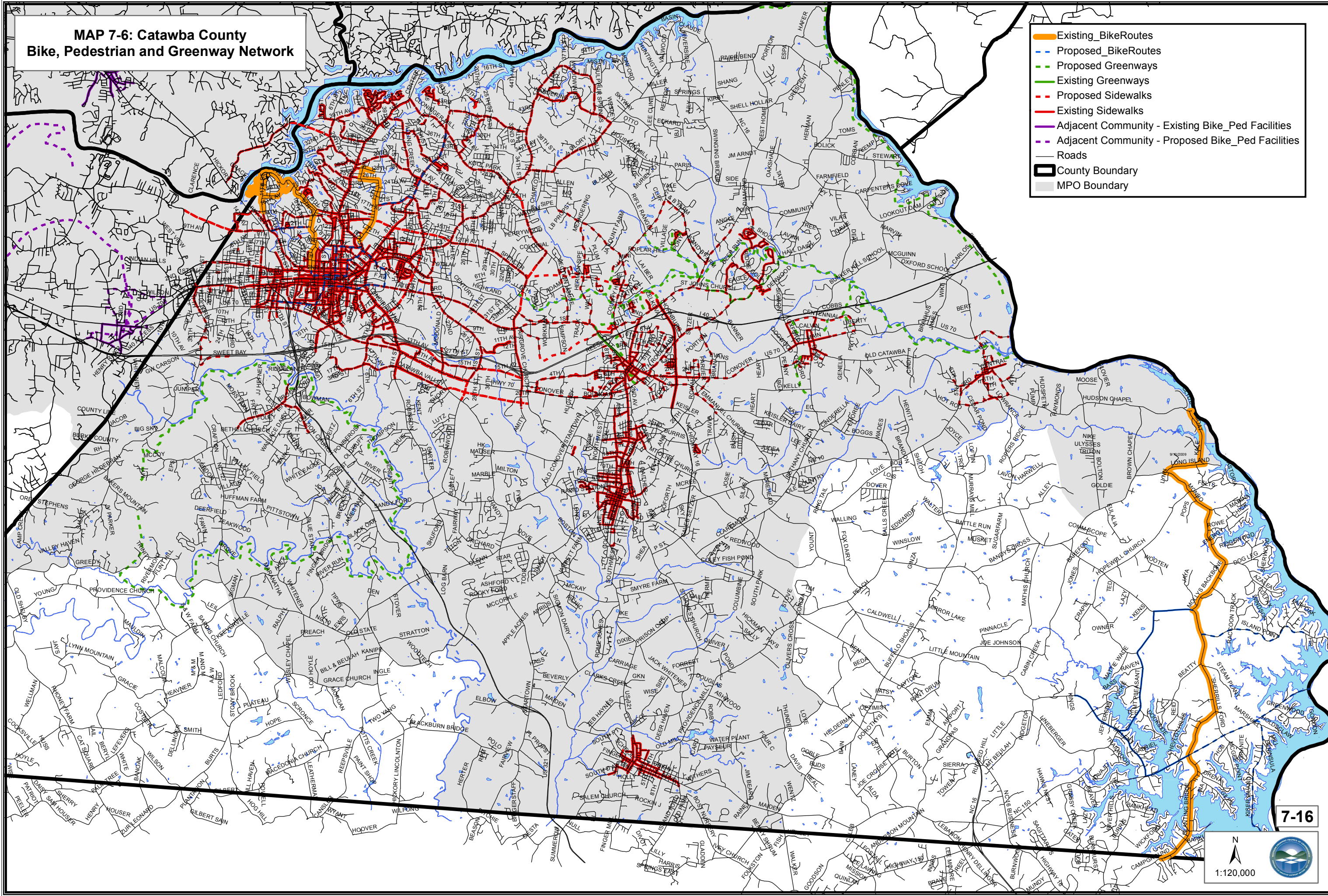
**MAP 7-5: Caldwell County  
Bike, Pedestrian and Greenway Network**



- Existing Sidewalks
- - - Proposed Sidewalks
- Existing Greenways
- - - Proposed Greenways
- Adjacent Community - Existing Bike\_Ped Facilities
- - - Adjacent Community - Proposed Bike\_Ped Facilities
- Roads
- County Boundary
- MPO Boundary

**MAP 7-6: Catawba County  
Bike, Pedestrian and Greenway Network**

- Existing\_BikeRoutes
- - - Proposed\_BikeRoutes
- - - Proposed Greenways
- Existing Greenways
- - - Proposed Sidewalks
- Existing Sidewalks
- Adjacent Community - Existing Bike\_Ped Facilities
- - - Adjacent Community - Proposed Bike\_Ped Facilities
- Roads
- County Boundary
- MPO Boundary



# **SAFETY AND SECURITY**

## **Introduction**

Special concerns and emphasis on safety and security have dramatically increased in the wake of the events of September 11, 2001. Prior to SAFETEA-LU the language for safety and security stated “increase the safety and security of the transportation system for motorized and non-motorized users.” With the passage of SAFETEA-LU, the language now reads, “increase the safety of the transportation system for motorized and non-motorized users” and “increase the security of the transportation system for motorized and non-motorized users.” Ensuring that safety is addressed at the planning level is important for SAFETEA-LU requirements. Ways to incorporate safety in transportation are reflected in the American Association of State Highway and Transportation Officials Strategic Highway Safety Plan and the North Carolina Strategic Highway Safety Plan. Through proper engineering, education, enforcement and emergency management, a safe transportation network can be provided to the region.

Transportation planning plays a role during the engineering and the development of the physical improvements to the transportation system. The transportation planner’s responsibility is to provide the transportation improvement process with data and safety principles and to facilitate the development of safety strategies. Education is generally handled by the Governor’s staff for highway safety. “Click It or Ticket” is an example of one of the educational programs. Education can also be conveyed through driver’s education courses. Enforcement is important to the success of programs such as “Click It or Ticket.” Safety laws are only effective if they are enforced. Crash data collected in the field by emergency services personell are the basis on which safety programs are developed. Even with excellent enforcement and safety planning, accidents will happen. Quick emergency medical service can mean the difference between life and death and can reduce injury severity when crashes occur. Intelligent Transportation Systems tools can manage the safe flow of traffic if an accident occurs. The City of Hickory has installed these tools on a number of the traffic lights.

Enhancing highway safety is critical to the health and well being of the citizens of North Carolina and those who travel and conduct business on our streets and highways. Without the continued substantial improvement in highway safety, traffic crashes will continue to be a leading cause of death and injury for a large segment of the population, as well as a major socio-economic drain on the resources of government and the people of this State.

## **Streets and Highways**

A major source of crashes is congestion on the roads. The collection of accurate crash data will help planners identify high-crash intersections and corridors and determine the type of crash and the contributing factors. The data are valuable in identifying and designing transportation improvements. One goal of the GHMPO and Unifour RPO is to develop an efficient street and highway network to provide appropriate levels of service. Travel efficiency and level of service are directly related to congestion. Engineering new roads and improvements to reduce congestion on existing roads will effectively provide a safer transportation network.

The Strategic Highway Network (STRAHNET) is an important element in the security of the region, state and nation. STRAHNET provides the military with access, continuity and emergency transportation of personnel and equipment. The system totals 61,000 miles of public highways designated by the Federal Highway Administration in partnership with the Department of Defense. Approximately 45,400 miles of Interstate and defense highways and about 15,600 miles of other highways make up the STRAHNET system. Additional highway routes link more than 200 military installations and ports to the STRAHNET system. The roads in the STRAHNET system are designed to support large military convoys and rapid mobilization and deployment of armed forces. In the GHMPO and Unifour RPO, I-40 and US 321 are the two designated Strategic Highway Network routes.

Strategic Highway Corridors are highways designated by NCDOT that provide mobility, connectivity to activity centers, Interstate highway connections and alternate routes to Interstate highways. There are

five Strategic Highway Corridors that traverse the GHMPO and Unifour RPO region: I-40, US 321, NC 18, NC 16 and NC 150 (*see map XX, "Unifour Strategic Corridors"*).

## **Transit System**

Western Piedmont Regional Transit Authority's (WPRTA) mission is to develop and maintain an effective, efficient and safe system of public transportation services within Alexander, Burke, Caldwell and Catawba Counties.

The WPRTA offers interactive training programs to educate its employees. Each employee must follow the "Western Piedmont Regional Transit Authority: Operators Handbook." This document outlines how the personnel should perform in their normal duties and in emergency situations such as crashes. The Federal Transit Administration publishes informational guides and booklets for workplace violence, transit system security and the recognition and reaction to terrorist activity. The booklets are provided to each employee of the WPRTA.

The Reaction and Recognition guide addresses prevention, spotting suspicious activity and items, responding to threats, information gathering and reporting. The Workplace Violence guide describes how to prevent and respond to violence committed by transit users or employees. It outlines how to deal with difficult people and recover from the effects of violence in the workplace.

## **Bike and Pedestrian Network**

The National Highway Traffic Safety Administration has determined that pedestrian crashes are more likely to occur during peak travel periods in the morning and afternoon. Most crashes with pedestrians will occur in urban areas where the volume of pedestrian and vehicle traffic is high; however, rural areas can also be dangerous for pedestrians due to the lack of sidewalks, paths, wide shoulders and cross walks. Driver behavior is a factor as well; speed and alcohol involvement have an impact on many crashes with pedestrians.

The Safe Routes to Schools program encourages and enables children to walk and bike to school by making these activities safe. It also supports the planning, development and implementation of projects that improve safety and reduce traffic, air pollution and fuel usage in the vicinity of schools. The program is funded through federal highway allocations to each state to implement the program.

Methods to improve safety for pedestrians and bicyclists include designating crossings, providing grade separations between roads and sidewalks and constructing pedestrian refuge islands. The Transportation Planner's Safety Desk Reference is one source of additional safety strategies and improvements.

## **Security and Emergency Management**

The National Guard maintains a database of state and local emergency responders called the Regional and State Online Resource for Emergency Management. The National Guard has located every fire, police, hospital, and local EMS provider across the country and has created a searchable database and mapping system. The Guard is also developing the US-Nexus project, an avatar-based virtual world for government-wide training. Users will be able to walk around the virtual city and complete training by visiting the police stations, fire departments, EMS stations, etc. The five (5) Army National Guard bases in the region, located in Morganton, Lenoir, Taylorsville, Hickory and Newton, serve to supplement the regular armed forces and assist during national emergencies and declared states of emergency.

Alexander, Burke, Caldwell and Catawba Counties have each adopted Hazard Mitigation Plans, which provides guidelines for evacuations, containment and first responder actions. These plans are written through coordination with transportation, law enforcement, planning and operational agencies.

All four counties operate 9-1-1 systems to serve the communities and local government agencies with effective communication services and facilitate communications for public safety agencies.

# NATURAL ENVIRONMENT

## Consultation

### Introduction

As it developed the LRTP, the GHMPO took the opportunity to consult with environmental agencies and conduct a system-wide review of potential environmental impacts. The LRTP consultation process is an initial step in identifying impacted areas and adjusting project alignments to avoid or minimize impacts to natural resources. It also allowed the MPO to make informed decisions when setting project priorities for the urban area. The consultation process ensures a transportation plan that minimizes negative impacts on the natural environment and is more efficient, timely and cost-effective.

Federal regulations require that:

*The MPO shall consult, as appropriate, with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of the transportation plan. The consultation shall involve, as appropriate,*

- (1) a comparison of transportation plans with state conservation plans or maps, if available; or*
- (2) a comparison of transportation plans to inventories of natural or historic resources, if available (23 CFR450.322).*

This consultation plan not only meets the intent of the MAP 21, but ensures that the GHMPO develops a transportation system that protects and enhances the environment and maintains the quality of life in our community.

### Plan

The Greater Hickory MPO encouraged the participation of resource agencies throughout the development of the Long-Range Transportation Plan (LRTP).

Every agency was contacted at the milestones where that agency's input would have a significant impact of the development on the LRTP.

- The Greater Hickory MPO compared the proposed transportation plan to available maps, inventories, plans, policies and strategies as listed by the agency contacts. The MPO provided resource agencies with an opportunity for review and comment prior to decision points where agencies' input was significant.
- The Greater Hickory MPO provided the resource agencies with an outline or schedule for the development of the LRTP.
- The Greater Hickory MPO used e-mail, website, telephone, private face-to-face and public meetings to ensure that our process was accessible to resource agencies.
- The Greater Hickory MPO provided written or email notice to the resource agencies of upcoming public review meetings or public comment periods being held on the draft and final LRTP and TIP, and transportation conformity process.



- Amendments to the LRTP and TIP requiring a transportation conformity determination and/or analysis (additions or deletions of regionally significant projects) followed the same consultation notification as listed above.
- Documentation of resource agency contacts and any comments received by the MPO are included in the appendices of this chapter of the LRTP. A summary of comments and changes to the LRTP and/or the analysis and mapping as a result of the resource agency comments is included under the “Summary of Resource Agency Comments” heading at the end of this section of this chapter.

### **Land Use Management**

The Greater Hickory MPO has sought to integrate land use management into the transportation planning process on an ongoing basis. The goals and objectives of the 2040 LRTP are consistent with those of the adopted land use plans of jurisdictions in the MPO. In addition, the MPO maintains continuous consultation with land use planning departments in the MPO area, since planning staff from municipalities and the four counties in the region serve as members of the MPO’s Technical Coordinating Committee (TCC).

### **Historic Preservation**

In addition to consulting with the NC State Historic Preservation Office, MPO staff, as part of the update of this 2040 LRTP, sought comments from County and municipal historical societies and organizations. Historic sites in Alexander, Burke, Caldwell and Catawba Counties were mapped and verified with local historical groups in each county.

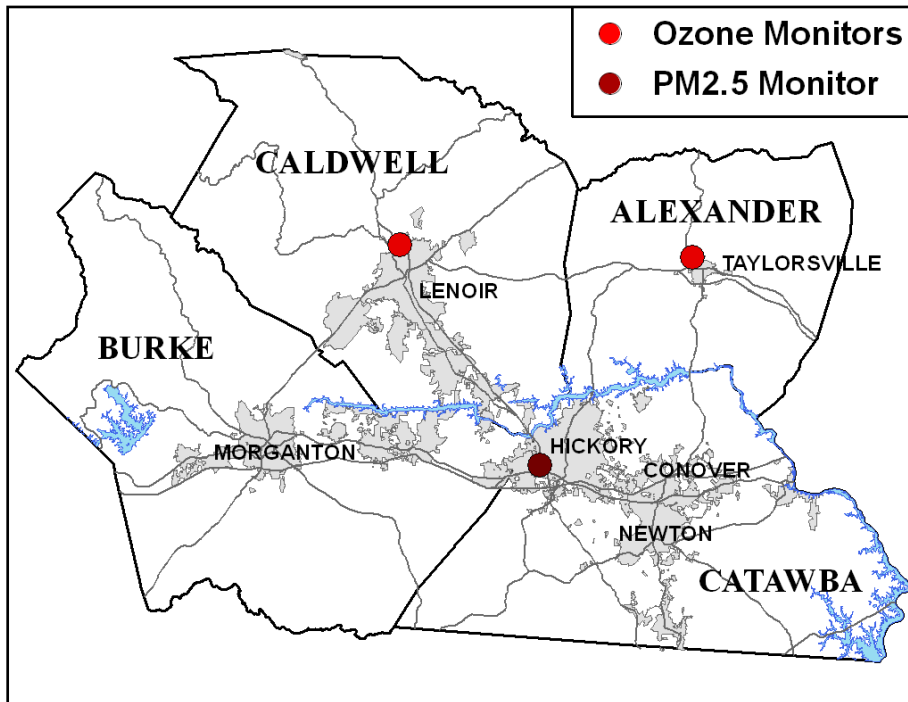
## **Air Quality**

### **Air Quality and Emissions**

Ozone and particulate matter (PM) are two pollutants found in air that can cause harm to the health of people. The Clean Air Act of 1990 passed by Congress directed the Environmental Protection Agency (EPA) to issue regulations regarding these and other air quality issues. During the 1990’s, the EPA conceived regulatory mechanisms requiring the states to submit plans and abatement strategies for ozone and PM to the EPA. Suits challenging the legality of EPA regulations were filed in the courts; thus, enforcement by the federal agency was delayed until the U.S. Supreme Court upheld EPA ozone and PM standards and clarified regulatory processes.

With the legal certification of the EPA’s scientific methods and enforcement powers by the Court, the EPA directed the states to submit plans, which included designation of “non-attainment” and “attainment areas” within their borders. These “State Improvement Plans” must be approved by the Federal EPA. The N.C. Division of Air Quality (NCDAQ), part of the N.C. Department of Environment and Natural Resources (DENR) is the state agency with the authority and responsibility for plan submission to the Federal government.

**Map 9-1**  
**Air Quality Monitors in the Unifour**



## **Ozone**

### **Sources**

Ozone (O<sub>3</sub>) is a gas composed that is formed from motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents as well as natural sources emit NO<sub>x</sub> and VOC that help form ozone. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form in harmful concentrations in the air.

Ozone is not usually emitted directly into the air, but at ground-level is created by a chemical reaction between oxides of nitrogen (NO<sub>x</sub>) and volatile organic compounds (VOC) in the presence of sunlight. It has the same chemical structure whether it occurs miles above the earth or at ground-level and can be 'good' or 'bad,' depending on its location in the atmosphere.

### **Health Impacts**

Ozone can harm people's lungs, and EPA is particularly concerned about individuals with asthma or other lung diseases, as well as those who spend a lot of time outside, such as children. Ozone exposure can aggravate asthma, resulting in increased medication use and emergency room visits, and it can increase susceptibility to respiratory infections.

The United States has made significant progress reducing ground-level ozone across the country. Since 1980, ozone levels have dropped 21 percent as EPA, states and local governments have worked together to improve the quality of the nation's air. EPA expects improvement to continue, as a result of landmark regulations such as the Clean Air Interstate Rule, to reduce emissions from power plants in the East, and the Clean Diesel Program, to reduce emissions from highway, nonroad and stationary diesel engines nationwide.

**Assessment of Ozone Trends**

The Unifour has two ozone air monitors; one near Lenoir and the other in Taylorsville (Map 9-1). Currently, the three-year average of ozone concentrations is under the 1997 8-hour air standard for both monitors. However, previous three-year averages (calendar year 2001-2003 and 2002-2004) indicated ozone levels above the acceptable federal level (see graphs). Therefore, the EPA designated the Unifour as a “non-attainment” area in April 2004. The designation leads to penalties involving the loss of federal and state grant funds for road and transportation improvements as well as, additional requirements for locating new industry/business in the area. Beyond the direct economic impacts, the “non-attainment” label can cause people not to move to geographic location, which can hurt economic growth and employment opportunities, etc. The successful completion of the EAC process kept the region from dealing with the penalties of nonattainment status.

The NCDAQ is required to evaluate design value (DV) trends and ozone exceedance trends to determine if any of the State’s monitors show increases in ozone formation. Specifically, the NCDAQ evaluates the following data as part of the air quality analyses:

- 8-hour Ozone Design Value Trends – Most recent design values (1 and 3 year average of the 4th highest 8-hour ozone average), compared to the trend in design values from the 2000 timeframe to present.
- 8-Hour Ozone Exceedances – Number of exceedances of the 8-hour ozone standard at each monitor in the EAC areas for the most recent ozone season, compared to the number of exceedances at each monitor from 2000 to present.

**8-hour Ozone Design Value Trends**

The Federal standard for ozone until 2008 was 0.085 parts per million (ppm). The standard was lowered in 2009 to 0.075 ppm. Table 9-1 below shows the trend in 8-hour ozone values at monitors in Alexander and Caldwell County. The design values are presented in ppm, with design values exceeding the standard highlighted in gray with bold lettering.

<b>Table 9-1. Fourth Highest 8-Hour Ozone Values (parts per million), 2000-2012</b>													
Monitor	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Waggin Trail (Alexander Co.)	0.091	0.088	0.095	0.081	0.071	0.080	0.076	0.080	0.076	0.063	0.071	0.067	0.067
Lenoir (Caldwell Co.)	0.085	0.082	0.092	0.079	0.070	0.075	0.076	0.077	0.072	0.063	0.071	0.066	0.063

Source: USEPA and NCDAQ, 2012.

Note: Data based on 0.085 8-hour federal ozone standard in 2000 to 2008 and the 0.075 parts per million standard in 2009. Grey shading are years that fourth highest 8-hour ozone value was higher than the federal standard. Federal ozone standards are currently under EPA review.

Higher ozone values were observed from 2000 to 2002. As can be seen from the data, 2002 was a year in which high ozone was observed at both the Alexander and Caldwell County monitor

sites. There has been a general decrease in the values following the 2002 period. In fact, since 2002 there have not been any instances where the 4<sup>th</sup> highest value was above the 1997 8-hour ozone standard. A closer look at the data reveals that the Unifour area saw decreases in monitored ozone levels in 2003 and 2004 with small increases in 2005 and 2007. The 2007 season was very conducive to ozone development, with warm temperatures and relatively little precipitation. In 2009, ozone design values were the lowest ever recorded in the region, which could be attributed to multiple factors, including traffic improvements, mobile source emission reductions, alternative fuels and technologies, more favorable weather patterns, and poor economic conditions. Ozone has remained below the federal standard in 2010, 2011, and 2012.

**8-Hour Ozone Exceedance Trends**

Table 9-2 below shows the number of 8-hour ozone exceedances at monitors in Alexander and Caldwell County. The numbers exceeding the standard are highlighted with bold lettering.

The number of 8-hour ozone exceedances peaked during the 2002 season, in which 27 were observed at both monitors combined. Since 2002, exceedances of the 8-hour standard have decreased dramatically. There have been no exceedances of the 8-hour ozone NAAQS in the last nine years (2004-2012) at either monitor.

<b>Table 9-2.</b>													
<b>Number of 8-hour Ozone Exceedances at Unifour Ozone Monitors, 2000-2012</b>													
<b>Monitor</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Waggin Trail (Alexander Co.)	7	5	17	1	0	0	0	0	0	0	0	0	0
Lenoir (Caldwell Co.)	4	2	10	3	0	0	0	0	0	0	0	0	0

Source: USEPA and NCDQAQ, 2012.

Note: Data based on 0.085 8-hour federal ozone standard in 2000 to 2008 and the 0.075 parts per million standard in 2009. Grey shading is years that four or more exceedances occurred for that year. Federal ozone standards are currently under EPA review.

**4th Highest Value Trends**

The design value is calculated by averaging the 4<sup>th</sup> highest 8-hour ozone value for each of three years. Since the design value is an average of three years, a decrease may be the result of one really good air quality year; or conversely, an increase may be the result of one bad air quality year. Therefore, looking at the trends of the 4<sup>th</sup> highest value can give insight as to how the air quality in an area is improving.

Table 3 displays the 4<sup>th</sup> highest 8-hour ozone 3-year averages for the Unifour area. Although there can be a great deal of fluctuation in the 4<sup>th</sup> highest value, the general trend since 2001-2003 has been downward. There was an increase in these values from 2005 to 2007; however, these levels were still significantly lower than the 2001-2003 values. This downward trend continued with the 2007-2009 data. The 2009 value of 0.063 ppm for both monitors helped bring the 3-year averages below the 2008 standard of 0.075 ppm. The three-year averages have continued to decrease.

<b>Table 9-3.</b>											
<b>Fourth Highest 8-Hour Ozone 3-year Averages (or Design Values) (parts per million), 2000-2012</b>											
<b>Monitor</b>	<b>2000-02</b>	<b>2001-03</b>	<b>2002-04</b>	<b>2003-05</b>	<b>2004-06</b>	<b>2005-07</b>	<b>2006-08</b>	<b>2007-09</b>	<b>2008-10</b>	<b>2009-11</b>	<b>2010-12</b>
Waggin Trail (Alexander Co.)	<b>0.091</b>	<b>0.088</b>	0.082	0.077	0.076	0.079	0.077	0.073	0.070	0.067	0.067
Lenoir (Caldwell Co.)	<b>0.086</b>	0.084	0.080	0.075	0.074	0.076	0.075	0.071	0.069	0.067	0.067

Source: USEPA and NCDAQ, 2012.

Note: Data based on 0.085 8-hour federal ozone standard in 2000 to 2008 and the 0.075 parts per million standard in 2009. Grey shading is violations of the three-year ozone federal standard (design value). Federal ozone standards are currently under EPA review.

## **PM 2.5**

### **Sources**

Fine particulate pollution, also called PM 2.5, consists of suspended fine particles that are less than or equal to 2.5 micrograms in diameter. PM 2.5 is made up of a variety of microscopic solids and liquid droplets such as allergens, dust, nitrates, organic chemicals and sulfates. Unlike ozone, PM 2.5 emissions can occur throughout the year, although the amount and chemical compositions of PM 2.5 depends on location, time of year and local weather conditions.

The formation and transportation of PM 2.5 is still under considerable study, however, it is known that PM 2.5 has both primary sources and secondary sources. The primary sources of PM 2.5 pollution are many and varied: wood smoke from residential or commercial combustion; automobile exhaust in the form of oxides of nitrogen; coal-fired power plants; small engines; open burning of trash or construction debris; and dust from agricultural operations or open areas. Secondary sources can be generated from fuel combustion working in conjunction with sunlight and water vapor.

### **Health Impacts**

Health studies indicate a correlation between elevated PM 2.5 levels and premature death from heart or lung disease. High PM 2.5 levels have also been associated with heart attacks and respiratory symptoms such as asthma attacks and bronchitis. This can in turn lead to increased levels of hospitalization as well as school and work absences.

Although PM 2.5 has not been regulated for as long a time period as “coarse” particulates (PM 10), it is considered to be an even graver threat to human health since the finer particles are more readily absorbed deeper in lung tissue. The health effects of being exposed to high levels of PM 2.5 are serious, and include decreased lung function, irregular heart function including heart attacks, and exacerbating pre-existing asthma conditions.

## **Assessment of PM 2.5 Trends**

### History of the PM 2.5 Standard

After several years of analyzing various health and scientific research studies, EPA issued fine particle standards in 1997. After adding 1,200 monitors across the country between 1997 and 2003, in April, 2003 EPA issued a memorandum to state governments showing the schedule for designating areas that were either in attainment or non-attainment for the new standard. EPA would “designate an area non-attainment if it has violated the fine particle standards over a three-year period, or if relevant information indicates that it contributes to violations in a nearby area.” The three-year period was defined by EPA from 2001 to 2003.

The PM 2.5 standards were then revised in 2006. The yearly standard was set at 15 micrograms per cubic meter based on a three-year average of annual PM 2.5 concentrations. The 24-hour standard was 35 micrograms per cubic meter. In 2012 the yearly standard was revised to 12 micrograms per cubic meter.

### Hickory Water Tower Monitor Trends

Within the Unifour area, only one official monitor tracks PM 2.5 levels (Map 9-1). The monitor is located one block west of US 321 close to the water tank owned by the City of Hickory. Additional monitoring related to the official monitor is also taking place on the site. Table 1 shows the yearly readings for the Hickory monitor between 2000 and 2012. Monitor results reveal a decline in PM 2.5 levels from 15.98 in 2001 to 15.04 in 2003. The three-year average between 2001 and 2003, however, equaled 15.36, or just slightly above the standard.

Since the monitor was above the standard EPA initially recommended Catawba and a portion of Burke and Caldwell counties be deemed non-attainment for PM 2.5. In February 2004, the NC Division of Air Quality (NCDAQ) recommended that only the part of Catawba County (defined as the portion of Catawba County within the boundary of the Greater Hickory Metropolitan Planning Organization) be deemed for non-attainment since Burke, Caldwell and the rural portion of Catawba County was not contributing the PM 2.5 problem. In December 2004 EPA made its final designations. It placed all of Catawba County in non-attainment status for PM 2.5 based on the three-year average between 2001 and 2003 being slightly above the 15.0 standard. In April 2005 the PM 2.5 designation for Catawba County was consequently published in the federal register. Davidson and Guilford counties in North Carolina were also placed in non-attainment status.

Once an area has been designated as non-attainment with regard to EPA standards for a controlled pollutant, the area’s local and state governments typically respond to have the designation overturned or lessened (geographically in size or in severity of the designation), or, if it is clear that the designation cannot be ameliorated, they must work to develop and implement a plan to bring the area back into attainment with the national standard.

The NCDAQ is required to evaluate PM 2.5 to determine if Catawba County is in attainment for the Federal Standards for PM 2.5. Specifically, the NCDAQ evaluated the following data yearly as part of the air quality analyses:

- Annual PM 2.5 Averages – Average daily reading during the course of one calendar year.
- PM 2.5 3-year Averages – Average of the last three years used to determine change over longer period of time.

- PM 2.5 98<sup>th</sup> Percentile Daily Reading – 6<sup>th</sup> or 7<sup>th</sup> highest reading during the course of a year.

The Unifour area was in nonattainment for the 15 micrograms per cubic meter standard until the 2006-2008 three-year average finally reached 14.2 micrograms per cubic meter. The region was placed in maintenance for PM 2.5 in December 2012, and the numbers remain below even the new standard of 12 micrograms per cubic meter.

Annual PM 2.5 Averages

The current annual standard for PM 2.5 is 15 micrograms per cubic meter. Table 9-4 shows the trend in PM 2.5 averages at the monitor in Catawba County. The design values are presented in micrograms per cubic meter, with values exceeding the standard highlighted with bold lettering.

<b>Table 9-4.</b>													
<b>Annual PM 2.5 Averages (micrograms per cubic meter), 2000-2012</b>													
<b>Monitor</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Hickory Water Tower	<b>17.9</b>	<b>16.0</b>	<b>15.4</b>	15.0	15.0	<b>16.0</b>	<b>15.2</b>	14.6	12.8	10.4	11.3	10.5	9.5

Source: USEPA and NCDAQ, 2012.

Note: Grey shading is years that the annual average exceeded the annual federal standard of 15 micrograms/per cubic meter. Federal PM 2.5 standards are currently under EPA review.

Annual PM 2.5 averages peaked between 2000 and 2002. There is a general decrease in the values for the 2003 and 2004 periods before increasing again in 2005 and 2006. The area has been below the standard of 15.0 micrograms per cubic meter since the 2007 period. The Hickory monitor recorded its lowest annual PM 2.5 readings in 2008 and 2009 which could be attributed to multiple factors, including scrubbers at Duke Energy’s coal fired Marshall Steam Station, traffic improvements, more precipitation, and a poor economy. PM 2.5 values continued to fall between 2010 and 2012, when it reached its lowest value of 9.5 micrograms per cubic meter.

PM 2.5 3-year Averages

The PM 2.5 three year average is a health based standard and is used to see how air quality is changing over time, so they average over a longer period of time. It is calculated by averaging the annual value for each of three years. Since the design value is an average of three years, a decrease may be the result of one really good air quality year; or conversely, an increase may be the result of one bad air quality year. Therefore, looking at the trends of the 3-year average can give insight as to how the air quality in an area is improving.

Table 9-5 displays the 3-year averages for the Unifour area. The Unifour area was in nonattainment for the 15 micrograms per cubic meter until the 2006-2008 seasons.

Table 9-5.											
PM 2.5 3-year Averages (micrograms per cubic meter), 2000-2012											
Monitor	2000-02	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Hickory Water Tower	16.4	15.5	15.1	15.3	15.4	15.2	14.2	12.6	11.6	10.7	10.4

Source: USEPA and NCDAQ, 2012.

Note: Grey shading is years that the annual average exceeded the annual federal standard of 15 micrograms/per cubic meter. Federal PM 2.5 standards are currently under EPA review.

### PM 2.5 98th Percentile Daily Reading

Besides setting an annual standard, EPA also has a daily PM 2.5 standard to protect public health. The annual federal standard is currently 35 micrograms per cubic meter. The standard is calculated at the 98<sup>th</sup> percentile for each year (EPA uses a three-year average for the standard), which is equivalent to the 6<sup>th</sup> or 7<sup>th</sup> highest daily reading at the monitor site in a given year. The PM 2.5 98<sup>th</sup> Percentile Daily Reading has been below the standard every year except in 2005 (Table 9-6). The three-year average has never violated the daily standard.

Table 9-6.									
PM 2.5 98 <sup>th</sup> Percentile Daily Reading (micrograms per cubic meter), 2000-2012									
Monitor	Yearly Readings								
	2004	2005	2006	2007	2008	2009	2010	2011	2012
Hickory Water Tower	34.0	36.9	32.9	30.7	25.6	21.2	23.2	22.4	22.8

Source: USEPA and NCDAQ, 2012.

Note: Grey shading is years that the 98<sup>th</sup> daily reading exceeded the annual federal standard of 35 micrograms/per cubic meter. Federal PM 2.5 standards are currently under EPA review.

### **The Unifour Air Quality Committee (UAQC)**

When the WPCOG learned that Unifour Region’s ozone levels would violate the new EPA 8-Hour Standard, public meetings were held with local governments, the North Carolina Division of Air Quality, Economic Development Corporations, Chambers of Commerce and other interested groups. In November 1999 the Catawba Air Quality Committee (CAQC) was formed. During the next four years the CAQC was expanded to include other regional members to form the Unifour Air Quality Coalition. The coalition eventually evolved into more formal Unifour Air Quality Committee (UAQC) and the Unifour Air Quality Oversight



Committee (UAQOC) which is made up of stakeholders and elected officials from throughout the region

The Unifour Air Quality Committee (UAQC) consists of stakeholders from the private and public sector dedicated to improving the air quality in the Unifour area. Staff support for the UAQC and UAQOC is provided by the Western Piedmont Council of Governments (WPCOG). Funding for the UAQC/UAQOC activities is provided by the Greater Hickory Metropolitan Planning Organization (GHMPO), the Unifour Rural Planning Organization (URPO), and a small assessment of the 28 local governments in the region (based on population).

To fully integrate air quality impact analysis into the transportation process, the Greater Hickory MPO has developed an ongoing consultation relationship with the agency responsible for air quality monitoring and permitting in Alexander, Burke, Caldwell and Catawba Counties. In December 2002 the UAQC/UAQOC developed an agreement between Federal, State, and local governments to address ozone pollution in a more expedient manner than what is required in the Clean Air Act through an Early Action Compact (EAC). The Unifour EAC has been recognized by EPA as one of the most successful programs in the United States. The EAC helped the region to obtain attainment status for ozone in 2008.

#### UAQC/UAQOC Accomplishments and Commitments

The UAQC and UAQOC meet monthly and are committed to improving air quality in the region through various strategies. Measures already taken include:

- **Unifour Early Action Compact (EAC)** - In December 2002 the UAQC/UAQOC assisted in an agreement between Federal, State, and Local governments to address ozone pollution in a more expedient manner than what is required in the Clean Air Act through an Early Action Compact (EAC). The Unifour EAC has been recognized by EPA as one of the most successful programs in the United States.
- **Hiring Technical Consultants** - the UAQC/UAQOC gets assistance from consultants to provide guidance and expertise to the committee. For example, the UAQC/UAQOC commissioned a study with the Louis Berger Group to determine the local causes of PM 2.5 in the Unifour Area.
- **Air Awareness Programs** - The North Carolina Air Awareness Program is a public outreach and education program of the North Carolina Division of Air Quality. The goal of the program is to reduce air pollution through voluntary actions by individuals and organizations. For the past decade NCDAQ has supported and collaborated with local Air Awareness Coordinators throughout the state including the Unifour Area. WPCOG staff acts as regional Air Awareness Team members in conjunction with NC DAQ's Air Awareness Program, providing air quality outreach to the region, including students, teachers and the general public.
- **Air Quality Brochures** - The main local print based outreach item produced by the UAQC is our brochures. They were originally produced in 2008 in two forms; one on overall local air quality issues and the other more focused on PM 2.5. Both brochures are in a tri-fold format printed on heavy glossy cardstock paper and contain a pocket for insert sheets that can be updated or focused for a particular target audience and message. These can be mailed, but most have been distributed through events and at local government offices.

- **Unifour Strategic Air Quality Plan** -The WPCOG completed the Air Quality Plan in 2010. The UAQC wanted to build on all of the previous work by having a regional planning document that explained ongoing strategies to improve air quality.

Multiple air quality strategies were gathered from multiple sources, including the Ozone Early action Compact strategies and the PM 2.5 Source Apportionment Study recommendations, as well as materials and guidance documents prepared by NC DAQ. The intent was to gather any strategy that may be applicable to the area and present them to multiple groups in order to determine what the most applicable strategies may be. Implementation of the final strategies, as described in Table 9-7, is described in detail within the plan.

<b>Table 9-7</b>	
<b>Unifour Air Quality Plan Recommendations</b>	
<b>Transportation Mitigation Strategies</b>	
1	Airport Ground Equipment Emissions
2	Alternative Fuel and the Clean Cities Program
3	Diesel Retrofit Technologies
4	Diesel Truck Anti-Idling & Truck Stop Electrification
5	Encourage Bicycle and Pedestrian Development and Usage
6	Gas Cap Check and Replacement Program
7	Public Transportation Benefit Programs
8	Reduce Locomotive Idling
9	Transportation Design and Operations
10	Two-Stroke Engine Restrictions/Buy-Back Program
11	Voluntary Non-Peak Refueling of Vehicles
12	Anti-idling Program
<b>Major Stationary Source Mitigation Strategies</b>	
1	Best Workplaces for Commuters Campaign
2	Compressed Work Weeks or Flexible Hours
3	Fuel Switching
4	Stationary Controls
5	Voluntary Stationary Source Operations
<b>Site Control Measures</b>	
1	Promote Energy Audits/Efficiency
2	Enhanced Burning Restrictions
3	Implement Smart Growth, Mixed Use and Infill Dev. Policies
4	LEED for New, Rehabilitated, or Expanded Buildings
5	Tree Planting Programs and Landscaping Standards
6	Urban Forestry

7	Woodstove Programs
<b>Education Mitigation Measure Strategies</b>	
1	Adopt a Local Clean Air Policy
2	Air Monitoring and Emergencies
3	Air Quality Partnerships
4	Educational Programs (Air Awareness, Ozone Outreach)
5	Develop Online Presence

**The Western NC Air Quality Conference (Formerly the Unifour Air Quality Conference)**

Organizing this annual spring conference has been the primary event sponsored by the UAQC. The purpose of the conference is to educate the public, government officials and the private sector on current air quality issues important to the Unifour region. The conference regularly attracts near 100 attendees representing local municipalities, local industries, public health organizations, public education agencies, environmental advocacy groups, state and federal agencies staff and other public groups and private citizens. The first conference was held in 2007, and it has been an annual event ever since. In 2013 the name of the Conference was changed from the “Unifour Air Quality Conference” to the “Western North Carolina Air Quality Conference.”

The conference has been held on the Lenoir-Rhyne University campus located in the City of Hickory. Lenoir-Rhyne’s Reese Institute for Conservation of Natural Resources has graciously sponsored the complementary luncheon portion of the conference and organizes the online registration. Duke Energy, Shurtape Technologies and local Chambers of Commerce have provided additional support for the conference. The Western North Carolina Air Quality Conference is free of charge to attendees.

The UAQC has been successful at soliciting a variety of excellent speakers from various state and federal agencies as well as from medical, business, industrial professions and academia.

The opening and plenary sessions of the conference have taken place in Belk Centrum auditorium on the Lenoir Rhyne campus. The past plenary sessions have been an opportunity to hear from senior staff of our state and federal environmental regulatory agencies. Morning and afternoon breakout sessions take place at locations throughout campus.

In 2013, the National Association of Development Organizations (NADO) chose the Western North Carolina Annual Air Quality Conference project for their Innovation Award. NADO recognized the Western Piedmont Council of Governments (WPCOG) during the 2013 National Rural Transportation Conference on April 24th, 2013 in Greenville, SC.

**Water Quality**

Water quality in the Catawba River basin’s mountain headwater streams and upper lakes is generally good. But downstream areas are experiencing increasing amounts of pollution from runoff and wastewater. For example, Lake James, the river’s cleanest lake, lies close to the Catawba’s headwaters.

**Stormwater**

Almost two-thirds of water pollution in North Carolina is caused by polluted runoff. When it rains, water washes over lawns, sidewalks, and streets. Besides litter, this water picks up

chemicals found in lawn fertilizers, bacteria found in pet waste, and oil from cars. This polluted water then enters roadside ditches and the storm drains found in our streets. Large pipes under the ground connect the storm drains to the closest lake or stream.

Road construction can increase the amount of impervious surface which in turn can increase water flow by not allowing the water to properly infiltrate into the ground. This can cause flash flooding, and can increase erosion of sediment.

As well as muddying the water, sediment tends to bind to and carry other pollutants across the landscape and into waterways. Sediment also covers the spawning beds of fish, and by decreasing the depth of lakes, adds to invasive weed, mosquito and water-warming problems. Agriculture, as well as home or road construction, are typical sources of sediment pollution.

Sediment contains excessive amounts of nutrients such as phosphorus and nitrogen. In small amounts, these nutrients are beneficial to aquatic life. But excessive amounts can trigger algae blooms that reduce dissolved oxygen levels and sometimes cause fish kills.

### Stormwater Permits

In 1972, The National Pollutant Discharge Elimination System (NPDES) program was established under authority of the federal Clean Water Act and then delegated to the Division of Water Quality for implementation in North Carolina. Phase I of the NPDES stormwater program was established in 1990, and it focused on site and operations planning to reduce pollutant sources. **Phase I** covered industrial activities in 10 categories; construction activities that disturbed five or more acres; and municipalities with populations of 100,000 or more that owned or operated a municipal separate storm sewer system (MS4) (North Carolina had six). **Phase II** of the program expanded permit requirements to construction disturbing an acre or more and to smaller communities (< 100,000 pop.) and public entities that own or operate an MS4.

NPDES Phase II Stormwater rules affect a large number of local governments in our region, which are required to obtain permits. Unlike most governments in other regions throughout NC, a Phase I community is not available as a resource to assist with implementation of the new rules in our area. A Stormwater Working Group (SWWG), which meets monthly at the WPCOG offices, was formed in 2006 and continues to assist local governments, through sharing resources, providing a forum to assure uniform implementation of program provisions when possible.

Stormwater programs are administered by DOT and local governments to deal with excessive runoff of impervious surfaces. These programs utilize best management practices (BMPs) which are becoming common practice. BMPs help to capture pollutants from roadways such as oil, break dusts and other contaminants.

Construction of roads and buildings can cause significant impact to aquatic sources. BMPs can minimize the impact, but sometimes mitigation is required on larger projects. DOT funds are often channeled through DOT's Environmental Enhancement Program (EEP) to assist in Plans and watershed restoration efforts in the region.

### Watershed Planning

Runoff from rainwater or snowmelt can contribute significant amounts of pollution into the lake or river. Watershed management helps to control pollution of the water and other natural resources in the watershed by identifying the different kinds of pollution present in the

watershed, how those pollutants are transported, and recommending ways to reduce or eliminate those pollution sources.

All activities that occur within a watershed will somehow affect that watershed's natural resources and water quality. New land development, runoff from already-developed areas, agricultural activities, and household activities such as gardening/lawn care, septic system use/maintenance, water diversion and car maintenance all can affect the quality of the resources within a watershed. Watershed management planning comprehensively identifies those activities that affect the health of the watershed and makes recommendations to properly address them so that adverse impacts from pollution are reduced.

Watershed management is also important because the planning process results in a partnership among all affected parties in the watershed. That partnership is essential to the successful management of the land and water resources in the watershed since all partners have a stake in the health of the watershed. It is also an efficient way to prioritize the implementation of watershed management plans in times when resources may be limited.

#### Local Efforts

The Water Resource Committee is the key interface that the Western Piedmont Council of Governments (WPCOG) uses to interact with local governments on the issue of water resources. Formed in 1986, this Committee is staffed by the WPCOG serves in an advisory role for 28 local governments within the Greater Hickory Metro on issues including water quality, water supply, water safety and recreation, and watershed issues within the Upper Catawba River Basin. The Catawba River Study Committee consists of individuals representing local governments, nonprofit organizations, educational institutions and businesses from Alexander, Burke, Caldwell, Catawba and McDowell Counties in Western North Carolina. Regular Water Resource Committee meetings are held to encourage regional cooperation and coordination of watershed activities. Meetings include networking opportunities, special presentations information sharing, coordination and program updates.

#### Lake Rhodhiss

The federal designation of Lake Rhodhiss as an impaired surface water has made the lake a regional priority. The WPCOG completed a comprehensive watershed restoration plan for Lake Rhodhiss in late 2009. Currently local governments are being encouraged to adopt and begin implementation of the twenty-two (22) recommendations in the Plan.

#### Lower Creek

There is continued support for the Lower Creek Advisory Team whose mission is: To restore and protect Lower Creek and its tributaries, while increasing public awareness of local water quality issues. The WPCOG has participated in the Lower Creek Watershed Plan, as well as completing the Lower Creek Source Water Protection Plan.

### **Funding Watershed Activities**

The WPCOG continues to seek funding for planning and restoration grants, grant applications to 205j, 319h, Clean Water Management Trust Fund and other available grant sources.

### **Boating**

Marinas and public access areas serve as important entry points to lakes and rivers in North Carolina. Twenty-nine marinas are situated on the Catawba River alone in North Carolina, while another 33 Duke Power access areas are distributed among seven reservoirs in the state (Duke Power Company, 2005). On Lake Norman alone, over two million people utilized marinas and public access areas during a 12-month period in 2004-05. Duke Power estimates that usage at these facilities will increase by 11% per decade through 2050.

According to the US EPA (1993) marinas “can have significant impacts on the concentrations of pollutants in the water, sediment, and tissue of organisms within the marina itself.” Part of the challenge in managing pollutants originating at marinas is that these areas typically experience frequent use by humans. Another important factor is because marinas are located at the water’s edge, there is typically no filtering that occurs following the release of pollutants near lakes or rivers. EPA identifies five adverse environmental impacts that may result from the following sources of pollution associated with marinas and recreational boating.

1. Poorly flushed waters near boat ramps where dissolved oxygen may become critically low.
2. Pollutants, like sewage, discharged directly from boats.
3. Pollutants transported in stormwater runoff from parking lots and other impervious surfaces.
4. The physical alteration or destruction of important fish and wildlife habitat during the construction and operation of marinas, ramps and related facilities.
5. Pollutants generated from boat maintenance activities on land and in the water.

## **Environmental Analysis and Mitigation**

### **Overview**

The impacts of specific transportation projects on communities and the natural environment have been assessed for many years as key elements of project development, environmental documentation and design. Federal law also includes requirements for planning-level environmental review. This section, then, discusses the MPO’s generalized analysis of potential environmental impacts and identifies potential mitigation strategies to restore or maintain environmental functions affected by projects. It also summarizes the MPO’s consultation with federal and state environmental regulatory agencies relative to the plans, inventories, policies and concerns.

A preliminary environmental impact screening can identify potentially serious impacts that could end up stopping a project. Recognizing such issues at the earliest stage of planning provides the opportunity to avoid or mitigate undesirable impacts through modification or elimination of the project. Early “fatal flaw” analysis of this type helps reduce the possibility that subsequent, more detailed analyses will uncover unexpectedly serious environmental impacts. This approach helps

reduce the inherent risks in an uncertain planning process and helps ensure that time and resources are not unnecessarily expended.

A systems-level environmental screening allows consideration of the interactions between various projects. Rarely does a project stand independent of other projects. The combined impacts of several projects can vary substantially from the sum of each project's individual impacts. Similarly, modification or elimination of one project due to environmental considerations can significantly alter the performance and impacts of other projects. It is important to be able to assess project impacts in the context of the entire LRTP. This knowledge not only reduces the likelihood of unexpected environmental impacts; it also allows future environmental studies to focus on critical issues. The result is a transportation plan that minimizes negative impacts on the natural and man-made environments and is ultimately more efficient, timely and cost-effective.

This environmental screening process and its results reflect the reality that the overwhelming majority of the recommended LRTP's environmental impacts are associated with roadway projects. Once a few critical decisions are made, constraints on roadway cross sections and alignments (due to safety factors and design criteria) limit opportunities to avoid or reduce these negative impacts.

Sidewalks and bicycle facilities are much more limited in the magnitude of their environmental and community impacts, due to smaller cross-sections and greater flexibility in design. Furthermore, pedestrian and bicycle facilities are most often built in conjunction with roadway facilities and have only marginal environmental impacts beyond those of the roadway itself. Bicycle and pedestrian travel is also inherently less disruptive to the environment than travel by automobile, especially regarding air pollution, noise and energy consumption.

Most of the transit elements in the LRTP are associated with bus route and service expansions, which typically involve no new construction and have minimal negative impacts on either natural or man-made environments. In general, transit impacts tend to be positive, since increased service tends to reduce vehicle-miles traveled and typically improves accessibility in disadvantaged neighborhoods. It is difficult to identify environmental impacts for these facilities in the context of this LRTP update.

### **Environmental Screening Analysis**

A generalized screening was performed to assess the potential environmental impacts of the roadway projects recommended for inclusion in the Greater Hickory Area 2040 LRTP. To identify environmentally sensitive areas and features for analysis, the Greater Hickory MPO used existing GIS data and consulted with resource agencies for their recommendations on additional data sets to use for analysis.

This analysis consisted of overlaying street and highway project alignments and locations onto maps depicting sensitive natural and cultural resources. MPO staff decided to create three maps, a Hydrological Factors Map (9-2), Environmental Factors Map (9-3) and a Historic, Cultural and Agricultural Factors Map (9-4).

Impacts in the following categories were assessed, based on project and environmental, historic, cultural and agricultural factors:

#### Hydrological Factors Map

- Hydrography
- 303(d) Listed Streams

- Floodplains
- Wetlands (National Wetlands Inventory)
- Regulated Water Supply Watersheds

#### Environmental Factors Map

- Significant Natural Habitat Areas
- Hazardous Substance Disposal Sites
- Land Trust Conservation Properties
- Land Managed for Conservation and Open Space
- Conservation Tax Credit Properties

#### Historic, Cultural and Agricultural Factors Map

- Historic Areas
- Schools
- Public Parks
- Voluntary Agriculture Districts
- Farmland Preservation

Since this was a system-wide, planning-level screening, no formal field investigation was conducted, and screening was performed only on those features for which GIS coverage was available. The screening process allowed early identification of impacts and areas of uncertainty that will need to be investigated further as a particular project moves forward through detailed planning and design. For some of the projects in the LRTP, environmental studies based on federal guidelines were already underway or completed. When a project is ready to move from the LRTP into the project planning/design/engineering phases, the project sponsor will conduct any necessary analysis as required by state and federal regulations.

## **Environmental Mitigation**

### **Overview**

Since the transportation planning activities of the MPO are regional in scope, this environmental mitigation discussion does not focus on each individual project within the Long Range Transportation Plan but rather offers a summary of environmentally mitigation strategies that could be considered in an effort to minimize any negative affect that a project may have on an environmentally sensitive area.

MAP-21 reinforces SAFETEA-LU's provisions for environmental mitigation, specifically, MAP-21 instructs State DOTs and MPOs to include in their long range transportation plans (LRTP) and transportation improvement programs (TIP) a discussion in the planning process that addresses:

*“types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan. This discussion shall be developed in consultation with federal, state, and tribal wildlife, land management, and regulatory agencies.”*



In order to meet these requirements, it is essential to know how federal regulations actually define mitigation:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

### **Sequencing**

An ordered approach to mitigation, known as “sequencing,” involves understanding the affected environment and assessing transportation effects throughout project development. Effective mitigation starts at the beginning of the environmental process, not at the end. Mitigation must be included as an integral part of the alternatives development and analysis process.

### **AVOID ► MINIMIZE ► REPAIR/RESTORE ► REDUCE OVER TIME ► COMPENSATE**

NEPA’s mitigation policy, when the project moves forward from planning to implementation, states: “Measures necessary to mitigate adverse impacts will be incorporated into the action and are eligible for Federal funding when the Administration determines that:

- The impacts for which mitigation is proposed actually result from the Administration action; and
- The proposed mitigation represents a reasonable public expenditure after considering the impacts of the action and the benefits of the proposed mitigation measures. In making this determination, the Administration will consider, among other factors, the extent to which the proposed measures will assist in the compliance with a Federal statute, Executive Order, or Administration regulation or policy.

### **Mitigation Strategy**

The Greater Hickory MPO is committed to minimizing and mitigating the negative effects of transportation projects on the natural and built environments in order to preserve our quality of life. In doing so, the MPO recognizes that not every project will require the same type or level of mitigation. Some projects, such as new roadways and roadway widening, involve major construction with considerable earth disturbance. Others, like intersection improvements, street lighting and resurfacing projects, involve minor construction and minimal, if any, earth disturbance.

The mitigation efforts used for a project should be dependent upon how severe the impact on environmentally sensitive areas is expected to be. The following three-step process was used to determine the type of mitigation strategy to apply for any given project:

1. Identify and confirm environmentally sensitive areas throughout the project study area.

2. Determine how and to what extent the project will impact these environmentally sensitive areas.
3. Develop and review appropriate mitigation strategies to lessen the impact these projects have on the environmentally sensitive areas.

The three-step mitigation planning process is designed to solicit public input and offer alternative designs or alignments and mitigation strategies for comment by the environmental review agencies, MPO, and local governments.

To the extent possible, transportation projects should minimize off-site disturbance in sensitive areas and develop strategies to preserve air and water quality, limit tree removal, minimize grading and other earth disturbance, provide erosion and sediment control, and limit noise and vibration. Where feasible, alternative designs or alignments are developed that would lessen the project's impact on environmentally sensitive areas. For major construction projects, such as new roadways, or for projects that may have a region-wide environmental impact, a context-sensitive solution process with considerable public participation and alternative design solutions should be used to lessen the impact of the project. Table 9-8 below details mitigation activities and measures that could be considered when dealing with environmental impacts during the project development phase.

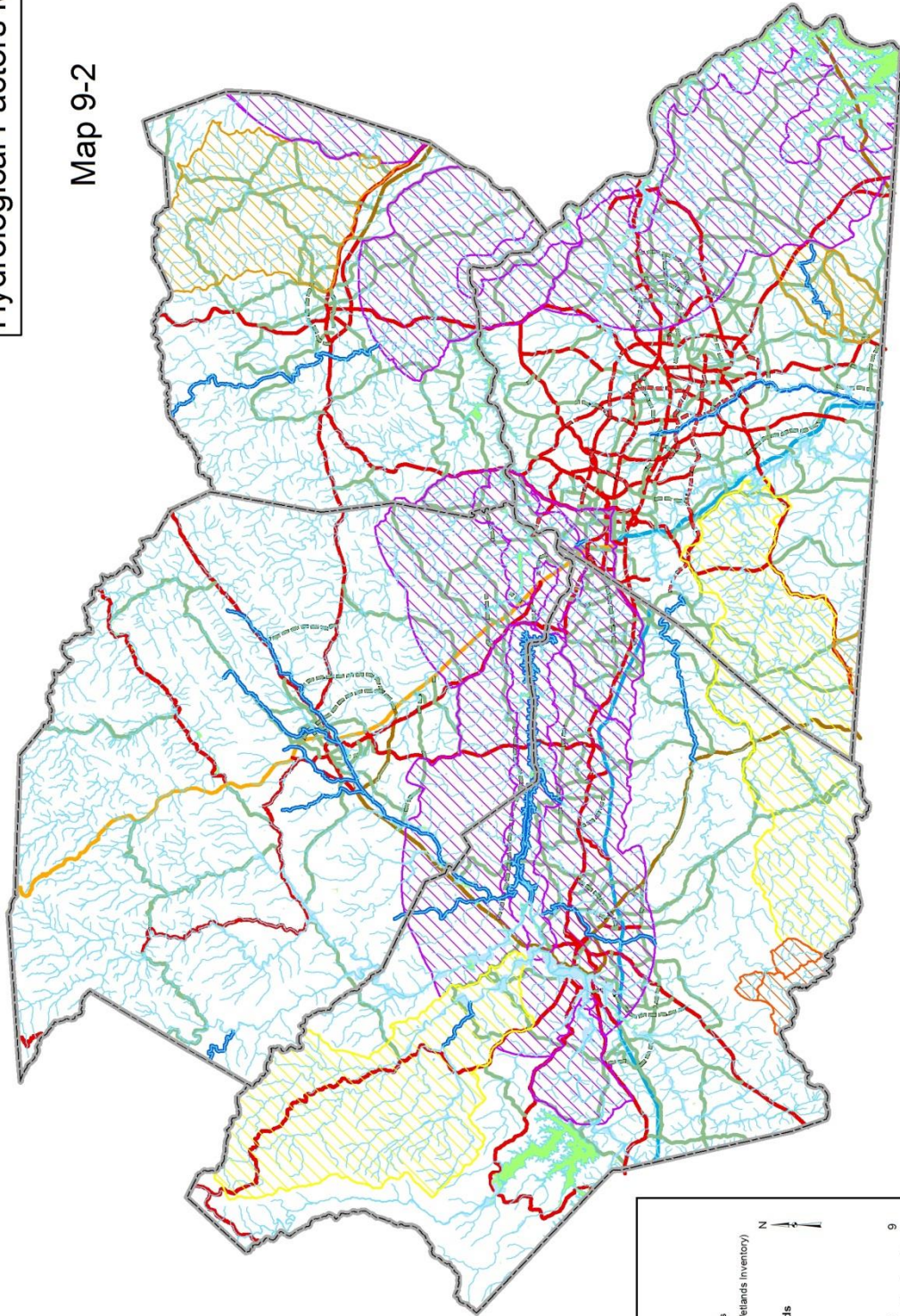
<b>Table 9-8</b>	
<b>Mitigation Activities and Measures</b>	
<b>Impacts</b>	<b>Mitigation Measures</b>
<b>Air Quality</b>	Designate pedestrian/Transit Oriented Development areas Develop energy efficient incentive programs Adopt air quality enhancing design guidelines
<b>Archaeological</b>	Design modifications to avoid area Archaeological excavation Educational activities
<b>Community Impacts</b>	Sidewalks Bike lanes Develop recreational areas Traffic calming Context sensitive design View corridors/sheds
<b>Environmental Justice</b>	Property owners paid fair market value for property acquired Continuous public involvement Continuous systems level analysis of EJ populations
<b>Communities</b>	Residential and commercial relocation
<b>Farmland</b>	Protect one to one farmland acre for every acre converted Agricultural conservation easement on farmland Compensation
<b>Fragmented Animal</b>	Construct overpasses with vegetation

<b>Habitats</b>	<p>Construct underpasses, such as culverts/viaducts</p> <p>Other design measures to minimize potential fragmenting of animal habitats</p>
<b>Historic Sites</b>	<p>Relocation of historic property</p> <p>Design modification</p> <p>Landscaping to reduce visual impacts</p> <p>Photo documentation</p> <p>Historic archival recording for public presentations</p> <p>View corridors/sheds</p>
<b>Light Impacts</b>	<p>Direction of lighting</p> <p>Low level lighting</p>
<b>Noise</b>	<p>Depressed roads</p> <p>Noise barriers</p> <p>Planting trees</p> <p>Construct tunnels</p> <p>Berms/vegetation</p>
<b>Park Impacts</b>	<p>Construct bike/pedestrian pathways</p> <p>Dedicate land</p> <p>Compensation for park dedication fees</p> <p>Replace impaired functions</p>
<b>Streams</b>	<p>Stream restoration</p> <p>Vegetative buffer zones</p> <p>Strict erosion and sedimentation control measures</p> <p>Best management practices for stormwater management, particularly with potential impact on 303(d) listed waters</p> <p>Ecosystem Enhancement Program (EEP)</p>
<b>Threatened &amp; Endangered Species</b>	<p>Preservation</p> <p>Enhancement or restoration of degraded habitat</p> <p>Creation of new habitats</p> <p>Establishment of buffer areas around existing habitats</p> <p>Modifications of land use practices</p> <p>Restrictions on land access</p>
<b>Viewshed</b>	<p>Vegetation and landscaping</p> <p>Screening</p> <p>Buffers</p> <p>Earthen berms</p> <p>Camouflage</p> <p>Lighting</p>
<b>Wetlands</b>	<p>Compensation</p> <p>Wetland restoration</p> <p>Ecosystem Enhancement Program (EEP)</p>

<b>Wetlands, cont'd</b>	Creation of new wetlands Strict erosion and sedimentation control measures Stream buffers
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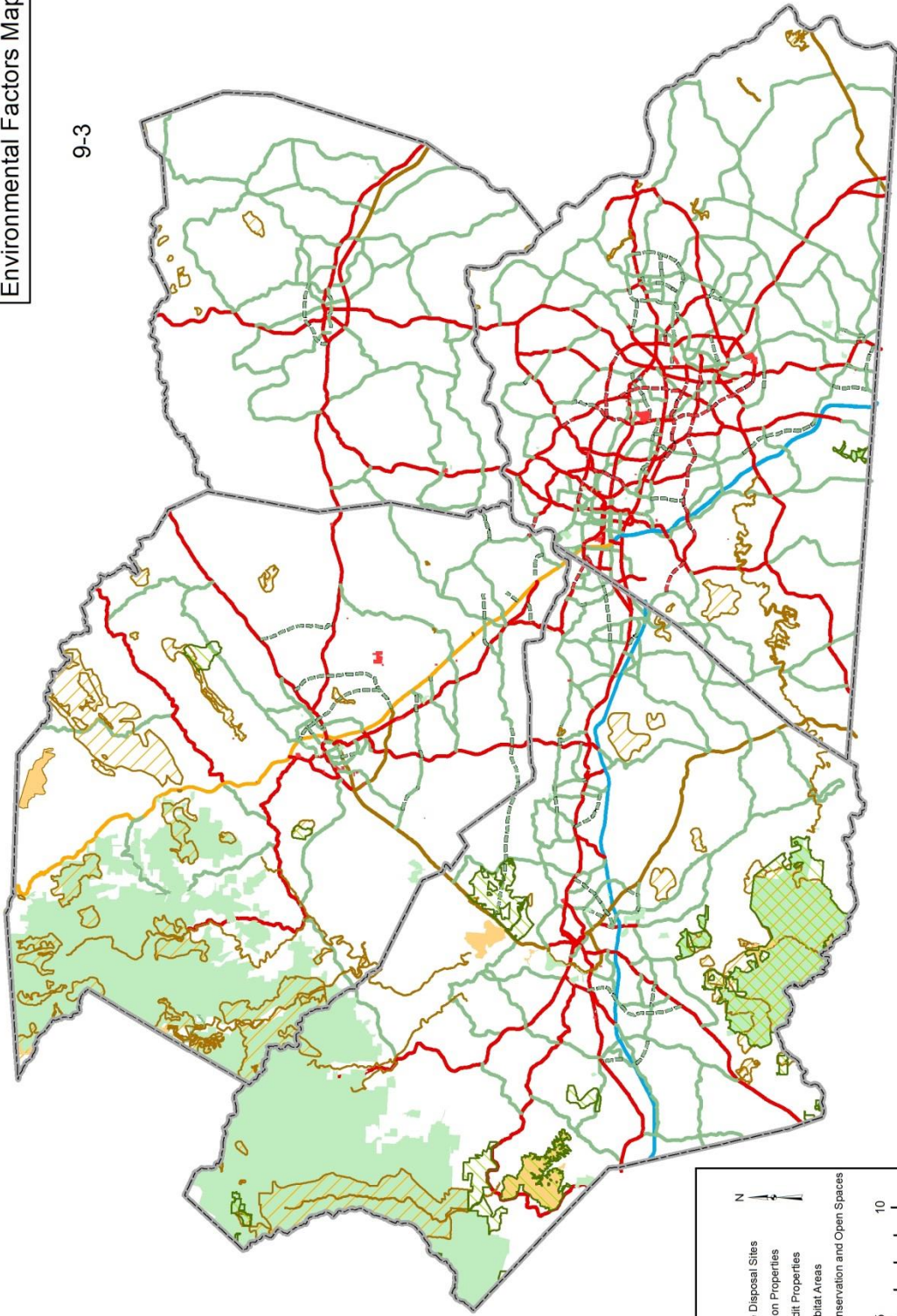
# Hydrological Factors Map

## Map 9-2



Environmental Factors Map

9-3



County Boundary  
Major Roads  
Hazardous Substance Disposal Sites  
Land Trust Conservation Properties  
Conservation Tax Credit Properties  
Significant Natural Habitat Areas  
Land Managed for Conservation and Open Spaces

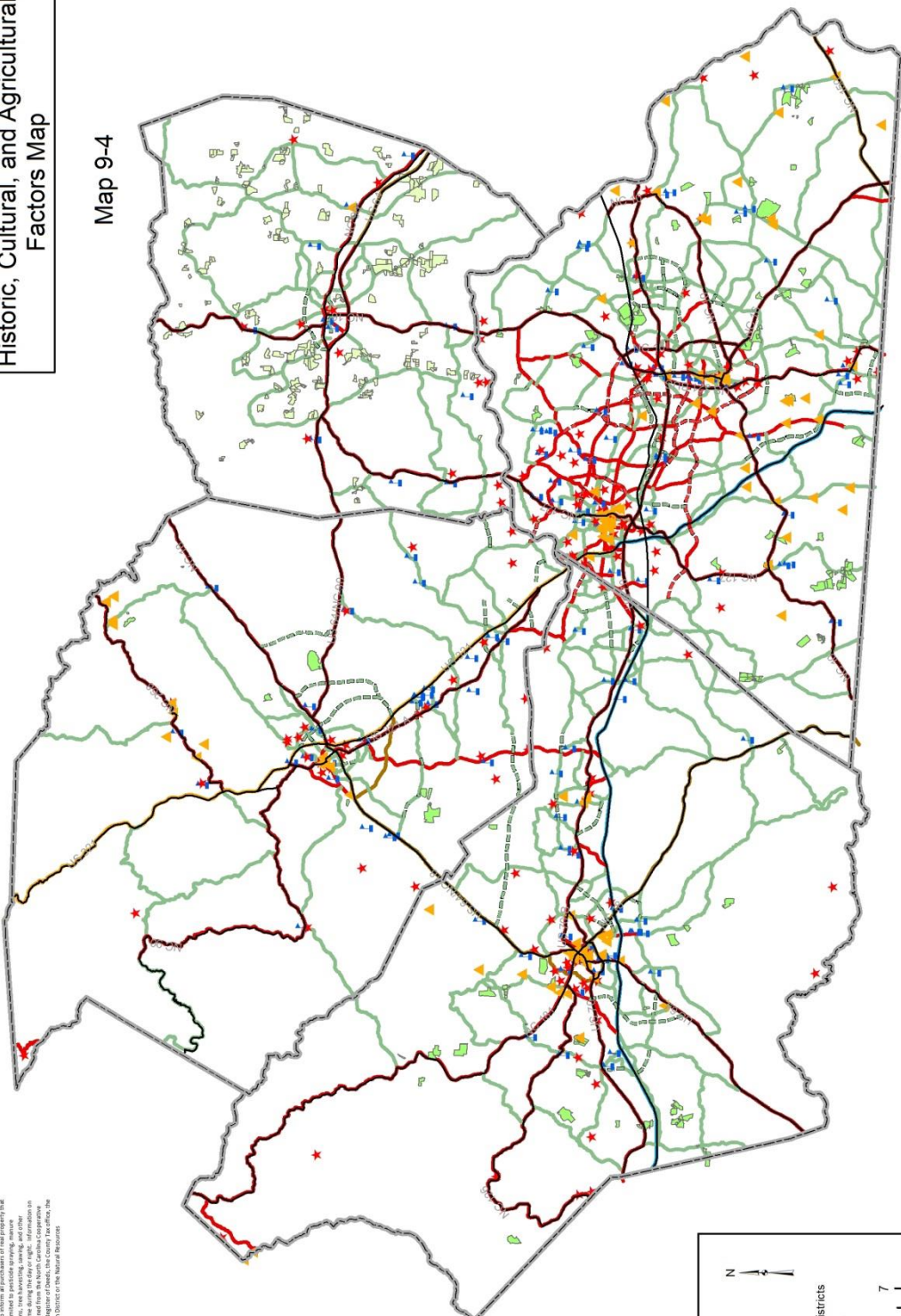
0 2.5 5 10  
Miles

N

# Historic, Cultural, and Agricultural Factors Map

### Map 9-4

Catawba County has established agricultural districts to protect and preserve agricultural lands and  
certain agricultural and forestry activities, including but not limited to pastured grazing, nursey  
operations, machinery and tool operations, livestock operations, seed processing, drying, and other  
operations, and operations related to the production, processing, marketing, and distribution  
of agricultural products. The location and establishment of these districts can be obtained from the North Carolina Cooperative  
Extension Service, the County Planning Office, the County Public Health Department, the County Tax Office, the  
County Planning Office, the County Planning Office, the County Planning Office, the County Planning Office,  
the County Planning Office.



County Boundary  
Major Roads  
Historic Areas  
Public Parks  
Schools  
Voluntary Agriculture Districts  
Farmland Preservation

0 1.75 3.5 7 Miles

N

# ENVIRONMENTAL JUSTICE

## Background and Goals

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color and national origin in programs and activities receiving federal financial assistance -- including transportation. The Environmental Justice (EJ) Orders add that "Federal agencies shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Compliance with provisions of Title VI and the EJ Orders extend to all transportation investment and planning processes and need to be considered in metropolitan and statewide planning.

Environmental Justice addresses the effects of all programs, policies, and activities on minority and low-income populations. Environmental Justice seeks to:

- avoid or minimize high and adverse human health, environmental, social and/or economic effects on minority and low-income populations;
- ensure full and fair participation of all potentially affected communities in the transportation decision-making process; and
- prevent denial of, reduction in or significant delay in the receipt of benefits by minority and low-income populations.

In the context of Environmental Justice, disproportionate and adverse effects are defined as unfavorable effects that minority and low-income populations predominately experience. They are typically more severe or greater in magnitude than the adverse effects suffered by non-minority or non low-income populations. The Greater Hickory Metropolitan Planning Organization (GHMPO) will work through compliance goals and planning process goals to conduct population identification, process documentation and benefit/burden assessments in order to identify and avoid disproportionately high and adverse effects on minority and low-income populations.

One of the Goals in the GHMPO's 2040 Long Range Transportation Plan (LRTP) specifically addresses the issue of Environmental Justice. The GHMPO seeks to provide:

- A transportation system that gives equitable transportation options to low-income and minority neighborhoods and improves the quality of life of all residents of the GHMPO Planning Area.

The following Objective and Policy statements ask the GHMPO to

- Ensure a multi-modal transportation system which provides access and mobility to all residents, while protecting the public health, natural environment, cultural resources and social systems.
- Ensure environmental justice by providing transportation facilities that do not disproportionately affect disadvantaged populations.



## Minority Population and Population below Poverty Level

### Minority Persons

Minority persons are those who are identified as:

- African American,
- American Indian,
- Asian/Pacific Islander,
- Other/Mixed Race, or
- Hispanic (any race).

### Poverty

The US Census Bureau's defines poverty as "following the Office of Management and Budget's (OMB) Statistical Policy Directive 14, the Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using Consumer Price Index (CPI-U). The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps)." For example, the weighted average poverty threshold for a family of four in 2011 was \$23,021.

(See <<http://www.census.gov/hhes/www/poverty/data/threshld/index.html>> for the complete set of dollar value thresholds that vary by family size and composition.)

### Environmental Justice Analysis

Table 10-1 describes the total population of the Greater Hickory MPO/Unifour RPO and those in minority, low-income and seniors/persons 65+ groups. The total population is 364,567 with an estimated 82.2% of the population as white, non-Hispanics. Minority population totals 17.8%. The minority population in the Greater Hickory MPO is found in three categories: African American, 6.8%, Hispanic, 6.5% Asian and Pacific Islander 2.4% and Other/Mixed Race, 4.7%. Residents below the poverty threshold in the region constitute 65,726 persons, or 18.4% of the total population. Persons over 65 (seniors) equaled 56,506 residents, or nearly 15.5% of the total population.

<b>Table 10-1.</b>		
<b>Greater Hickory MPO/Unifour RPO Demographic Estimates, 2011</b>		
<b>Demographic Group</b>	<b>Estimate</b>	<b>Percent</b>
Total Population	364,567	100.00
White Non-Hispanic	299,842	82.2
<b>Total Minority</b>	<b>64,725</b>	<b>17.8</b>
African American	24,862	6.8

American Indian	1,432	0.4
Asian/Pacific Islander	8,824	2.4
Other/Mixed Race	17,277	4.7
Hispanic (Any Race)	23,644	6.5
<b>Individuals below Poverty Level</b>	<b>65,726</b>	<b>18.4</b>
<b>Seniors (65 years and over)</b>	<b>56,506</b>	<b>15.5</b>

Source: 2011 American Community Survey, US Census Bureau.

GIS technology enables the GHMPO proposed thoroughfare improvements, transit routes, criteria pollutant air quality monitors, and employment concentration areas (defined as traffic analysis zones with more than 500 employees) to be superimposed on locations of minority and below poverty population concentration areas to complete an environmental justice analysis. Maps provided were separated by County, which includes Alexander County (Map 10-1, page 10-4), Burke County (Map 10-2, page 10-5), Caldwell County (Map 10-3, page 10-6), and Catawba County (Map 10-4, page 10-6).

#### Poverty Population Concentration Areas Determination

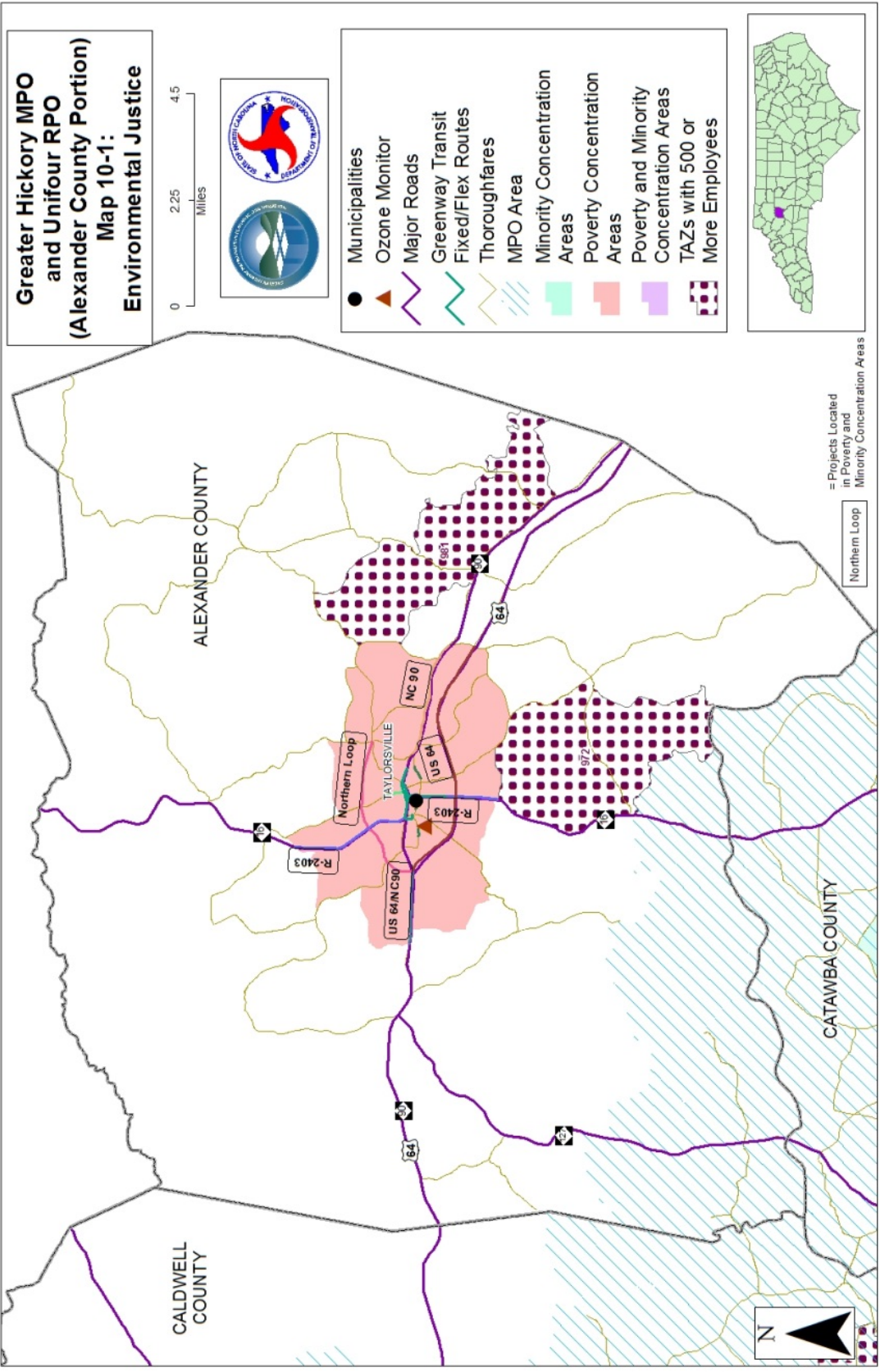
The maps for this chapter show poverty concentration areas by highlighting in pink census tracts with poverty levels that are 125% of the regional average (18.4%) or 23%. Poverty data comes from the 2007-2011 (5-year) American Community Survey. A total of 10 out of 73 Census tracts in the region were identified as poverty concentration areas by using the 125% of the regional poverty average threshold. Census Tracts shaded in purple are both a poverty concentration area and a minority concentration area. Results from Maps 10-1 to 10-4 indicated that poverty concentrated areas can be found in both urban and rural locations in the region.

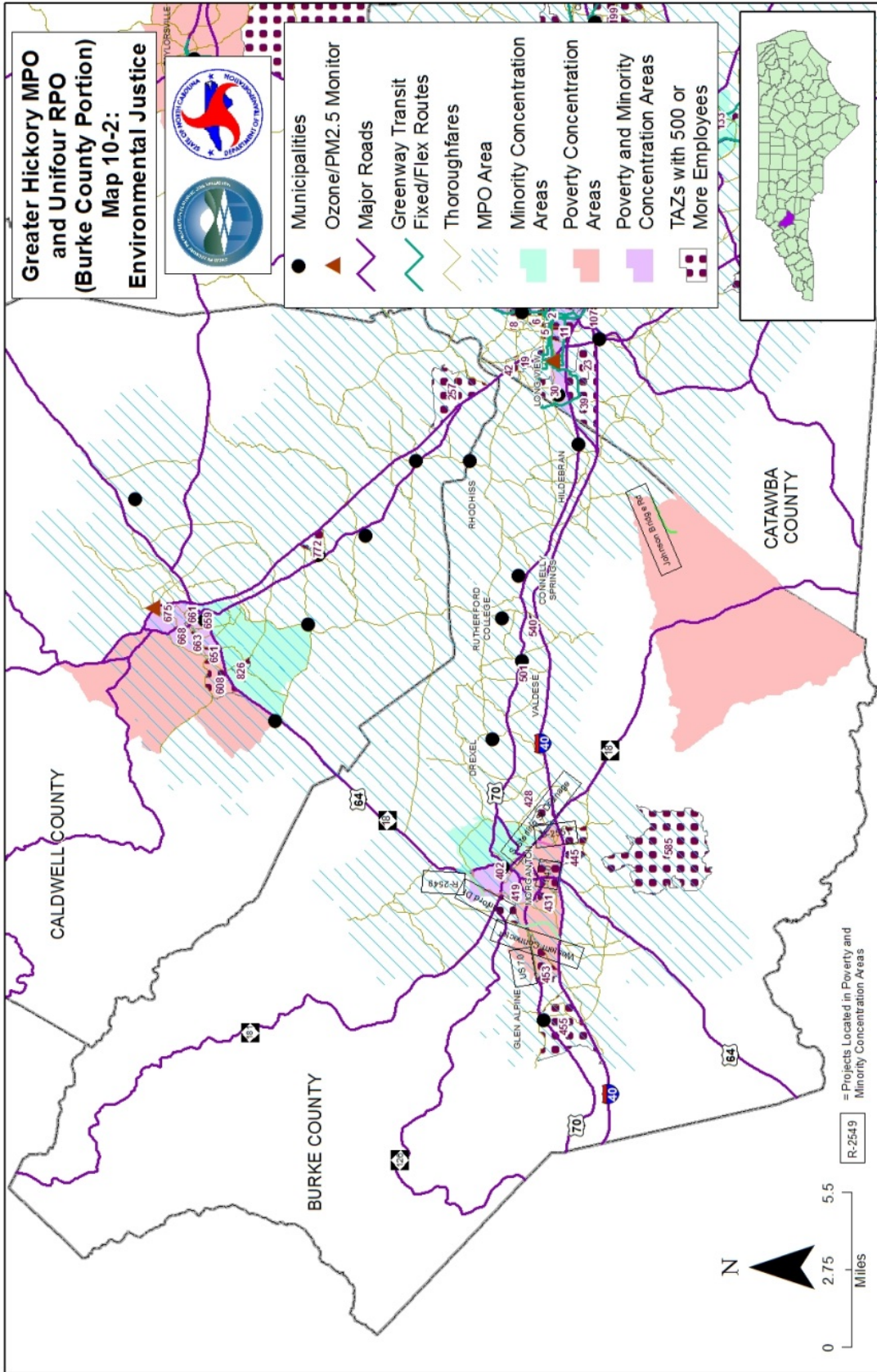
#### Minority Population Concentration Areas Determination

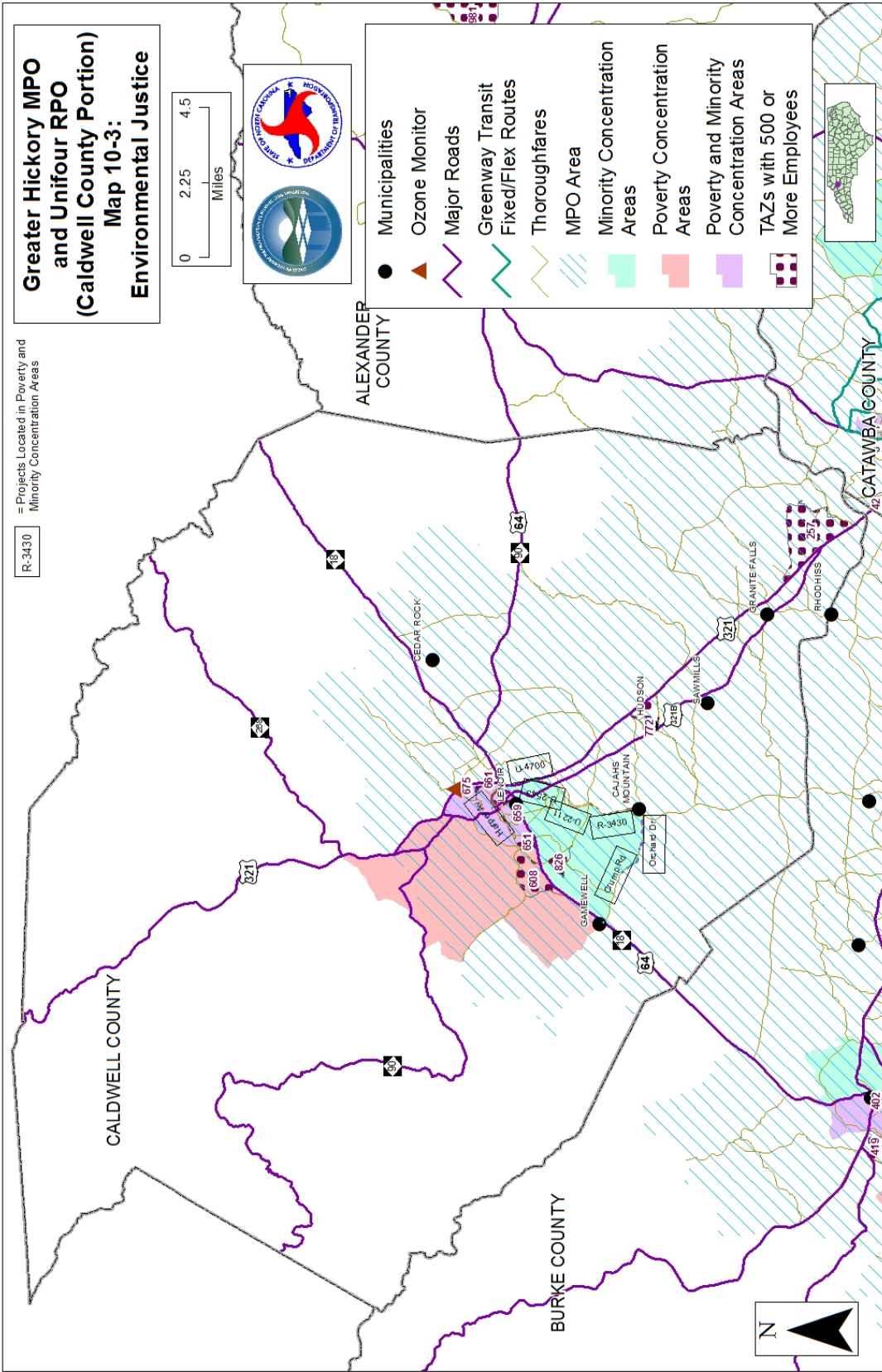
The maps for this chapter show minority concentration areas by highlighting in blue Census tracts with minority population that are more than 150% of the regional average (17.8%) or 26.7% minority population. Minority Census tract data comes from the 2010 Census. Minority means anyone who resides the region that is not white non-Hispanic. A total of 12 out of 73 Census Tracts in the region were identified as minority concentration areas by using the 150% of the regional minority average threshold. Census tracts shaded in purple are both a poverty concentration area and a minority concentration area.

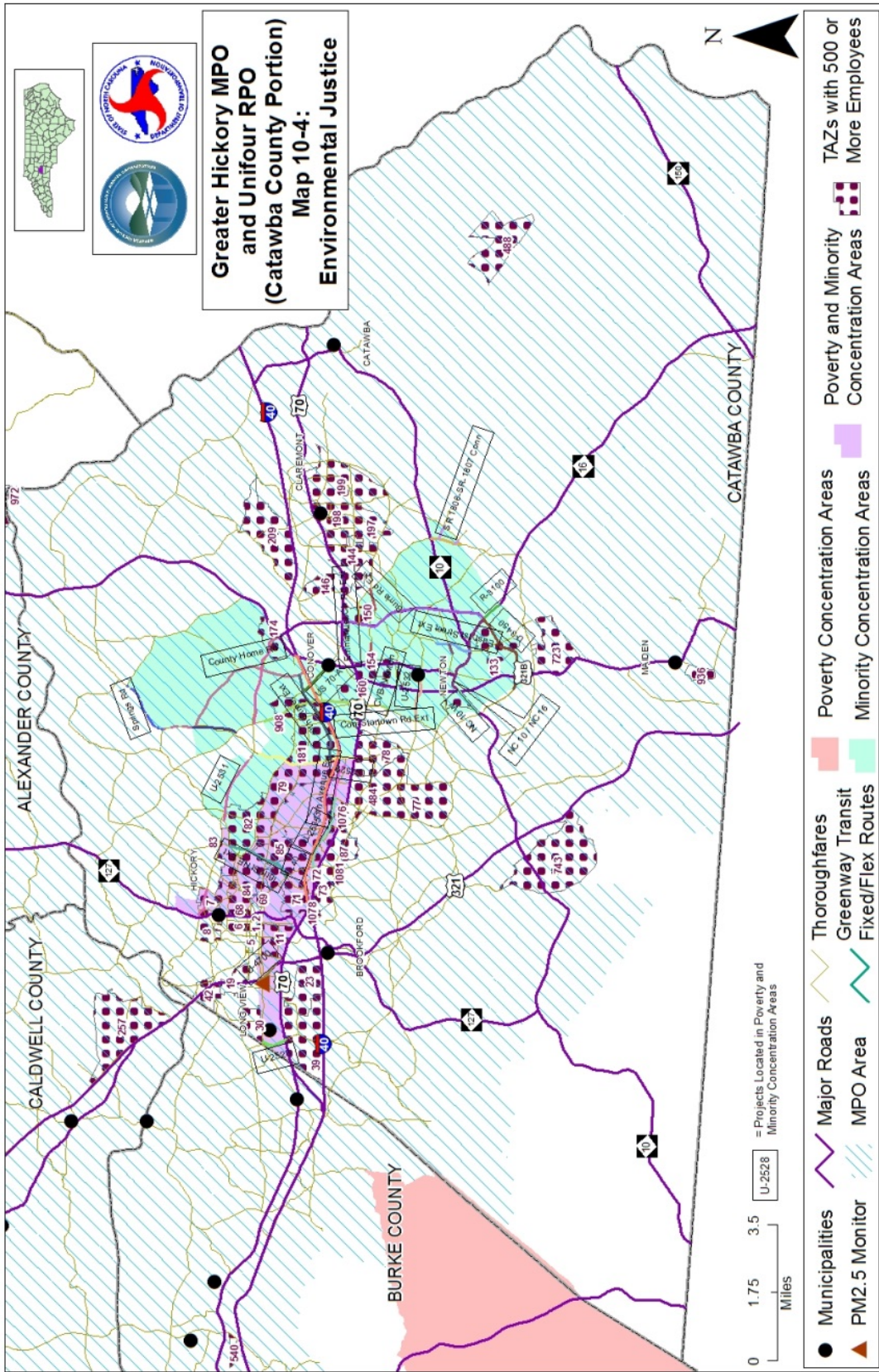
#### Poverty and Minority Concentration Areas by County

In Alexander County one Census Tract (404) was identified as a poverty concentration area (Map 10-1). This Census tract which includes Taylorsville is located outside the MPO boundary. Within the Alexander County poverty concentration Census tract is the Taylorsville flex route which runs from 10 A.M. to 5:00 P.M. three days a week. Greenway transit provides demand response service to Alexander County five days a week. The Alexander County ozone monitor is also located in the poverty concentration Census tract. The ozone monitor is currently in attainment status.









The analysis identified two TAZs with more than 500 employees adjacent to the Alexander County poverty concentration Census tract. These TAZs include employment with the Alexander County prison and several manufacturing facilities. Several major thoroughfares including US 64, NC 90 and NC 16 cross the poverty concentration area. Several minor projects listed on the LRTP run through the Alexander County poverty concentration area. A detailed description of these projects can be found in Chapter 2 or in Appendix D. No minority concentration areas were identified in Alexander County.

In Burke County (Map 10-2) Poverty Concentration Areas and Minority Concentration areas are located in Morganton. Additionally, a Poverty Concentration Area exists in the southeast portion of Burke County, which is mostly outside of the MPO Boundaries. Greenway transit does not offer fixed route service in Burke County; however, demand response is available for Burke County residents five days a week. Employment TAZ analysis shows that several job centers are located within or adjacent to the minority and poverty concentration areas in Morganton.

Numerous major thoroughfares cross the poverty and minority concentrations in Morganton. Improvements to I-40 interchanges in Morganton will help improve access to the Interstate for residents in the Morganton minority and poverty concentration areas. NC 18 runs through the poverty concentration zone in southeastern Burke County.

Caldwell County (Map 10-3) poverty concentration areas are focused in the northwestern portion of the City of Lenoir and overlap with minority concentration areas near downtown Lenoir. Both concentration areas fall mostly within the MPO Boundaries and within proximity to major thoroughfares. Greenway transit does not offer fixed route service in Caldwell County; however, demand response is available for Caldwell County residents six days a week. The Caldwell County ozone monitor is located in the minority and poverty concentration census tract. The ozone monitor is currently in attainment status.

TAZs with 500 or more employees are located mainly along Highway 321 which runs from Lenoir to Hickory. Several major thoroughfares traverse the minority and poverty areas in Lenoir including US 64, US 321, US 321 A, NC 18 and NC 90. Thoroughfare planning calls for improvements to US 321 and 321A, a loop on Lenoir's east side, and a new road beginning at US 321 connecting to NC 18 near Cedar Rock. These thoroughfare improvements will make moving around the Lenoir area easier for residents, workers and visitors.

In Catawba County (Map 10-4) Poverty Concentration Areas completely overlap with Minority Concentration Census tracts and are located primarily in Hickory and Long View. Minority Concentration Areas extend further eastward into Newton and Conover. The entirety of these areas fall within the MPO boundaries, and are within proximity to multiple TAZs with 500 or more employees, primarily located along the I-40 and US 70 Corridor. A fine particulate matter monitor is located in the minority and poverty concentration zone in Hickory. The monitor is currently in maintenance status with no violations over the federal limit in more than 5 years.

Greenway transit has six fixed routes that run through the minority and poverty concentration zones in Catawba County. Routes 1 and 2 provide service in Hickory. Routes 3 and 4 provide services for portions of Hickory and Newton. Routes 5 and 6 provide service for portions of Conover and Hickory. Demand response service is also available in Catawba County six days a week.

Thoroughfare improvements in the cities of Conover, Hickory and Newton will increase connectivity in and around these cities. Improvements to NC 16, NC 10 and NC 127 South will

also benefit residents in the minority and poverty zones by helping them move more easily around these cities and into surrounding areas of the County and the GHMPO.

Transit access for poverty concentrated areas in Catawba County is limited to the major urban areas where transit is readily available -- the cities of Hickory, Newton, and a small portion of Conover (Map 10-4). Fixed transit, unfortunately, is essentially non-existent for rural areas outside of the larger cities. Major plans for thoroughfare improvements in Catawba County include increased connectivity in Hickory, Newton and Conover and substantial improvements to NC 16, NC 10 and NC 127 South. These major thoroughfare improvements will enable low-moderate income persons in the urban areas greater access to other areas in the County and beyond.

## **Conclusions**

The tract with the highest minority concentration (80.3%) in the MPO is Census Tract 109, located in the Ridgeview and Kenworth areas of Hickory. Census Tracts 104.02 with 45.9% minority and Tract 110 with 41.6% minority are also located in the Hickory city limits. Other areas of high minority concentration can be found in the central area of Lenoir (Tract 301, 45.1%), Morganton (Tracts 206, 43%; Tract 204, 39%, and Tract 205, 38.1%) and Newton with Tract 113 at 34.9% minority population.

Map 10-4 presents in detail the central areas of Hickory and Newton and clearly shows that transit is widely accessible in areas of minority concentration in central Hickory and Newton, as well as providing access to retail and medical service along US 70, Highland Avenue and Tate Blvd. No fixed transit routes exist at this time in Morganton (Map 10-2) or Lenoir (Map 10-3), the other minority population concentrations in the MPO. Proposed thoroughfare improvements, also shown on Map 11-4, indicate a balance between areas of minority concentration, where fewer thoroughfare improvements are projected, and more rural areas across the MPO. New thoroughfares are less likely to be needed in urban areas where land is typically more intensely developed than in rural areas. Fewer new thoroughfares mean less disruption to the existing urban fabric and the daily lives of minority residents.

Minority residents and some who live below the poverty threshold live in the same Census tracts. These are areas where the GHMPO must continue to insist that transportation policies and decisions do not disproportionately negatively affect these groups. Transit access is good for urban residents of Catawba County's largest cities; residents of Morganton and Lenoir, however, are currently without fixed transit routes. Low and moderate income residents of the MPO have better access to fixed transit routes if they live in the larger cities in Catawba County than if they live in other counties. Rural residents with low-moderate household incomes are not served by fixed transit in the GHMPO. Western Piedmont Regional Transit Authority (WPRTA), however, does serve all four counties with demand response van service which is utilized by low-moderate income and older populations.

## **Suggestions for Environmental Justice Recommendations**

- The GHMPO shall put into practice the three basic principles of Environmental Justice, described above (page 10-1) to benefit minority, low income and older populations.
- The GHMPO shall work to establish fixed transit routes in minority, low income and older population areas of Morganton and Lenoir where they are currently non-



existent. The process should begin with a feasibility study of adding fixed transit service to these areas. Increase public outreach to poverty and minority concentration areas to seek their feedback and needs for transit service, including access to work and medical care.

- Transit options to low income residents in the GHMPO shall be extended, where feasible and as funding allows, to low income residents in rural areas of the counties.
- Expand fixed transit routes in the Morganton area and from Morganton east to Valdese and Rutherford College where many seniors currently reside.
- Map past transportation projects in identified environmental justice areas (minority and poverty concentration) to determine project effects over time.

# FINANCIAL PLAN

## Introduction

When the Intermodal Surface Transportation Efficiency Act (ISTEA) was enacted by Congress in 1991, one of the primary provisions of that original legislation was that the long range transportation plan (LRTP) for an urbanized area must be financially constrained. This meant that a financial plan had to be developed as a part of the LRTP. As subsequent transportation legislation (TEA-21), (SAFETEA-LU) and current MAP-21 became enacted, the financial plan provisions in the legislation have remained fairly consistent.

The financial plan is basically a comparison of existing funding streams with projected needs.

The statutory language specifically requires that the financial plan indicate the resources from public and private sources that are reasonably expected to be made available to carry out the Greater Hickory Urban Area LRTP. The Federal law also requires that an urban area's financial plan will:

- Demonstrate how the State Transportation Improvement Program (STIP) can be implemented.
- Identify any innovative financing techniques to provide funds for the projects, programs and strategies in the long range transportation plan.
- Identify other transportation projects that would be implemented if additional funds were available.

The Federal and State lawmakers are continuing to face a serious challenge to find sufficient funding to meet our growing transportation needs. Population growth, greater amounts of individual travel, and increases in economic activity and freight shipments are deteriorating the transportation infrastructure, causing congestion and increasing the overall burden on the surface transportation network. The cost of building and maintaining this network has also skyrocketed in recent years.

At the same time, North Carolina has less money available to spend on transportation. Gas taxes – a staple of transportation funding – have declined in their purchasing power, are less capable of filling the funding need, and have increasingly become politically difficult to increase. Other funding sources, like North Carolina's general funds, are being squeezed by major items like education.

In this section, the financial plan for the Greater Hickory Urban Area 2040 Transportation Plan is presented. The financial plan contains several important sections including, the various funding sources for transportation, a summary of the Federal and State funds in the Fiscal Year 2012-2018 State Transportation Improvement Program (STIP), and the Urban Area's projected transportation revenues through the 2040 horizon year are presented.

## Street and Highway Funding Revenue Sources

The North Carolina Department of Transportation (NCDOT) is responsible for the funding and implementation of thousands of street and highway projects every year in North Carolina. A variety of Federal, State, and, local funds are used to plan, design, construct and maintain these projects. Funding for most of the street and highway projects in the Greater Hickory Urban Area come from the Federal government or the State of North Carolina. However, there is a

growing shift of the financial burden being placed at the local level as Federal and State resources continue to face funding shortfalls. Below is a brief description of each of the major funding categories:

### **Federal Funds**

Each year, highway users pay billions of dollars in highway excise taxes, which end up in the Federal Highway Trust Fund. Federal legislation generally requires that funds paid into the Highway Trust Fund to be returned to the States for various highway programs. There are four (4) primary categories of Federal funds which are usually provided for street and highway purposes in the Greater Hickory Urban Area. The categories include: Surface Transportation Program (STP), National Highway System (NHS), Interstate Maintenance (IM) and Congestion Mitigation and Air Quality (CMAQ).

### **State Funds**

The State of North Carolina has been funding street and highway projects since 1921, which is when the North Carolina General Assembly first imposed the gasoline tax of .01 cents per gallon on all motor vehicle fuels sold or distributed in the state. The Highway Fund, along with the Highway Trust Fund and Powell Bill Funds, are the three primary revenue sources for street and highway purposes in the Greater Hickory Urban Area.

### **Local Funding**

Municipalities often use local taxes or bonds to build and maintain their streets and highways.

Occasionally, street and highway facilities in the Greater Hickory Urban Area are constructed by the private sector, usually as a condition of development. In some locations, portions of planned streets and highways on the Transportation Plan, or small area plans are built. Other minor road widening, turn lanes, sidewalks, greenways and greenway easements are built to serve the development site as well as the overall needs of the general public.

## **Identification of Highway Revenue Resources**

### **State ROW and Construction Funding**

In order to forecast the amount of revenue for projects within the Greater Hickory Planning Area, staff first analyzed the amount of money scheduled to be received in the MPO Planning Area through 2012-2018 State Transportation Improvement Program (STIP). The average yearly amount programmed for the projects within the MPO in the current STIP is nearly \$40,000,000.

The simple interest formula was used to forecast this average into the future, assuming a 3.5 percent increase. When projected annually through the year 2040, the amount for that year is \$104,806,878. Projected revenue totals are shown in Table 1.

### **State Highway Maintenance Funding**

To forecast the amount of funding expected to maintain existing state facilities, staff used the amounts received for the years 2003 through 2012. These values were obtained from NCDOT.

The annual maintenance revenue has fluctuated over the past decade, so the maintenance revenues were averaged over the seven-year period. Staff assumed that 90 percent of the amount for Catawba County would be spent in the MPO area and 10 percent in the RPO area; 20 percent of the amount for Alexander County would be spent in the MPO area and 80 percent in the RPO area; 75 percent of the amount for Burke Count would be spent in the MPO area and 25 percent in the RPO area; and 70 percent of the amount for Caldwell County would be spent in the MPO area and 30 percent in the RPO area. Staff assumed that the NCDOT would increase the amount spent on maintenance, and utilized a 3.0 percent annual rate increase. The expected totals are identified in Table 11-1.

**Powell Bill**

The next source of funding comes from the Powell Bill, which supplies funding directly to municipalities for local street maintenance, construction and enhancements. Recent funding (2010) for each municipality in the Hickory Urban Area was aggregated and the compound growth rate between each funding year was calculated. Historically, the average rate increase for this period was found to be 4.62 percent but was reduced to 4.0 percent for these calculations. This growth rate (which assumes to account for inflation, population and lane mileage increases) was applied to each forecast year to 2040. The resulting amount of funding is shown in Table 1.

**Local Funding Initiatives for Roads**

The funding and construction of projects by the municipalities represents significant local contributions to the necessary improvements to the MPO thoroughfare system, and it is hoped that this level of commitment will continue.

Local contributions and private rights-of-way dedication equals approximately \$2,935,740 per year in the MPO. Staff assumed that local contributions would increase and utilized a 3.0 percent annual rate increase. Table 11-1 shows the amount of funding that would be available in each funding period through 2040.

Table 11-1					
Projected Highway Revenue by Source					
Horizon Period	State Revenue	Local Funding	Maintenance Revenue		Total Funding
			Powell	State	
2011-2020	454,739,832	32,760,234	61,400,769	217,813,707	766,714,542
2021-2030	612,272,284	33,654,969	95,564,170	255,203,470	996,694,893
2031-2040	822,842,755	45,229,463	150,121,278	304,991,774	1,323,185,270
Total	1,889,854,871	111,644,666	307,086,217	778,008,951	3,086,594,705

Table 11-2 Projected Highway Expenditures by Source					
Horizon Period	State Expenditure	Local Expenditure	Maintenance Expenditure		Total Expenditure
			Powell	State	
2011-2020	454,739,832	32,760,234	61,400,769	217,813,707	766,714,542
2021-2030	612,272,284	33,654,969	95,564,170	255,203,470	996,694,893
2031-2040	822,842,755	45,229,463	150,121,278	304,991,774	1,323,185,270
Total	1,889,854,871	111,644,666	307,086,217	778,008,951	3,086,594,705

**Identification of Highway Expenditures**

**Highway Maintenance Expenditures**

Staff assumed that 90 percent of the lane mileage for Catawba County is included in the MPO, 20 percent of the lane mileage for Alexander is included in the MPO, 75 percent in Burke County is included in the MPO, and 70 percent in Caldwell County is included in the MPO.

The total amount of highway maintenance expenditures are assumed to equal the total amount of highway maintenance revenues. These amounts are identified in Table 11-1 and Table 11-2.

**Highway Capital Costs**

There are two categories of funding within capital costs, the first of which are the municipal expenditures. This represents the expenditures made on local streets such as construction, widening, resurfacing and enhancements, which are paid for by the municipality. For the Greater Hickory MPO, the forecasted expenditures are assumed to equal the estimated revenue received from the Powell Bill. These amounts are identified in Table 11-1 and Table 11-2.

The second category is the transportation improvement program, or the program of projects within the local area to be funded by the state. To forecast expenditures for the transportation improvement program, staff examined the funding in the current STIP in conjunction with the remaining projects included in the existing Transportation Plans for the local governments in the Greater Hickory MPO Planning Area.

New cost estimates for these future projects were developed using a base year of 2011 and were increased for each funding period using an inflation rate of 3.0%. These projects are identified in Charts A (2011-2020), Chart B (2021-2030), Chart C (2031-2040) and Chart D (Post 2040).

The anticipated revenue for each time period was balanced against the expected expenditure of the same time period and only projects that could be funded in those specific time periods were listed. It was assumed that inflation was accounted for the STIP projects for the 2011-2020 time period. To account for inflation in the remaining time periods an inflation rate of 3.0% for projects in the 2021-2030 time period and in the 2031-2040 time period was used. These expenditures are identified in Table 11-2.

The projected revenue in Table 11-1 has been balanced against the projected expenditure in Table 11-2 for projects listed in Charts A, Chart B and Chart C. There should be enough revenue to complete the

projects in Charts A, B and C by 2040. The remaining projects were listed in Chart D and could be moved up to earlier years if additional funding becomes available.

### **Innovative Funding Techniques**

Some of the following innovative funding techniques have the potential to help fund additional highway projects and likely can help with some of the lower cost road projects, intersection improvements and safety projects:

- Advertising revenue
- Battery Tax
- Bicycle Fees
- Congestion Pricing
- Driver's License Fee Increases
- Drive Through Service Fee
- Electricity Generated by Vehicle Tax
- Emissions Fees
- Facility Tolling
- Fare Programs
- Impact Fees
- Mileage Fee (Vehicle Miles Traveled Fee)
- New Vehicle Tax
- Privatizing Transportation Facilities
- Property Tax, Vehicle Ownership Tax or Use Fees
- Registration Fees
- Rental Car Tax
- Road Utility Fees
- Safety Violation Fee
- Sales Tax Increase
- Special License Plate Fees
- Studded Tire Fee
- Temporary Visitor Access Fee
- Tire Tax
- Title Fees
- Transportation Impact Fee
- Use Fuels Tax Increase
- Vehicle Impact Fee

- Weight Mile Truck Tax

Several of the innovative funding techniques have the potential to increase transportation funding but a sales tax option (similar to House Bill 148 that proposes to allow 94 counties in North Carolina to levy a ¼ percent sales tax for public transportation) would be one of the more reasonable pursuits for additional transportation funding for the Greater Hickory MPO.

### **Public Transportation**

In July 2008, the newly formed Western Piedmont Regional Transit Authority (WPRTA) began providing public transportation service within the Greater Hickory Urban Area. The Authority was formed by the merger of four transit systems which previously operated in the counties of Alexander, Burke, Caldwell and Catawba. The Authority currently operates under the business name of Greenway Public Transportation.

Greenway Public Transportation is funded by a combination of Federal, state and local sources, and those funds are used for operations and capital acquisitions. Federal funding includes Section 5307 funding. Projected State funding (including Federal funds pass-through funds initially received by the state) includes Section 5311 funding, State Maintenance Assistance Funding, and Rural Operating Assistance Program funding.

Other projected local sources of funding include passenger fares and donations and contract revenues and advertisement sales. It is assumed that in subsequent years, Federal Stimulus Funding would not be received by the Authority.

- Funding for public transportation will continue to increase annually by a variety of Federal, State and local sources. The increased funding will be used to expand service to needed areas in the four-county region.

### **Bicycle and Pedestrian**

Based on the history of the financing of bicycle and pedestrian projects, and the analysis of existing financial resources available to the NCDOT and the Greater Hickory Urban Area, the following very conservative and general assumptions were made to guide the development of revenue projections through the year 2040:

- Funding for bicycle paths, greenways, sidewalks and other pedestrian facilities will continue to increase at an average of five percent (5%) annually by a variety of Federal, State and local sources.

### **Grant Anticipation Revenue Vehicles (GARVEE)**

GARVEE bonds are tax-exempt debt instrument financing mechanisms backed by annual Federal appropriations for Federal-aid transportation projects. They were authorized in Federal law by Section 311 of the National Highway System Designation Act of 1995, which amended Section 122 of Title 23 of the United States Code (the Federal Aid Highway Act) to expand the eligibility of bond and other debt instrument financing costs for Federal-aid reimbursement. Burke and Catawba Counties received GARVEE funds in 2009 for pavement rehabilitation from Exit 119 in Burke County to the Catawba/Iredell County line. The total amount of funding was approximately \$29,000,000 which will be repaid either exclusively or primarily, with future Federal-aid highway funds.