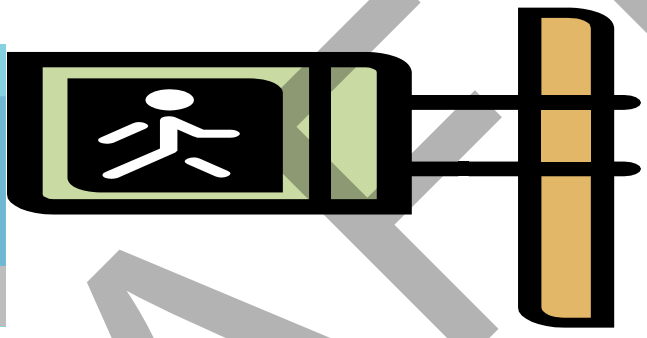
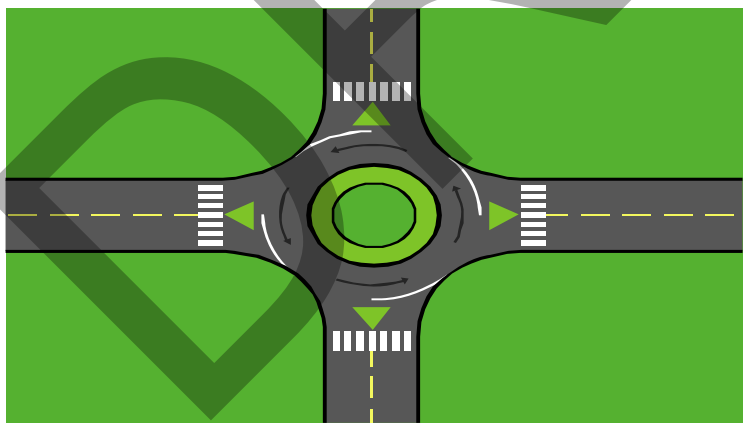
Greenville Urban Area Metropolitan Planning Organization



Metropolitan Transportation Plan

2014-2040



August 2014

CHAPTER 1
INTRODUCTION

Federal guidelines require MPO Metropolitan Transportation Plans be developed out to at least a 20-year planning horizon. Federal guidelines also require the Metropolitan Transportation Plan (MTP) be updated every five years by Metropolitan Planning Organizations (every four years for nonattainment areas). This report is an update of the *2009-2035 Metropolitan Transportation Plan* adopted by the Greenville Urban Area Metropolitan Planning Organization in August, 2009.

The 2014-2040 Metropolitan Transportation Plan brings the Greenville Urban Area MPO out to the year 2040, spanning a 26 year planning window. The Greenville Urban Area MPO has been actively updating many elements of the plan and performing field data gathering activities in order to make reasonable assumptions for planning for transportation needs, funding, and programs. This *2014-2040 Metropolitan Transportation Plan* is the culmination of efforts by all of the members of the Greenville Urban Area MPO.

The City of Greenville, Town of Winterville, Town of Ayden, Village of Simpson, Pitt County, and the North Carolina Department of Transportation, in cooperation with the various administrations within the U.S. Department of Transportation participate in a continuing transportation planning process for the Greenville Metropolitan Planning Area as required by Section 134 (a), Title 23, United States Code.

The current and updated Memorandum of Understanding (MOU) establishes the general operating procedures and responsibilities by which short-range and long-range transportation plans are developed and continuously evaluated. This MOU establishes the Greenville Urban Area Metropolitan Planning Organization (MPO). Map 1-1 shows the boundaries of the Greenville Metropolitan Planning Area as revised due to the 2010 Census. Figure 1-2 shows the current organization chart.

Activities undertaken by the Greenville Urban Area MPO are generally categorized in the Prospectus for Continuous Transportation Planning for the Greenville Urban Area (2001) prepared by the NCDOT Transportation Planning Branch, Systems Planning Unit in cooperation with other Greenville Urban Area MPO member agencies.

The Greenville Urban Area MPO consists of the boards of general-purpose local government; the North Carolina Department of Transportation; a Transportation Advisory Committee; a Technical Coordinating Committee; and the various agencies and units of local and State government participating in transportation planning for the area.

Policy decisions concerning transportation planning issues for local agencies of government are made by the respective governing boards (City Council, Town Board of Alderman, Town Board of Commissioners, Town Council, or County Board of Commissioners). The Board of Transportation makes policy decisions for the North Carolina Department of Transportation. The municipal governing boards and the N.C.

Department of Transportation have implementation authority for construction, improvement, and maintenance of the transportation infrastructure.

The City of Greenville is designated as the Lead Planning Agency (LPA) to manage the daily operations of the MPO, and is primarily responsible for annual preparation of the Planning Work Program (PWP), Metropolitan Transportation Improvement Program (MTIP), and Metropolitan Transportation Plan (MTP). The City of Greenville Public Works Department is the primary local recipient of planning funds received from USDOT for the Greenville Planning (Metropolitan) Area.

The Mid-East Commission serves as the E.O.12372 intergovernmental review agency. The Mid-East Commission is a regional council serving the North Carolina counties and municipalities of Beaufort, Bertie, Hertford, Martin, and Pitt. The mission of the Mid-East Commission is to enhance the ability of local governments to successfully improve the quality of life for area citizens: Leadership in technical assistance, planning, program management and development and public-private partnerships.

Public participation is an important element of the transportation planning process and is achieved by making study documents and information available to the public and by actively seeking citizen participation during plan reevaluation. Involvement is sought through such techniques as goals and objectives surveys, neighborhood forums, open houses, workshop seminars, and public hearings. The Greenville Urban Area MPO adopted a Public Participation Policy in 1993 and updated it in 1994. In 2008 this document was renamed the Public Involvement Plan (PIP) and updated to comply with the Safe, Accountable, Flexible, Efficient Transportation Equity Act a Legacy for Users (SAFETEA-LU). This plan was presented to the TCC and TAC committees on two separate occasions separated by a 45-day public comment period. The PIP was adopted in December, 2008.

Planning Factors

As required by federal regulations, the following is a discussion of the eight planning factors that need to be considered as long range metropolitan transportation plans are developed. Although each factor may be discussed in other sections of this report, we are including this list to highlight specific items. Moving Ahead for Progress-21 (MAP-21) was enacted June 2012, as Public Law 109-59. MAP-21 authorizes the Federal surface transportation programs for highways, highway safety, and transit for the two-year period 2012-2014. Examples of how these factors are considered in transportation plans and programs in the Greenville Urban are provided below.

Factor A – Support the Economic Vitality of the Metropolitan Area, Especially by Enabling Global Competitiveness, Productivity and Efficiency

An integral part of the goals statement for the metropolitan transportation plan in the Urbanized Area is to assure compatibility between transportation plans and economic development activities. The Southwest Bypass project is an example of a programmed transportation improvement that will benefit economic development activities. Existing and future industries located within the region compete in global markets. The construction of this bypass will continue to enhance the efficiency of product movement by truck. The bypass will significantly enhance the movement of goods and services throughout the region while eliminating delays related to signalized intersections that would normally be encountered along NC-11.

The bypass will connect to the US 264 corridor containing several regional manufacturing centers. By circumventing the stoplights along NC-11, construction of the bypass will allow further productivity, efficiency, and global competitiveness for traffic connecting to the south of the area.

The need to improve the NC-33 corridor between US-264 Bypass to US 64 southeast of Tarboro is a transportation project that provides improved connection between Greenville and Tarboro and an improved connection from Tarboro to the North Carolina Global TransPark in Kinston. The North Carolina Global TransPark (GTP) is a 2,400-acre industrial/airport site located in Kinston.

The Evans Street and Old Tar Road Project will also create economic benefits for the citizens of the area. Safety issues and delays related to overcapacity on this corridor have raised the level of interest in improving this vital transportation corridor. This corridor serves as one of the primary roads connecting downtown Greenville with the numerous housing developments located to the south in Winterville and Ayden. It plays a major role in the economic vitality of the urbanized area. The roadway improvements will alleviate delays associated with the congestion on this improving the capacity of the roadway will reduce user expenses, such as decreased fuel consumption resulting from decreased automotive idling time. It will also increase efficiency in driving time while simultaneously reducing time wasted idling in congested traffic.

An Intermodal Transportation Center Feasibility Study was commissioned by the City of Greenville and completed in March 2006 and was updated in 2012. The proposed intermodal facility would serve the transportation needs of the public at large by fulfilling the desire to improve service quality for transit riders, to make it easier to transfer between services, and to contribute to downtown revitalization. The study indicates that public supports such a center and would support city and regional travel needs. Additionally, similar intermodal centers in other cities have generally been successful. An intermodal center is a good example of a transportation project supporting the economic vitality of this metropolitan area and beyond. This project is fully funded and is programmed for construction in the MPO's TIP for Fiscal Year 2014.

Factor B – Increase the safety of the transportation system for motorized and nonmotorized users

The City of Greenville's sidewalk construction program also provides an example of improving safety of the transportation system has been considered by the transportation plan. The City's continued commitment to this construction endeavor will provide city residents with a safe alternative of non-motorized transport. The City has provided thermoplastic crosswalk markings throughout the City and is committed to improving the safety of pedestrians.

The MPO has a Bicycle and Sidewalk Master Plan that acknowledges its commitment to planning and safety for nonmotorized users of the transportation system in throughout the metropolitan planning organization's jurisdiction.

The locally-funded Thomas Langston Road (now called Regency Boulevard) extension project now provides a vital connection from Memorial Drive / NC-11 to Evans Street, as well as sidewalks and bicycle transportation improvements. Thus, this project is another example of how safety for all forms of transportation will be improved.

The City of Greenville's bicycle and pedestrian master plan was completed in 2011. This plan allows for proper prioritization of projects and efficient use of funds to provide safe travel for these transportation modes. Thus, between bicycle, pedestrian, and greenway systems, the City considers non-motorized uses in its planning and design of the transportation system. Furthermore, the City of Greenville, in 2009 created the Bicycle Pedestrian Advisory Commission to examine and explore ideas and methodologies for improving bicycle safety and awareness throughout the area.

Safety of both motorized and unmotorized transportation modes considered in this MTP is consistent and supports the goals of the *North Carolina Strategic Highway Safety Plan.* Furthermore, some safety initiatives mentioned in the plan have already been implemented, such as the recent installation of rumble strips on the SB US 264 to EB Stantonsburg Road exit ramp. The highway spot safety improvements listed in the MTP are all intended to improve safety conditions at those areas. These safety improvements were placed on the priority list as a result of analyzing DOT crash data.

Freight rail service is important in the MPO's planning area, with numerous freight trains transversing the area daily. To reduce the potential for train-vehicle collisions, NCDOT is working with the City of Greenville to conduct detailed engineering evaluations and implement recommended rail crossing improvements. A traffic separation study is currently being conducted which evaluates 45 highway grade crossings of the CSX Transportation and the Carolina Coastal Railway lines in the City of Greenville. The study groups recommended implementations into 3 categories: mid-term, and long term. An example of a long term recommendation would be the grade-separated crossing that is planned for the Tenth Street Connector Project. Projects at other intersections would involve the installation of flashing signals, cantilevered gates, and if

applicable, traffic signal pre-emption, depending on the specific characteristics of the crossing.

The projects mentioned above are compliant with the goals and objectives detailed in NCDOT's Strategic Highway Safety Plan (SHSP).

Factor C--Increase the security of the transportation system for motorized and non-motorized users. System security is considered in each project. The following projects are an example of how security is increased throughout the system.

The 10th St. Connector project will provide a key east-west roadway connection linking the hospital with the downtown area and points west. This project will provide for a bridge over the railroad, thus eliminating any potential hazardous vehicular-with-train interactions. This project will also provide for quicker emergency access between the east and west sides of town, without being impeded or slowed down at an at-grade rail crossing.

Improvements to Evans St./Old Tar Road will provide for transportation redundancy and more capacity to the roadway.

Another project provides medians on Arlington Boulevard between Firetower Road and NC 43. This project will limit access control, furthering safety of the motoring public.

The replacement and upgrade of traffic control devices will further the security of the transportation system in the area. The current control devices are no longer manufactured and are outdated. Replacement of these devices will aid in ensuring that the transportation system will remain reliable in the future.

For the city of Greenville transit system, security cameras on the buses provide more security for passenger. Security cameras will also be used at the intermodal center once it's constructed.

Security can also be part of a vulnerability assessment, which identifies infrastructure problems that could results from hurricanes, tornadoes, or flood events

Because the transportation infrastructure is openly accessible there are challenges with providing security. Four measures that can be used to address vulnerabilities are:

1. Prevention: such as limiting access to operation control centers or using surveillance techniques.
2. Protection: such as safeguarding vulnerable targets with new design standards.
3. Redundancy: such as no single point failure in the construction of one component of the transportation infrastructure or in the overall transportation network.
4. Recovery: such as communications in the short-term or traffic flow continuity in the long-term.

Factor D --Increase the accessibility and mobility options available to people and for freight

Pitt Area Transit System (PATS) is a community transportation system operating within the MPO-designated area and throughout all of Pitt County. PATS offers subscription route, demand/response and Rural General Public (RGP) service to the residents of Pitt County. These transportation services are open to all residents of Pitt County living outside the city limits of Greenville. PATS also provides American Disabilities Act (ADA) Paratransit for Greenville Regional Area Transit Bus within the Greenville City Limits.

Locations of fixed public transit routes are determined by need/demand for services using demographic profiles and evaluate associated data. The transit aspect of the planning process also ensures that those populations requiring specialized transportation services, such as the elderly and persons with disabilities, are identified and have access to public transit.

Recently, NCDOT completed a Rail Improvements Project. This project investigates the feasibility and construction costs associated with improvements to the CSX Transportation and Carolina Coastal Railway crossing in the vicinity of the Fourteenth Street/Beatty Street intersection which would permit more rapid train traffic moving from North-South to East-West rails. This project involves the construction of a new connector track which would join the CST Transportation line with the Carolina Coastal Railway line. This project will improve flow and movement of freight in addition to decreasing motorist delays at these crossings.

NCDOT is currently completing the Greenville Rail Yard relocation project. This project relocates the existing CSX switching operation, currently located between Arlington Road and Howell Street, to a new yard just north of NC 903. This new rail yard, opened in July 2013, and will help to improve the movement of freight through Greenville.

The Traffic Separation Study (currently underway) investigated the conditions of 45 highway grade crossings of the CSX Transportation and the Carolina Coastal railroad lines in the City of Greenville. Environmental protection (resulting from reduced vehicle emissions), energy conservation (fuel), and improved quality of life, from reduced delay time will result from implementing study recommendations. As trains pass across roadways, vehicle access at the tracks is blocked, affecting emergency services, deliveries, school buses and commuters. Improved crossings can help traffic flow through these intersections.

Factor E– Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns

The maps contained in Chapter 7 identify selected environmental characteristics of the transportation study area. Consideration of these characteristics will serve to help

protect the environment by identifying any major environmental concerns associated with planned transportation improvement projects early in the plan development process, The projects, such as highway or intermodal facilities, may impact natural, cultural and recreational resources. To identify and limit these impacts, federally sponsored projects are required by the National Environmental Policy Act (NEPA) to have either an environmental assessment (EA) or an environmental impact statement (EIS). Federal regulations require these documents to show how proposed projects are likely to impact environmental resources.

These reports must identify project impact on wildlife habitat, adverse effects that cannot be avoided with project implementation; measures to minimize impacts, and alternatives to the proposed construction and any irreversible environmental changes that would be the result of implementing the proposed project. Examples of environmental characteristics studied may include rare plants and animals along with supporting habitats; historic sites, structures and/or landscapes; selected agricultural and forest lands; wetlands, water bodies and waterways, air quality, ground water and mineral resources.

Transportation improvements enhance the quality of life for users of the transportation system. Improvements such as facility reconstruction often eliminate traffic hazards and reduce travel time for system users. Improvements that enhance the capacity of existing facilities may create enhanced opportunities for further economic development along travel corridors.

Pursuant to Section 450.316 of MAP-21, the Greenville Urban Area MPO consults with resource agencies and other organizations regarding compatibility of resource conservation plans/inventories and transportation plans. Comment on the *2040 Metropolitan Transportation Plan* was requested from multiple resource agencies and several regional economic development and other organizations responsible for other planning activities affected by transportation plans. Chapter 7 of this report provides a listing of resource agencies contacted in December 2012, including a copy of the correspondence requesting comments on the 2040 Plan. Comments received as a result of this effort are presented in this chapter also. Each of the comments received were considered and several have been incorporated into the 2040 MTP update.

A general discussion on environmental mitigation and a listing of potential mitigation strategies is provided in Chapter 7.

Factor F – Enhance the Integration and Connectivity of the Transportation System, Across and Between Modes, for People and Freight

The potential Greenville Intermodal Transportation Center is an example of a facility that would allow travel connections using differing modes of transportation. The site for the center was selected by the Greenville City Council in December 2012. Once the center constructed, it could potentially serve buses, taxis, limousines, delivery, baggage and

package express, private car parking, bicycles and pedestrians, as well as possible future rail service. Clearly, this project will greatly enhance modal choice and ensure connectivity of the transportation system.

It is expected that existing fixed-route transit service provided by Greenville Area Transit (GREAT) will offer connections for patrons at the planned intermodal center. In addition, the City worked with Amtrak to establish a bus shuttle service between the nearest rail station in Wilson and the GREAT bus transfer point along Reade Street in downtown Greenville.

The City's continued support of its sidewalk construction program also helps to insure connectivity and integration of the transportation system. Furthermore, sidewalk construction may occur through NCDOT's *Safe Routes to Schools* grant program. This program offers grants to communities for planning; education, enforcement and encouragement programs; and infrastructure enhancements, which are all vital components of creating a safe environment for bicycling and walking to school.

Whenever possible, sidewalk projects are selected to ensure connectivity to existing facilities, to have logical termini, to serve diverse, economically disadvantaged, and disabled populations, and enhance intermodal connectivity.

Chapter 4 provides a discussion of the regional bikeway plan adopted by the MPO in 2011 along with a map reference showing recommended bikeway facilities for the Greenville Urban Area.

Factor G– Promote Efficient System Management and Operation

This planning factor is accomplished by providing continuous and comprehensive needs assessment of the transportation system.

The monitoring of growth and travel patterns in the study area, maintaining a travel forecasting model, applying the Computerized Signal System, and implementing transportation facility improvements all serve to promote system efficiency managing and operating the transportation system.

This Metropolitan Transportation Plan incorporates a traffic monitoring system that identifies system management and operational improvements (the City's Computerized Signal System). This central computerized system monitors and coordinates the operation of these traffic signals. The system enables operators to optimize traffic flow along busy thoroughfares. The signal system will enable traffic to flow easier and safer through coordinated signals.

The Greenville Urban Area MPO pursues cost-effective practices that will not only maintain the current transportation system, but will enhance its efficiency and operation through state-of-the-art measures. This task includes securing State and local funding to support such programs.

The MPO is committed to promoting efficient system management and operations. The MPO accomplishes this by maximizing the transportation system performance through a coordinated and integrated approach to the operation of transportation facilities. The following table details management and operational goals, objectives, performance measures, strategies, and projects/implementation.

Figure 1-1: Management and Operations

Goal	Improve transportation system reliability and reduce unexpected traveler delay		Improve awareness and usage of public transportation
Regional Operations Objectives	Reduce traffic signal delay to reduce fuel consumption and emissions	Reduce incident based delay so travelers experience fewer unnecessary delays	Improve access to travel information so that ridership of the public transportation system is increased.
Performance Measures	Time delay at intersections along major corridors	Vehicle hours of non-recurring delay due to incidents	Percent increase in ridership.
Strategies	Keep traffic signal timings up to date with changes in traffic volume	Utilize traffic cameras to identify incidents along major corridors	Increase public awareness of transit system availability and schedule.
Projects / Implementations	Annual traffic count program to obtain counts at all intersections along major corridors	Install traffic cameras at major intersections allowing staff to view the entire length of the corridor	Distribute schedules in public locations. Advertise routes and schedules on government TV stations, radio, regional newspaper, and local minority publications.

Factor H - Emphasize the Preservation of the Existing Transportation System

This planning factor is achieved by establishing control measures that will preserve existing transportation facilities and function. An example of this measure is local ordinances that implement proper access management principles. Application of these principles will preserve traffic flow and movement. One example is by having adjacent parcels share driveway connections.

Facility maintenance of transportation infrastructure is a continuing State and local priority. Project level information on maintenance projects is included in the *Greenville Urban Area Transportation Improvement Program.* Municipalities implement Pavement Management Systems as a way to proactively assess pavement condition and plan for resurfacing needs. In 2014, Ayden, Winterville, and Greenville initiated a pavement management system.

Map 1-1

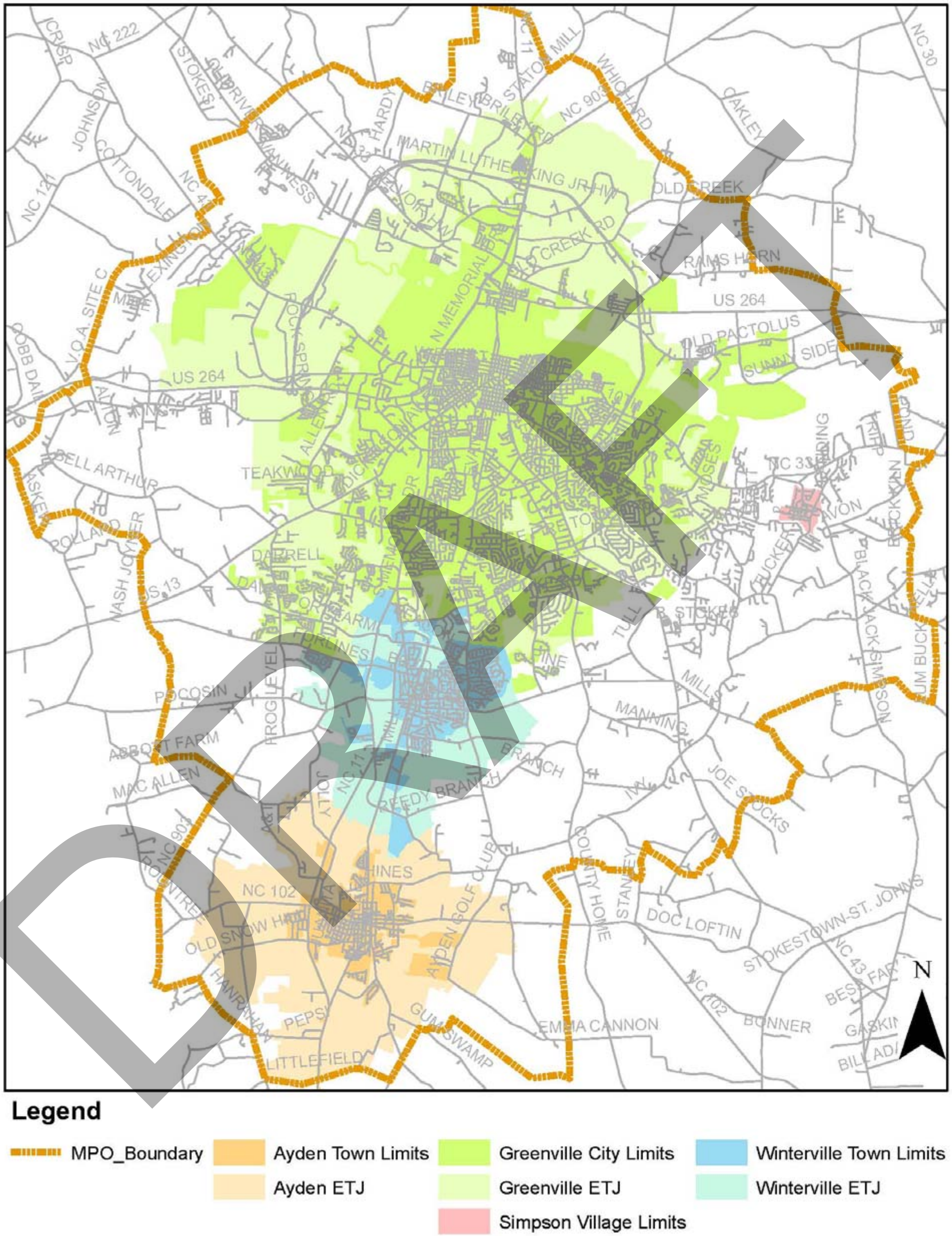
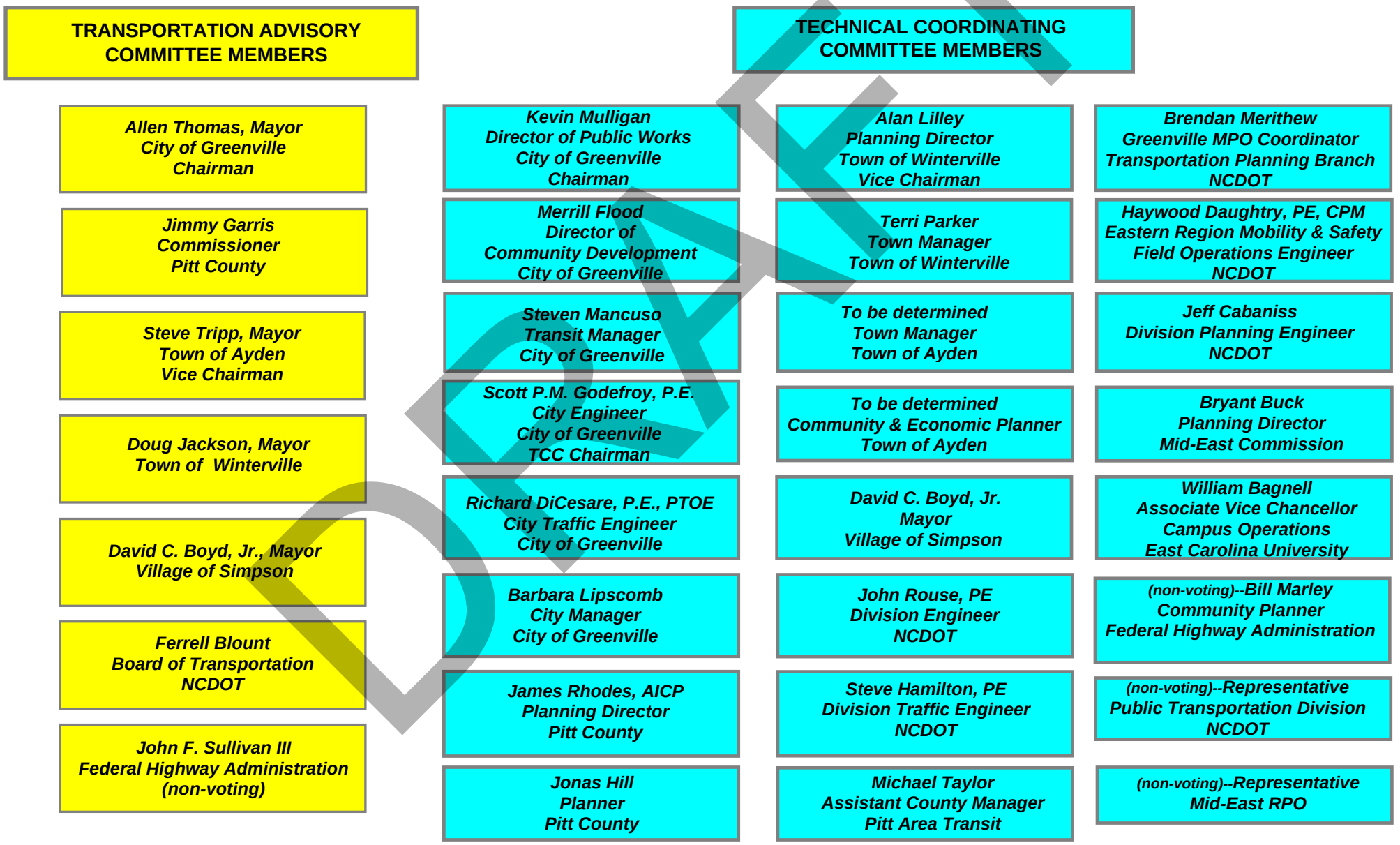

Legend
MPO_Boundary
Ayden Town Limits
Ayden ETJ
Greenville City Limits
Greenville ETJ
Simpson Village Limits
Winterville Town Limits
Winterville ETJ
DRAFT

Figure 1-2: Greenville Urban Area Metropolitan Planning Organization



CHAPTER 2
REVIEW OF EXISTING CONDITIONS

INTRODUCTION

The thoroughfare plans within the Greenville Metropolitan Planning Area adopted in the early 1990s recognized the major factors influencing the transportation needs of the area, which are population, economy and land use. They were 20-year plans, so most of the projections of future growth and needs were based on the year 2010 or 2015. The Greenville Urban Area MPO adopted the 2004-2030 MTP in August, 2004 and the five-year update in August 2009.

This chapter of the *2014-2040 MTP* includes updates of existing conditions regarding population, economic trends, land use, codes and regulations, and goals and objectives. The Greenville Urban Area MPO and its member agencies have been active in enacting policies and procedures to foster good, common sense growth.

POPULATION

Population and employment projections for the area were developed as a part of the MPO's travel demand model update. The following describes the processes and procedures used to forecast future population and employment within the Greenville urban area boundary for the 2010 model update. This methodology serves as a land use planning tool which consists of several procedures used for a variety of land use planning applications resulting from the allocation of future growth to Traffic Analysis Zones (TAZs). A traffic analysis zone is the unit of geography most commonly used in conventional transportation planning models.

Traffic analysis zones (TAZs) are the basic geographic unit for inventorying demographic data and land use within a study area. Zones are constructed by census block information. Traffic analysis zones are basic spatial units of analysis facilitating the ability of transportation planners to forecast changes in commuting patterns, trip volumes, and modes of travel, and to develop plans to meet the changing demands for transportation facilities and capacities. Each TAZ represents an area containing similar kinds of land use and commuter travel.

In general, the methodology, similar to a holding capacity method, uses county-wide and region-wide control totals in coordination with land use (layers) to allocate the future growth into TAZs. The forecasted data can then be imported directly into TransCAD, which is a special GIS application for transportation.

The following sections discuss data forecasting procedures for the Greenville regional travel demand model. These inputs include control totals, land use designations, and interim year forecasting.

Future year county-wide control totals were developed for future years of 2020, 2030, and 2040. Population totals were obtained from the Office of State Budget and Management (OSBM) and can be found online at:

http://www.osbm.state.nc.us/ncosbm/facts_and_figures/socioeconomic_data/population_estimates/county_projections.shtm

The State provides population projection up to 2033. These totals will be extrapolated out to 2040 by adding a growth factor.

The Greenville model forecasts are created using a "top down, bottom up" process where regional trends are balanced with local growth plans/building permit data. Regional trends are used to guide what the long-term control totals are, while building plans and local data are used to guide how development occurs, and in some instances, influence the long-term trends.

To project the growth in households and employment to the year 2040, the county-wide population forecasts were used along with the local planning knowledge, approved developments, Census 2010 data, and employment data collected by InfoUSA and NCDOT. In order to complete these projections, several assumptions were made through the forecasting process and are explained below. This type of forecasting process relies on a series of assumptions that are necessary to complete socioeconomic forecasts at a Traffic Analysis Zone (TAZ) level. These assumptions are (in hierarchal order):

1. Identify Regional Population Control Totals
2. Identify County Population Control Total
3. Assume Growth Ratio for inside vs. outside of study area
4. Identify Model Population Control Total
5. Identify Employment to Population Ratios
6. Assume % of Regional Employment Growth by County
7. Identify County Employment Control Total
8. Assume Group Quarters Growth Rate
9. Assume Household Size Growth Rate

To provide a larger perspective, the County, model area, and MPO census totals are presented below. The Greenville Model includes only Pitt County but also

includes some areas outside of the Greenville MPO boundary. For purposes of this plan update, the below discussion regarding the development of population and employment forecasts for the model planning area is applicable to the MPO's boundary. Greenville control totals, shown in **Figure 1**, are based on historical data and 2010–2033 forecasts prepared by the NC Office of State Budget and Management.

1.1.1. Census 2010

1.1.1.1. Population

- Pitt County population was 168,687
- Greenville Model area population was 142,727
- Greenville MPO population was 133,069
- The Greenville Model population makes up 84.5% of the County population

1.1.1.2. Employment

- The statewide employment was 4,136,257
- The Pitt County employment was 75,696
- The employment figures were obtained from Bureau of Labor Statistics (http://recenter.tamu.edu/data/emp/)

1.1.2. Projection to 2040

1.1.2.1. Population Projections

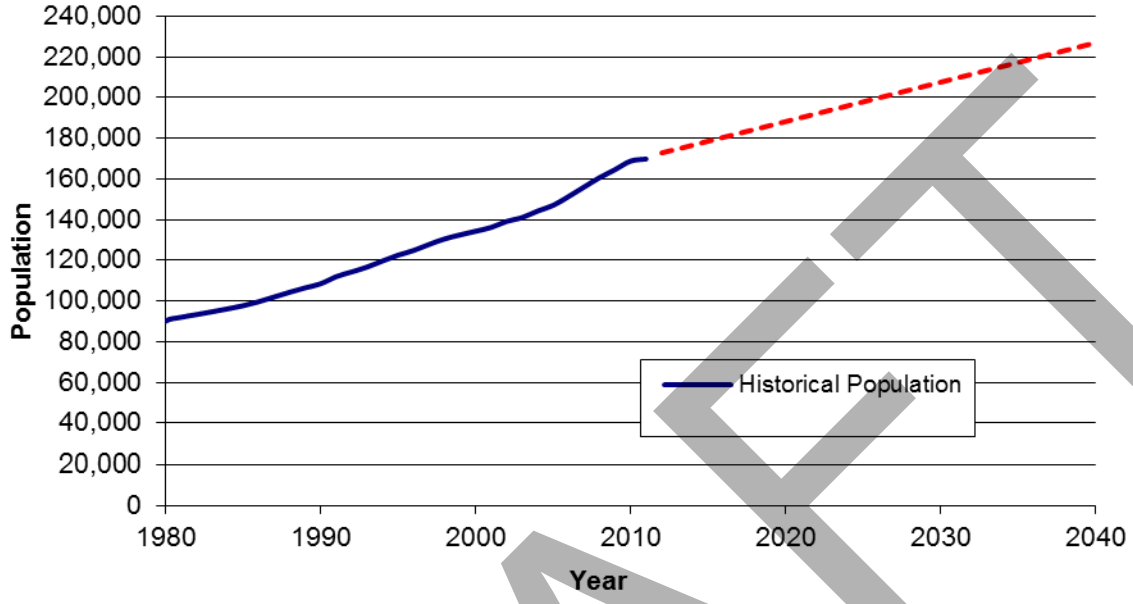
- The 2033 OSBM Pitt County population projection is 213,360
- The 2040 County population forecast is 226,968
- The 2040 Model population forecast is 197,999
- The Greenville Model population makes up 87.2% of the County population

1.1.2.2. Employment

Since employment control totals are not available for the region or counties, some forecasting of employment trends needs to be developed. The method that will be used for this model update is to tie employment growth to population ratio using an assumed

employment population ratio, and is discussed in **Section 3.5**

Figure 1: Pitt County Population Growth Projection



County control totals are determined by looking at historical county projections, along with the projected growth provided by the NC Office of State Budget and Management Projections, shown in **Table 1**, indicate that there was aggressive growth in the region from 2005-2010, which has slowed to more moderate growth trends from 2010 to 2013. Anecdotal experience of the area shows that between 2010 and 2013 growth has been very slow, primarily due to economic conditions, and will resume at a slower pace than was experienced during the mid-2000s expansion. **Figure 1** shows a comparison of historical and projected county populations.

To determine the model population control totals, it is also necessary to assume the percentage of growth in the County that occurs in the model study area. Most of the urban areas in the County are represented inside the model area. It is projected that the majority of the growth that occurs in the County will occur in the urban areas. In 2010, 84.5% of the County population was inside the model area; that number is projected to increase to 87.2% in 2040.

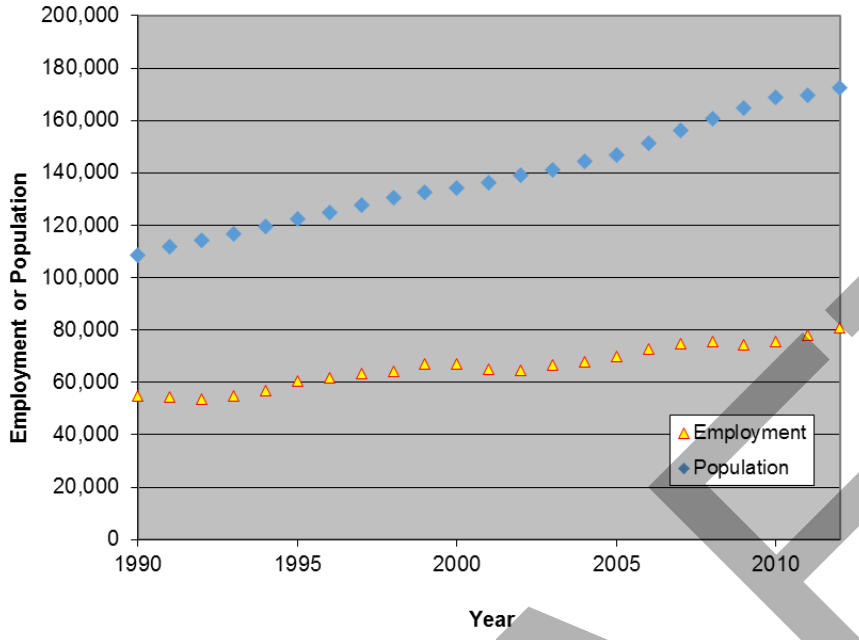
Table 1: Population Summary				
Year	County Population	Model Population	Average Annual Growth Rate, County	Average Annual Growth Rate, Model Area
2000	134,321	110,003		
2005	147,010	121,423	1.8%	2.0%
2010	168,787	142,727	2.8%	3.3%
2020	188,099	161,073	1.1%	1.2%
2030	207,532	179,535	1.0%	1.1%
2040	226,968	197,999	0.9%	1.0%

County Employment Control Totals

To calculate the employment control totals, an assumption is made that growth in employment follows similar trends to population growth. **Figure 2** shows historical region population and employment from 1990 to 2010.

Control totals for employment will be determined using the ratio of population to employment. By forecasting this ratio, the population control (already established in Table 1) can be multiplied by the ratio to determine employment controls. Reviewing the Pitt County data, population-to-employment ratios have remained nearly steady, ranging from 0.45 to 0.50 employees per population since 1990.

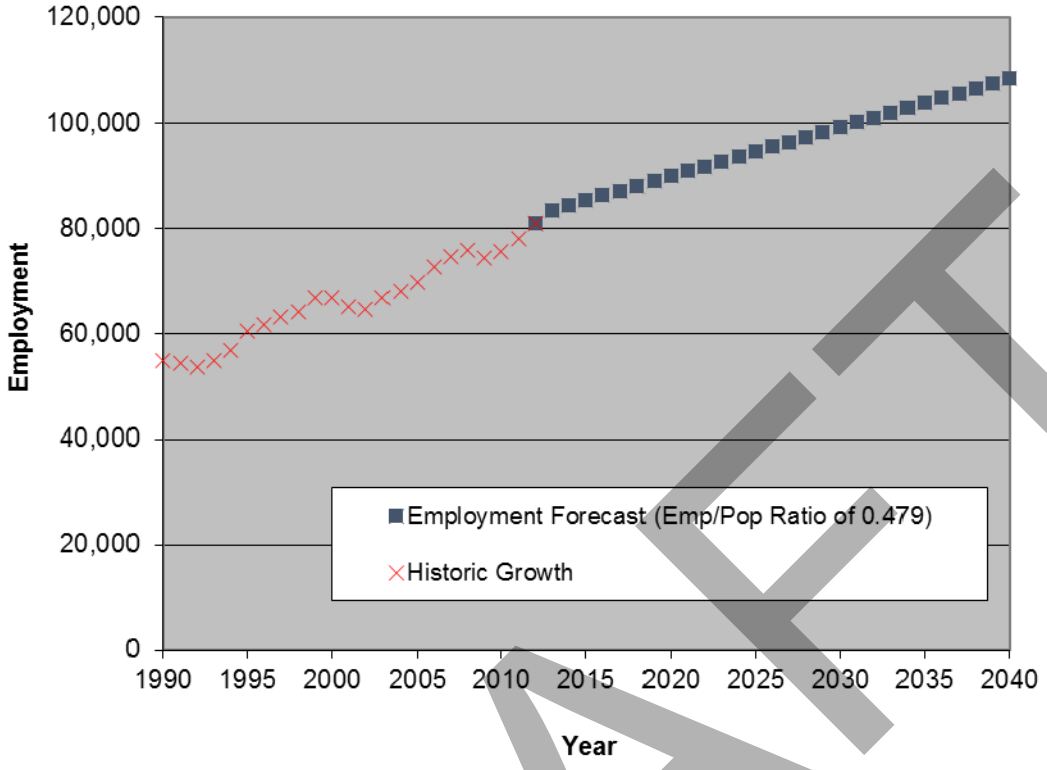
FIgure 2: Historical Regional Population and Employment Growth



Recent nationwide economic issues have affected the short-term employment growth, but these are expected to rebound over the next 10 years. **Table 2** shows the historical employment ratio data, along with the assumed employment ratios for future growth. In order to project employment data, historical data was considered, and a future employment-ratio of 0.479 was assumed for the area. The ratio assumption provides the data necessary to determine a regional employment total for future forecasts. **Figure 3** shows the projected County-wide employment.

Table 2: Employment-Population Ratios				
1995	**2000**	**2005**	**2010**	**2011-2040 (assumed)**
0.494	0.498	0.475	0.448	0.479

Figure 3: Projected 2010-2040 Pitt County Employment



The next step in the employment forecasting process is to determine the percentage of County growth that occurs in the model area. Since no specific data is available on employment projections for the next 30 years, this is completed by assuming the percentage of employment that is distributed to the model. These percentages, which are shown in Table 3, are based on historical data and local planning knowledge.

Table 3. Employment Distribution by Year

Year	County Employment Projection	Model Employment Projection	% of County Employment inside Model Area
2012	81,032	54,791	68%
2020	90,007	65,150	72%
2030	99,306	71,880	72%
2040	108,606	78,612	72%

Household Control Totals by County

Prior steps in the forecasting methodology have been based on population, but the Greenville travel demand model uses Households as the primary catalyst for trip generation. Therefore, the County control totals in **Table 1** must be disaggregated into Household vs. Group Quarters Population, and then allocated into households.

The first step in forecasting the household control totals by County is to remove the group quarters from population, as shown in **Table 4**. Group Quarters represent populations such as college dorms, nursing homes, and prisons who do not reside in traditional households. They are forecasted by assuming future group quarter population growth is proportional to County population growth. 2040 group quarters are grown using a ratio of 2040 County population to 2010 County population multiplied by 2010 group quarters information (the most recent year available). Population in Households is the remainder of the Model Population that is not in Group Quarters. Forecasted Group Quarters and Household Population are shown in **Table 4**.

Table 4: Household and Group Quarters Forecasts

Year	Model Area Population	Household Population	Group Quarters	Households	Average Household Size
2000	110,003	103,791	6,212	43,415	2.39
2005	121,423	115,091	6,332	48,541	2.37
2010	142,727	136,296	6,431	57,636	2.36
2020	161,073	154,370	6,703	66,654	2.32
2030	179,535	172,570	6,965	75,490	2.29
2040	197,999	190,761	7,238	84,557	2.26

The last step in determining the number of households is to assume the average Household Size of **new** households in the region. Historically, average household size has dropped significantly in the Greenville region over the last 40 years due to factors such as families with fewer children and retirement population growth. According to the US Census, the 1970 average household size was 3.5, the 2000 average household size was 2.43, and the 2010 average household size was 2.39. For this forecast update, we assume that the household size continues to decrease, but at a much slower rate. An average household size for new households is assumed to slowly decrease over time. This size is applied to the forecasted population to determine how many households need to be allocated to the model for each model year.

LAND USE

The generation of traffic on a particular street is correlated to the land use of the adjacent property. The Town of Ayden's Land Use Plan was adopted in 2004. The City of Greenville adopted a Land Use Plan in 1998 and updated its *Horizons Plan* (including the Land Use Plan) in 2010. The Town of Winterville updated its Land Use Plan in 2004 to include more residential categories. The Town of Ayden adopted a comprehensive plan in 1996. Pitt County adopted a new Land Use Plan in 2011. The Village of Simpson updated its Land Use Plan in 2008. Greenville, Winterville, Ayden, and Simpson have some control over land outside their corporate boundary through extraterritorial jurisdiction (ETJ) granted by the legislature. Land Use Plans are updated approximately every 5 years. Maps associated with the plans are generally revised on a continual basis.

Most of the Greenville Metropolitan Planning Area remains zoned residential. The ratio of residential to commercial has not increased during the past ten years. The Planning staffs of the City and Towns do not expect this to change during the next ten years. The Land Use Plans were developed to conform to the Transportation Plan, so the Transportation Plan is consistent with the Land Use Plan.

GOALS AND OBJECTIVES OF THE METROPOLITAN TRANSPORTATION PLAN

1. Achieve a system of safe, efficient, reliable, environmentally sound, and economically feasible transportation.

2. Coordinate highway planning and improvements to ensure that adequate Transportation is provided to existing, developing, and proposed activity centers and residential areas.

Principles used in development of this PLAN:

- ❑ Start with the existing transportation plans
- ❑ Identify current needs
- ❑ Identify future needs
- ❑ Incorporate citizen input
- ❑ Incorporate a holistic approach by looking at the system as a whole and from the perspective of each mode of transportation (auto, truck, bicycle, pedestrian, and public transportation)
- ❑ Meet present and future travel needs
- ❑ Be compatible with the environment, community character and vision
- ❑ Provide safe roads

SUMMARY

While a number of factors have changed since the early 1990s, the basic concepts of the thoroughfare plans adopted at that time are still valid. The economy and population have changed but the Greenville Metropolitan Planning Area is still primarily a residential, medical, service, manufacturing and educational area, and development has followed the land use plans. The sources of revenue available to local governments have not substantially changed since that time. The predominant source of revenue for local road maintenance is still ad valorem taxes and Powell Bill funds. For new road construction, the primary source of funds for new major road construction is still the North Carolina Department of Transportation.

The previous thoroughfare plans adopted in the early 1990s accurately reflected the conditions and needs of the Greenville Metropolitan Planning Area at that time. While conditions and needs have changed, the fundamental principles of the thoroughfare plans are still valid today. Since many of the needs identified in the thoroughfare plans have not been met, the needs and goals identified in these plans are still needs and goals today. The Greenville Urban Area MPO will continue through the planning process and through its planning development process its transportation planning efforts.

CHAPTER 3
HIGHWAYS AND BRIDGES

INTRODUCTION

The thoroughfare plan focuses primarily on the highway and bridge system. Many of the recommended thoroughfare projects have been constructed since the plan was adopted.

The six-year Transportation Improvement Program (TIP) development process is a biannual process. The TIP is developed with consideration given to the MPO's adopted priorities.

The Greenville Urban Area MPO, as part of the TIP cycle, updates its Transportation Priorities Lists by type of project. An extensive public involvement process is utilized, including advertisements, open houses, and consulting with local governing bodies.

The most recent Priorities Process (as of the drafting of this plan) was initiated in early 2014. This chapter includes a listing and map of candidate transportation projects identified and adopted by the Greenville Urban Area MPO.

Major projects included in the 2012-2018 TIP are the Southwest Bypass, Tenth Street Connector, King George Road Bridge Replacement, and the South Tar River Phase 3 greenway. A number of local projects are also in the project planning process.

The MPO-member municipalities have locally-funded roadway projects that will improve interconnectivity and ease congestion on existing major roadways. Municipalities adopt a Capital Improvement Program identifying the projects they intend to undertake in a given fiscal year. Some examples of locally-funded transportation projects are:

- Roadway extension (i.e., Frontgate Drive)
- Mast Arm Replacements
- Sidewalk Construction
- Traffic Calming projects
- Street Lighting Improvements
- Streetscaping projects
- Other road improvements

The $4.4 million Computerized Signal System Phase II project (approximately 40 signals) was completed in 2005. This completes one of the first major municipal purchase and takeover of State signals in North Carolina. The MPO is contributing funds for purchase of pavement management software for the City of Greenville.

The City of Greenville requires developers to build the entire cross section for new location projects that traverse the developer's property. The Town of Winterville, in its Subdivision

Regulations, has established a framework between the developer and the Town for cost sharing of new thoroughfares within subdivisions.

The following table indicates the number of miles of state maintained roadways within MPO-member jurisdictions.

Greenville MPO Mileage

State-maintained mileage current as of 2014 1st Quarter; municipal mileage from Powell Bill Fiscal Year 2012-2013

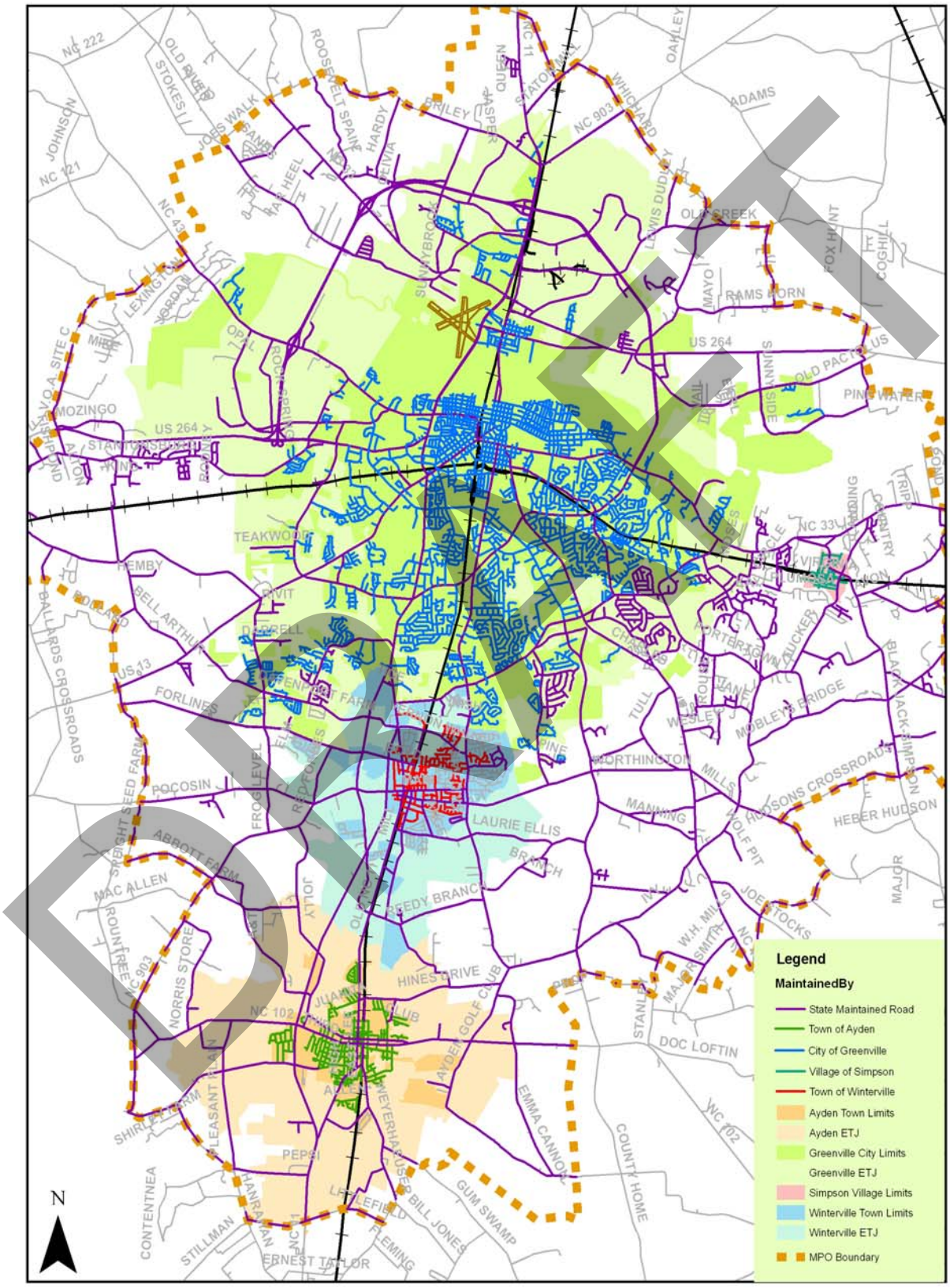
Information prepared by NCDOT Management Systems and Assessments Unit, March 4, 2014

Table 3-1

Location	US Routes	NC Routes	Secondary Routes	Total State-Maintained	Muncipal-Maintained Routes	Total Public Mileage
Ayden	0	7.008	10.081	17.089	31.02	**48.109**
Greenville	15.277	11.844	37.621	64.742	269.077	**333.819**
Simpson	0	0	2.462	2.462	2.69	**5.152**
Winterville	0	2.516	15.814	18.33	43.371	**61.701**
Unincorporated	23.877	35.72	292.269	351.866	0	**351.866**
Total	**39.154**	**57.088**	**358.247**	**454.489**	**346.158**	**800.647**

Map 3-1 below indicates the roadway maintenance responsibilities of roads in the Greenville Urbanized Area

Map 3-1: Roadway Maintenance Responsibilities



BRIDGES

The following bridge project may be undertaken during the 26-year plan timeframe. This bridge is maintained by the City of Greenville.

- Oxford Road Bridge Replacement at Bells Branch (Bridge # 419)
  - This project would replace the Oxford Road Bridge. Presently, the bridge is posted with a maximum load limit of 29 tons for single-axle vehicles and 34 tons for semi-trailers. The posting occurred in FY 90-91, following a regular bridge inspection by NCDOT, during which this bridge was found in usable, but functionally obsolete condition. Total estimated cost of this project is $750,000.

This bridge project is programmed and can be found in the fiscally-constrained projects list.

- B-5100--King George Road Bridge Replacement at Bells Branch (Bridge # 421)
  - This project would replace the King George Bridge. Presently, the bridge is posted with maximum load limits of 21 tons for single-axle vehicles and 27 tons for legal gross weight for semi-trailers. The posting occurred in FY 90-91, following a regular bridge inspection by NCDOT, during which this bridge was found in usable, but functionally obsolete condition. The proposed project will provide for continued safe use of King George Road by passenger and heavier vehicles without limitation to load. It will also allow for a wider structure so as to support joint pedestrian/vehicular use. The existing structure is suited to vehicular use only because of its width. Total estimated cost of this project is $737,000.

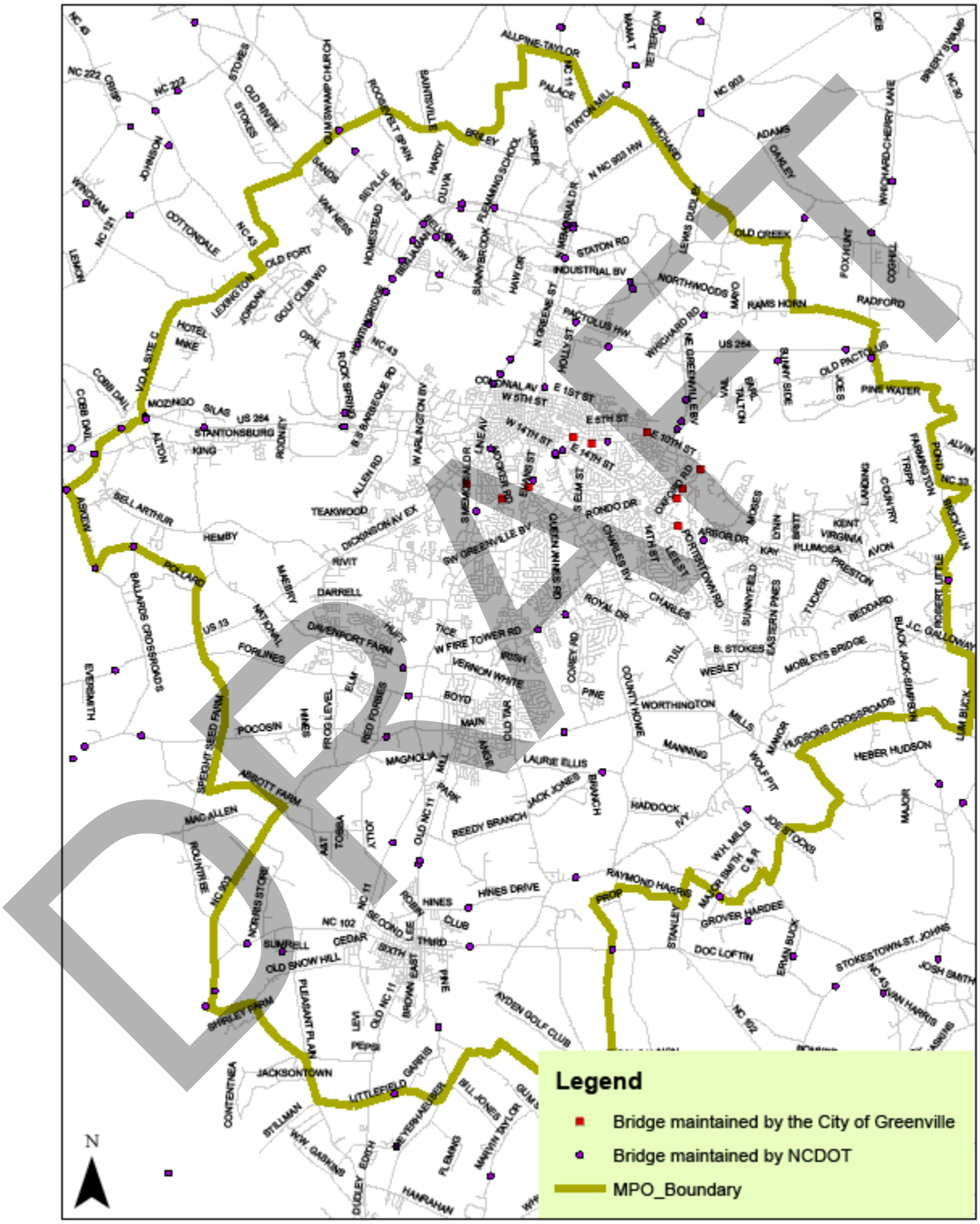
Currently, NCDOT offers assistance to local governments in replacing structurally deficient or otherwise functionally obsolete bridges through the Federal Highway Bridge Replacement Program. Bridges qualifying for such assistance may be replaced by the involved municipality with NCDOT paying 80% of the costs and the City the remaining 20%. The Bridge Replacement Program generally requires the municipality to follow stringent guidelines in the design, construction, administration, and bookkeeping for the bridge replacement project.

The City of Greenville maintains 10 bridges within the MPO planning boundary area.

Accident reports are submitted by local police and County Sheriff's deputies to the NCDOT's Division of Motor Vehicles. Locations experiencing a high number of accidents are identified for evaluation to the appropriate Raleigh and Division NCDOT Traffic Engineering offices.

The MPO recognizes that there may be future needs and improvements as a result of future bridge condition reports. Bridge projects will be done in conjunction with and as data becomes available from NCDOT. Plan updates will be made accordingly to recognize future bridge projects.

Map 3-2: Bridges maintained by NCDOT and the City of Greenville



Greenville Urban Area MPO Thoroughfare Plan/ Comprehensive Transportation Plan Highway Map

In 2001, revisions were made to North Carolina General Statute 136-66.2 intended to expand current transportation planning in North Carolina to include consideration of non-roadway alternatives. The statute now calls for the development of a Coordinated Transportation Plan (CTP). The CTP is a long-term "wish-list" of recommended transportation improvements intended for an entire Metropolitan Planning Organization (MPO) planning area. It does not identify specific timelines, costs, or funding sources for identified projects. The plan is expected to be a living document that provides for inter-jurisdictional cooperation and planning to replace previously used thoroughfare plans.

The purpose of a Comprehensive Transportation Plan (CTP) is to update the official Greenville Urban Area Thoroughfare Plan that is used by local, regional, state and federal decision-makers. It is developed jointly by local government representatives to Metropolitan Planning Organizations (MPO) and the North Carolina Department of Transportation. In the development of the CTP, consideration shall be given to all transportation modes including: street systems; transit alternatives; and bicycle, rail, pedestrian, and operating strategies.

The plan provides for land reservation of future transportation corridors and helps to guide decisions on setbacks and transportation improvements as development occurs today and into the future.

The Greenville Urban Area MPO is in the process of updating the Thoroughfare Plan by development of the maps for the required transportation modes of the CTP.

A working team from the City of Greenville, Town of Winterville, Town of Ayden, Village of Simpson, Pitt County, and North Carolina DOT will collaborate to put together a plan that will address the current and future travel needs of our area.

The MPO has, to date, developed one of the five required maps--the CTP Highway Map.

Selected projects contained within the CTP Highway Map will be included in an updated financial plan chapter of the MTP. The selected projects represent those which are fiscally constrained for the MTP's time horizon. Subsequent sections of the CTP detailing rail, transit, bicycle, and pedestrian modes of travel are anticipated for future development.

Principles Used in Developing the CTP Highway Map:

- **Existing thoroughfare plans are the starting point**
  When we reviewed the existing thoroughfare plans and compared them to the projections, we found that the recommendations for most thoroughfares in these existing plans, if constructed, would be adequate to handle future traffic. Most of the proposed changes and new thoroughfares are intended to accommodate the growth that is occurring outward from the already developed area.

- **Identify current and future needs**
  We reviewed the most recent traffic counts and NCDOT estimated traffic volumes for the 2035 Plan Year using a travel model and other traffic projection methods

- **Incorporate citizen input**
  The MPO has presented the draft map for public comment during each member jurisdiction's regularly-scheduled governing body meeting. They were held in various locations throughout the urban area. We also put the draft highway map, differences between the draft highway map vs. the existing thoroughfare plan, and public comment information on the MPO's web site.

- **Look at the thoroughfares from auto, truck, bicycle, pedestrian, and public transportation perspectives.**
  The MPO has an adopted bicycle plan and the City of Greenville and Pitt County have both adopted a greenways plan. The MPO has programmed the development of an MPO area-wide bicycle and sidewalk master plan. The CTP Highway Map plan is developed with these plans and alternate modes of transportation in mind.

- **Meet present and future travel needs**
  Projects included on the draft map are intended to meet those needs

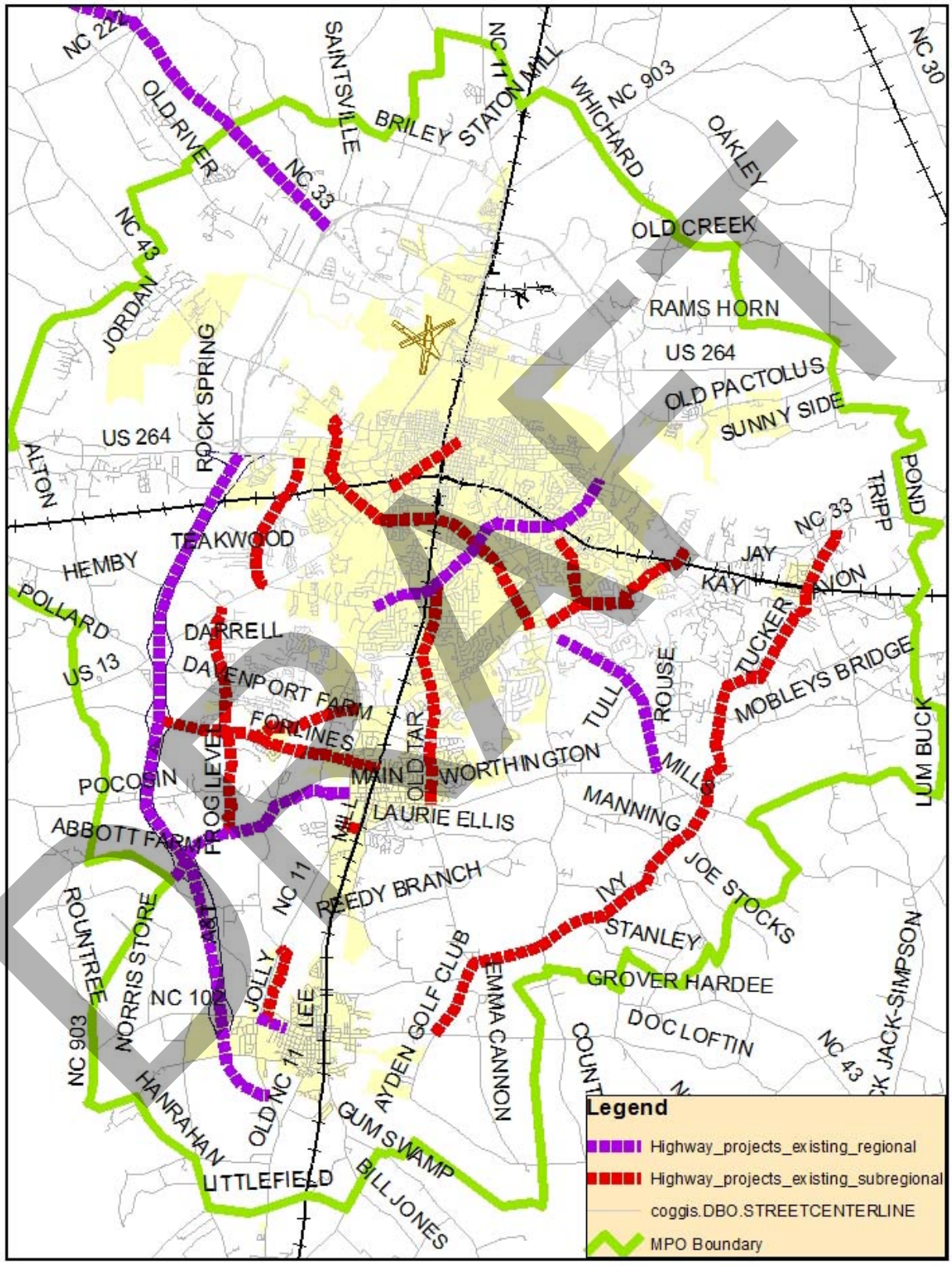
- **Be compatible with the environment, community character and vision**
  We reviewed the local comprehensive plans and land use plans to ensure that the recommendations are compatible with the local visions. Thoroughfares are part of our community and our environment.

- **Provide safe roads**
  Safety is a major goal in this effort.

MPO Transportation Priorities

Based upon the existing thoroughfare plan / CTP and the *Metropolitan Transportation Plan*, (MTP) the Greenville Urban Area MPO adopts its Priorities List every two or three years. The Candidate Transportation Projects List as adopted by the TAC on February 7, 2014, is included below.

Map 3-3: 2014-2015 Candidate Highway Transportation Projects



2014-2015 CANDIDATE TRANSPORTATION IMPROVEMENT PROJECTS

Adopted February 7, 2014

Table 3-2

DIVISION projects					
Candidate transportation projects					
Row #	**Improvement Type**	**Route Name**	**From / Cross Street**	**To**	**Description**
DIVISION level Highway Projects					
1	Modernize	Ayden Golf Club Road, Tucker Road, Ivy Road	NC 102	NC 33	Widen to meet tolerable lane width requirements, including straightening and realigning Intersections, to serve as a connector between NC-102, NC-43 South, and NC-33 East.
2	Capacity	Firetower Road	NC 43 (Charles Boulevard)	SR 1704 (14TH Street)	Widen existing 2-lane roadway to a multi-lane urban section facility
3	Modernize	Boyd Street	NC 11	Railroad Street	Widen to meet tolerable lane width requirements, provide bicycle and pedestrian facilities, construct curb and gutter and associated drainage structures, and construct turn lanes to allow the facility to serve as a connector between NC 11 and
4	Modernize	Frog Level Road	US 13 (Dickinson Avenue)	NC 903	Widen to tolerable lane width and add continuous 2 way left turn lane
5	Capacity	Evans Street/Old Tar Road	SR 1711 (Worthington Road) in Winterville	US 264A (Greenville Boulevard)	SR 1711 (Worthington Road) in Winterville to US 264A (Greenville Boulevard). Widen to Multi-Lanes.
6	Modernize	Dickinson Avenue	NC11	SR 1610 (Reade Circle)	Demolition and replacement of subgrade, asphalt, and curb & gutter, demolition of concrete slab beneath roadway; as necessary provide drainage repairs and upgrades, removal / replacement of existing sidewalk and construction of wheelchair
7	Capacity	Allen Road	SR 1467 (Stantonsburg Road)	US 13 (Dickinson Avenue)	Widen existing 2 and 3 lane roadway to multi-lane urban section facility with sidewalk, bicycle, and landscaping improvements
8	Capacity	Firetower Road, Portertown Road	SR 1704 (Fourteenth Street)	NC 33	Widen existing 2-lane roadways to multi-lane urban section facilities . includes Intersection improvements at Firetower Road and Portertown Road change the primary movement to East Firetower Road and the northern leg of Portertown Road
9	Capacity	Fourteenth Street	Red Banks Road	SR 1708 (Firetower Road)	Widen existing 2-lane roadway to a multi-lane urban section facility with Intersection improvements from Red Banks Road to Firetower Road (SR 1708)
10	Capacity	Laurie Ellis Rd Ext/Connector SR1713	NC 11	SR 1149 (Mill Street)	Laurie Ellis Rd Extension/Connector: Construct on new location 2-lane roadway with bicycle and pedestrian facilities. Construct intersection with NC11 turn lane improvements and traffic light
11	Capacity	New Route - Firetower Road Extension	SW Bypass	NC 11/903	SW Bypass to NC 11/903. Construct Multi-Lane Facility, Part on New Location.
12	Capacity	Forlines Road	Greenville Southwest Bypass (R-2250)	NC 11	Widen existing 2-lane roadway to multi-lane urban section facility including bicycle and pedestrian facilities
13	Corridor Management	Arlington Boulevard	SR 1708 Firetower Rd	NC43 (W 5Th St)	Upgrade drainage facilities, construct medians / channelized turn lanes, bicycle facilities, and sidewalk.
14	Modernize	Jolly Road (SR1120)	NC11	NC102	modernize roadway to meet tolerable lane width requirements, provide bike/ped facilities

DIVISION level Bike/Ped Projects					
15	Greenway	S. Tar River Greenway Ph2 section A	Green Mill Run Greenway	Tar River/Hardee Creek	Design and Construct section A of the S. Tar River Greenway, Phase 2, from existing Green Mill Run Greenway to Tar River/Hardee Creek Greenway
16	Greenway	S. Tar River Greenway Ph2 section B	Tar River/Hardee Creek	near cemetary on NC33	Design and Construct section B of the S. Tar River Greenway, Phase 2, from the Tar River/Hardee Creek Greenway to City property near cemetary on NC33
17	Greenway	Tar River to Hardee Creek	S Tar River Trail	Bells Branch/NC33	Design and Construct greenway from S. Tar River Trail to Hwy 33 intersection with Bells Branch
18	Sidewalk	Ange St (SR 1712)	Primrose Lane	Sylvania St	Construct sidewalk on east side of roadway (Primrose Lane to Blount St). Construct west side: Blount St to Sylvania St. Sign+mark crosswalk. Construct s/w on Primrose Lane- from Ange St to Forbes Ave South side
19	Sidewalk+Hawk+street improvement	NC102	NC11	Lee St (SR1149)	sidewalk construction + replacement; install HAWK signal connecting public schools; construct pedestrian refuge island; signage; marking, and crossing improvements throughout

REGIONAL projects

Candidate transportation projects

Row #	Improvement Type	Route Name	From / Cross Street	To	Description
REGIONAL level Highway Projects					
1	Modernize	NC903	NC 11	Greene County Line	Widen existing pavement to 32 ft (4ft widening either side to accomodate Bicycle) - Utility relocation, structure improvements, widen typical roadway section, various Intersection improvements
2	Capacity	Greenville Boulevard	NC 11 (Memorial Drive)	NC 33 (East 10th Street)	Widen to 6 travel lanes and improve Intersections from NC-11 to NC 33.
3	Capacity	NC 33	NC 222 at Belvoir Crossroads	US 264 Bypass	US 264 Bypass in Greenville to US 64 Southeast of Tarboro. Widen to A Multi-Lane Facility. Section C: NC 222 at Belvoir Crossroads to US 264 Bypass.
4	Capacity	NC 43	North of Signature Drive	SR 1711 (Worthington Road)	Widen existing 2-lane and 3-lane roadway to a mulit-lane urban section facility including sidewalk, landscaping, and bicycle improvements
5	Capacity	NC102	NC 11	Verna Avenue	Widen to a multi-lane facility with sidewalks
6	Capacity	SW Bypass	US264	NC11	Construct a four-lane, median divided, fully-controlled access facility on new location from US-264 west of Greenville to NC-11 near Ayden

Update to the MPO's Travel Demand Model

The 2014Greenville travel demand model was developed using TransCAD® software package, complete with a new interface to aid in the running and using of the model. The model has a base year of 2010 and a design year of 2040 interim years of 2020 and 2030. The model represents daily highway trips, although it has the framework in place to model hourly trips along with transit and non-motorized modes. Both private and commercial vehicle travel is represented (autos and trucks), and a level-of-service for each link is produced as part of the analysis.

The Greenville model was developed to follow the boundary recommended by the NCDOT Transportation Planning Branch and the Greenville MPO for this update. This boundary includes all of the local urban area and areas of potential expansion, follows natural boundaries whenever possible, and encompasses the jurisdiction of the Greenville MPO.

The Greenville travel demand model has been developed to assist in the analysis of the transportation system in the Greenville, NC area. The model is intended to be used as a planning tool that will assist the City of Greenville, Pitt County, Town of Ayden, Town of Winterville, and the North Carolina Department of Transportation (NCDOT) in analyzing and forecasting traffic in the Greenville Metropolitan Planning Organization (MPO) area.

The MPO's previous model, developed in TRANPLAN by the North Carolina Department of Transportation Planning Branch (formerly the Statewide Planning Branch) in the 1990s, had a base year of 2006 and a forecast year of 2035. To meet federal requirements that the latest available data be used when considering future planning efforts, the 2006 Greenville model was updated using recently compiled 2010 decennial Census data and a horizon year of 2040.

The main objective of developing the new Greenville travel demand model was to provide the information necessary for transportation planning needs in the Greenville area. Analysis needs were required by the development of the metropolitan transportation plan, the transportation improvement program, localized studies, and air quality conformity analysis as determined necessary by federal Clean Air Act Amendments.

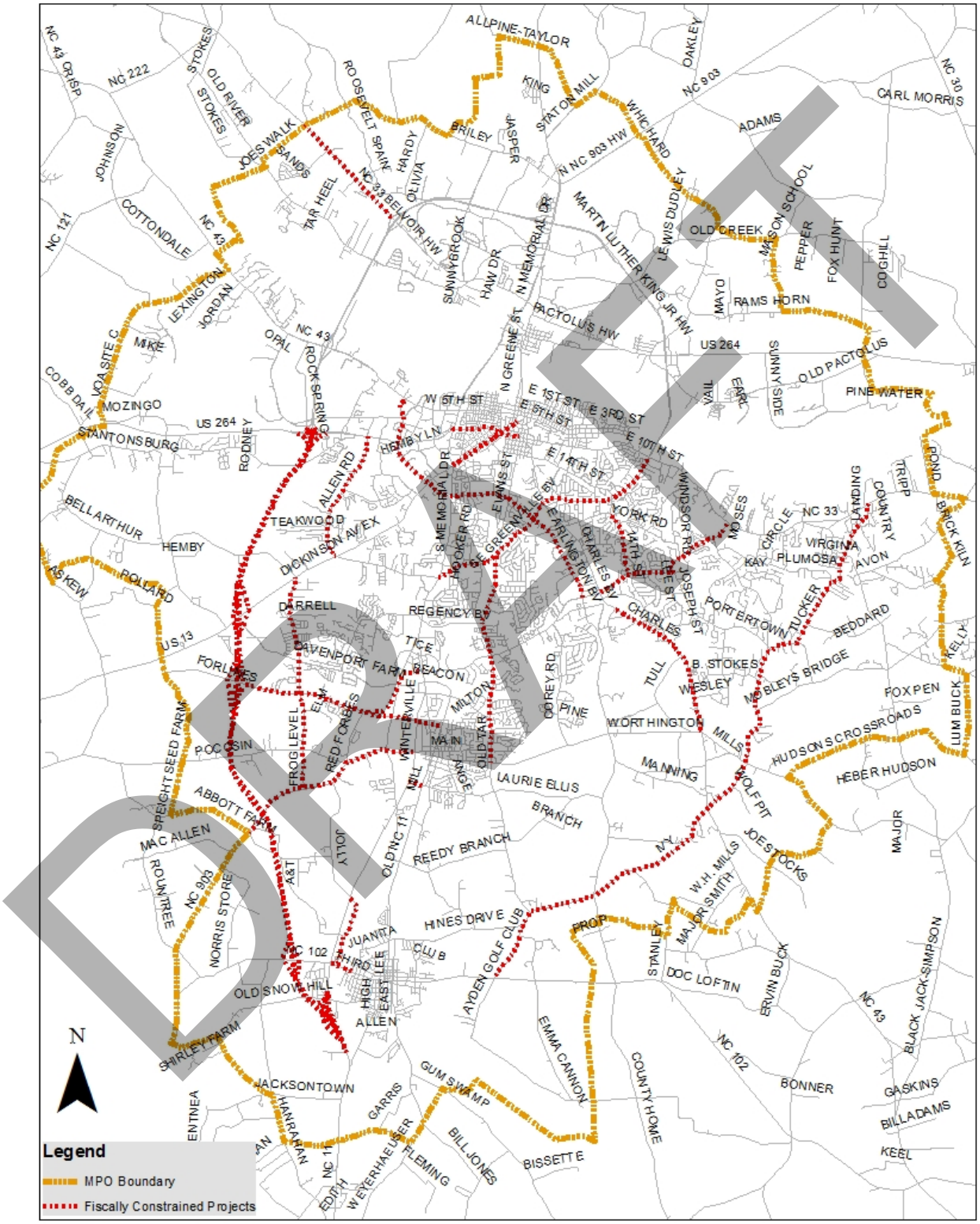
Additional objectives of the model development included:

- Providing accurate representations of traffic volumes, operating speeds, and vehicle trips on major roadways
- Providing a sound and defensible model design
- Merging travel demand model with geographic information system (GIS) data, including data from the U.S. Census Bureau, the City of Greenville, and Pitt County
- Incorporating "state of the practice" travel demand modeling tools
- Including tools for a variety of decision-making requirements

• Providing a framework that allows additional features to be included as future model demands require

The updated travel demand model was formally adopted by the MPO on February 7, 2014. Roadway projects included in the travel demand model can be seen in map 3-4 below.

MAP 3-4: Roadway projects included in the travel demand model



CHAPTER 4
BICYCLE/PEDESTRIAN

Bicyclists and pedestrians have the same origins and destinations as other transportation system users. It is important for them to have safe and convenient access to airports, transit, and other intermodal facilities. They also need facilities to access jobs, schools, services, recreation facilities, and neighborhoods. This Plan places an emphasis on creating a seamless transportation system for all users to enjoy and use efficiently and safely.

Improving conditions and safety for bicycling and walking embodies the spirit and intent of the Moving Ahead for Progress in the 21st Century act (MAP-21) and its predecessors, Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users; Intermodal Surface Transportation Efficiency Act (ISTEA) and The Transportation Equity Act for the 21st Century (TEA-21). Creating an integrated, intermodal transportation system that provides travelers with a real choice of transportation modes is one of the stated goals in these laws. State and local agencies are challenged to work together cooperatively with transportation providers, user groups, and the public to develop plans, programs, and projects which reflect this vision.

Bicyclists and pedestrians need to have safe and convenient access to the transportation system. Every transportation improvement is an opportunity to enhance facilities for bicycling and walking, which are routinely included in the planning, design, and operation of transportation facilities. The decision not to accommodate them is the exception rather than the rule.

BICYCLE

MPO Bicycle and Pedestrian Master Plan:

A MPO-wide combined bicycle and pedestrian master plan was completed with extensive public involvement in February 2011.The plan builds on the plans and policies of its member jurisdictions, such as the Town of Winterville's recently completed Comprehensive Pedestrian Plan. This plan contains numerous goals and objectives taken from older plans and new goals that will help Greenville become a bicycle friendly community.

The chief outcome of this Plan will be an integrated, seamless transportation framework to facilitate walking and biking as viable transportation alternatives throughout the region.

The development of this Plan included an open, participatory process, with area residents providing input through public workshops, stakeholder meetings, the project Steering Committee, social media, and an online comment form.

This Plan features:

A thorough analysis of current conditions for walking and biking in Greenville
A comprehensive recommended bicycle and pedestrian network
Standards and guidelines for the development of bicycle and pedestrian facilities
A prioritized list of recommended strategic and low-cost improvements
Integration of bicycle and pedestrian policy into codes and ordinances
Recommendations for programming, maintenance, and funding

Measureable goals:

1. Continually reduce the number of bicycle and pedestrian accidents per year.
2. Increase the miles of bike lanes as a percent of total regional roadways.
3. Complete five high priority bicycle and pedestrian projects by 2012 and complete the top 10 bicycle and pedestrian projects by 2014.
4. Earn a designation for Greenville as a 'Bicycle-Friendly Community' through the League of American Bicyclists by 2012.
5. Earn designations for Greenville, Winterville, Ayden, and Simpson as a 'Walk-Friendly Communities' through the Pedestrian & Bicycle Information Center by 2014.
6. Double the 2000 Census bicycle and pedestrian commute rate by 2016.
7. Launch or participate in three new bicycle or pedestrian programs in three years:

A) Bike-Walk Education and Encouragement Programs

- Continue to work with the Bicycle and Pedestrian Advisory Commission, specifically in their implementation of this plan.
- Produce online and hardcopy walking, bicycle, and transit maps and obtain a variety of educational materials for distribution and online display that cover bicycle and pedestrian safety, etiquette, and rules and regulations.
- Engage and partner with multiple Greenville area schools to become involved with national Safe Route to School programs and funding opportunities.

B) Bicyclist, Pedestrian, and Motorist Enforcement Program and Internal Training

- Provide officers with an educational brochure to be given out during pedestrian and bicycling-related citations and warnings.
- Offer training for planning, public works, engineering, and law enforcement staff that focuses on walking and bicycling-related issues.

C) Bicycle Facility Development Program

- Hire a full-time multi-modal planner for the MPO.
- Establish regular CIP and TIP funding for roadway retrofits and restriping.
- Integrate bicycle-related improvements with scheduled roadway maintenance and restriping projects.
- Add bicycle parking at 50 key locations throughout the region.

Nearly half of all personal trips in this country are less than three miles, which can be easily covered by bicycle. Yet a lack of dedicated areas makes bicycling unsafe. Installing bikeways is one of simplest and most cost effective solutions available.

Moreover, replacing a single car trip with biking or walking can save money for individuals and society by reducing:

- Fuel costs
- Traffic congestion
- Vehicle wear
- Roadway repair
- Parking fees

The bicycle network plan adds 286 miles to the current system of 31 miles. The pedestrian network adds 190 miles of sidewalks and 100 miles of greenway. By walking or biking for our trips that are less than 2 miles, we could eliminate 40% of the car trips within the Greenville MPO planning area.

Bicycle safety

North Carolina is ranked 44 out of 50 in the 2012 benchmarking report for having one of the worst (highest) pedestrian and bicyclist fatality rates in the country. Greenville reported 120 vehicle-pedestrian crashes between 2000 and 2010.

The Greenville MPO also coordinates with the North Carolina Dept. of Transportation on multimodal facilities for new construction projects. NCDOT implemented a complete streets policy in 2011 to provide a more efficient multimodal transportation network in the state, to assure that the access, mobility, and safety needs of motorists, transit users, bicyclists, and pedestrians of all ages and abilities are safely accommodated

This policy requires that NCDOT's planners and designers will consider and incorporate multimodal alternatives in the design and improvement of all appropriate transportation projects within a growth area of a town or city unless exceptional circumstances exist. Routine maintenance projects may be excluded from this requirement; if an appropriate source of funding is not available. The MPO has requested that the agency follow its complete streets policy in the final design for widening of Evans Street in Greenville and Old Tar Road in Winterville.

Bicycling can contribute to improved public health

Obesity is an increasing public health problem in the United States and in North Carolina. Our state has the 17th highest rate of obesity in the country, according to the Centers for Disease Control and Management. In Pitt County 33% of the population is obese – a figure which is higher than the statewide average of 29% and the national benchmark of 25%.

Mild daily physical activity, such as walking and bicycling can turn that trend around by:

- Reducing the risk of cardiovascular disease, diabetes and some types of cancer
- Controlling and reducing weight

- Improving mood
- Lowering stress levels
- Reducing the chance of premature death from obesity-related illness

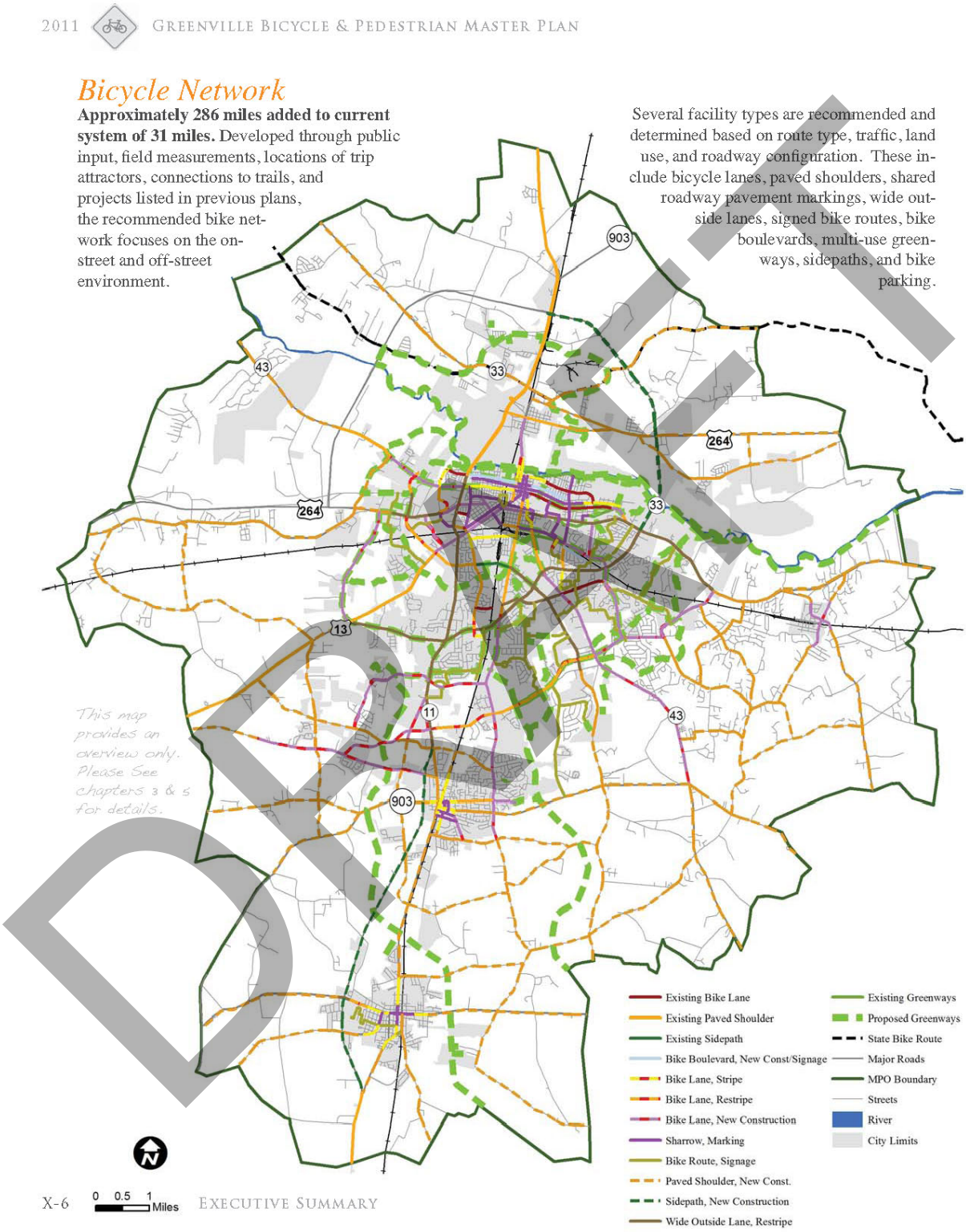
The biggest challenge for North Carolinians is the lack of access to safe environments for walking and bicycling. Sixty percent of North Carolinians say that better access to sidewalks, trails and paths would encourage them to increase their walking and biking activities.

The need for improved public health is addressed in the Pitt County comprehensive land use plan. Some of the implementation strategies include:

- Encourage multi-modal transportation efforts, such as "complete streets" which provide multiple transportation options including pedestrian, bicycle, and transit.
- Require sidewalks or pedestrian paths where residential development is within walking distance of schools, parks, and other public facilities.
- Provide continuous pedestrian and bicycle networks within and between existing and new developments to facilitate safe and convenient pedestrian and bicycle travel.

Bicycling and walking also use less land and less energy for short trips than driving a motor vehicle. A modest increase in bicycling and walking in the U.S. will save 3.8 billion gallons of fuel and reduce CO2 emissions by 33 million tons. Replacing two miles of driving with walking or bicycling per day will prevent 730 pounds of carbon dioxide from entering the atmosphere.

Map 4-1: Bicycle Plan, Long-Range System



PEDESTRIAN

Every person begins and ends a trip as a pedestrian, even if the distance is from the front door to the car. The members of the Greenville Urban Area MPO plan for pedestrian facilities to provide comfort, convenience, safety, and economy. Good pedestrian planning will reduce the conflict between pedestrians and vehicles and simplify mobility and access for people who don't drive.

City of Greenville Sidewalk Construction Program:

The City's objective of the sidewalk construction program is to improve pedestrian safety and community livability through the addition of sidewalks to roadways throughout the City. Standards and Regulations developed by the Public Works Department in support of this program are intended to provide for adequate and coordinated construction of sidewalks with appropriate features necessary to serve and protect potential users. The policies implementing this program are intended to save unnecessary expenditures of public funds through thorough planning and selection of sidewalk locations, identification of alternate funding sources where available, initial proper construction, and construction standards that will keep maintenance and replacement costs to a minimum.

Projects are identified and evaluated based on the attached scoring system which has been structured to give the highest priority to projects located near schools and parks which are adjacent to heavily traveled roadways. Once the critical projects were identified and rated, they were placed in ranked order, given an estimated construction cost, and programmed for construction based on the anticipated annual funding levels. Where NCDOT is scheduling widening or realignment of a roadway, efforts are being made to involve the state in construction of the necessary sidewalks. Projects are being constructed using a single annual sidewalk construction contract similar to the City's street resurfacing work. Funds are allocated annually by the City Council as needed.

Given the great need for sidewalks throughout the City, staff focused their initial evaluation efforts on areas within one-quarter mile of the City's schools and parks. Sidewalk construction projects are limited to areas within the city limits; however, no distinction shall be made between City and State owned streets. Project evaluations will be expanded to other areas as time and budget permit.

In addition to staff-identified projects, the City will accept requests from citizens who have an area they feel needs evaluation. Funding priority is based on scores received during the evaluation process.

Funding for sidewalk construction is programmed through the City's Capital Improvement Program (CIP) and from a variety of revenue sources including General Fund, Powell Bill, Special Grants, NCDOT roadway enhancement funds, Revenue Bonds, and Special Assessments.

Residents may petition the City to construct low priority projects funded through special assessments. This process will require that the proposed project meet a set of minimum

design criteria and that a majority of the affected property owners sign a petition for the project. Projects receiving approval will be included within the annual sidewalk contract.

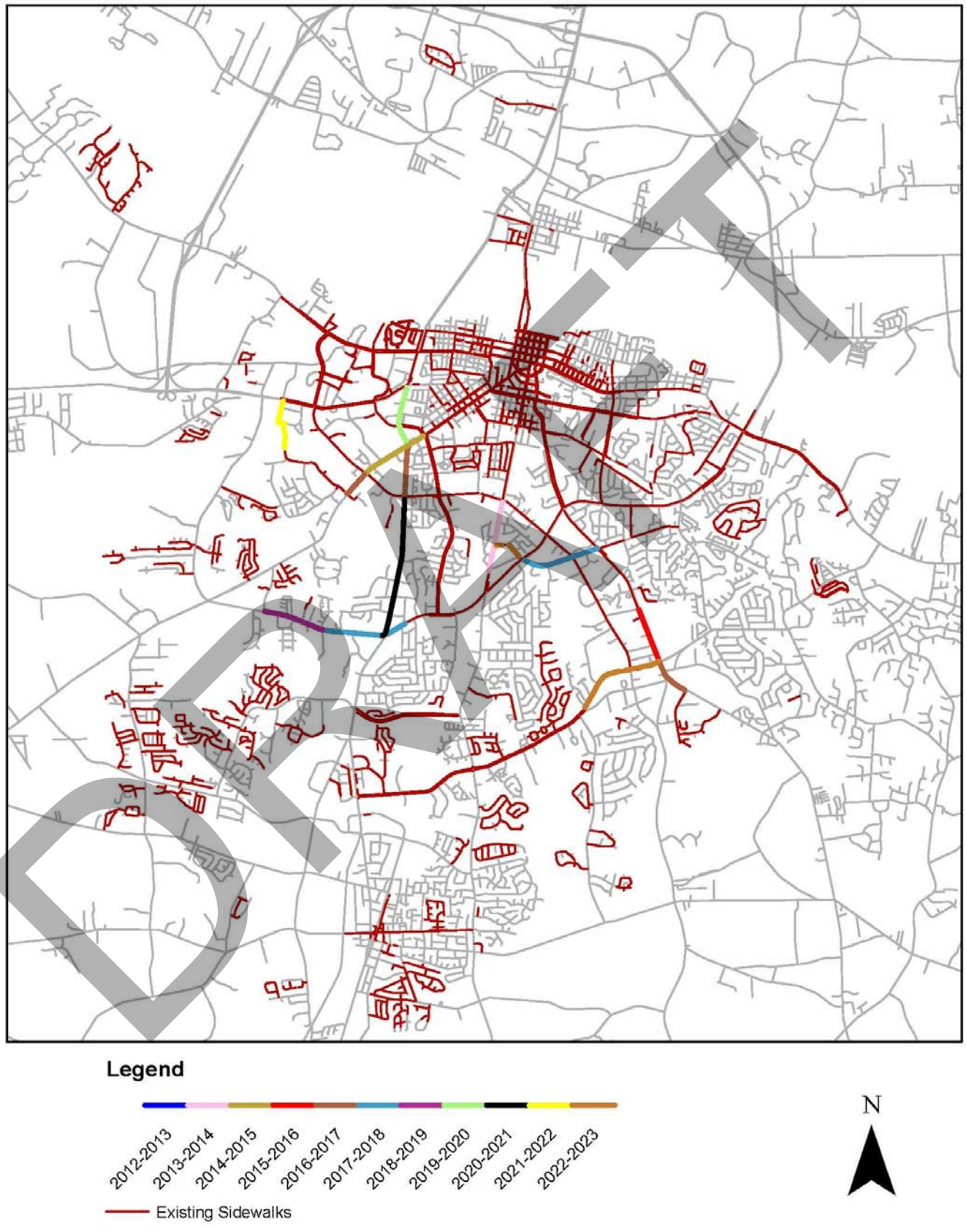
Map 4-2 specifies sidewalk projects that have been constructed through the City of Greenville's sidewalk construction program. Map 4-2 indicates possible future sidewalk projects that could be funded through the City's sidewalk construction program. The quantity and timeframe of sidewalk projects that will actually be funded may change from those implied on the map. This map is to show the extent that the City's sidewalk construction program entails, and the connectivity of sidewalk infrastructure that may occur as future sidewalk construction occurs.

Safe Routes to School Program:

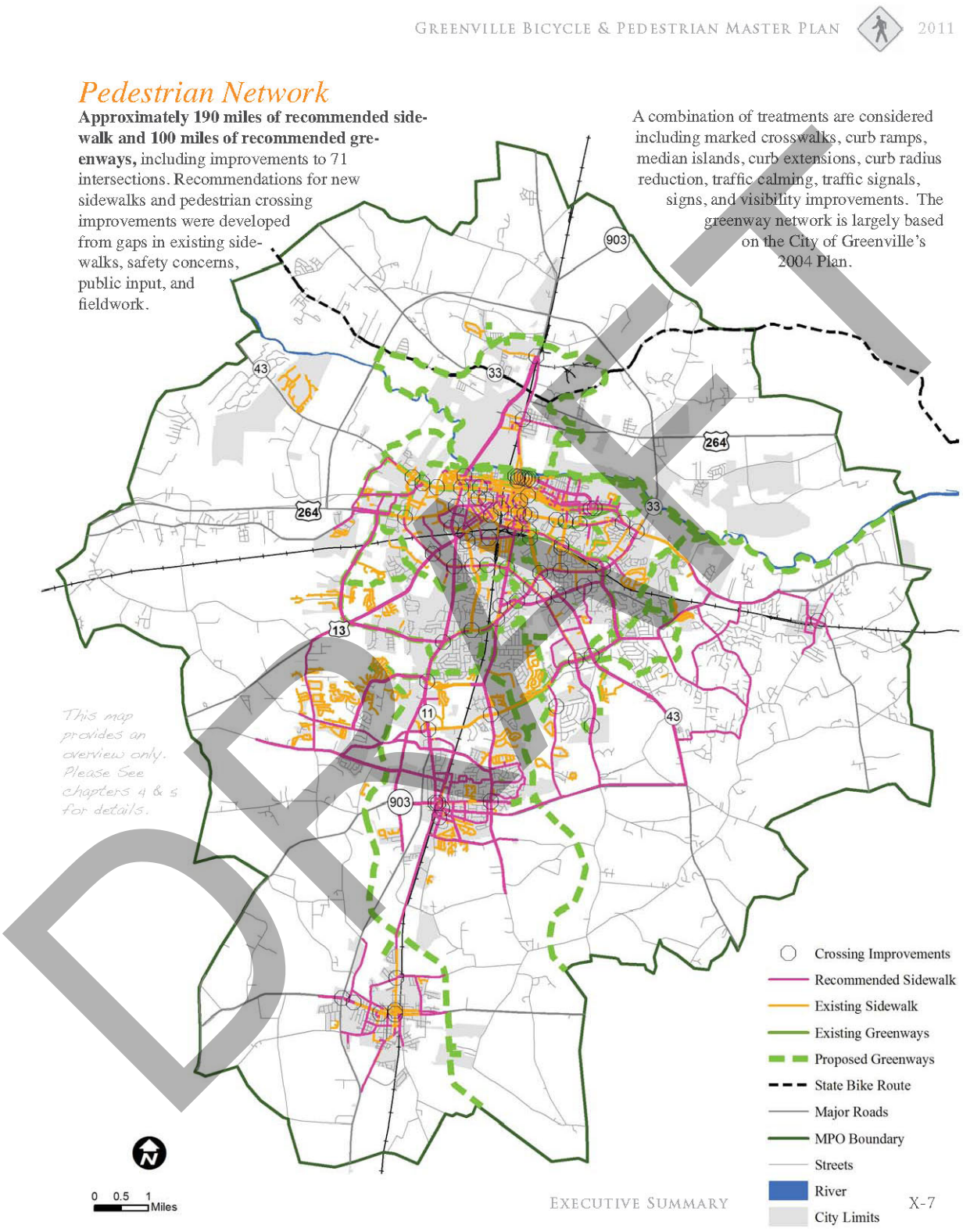
The Safe Routes to School (SRTS) Program was established by federal law in August 2005 and continued in MAP-21. The program has changed with the new MAP-21 highway law and funding is no longer allocated separately for this program.

In 1969, about half of all students walked or bicycled to school. Today, however, the story is very different. Fewer than 15 percent of all school trips are made by walking or bicycling, one-quarter are made on a school bus, and over half of all children get to school in private automobiles. Most SRTS project requests are for a sidewalk or a shared-use path. However, intersection improvements (i.e. signalization, marking/upgrading crosswalks, etc.), on street bicycle facilities (bike lanes, wide paved shoulders, etc.) or off-street shared-use paths are also eligible for SRTS funds. Implementation of the new Strategic Transportation Investments (State Law) requires a minimum project scope of $100,000 for NCDOT's funding participation towards Safe Routes to School Projects. This is 100% Federal funding and must comply with all Federal requirements.

Map 4-2: Potential City of Greenville-funded Future Sidewalk Construction



Map 4-3: Pedestrian Plan - Long Range



At its heart, the SRTS Program empowers communities to make walking and bicycling to school a safe and routine activity once again. The Program makes funding available

for a wide variety of programs and projects, from building safer street crossings to establishing programs that encourage children and their parents to walk and bicycle safely to school. [1]

The MAP-21 legislation specifies that sidewalk improvements, traffic calming and speed reduction improvements, pedestrian and bicycle crossing improvements, on-street bicycle facilities, off-street bicycle and pedestrian facilities, and traffic diversion improvements are all eligible infrastructure-related projects. Each of these categories is further defined below:

- Sidewalk system improvements: new sidewalks, sidewalk widening, sidewalk gap closures, sidewalk repairs, curbs, gutters, and curb ramps.
- Pedestrian and bicycle crossing improvements: crossings, median refuges, raised crossings*, raised intersections*, traffic control devices (including new or upgraded traffic signals, pavement markings, traffic stripes, flashing beacons, bicycle-sensitive signal actuation devices, pedestrian countdown signals, vehicle speed feedback signs, and pedestrian activated signal upgrades), and sight distance improvements.
- On-street bicycle facilities: new or upgraded bicycle lanes, widened outside lanes or roadway shoulders, geometric improvements, traffic signs, and pavement markings.
- Off-street bicycle and pedestrian facilities: exclusive shared-use bicycle and pedestrian trails and pathways that are separated from a roadway.
- Traffic calming and speed reduction improvements: bulb-outs, speed humps*, raised crossings*, raised intersections*, median refuges, narrowed traffic lanes, lane reductions, automated speed enforcement, and variable speed limits.
- Traffic diversion improvements: separation of pedestrians and bicycles from vehicular traffic adjacent to school facilities, and traffic diversion away from school zones or designated routes to a school.

*Speed humps, raised crossings, and raised intersections may only be installed on roads that are not state-maintained.

The above list is not exhaustive; other types of projects that are not on this list may also be eligible if they meet the objectives of improving pedestrian and bicycle safety and access and the purpose of the SRTS program.

Greenways provide opportunity for walking and bicycling

[1] http://safety.fhwa.dot.gov/saferoutes/

The Greenville urban area is fortunate to have the South Tar River Greenway on the banks of the Tar River in the middle of the city. This 3.1 mile trail provides excellent access and opportunity to improve public health with opportunities for walking, running and bicycling. The Green Mill Run Greenway is also complete from Green Springs Park to College Hill Drive. The City of Greenville's greenway master plan was adopted in 2004.

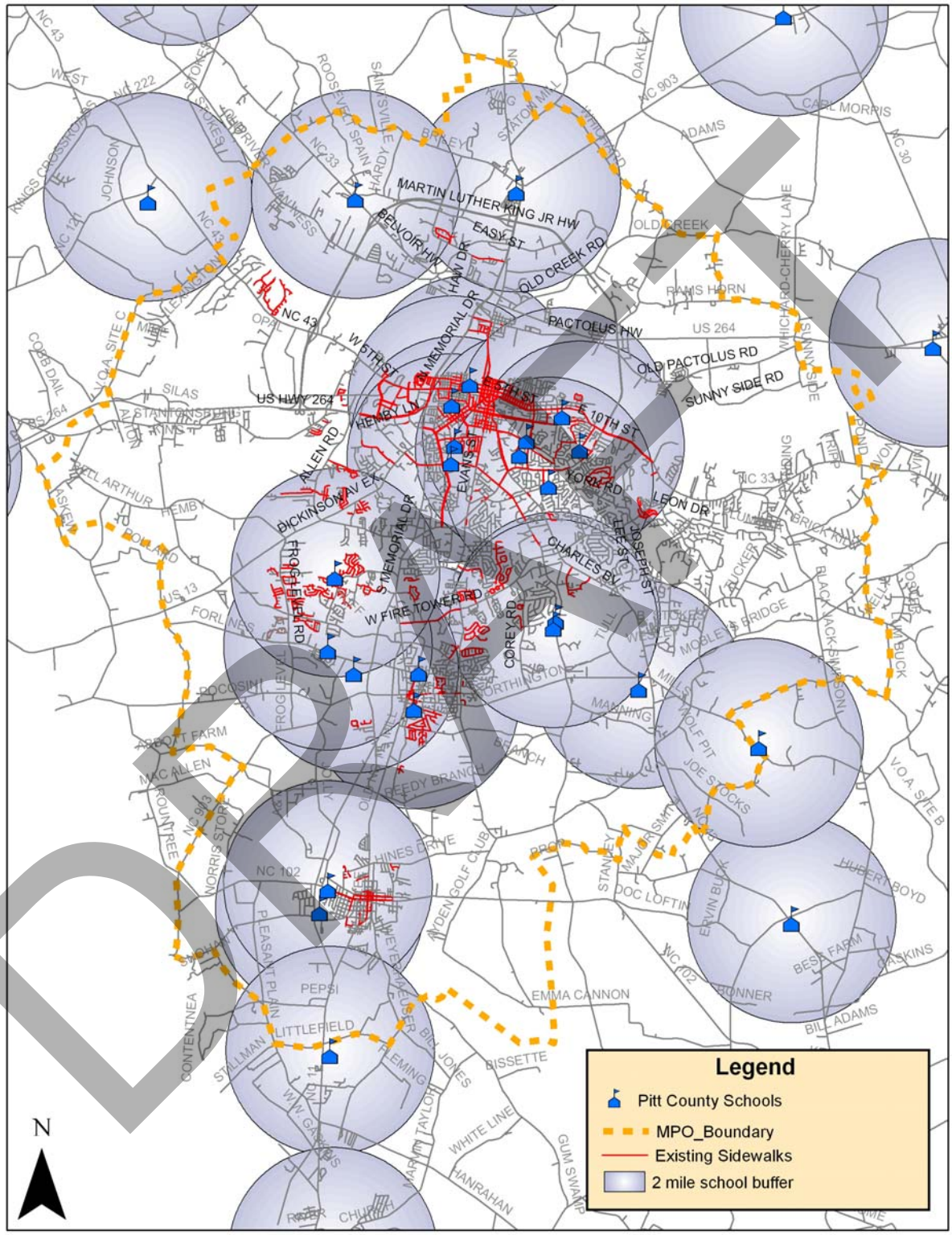
Pitt County adopted the Pitt County Greenway Plan 2025 in 2005. The plan recommended the consideration of approximately 215 linear miles of greenway network primarily along some of the major, critical stream and rivers in the County. The proposed greenways consisted of approximately 155 linear miles within the Extraterritorial Jurisdiction (ETJ) of county municipalities and an additional 14 linear miles within the city limits of county jurisdictions.

Pitt County Walking Trails

The Pitt County Community Schools and Recreation Department has made it a priority to develop safe, accessible places where people of all ages and abilities can walk. There are many trails throughout the County, although not all are paved or lighted.

Map 4-4: Pitt County Schools shown with 2-mile radius buffer and existing

sidewalks



NCDOT Transportation Alternatives Program:

The United States Congress develops and enacts surface transportation authorizing legislation. MAP-21 legislation substituted “alternatives” for “enhancements,” thus minimizing the enhancements program.

Legislation	Years
(ISTEA) Inter modal Surface Transportation Efficiency Act	1991-1997
(TEA-21) Transportation Equity Act for the 21st Century	1998-2003
(SAFETEA-LU) Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users	2004-2009
(MAP-21) Moving Ahead for Progress--21	2012-2014

State Implementation

As of the writing of this document, the State of North Carolina will only allow division-level funds to be used for bicycle and pedestrian projects. Eligible projects include bike lanes, multi-use paths/greenways, paved shoulders, sidewalks, pedestrian signals, and other streetscape/pedestrian improvements such as median refuge islands, crossing improvements, etc. All future bicycle and pedestrian projects, independent of roadway projects will require a local match. Federal funding requires a 20% match. State law prohibits state funding of these types of projects, except for the use of Powell Bill funds. To be considered eligible for funding through the MPO process, there is a minimum project cost requirement of $100,000. Right-of-Way is not an included project cost to NCDOT. Furthermore, any bicycle or pedestrian projects submitted through the MPO process must be specifically identified in a locally-adopted master plan (bicycle, pedestrian, greenway, or comprehensive transportation plan).

Available funding sources for bicycle/pedestrian projects include

- Surface Transportation Funds (STP)
- Transportation Alternatives (TA)

- Safe Route to School (SRTS)
- Highway Safety Improvement Program (HSIP)
- Incidental projects

Greenville Sidewalk Ordinance:

In 1998, the City adopted a sidewalk ordinance which provides sidewalks by the subdivider in accordance with the following:

1. Sidewalks shall be provided in conjunction with public street extensions pursuant to Section 9-5-81 (Street design standards, of this Chapter).
2. The location of proposed sidewalks required pursuant to this Section shall be in accordance with the Manual of Standard Designs and Details.
3. Sidewalks shall be provided along both sides of all minor and major thoroughfare streets as shown on the official thoroughfare plan.
4. Sidewalks shall be provided along one (1) side of all collector, standard residential, and planned industrial streets.
5. Sidewalks shall be provided along one (1) side of all minor residential streets which are in excess of five hundred (500) feet in length in the case of a cul-de-sac/terminal street or one thousand (1000) feet in length in the case of a loop/connecting street.
6. The arrangement of sidewalks in new subdivisions shall make provision for the continuation of existing sidewalks in adjoining areas.

Winterville also requires sidewalks in new subdivisions via similar policies. The Town of Ayden requires a 5-foot sidewalk on one side of all new streets excluding cul-de-sacs serving 10 or fewer lots.

The NCDOT Division of Bicycle and Pedestrian Transportation (DBPT) and the Transportation Planning Branch created an annual matching grant program – the Bicycle and Pedestrian Planning Grant Initiative – to encourage municipalities to develop comprehensive bicycle plans and pedestrian plans. This program was initiated in January 2004 and is currently administered through NCDOT-DBPT.

Greenways:

The City of Greenville's Greenway System is still under construction. Phase 1 (Green Springs Park to ECU) was constructed in 1994, and Phase 2 will be completed in 2013. The 1.5 mile walkway provides a scenic and environmentally friendly walkway and bike path along the water of the Green Mill Run for the enjoyment of walkers, runners, bicyclists, and nature enthusiasts. Additional phases are planned. With the completion of Phase 2, a recreational bicycle and walking trail will connect Green Springs Park, ECU, Rose High School, and Evans Park. Phase 3 of the Tar River Greenway is under

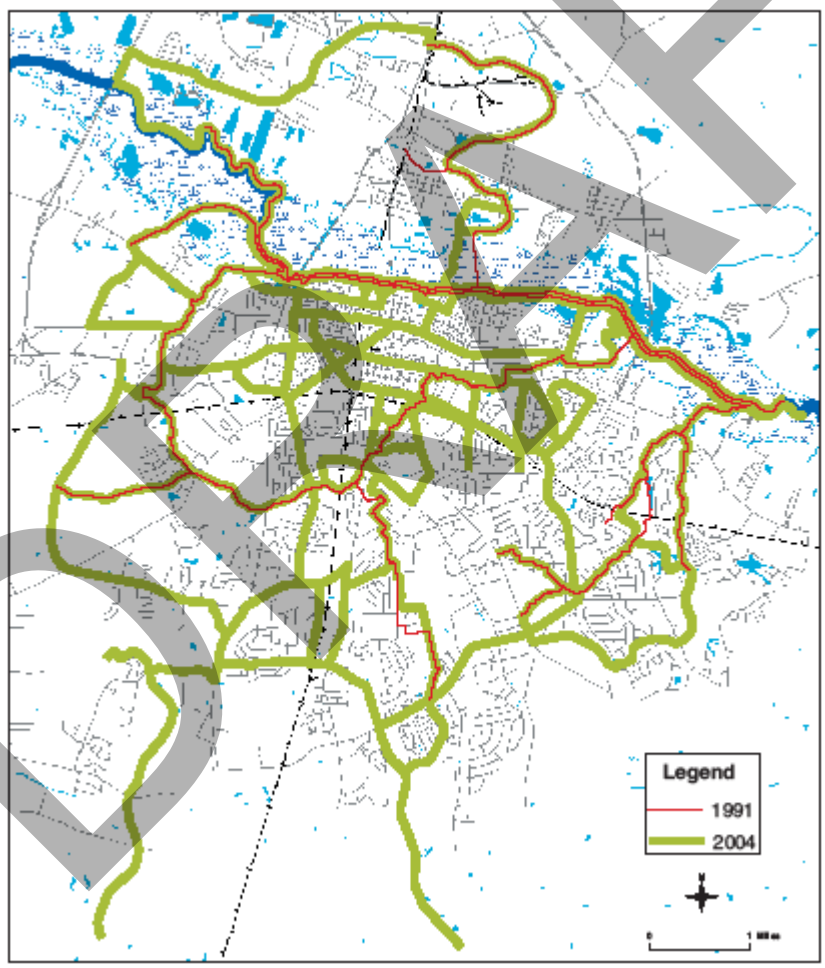
design and will be completed in 2014.

An update to the Greenville Greenway Master Plan was adopted by the City in March 2004. The Executive Summary is below.

> "The 2004 Greenway Master Plan has been designed to: 1) Reevaluate the feasibility of the greenway corridor proposals found in the original plan, ensuring that they continue to be viable routes. 2) Offer alternatives for those corridors found to be no longer feasible and 3) Present new corridors that can provide opportunities in previously underserved areas of the community and can meet additional recreation, transportation, and natural area protection needs.

Map 4-5

1991 and 2004 Greenway System Proposals



In the system recommendations chapter, maps have been included for each existing and proposed corridor. These maps and their associated descriptions delineate the precise route, provide expected use and cost information, and list particular opportunities and constraints associated with the corridor. Following the presentation of these 42 individual maps and descriptions, a new implementation chapter breaks down the entire system into a set of project phases. The timing of each phase is based, in part, on inputs from the citizens of Greenville regarding their greenway priorities and interests. Each of the phases includes a detailed timeline of when land acquisition, master corridor planning, and construction steps should occur so that the

development of Greenville's greenway system becomes a steady, measurable project over the following decades.

In addition to the detailed actions associated with each phase, the implementation chapter includes a set of 8 general action steps that should be undertaken immediately to get the greenway implementation process started.

For the most part, the original 1991 greenway alignments remain viable proposals today. In cases where constraints might make the route too expensive or simply no longer possible, alternative alignments have been suggested. These have been combined with other, entirely new greenway segments to form a complete greenway system. The system design is centered on a set of primary greenways along creeks and rivers. Connectors for bicycle and pedestrian traffic are then added to link the primary corridors to each other and to shopping, business, residential, education, and recreation destinations.

The 2004 Greenway Master Plan also includes a funding chapter to help the community think through local strategies for raising capital, look for matching funds from other private and public sources, and help calculate the cost differences that might come from different trail designs and surfaces. A similar chapter is included in the 2009 bicycle-pedestrian master plan.

In 2008, the City of Greenville amended the Greenway Master Plan to include an extension to the Pitt County District Park's walking trail to facilitate connectivity as plans for adjacent properties and associated transportation improvements are designed.

Greenville has a significant history of greenway planning and the citizens have consistently shown broad support for the concept of "putting the green back in Greenville" through the development of a comprehensive network of greenways. In general, they favor using existing tax dollars or other local government money for this sort of activity and they see greenways as an important tool in shaping the land use patterns in the community, providing additional transportation opportunities, protecting water quality and natural areas and, in the end, improving the quality of life for individuals living and working in Greenville.

The implementation of a comprehensive greenways program in Greenville promises many benefits including enhanced water quality protection; preservation of critical wildlife habitat and green spaces; additional recreation, fitness, and education possibilities; and enhanced alternative transportation options for pedestrians and cyclists. All of these contribute to elevating the general quality of life in Greenville - increasing its appeal as a tourist destination, new business location, and thriving community where one might raise a family. In the end, investments in quality of life components yield a return to the bottom line of City and personal finances by increasing property values and subsequently increasing the City's tax base.

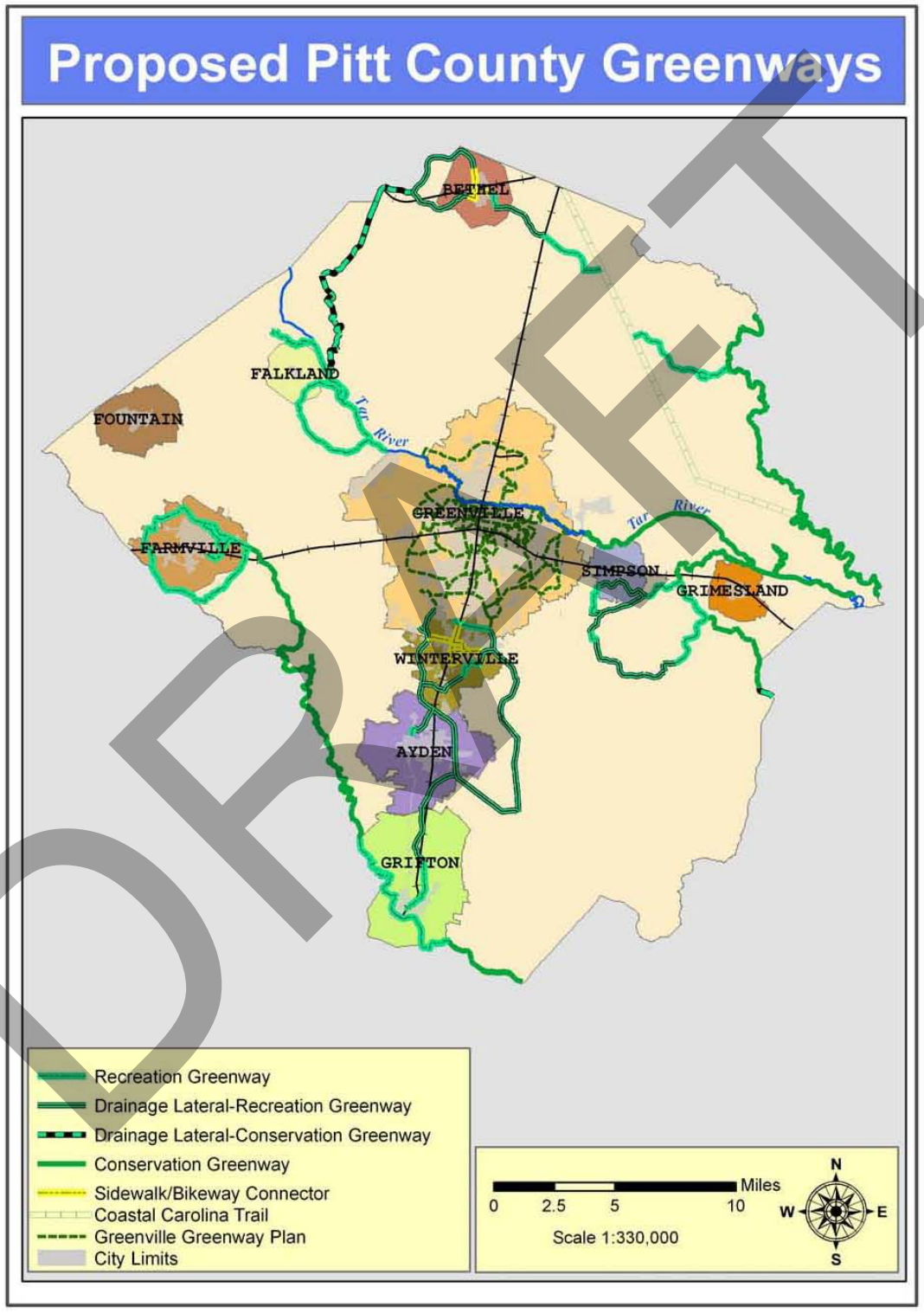
The stage is set for success. What is required now is a commitment for sustained, collaborative action among the leaders of the community. There will be a need for adequate City staff to support the greenways program, new agreements among City departments to work together on implementation steps and fundraising, and new programs such as a Green Streets program which would add new trees along sidewalks and bikeways. Together, this leadership and combined community effort will yield a first rate greenways system for the City of Greenville.

A Greenway Plan to identify potential greenway corridors has been completed for the remainder of Pitt County. The Pitt County Greenways Plan was adopted by the Pitt County Board of Commissioners at their February 20th, 2006 meeting. The plan was a joint effort between the Pitt County Planning Department and the East Carolina University Planning Program. The plan will utilize the nearly 215 linear miles of trails, mostly along creeks and streams, for recreational use, open space conservation, and some urban uses. Map 4-6 indicates the greenways identified in this plan.

Other Pedestrian Policies and Programs:

Greenville Urban Area MPO policy also includes requesting pedestrian facilities in all thoroughfare and bridge projects. In addition, the MPO staff is coordinating with NCDOT on adding sidewalks and bike paths to the widening of Evans St.-Old Tar Road between Greenville and Winterville.

Map 4-5: Proposed Pitt County Greenways



CHAPTER 5
TRANSIT, RAIL AND AVIATION

TRANSIT

Within the planning boundaries of the Greenville MPO, four separate transit services are in place. They are the Greenville Area Transit (GREAT); Pitt Area Transit System (PATS); Vidant Health System, and East Carolina University Transit.

GREAT is a division of the Greenville Public Works Department, providing fixed route transit within the City of Greenville and complementary paratransit through Pitt Area Transit, Pitt County's human service and Rural General Public (RGP) transportation provider. GREAT currently has a fleet of 11 buses, operating six routes Monday through Saturday. GREAT transported 543,282 passengers for the fiscal year ending June 30, 2013.

GREAT currently charges a $1 fare with free transfers. A half price fare of $.50 is in effect for elderly/disabled citizens (65 years of age or disabled). A 22-ride pass (two free rides) is available for $20 full fare and $10 half fare. A 44-ride pass (four free rides) is available for $40 (full fare) and $20 (half fare). Day Passes are $2 (regular) and $1 (elderly/disabled) and are good for day of purchase only. A Summer Youth pass is available for $15 and offers unlimited trips for youth 6-16 from June 1st to August 31st.

The GREAT revenue vehicle fleet currently consists of 11 35-foot heavy duty transit coaches, two (2) of which are hybrid powered. All of the buses are fully accessible and equipped with a voice announcement system as well as a video/audio surveillance system. GREAT provides service on six (6) routes from 6:20 a.m. to 7:00 p.m. Monday through Friday, and from 9:20 a.m. to 6:00 p.m. on Saturdays. The routes extend throughout the City of Greenville and to Pitt Community College located in adjacent Winterville.

Currently, GREAT has engaged a consultant to develop a short range transit development plan, which was completed in September 2013. Future GREAT services will reflect the recommendations contained in the completed plan.

Other transit providers in Greenville and Pitt County include East Carolina University Transit which serves the students, staff and faculty of the University and is not open to the general public. PATS provides human service, rural general public transportation in Pitt County and ADA paratransit service for Greenville Area Transit (GREAT). Vidant Medical Center, on the west side of Greenville, operates a shuttle service in and around the medical district and parking areas for visitors and staff.

ECU Transit provides shuttle service between the ECU School of Medicine and the main campus, shuttle service around the main campus itself, and service from student apartments and shopping centers throughout the area. It currently operates 36 buses, six (6) vans and two (2) support vehicles. The system carried 2,320,288 passengers

between July 2011 and June 2012 and provides 49,651 service hours.

ECU Transit is operated as a Department of East Carolina University and is supported by student fees

PATS provide human service and rural general public transportation throughout Pitt County. PATS operated 24 vehicles, provided 43,273 passenger trips, and ran 388,962 miles in Fiscal Year 2012-2013[1].

Greenville/Pitt County Regional Transit Feasibility Study:

This study determined the feasibility of a region-wide system of transit services and connections. The issue is improved mobility throughout the area. This study was intended to specifically address ways to provide more cost effective and efficient transportation to citizens and students in the City of Greenville as well as how to identify and address the more regional transportation needs.
The study examined the need and potential for regionalized transportation services. The four transit services operating within the county are:

- The Greenville Area Transit (GREAT) service – fixed route service throughout the city of Greenville
- Pitt Area Transit System (PATS) – human service agency demand-responsive service throughout the county
- East Carolina University –services for ECU students
- Pitt County Memorial Hospital – parking lot shuttles for its campus.

This study examined the operation of the existing systems and evaluated the desirability of providing a more consolidated or coordinated system in the region. Besides extensive meetings with all of the parties, a separate survey was conducted of ECU students to evaluate their perspectives.

The study concluded that a coordinated, regional service will provide the best overall service for residents in the area.

Currently, GREAT is working closely with PATS and ECU to identify more areas of coordination and cooperation. There is now a link from the City's (GREAT) website to ECU Student Transit Association (ECUSTA) and regular working group meetings have been established with ECUSTA staff and City staff. Pitt Area Transit continues to provide the City's paratransit service and GREAT and PATS work closely to ensure that individuals receive needed services. In addition, the City's Transit Manager serves on the PATS Transit Advisory Board. PATS also has a seat on the MPO's Technical Coordinating Committee. A major goal of the City is to facilitate more coordination efforts among the transit providers in Pitt County.

[1] Ms. Rebecca Clayton, Manager, PATS

Greenville Transportation Activities Center (GTAC):

A Greenville Intermodal Transportation Center (ITC) Feasibility Study was completed in March 2006 by Martin/Alexiou/Bryson, PLLC. The study concluded that a transportation center is indeed feasible for Greenville, and recommended that the City move forward with the project, now called GTAC.

Another study by Mayer and Associates in 2012 and 2013 recommended a different site that would be a catalyst for economic development. This site is in downtown Greenville off Dickinson Avenue and Pitt Street. The project is now fully funded as of April 2014 and construction will start in early 2015.

This center will provide a central location for intercity transit service (provided by Greyhound), urban transit service (provided by GREAT), human service and rural general public transportation provided by PATS, ECU student/faculty/staff transportation provided by ECUSTA), taxi service and a possible future passenger rail component. The GTAC project will improve the image and visibility of transit and provide more transportation options and amenities for riders. A map of the preferred site is attached.

Background

The City of Greenville and its public transportation system (GREAT, the Greenville Area Transit System), have been planning the development of a Transportation Center as a hub for their system for several years. In 2006, the consulting firm Martin Alexiou Bryson (MAB) completed a detailed Feasibility Study which concluded that a Transportation Center was both needed and feasible. The suggested partners for this Center included:

- GREAT
- East Carolina University Transit (ECUT)
- Pitt Area Transit System (PATS)
- Pitt County Memorial Hospital (PCMH)
- Greyhound
- Local taxi providers.

The MAB Feasibility Study recommended that the project move to a Site Selection and Conceptual Design phase to further define the project and its anticipated scope. This project was eventually delayed and became the project now underway.

Public involvement

The city and MAB hosted an open community workshop in October 2012. The meeting was advertised by the City through various media. The City and MMPA staff were available at the workshop to answer questions and provide information about the GTAC. Eighty-seven citizens attended.

City Council Presentation

The consultant made a final presentation to the City Council on Dec. 10, 2012 for formal approval of the recommended site and concept plan. Two sites were presented and the Council approved Site 5, which is now being designed.

Environmental Work

The City has selected a site bounded by Pitt Street, Atlantic Avenue, Clark Street and Bonner Lane. It is within the Dickinson Avenue historic district and is a brownfield which would require a NEPA Phase 1 environmental assessment.

Next Steps

1. Obtain environmental approvals from FTA
2. Acquire the properties that make up the preferred site
3. Move forward with the next step in project design.

Greenville expects to move these steps forward in 2014.

Short Range Transit Development Plan

This study began in 2013 and is intended to prioritize the GREAT system's expansion plans for the next five years. The project will identify future transit demand, prioritize potential changes in the current level of service and develop a financial plan for all recommended changes.

Energy savings in transit operations

GREAT and the city of Greenville are committed to reducing greenhouse gas emissions from transit vehicles and saving money on energy cost in transit operations. Below are some strategies which could be considered in an energy savings program.

Table 5-1
CATEGORIES OF ENERGY SAVING STRATEGIES AND EXAMPLE STRATEGIES

Category	Examples of Strategies
Transit Vehicle Technologies	• Hybrid-electric and battery-powered buses • Efficient heating and lighting systems • Regenerative braking for rail systems • Lightweight vehicles
Vehicle Operations, Maintenance, and Service Design	• Idle reduction policies • Driver training • Route design • Signal prioritization
Non-Revenue Vehicle Efficiency Strategies	• Hybrid-electric vehicles • Driver training • Reducing fleet size
Energy Savings at Stations and Stops	Energy-efficient lighting Energy-efficient escalators Solar energy generation

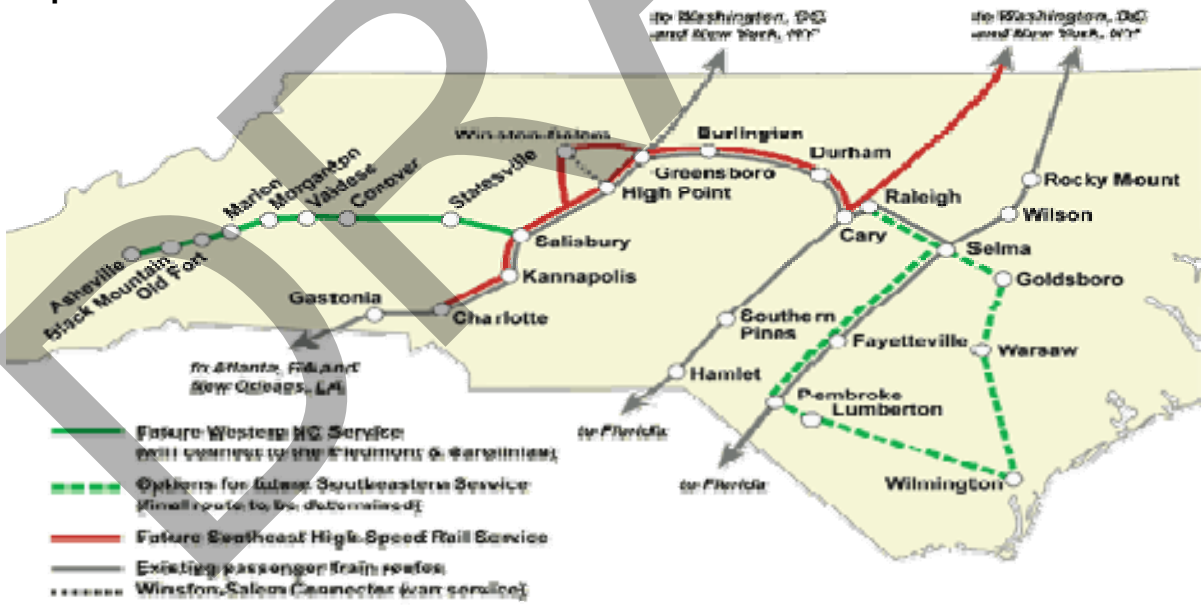
Energy Saving Strategies for Buildings	Energy-efficient lighting Green building certification Energy management systems
Strategies to Reduce Indirect Energy Use	Employee commute programs Recycled construction materials Low-flow water fixtures Recycling programs
Renewable Power Generation	Solar power installations Wind power Geothermal

RAIL

Passenger Rail:

NCDOT identified Greenville as a potential future passenger rail service location (Map 5-1). Accessibility to future passenger rail is also proposed for the Greenville Transportation Activities Center (GTAC). A Passenger Rail Feasibility Study is in the MPO's current Transportation Improvement Priorities list. In 2012 Amtrak began providing bus shuttle service from Greenville to the Amtrak rail station in Wilson, simplifying passenger access.

Map 5-1



Source: http://www.bytrain.org

Rail Freight Service:

Pitt County is served daily by two of the nation's largest and most financially sound railroad systems - CSX Transportation Inc. (CSXT) and Norfolk Southern Railway Company (NS).

CSXT and its 32,000 employees provides rail transportation and distribution services over 22,000 route miles in 23 states in the east, Midwest, and south, the District of Columbia, and Ontario and Montreal, Canada. Direct shipments can be handled from Greenville to Miami, New Orleans, Memphis, St. Louis, Chicago, Detroit, Toronto, Buffalo, Montreal, and points in between without leaving the CSXT system. CSXT is a business unit of CSX Corporation and is headquartered in Jacksonville, Florida.

Norfolk Southern Railway's lines extend over 21,200 miles in twenty-two eastern US states, the District of Columbia, and Canada. Single line rail freight service is available between Greenville and many major cities including New Orleans, Birmingham, Memphis, Buffalo, Detroit, Chicago, St. Louis and Kansas City. Norfolk Southern Railway is wholly owned by Norfolk Southern Corporation which is headquartered in Norfolk, Virginia.

Both rail systems operate two trains seven days a week and provide daily switching. Special switching arrangements can be made. CSXT bisects Pitt County, running north-south through Bethel, Greenville, Winterville, Ayden, and Grifton. Norfolk Southern runs east-west, serving Grimesland, Greenville, and Farmville. The two systems interconnect at Greenville.

Carolina Coastal Railway (CLNA) recently leased a 142-mile line between Raleigh and Plymouth, N.C., from Norfolk Southern Railway. The line connects with CLNA's existing 17-mile line between Pinetown and Belhaven, N.C., which the short line leased from NS in 1989. The transaction includes trackage rights for an additional eight miles.

CLNA will interchange with NS in Chocowinity, N.C., and Raleigh (after an out-of-service segment reopens). Owned by Main Line Rail Management, the short line also interchanges with CSX Transportation in Greenville and Wilson, N.C.

CLNA previously was owned by Rail Link Inc., which became a Genesee & Wyoming Inc. subsidiary in 1995. Main Line Rail Management acquired the short line in 2003.

Van-On-Flat-Car (VOFC, TOFC, COFC, or "piggyback") service is available on the CSX system in Charlotte (197 miles) or Portsmouth, VA (104 mile). Regional Storage and Transport in Greenville also handles VOFC freight. VOFC shipments on the Norfolk Southern Railway are handled out of Greensboro (140 miles).

Public Rail Siding: CSXT operates a public track in Greenville, N.C. for loading and unloading of rail cars. The siding can accommodate up to 10 cars and is located off Dickinson Avenue adjacent to the company's freight depot[2].

Rail Improvement projects:

2 Source: Pitt County Development Commission

Both CSX Transportation and Carolina Coastal Railway operate freight trains through Greenville. A hospital and other major employment areas are located on the northwest side of the city, and most of the residential areas and new growth are located on the southeast side of the city — both are areas linked by roads that contain railroad crossings. Because the majority of train traffic occurs through the core of the City, commuters, school buses and emergency vehicles must pass through the rail crossings on a daily basis.

In addition, a small switching yard (an area where freight cars are maneuvered and linked to build eastbound trains) is located between Arlington Road and Howell Street. The train switching operations in this yard often occur during peak travel times, blocking the railroad crossings at Fourteenth Street, Howell Street and Arlington Road.

Together, these situations create a significant increase in vehicle delay and can impede emergency response access and response time.

NCDOT has recently finished the following projects:

The Greenville Connector

The CSX switching operation, formerly located between Arlington Road and Howell Street, has been moved to a new yard located just north of NC 903. The Greenville Rail Yard project will also include the addition of two long siding tracks. A new connection track (known as a wye) will be located near the CSX Transportation and Carolina Coastal Railway crossing between Arlington Road and Howell Street. This new rail yard will help eliminate the blockage of crossings and improve the movement of freight through downtown Greenville.

The Greenville Connector project involves building a connector track, known as a wye, and joining the CSX Transportation line with the Carolina Coastal Railway line. This will improve flow and movement of freight, as well as decrease motorist delays at these crossings.

Map 5-2 provides an overview of these projects.

Traffic Separation Study

Improving Railroad Crossings in Greenville

A growing number of housing and job opportunities are contributing to population increases in and around the City of Greenville. As traffic volume grows and the number of freight and passenger trains continues to increase, Greenville's elected officials and North Carolina Department of Transportation (NCDOT) staff agreed that a high priority must be given to safety enhancement projects such as the Greenville Traffic Separation Study.

Continued improvements to crossings can help lessen the possibility of train-vehicle collisions. In addition, as trains pass across roadways, vehicular access at the tracks is

blocked, affecting emergency services, deliveries, school buses and commuters. Improved crossings can help traffic flow through these intersections.

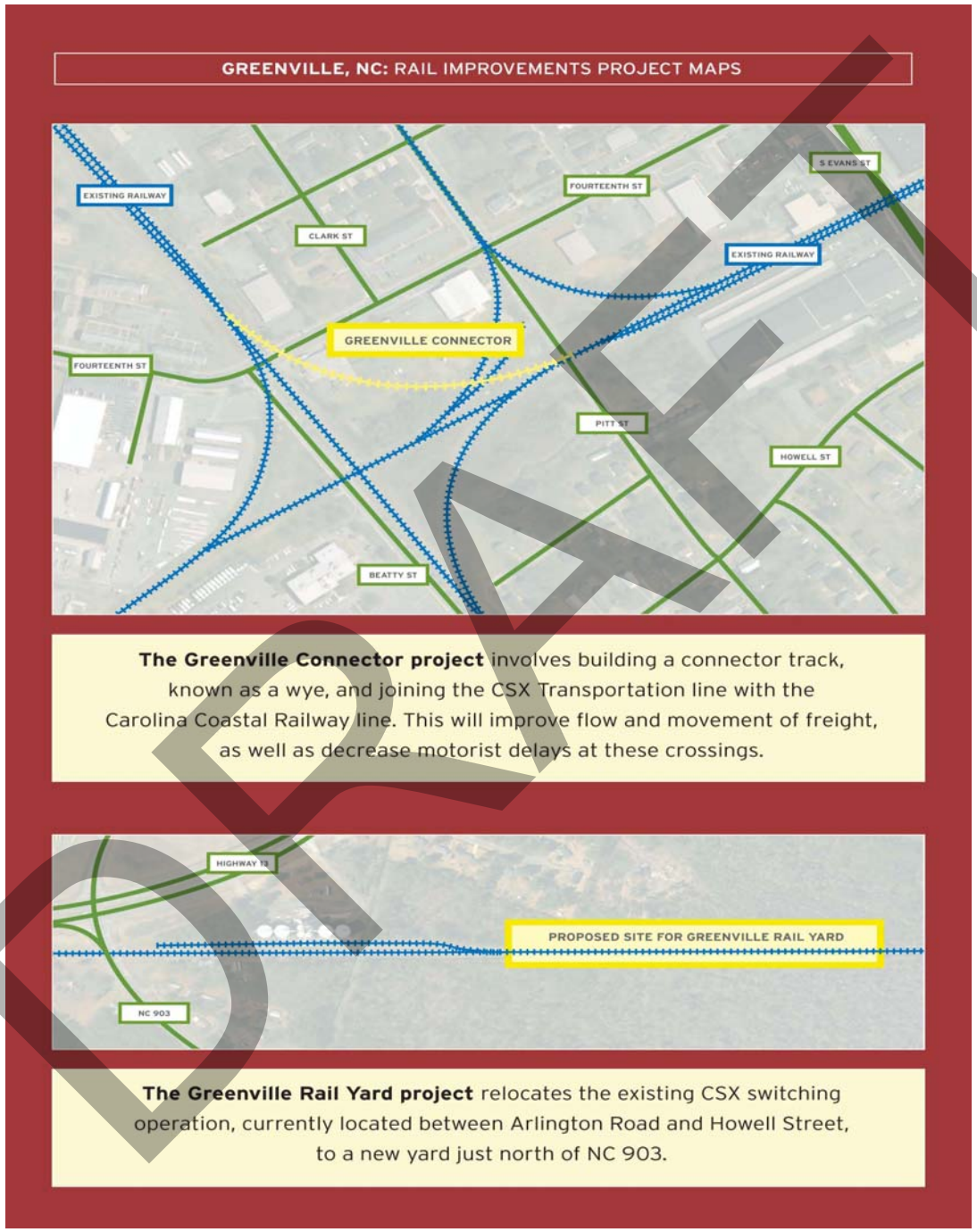
NCDOT is working with communities such as Greenville to conduct detailed engineering evaluations and implement recommended rail crossing improvements. The Traffic Separation Study (TSS) conducted by NCDOT consultant STV/Ralph Whitehead Associates evaluated the volume of train traffic and flow of vehicular traffic patterns through town. It recommends crossing improvements that may include the following: upgrading existing, or adding new, flashing lights and gates; relocating existing crossings; or, in some cases, closing the crossing. These enhancements result in improving the safety of motorists, pedestrians, rail passengers and train crews. As of December 2009, the NCDOT has closed approximately 53 public rail crossings (statewide) based on recommendations from various TSS and corridor studies.

NCDOT has completed a TSS of 45 highway grade crossings of the CSX Transportation and the Carolina Coastal Railway lines in the City of Greenville.

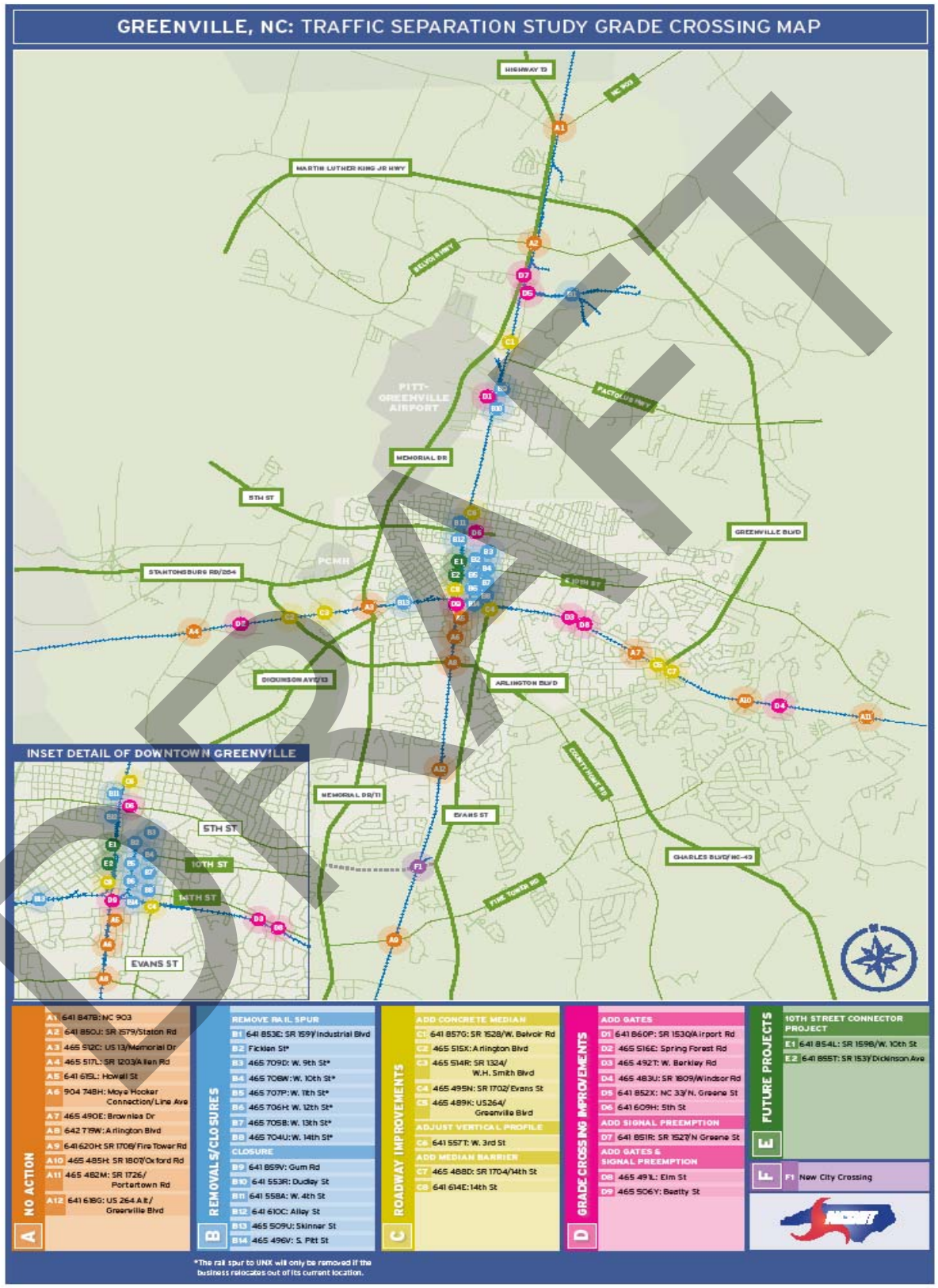
Map 5-3 details the Traffic Separation Study Grade Crossings and the proposed improvement for each.

The MPO recognizes that there may be future needs and improvements as a result of these studies and efforts. This will be done in conjunction with and as data becomes available from NCDOT's Rail Division. Plan updates will be made accordingly to recognize future rail projects.

Map 5-2: Rail Improvements Projects



Map 5-3 Traffic Separation Study Grade Crossings



AVIATION

The Pitt County - City of Greenville Airport Authority is a body corporate and politic created by the North Carolina General Assembly and by joint resolution of the City of Greenville and Pitt County for the purpose of administering the activity of operating a municipal airport. The Airport Authority is charged with the operation, maintenance and improvement of the Pitt-Greenville Airport for the benefit of our community's citizens and their air-traveling guests in accordance with Federal and State regulations. The Pitt-Greenville Airport is located on NC Highway 11 adjacent to the Greenville Industrial Park in the northwest portion of the City of Greenville.

The Airport Authority consists of four members appointed by City Council (includes one City Council Member) and four members appointed by Pitt County (includes one County Commissioner).

- The Pitt-Greenville Airport Complex is comprised of approximately 1,000 acres.

- The Airport's infrastructure consists of:

  - Two cross-wind Runways (6,500', and 5,000', both 150' wide)
  - Associated Parallel Taxiways at 50' width
  - Two lighted Runways with navigational aids allowing night and inclement weather landings, and their Taxiways
  - Myriad of Ramp and Security Lights and lighted Airfield Signage
  - Instrument Landing System with Distance Measuring Equipment to all for all-weather landing
  - Automated Weather Observation System with Satellite Transmission for Dissemination
  - 40,000 square foot Terminal Complex for Commercial and General Aviation
  - Internal Roadways and 300+ Auto Parking Spaces
  - Fifteen (15) leased Corporate and Private Aircraft Storage and/or Maintenance Hangars consisting of some 86,300 square feet
  - Airport Rescue Fire Fighting Facility with three Fire Trucks and a Water Rescue Hovercraft
  - 32,000 gallon Fuel Farm Facility and four fueling vehicles
  - Maintenance/ Storage facilities with appropriate and numerous pieces of equipment to maintain Complex

- The 15 staff members of the Airport operate and maintain the Airport Complex within a $3 million annual Budget only with revenues derived from the Airport. The Airport does not receive an operational subsidy from City or County.

- The Airport maintains required Federal and State operating certificates to allow conduct of Commercial Operations.

- The Airport is a Commercial Service Facility which accommodated over 120,000 passengers in 2012 as well as accommodating East Carolina University athletics and visiting team charters.

- Commercial Air Passenger Service is provided through USAirways Express, offering daily arrivals and departures from 5:.0 a.m. until 11:30 p.m. to/from Charlotte-Douglas International Airport.

- The Airport maintains a Tenant base that generates approximately $550,000 in personal property tax collections to the City of Greenville and Pitt County

- Through the years, the Airport Authority has secured Capital Project Grants from the Federal Aviation Administration and NCDOT - Division of Aviation totaling over $40,000,000 to upgrade, improve, and expand the Airport.

- The Airport serves as Aviation Gateway for a multitude of local and visiting Corporations and Businesses which create a major economic impact to community.

CHAPTER 6
FINANCIAL PLAN

INTRODUCTION

Federal regulations require a financial plan as part of an MPO Metropolitan Transportation Plan (MTP) update. The purpose is to demonstrate that proposed investments are based on reasonably anticipated future revenues over the life of the plan. Meeting this test is called “fiscal constraint.”

The 2040 MTP is fiscally constrained. The transportation investments proposed to meet metropolitan transportation needs over the next 26 years are consistent with revenue forecasts. The Financial Plan details both proposed investments and revenue forecasts over the life of the plan.

The federal intent of requiring financial plans is to make local and state officials consider how funding can be generated to construct the approved projects. Evaluating financial resources is an integral part of the transportation planning process and often defines the choices available to the Transportation Advisory Committee of the MPO. One of the most critical elements of any plan is to make sure that adequate funds are available to construct the approved projects.

OVERVIEW OF EXISTING FINANCIAL RESOURCES

A major focal point of the Greenville Urban Area Transportation Plan is planning for transportation needs within current and future financial constraints. To achieve this goal of presenting a realistic plan both in terms of projects that meet the needs of the planning area and the ability to fund construction of those projects, the financial plan describes and analyzes the available funds and future funds. This section presents the financial resources that are currently being used in the Greenville Metropolitan Planning Area and the sustainability of those funds.

The State of North Carolina and the governments of the Greenville Metropolitan Planning Area have a variety of funding sources at their disposal for the development and maintenance of its transportation system. The vast majority of transportation funds available are from fuel taxes levied by the state and federal governments. Federal funds are collected and distributed to federal highway, railway, and transit programs from which the State of North Carolina receives funds based upon eligible projects and funding formulas dictated by legislation. The State of North Carolina collects fuel taxes and uses them to construct roads and highways; distributes them to eligible cities for maintenance and improvement of roads; and for maintenance of the existing state road network. At the local level, funds are collected from local tax levies, business license fees, and similar sources.

SUMMARY OF EXISTING USES

In the Greenville Metropolitan Planning Area, federal and state funds are allocated to statewide programs, initiatives and responsibilities. A portion of the funds is also allocated to the local governments for the development of metropolitan transportation plans. The Federal and State funds in the Greenville Metropolitan Planning Area are allocated to the following types of projects:

- New highway construction
- Roadway widening
- Road resurfacing
- Public transportation (GREAT)
- Sidewalks
- Bike paths
- Bridge replacement
- Bridge repair
- Planning and engineering costs
- Operations and maintenance of existing highways
- Administration

In some cases, NCDOT uses the funds to do the work directly through state crews or through contract. In some areas, the state provides the funds and the local governments perform the work with their crews or by contract.

In addition to the funds provided to local governments by the state, local governments also generate funds to be used in road maintenance and street construction. The local governments in the Greenville Metropolitan Planning Area use a combination of taxes and fees to pay for transportation projects and maintenance. The most often used sources are ad valorem taxes and Powell Bill funds. Powell Bill funds are monies returned by NCDOT to eligible cities for maintenance of city streets. The amount of Powell Bill funds received is based upon the number of miles of streets to be maintained and the city's population. The source of the Powell Bill fund is the gasoline tax imposed by the State on users of the highway system. Cities and counties have also used grants and developer contributions to make improvements to their transportation systems.

The local governments of the Greenville Urban Area MPO have implemented subdivision ordinances that require any subdividing property to meet certain requirements. The requirements include construction of streets to the NCDOT standards at a minimum. The City of Greenville has driveway spacing and street construction requirements that exceed NCDOT requirements. Also, the City of Greenville has zoning regulations that require additional building setbacks on thoroughfares that have been identified in the Transportation Plan. This allows for the property owner to develop his/her property but also tries to minimize the neighborhood disruption when the street is constructed.

FINANCIAL PROJECTIONS

The following section presents an assessment of available funds for the Greenville Urban Area MPO Metropolitan Transportation Plan from current sources through the year 2040. As with any projections, the information provided is the best estimate at this time. Actual future funding depends on a number of factors including the economy, population increases or decrease, and governmental regulations.

For the purpose of this analysis, it was assumed that funding levels for federal, state and local governments would remain at current levels. To determine state and federal share applicable to the Greenville Metropolitan Planning Area, the funding levels presented in the latest TIP were used as a foundation, and then extrapolated for fiscal years thereafter. For an estimation of local shares, current funding levels were used and assumed that the same level relative to inflation would be maintained.

REVENUE PROJECTIONS: (definitions of the various TIP codes can be located in the MPO's Metropolitan Transportation Improvement Plan)

Methodology:

TIP codes were grouped into general funding categories and are displayed in table 6-1 below.

The funding for the 10 years shown in NCDOT's 13-23 Program and Resource Plan is the basis from which future revenue projections are derived. The total amount of funds for each funding category listed in the 2013-2023 Program and Resource Plan was first summarized by TIP funding category. The definitions of funding codes can be found in the MPO's TIP. The total amount of funding was totaled for each Fiscal Year. These totals were used for revenue for the 10 years the plan covers, and then extrapolated into future years. A 4% inflation rate is applied in the revenue calculations. Federal requirements are that dollars of expenditure and revenue have taken into account inflation and are expressed in Year of Expenditure (YOE) dollar amounts.

Local Funds

MPO-member jurisdictions may also locally-fund transportation projects. These funds may come from a city's general fund or Powell Bill. A total of $1,000,000 per year is assumed to be available for locally-funded transportation projects through these various funding mechanisms. This is a total for all jurisdictions within the MPO, and is based upon prior history, planned projects, and existing Capital Improvement Programs. For assumptions in this report, a 4% inflation rate will be applied to this total. This yields a total of $46.08 M to provide for construction projects over the 26-year plan timeframe.

For this plan update, it is assumed that the importance of transportation infrastructure's role on the local economy will be a prominent issue, and thus spur appropriate revenue into transportation projects through bonds, etc. The City of Greenville has issued bonds over the years for smaller scale transportation projects, such as the Hooker Road widening project, and Phase 1 and 2 of the Computerized Signal System. This plan assumes local borrowing through General Obligation Bonds in a total amount of $30M over the plan period.

The amount estimated to be locally funded over a 26-year timeframe is $46.08M + $30M = $76.08M and is included in the “Local” funding category revenue summary below.

Expenses for local funds are assumed to be 20% of the various greenway and bike/ped projects. There are $31.34M (YOE) of listed bike/ped projects, making the locally-funded portion equal to $6.27M. Another local expense noted is a YOE estimate of $27.72M for locally-funded roadway projects. The total expenses for locally-funded projects is $6.27M + 27.72M = $33.99M.

Thus, there is sufficient revenue ($76.08M) to fund the projected expenses of $33.99M. The remainder of $42.09M of local funds is expected to fund bicycle and pedestrian projects.

Bicycle/Pedestrian projects

Costs for incidental projects are incorporated in project cost estimates. Funding for bicycle accommodations is included in “Highway Projects”. Projects are expected to be built to cross sections to include bicycle accommodations, in accordance with NCDOT's complete streets policy. A total of $7.2M is expected to be available to fund stand-alone bicycle and pedestrian projects (STPEB funding category). Bike/ped projects may also be funded through local funding sources such as the City of Greenville’s sidewalk construction program (estimated at approximately $150K / yr). There is a total of $31.34M (YOE) in total of these types of projects. Subtracting the STPEB funding amount of $7.2M leaves an expense of $24.14M, that is assumed to be funded from remaining local anticipated revenues of $42.09M, discussed above.

Safe Routes to School

Safe Routes to School eligible and selected projects are 100% funded through this program. Funding assumptions for this plan are that, on average, $750k of projects will be funded throughout the MPO planning area on a yearly basis. In this category, the yearly revenues of $750k match the expenditures for eligible projects.

Railroad

In keeping with historical revenue in this category, total revenue projections over the plan's time frame is anticipated to be $11M, which is the same as the projected expenses for rail projects.

Bridge

For those bridges that are owned by the City of Greenville, revenue estimates are considered in the local projects funding category. For this category, funding estimates are derived from historical funding from the Federal Assistance (FA) and Non-Federal Assistance (NFA) funding categories. The total projected funding from these two categories over the plan's time horizon is $68.37M, which is more than the $56.247M in anticipated expenses for all bridge projects.

Maintenance

On a bi-annual basis, NCDOT provides financial assistance in the form of State Street Aid via the Powell Bill program. These funds can be expended only for the purpose of maintaining, repairing, constructing, reconstructing or widening of any street including bridges, drainage, curb and gutter, and other necessary appurtenances within the corporate limits of the municipality, or for the planning, construction, and maintenance of bikeways located within the rights-of-way of public streets and highways, or for the planning, construction, and maintenance of sidewalks (HB 1661 ratified 7/6/94) along public streets and highways. Powell Bill funds may also be spent for traffic control devices and regulatory signs and for the payment of principal and interest on municipal street bonds, and as shown on NCDOT's Powell Bill Expenditure Guidance.

Powell Bill funds are distributed among eligible municipalities according to a two-part formula. Three-quarters of the local proceeds are distributed on a per capita basis (a per capita rate of $20.62 in 2013) and one-quarter according to the number of miles of non-state streets in each municipality (a per mile rate of $1,632.91 in 2013). Powell Bill funds are derived from the State Motor Fuel Tax. Since the creation of the Powell Bill program, there have been occasional increases to both the Powell Bill rate taxed per gallon and the rate of the Motor Fuel Tax itself. This report assumes that the North Carolina General Assembly will keep increasing this rate to provide sufficient street aid funding to local municipalities. Aside from the Motor Fuel Tax, the Powell Bill also derives revenue from an additional percentage of the net proceeds of the North Carolina Highway Trust Fund.
As can be seen in the table below, the amount of funds received by MPO-member municipalities have been consistently increasing, in keeping with increases in both population and road mileage.

Table 6-1 2011-2013 POWELL BILL Allocation Amounts

Year	Ayden	Greenville	Simpson	Winterville
2013 Powell Bill[1]	$153,600.48	$2,215,848.27	$12,992.12	$264,732.85
2012 Powell Bill[2]	$150,587.12	$2,171,367.02	$12,874.89	$260,673.18
2011 Powell Bill[3]	$147,255.75	$2,125,754.44	$12,614.53	$254,385.72

On average, the Powell Bill funding allocations have been increasing by 2%.

Applying a 2% growth rate to the 2013 amounts over the 26-year timeframe yields a total of approximately $90.92M. Furthermore, to meet performance standards, this report assumes that NCDOT will have the flexibility to use State System Preservation funds for pavement as well as bridges. With this flexibility, NCDOT will be able to provide sufficient funds for maintenance of the transportation system.

As noted in Chapter 3, there are 454.489 miles of State-maintained roads within the MPO boundary. Funding for maintenance for these roads comes from NCDOT's local division office. Between 2012-2014, there was an average of $3,623,803 available for maintenance activities in Pitt County. There are approximately 1,100 miles of roadway in Pitt County. Applying the proportion of State-maintained road miles in the MPO to the total funding yields an average yearly funding amount of $1,497,253 for State-maintained roads within the MPO for 2012-2014. This yields an amount of $3,294 per mile per year. Applying a 2% growth rate over the 26-year plan timeframe yields a total of $51.42M.

Thus, total maintenance revenue over the 26-year time period totals $51.42M + $90.92M = $142.34M. This is equal to the expenses in this category.

Table 6-2: **Total estimated revenues by funding category, expressed in YOE.**

[1] 2013 State Street Aid Allocations to Municipalities

[2] 2012 State Street Aid Allocations to Municipalities

[3] 2011 State Street Aid Allocations to Municipalities

Funding category	TIP code	Total estimated revenues ($)Million
Federal	HES, HP, STP, HSIP	335.36
State	T,S	779.94
Local	L	76.08
Bridge projects	FA, NFA, NFAM	68.37
Transit projects	FBUS, FED, FUZ, SMAP,STAT, FEDU	158.92
Transit passenger revenues	N/A	153
Railroad projects	RR	11
Bike/Ped projects	STPEB	7.2
Highway Maintenance	N/A	142.34
Aviation Projects	AV + others	6.012

TOTAL FUNDS FROM ALL SOURCES: $1,738.22 M

TOTAL AVAILABLE FUNDS FOR ROADWAY CONSTRUCTION PROJECTS (INCLUDING PEDESTRIAN, BICYCLE, BRIDGES, RR CROSSINGS, and VARIOUS INTERSECTION PROJECTS): $1,277.95 M

COST ESTIMATES

The North Carolina Department of Transportation has provided data for cost estimates for various types of roadway cross sections. The cost estimates are used by NCDOT in its planning efforts, so the NCDOT per mile cost was used in this plan to estimate the cost of the various road projects. The Lead Planning Agency of the MPO performed the actual cost estimates with a review by NCDOT. Construction cost estimates included in the MPO Priority List are based upon the length of the road to be improved multiplied by the per mile cost for the roadway cross section. For the cost of additional right of way, the latest cost estimates provided by NCDOT were used. Real estate costs vary from project to project and are dependent upon a number of factors. In most cases, the property owner is not a willing seller so a premium must be paid for the right of way or easement. Any thoroughfare project already contained in the State Transportation Improvement Program is listed with its TIP-budgeted cost.

All of the projects that have been included in the highway element of this Transportation Plan Update are from approved thoroughfare plans / CTP Highway Maps (which are long range plans identifying future thoroughfare needs and are not fiscally constrained).

Federal regulations require that the operation and maintenance of the existing transportation network be considered. As noted above, each municipality within the MPO boundary receives Powell Bill funds, which provides for street resurfacing and other facility

improvements.

As noted earlier, we reviewed the present seven-year Metropolitan Transportation Improvement Program, the five-year work program, and 10-year program and resource plan and summarized the total construction and right of way cost for the federal and state-funded highway projects and then projected the same level of funding to the year 2040.

The cost estimates per mile from 2009 were used, with an inflation factor of 4% applied through the estimated completion year for those projects where newer cost estimates were not available.

YEAR OF EXPENDITURE ADJUSTMENT AND REVENUE PROJECTION

Federal legislation requires updates of the long-range transportation plan to account for year of expenditure cost estimates. The present values analysis accounts for inflation by bringing all costs to a common year of analysis. Inflation has not been factored into the above revenue estimates. However, new Federal Transportation legislations historically tend to be of a greater amount than the preceding legislation. Furthermore, considering the recent economic downturn and national economic weakness, it is assumed that the Federal Government will continue to issue new legislation for an amount greater than previous legislations for the purpose of job creation and infrastructure investment in the productive capacity of the country. As a result, it is assumed that Federal legislations will not only keep pace with the rate of inflation, but will exceed it such that there is a net gain of 2% annually. Revenue is expected to grow at a higher rate than inflation through the horizon year, as a result of anticipated increases to Federal transportation infrastructure funding due to the nation's aging infrastructure in addition to further stimulus to the economy as a result of an anticipated increase in the percentage of population entering retirement causing a potential decrease in personal consumption and spending and an increase in public transit, livable communities, and walkable neighborhoods.

The calculations in this chapter have not factored in this additional 2% since there were sufficient funds available to fund the MPO's transportation projects, and thus fiscally constrained. Future updates to this plan may indicate these revenues.

The regulatory requirement is to show costs in the year of expenditure rather than year of analysis. To comply with this requirement the MPO 'inflated' cost estimates using the following formula: $F = P(1 + i)^n$
Where:
F = the future cost of the project
P= the present cost of the project
I= the interest rate
n = the number of years between the present and future year.

MPO staff estimated when individual projects would be open to traffic for calculating the year of expenditure. For analysis purposes, horizon years of 2020, 2030, and 2040 are analyzed. The revenue anticipated to be available for each of the 10-year horizon periods is sufficient to fund those projects expected during that time frame.
The assumptions above give cost multipliers shown below. The MPO also assumed a 4% rate of inflation for the period of the plan.

City of Greenville's Transit system (GREAT)
The following summarizes revenues and expenses for various elements of the transit portion of fiscally-constrained public transportation projects.

While the same methodology was used for revenue projection for both transit and roadway projects, recent history records that transit projects and funding have been rising at ever increasing levels, as federal and state politicians discover the numerous benefits provided by implementation of transit projects. Therefore, it is possible that the increase in revenues for transit projects will exceed those estimated for roadway projects.

Planning Assistance (5303 funds)
Total revenues are projected at $1.349M Federal funds, $150M local, and $150M State funds. Expenses are projected to equal this amount.

Table 6-3
GREAT Transit Ridership

Fiscal Year	Ridership by Fiscal Year (# of passengers)	Percent increase from previous year (%)
2008	281,968	
2009	359,263	27
2010	412,977	15
2011	464,107	12
2012	509,644	10
2013	553,862	9
	Most recent 3-years average =	10

As evident from the above table, the average yearly transit passenger ridership has been growing by a yearly rate of 10% for the past three years (the most recent data available).

GREAT Operations, Maintenance, Routine Capital, and Safety/Security

The City's expenses for the most recent year available (FY 2013-2014) indicate a total expense of approximately $2.23M. This cost includes operations and maintenance (O & M) costs for the year. Due to having the highest ridership-to-date, fiscal year 2013-2014 is deemed the most accurate information for the purposes of expenditure forecasting. This expense is increased at a rate of 4% annually to account for inflation in figure 6-3 below. The total operation and maintenance costs over the plan time frame are calculated to be $103.13M.

Revenues available for these expenses include a projected $82.21M in Federal funds, $41.15M in local funds, and $13.71M in State funds. The total projected revenues of $137.07M are sufficient to fully provide for the anticipated expenses, leaving a balance of $33.93M. Expenses for other routine capital, safety, and security items are projected to be less than $33.93M over the plan time-frame.

Intermodal Center Construction

The estimated construction costs of the GTAC are estimated to be approximately $7.9 M ($7,917,144 is the precise construction estimate and the amount used in the fiscal constraint process in this plan). Funding has been secured for construction of this facility, and is programmed in FY14 in the TIP.

GREAT has a grant (NC-04-0032-02) with a remaining amount of $2,668,490 to be used for this project, leaving an additional $5,231,510 to be funded. 10% will be locally funded and 10% will be State funded ($523,151), leaving a projected Federal funding amount of $4,185,208 (2014 dollars). This funding amount has been identified, made available to the MPO, and was programmed in the TIP at the MPO's April 22, 2014 TAC meeting. Therefore, all design, construction, planning, and acquisition costs are available.

Intermodal Center Operation and Maintenance (O&M)

The latest cost estimate for the yearly operational and maintenance cost of the GTAC is estimated to be $198,565. Federal grants are anticipated to cover $114,403, with a local match of $84,163. This anticipated future expenditure is increased at a rate of 4% annually to account for inflation in Figure 6-3 below. Over the plan time-frame, the total cost of O&M is anticipated to be $9,150,712 with a Federal revenue requirement of $5,272,172, and a local match of $3,878,586.

Passenger Revenues

For the last 3 years, passenger revenue has grown by an average of 14%. The process to determine passenger revenue is to start from a base revenue as shown for 2013 and factor in an additional 4% inflation factor in addition to the latest 3-year average growth rate (14%) over the plan time-frame. The total passenger revenues are projected to be a total of $153M (YOE) over the plan time-frame.

Table 6-4 **Passenger Revenues by Fiscal Year**

Fiscal Year	Passenger Revenue by Fiscal Year $	Percent increase from previous year (%)
2009	203,661	
2010	217,339	7
2011	273,140	26
2012	301,022	10
2013	319,962	6
	Most recent years average =	14

Replacement Buses

GREAT buses are replaced in accordance with a schedule that assumes a 15-year lifespan. The buses cost approximately $650k with a 10% local contribution ($65k). The replacement schedule below indicates the years that buses will need to be purchased in keeping with a 15-year replacement cycle.

Table 6-5 **Total YOE cost for replacement buses is as follows**:

Year	Number of Busses	Total YOE COST ($)
2018	4	3,041,632
2020	1	822,457
2021	2	1,710,711
2023	2	1,850,305
2026	2	2,081,342
2030	2	2,434,876
2033	4	5,477,808
2035	1	1,481,199
2036	2	3,080,894
2038	2	3,332,295
Total	20	25,313,521

Bus costs are 10% local, 10% State, and 80% Federal. This yields a total of $2,531,352 in total for both local and State, and $20,250,817 in Federal costs over the plan time-frame.

Revenues for replacement buses are projected to total $26.31M, providing more than enough funds to cover the $25.31M in expenses.

Table 6-6

GREENVILLE AREA TRANSIT (GREAT)

ROLLING STOCK PURCHASES (15 YR CYCLE)

	REPLACEMENT BUSSES									EXPANSION	TOTAL
MODEL YEAR	2003	2005	2006	2008	2011	2015				BUSSES	
QUANTITY	4	1	2	2	2	2					11

FY 14											11
FY 15										2	13
FY 16											13
FY 17											13
FY 18	4										13
FY 19											13
FY 20		1									13
FY 21			2								13
FY 22											13
FY 23				2							13
FY 24											13
FY 25											13
FY 26					2						13
FY 27											13
FY 28											13
FY 29											13
FY 30						2					13
FY 31											13
FY 32											13
FY 33	4										13
FY 34											13
FY 35		1									13
FY 36			2								13
FY 37											13
FY 38				2							13
FY 39											13
FY 40											13

Expansion Buses

GREAT plans to add 2 expansion buses to the bus system over the plan time-frame. Anticipated to be purchased in 2015 and replaced in 2030, historical and TIP projections provide for these costs. The two buses will have a YOE cost of $1,300,000, with State and Local match to equal $130,000, and Federal grant funds paying for $1,040,000. There is projected revenue of $1.3M to match these expenses, with local and State revenues equal to that shown above.

Table 6-7 **Transit expense summary, totals for plan time-frame, (YOE)**

Function	Federal Expenses ($, M,)	State Expenses ($, M)	Local Expenses ($, M)
Expansion Bus	1.04	.130	.130
Replacement Bus	20.25	2.53	2.53
O&M, Routine Capital, Safety / Security	82.21	13.71	41.15
Planning Assistance (5303)	1.349	.150	.150
Intermodal Center	6.85	.523	.523
Intermodal Center O&M	5.27		3.88
TOTAL	116.97	17.04	48.37

Total transit-related expenses: $182.38

Table 6-8 **Summary of Transit Revenues, totals for plan time-frame (YOE)**

Function	Fed Revenue ($, M)	State Revenue ($, M)	Local Rev. ($, M)
Expansion Bus	1.04	.130	.130
Replacement Bus	26.32	2.53	2.53
O&M,Routine Capital, Safety / Security	123.36	82.207	41.15
Planning Assistance (5303)	1.349	.150	.150
Passenger Revenue			153
Intermodal Center	6.85	.523	.523
TOTAL	158.92	85.54	197.48

Total transit revenues, all sources: $441.94

Transit sub-element fiscal constraint
As can be seen from the above information, there is sufficient revenue to fund the transit-related items in this plan.

Railroad Projects

Revenues

Estimated revenue as stated in Figure 6-1 for railroad projects is $11M in present –day dollars, based upon historical rail projects funded in the area. Applying the same methodology used for the roadway and transit projects above results in total available revenue of $92.52 M in the year 2035.

Expenses

There is an estimated $11M in total of Rail improvement projects to be expended over the 26-year plan time horizon.

Intersection Projects

At time of plan development, three intersection projects have been identified. Future or other intersection projects beyond these three projects are considered consistent with this plan, are financially constrained, and are accounted for in the plan's funding calculations.

	Project	Est. Cost
Intersection Project A:	Portertown Rd and Eastern Pines Rd	$775,000
Intersection Project B:	US13/NC11/Memorial Dr and NC43/5th St	$233,000
Intersection Project C:	NC11 and Littlefield Rd	$1,550,000

Expenses
There is an estimated $10M in total of Intersection projects to be expended over the 26-year plan time horizon. When inflation is factored in, the amount in year 2040 dollars equals $27.725M

Revenues
Funding for intersection projects are projected to be derived from a combination of State, Federal, and/or Local funds. There are sufficient funds available for the intersection projects shown above, in addition to other, as yet undefined, intersection projects.

Aviation Sub-element

Aviation Projects
Pitt-Greenville Airport (PGV) has, at the time of this writing, the following projects:

Project Title	Project Description	Est. Project Cost
ARFF Vehicle	ARFF Vehicle Acquisition (includes Project Request Numbers: 2555)	$700,000
VISUAL NAVAIDS 8-26 PAPIS & REILS DESIGN AND CONSTRUCTION	Visual NAVAIDS Runway 8-26 PAPIS & REILS Design and Construction (includes Project Request Numbers: 3271)	$352,000
APRON EXPANSION	Apron Expansion - Design and Construction (Concrete and Bituminous) for air carrier ramp (includes Project Request Numbers: 2538)	$1,460,000
Airfield Drainage Improvements	Airfield Drainage Improvements (includes Project Request Numbers: 2558)	$750,000
Access Road Improvements	Airfield Emergency Access Road Improvements; Airport is currently in the process of updating the ALP to show this project (includes Project Request Numbers: 2549)	$660,000
Apron Lighting & Construction	Apron Lighting Design and Construction (includes Project Request Numbers: 2554)	$300,000
Vehicle/Equipment Storage Building	Vehicle/Equipment Storage Building (Site Preparation, Paving and Building, Design and Construction (includes Project Request Numbers: 3274)	$580,000
T-hangar site preparation & access road	T-Hangar Site Preparation & Access Road - Design and Construction (includes Project Request Numbers: 3276)	$630,000
Consolidated Rental Car Facility	Consolidated Rental Car Facility (Site preparation, paving, design and construction (includes Project Request Numbers: 3275)	$580,000
		Total=$6,012,000

Expenses

From the above chart, a total of $6,012,000 of project expenses have been identified as of the writing of this plan.

Revenues

Airport projects are anticipated to be funded by a combination of Federal and State funding. State funding for aviation projects at PGV is currently capped at a maximum of $300,000 per project. Current State legislation allocates a percentage of the total available transportation funding to be allocated per mode. Over the plan time frame, NCDOT is expected to fund the $300,000 per project for a total of $2.7M for the 9 projects above. The remaining $3,312,000 will be funded from Federal Aviation Airport Improvement Program (AIP) Grants or a combination of Federal funds and passenger facility charges or other

airport-derived funds, such as those derived from parking and/or concessions. Thus, there are sufficient revenues to fund all of the airport projects.

FINANCING STRATEGY AND SUMMARY

This chapter outlined the current funds used for capital road projects and road maintenance. It also outlined future funds that are anticipated to be available for road construction and maintenance. It also looked at the cost of the streets to be constructed by the Year 2040, in addition to transit projects.

The projects listed as other thoroughfare projects could be funded in a number of different ways including increases in the federal allocation to NCDOT, increases in NCDOT direct revenues, and increase in the revenues available to local government such as taxes and grants. As funding changes, the Transportation Plan priorities should be re-examined.

A factor not included in the revenue projections was developer contributions. Through diligent planning and earlier project identification by MPO member agencies, regulations, policies, and procedures could be developed to further protect future thoroughfare corridors. To accomplish this goal, it will take the local governments working with NCDOT.

The previously adopted thoroughfare plans accurately predicted the transportation needs of the Greenville Metropolitan Planning Area. Some of the projects on the previous thoroughfare plans' priority lists have been constructed and therefore have been deleted from the current MPO Priority List. As work is completed on the thoroughfare plan update, more projects may be identified in the future. This plan has reviewed the existing approved thoroughfare plan / CTP Highway Map and found it still reasonably predicts transportation needs.

CONCLUSION

The total cost for all fiscally-constrained transportation projects is $1,053.245M + $6.012M (for aviation projects) = $1,059.257M. Total revenues for the plan time-frame are projected to be $1,738.22M.
Thus, there are sufficient revenues to fund the fiscally-constrained transportation projects in this plan, noted in the table on the next page.

Table 6-9: FISCALLY CONSTRAINED TRANSPORTATION PROJECT LIST

Roadway Projects Expected to Be Funded in 2014-2040

TIP Project ID No.	Project Description	From	To	Estimated year of project	Cost Estimate Year of Expenditure ($k)
U-3315	Tenth Street Connector	Memorial Drive	Tenth Street	2015	51,798
U-5606	Dickinson Ave modernization	NC11	Reade Circle	2016	8,653
	Arlington Blvd Corridor Management	Firetower Rd	NC43/W. 5th St	2018	17,257
	Signal System hardware upgrade/replacement			2019	9,733
	Allen Road Widening	US 264 (Stantonsburg Road)	US 13	2020	23,578
R-2250	Southwest Bypass	US 264	NC 11 Ayden	2021	305,388
U-2817	Evans Street/Old Tar Road widening	US 264A Greenville Blvd	SR 1711 Worthington Rd	2022	33,021
U-5006	Fire Tower Road extension to SW Bypass	NC 11	SW Bypass	2024	21,706
	Fire Tower Road Phase 3 widening	NC 43	Fourteenth St.	2026	7,174
	Forlines Rd Widening	NC 11	SW Bypass	2031	35,450
	Frog Level Road (SR 1127) modernization	US 13	NC 903	2031	16,924
FS-1002B	Greenville Boulevard modernization/improvements	NC 11	US264 East	2031	98,494
	Fourteenth Street (SR 1703 and SR 1704)	Red Banks Road	Fire Tower Road	2032	18,463
	Fire Tower Road Phase 4 and Portertown Rd	Fourteenth Street	NC-33 East	2033	34,341
	NC 43 South Widening	Bells Fork Plaza	Worthington Road	2034	47,068
	Ivy Road. Tucker Road, Ayden Golf Club Rd	NC-102	NC33 East/E. 10th St	2034	57,577
	3rd St / NC 102 Widening and/or Turn Lanes, Ayden	NC 11	Verna Street	2036	8,497
R-3407	NC-33 widening, Greenville to Tarboro	US 264	MPO Boundary	2036	29,275
	NC 903 modernization	NC 11	MPO Boundary	2037	55,394
	Laurie Ellis Road-NC 11 Connector, Winterville	Mill Street	NC 11	2039	3,899
	Jolly Rd modernization	NC11	NC102	2040	8,816
	Boyd St modernization (Winterville)	NC11	Railroad St	2040	4,622
Greenway/Bicycle/Pedestrian and other Local projects					
EB-4996	Green Mill Run Greenway	Charles Blvd	Evans Park	2014	1,541
EB-5539	South Tar River Greenway, Phase 3	Pitt St	Moye Blvd	2014	2,120
EB-5618	Pedestrian Crosswalk improvements	intersections throughout City of Greenville		2015	811
	NC102 pedestrian enhancements in Ayden	NC11	Lee St	2019	365
	Bike/Ped Bridge over Tar River	River Park North	Town Common	2019	1,582
	Ange St sidewalks (Winterville)	Cooper St	Laurie Ellis Rd	2023	285
	South Tar River Greenway, Phase 2	existing S. Tar River trail	near cemetary on NC33	2025	4,618
	Town common to River Park north trail	River Park North	Town Common	2031	4,052
	Tar River to Hardee Creek	S.Tar River Ph2 trail	NC33 int. w/Bell's Branch	2033	2,107
	Throughout MPO- Various sidewalk and greenway projects	varies	varies	2014-2040	13,862
B-5100	King George Road Bridge #421	replace bridge #421		2015	797
	Throughout MPO - Various Bridge replacment projects	varies	varies	2014-2040	55,449
	Throughout MPO - Safe Routes-to-School projects	varies	varies	2014-2040	2,079
	Other locally-funded roadway projects	varies	varies	2014-2040	27,725
	Intersection projects (various--refer to text)	varies	varies	2014-2020	27,725
	Throughout MPO -Various Rail projects	varies	varies	2014-2040	11,000
				Total:	$ 1,053,245

Table 6-10 ESTIMATED COST PER MILE	
NEW-LOCATION ROADWAY	
Description	**$ / Mile**
4-lane divided w/median - freeway	$5,600,000
7-lane curb & gutter (88' F-F)	$4,300,000
5-lane curb & gutter (64' F-F)	$4,700,000
6-lane curb & gutter w/raised median	$4,800,000
4-lane curb & gutter w/raised median	$4,800,000
4-lane curb & gutter w/blvd grass median	$3,400,000
4-lane curb & gutter (52' F-F)	$4,100,000
3-lane curb & gutter (40' F-F)	$3,700,000
2-lane curb & gutter - parking each side	$3,000,000
2-lane curb & gutter - parking one side	$2,800,000
2-lane shoulder w/2 ft. paved shoulders	$2,800,000
6-lane divided shoulder section w/grass median	$5,700,000
8-lane curb & gutter w/raised median	$6,900,000
5-lane curb & gutter with bike lanes*	$3,600,000
2-lane shoulder section w/bike lanes*	$2,200,000
4-lane curb & gutter w/raised median plus bike lanes*	$3,700,000
5-lane shoulder section (undivided)	$4,500,000
6-lane shoulder section w/median - freeway	$7,800,000
4-lane shoulder section w/median - non-freeway	$4,800,000
WIDENINGS	
Existing 2-lane shoulder section to:	
3-lane curb & gutter	$ 2,250,000
4-lane curb & gutter	$ 3,300,000
4- lane curb & gutter w/raised median	$ 4,100,000
5-lane curb & gutter	$ 3,700,000
5-lane shoulder section	$ 3,600,000
4-lane shoulder section w/median (non-freeway)	$ 3,800,000
4-lane shoulder section w/median (freeway)	$ 4,500,000
Existing 4-lane w/ median to:	
6-lane (existing 30' to 22' median) interstate	$ 12,300,000
6-lane (existing 70' to 46' median) interstate	$ 5,900,000
8-lane (existing 68' to 22' median) interstate	$ 12,200,000
Existing 18-foot pavement to:	
24-foot shoulder section	$ 1,250,000
STRUCTURES	
Bridges:	**$/ sq.ft.**
new bridge over stream	$ 105
widen existing bridge over stream	$ 140
Grade Separation	**$ / Mile**
grade separation (Highway over Highway)	$ 1,850,000
grade separation (Highway over Railroad)	$ 2,000,000
grade separation (Railroad over Highway)	$ 2,600,000
*Includes bicycle facilities **Spreadsheet updated January 15, 2009**	

Table 6-11

Unfunded Roadway Projects (listed for historical purposes)

Project Description	From	To	Total Cost($K) 2014 dollars
NC-33 East Widening	Blackjack Simpson Road	MPO Boundary	22,312
Allen Road Extension	MacGregor Downs Road	NC 43	4,328
NC 43 South Widening	Worthington Street	Lester Mills Road	1,556
Brownlea Drive Extension	Tenth Street	Fourteenth Street	1,808
Dickinson Avenue Widening	Memorial Drive	Arlington Blvd	4,234
Dickinson Avenue Widening	Arlington Blvd	Speight Seed Farm Road	40,369
Reedy Branch Rd/Jack Jones Rd/SR 1725 Improvements and Connections, Winterville	NC 11	County Home Road	17,654
Fourteenth Street Widening	Charles Blvd	Elm Street	5,617
Main Street/Worthington Road Connector	Main Street	Worthington Road	7,383
Juanita Avenue Extension, Ayden	Snow Hill Road	Weyerhaeuser Road	6,873
Mill Street/Old NC 11 Widening, Winterville	NC 11 (Winterville Pkwy)	SR 1131 Reedy Branch Road	21,809

Unfunded Projects
(continued)

Project Description	From	To	Total Cost($K) 2014 dollars
Arlington Blvd Widening	Stantonsburg Rd	Greenville Blvd	33,254
County Home Road Widening	Firetower Rd	Worthington Road	18,217
Hines Rd Extension	NC 11	Juanita Ave	2,612
Mobley Bridge Rd Extension	NC 43 South	Ivy Rd	5,521
NC 43 North Widening	US 264	MPO Boundary	16,874
Southeast Bypass	NC 11	US 264 East	177,743
Ayden Southern Loop (Ayden)	Weyerhaeuser Rd	Ayden Golf Club Rd	6,536
Signature Drive	NC 43	County Home Road	1,711
Frontgate Drive Extension	End of Pavement	Thomas Langston Rd	3,175
Reedy Branch Rd Extension	NC 11	Reedy Branch Rd	2,093
Northeast Bypass	US264	NC33 E	139,101

Chapter 7: Environmental

Introduction

MAP-21 and implementing federal regulations added environmental consultation and mitigation requirements for the long-range transportation planning process. Specifically, MPO's are required to consult with Federal, state and county environmental and historic/cultural resource agencies in development of the regional transportation plan. The consultation is to include comparison of the transportation plan with conservation and environmental protection plans and inventories of natural and historic resources. Regional transportation plans are also required to include a discussion of potential environmental mitigation strategies, policies, and actions that, over time, will serve to avoid, minimize, or compensate for (by replacing or providing substitute resources) the impacts to, or disruption of the human and natural environment associated with implementation of the plan

The strategies are intended to be regional in scope, since the MPO's transportation planning activities are regional in scope. This environmental mitigation discussion does not focus on each individual project within the Metropolitan Transportation Plan but instead offers a summary of environmentally sensitive areas to be aware of, the analyses conducted by the MPO to identify potential conflicts of planned projects, and mitigation strategies that could be considered in an effort to minimize any negative affect that a project may have on an environmentally sensitive area.

Environmental mitigation describes projects or programs intended to offset known impacts to an existing natural resource such as a stream, wetland, or endangered species. Actions taken to avoid or minimize environmental damage are considered the most preferable method of mitigation. Potential mitigation activities are presented in Table 7-1.

Natural resource impacts and opportunities are examined in the planning stage, across multiple projects in a region or state, and integrating land use, transportation, and natural resource restoration/ conservation planning directs priority investments. Decisions and analysis can occur during planning that can simplify compliance with natural resource laws and regulations.

The requirements detailed in MAP-21 allow for GUAMPO to initiate contact with resource agencies and build relationships with federal, state, county, municipal, and the public and other stakeholders. These agencies can participate in long-range conservation and management measures; they offer important services and knowledge; and may have significant project and mitigation implementation concerns that can be understood in planning. In addition to fostering transparent decision-making, their involvement often leads to creative solutions not previously considered. This promotes a collaborative culture at the field-office level so agencies can develop ecosystem approaches at both the planning and project development levels, and ultimately integrate their planning efforts at a regional level.

During the planning process, existing resource information as well as recovery or management plans should be used to help screen all planning scenarios and project concepts by comparing resource information with community and transportation plans and proposals. This comparison provides partners with an understanding of the locations and potential impacts of proposed infrastructure actions. With this understanding, they can more accurately identify the areas most in need of protection, and better predict and assess cumulative resource impacts. This can also streamline infrastructure development by identifying ecologically significant areas, potentially impacted resources, regions to avoid, and mitigation opportunities before new projects are initiated.

Specifically, MAP-21 instructs State DOT's and MPO's to include in their Metropolitan Transportation Plan (MTP) and transportation improvement programs (TIP) "a discussion of the 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 metropolitan transportation plan. The discussion shall be developed in consultation with federal, state and tribal land management, wildlife and regulatory agencies."

The objective of these requirements is to strengthen the linkage between regional transportation planning and the project development and associated environmental analysis process required by the National Environmental Policy Act (NEPA) of 1969 by:

1) Improving accountability for the natural and human environment in transportation planning and decision making; and

2) Improving understanding and respect for the comprehensive system level analysis and public decision making that occurs during the transportation planning process as the foundation for individual project purpose and need during project development under the NEPA process.

Federal regulations define mitigation as:

- 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. (Source: 40 CFR 1508.20)

An ordered approach to project level mitigation, known as "sequencing," involves understanding the affected environment and assessing transportation effects throughout project development. Effective mitigation starts at the beginning of the NEPA process, rather than the end. Mitigation is included as an integral part of the alternatives

development and analysis process.

FHWA's mitigation policy 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 would assist in complying with a Federal statute, Executive Order, or Administration regulation or policy. (Source: 23 CFR 771.105(d))

Identifying Sensitive Areas

Numerous environmentally sensitive areas exist throughout the Greenville Urbanized region. Many areas are too small or too numerous to map at a regional level and can only be clearly identified through a project level analysis. Some areas are yet to be identified and will only become known once a project level analysis is completed, such as sinkholes and wetlands. When a project is ready to move from the Long Range Transportation Plan into the design / engineering phases, the project sponsor will conduct any necessary analysis as required by state and federal regulations to determine the type and location of environmentally sensitive areas within the project study area.

The Greenville Urban Area MPO studies proposed project locations throughout the region to determine their proximity to natural or socio-cultural resources. That analysis provides early guidance to project sponsors to develop mitigation strategies.

Environmental Mitigation Activities

The Greenville Urban Area MPO is committed to minimizing and mitigating the negative affects 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 and/ or level of mitigation.

Some projects such as new roadways and roadway widenings 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 depend on the severity of the impact on environmentally sensitive areas. The following three-step

process is used to determine the type of mitigation strategy to apply for any given project:

1. Identify environmentally sensitive areas throughout the project study area
2. Determine how and to what extent the project will impact these environmentally sensitive areas; and
3. Develop appropriate mitigation strategies to lessen the impact that these projects have on the environmentally sensitive areas.

To the extent possible, transportation projects are constructed in such a way so as to minimize off-site disturbance in sensitive areas and include 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 selected that would lessen the project's impact on 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. For major construction projects, such as new roadways, or for projects that may have a region-wide environmental impact, a context-sensitive solutions process is followed in which considerable public participation and alternative design solutions are used to lessen the impact of the project.

The table below details mitigation activities that address the primary areas of concern.

Table 7-1 **Mitigation Measures**

Impacts	**Mitigation Measures**
Air Quality	Designate Pedestrian/Transit Oriented Development Areas Develop energy efficient incentive Programs Fund Transportation Control Measure Program
Archaeological	Archaeological Excavation Design Modifications to avoid area Educational Activities
Community Impacts	Bridge Community Sidewalks Bike Lanes Develop recreational areas Traffic Calming Oral History Project Context-sensitive design solutions

Environmental Justice Communities	Property Owners paid fair market value for property acquired Residential and Commercial Relocation Map communities Conduct public outreach Context-sensitive design solutions
Farmland	Protect one to one farmland acre for every acre converted Agricultural conservation easement on farmland Compensation
Fragmented Animal Habitats	Construct overpasses with vegetation Construct underpasses, such as culverts and viaducts Other design measures to minimize potential fragmenting of animal habitats
Historic Sites	Relocation of Historical Property Design Modification Landscaping to reduce visual impacts Photo documentation Historic archival recording to present historic information to the public Avoidance Context-sensitive design solutions
Light Impacts	Lens Color Direction of lighting Low Level lighting
Noise	Depressed Roads Noise Barriers Planting Trees Construct Tunnels
Park Impacts	Construct bike/pedestrian pathways Dedicate land Compensation for park dedication fees Replace impaired functions
Streams	Stream Restoration Vegetative buffer zones Strict erosion and sedimentation control measures Consider best practices for stormwater management
Threatened & Endangered Species	Preservation Enhancement or restoration of degraded habitat Creation of new habitats Establishment of Buffer areas around existing habitats Modifications of land use practices Restrictions on land access

Viewshed Impacts	Vegetation and Landscaping Screening Buffers Earthen Berms Camouflage Lighting
Wetlands	Compensation Wetland Restoration Creation on new wetlands Strict erosion and sedimentation control measures Ecosystem Enhancement Program (EEP)

Federal funding rules allow the MPO to use its funds to make contributions to statewide and regional efforts to conserve, restore, enhance, and create natural habitats and wetlands, and the development of statewide and regional environmental protection plans, including natural habitat and wetland conservation and restoration plans.

North Carolina Ecosystem Enhancement Program (EEP)

The Clean Water Act of the United States requires compensation for unavoidable impacts to aquatic resources due to development activity. This compensation is provided through the restoration of degraded streams and wetlands. The NC Ecosystem Enhancement Program was established in 2003 to provide all of the NC Department of Transportation's offsite compensatory mitigation for streams and wetlands. A primary driver of the program's establishment was related to the fact that compensatory mitigation issues were delaying the construction of approximately 40% of the state's transportation projects. The program was also created to improve the quality of restoration provided to satisfy compensatory mitigation requirements. A tri-party arrangement between the Wilmington NC District of the US Army Corps of Engineers, the NCDOT and the NC Department of Environment and Natural Resources requires that this mitigation be watershed-based and sets forth a timeline for providing restoration in advance of permitted impacts. The EEP also administers an in-lieu fee program that provides an option for private developers to satisfy compensatory mitigation requirements as well as state programs requiring buffer mitigation and nutrient management in sensitive river basins. All program requirements and resources are consolidated such that the program holistically targets restoration efforts based on environmental need. Through strategic planning, EEP seeks to maximize the opportunity afforded by mitigation funds to benefit North Carolina's natural resources.

The program has restored or initiated the restoration of close to 630 miles of streams and 30,000 acres of wetlands. Through 2012, EEP allocated existing funds toward preservation partnerships that helped to protect more than 50,000 acres of high-quality assets, and more than 680 acres of wetlands. This program has achieved record successes in restoring and preserving our streams and wetlands and the Greenville Urban Area MPO supports and recommends the continued use of the program as appropriate within the Greenville Urbanized area.

More information about this program can be found at http://www.nceep.net/

Green Infrastructure

The Greenville Urban Area MPO encourages Low Impact Development practices and other innovative methods and practices to protect existing stream quality. These practices may minimize impacts to many types of natural resources in the area. The EPA has developed handbooks for municipalities interested in green infrastructure practices.

Green infrastructure applications and approaches can reduce, capture, and treat stormwater runoff at its source before it can reach the sewer system. Site-specific practices, such as green roofs, downspout disconnections, rain harvesting/gardens, planter boxes, and permeable pavement are designed to mimic natural hydrologic functions and decrease the amount of impervious area and stormwater runoff from individual sites. The applications and design approaches described below can also be applied in neighborhood settings (i.e., green streets) or at larger regional scale (i.e., riparian buffers and urban forestry) to manage stormwater. These applications and approaches can keep stormwater out of the sewer system to reduce overflows and to reduce the amount of untreated stormwater discharging to surface waters. The MPO encourages the protection of existing stream quality.

Riparian Buffer / Water Quality

Riparian buffers are vegetated strips of land along creeks, rivers and lakes, ideally covered by native trees, shrubs and grasses. Vegetated buffers protect the health of waterways by filtering pollutants that could degrade water quality by holding the stream bank in place to prevent erosion. This makes the waterway a more suitable fish habitat and also provides food, shelter, and travel corridors for other wildlife. In addition, riparian buffers reduce the negative impacts of floods and provide a visually pleasing screen resulting in an improved overall quality of life.

The buffer protection rule is one part of the NC Nutrient Sensitive Waters management Strategy (15A NCAC 02B.0259) for the Tar-Pamlico River Basin. It establishes a 50-foot wide buffer, measured horizontally from the water's edge and has two zones of 30 feet (nearest the water) and 20 feet (landward of the previous zone).

All of the area encompassed by the MPO boundary is either within the Tar-Pamlico River basin or the Neuse River basin. Both of these basins have rules protecting riparian areas along streams. Impacts to these riparian areas may require mitigation per 15A NCAC 02B .0233 (Neuse) and 15A NCAC 02B .0243 (Tar-Pamlico). Again, applicants seeking approval to impact riparian buffer areas within protected basins must show that proper avoidance and minimization efforts have been made.

Portions of the Tar River and some tributaries, primarily to the northwest of Greenville, are classified as Water Supply IV watersheds. Water supply watersheds typically

require more stringent stormwater controls, enhanced road design criteria, and more stringent construction practices.

All applicants seeking a 401 Water Quality Certification must avoid and minimize impacts to wetlands and streams to the best extent practicable.

Agency Outreach and Review

The Greenville Urban Area MPO is committed to involving environmental review agencies, local governments, and citizens in the transportation project planning process. In doing so, the MPO obtained input from environmental review agencies to strengthen the development of the LRTP. The following details this outreach effort. Correspondence concerning interagency coordination can be found in Appendix A.

On December 18, 2013 an agency coordination initiation letter was emailed to the resource agencies identified in table A-1. The initiation letter, agency contact list, and draft environmental maps were included as attachments in the email, and were placed on the Greenville Urban Area MPO's web site. The Responses were received and are included in Appendix A. Comments received were incorporated into map 7-1 through map 7-6 presented below and throughout this chapter of the LRTP, whenever possible and pending availability of data.

Environmental Resources Inventory

A comprehensive, up-to-date inventory of environmental resources and plans was prepared. Geographic information system (GIS) databases of the resources were mapped in relation to proposed capacity expansion projects and major transportation studies that might lead to such proposed projects. The resource inventory databases and maps provide a baseline of existing conditions for later use during project scoping and environmental assessment as required by NEPA. In the meantime, they allow an initial environmental screening of planned transportation projects to be conducted to identify any that has the potential to negatively impact the natural and built environment.

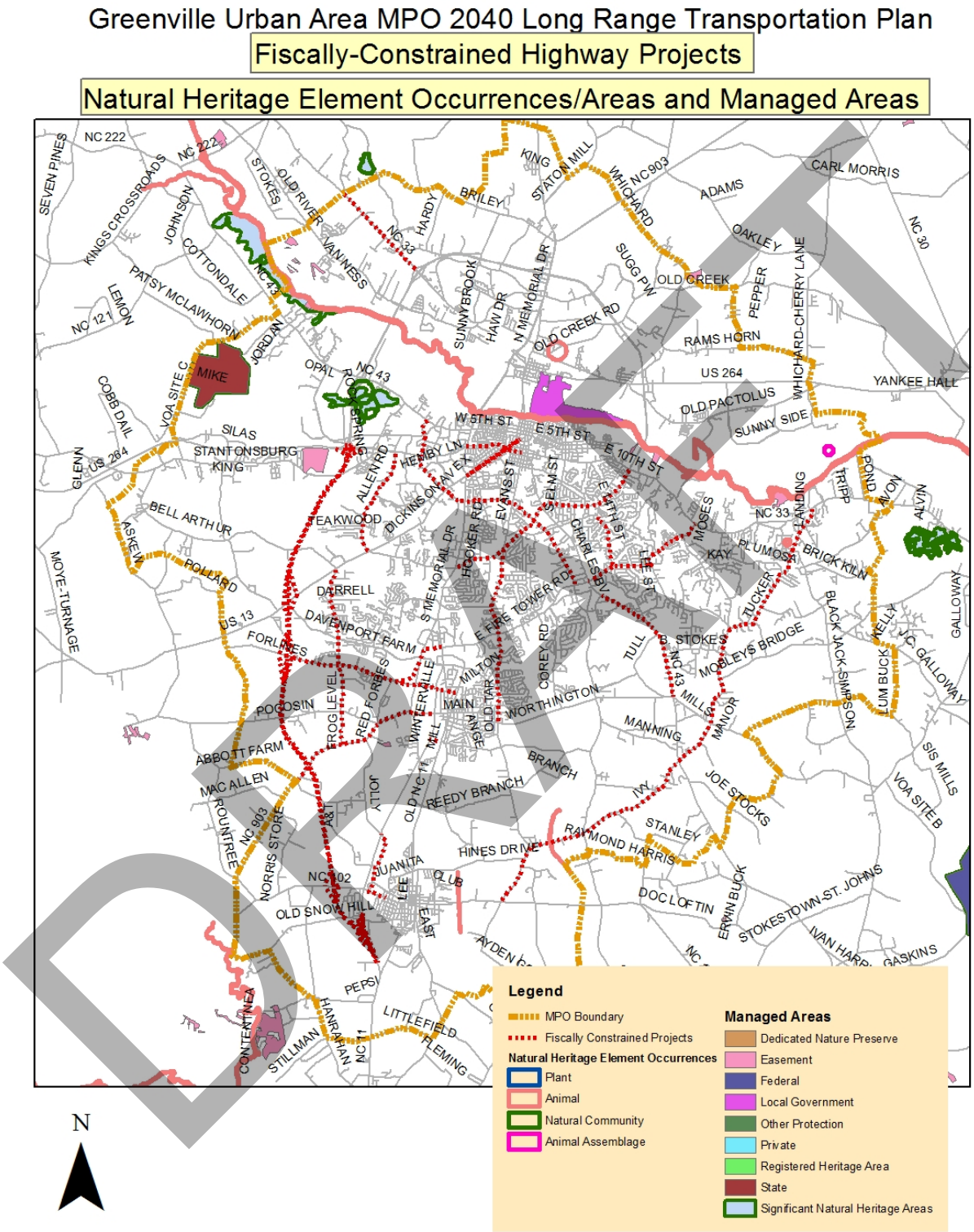
The resource inventory was compiled from the following plans and databases:

- City of Greenville GIS information
- Pitt County GIS information
- North Carolina Strategic Lands Inventory
- One NC Naturally Conservation Planning Tool

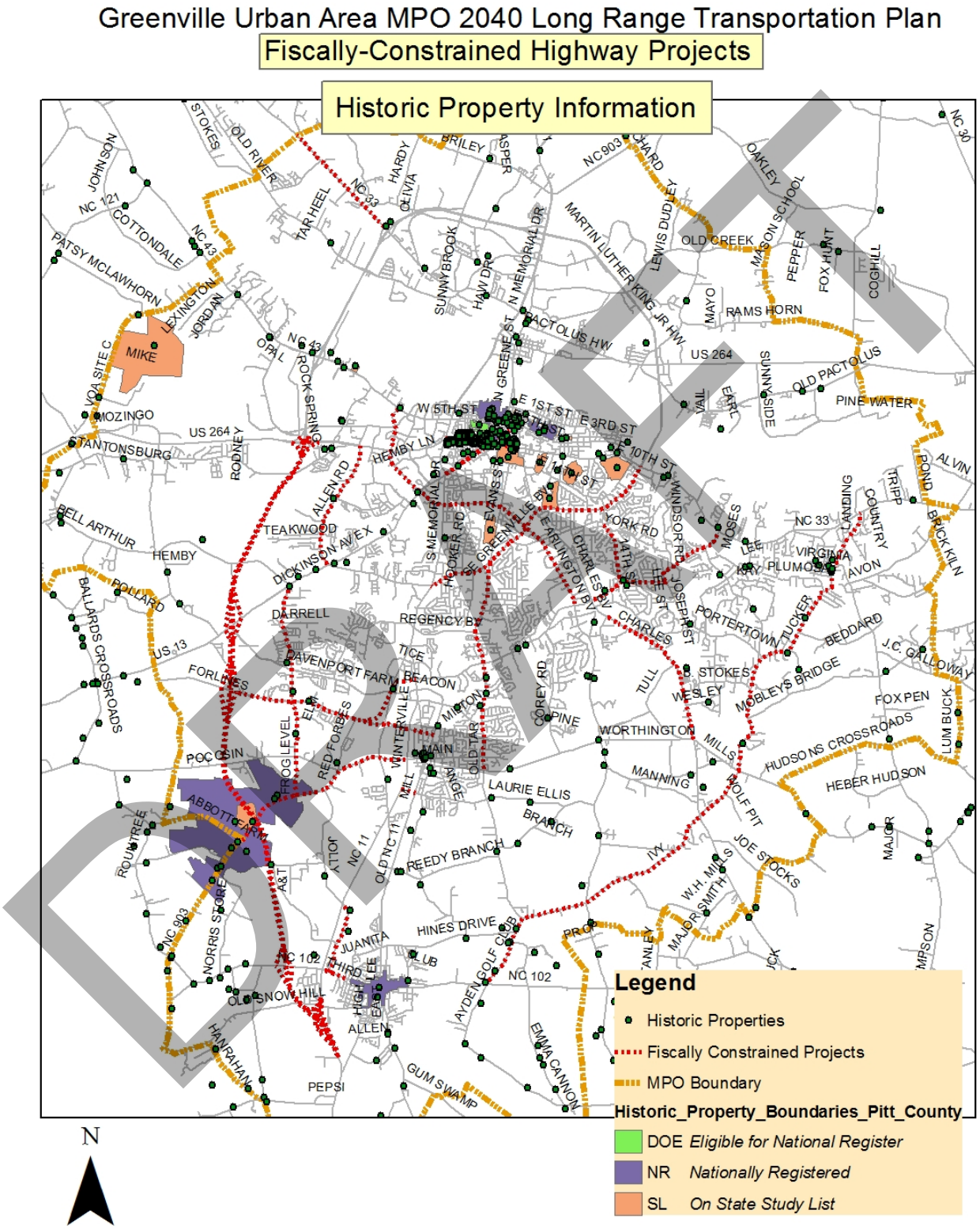
An explanation of how values were derived for assessed areas can be found on the www.*OneNCNaturally.com* web page, as this is the source for this information. An explanation of how suitability levels were derived can be acquired from the North Carolina Department of Environment and Natural Resources' Center for Geographic Information & Analysis, as that office provided the information. A discussion of the data

was included in the Strategic Lands Inventory provided to the Lead Planning Agency as a part of the two DVD's provided by the resource agency.

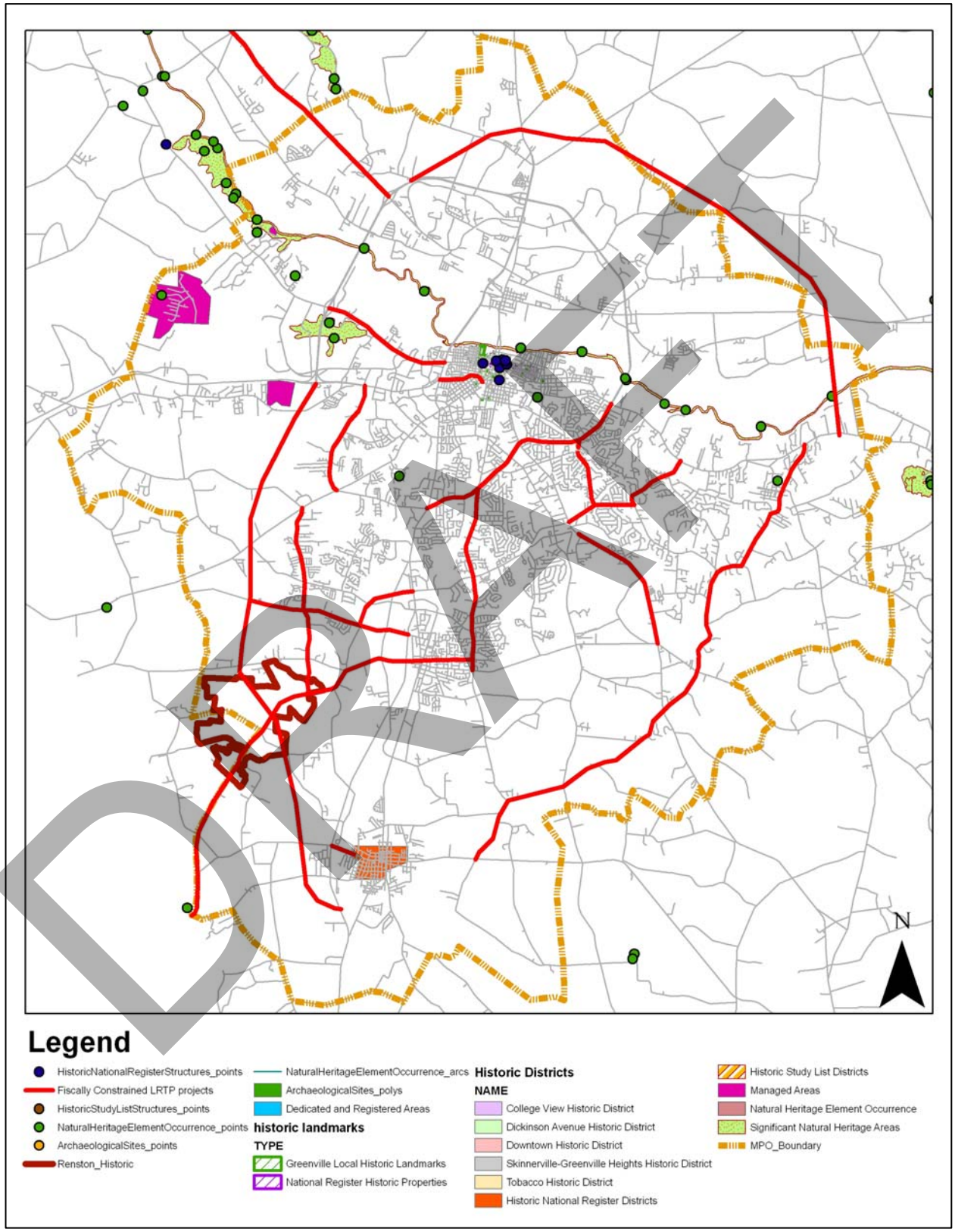
Map 7-1: Natural Heritage Element Occurrences



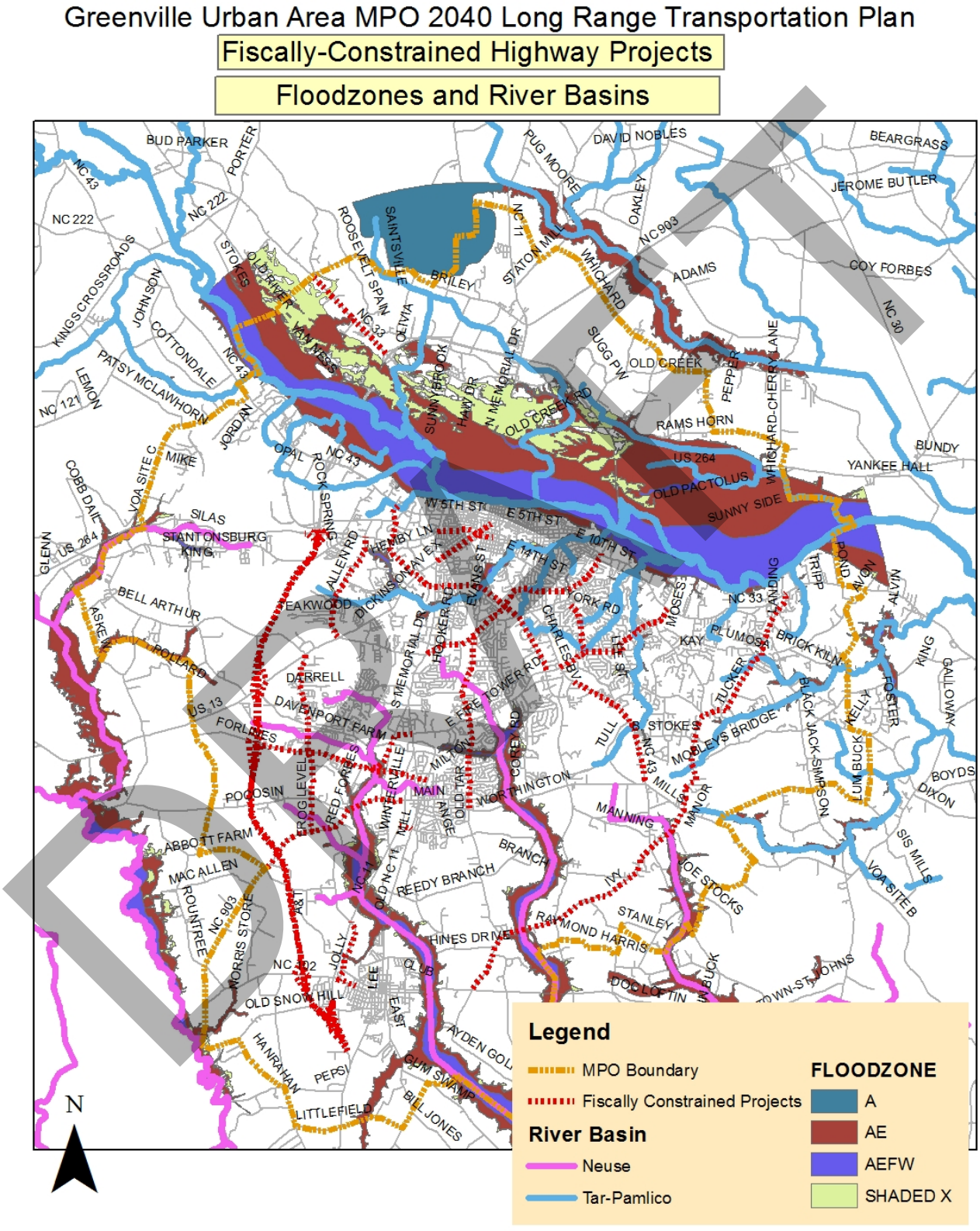
Map 7-2: Historic Properties



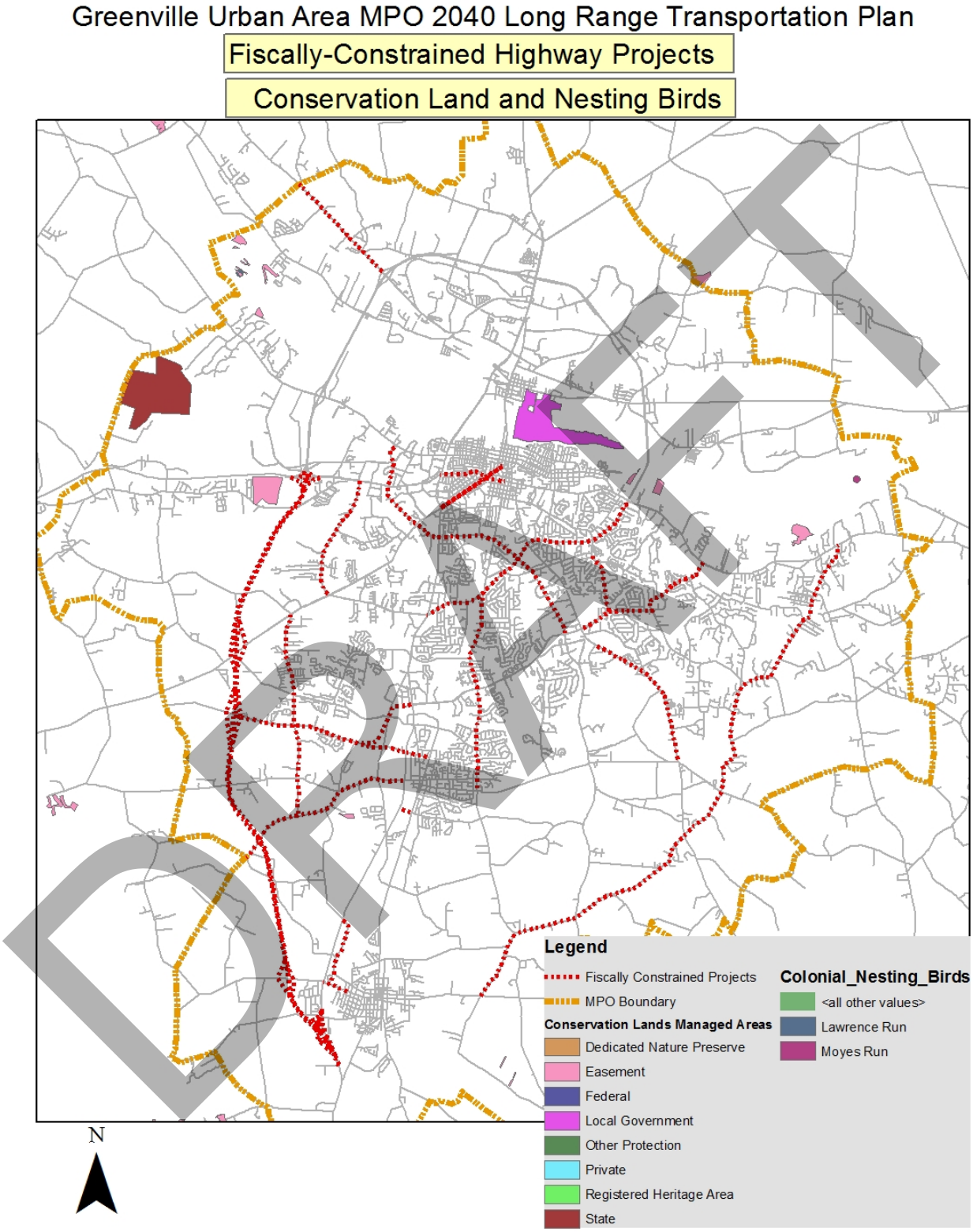
Map 7-3: Historic, Archaeological, and Natural Heritage



Map 7-4: Hydrographical Features and Flood Zones



Map 7-5: Conservation Land and Nesting Birds

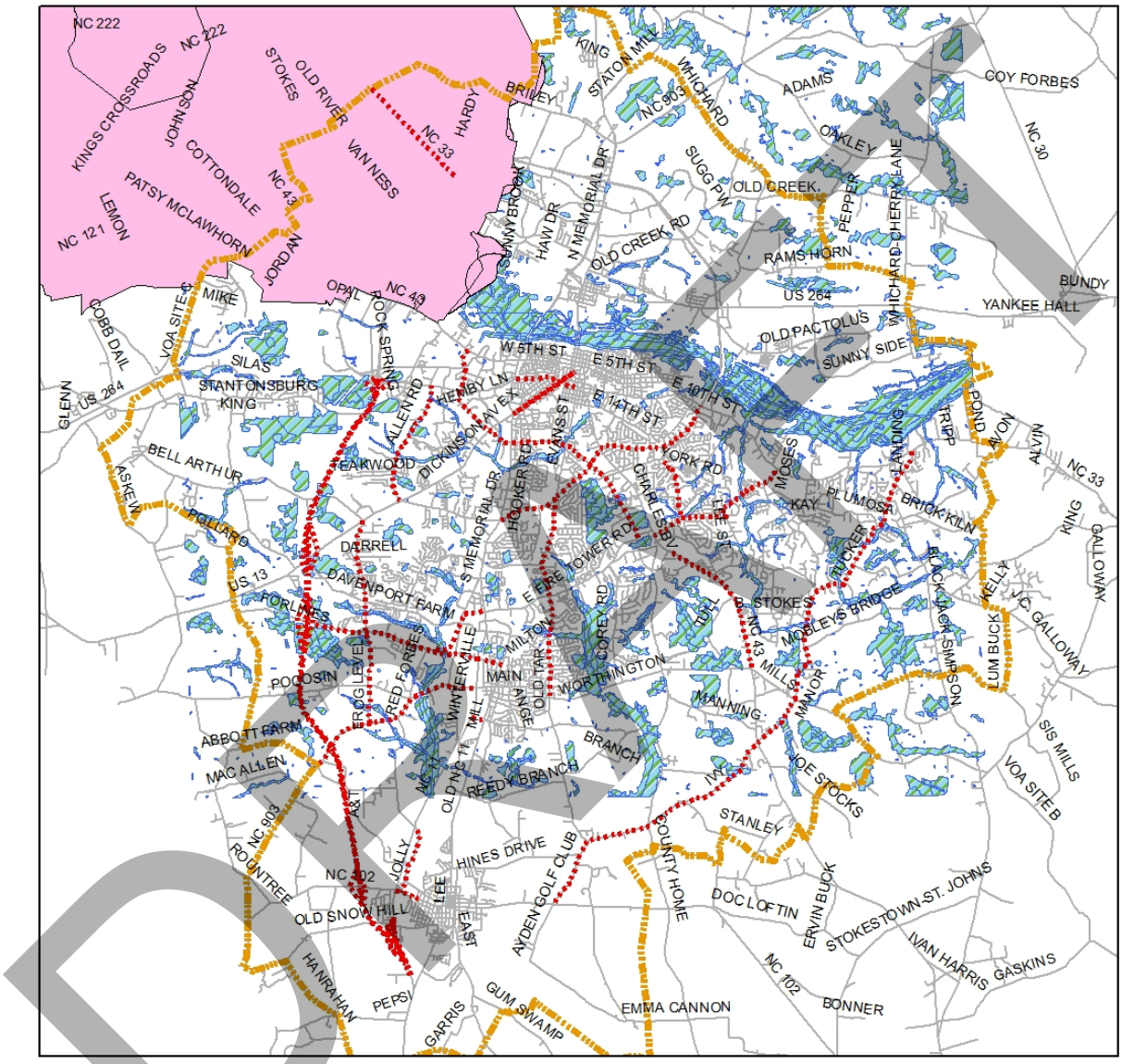


Map 7-6: Wetlands

Greenville Urban Area MPO 2040 Long Range Transportation Plan

Fiscally-Constrained Highway Projects

Wetlands and Water Supply Watersheds



Chapter 8
Environmental Justice

Introduction

Federal Executive Order 12898 sets out requirements for transportation and Environmental Justice. The intent is to demonstrate that minority and low-income communities would not be disproportionately affected in an adverse manner under the transportation plan. Environmental Justice requirements also address public involvement, and these requirements are satisfied under the MPO's Public Involvement Plan and the steps taken for the MTP public involvement effort.

This effort is consistent with Title VI of the 1964 Civil Rights Act, and is promoted by the U.S. Department of Transportation (USDOT) as an integral part of the long-range transportation planning process, as well as individual project planning and design.

The environmental justice assessment incorporated in the MTP update is based on three basic principles, derived from guidance issued by the USDOT:

- The planning process should minimize, mitigate, or avoid environmental impacts (including economic, social, and human health impacts) that affect minority and low-income populations with disproportionate severity.
- The benefits intended to result from the transportation planning process should not be delayed, reduced, or denied to minority and low income populations.
- Any community potentially affected by outcomes of the transportation planning process should be provided with the opportunity for complete and equitable participation in decision-making.

As part of this MTP update, the Greenville Urban Area MPO staff identified the geographic distribution of low-income and minority populations in order to assess the effects of various transportation investments in the plan. This update to the MTP also includes analysis of the elderly population. The MPO also endeavored to develop and carry out a public involvement process that reduced obstacles to participation by minority and low income communities. This effort is detailed in Chapter 9 of this report. It must be stressed that the environmental justice screening conducted for this study is not intended to quantify specific impacts. As described above, it is intended to guide the development of a plan that is equitable in terms of both costs and benefits. In addition, a critical purpose of this screening is the identification of projects in the MTP that have the potential to affect communities of special interest. When individual studies begin as part of project implementation, more detailed analyses, including field surveys, will be needed to identify and minimize specific community impacts on a project-by-project basis.

Data on Race, Elderly population, and Persons at or below poverty were used. Calculations were performed on the data to determine the percentage of persons within each Block or Block Group, based on the total Block or Block Group's population, that were within available demographic groups, and elderly population. 2012 median household income is developed by Environmental Systems Research Institute (ESRI) from estimates based upon the Census 2010 geographies.

Analysis

Demographic data from the 2010 Census were used to establish thresholds of low-income, total minority population, and elderly population concentrations.

ESRI's census mapping data comes with a standardized percentage threshold demarcation. Since ESRI data is considered an industry standard, these demarcation levels were left as originally developed. Upon review, the population percentages appear to properly represent the area.

Diversity Index Map:

This map summarizes racial and ethnic diversity in the United States in 2012. The Diversity Index shows the likelihood that two persons chosen at random from the same area, belong to different race or ethnic groups. The index ranges from 0 (no diversity) to 100 (complete diversity).

Diversity in the U.S. population is increasing. The diversity score for the entire United States in 2012 is 61

Conclusions:

Maps created for the analysis begin with Map 8-1 and continue on through Map 8-7. Examination of environmental justice from these Maps provides the following conclusions.

- Roadway projects have been selected purely on travel demand, and do not inequitably impact environmental justice populations. As indicated on the below maps, roadway projects affect environmental justice communities and non-environmental justice communities. It is evident that roadway projects do not specifically impact environmental justice communities and were chosen to be of equal benefit to all users of the roadway system while not centering on or specifically isolating any environmental justice community.
- GREAT's fixed transit routes predominately provide accessibility to environmental justice communities. While accessing these communities, the routes provide access to job centers and corridors, Pitt County Memorial Hospital, East Carolina University and Pitt Community College.

Especially in the case of elderly and low income groups, this is of immense service to these populations and provides social equity in the total expenditure of transportation funds.

- Existing sidewalks are predominately located around the downtown Greenville city center while providing access to East Carolina University and Pitt County Memorial Hospital. There are numerous locations where sidewalks provide access to transit facilities, furthering the multi-modal transportation choices from environmental justice communities. The majority of sidewalks are located in areas impacting low-income communities, allowing transportation facilities and options to these communities, in addition to providing social equity in the expenditure of transportation dollars.
- Bicycle routes generally follow established roadways. These roadways connect many origins and destinations throughout the Urbanized Area. As seen from the maps below, the majority of bicycle routes are accessible to many environmental justice communities throughout the Urbanized Area. These routes provide non-motorized and alternative transportation choices for these communities, in addition to providing social equity in the expenditure of transportation dollars.

Both the current project lists and past transportation plans show an emphasis on roadway projects, including expansion and improvement in outlying, unincorporated regions of the urbanized area. Some of these areas are environmental justice communities. However, with the programmed development of a pedestrian and bicycle master plan for the urbanized area, alternative transportation choices will be appropriately accommodated in the planning process. Many sidewalks and bicycle accommodations are constructed incidental to roadway projects. One example of this is the Tenth Street connector project, planned for bicycle lanes and sidewalk accommodations in its design.

It can be challenging to project what transportation service is needed and how environmental justice provisions can be met. However, improving transit service by expanding into new areas, reducing headways on existing routes and providing more services during off-peak times in minority and low-income areas appears to be an effective way to provide equal access to the transportation network in addition to providing alternative transportation choices and multi-modal options.

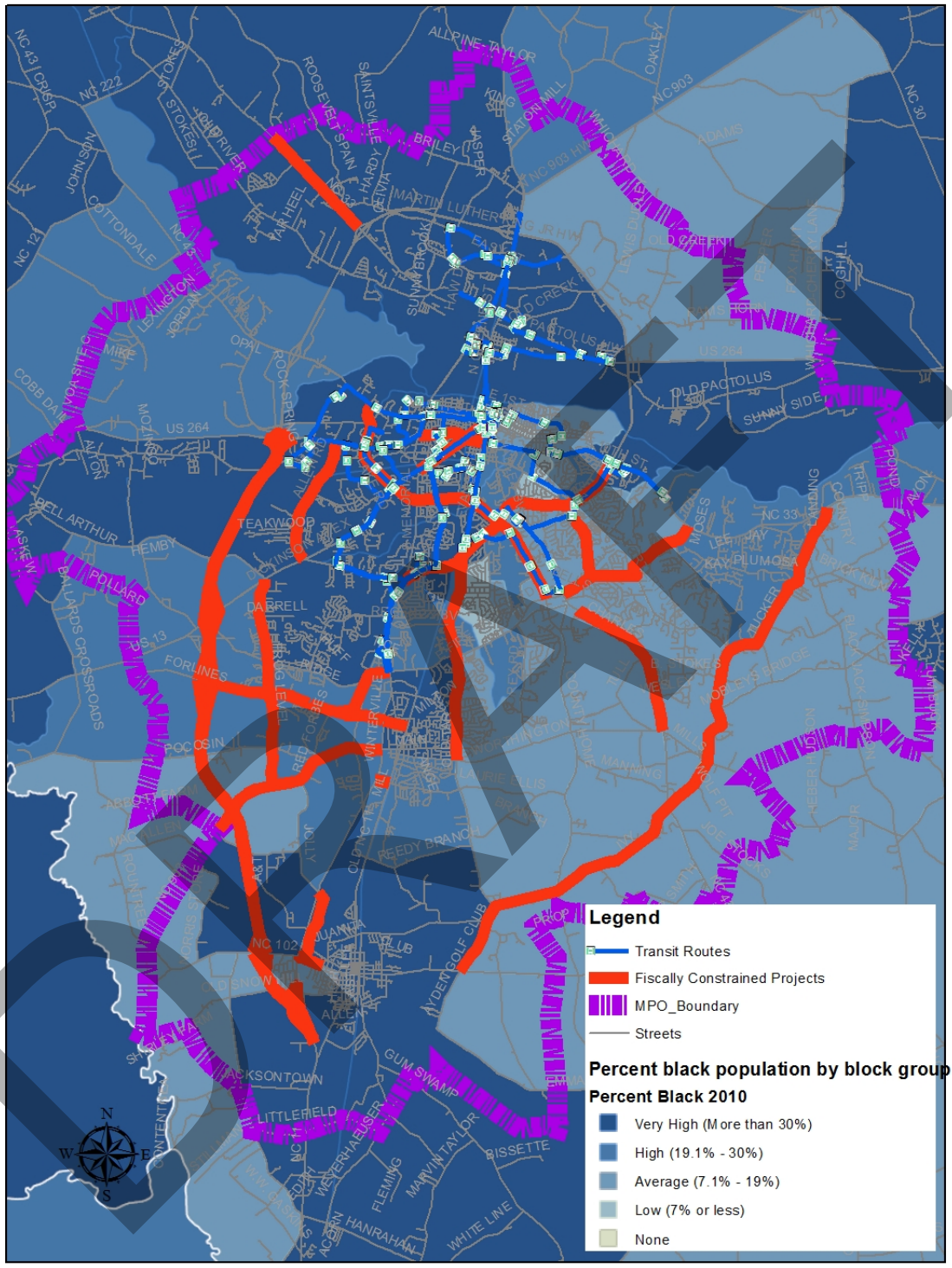
For this to occur, the state, MPO, and local jurisdictions should consider ways to further extend alternative transportation options and public transportation services into suburban areas of the region while also improving service times (i.e., reduced headways, off-peak time services and weekend service for existing routes).

Implications

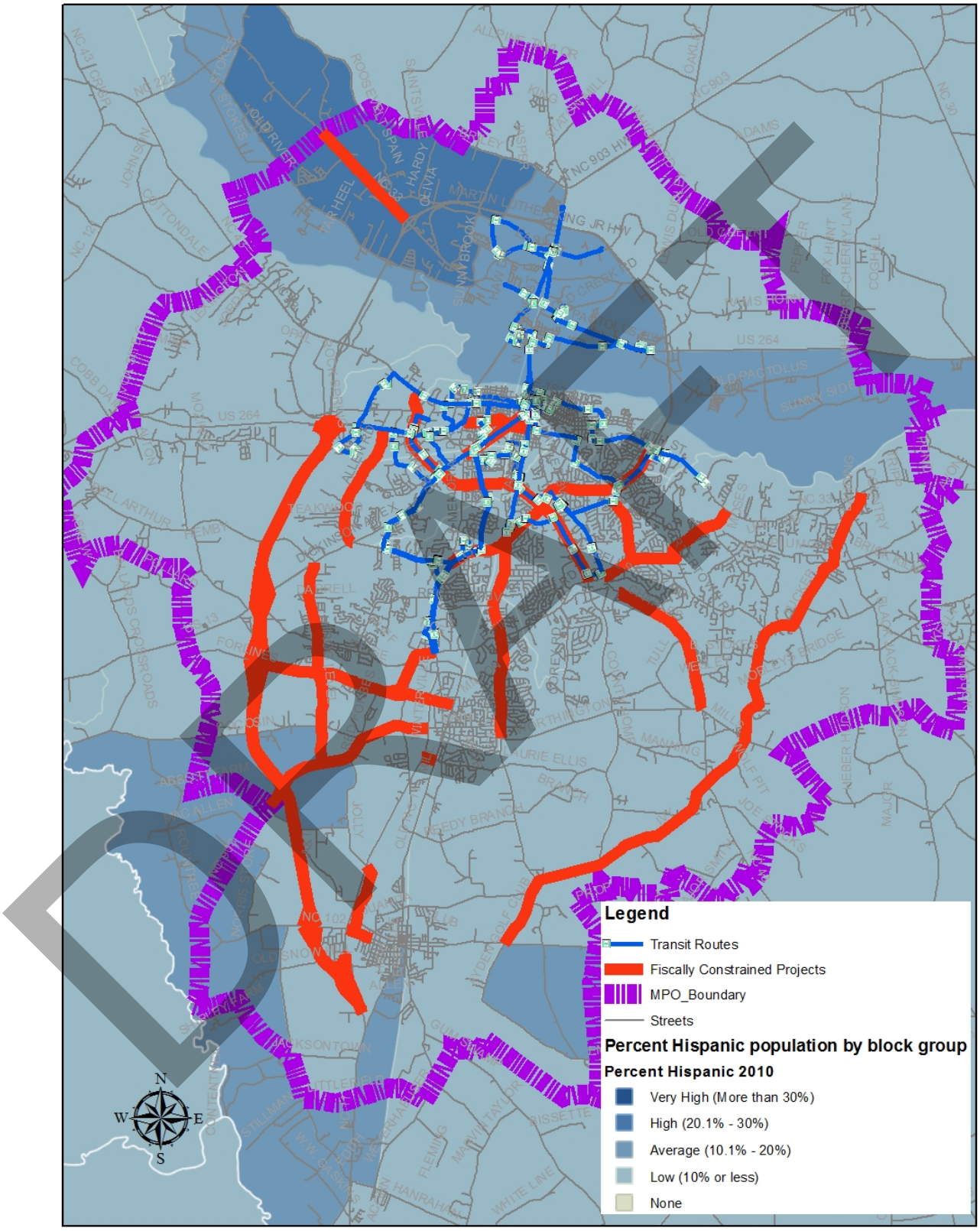
This analysis provides GUAMPO and its partners with a basis for identifying and understanding potential benefits and burdens upon communities of concern as a result of transportation planning and improvement projects. In order for the EJ process to be more responsive to communities of concern, an effort needs to be undertaken to involve effected communities in planning processes. Such a process would help the MPO to consider how current federal aid funds are allocated and address any inconsistencies in benefits and burdens brought to bear on communities of concern.

In the Greenville Urbanized Area, it is the policy of the MPO to provide public access and involvement under a collaborative planning process in which the interests of all of the stakeholders are reflected and considered. The MPO has an endorsed public involvement process that is based upon a proactive public involvement program at both MPO and Technical Coordinating Committee (TCC) meetings. The MPO strives to enhance this process by exploring new networks of contacts and venues for community and neighborhood involvement in the transportation planning and programming process.

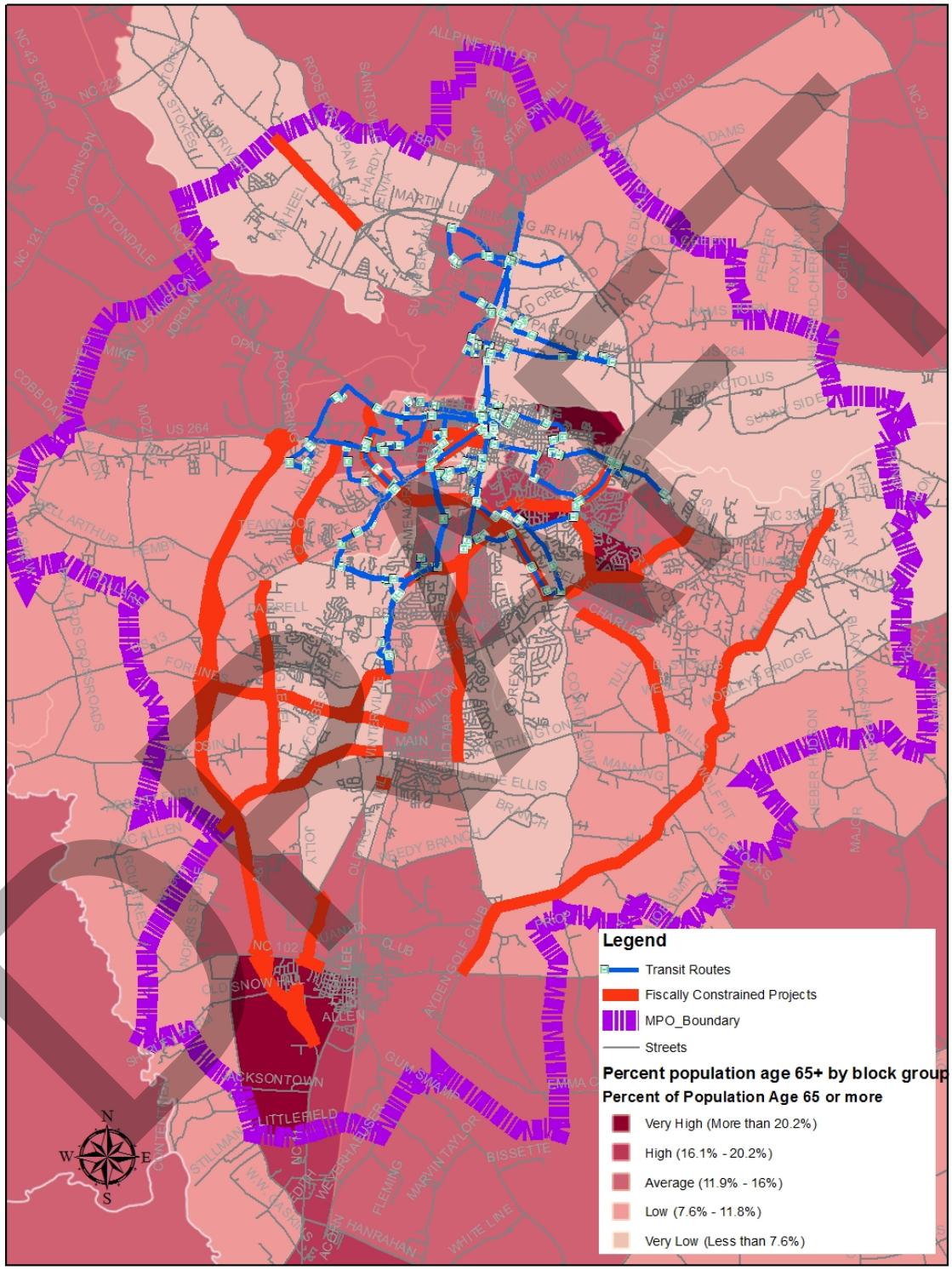
Map 8-1: African American Population Percentage



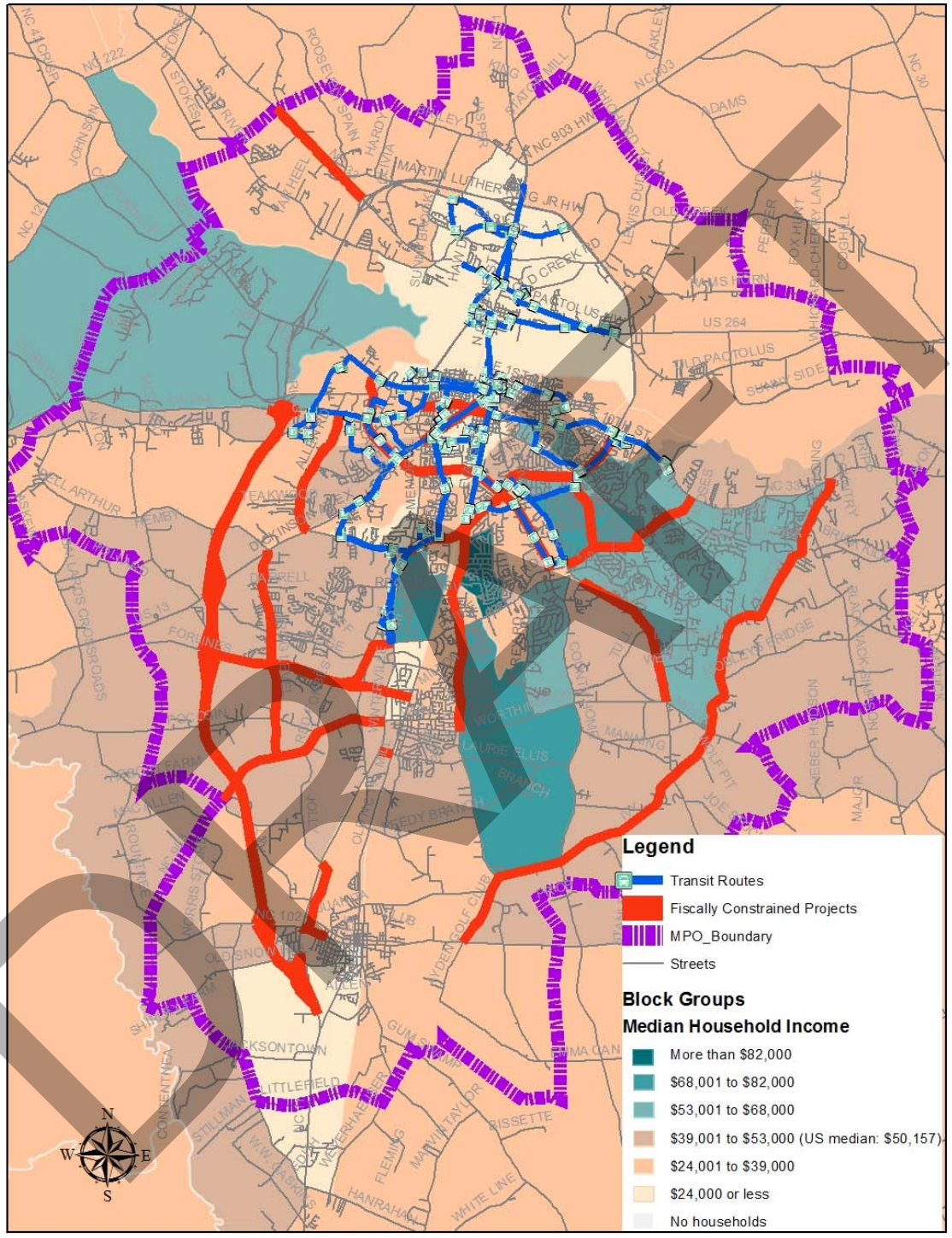
Map 8-2: Hispanic Population Percentage



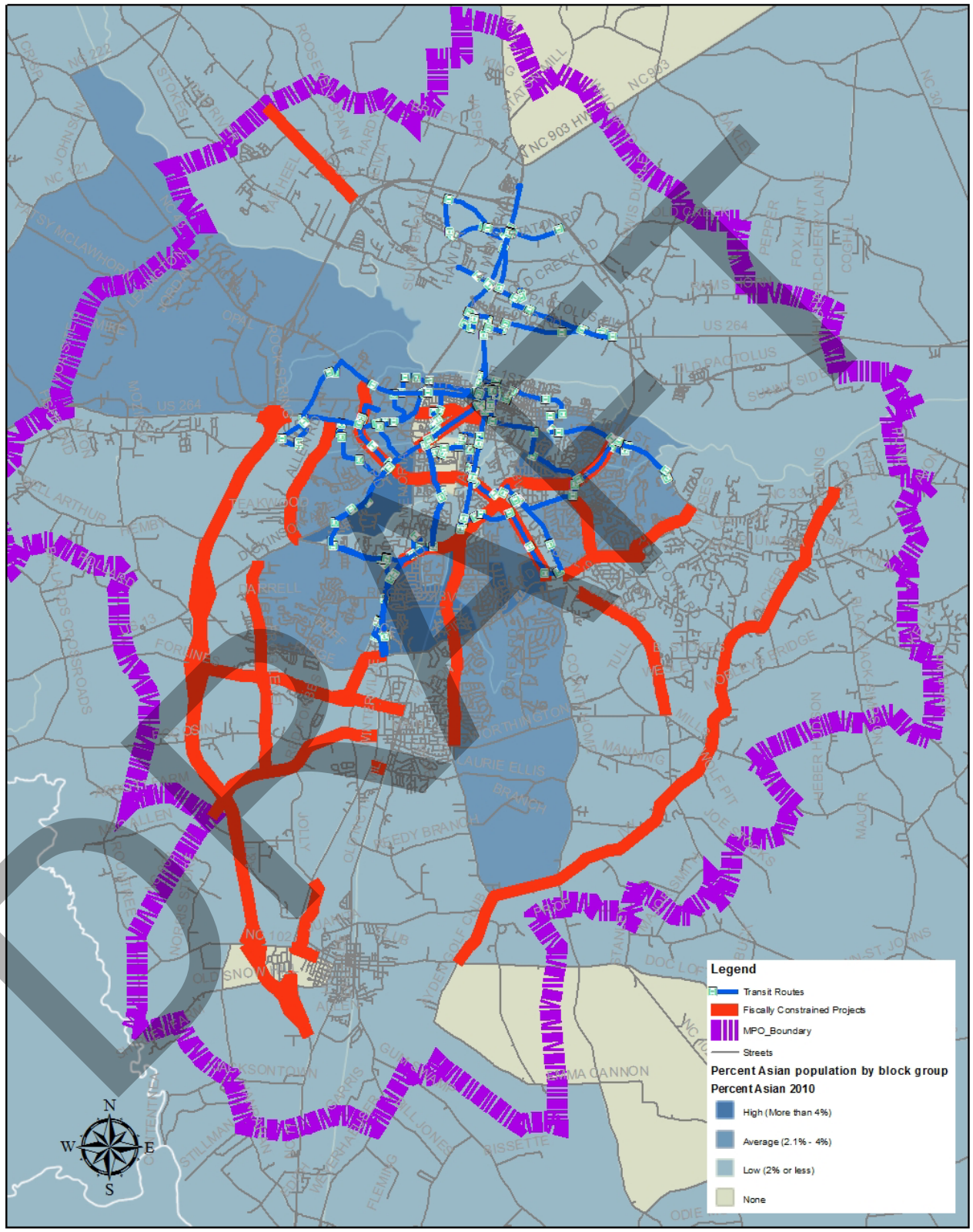
Map 8-3: Elderly Population Percentage



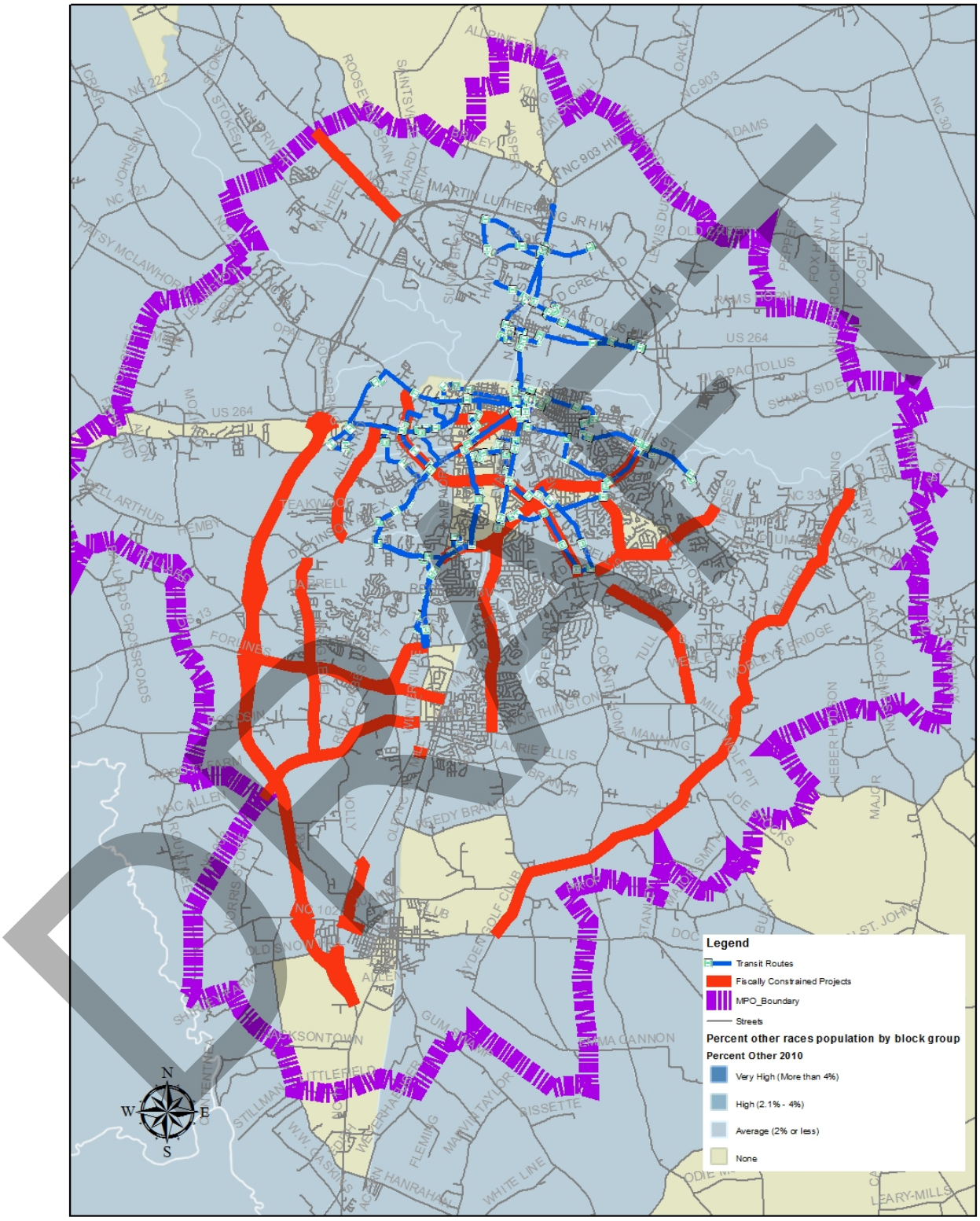
Map 8-4 Median Household Income



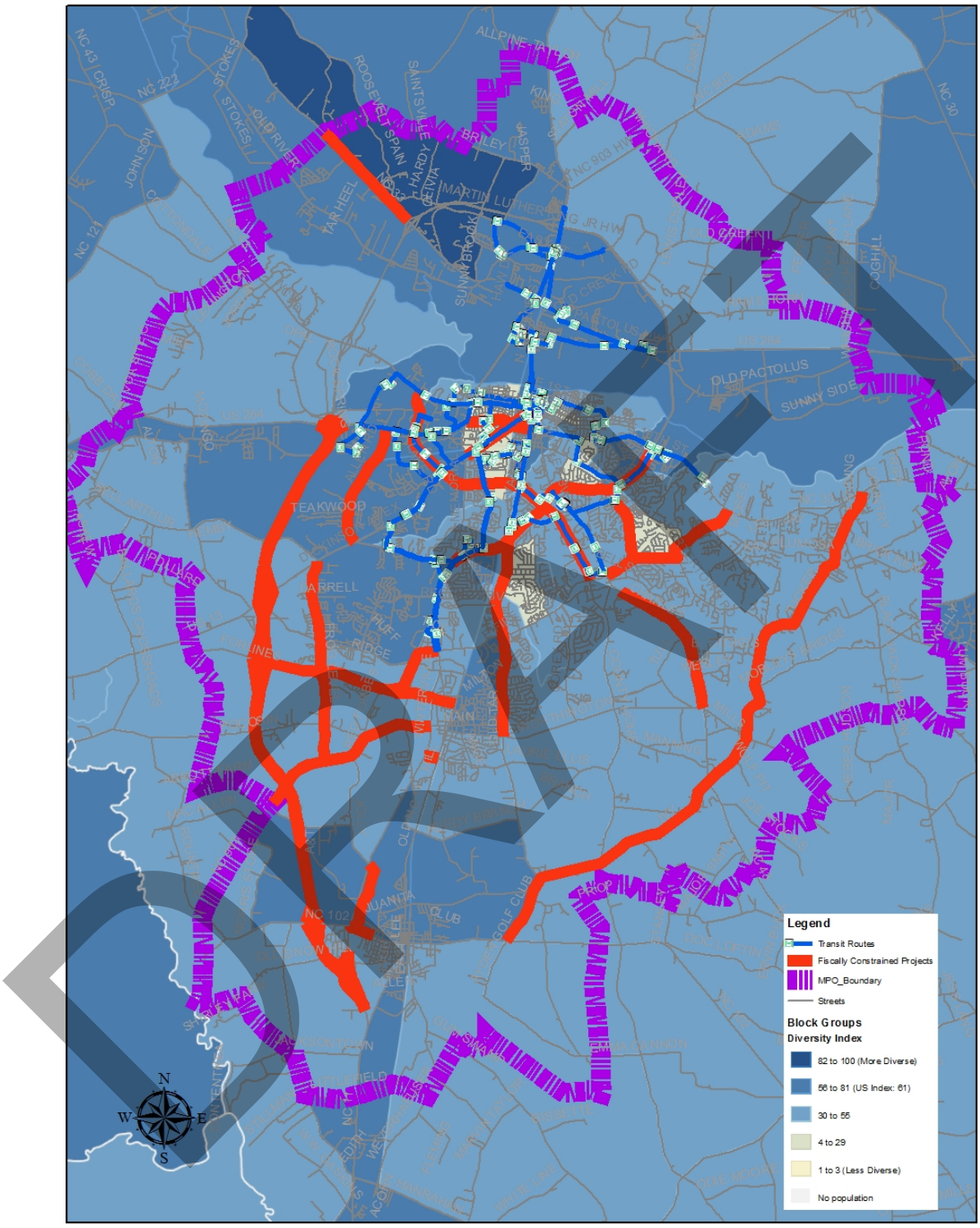
Map 8-5 Asian Population



Map 8-6 Other Races Population



Map 8-7 Diversity Index



CHAPTER 9
SAFETY AND SECURITY

MAP-21 expanded the number of planning factors from seven to eight by splitting safety and security into two separate factors. Before MAP-21, the factor for safety and security read: “increase the safety and security of the transportation system for motorized and non-motorized users.” Under MAP-21, the factor 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.” The goal behind this change was to emphasize the importance of safety, and to acknowledge the special concerns regarding security in the wake of the events of September 11, 2001.

Safety

Safety has long been a primary concern of transportation system management, maintenance, and system expansion. MAP-21 places a greater emphasis on safety at the planning (MTP) level. One way this emphasis is reflected is in linkages to the North Carolina Strategic Highway Safety Plan. As projects are developed elements from the SHSP will be incorporated.

(*) Provisions that are included or supported in the MTP

The key areas of emphasis are:

- Drivers
  - Graduated licensing for young drivers
  - Ensuring drivers are licensed and fully competent
  - Sustaining proficiency in older drivers
  - Curbing aggressive driving
  - Reducing the number of impaired drivers
  - Keeping drivers alert*
  - Increasing driver safety awareness*
  - Increasing seat belt usage

- Special Users
  - Making walking and street crossing safer*
  - Ensuring safer bicycle travel*

- Vehicles
  - Improving motorcycle safety and increasing motorcycle awareness
  - Making truck travel safer*
  - Increasing safety enhancements in vehicles

- Highways
  - Reducing vehicle-train crashes*
  - Keeping vehicles on the roadway*

- Minimizing the consequences of leaving the road*
- Improving the design and operations of highway intersections*
- Reducing head-on and across-median crashes*
- Designing safer work zones*

- Emergency Medical Services
  - Enhancing emergency medical capabilities to increase survivability*

- Management
  - Improving information and decision support systems*
  - Creating more efficient processes and safety management systems*

The goal of the NCDOT Strategic Highway Safety Plan is to reduce the number of fatalities and to decrease the economic impact from highway-related accidents. This goal is incorporated into the MTP.

In 2011 the Greenville City Council adopted the Bicycle-Pedestrian Master Plan that addresses the infrastructure and safety needs of bicyclists and pedestrians throughout the Greenville Urbanized Area.

The NCDOT Highway Safety Improvement Program Group focuses on potentially hazardous locations and hazardous features analysis. Every two years the Traffic Safety Systems Management Unit produces a Potentially Hazardous Location listing to inventory hazardous locations on North Carolina roads. These locations are submitted to field engineers for on-site investigation, further analysis, and recommendation of engineering countermeasures to address the safety problems. Included in the safety program are locations with crashes involving intersections, interchanges, bridges, pedestrians, wet pavement conditions, and night-time crashes.

The MTP recommends continued use of incident management patrols, coordination with law enforcement agencies, and implementation of safety and mobility projects by the City and the NCDOT to respond to safety trends and issues. Additional City and NCDOT strategies aimed at increasing the efficiency of the transportation system without adding additional capacity to the roadways include the expansion of transit operations.

Strategic Highway Corridors

In a renewed effort to enhance and preserve the backbone of the highway system, the North Carolina Department of Transportation created the Strategic Highway Corridors (SHC) Vision Plan.

The primary purpose of the Strategic Highway Corridors vision plan is to provide a safe, reliable, and high-speed network of highways that connect to travel destinations throughout and just outside North Carolina. There are several goals associated with the concept, which incorporate the three themes mentioned above. One of these goals is Mobility.

Mobility is defined as the ability to move unimpeded, safely, and efficiently using a reliable transportation system. The Strategic Highway Corridors concept will enhance the quality of life by enhancing motorists' ability to travel to destinations in a safe and efficient manner.

One project included in this MTP is the Greenville Southwest Bypass. The purpose of this project is to improve traffic flow and minimize congestion on Memorial Drive (NC 11) and Stantonsburg Road (US 264 Business) within the project area; relieve congestion on NC 11 in Greenville, thereby improving safety and reducing the potential for accidents; and improve regional travel along the US 264/NC 11 corridor.

The following Strategic Highway Corridors are within the Greenville Urbanized Area and are noted in the Strategic Highway Corridors vision plan;

Corridor #45: Raleigh to Washington (US 264)

- US 264: I-440 to US 17 (Freeway)

Corridor # 53: Wilmington to Norfolk, VA (I-40, NC 24, NC 11, US 13)

- NC 11: NC 24 to US 13 (North) in Greenville (Freeway)
- US 13/NC 11: US 13 (North) in Greenville to US 64 (Freeway)

Security

Singling out security considerations in transportation planning has only recently been encouraged and has been emphasized due to the terrorist attacks carried out on September 11, 2001. For transportation planning purposes, security is defined as "the protection of persons or property from intentional damage or destruction caused by vandalism, criminal activity, or terrorist events". (National Cooperative Highway Research Program Report 525, Volume 3, Surface Transportation Security) It is important for security to be addressed in the transportation planning process because the transportation infrastructure:

1. is vital to maintaining a community's economy and way of life; and
2. is the network that facilitates evacuation of citizens from an area and provides access for emergency response personnel to an area in the event of a disaster (man-made or natural).

Because the transportation infrastructure is openly accessible there are challenges with providing security. Four measures that can be used to address vulnerabilities are:

1. Prevention: such as limiting access to operation control centers or using surveillance techniques.
2. Protection: such as safeguarding vulnerable targets with new design standards.

3. Redundancy: such as no single point failure in the construction of one component of the transportation infrastructure or in the overall transportation network.
4. Recovery: such as communications in the short-term or traffic flow continuity in the long-term.

Security considerations are included in current TIP projects such as improvements to traffic signals at various intersections, medians on Arlington Blvd. from Firetower Road to NC 43, and widening of Evans St.-Old Tar Road to provide a safer and more secure roadway with sidewalks and bike lanes.

Security can also be part of a vulnerability assessment, which identifies infrastructure problems that could results from hurricanes, tornadoes, or flood events. The Greenville Urban Area Metropolitan Planning Area is served by an extensive road network that provides many points of ingress and egress. There are several multi-lane roads running east/west and north/south out of the area including one controlled access freeway (US-264). The terrain in eastern North Carolina is relatively flat and open. The only natural barriers are the streams, creeks, and the Tar River, which would become obstacles if major flooding or damage to a bridge were to occur.

The issue of community security is addressed in various goals, objectives and policies of the Horizons 2040 Land Use Plan and the city of Greenville's Hazard Mitigation Plan, as updated in 2011. Some of the strategies for mitigation include:

- Manage future development so that vulnerability to natural hazards is not significantly increased.
- Promote greenways, parks and recreation uses throughout the City, particularly along existing streams and in previously flooded areas utilizing flood buyout properties.
- Recommend rezoning requests to consider using the Conservation Overlay Zoning District to ensure that vulnerable areas will never be developed.
- Ensure that critical facilities are located within reasonable locations. Consider developing new facilities where needed.

In addition, the city maintains an emergency operations plan that will allow for continued operations and rapid response to any situation affecting transportation infrastructure.

Community security also has been addressed in other local plans in the Greenville Urban Metropolitan Planning Area that include a transportation element, such as the Pitt County Multi-jurisdictional Hazard Mitigation Plan, with the most recent update in 2012. The update to the transportation element of the plan is included in the current Planning Work Program for the Urbanized Area. As updated, the plan will

1. Identify and analyze each of the hazards possibly affecting the area.
2. Perform a vulnerability assessment.
3. Assess the community's capability to manage and mitigate hazards.
4. Research goals relevant to mitigation.
5. Create a mitigation strategy.

The North Carolina Department of Transportation, Greenville Public Works Department, Greenville Area Transit and other member agencies all have roles in an evacuation of the area. These roles are specified in the disaster plan mentioned above which are coordinated efforts involving all departments of each governmental body. Transportation is one component of these plans. GUAMPO offers a forum for local transportation professionals to plan and coordinate security-related transportation issues from the various emergency preparedness plans as listed below.

PROJECT PLANNING

- Adding bi-directional turn lanes or emergency crossovers on divided highways to increase road capacity for evacuations.
- Providing alternate ingress/egress points to major commercial/industrial developments and residential subdivisions
- Maintaining routes that are designated for evacuations.
- Constructing bridges with alternative design standards in vulnerable locations.
- Assuring an adequate number of mass transit vehicles are available and maintained to facilitate evacuations.

COORDINATION

- Assuring communications between transportation agencies during an emergency event.
- Agreeing on techniques to control and direct traffic during an emergency event including signage and directional barricades.
- Mapping of critical transportation infrastructure facilities.
- Sharing information on vulnerability assessment of critical infrastructure.

GUAMPO will continue to integrate security issues into the transportation planning process specifically and the participating agencies will continue to work together to assure the security of the transportation infrastructure and the community.

CHAPTER 10
Public Involvement Plan for the MTP

The Public Involvement Plan for the Greenville Urban Area MPO 2040 MTP was developed to comply with the F.S. Sections 286.0105, 286.011, and 339.155, Executive Order 12898 regarding Environmental Justice, Part 23 of the CFR, and Section 6002 of the Moving Ahead for Progress in the 21st Century (MAP-21).

The Greenville Urban Area MPO recognizes that the success of the 2040 MTP is dependent upon a successful public outreach effort. As such, the MPO is committed to conducting a public involvement program that focuses on soliciting community interaction and incorporates an extensive evaluation of community impacts and opinions throughout the public involvement process. The public's input will reflect the community's vision, and will help guide the long term transportation investments in the urbanized area with the purpose of achieving the best possible mobility connections. It is believed that the positive value of implementing a strong public involvement effort will result in public awareness of and support for the 2040 MTP. This chapter documents the public participation process adopted to engage the community. The MPO's public involvement strives to cover the diverse demographic groups within the urbanized area, especially targeting the underserved and disenfranchised stakeholders most reliant on public policy regarding transportation.

MAP-21 REQUIREMENTS

MAP-21 is the reauthorization of SAFETEA-LU and TEA-21 (Transportation Equity Act) and was enacted into law by President Obama on June 30, 2012. The MAP-21 legislation includes several new requirements affecting the long range transportation planning process. The new legislation also has specific requirements regarding public participation.

Per MAP-21 requirements, the public participation plan "shall provide that all interested parties have reasonable opportunities to comment on the contents of the transportation plan." In addition, the new public participation requirements also include the following.

- All public meetings and workshops must be accessible.
    - TCC and TAC meetings are typically held at the City of Greenville's Public Works Department Main Conference Room or at City Hall. Both facilities are ADA-compliant and are conveniently located near a bus stop. TCC and TAC meetings are held during regular office hours from 8 am to 5 pm. TCC and TAC meetings are open to the public, are advertised in the newspaper in advance of the meeting date, and provide for a public comment period.

- Employment of visualization techniques to describe the MTP. These can include maps, charts, graphs, diagrams, and techniques such as scenario planning.
    - To meet this requirement and to convey the components of the MTP to the public, the lead planning agency will use a variety of maps and graphics. The lead planning agency will utilize GIS to create maps of demographic and socioeconomic conditions, display existing and proposed transportation conditions and improvements, and to identify transportation projects considered as part of the transportation model.
- All public information must be made available in electronically accessible formats, such as the World Wide Web.
    - The MPO's website will provide information and updates regarding the development of the 2040 MTP. The website will allow users to interact with the lead planning agency and the MPO staff as well as access data and provide input. All of the public informational materials will be available for download in easy to use formats. The MPO's website can be found at the following address: http://www.greenvillenc.gov/departments/public_works_dept/information/default.aspx?id=510

The MPO has an adopted Public Involvement Plan (PIP). The purpose of the PIP is to provide guidelines for establishing and maintaining optimum public involvement in the transportation planning process. The PIP incorporates current public involvement objectives, policies, and techniques.

The following summarizes the update process for the MTP, as established in the PIP:

- Draft document(s) are presented to the TCC. The TCC reviews, comments, and recommends that the TAC consider and present the draft document(s) to the public.
- Draft document(s) are presented to TAC which will consider presenting the draft document(s) to the public.
- After the TCC and TAC have commented, the document(s) will be updated, as necessary. Following approval of the draft document by the TAC, a draft version of the MTP will be available for comment for at least 30 calendar days.
- The document(s) are once again presented to the TCC along with a summary of public comments. The TCC will consider recommending the document(s) for TAC adoption.
- The document(s) are presented to the TAC for their consideration and adoption.
- The Greenville Urban Area MPO shall provide for an additional public comment period of at least 10 calendar days if the final MTP differs significantly from the version that was made

available for public comment by the MPO and raises new material issues which interested parties could not reasonably have foreseen from the public involvement efforts.

- The final adopted version of the MTP shall be made available to the public and on the MPO's web site.

Each of the meetings mentioned above will be advertised in the *Daily Reflector* in advance of each meeting. Meeting agendas are available on the MPO's web site.

In addition, the draft 2040 MTP was available in its entirety on the MPO's website from May 5, 2014 through the closing of the public comment on June 27, 2014.

Public Notice:

The Greenville Urban Area Metropolitan Planning Organization Seeks Public Review and Comment on the DRAFT 2040 Metropolitan Transportation Plan (MTP)

The Greenville Urban Area MPO (GUAMPO) will officially begin a 45-day public comment period for its **Draft 2040 MTP** on **May 5, 2014**.

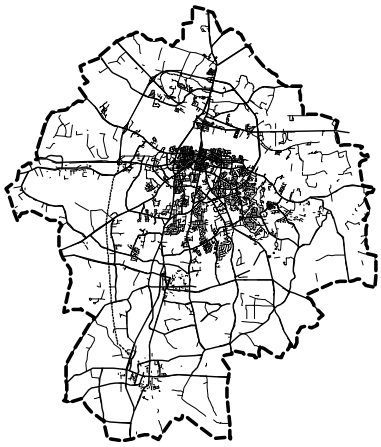
The MTP is a blueprint to guide the Greenville Urban Area's transportation development over a 25-year period. Updated every five years to reflect changing conditions and new planning principles, the **Draft 2040 MTP** looks at major urban transportation planning issues such as complete access to transportation; alternative transportation modes (i.e., bicycle and pedestrian); and highway traffic congestion.

The public review/comment period for the **Draft 2040 MTP** will commence on May 5, 2014. **Comments received on or before June 27, 2014 will be included in the 2040 MTP.** The Draft 2040 MTP and comments received will be presented to the Transportation Advisory Committee (TAC) at the August 5, 2014 meeting.

The **Draft 2040 MTP** may be reviewed at the MPO's website: http://www.greenvillenc.gov/departments/public_works_dept/information/default.aspx?id=510. Comments must be submitted in written format by fax, written communication, or email. All comments should be sent to Daryl Vreeland, Transportation Planner, Greenville Urban Area MPO, 1500 Beatty Street, NC 27834, by e-mail at dvreeland@greenvillenc.gov, or by fax at 252-329-4535. All comments, except those provided at the August 5, 2014 TAC meeting, must be received by 5:00 p.m. on June 27, 2014 to be considered.

Public Comments
All public comments received during the public comment period will be presented in this section of the approved 2040 MTP.

There were no comments received during the public comment period.



GREENVILLE URBAN AREA
METROPOLITAN PLANNING ORGANIZATION

APPENDIX A

INTERAGENCY COORDINATION DOCUMENTATION

Initial agency outreach contact letter sent via email:

Daryl Vreeland

From:	Daryl Vreeland
Sent:	Wednesday, December 18, 2013 11:15 AM
To:	Daryl Vreeland; 'durbrow.rick@epa.gov'; 'militscher.chris@epa.gov'; 'matthews.kathy@epa.gov'; 'josh.r.pelletier@usace.army.mil'; 'william.g.wescott@us.army.mil'; 'pete_benjamin@fws.gov'; 'maximilian.merrill@ncmail.net'; 'scott.power@ncmail.net'; 'renee.gledhill-earley@ncmail.net'; 'steve.claggett@ncmail.net'; 'david.giordano@ncmail.net'; 'garcy.ward@ncmail.net'; 'david.wainwright@ncmail.net'; 'travis.wilson@ncwildlife.org'; 'david.cox@ncwildlife.org'; 'maria.dunn@ncwildlife.org'; 'eddie.dancusse@fhwa.dot.gov'; 'Keith.Melton@dot.gov'; Tom Wisemiller; 'mmccann@conservationfund.org'; Dancausse, Edward; Bill Marley; 'william.g.wescott@usace.army.mil'; Brendan Merithew; Beshad Norowzi
Cc:	Kevin Mulligan
Subject:	Greenville Urban Area Metropolitan Planning Organization (GUAMPO) Long Range Transportation Plan 2040 Update - Agency outreach and coordination
Attachments:	Potential_Projects_in_2040_LRTP.pdf; natural element occurrences.pdf; historic.pdf; Natural Heritage Element Occurences.pdf; conservation lands_nesting birds.pdf; wetlands.pdf; Floodzone and River Basins.pdf

To: Consultation Partners/Resource Agencies

From: Daryl Vreeland, AICP, Transportation Planner

Subject: Greenville Urban Area Metropolitan Planning Organization (GUAMPO) Long Range Transportation Plan 2040 Update

The Greenville Urban Area Metropolitan Planning Organization (GUAMPO) is in the process of updating its multi-modal Long Range Transportation Plan (LRTP) to the horizon year of 2040. The urbanized area is comprised of the City of Greenville, and Towns of Winterville, Ayden, and Simpson, along with portions of unincorporated Pitt County. The update process involves developing a plan that is compliant with federal requirements pursuant to the Moving Ahead for Progress-21 transportation legislation.

One aspect of these regulations involves the initiation of a consultation process by GUAMPO with appropriate Federal and State resources agencies. This involves assisting us with the consultation requirements, in addition to helping us develop the mitigation component of the LRTP (23 CFR 450.322f7). GUAMPO's mitigation-related efforts will be at a system level, as opposed to a project-specific level.

Your comments on the project map will help develop the framework for the LRTP's mitigation element. The narrative for this element of the LRTP will include a general discussion of various types of potential environmental mitigation activities.

This evaluation can be accomplished in a variety of ways, and we would like to hear from you about the ways that best suit your needs and schedules. In the meantime, here are some suggested review methods:

- **Use email)** You may email dvreeland@greenvillenc.gov during plan development with any environmental concerns. You may choose to receive information from GUAMPO via email. This will permit agencies to review the information and provide feedback to GUAMPO staff.

- **Use of GUAMPO's Website** The website will contain a section devoted to the LRTP update, which includes a Resource Agency Consultation section. This will permit agencies to review the information at any time, and provide feedback to GUAMPO staff. The website address is: http://www.greenvillenc.gov/departments/public_works_dept/information/default.aspx?id=510
- **Traditional Meeting** At your request, staff can notify you of upcoming TCC, TAC, and public involvement meetings for all interested parties to attend. All pertinent information will be available, and staff will be present to answer questions.
- **One-on-One Meeting** GUAMPO staff is available to meet individually with an agency to review the project map.

As a resource agency involved with land use management, natural resources, environmental protection, conservation, and/or historic preservation, GUAMPO wishes to engage your agency in a consultation process focused on a comparison of the 2040 LRTP with functional, area-wide plan(s)/inventories developed by your agency.

Our schedule is to complete the 2040 LRTP and have it submitted to the Federal Highway Administration by August 2014. The revised LRTP will update planning assumptions including socio-economic, traffic and financial data. Updates to the actual data and maps to be used in the LRTP are underway. In the first quarter of 2014, the public involvement process for the draft LRTP document is expected to commence. Roadway projects shown on the attached maps are "draft" in nature and subject to change.

Please compare the attached map(s) of potential roadway projects to be included in the 2040 LRTP with conservation plans/inventories prepared by your agency . Send any written comments your agency may have regarding sensitive resource areas that may potentially be impacted or affected by these projects and any recommendations your agency may have for enhancement within 45 days of this email to dvreeland@greenvillenc.gov.

Again, this coordination effort is intended for GUAMPO to receive comment on a system-wide level, not project by project. Also, please provide GUAMPO with any relevant GIS files (or hyperlinks to your agency's web site containing the downloadable files, if available) containing information relevant to environmentally sensitive areas within the MPO boundary.

Please indicate how your agency would like to be involved in the review process. If your agency has no comment at this time, please send a reply accordingly.

If you have questions regarding this request, I can be reached at 252-329-4476.

Table A-1: Agency Contact List

Agency Name	Division of Agency	Contact Information	E-mail Address	Available Data	Format / Location
US Environmetal Protection Agency (EPA)	Region 4, Environmental Information Services Branch	Rick Durbrow Program Analyst (GIS Contact) Sam Nunn Atlanta Federal Center 61 Forsyth Street, S.W., Suite 17T50 Atlanta, GA 30303 404-562-8282	durbrow.rick@epa.gov	Southeastern Ecological Framework and Region 4 Atlas	http://www.epa.gov/region4/gis or http://geobook.sain.utk.edu
US Environmetal Protection Agency (EPA)	Region 4, NEPA Program, Raleigh Office	Christopher A. Militscher 109 TW Alexander Drive, Durham, NC 27709 919-856-4206	militscher.chris@epa.gov	NEPA compliance and cross-cutting issues (e.g. CERCLA& RCRA sites)	http://www.epa.gov/compliance/resources/faqs/nepa/index.html
US Environmetal Protection Agency (EPA)	Region 4, WMD, WCNPSB, Wetlands Regulatory Section Raleigh Office	Kathryn H. Matthews 109 TW Alexander Drive, Durham, NC 27709 919-541-3062	matthews.kathy@epa.gov	Aquatic resource avoidance and minimization, 404 Permits, mitigation	www.epa.gov/wetlands
US Army Corp of Engineers (USACE)	USACE-RD, Washington Field Office, Regulatory Division	Josh Pelletier, Pitt County Contact CESAW-RG-W P.O. Box 1000 Washington, NC 27889 (252) 251-4830 ext 34	josh.r.pelletier@usace.army.mil	Army permit requirements and wetland information	www.saw.usace.army.mil/wetlands
US Army Corp of Engineers (USACE)	USACE-RD, Washington Field Office, Regulatory Division	William Wescott, DOT Division Coordinator CESAW-RG-W P.O. Box 1000 Washington, NC 27889 (252) 251-4830 ext 31 (252) 975-1616 ext 31	william.g.wescott@usace.army.mil	Army permit requirements and wetland information	www.saw.usace.army.mil/wetlands
US Fish & Wildlife Service (USFWS)	NC Field Offices, Ecological Services	Raleigh Field Office - Pete Benjamin Ecological Services Supervisor 551-F Pylon Drive Raleigh, NC 27636 (919) 856-4520 ext. 11	pete_benjamin@fws.gov	1. Priority natural communities & habitat 2. Info on federally listed species (by county) 3. Species recovery plans	1. Contact Person 2.http://www.fws.gov/southeast/es/ 3.http://www.fws.gov/southeast/es/
N.C. Department of Agriculture and Consumer Services (NC DA&CS)	Environmental Programs Division/ Farmland Preservation	Maximilian (Max) Merrill Environmental Program Specialist 1035 Mail Service Center Raleigh, NC 27699 (919) 733-7125	maximilian.merrill@ncmail.net	Livestock Operation Site, Soils, Historical Farm Sites,Land Cover data	Contact person-Emergency Program
N.C. Department of Cultural Resources (DCR)	State Historic Preservation Office (SHPO)	Scott Power Regional Supervisor / Preservation Specialist 1157 VOA Site C Road Greenville, NC 27834 (252)-744-6734	scott.power@ncmail.net	Historic Properties and Archeological Sites	USGS Quad Maps Available in SHPO and OSA Offices by appointment
N.C. Department of Cultural Resources (DCR)	State Historic Preservation Office (SHPO)	Renee Gledhill-Earley Environmental Review Coordinator 4617 Mail Service Center Raleigh, NC 27699-4617 (919) 807-6579	renee.gledhill-earley@ncmail.net	Historic Properties and Archeological Sites	USGS Quad Maps Available in SHPO and OSA Offices by appointment

Table A-1: Agency Contact List (continued)

Agency Name	Division of Agency	Contact Information	E-mail Address	Available Data	Format / Location
NCDENR-Division of Water Quality	DWQ / Transportation Permitting Unit	David Wainwright DOT Projects Coordinator 1650 Mail Service Center Raleigh, NC 27699-1650 (919) 715-3415	david.wainwright@ncmail.net	Groundwater and surface water information	Contact person
NC Wildlife Resources Commission (WRC)	Inland fisheries-habitat conservation	Travis Wilson 1721 Mail Service Center Raleigh, NC 27699-1721 (919) 707-0220	travis.wilson@ncwildlife.org	Eastern DOT Projects Coordination/ Contact; Wildlife Action Plans	http://www.wildlifeactionplans.org/north_carolina.html
NC Wildlife Resources Commission (WRC)	Inland fisheries-habitat conservation	David Cox 1721 Mail Service Center Raleigh, NC 27699-1721 (919) 528-9886	david.cox@ncwildlife.org	Technical Guidance Supervisor/ Contact; Wildlife Action Plans	http://www.wildlifeactionplans.org/north_carolina.html
NC Wildlife Resources Commission (WRC)	Inland fisheries-habitat conservation	Maria Dunn 1721 Mail Service Center Raleigh, NC 27699-1721 (252) 948-3916	maria.dunn@ncwildlife.org	Regional Permit Coordinator/ Contact; Wildlife Action Plans	http://www.wildlifeactionplans.org/north_carolina.html
Federal Highway Administration (FHWA)	NC Division Office Planning & Program Development Unit	Bill Marley 310 New Bern Avenue, Suite 410 Raleigh, NC 27601 (919) 747-7025	bill.marley@fhwa.dot.gov	Legislation/ evidence, Peer exchange programs, linking planning & NEPA, CSS tools, Funding options / opportunites	Contact person
Federal Highway Administration (FHWA)	NC Division Office Planning & Program Development Unit	Eddie Dancusse 310 New Bern Avenue, Suite 410 Raleigh, NC 27601 (919) 747-7026	edward.dancausse@fhwa.dot.gov	Air Quality	Contact person
North Carolina Department of Transportation	Transportation Planning Branch	Behshad Norowzi Transportation Engineering Supervisor 1554 Mail Service Center, Raleigh, NC 27699-1554 (919) 733-4705	bnorowzi@dot.state.nc.us	NCDOT project coordination / contact	Contact person
Federal Transit Authority	Region 4 Administrator	Keith Melton, FTA Region IV 230 Peachtree Street, Suite 800 Atlanta, GA 30303 404-562-3514	Keith.Melton@dot.gov	Public Transit	Contact person
City of Greenville Community Development Department	Urban Development Division	Tom Wisemiller, Historic Preservation & Redevelopment Planner P.O. Box 7207, Greenville, NC 27835 (252)-329-4502	twisemiller@greenvillenc.go	Historic Properties	Contact person
The Conservation Fund	Resorceful Communities Program	Monica McCann Resourceful Communities Program Associate Post Office Box 271, Chapel Hill, NC 27514-0271 919.967.2223, x110	mmccann@conservationfun	Hoke Community Forest	http://www.resourcefulcommunities.org
NCDENR-Division of Water Quality	DWQ / Fayetteville Regional office	Garcy Ward Fayetteville DOT Projects Coordinator 225 Green St.,Suite 714 Fayetteville, NC 28301 (910) 433-3303	garcy.ward@ncmail.net	Groundwater and surface water information	Contact person