Long Range Transportation Plan

Bulding Blocks to a Sustainable Future

Jacksonville Urban Area

Metropolitan Planning Organization

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Introduction

Section Overview

Jacksonville Now and Then

By their nature, cities grow and gradually change over time. Jacksonville's own evolution as a city reveals that it is no stranger to this inescapable transformation.

The Onslow precinct was carved out of Carteret and New Hanover Counties in 1731 in an effort to make legal transactions easier for those living along the

New River. Centrally located, Jacksonville — originally named Onslow Courthouse — was created to serve as the Onslow County seat. In 1842, the local community's name was changed to Jacksonville, in honor of Andrew Jackson. 1941 saw the development of one of the largest Marine Corps bases in the area. This base became Camp Lejeune and was annexed by Jacksonville in 1990, increasing the local population to 67,000 people.

Much has changed over time. Between 2000 and 2008 Onslow County's population has grown by more than 17 percent to a population of over 176,000. This includes the City of Jacksonville, the 10th largest city (by population) in North Carolina, with a population of more than 81,000 people. Almost half of these people are living on Camp Lejeune and the New River Air Station. The Jacksonville metropolitan area has grown from the original one acre donated to build the Onslow Courthouse in the 1730's to the bustling urban area today that includes more than half of Onslow County.

The 1800s and Early 1900s

Jacksonville's lifeblood in the1800s was the New River. Fishing, logging, and the production of turpentine were the main industries. Logging companies such as Onslow Lumber Company, Jacksonville Lumber Company, and Roper Lumber Company all were established between 1890 and 1900. To this day, logging remains a viable industry for eastern North Carolina. In 1890, the Jacksonville Baptist Church was constructed at the corner of Anne Street and College Street. This was the first church in Jacksonville to be constructed for a specific denomination. The 1890s also saw the creation of the first bank for both Jacksonville and Onslow County. The Bank of Onslow was established by John W. Burton and was located in the courthouse until it moved across the street to Old Bridge Street. The bank merged with First Citizens Bank and Trust Company in the 1930s.

Court Street emerged as the commercial center for Jacksonville and Onslow County in the 1900s. In 1901, the Hinton-Koonce building became the first brick building to be constructed on Court Street. Popular businesses that developed in the area included the Ward Loy Drugstore, Sebastian Grocery, Brothers and Riverbank Store, and the Margolis Men's Store. Margolis Men's Store is the oldest surviving business name in Jacksonville, having remained in business in downtown Jacksonville until 1978 when it moved to a new location. The store still remains open today, and the original store on Court Street is now used as office space.

In 1943, Dr. H.W. Stevens convinced the federal government to build a hospital for Onslow County. Registered nurses working at the hospital stayed at the nurses' residence also called the "Nurses Home." In the 1950s a new hospital was built to accommodate the growing community of Jacksonville. The new 150-bed hospital was built on College Street near the original hospital and was named Onslow Memorial Hospital. In 1974 a modern multi-story hospital was constructed on Western Boulevard. The hospital now serves not only Jacksonville but also many of the surrounding communities. Jacksonville remained a small community throughout the 18th and 19th centuries. It was not until the creation of Camp Lejeune that Jacksonville was catapulted into the growth that has marked the 20th Century.

The Latter Part of the 20th Century

Camp Lejeune

Significant change began for Jacksonville in 1939, although most residents did not know it. As America was witnessing the escalating war in Europe, Colonel George W. Gillette with the U.S. Army Corp of Engineers surveyed the coast of North Carolina and labeled it "The "Unguarded Coastline" in 1939. This survey would change the lives of not only the Colonel but also those living in the communities of Jacksonville and Onslow County.

In 1941, Congressman Graham Barden of New Bern announced that a 100,000-acre-site had been selected as the location to build the largest Marine Corps base in America. Approximately 1/5th of the land area of Onslow County was acquired to construct Camp Lejeune. In one week Jacksonville's population grew from 800 residents to 1,600 with the announcement of the base construction.

Land acquisitions began immediately and construction started shortly thereafter. Much of the 100,000 acres initially acquired consisted of family home sites dating back several generations, and the little money received was often not enough to purchase a comparable home. Many African-Americans whose homesteads were lost through acquisition, however, were able to purchase property from Raymond Kellum. The resulting community that developed was named Kellumtown. Construction for Camp Lejeune began on April 5, 1941 with the clearing of the pine forests to make way for roads and buildings. Very few roads existed on the property acquired, but construction moved forward despite dense forest, deep sand, and humidity. Many of the initial barracks were canvas tents. Marines used the canvas barracks until permanent houses could be erected. Final barracks were completed in December 1942. Near the end of 1942, the base took on the name of Camp Lejeune, named in honor of the 13th Commandant and Commanding General of the 2d Division in World War I, MajGen. John A. Lejeune.

Grow the Force Initiative

In January 2007 the Department of Defense announced that the United States Marine Corps would increase its total personnel strength from approximately 180,000 to 202,000 by 2011. This increase is needed to pro-

vide adequate time to recover between deployments, train to meet combat readiness, and prepare for redeployment. This is to ensure that Marines are properly prepared and trained for existing combat and homeland protection missions and future conflicts. This growth includes permanent personnel (military and civilian) increases at Camp Lejeune and MCAS New River. By fiscal year 2011, Camp Lejeune would permanently increase personnel by about 8,500 and MCAS New River would increase by about 1,400. To support this growth the installations would need modernize existing facilities and construct new facilities and infrastructure. This growth would also bring approximately 11,700 dependents to the Jacksonville metropolitan area and an additional 7,700 in projected induced or secondary growth.

This will be the biggest economic driven growth event in eastern North Carolina since World War II and it is anticipated to put additional strain on already stretched infrastructure network. Among the most urgent transportation needs are improvements around and between the military installations. A new main gate at Camp Lejeune is being designed to alleviate the congestion along NC Highway 24, which is directly attributable to the increased growth on base. The safety, quality of life, and readiness issues associated with this congestion are characterized by increased accidents, travel times, and lost productivity. However, the opening of this new gate will not occur until 2014. The implementation of an Intelligent Traffic System in the region will offer instant relief by monitoring and controlling key choke points on area roadways that connect the base to the neighborhoods where its employees live and allow traffic managers to maximize the large capital investment in the new gate by ensuring efficient balancing of daily traffic on the network.

The Automobile Enters the City

First mass-produced and made affordable to the American public by Henry Ford, the automobile entered Jacksonville in earnest in the early 1900s. With an automobile, it became increasingly easier to cover longer distances in short periods of time, offering people not only the opportunity to cover greater distances for leisure, but also the opportunity to live greater distances from work, thereby fueling the spread of the city. More buildings and businesses were constructed and located in Jacksonville's central business district (CBD); the majority of growth, however, followed a less centralized pattern and occurred at the fringes of the city. With the announcement of Camp Lejeune's creation in 1941 and the subsequent construction businesses developed overnight along NC 24, which hinted to the future spread of the city. The city's traditional downtown core business district and grid street system declined as the city began to spread outward and the beginnings of a hub and spoke system started to take root.

Development Patterns

Reviewing the City's growth clearly shows how the compact downtown of the 1800s and early 1900s changes to the sprawling development with construction of Camp Lejeune in the 1940s. Initially, areas surrounding the CBD were laid out on a primarily rectilinear grid of streets. The next band of development looked less like a grid and is more easily identified today by its cul de-sac developments with low connectivity and vast commercial centers. By the late 1940s the focus of new residential development began to shift to areas outside the center city. Although the CBD remained the primary area for business, that would change in the following years as businesses relocated to the rapidly developing suburban business parks and shopping centers. These centers were developed beginning in the late 1950s and continue to be developed today. Despite the city's best efforts, redevelopment and downtown development became increasingly difficult to attract following the success of sprawling office parks, regional malls, and commercial strip centers.

The early 1990s marked the beginning of a renaissance in the redevelopment of downtown Jacksonville. The far greater pace and magnitude of development, however, remains at the suburban fringe where land is still

available and relatively inexpensive. The group B.O.L.D. ("Bettering Our Local Downtown") was developed in the early 1990s to champion the revitalization of downtown. With the continued sprawl of development on the fringes of town, the CBD had fallen into disrepair. Numerous storefronts were vacant and those that were occupied housed unappealing businesses. B.O.L.D. pushed for the redevelopment of downtown businesses and the surrounding roadway network. Since the redevelopment businesses have returned to the downtown. Though attracting downtown development remains a challenge, the city continues to strive toward the goal of a healthy center city through investment in the public realm.

Travel in Modern Jacksonville

In the past 200 years, travel modes and patterns have changed dramatically in Jacksonville. The early 1800s through the early 1900s were dominated by horse, horse-drawn, and foot travel. The introduction of the railroads in the 1850s, while not a dominant mode, ushered in an era of practical long distance travel and commerce. The 1930s saw the end of a travel era for Jacksonville. In 1939, a steel bridge replaced the last ferry to operate in the town, which had run from Sneads Ferry onto what is now Camp Lejeune.

The 20th century brought the automobile, a travel revolution, and an entirely new set of challenges. Similar to the influence of the railroads in the 1850s, the proliferation of commercial air transport in the 1950s and 1960s once again re-revolutionized long-distance travel. Today, horses and horse-drawn transportation are gone in Jacksonville except as means of recreation and the area's highway infrastructure continues to evolve as a way of addressing the needs of changing traffic and development patterns.

The transportation network has continued to expand modal options for uses. Albert J. Ellis Airport has grown to a vital component of the region's multi-modal network and public transportation throughout the region has been strengthened by the creation of the Jacksonville Transit System (JTS) in 2007. Over the past several years JTS and region's rural and demand response transportation providers, Onslow United Transportation Service (OUTS), have created a distinctive partnership to provide for a rapidly growing transit demand in the region. OUTS provides daily point to point transportation through Onslow County and JTS offers daily fixed route bus service throughout greater Jacksonville. Evening and weekend express service has also proven successful has continues to expand to meeting the unique transportation needs of the region.

Traffic related to recent growth of area military installations continues to be one of the region's biggest development challenges. Daily traffic to and from Camp Lejeune is expected to increase to over 80,000 vehicles per day by 2030. This commuting corridor as well as other traffic hotspots will continue to drive the attention of traffic operations and mitigation strategies. This is only exasperated by the current transportation funding circumstances. One emerging solution is the use of technology through the development of a regional Intelligent Transportation System that is scheduled to begin construction in 2011.

Journey to Work

As part of the US Census 2000, "journey to work" information was collected. The intent of collecting this data was to study travel characteristics of the American population. The most popular mode of transportation to and from work in Onslow County and Jacksonville was the privately-owned vehicle, driven alone (68.5%). Of the survey respondents, 17.6% rideshared or carpooled to work, while only 0.9% of respondents said that they used transit to travel to work; however, 10.9% responded as walking or bicycling to work. As a means of comparison, the Nationwide Personal Transportation Survey issued in 1995 found that only 2.4% of respondents walked or biked to work; Jacksonville's rate of walking is one of the highest in North Carolina thanks in large part to the low car ownership of military families.

Commuter Patterns

Information compiled by the North Carolina State Data Center (NCSDC) regarding commuting patterns indicates that 93 percent of Onslow County's workers commute to jobs in the County from locations within the County. Of the remaining workforce most commute from nearby counties, while a few travel longer distances from counties farther away.

Purpose and Need

These plans are the guiding documents for future investments in the region's multimodal transportation network as well as transportation related activities and services geared towards matching the needs of the region's expected growth.

Why Do We Need A Plan?

A transportation plan is essential for building an efficient transportation system. The implementation of any transportation project, such as building a new road, adding lanes to a highway, purchasing transit buses, constructing a rail system, or building bicycle lanes with a road widening project, often requires several years to complete from concept to construction. Once a community determines that a project is needed, there are many detailed steps to be completed: funding must be identified; analysis must be completed to minimize environmental and social impacts; engineering designs must be developed, evaluated, and selected; the public must be involved in project decisions; right-of-way may have to be purchased; and finally, the construction must be contracted and completed.

No matter which step one might consider the most important in this long process, the regional transportation plan is always the beginning of the process. In fact this basic planning concept is so important that federal regulations require that a project must be identified in a long-range transportation plan in order for it to receive federal funding and obtain federal approvals.

Federal regulations not only require a long-range plan, the regulations stipulate the contents of the plan and the process used in its development. The plan must have:

- A public involvement process that meets federal guidelines, and is sensitive especially to those groups traditionally left out of the planning process.
- A multi-modal approach that provides for all transportation modes, public transportation, walking, bicycling, aviation, and roadway needs.
- A minimum 20-year planning horizon.
- A financial plan that balances revenues and costs to demonstrate that the plan is financially responsible and constrained.

Regions like the Jacksonville metropolitan area must develop these plans at least every five years, and must formally amend these plans if they wish to undertake regionally significant transportation investments that are not included in them.

What is in the Plan?

Metropolitan areas in North Carolina prepare two distinct, but related types of transportation plans: Comprehensive Transportation Plans (CTPs) that show all the existing, new and expanded major roads, transit services, bicycle and pedestrian facilities and related transportation activities that are desired to meet the growth and mobility aspirations of our citizens as far out into the future as can be reasonably envisioned. The CTP has no defined future date by which the facilities and services would be provided, nor is it constrained by our ability to pay for facilities and services or the impacts of these facilities and services on our region's air quality.

Long-Range Transportation Plans (LRTPs) that show the new and expanded roads, transit services, bicycle and pedestrian facilities and related transportation activities that we believe we can pay for and build by the year 2035.

The facilities and services in a long range transportation plan are a subset of the facilities and services in a Comprehensive Transportation Plan. *Table INT-1* this relationship between the LRTP and CTP, and also the plans' relationship to the Metropolitan Transportation Improvement Program (MTIP), the seven-year program of projects that is also developed for metropolitan areas and that serves as the main implementing document of the LRTPs for

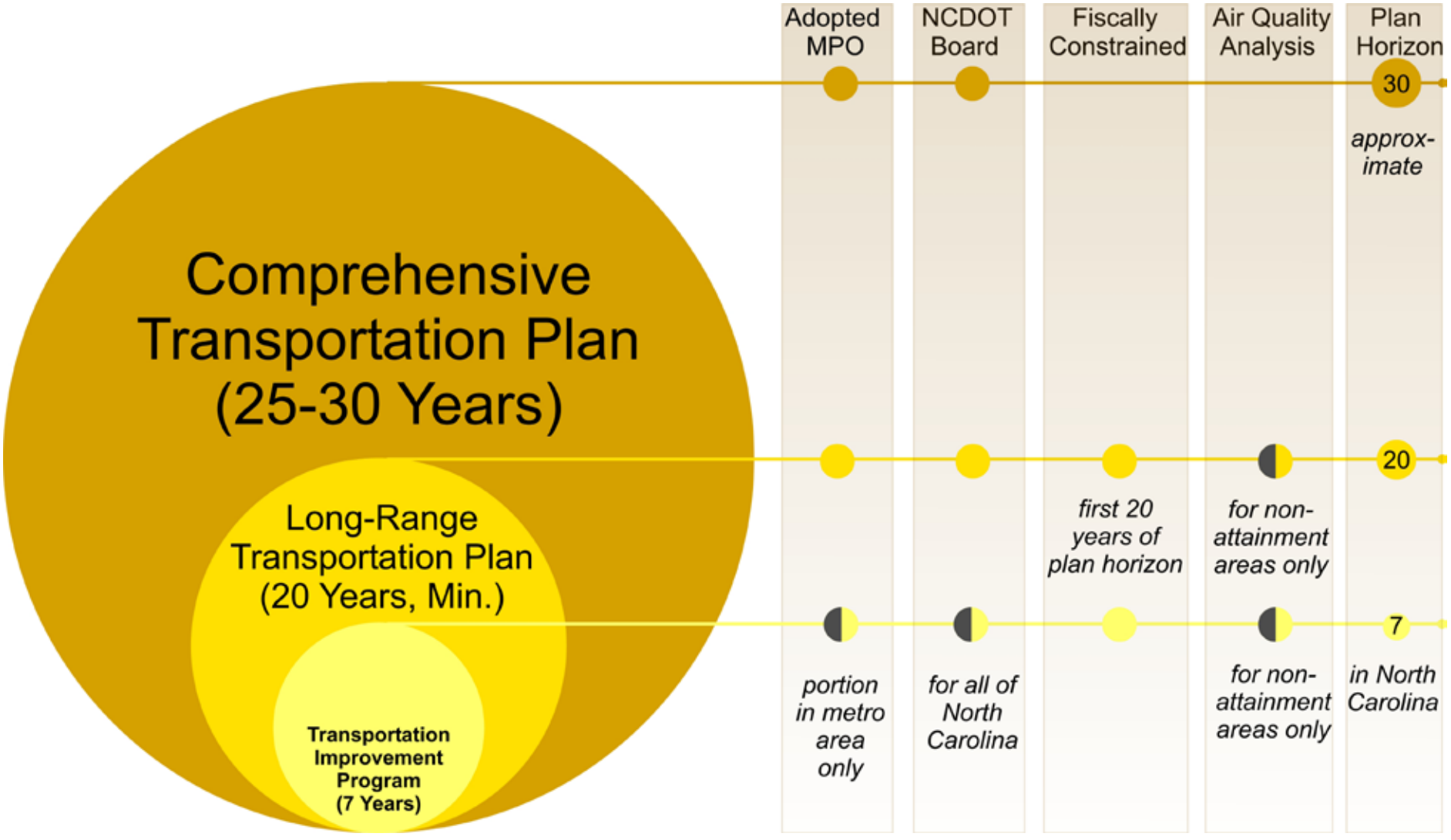
Adopted MPO
NCDOT Board
Fiscally Constrained
Air Quality Analysis
Plan Horizon
30
approx-imate
Comprehensive Transportation Plan (25-30 Years)
20
Long-Range Transportation Plan (20 Years, Min.)
first 20 years of plan horizon
for non-attainment areas only
7
Transportation Improvement Program (7 Years)
portion in metro area only
for all of North Carolina
for non-attainment areas only
in North Carolina

Table INT-1

those projects and services that use state and federal funding. The current MTIP covers fiscal years 2009 2015.

Introduction and Vision

Chapter 1 provided an overview of the growth that the Jacksonville metropolitan area has seen since it was known as Onslow Courthouse. With such growth comes the inevitable need to accommodate new progress. Jacksonville is a dynamic community, continually addressing new challenges and providing new opportunities. The Jacksonville Urban Area 2035 Transportation Plan is one indication of the community's efforts to support growth proactively. This potential for growth is shown by the expanse of the plan's study area (illustrated in Figure XX), which includes the City of Jacksonville, MCB Camp Lejeune, MCAS New River, and Onslow County which can reasonably be expected to effect change.

This plan addresses the area's transportation needs by identifying both general and specific transportation system improvement recommendations and strategies. It is important to acknowledge that these recommendations are intended to support a diversified transportation system that considers not only the automobile, but also the bicyclist, the pedestrian, and the transit user. The Jacksonville Urban Area 2035 Transportation Plan consists of the region's previous work, including the adopted Comprehensive Bicycle & Pedestrian Plan, the Collector Street Plan, and the New River Regional Transit Plan. Of course, a plan that does not consider practical implementation is doomed to remain unused. With this in mind, the transportation plan includes discussion on strategies, methods, and sources of funding for implementation.

The Vision

"To develop and maintain a safe, efficient, and environmentally compatible transportation system that provides convenient choices for accessing destinations throughout the Jacksonville Urban Area."

Eight Planning Factors

In addition to those considerations listed above, the development of the transportation plan was significantly influenced by the federal transportation planning requirements. Those requirements set forth by the Federal Highway Administration (FHWA) identify eight planning factors:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency
- Increase the safety of the transportation system for motorized and non-motorized users
- Increase the security of the transportation system for motorized and non-motorized users
- Increase the accessibility and mobility options available to people and for freight
- Protect and enhance the environment, promote energy conservation, and improve quality of life
- Enhance the integration and connectivity of the transportation system (across and between modes) for people and freight
- Promote efficient system management and operation
- Emphasize the preservation of the existing transportation system

These factors have functioned as the foundation for planning during the update to the *Jacksonville Urban Area 2035 Transportation Plan*. The eight factors represent a financially constrained multimodal plan that seeks to promote system preservation; sensitivity to the natural, social, and built en-

vironments; and the use and integration of alternate modes.

Supporting Economic Vitality The Jacksonville Urban Area 2035 Transportation Plan recognizes the positive impact of transportation improvements on quality of life, especially as a valuable recruitment characteristic for a trained workforce and related economic development initiatives. Continuing to develop a balanced transportation network will help to further the economic life of the region.

Safety

The plan identifies both traffic and pedestrian safety recommendations. It also includes an evaluation of causational factors and recommendations for improvements to 10 safety concern intersections (see Roadway and Highway Conditions). The Jacksonville Urban Area 2035 Transportation Plan enhances safety through a refined set of design standards for new roadways. Additionally, it clearly establishes a pedestrian realm through the comprehensive bicycle and pedestrian plan elements.

Accessibility and Mobility

The significant expansion of the roadway system identified in this plan, specifically as it relates to the collector street system, provides improved trip-making choices for motorized and non-motorized users. The expansion is characterized by improved connectivity throughout the region. The Plan's Freight Element further discusses the enhanced accessibility through improved designs as well as designated truck routes through the metropolitan area. In addition, the incremental expansion of the local public transportation system will improve transportation choices and further local efforts to improve accessibility to the transportation system.

Environment, Energy Conservation, and Quality of Life

The Jacksonville Urban Area 2035 Transportation Plan is responsive to both natural and built environments. Energy conservation is promoted by improving system performance through signal system enhancements, access management, and system-wide connectivity. These enhancements will help reduce congestion and travel delays and promote alternate travel modes. In total, the plan's transportation system enhances quality of life through improved choice, enhanced connectivity, and the creation of walkable environments.

Enhanced Integration

This transportation plan goes beyond planning for thoroughfares by including a specific collector street element. This element enhances the overall system connectivity for vehicle travel as well as cycling and walking. The integration of modes is best exemplified by the provision for sidewalks along all new roadways and the addition of wide outside shoulders or dedicated bike lanes. No longer are roads viewed as conduits merely for automobiles; rather, they are transforming into "complete streets" intended for use by multiple modes of travel. This element also specifically addresses ways to create a more sustainable street network that integrates environmental sensitivity, improved connectivity and traffic calming measures.

Systems Management and Operations

Transportation plans often overlook the use of management strategies as a means to improve safety and efficiency. Improvements to access management and the use of technology (e.g., coordinated signal system) will prove beneficial tools for the management of the existing system and improved integration as the system is expanded. While the Jacksonville MPO is not required to develop a Congestion Management System or plan, identifying ITS improvements and creating a collector street plan have been completed within the past two years of the adoption of this Plan.

System Preservation

The preservation of the existing transportation system is largely accounted for through the maintenance plans described in the financial element of the report. The Congestion Management Strategies and Collector Street Elements also targets specific improvements to congested roadway corridors in an effort to preserve and enhance their operation. Through changes in development patterns, access management, and improved signal coordination, these corridors can be enhanced incrementally, thereby maintaining their relevance to the overall transportation system for years to come.

Public Involvement

Public Involvement is another component of a successful transportation plan. Even the best conceived recommendations are destined to fail if the affected community is not involved during the plan development process. Community outreach for the Jacksonville Urban Area 2035 Transportation Plan included the involvement of a technical committee, newsletters,

stakeholder interviews, community surveys, and public workshops.

Technical Coordinating Committee

The Technical Coordinating Committee (TCC) included representations of State, County, and local government, military base representatives, the local community, economic development and advocates for alternate modes. This group met regularly and provided guidance and feedback to the project team throughout the planning process. In addition, the TCC was regularly involved with planning exercises that assisted the project team as area conditions were considered, and market forces and selection of alternatives occurred. Additional subgroups met to assist staff and guide the development of the bicycle, pedestrian, and transit modal elements.

Technical Coordinating Committee Members

- Reginald Goodson, Jacksonville Development Services Director
- Scott Shuford, Onslow County Planning & Development Director
- Ron Massey, City of Jacksonville Interim City Manager
- Grant Sparks, City of Jacksonville Public Services Director
- Allen Pope, NCDOT Division 3 Engineer
- Patrick Riddle, NCDOT-Division 3
- Tori Smith, NCDOT-Public Transportation Division
- James Upchurch, NCDOT- Transportation Planning Branch
- Robert Vause, NCDOT-Division 3
- Jim Rechardt , Jacksonville-Onslow Economic Development Director
- Matt Stuart, Onslow County Planning
- Joe Ramirez, USMC, Camp Lejeune
- Larry Brant, USMC, Camp Lejeune
- Carol Hurst Long, Onslow United Transit System Director
- Alex Rickard, Eastern Carolina COG
- Michael Yaniero, City of Jacksonville Police Chief

Stakeholder Interviews

In order to assure that individual stakeholder groups had the opportunity to interface with the project team and to identify their specific issues and concerns, a series of personal, telephone, and email interviews were conducted. During these interviews a series of questions were asked but most importantly, interviewees were given the opportunity to suggest recommendations and comment on current conditions and desired outcomes.

The purpose of these interviews was to:

- Introduce the vision contained within the current long-range transportation planning process
- Learn and document perceptions of those interviewed about transportation service delivery and planning in their community, the needs of their constituents regarding of their vision
- Gather initial feedback from key stakeholders regarding a variety of

transportation strategies
- Document new strategies that should be considered
- Enlist stakeholders as partners in distributing information about the project

The following individuals were selected by the MPO to participate in these interviews:

- Lt. Col. Timothy G. Hanson, USMC, New River MCAS
- Joe Ramirez, USMC, Camp Lejeune
- Jan B. Slagle, Mayor of Jacksonville
- Louis Sewell, North Carolina Board of Transportation member
- Joe McLaughlin, Onslow County Commissioner (TAC member)
- Horace Mann, Jacksonville City Council (TAC chair)
- Alva Williams, Jacksonville City Council (TAC chair)
- Jerome Willingham, Jacksonville City Council (TAC member)
- Kristoff Bauer, City of Jacksonville Manager
- Jack Kane, Jacksonville Bicycle Shop (COJ Trails & Greenways Commission)
- Carol Hurst Long, Onslow United Transit System Director
- Sylvia Battle, MV Transportation(Contracted Fixed-Route Transit Operator)
- Bruce Gombar, Director, Onslow County Economic Development
- Jim Rechardt , Jacksonville-Onslow Economic Development Executive Director
- Cynthia Woodson, Exec. Director, Georgetown Renaissance Assoc.

The results of these discussions were utilized to develop alternative solutions and formulate plan recommendations.

Community Workshops

Public workshops were conducted throughout the plan's update process. Workshops focusing on specific transportation modes as well as the overall region were conducted at public locations during the plan's update development timeline. Additionally, several information sessions were held in conjunction with community events including the Downtown Going Green Festival, the Onslow Senior Expo, and National Night Out events throughout 2008 and 2009. A regional transportation forum and workshop was held at the Jacksonville City Mall in November, 2008 to focus on the overall regional perspective. The intent of the workshops was to inform the public about the planning process, scope of work, and to educate them about existing conditions. The workshop allowed participants to express a transportation vision for their community and provide input on possible solutions to regional transportation challenges. During each of the workshop, staff provided information and briefings to the public, displayed maps and other graphic visualizations geared to aid the public in understanding our current transportation realities. Attendees could comment on the need for transportation improvements through available comment forms. In addition, participants were asked to prioritize various focus areas for the region's transportation planning efforts. All of these efforts built upon the initial efforts conducted during the Plan's development in 2005. The Plan's update also utilized technology unavailable in 2005 by developing a cyber presence through member organization websites and newer social networking web services such as Facebook. This gave staff a quick way to provide updates on the planning process as well as hear from segments of the public that do not ordinarily attend public meetings.

Bicycle Element

Section Overview

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- Methodology
- Signed/ Shared Roadway
- Develop a Project Vision
- Develop Project Goals
- Challenges and Opportunities
- Conceptual Development
- Conduct Public Workshop
- Development of Conceptual Alternatives
- Development of the Preferred Alternative
- Conduct Public Workshop
- Preliminary Master Plan Document
- Final Master Plan Document

Overview

The proposed bicycle network for the Jacksonville Urban Area consists of strategic bicycle facility improvements that will create safer, more accessible streets for cyclists. The guiding philosophy in devising this network is the hubs and spokes model. Bicycle corridors (spokes) should connect to trip attractors (hubs), such as parks, schools, Downtown, shopping centers, and greenways access points. The end result is a connected, comprehensive system of bicycle facilities, including both on road routes and on greenway trails. A more detailed discussion and analysis of the pedestrian network is included in the *Comprehensive Bicycle & Pedestrian Transportation Plan (BPTP).*

The proposed improvements were developed from project *visioning, field analysis, GIS mapping, and public input*. This chapter presents the methodology, recommended bicycle facilities, and overall bicycle network map. It also provides detailed recommendations for key network corridors.

Methodology

The proposed bicycle network developed out of a critical analysis of several main factors, most notably: existing data, previous plans and studies, the consultants' fieldwork, public input, and trip attractors for cyclists. Detailed fieldwork included an examination of roadway conditions for all major thoroughfares in the study area (not including limited-access highways, where bikes are prohibited), greenway feasibility, and conditions for smaller roadways that may provide key connections. A discussion and analysis of proposed bicycle improvements was also conducted during Steering Committee meetings and public meetings to determine areas of specific concern.

Specific consideration was given to the following:

- Locations of existing facilities
- Observed gaps in existing facilities or deficiencies in facilities

- Locations of existing and future trip attractors, including schools, parks, shopping areas, downtown historic district, high density residential areas, etc.
- Locations of safety concern (high speed, high volume roadways)
- Connectivity of regional and statewide bicycle and greenway routes
- Opportunities for greenway development including open space, available land, easements, and new developments
- Public comments collected from area residents via an online survey and during public workshops.
- Recommendations from representatives of the Steering Committee
- Projects and recommendations from previous planning efforts
- Field observations made by the consultant

Field observations included the use of the above worksheet while gathering data. Over 60 such worksheets were filled out during fieldwork data collection, corresponding to the many individual segments of roadway throughout the project study area. The data was used to help determine preliminary recommendations for bicycle-related roadway improvements.

The Bicycle Network

The Proposed Bicycle Network for the Jacksonville Urban Area consists primarily of signed/shared roadways, paved shoulders, bicycle lanes, sidepaths, and greenway corridors). Together, these proposed facilities will be incorporated into the existing roadway (or developed within existing rights-of-way) to create a safe and connected bicycle network throughout the Jacksonville Urban Area.

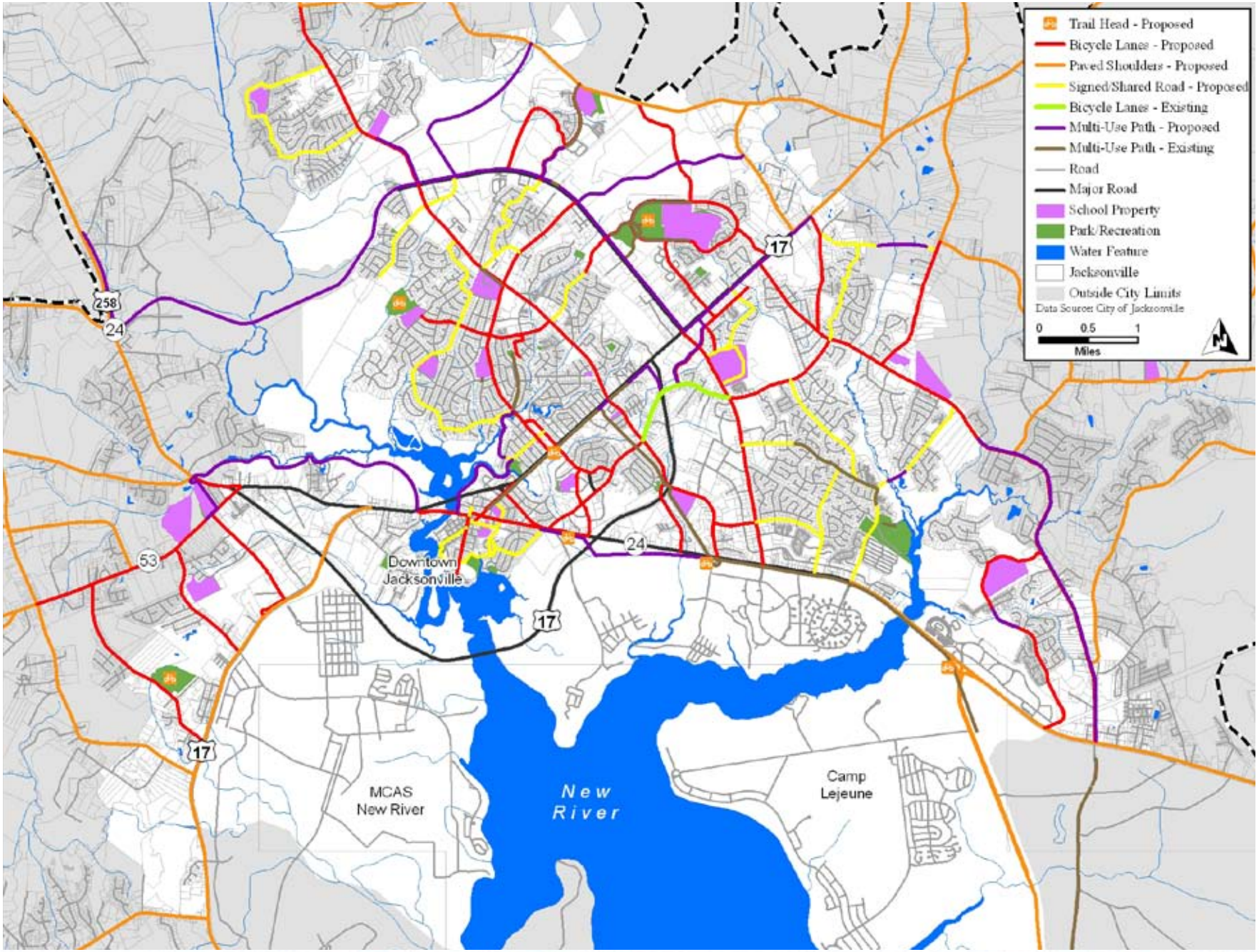
The network should be completed in phases as prioritized in Chapter 6 – Implementation of the BPTP. However, network segments should be developed whenever there is an opportunity (such as through development dedications, roadway resurfacing projects, etc.), regardless of the order in the recommended phases.

Five main types of bicycle facilities have been identified for the Jacksonville Urban Area and are outlined below. Please refer to the design guidelines in Chapter 7 - Design Guidelines of the BPTP, for detailed information regarding proper placement and facility treatments. Also included in Chapter 7 are guidelines for other important bicycle facilities, such as bicycle racks, signage, recommendations for bicycle-friendly intersections, etc.

The complete recommended network of bicycle facilities and off-road greenways can be found on *Map BEM-1 on page 14*. Each segment can be found in the prioritization matrix found in Appendix B.

Signed/Shared Roadway

Signed/shared roadways may either be a low volume (less than 3,000 cars per day) roadway with traffic calming and signage to create a safe shared use environment, or a higher volume roadway with wide (14-foot) outside lanes. Some Loca-


Trail Head - Proposed
Bicycle Lanes - Proposed
Paved Shoulders - Proposed
Signed/Shared Road - Proposed
Bicycle Lanes - Existing
Multi-Use Path - Proposed
Multi-Use Path - Existing
Road
Major Road
School Property
Park/Recreation
Water Feature
Jacksonville
Outside City Limits
Data Source: City of Jacksonville
0 0.5 1
Miles
258
24
53
17
Downtown Jacksonville
MCAS New River
New River
Camp Lejeune

Map BEM-1

tions of existing and future trip attractors, including schools, parks, shopping areas, downtown historic district, high density residential areas, etc.

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The network should be completed in phases as prioritized in Chapter 6 – Implementation of the BPTP. However, network segments should be developed whenever there is an opportunity (such as through development dedications, roadway resurfacing projects, etc.), regardless of the order in the recommended phases.

Five main types of bicycle facilities have been identified for the Jacksonville Urban Area and are outlined below. Please refer to the design guidelines in Chapter 7 - Design Guidelines of the BPTP, for detailed information regarding proper placement and facility treatments. Also included in Chapter 7 are guidelines for other important bicycle facilities, such as bicycle racks, signage, recommendations for bicycle-friendly intersections, etc.

The complete recommended network of bicycle facilities and off-road greenways can be found on *Map BEM-1 on page 14*. Each segment can be found in the prioritization matrix found in Appendix B.

Signed/Shared Roadway

Signed/shared roadways may either be a low volume (less than 3,000 cars per day) roadway with traffic calming and signage to create a safe shared use environment, or a higher volume roadway with wide (14-foot) outside lanes. Some advantage of linear stream corridors, easements, and other tracts of open space. Greenway trails in Jacksonville should be integrated with and serve as an off-road extension of the on-road bicycle and pedestrian network. Numerous greenway opportunities were identified throughout Jacksonville, via consultant fieldwork, public input, and other local and regional planning efforts. Proposed greenway corridors are illustrated on *Map BEm-2 on page 17.*

Ancillary Treatments

In addition to the above facilities, a number of other important bicycle treatments can improve safety throughout the bicycle network. A full listing and description of these facilities and treatments can be found in Chapter 7 - Design Guidelines of the BPTP. A summary of three major treatments is provided below.

Bicycle Parking: This refers not only to bicycle racks, but also covered bicycle parking. The design guidelines describe which types of racks should be used, and which types to avoid.

Driveway Access Management: This refers to reducing the size and frequency of driveways for motor vehicles crossing sidewalks and bicycle routes to adjacent parking lots and property. For the overall safety of cyclists and pedestrians, closing and/or rerouting driveways to side streets could prove to be more effective than the development of any single facility type.

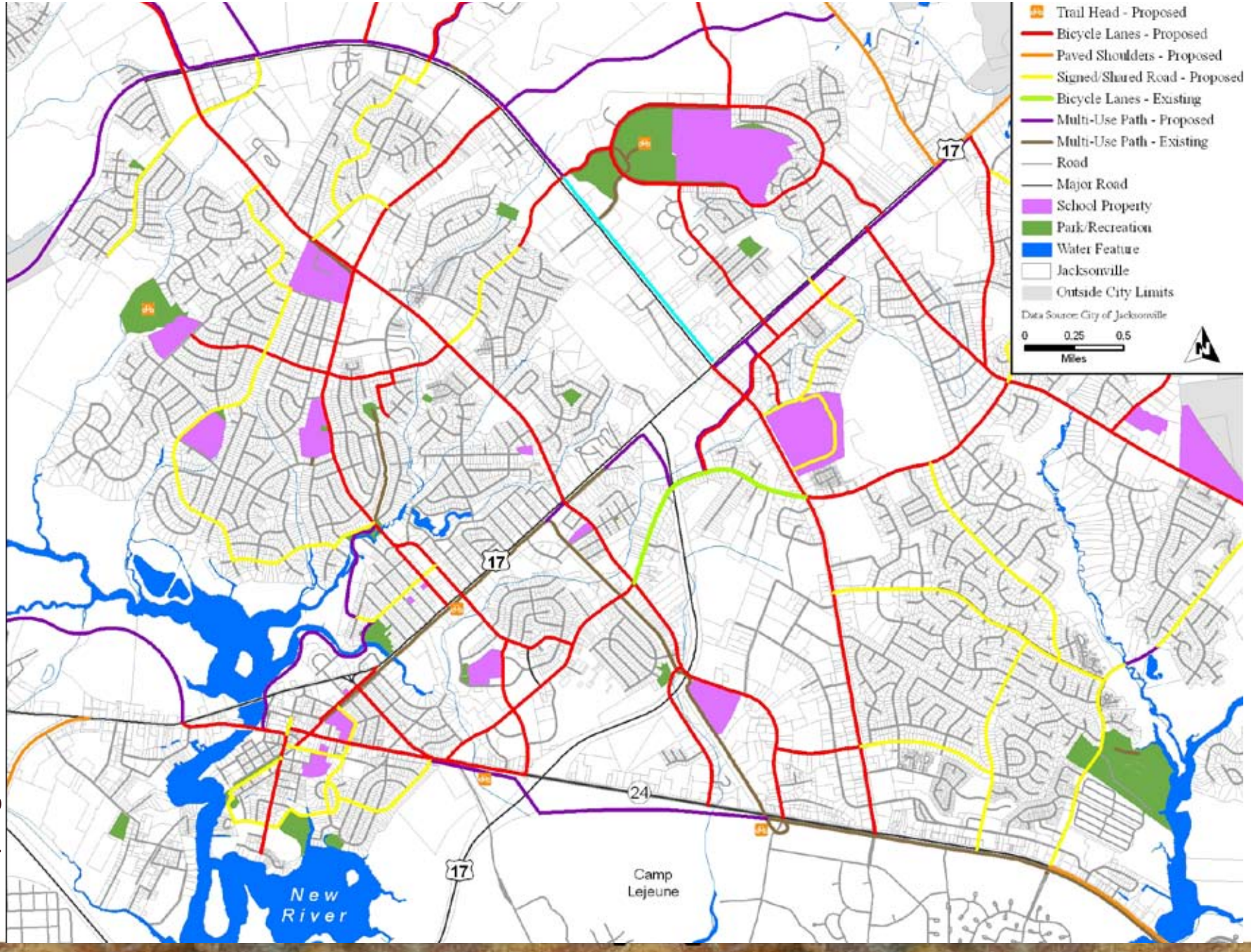
Traffic Calming: This refers to a range of measures that reduce the impact of vehicular traffic on residents, pedestrians and cyclists - most commonly on residential streets, but also now on commercial streets.

Bicycle Corridors

The locations of recommended bicycle facilities are shown on the network map (Map 3.4). The bicycle network is intended to provide a flexible guide for the community that can be responsive to changing conditions and community priorities. It is important to note that these recommendations are based on current knowledge, conditions, and projects, and are intended to be updated on an ongoing basis. As the area continues to change and grow, with modification of transportation corridors and development, new priorities may arise.

This plan recommends 175 miles of bicycle facilities in the ETJ. It is important to remember that while these recommendations may require extensive resources for execution, they are recommended in phases, and are prioritized for a manageable implementation. Furthermore, some of these miles of facilities will be simple re-stripes upon repaving, or simply signage

Map BEM-2


Trail Head - Proposed
Bicycle Lanes - Proposed
Paved Shoulders - Proposed
Signed/Shared Road - Proposed
Bicycle Lanes - Existing
Multi-Use Path - Proposed
Multi-Use Path - Existing
Road
Major Road
School Property
Park/Recreation
Water Feature
Jacksonville
Outside City Limits
Data Source: City of Jacksonville
0
0.25
0.5
Miles
17
17
17
24
New River
Camp Lejeune

installation with few actual roadway improvements. These are prioritized in Appendix B with the Top 10 projects listed in Chapter 6 – Implementation of the BPTP.

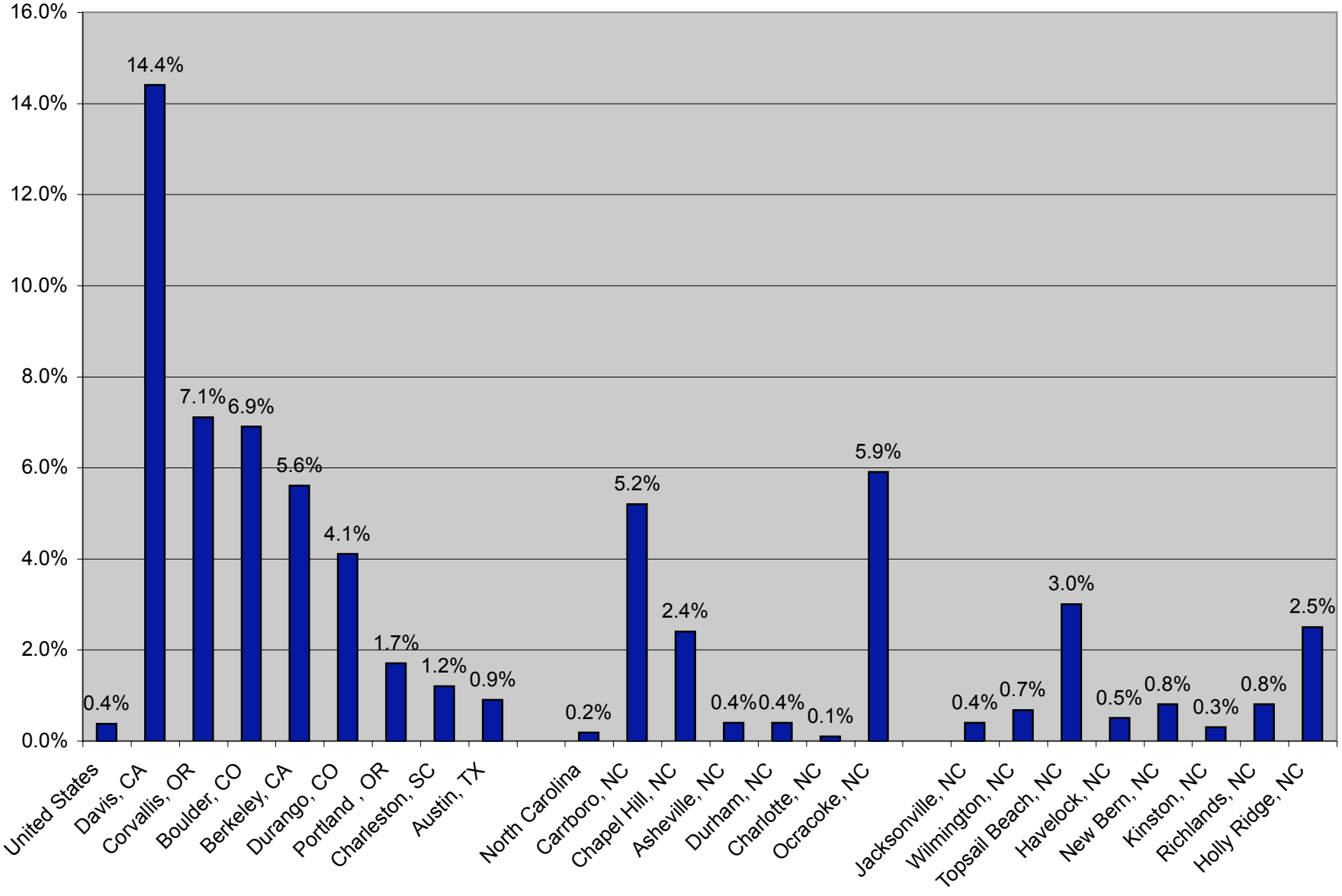
The following corridors and areas were chosen because of their importance in the overall network. They are key thoroughfares that connect multiple destinations and land uses. They also represent segments in need of significant improvements for bicycle safety and connectivity. For more detailed corridor recommendations, refer to Appendix B of the BPTP.

Key Roadway Corridors for Bicycle Improvements

Corridor	Improvement
US Hwy 17 Business (Marine Blvd.)	Bicycle lanes* and Rail to Trail along portions
US Hwy 17 Non-controlled access portion	Paved shoulders*
US Hwy 258	Bicycle lanes and paved shoulders
NC 24	Bicycle lanes* and paved shoulders* with Rail to Trail along portions
NC 53	Bicycle lanes and paved shoulders
Gum Branch Road	Bicycle lanes and paved side path
Bell Fork Road	Bicycle lanes
Henderson Drive	Bicycle lanes
Onslow Drive	Bicycle lanes
Western Boulevard	Multi-use path north of Marine Boulevard; bicycle lanes south of Marine Boulevard
Hargett Street	Bicycle lanes
Country Club Road	Bicycle lanes
Piney Green Road	Bicycle lanes and Multi-Use path

* = with extensive reduction of curb cuts and narrowing of motor vehicle travel lane width

Map BEM-3


16.0%
14.0%
12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
0.4%
14.4%
7.1%
6.9%
5.6%
4.1%
1.7%
1.2%
0.9%
0.2%
5.2%
2.4%
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5.9%
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0.7%
3.0%
0.5%
0.8%
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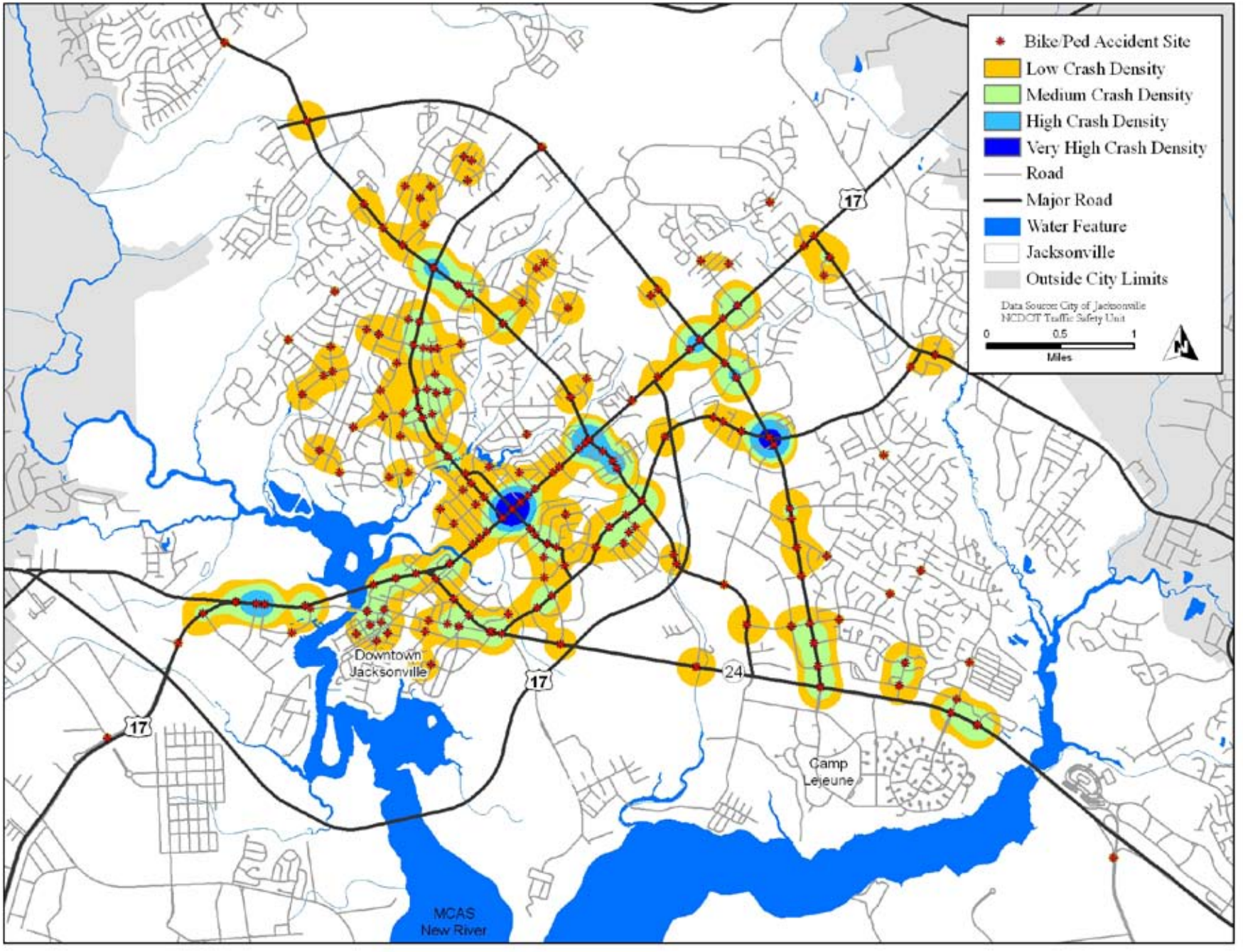
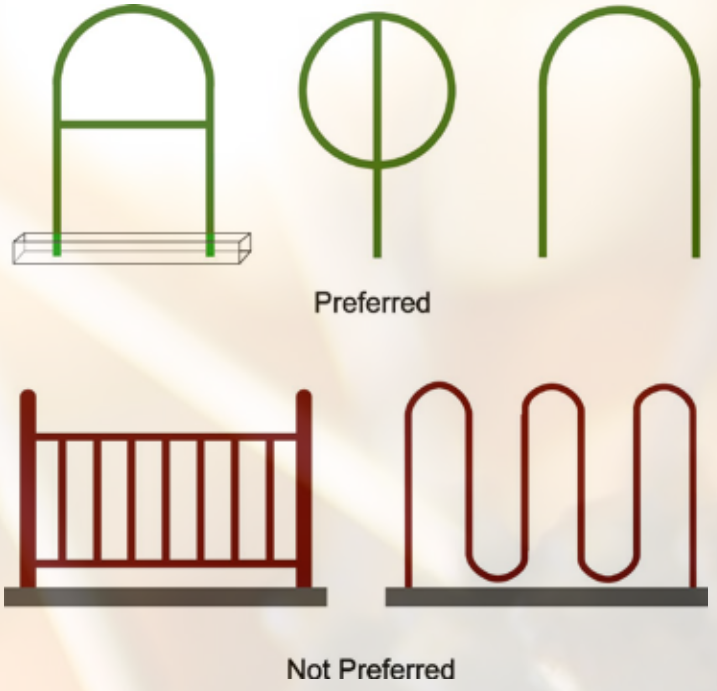
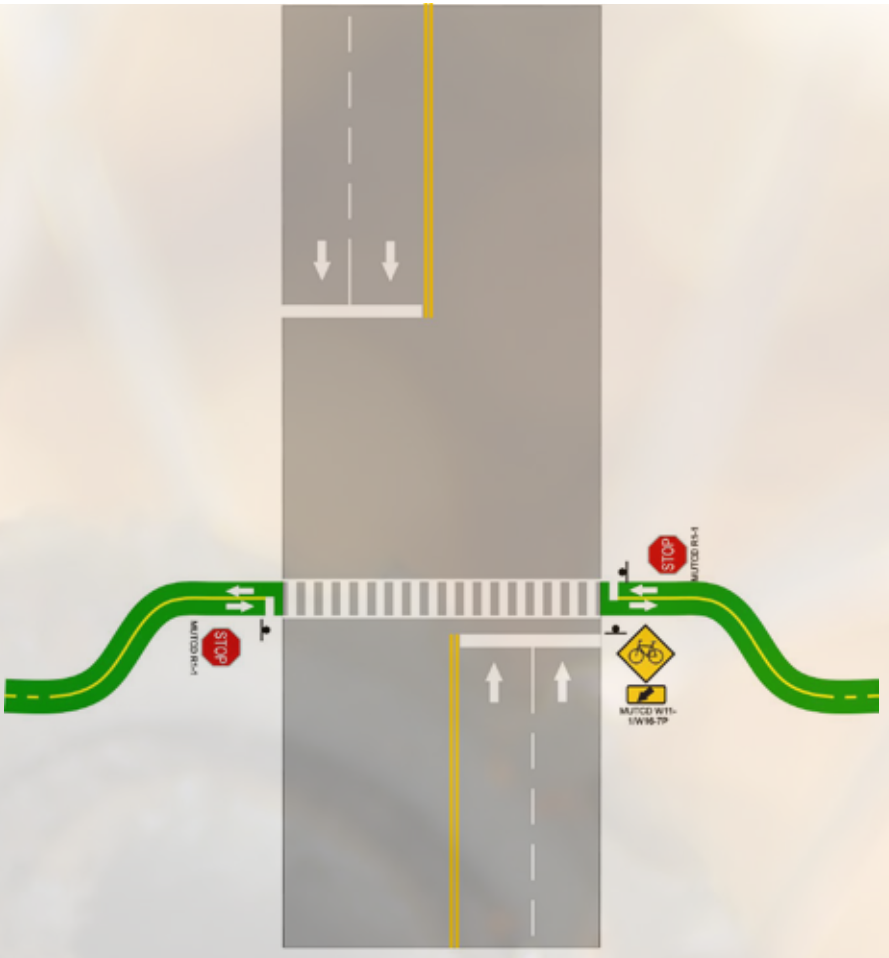
0.8%
2.5%
United States
Davis, CA
Corvallis, OR
Boulder, CO
Berkeley, CA
Durango, CO
Portland , OR
Charleston, SC
Austin, TX
North Carolina
Carrboro, NC
Chapel Hill, NC
Asheville, NC
Durham, NC
Charlotte, NC
Ocracoke, NC
Jacksonville, NC
Wilmington, NC
Topsail Beach, NC
Havelock, NC
New Bern, NC
Kinston, NC
Richlands, NC
Holly Ridge, NC


Bike/Ped Accident Site
Low Crash Density
Medium Crash Density
High Crash Density
Very High Crash Density
Road
Major Road
Water Feature
Jacksonville
Outside City Limits
Data Source: City of Jacksonville
NCDOT Traffic Safety Unit
0
0.5
1
Miles
N
17
24
Downtown Jacksonville
Camp Lejeune
MCAS New River





Bicycle Sidepath Crossing Street*

Sources: (1) AASHTO Guide for the Development of Bicycle Facilities (Figure 22) and (2) MUTCD 2003 Ed. (Figure 9B-7)

Sample Standards:

1. Bicycle Rack Options (top-left)
2. Sidepath Crossing of Unsignalized Intersection (top-right)
3. Sample Pedestrian Crossing Signs (bottom-left)

Pedestrian Element

Section Overview

- Overview
- Methodology
- The Pedestrian Network
- Pedestrian Crossings
- Develop Project Goals
- Greenway Corridors
- Ancillary Treatments
- Sidewalk Corridors
- Intersections
- Greenway Corridors
- Regional Connectivity

Overview

The proposed pedestrian network for the Jacksonville Urban Area is a series of pedestrian improvements that creates a more connected, comprehensive system. It has been developed from project visioning, field analysis, GIS mapping, and public input. This chapter presents the methodology, recommended pedestrian network facilities, and overall pedestrian network map. It also provides detailed recommendations for important network corridors and intersection improvements. A more detailed discussion and analysis of the pedestrian network is included in the *Comprehensive Bicycle & Pedestrian Transportation Plan (BPTP).*

The guiding philosophy in devising this network is the hubs and spokes model. Pedestrian corridors should connect trip attractors such as parks, schools, Downtown, shopping centers, and other pedestrian corridors. The network then becomes a practical solution for pedestrian connectivity.

Methodology

A variety of sources were consulted during the development of the Pedestrian Network: existing data, previous plans and studies, the consultants' fieldwork, public input, and noted pedestrian trip attractors. Detailed fieldwork included an examination of intersection conditions, greenway feasibility, areas of higher pedestrian activity such as the Downtown, Marine Blvd., and Western Blvd., and a consideration of gap connectivity. Map discussion and analysis was conducted at Steering Committee meetings and public meetings to pinpoint areas that need pedestrian improvements.

A GIS map of sidewalks and trails was developed by the Jacksonville MPO and utilized in this study. By overlaying the sidewalk layer on the roadway network, sidewalk gaps were easy to identify.

Specific consideration was given to the following:

- Locations of existing facilities
- Observed gaps in existing facilities or deficiencies in facilities

- Presence of worn path in the roadway shoulder or other observation of significant pedestrian activity
- Locations of the existing arterial and collector roads
- Locations of existing and future trip attractors, including schools, parks, shopping areas, downtown historic district, high density residential areas, etc.
- Locations of major street intersections and crossings
- Locations of safety concern (high pedestrian and auto traffic and inadequate facilities)
- Connectivity of regional pedestrian and greenway networks
- Opportunities for greenway development including open space, available land, easements, and new developments
- Public comments collected from area residents via an online survey and during public workshops.
- Recommendations from representatives of the Steering Committee
- Field observations made by the consultant
- Projects and recommendations from previous planning efforts

The Pedestrian Network

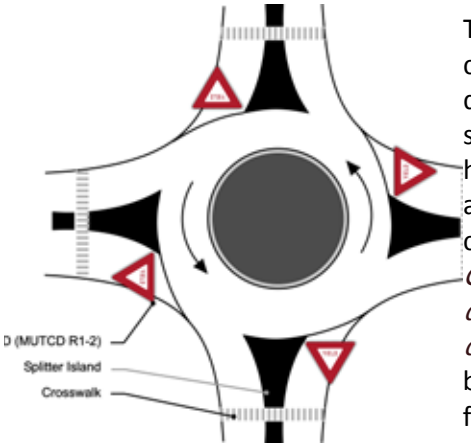
The Proposed Pedestrian Network for Jacksonville consists of sidewalk projects, crossing improvements, and off-road greenways. Together these proposed facilities should be developed or improved to create a safe and connected pedestrian network throughout the City. On-road and off-road components should be integrated to provide a connected pedestrian transportation and recreation network.

The network should be completed in phases as prioritized in *Chapter 6, Implementation of the BPTP.* However, network segments should be developed when there is opportunity (such as roadway reconstruction or resurfacing projects), regardless of the order. Because of ordinances in place, sidewalks should be constructed by the developer when commercial, industrial, mixed-use, institutional, government or residential development takes place along the pedestrian network.

Successful development of the pedestrian network will require a long-term, cooperative effort between the City, Onslow County, the North Carolina Department of Transportation, and other local and state agencies. Regional connectivity should also be considered during future development of the sidewalk and greenway network.

All pedestrian projects undertaken by the City of Jacksonville and developers should aim to meet the highest standards possible when topography and right-of-way allows. At a minimum, each pedestrian corridor should possess curb cuts with ramps at all driveways and intersections and be

paved to increase accessibility and decrease maintenance costs. Within each pedestrian facility development project, roadway intersections should have marked crosswalks, and major intersections should have pedestrian crossing signals. Wider sidewalks, with curb cuts and improved surface conditions will correct sidewalks that currently do not satisfy the standards set forth by the American Disability Act of 1991.



Traffic calming measures, such as curb extensions, traffic circles, medians, and pedestrian refuge islands should be used to create a more hospitable environment for pedestrians in neighborhoods and commercial districts. *See Chapter 7, Design Guidelines of the BPTP for specific descriptions on recommended facilities.* Finally, opportunities should be taken to incorporate pedestrian facilities into all municipal and state roadway improvement and widening projects.

Table PET-1. Some basic pedestrian crash reduction factors from a 2007 FHWA study (see Appendix F for more information).

Three main types of pedestrian projects have been identified for the City of Jacksonville and are outlined below. They include sidewalks, crossing improvements, and off-road greenway corridors. Ancillary improvements to create a more hospitable pedestrian environment are also detailed. Design guidelines in Chapter 7 of the BPTP provide detailed information regarding proper placement and facility treatments. Table 4-1 shows crash reduction factor per each pedestrian treatment.

Table PET-1

Pedestrian Crash Reduction Factors	
Countermeasure	Crash Reduction Factor
Install sidewalk	74%
Install pedestrian countdown signal heads	25%
Install pedestrian refuge islands	56%
Improve/install pedestrian crossings	25%

The complete recommended network of sidewalks, intersection improvements, and off road greenways can be found on *Map PEM-1 on page 25.*

Sidewalk Projects

Sidewalk projects are the major component of the proposed pedestrian network in Jacksonville. Sidewalks are located along road segments. In the long term, sidewalks should be constructed on both sides of arterial and collector roads wherever possible to provide adequate pedestrian connections throughout the City of Jacksonville. The sidewalk network is focused on significant roadways that provide service to major destinations within Jacksonville and link multiple land uses, such as residential, recreational, institutional, and commercial. The pro-posed pedestrian facilities along significant roadways craft the spine of the entire pedestrian network. Some sections along these significant roadways have existing sidewalk. However, the existing sidewalk is segmented, creating gaps in the connectivity or lacking sidewalk on one side of the street. Sidewalk projects are prioritized in Appendix B of the BPTP.

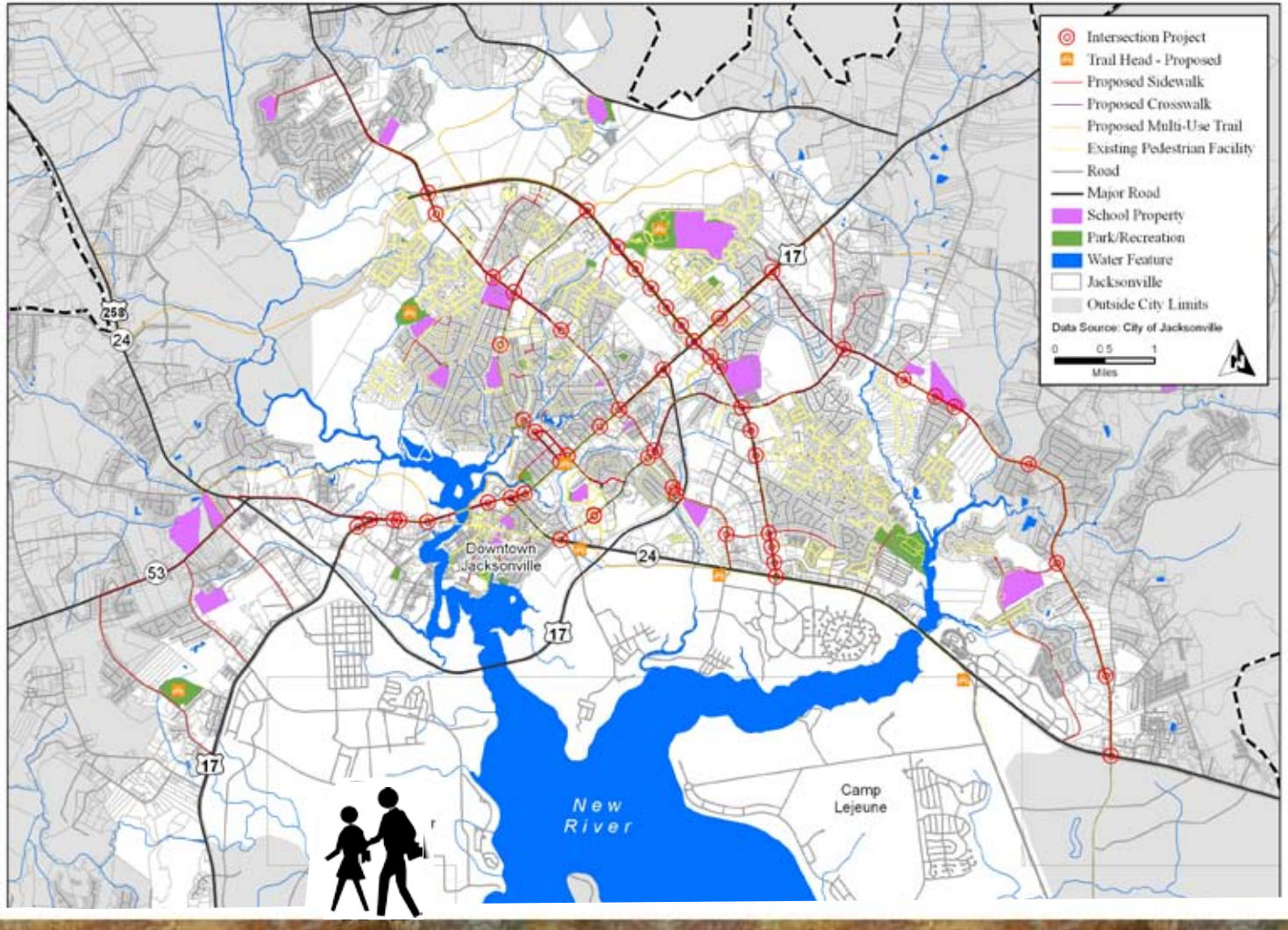
Crossings

Improving the safety of roadway crossings is essential for making Jacksonville more walkable. Intersections present situations where a pedestrian must traverse the motor vehicle environment. Pedestrians have a much greater risk

of being struck by a vehicle when crossing a roadway as opposed to walking on the shoulder or sidewalk beside it. Nationally, nearly 75% of all police-reported pedestrian crashes involve pedestrians crossing roadway travel lanes.[1]

Adequate facilities should be specific to the intersection, to provide a safe crossing environment. A combination of treatments is often necessary, especially across major roadways such as Marine Blvd. and Western Blvd. This plan recommends a number of solutions such as marked crosswalks, median islands, pedestrian countdown signals, curb radius reduction, etc. It should be noted that this is a planning level analysis. Each of these locations will need a more detailed project-level review. The conclusions reached through more detailed review may vary from those presented herein.

Map PEM-1



The pedestrian crossing recommendations were based on pedestrian safety, public input, and field observations. Major roadways were given significant consideration. Dozens of crossings, mostly at intersections, were analyzed. Most existing intersections are in need of minor to significant pedestrian facility improvements. Recommendations for each specific intersection are discussed in below.

Greenway Corridors

Greenway corridors, for the purposes of this study, are off-road, multi-use facilities that provide an excellent source for alternative transportation and recreation. Greenway corridors can also serve an environmental purpose, to protect forests and enhance water quality. Greenway corridors can be constructed of natural materials, gravel, crushed stone, asphalt, or concrete, depending upon the projected usage and surrounding landscape. These corridors typically take advantage of linear stream corridors, easements, and other tracts of open space. Greenway trails in Jacksonville should be integrated with and serve as an off-road extension of

the on-road pedestrian network. Numerous greenway opportunities were identified throughout Jacksonville, via consultant fieldwork, public input, and other local and regional planning efforts. Proposed greenway corridors are illustrated on *Map PEM-2.*

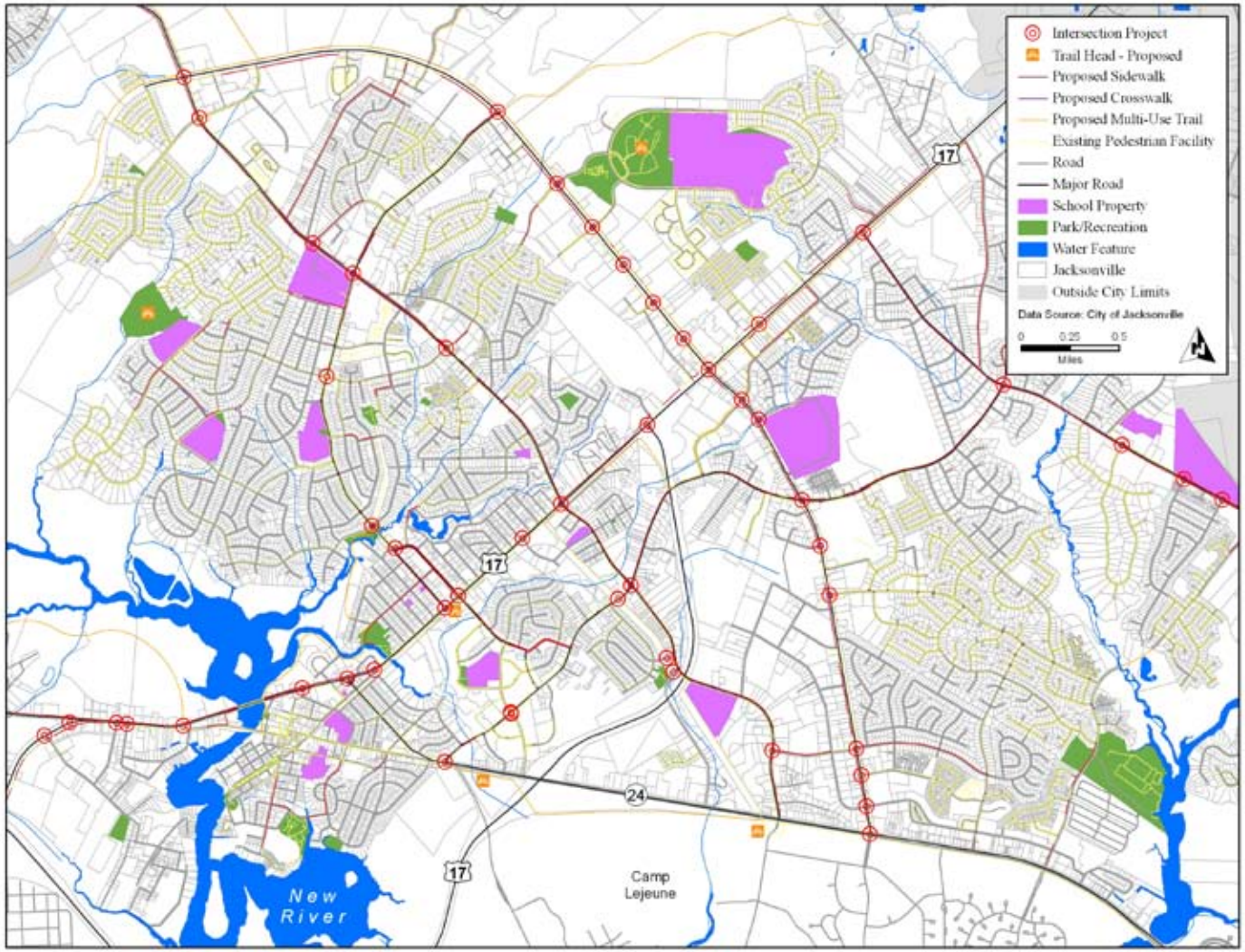
Ancillary Treatments

In addition to the above facilities, a number of other important pedestrian treatments can improve safety throughout the pedestrian network. A full listing and description of these facilities and treatments can be found in Chapter 7 - Design Guidelines of the Comprehensive Bicycle & Pedestrian Transportation Plan. *A summary of the major treatments recommended in Section 4.3 of the BPTP are described below.*

Median Refuge Island: This refers to an island in the roadway median, that offers a stopping or halfway point for a pedestrian.

Driveway Access Management: This refers to minimizing the size and amount of access points for motor vehicles crossing sidewalks to adjacent property.

Traffic Calming: This refers to a range of measures that reduce the impact of



Map PEM-2

vehicular traffic on residents, pedestrians and cyclists - most commonly on residential streets, but also now on commercial streets.

Sidewalk Corridors

This section describes sidewalk facility recommendations. The locations of recommended new sidewalks are shown on the network map *(MAP PEM-1).* Recommended sidewalks and crossing improvements have been created inside the existing sidewalk database, with attributes describing the recommendation. Constraints that would render sidewalk either impossible or cost-ineffective have also been considered, to the extent that this information is known. But the sidewalk network is vastly developed based on need.

The sidewalk network is intended to provide a flexible guide for the community that can be responsive to changing conditions and community priorities. It is important to note that these recommendations are based on current knowledge, conditions, and projects, and are intended to be updated on an ongoing basis. As the area continues to change and grow, with modification of transportation corridors and development, new priorities may arise.

This plan recommends 50 miles of new sidewalks in areas of existing development and along major travel corridors. These are mostly located where there are currently gaps in the existing sidewalk system. Improvements should not be limited to only these locations. In cases of new development or other opportunities sidewalks should be installed. *These are prioritized in Appendix B with the Top 10 projects listed in Chapter 6-Implementation of the BPTP.*

The following corridors and areas were chosen because of their importance in the overall network. They are key thoroughfares that connect multiple destinations and land uses. They also represent segments in need of significant improvements for pedestrian safety and connectivity.

Key Roadway Corridors for Sidewalk Improvements

- US 17/Marine Boulevard
- Western Boulevard
- Gum Branch Road
- Bell Fork Road
- Country Club Road
- Hargett Street
- Piney Green Road
- NC 24/Lejeune Road
- Onslow Drive
- Henderson Drive

Intersections

This section describes pedestrian crossing recommendations. This plan recommends 50 specific locations for pedestrian crossing improvements. The locations of recommended crossing improvements are shown on the network map *(MAP PEM-1 and PEM-2).* Section 4.8 Intersection Tables of the BPTP contains the specific pedestrian crossing inventory recommendations. These are some of the most critical locations in terms of pedestrian safety. The majority of locations recommended for improvement are on multi-lane roadways with high-volume, high-speed traffic and also corridors which connect multiple uses and larger populations.

At a minimum, marked crosswalks are also recommended along arterial and collector roads when intersected by a roadway or significant driveway entrance. These specific locations are provided in the recommendation database. Further study and analysis for providing safe pedestrian crossings along and even across these roadways is warranted.

Key Roadway Corridors for Crossing Improvements

- US 17/Marine Boulevard
- Western Boulevard
- Gum Branch Road
- Bell Fork Road
- Country Club Road
- Hargett Street
- Piney Green Road
- NC 24/Lejeune Road
- Onslow Drive
- Henderson Drive

4.5 Greenway Corridors

Prior to this planning effort, five greenway corridors were recommended for the Jacksonville area through the MPO TIP program. These include the Lejeune Blvd Greenway (south side of roadway), Western Blvd Greenway (east side of roadway), Marine Blvd. Greenway (south side of roadway), North Gum Branch/Henderson Greenway, and the Hargett Street Greenway. These would be in addition to the existing Rails to Trails Greenway and trails provided in the Commons area.

This Plan supports those recommendations and builds upon them. It should be noted that the majority of these greenways actually serve as sidepaths or wide sidewalks (10') because they follow along the right-of-way of existing roadways.

Key greenway/sidepath corridors are listed below with a brief description. *See Maps PEM-1 and PEM-2* to view the greenway recommendations.

Rails-to-Trails/Marine Blvd. Greenway Extension - This greenway/sidepath would extend northward along Marine Blvd to the US 17 Bypass. Utilizing the right-of-way of the Bypass, the greenway will follow along the west side of the US 17 Bypass to Country Club. The greenway will thus avoid the Western/Marine intersection which is being upgraded to a SPUI interchange. The greenway would expand upon existing sidewalk and a bicycle laneand follow Country Club eastward to Commerce Rd. Existing sidewalk along Commerce Rd. would be expanded upon to create a 10-foot wide trail. The greenway would follow Commerce Rd. through the Western Blvd. intersection, to Parkwood. At Parkwood, the greenway will turn north to return to Marine Blvd. The greenway would then follow Marine Blvd. in existing right-of-way to Piney Green Rd.

Western Blvd Greenway - Utilizing existing sidewalk and grass buffer, the Western Blvd. Greenway/Sidepath would be extended northward all the way to Gum Branch Rd. Adequate crosswalk markings and signals should be provided across the numerous roadway and driveway crossings.

The Harry Wiggins Trolley Track Trail was formerly the site of the last trolley line in Kansas City, and is now the site of a six-mile-long trail

Gum Branch Greenway - Because of available right-of-way and space, a greenway/sidepath/ should be provided along the eastern side of Gum Branch from the Summersill School area southward to Henderson Dr. and Jacksonville High School.

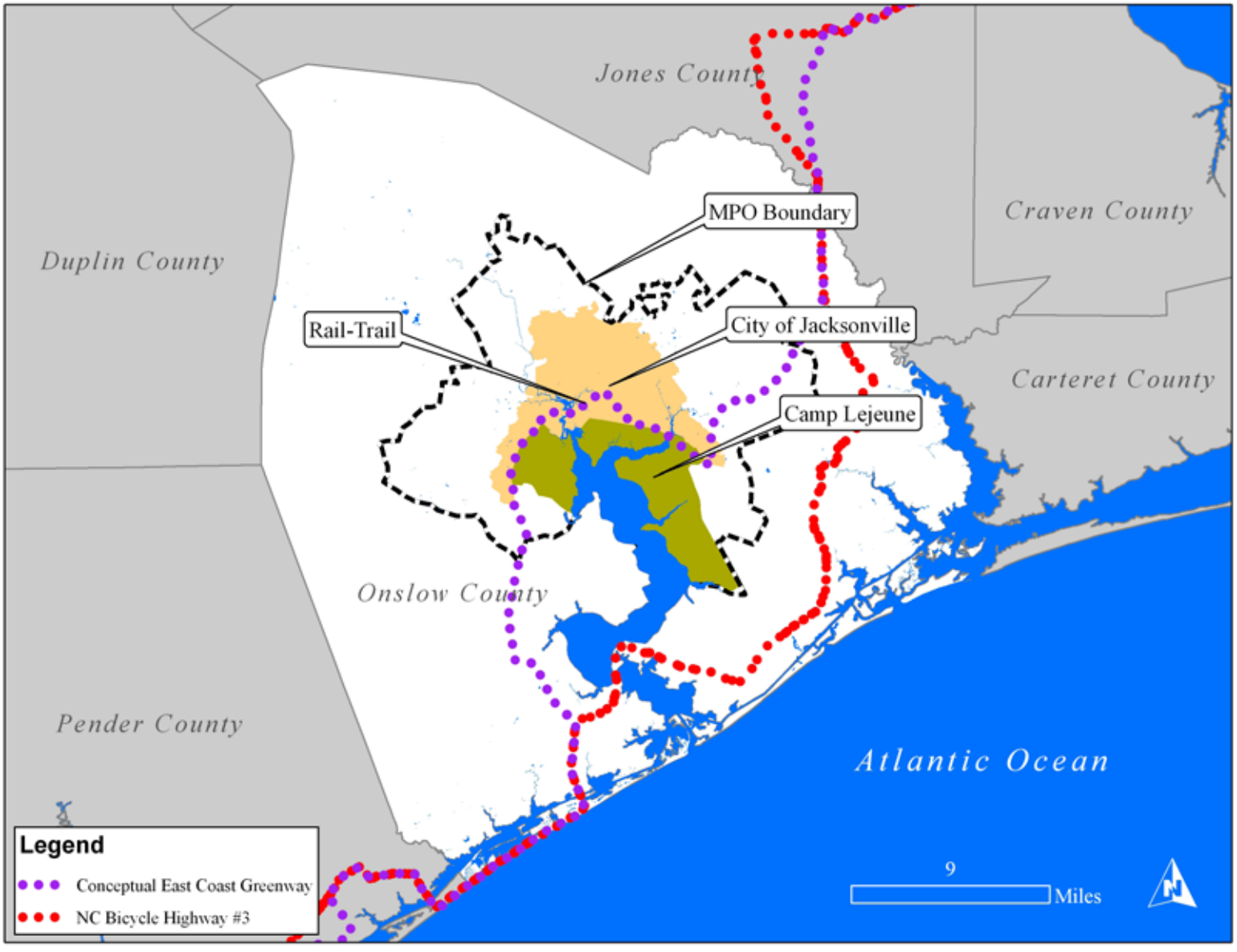
Regional Connectivity

Jacksonville's proximity to the Atlantic Coast and the Wilmington area enable the Town to not only develop a local bicycle and pedestrian network, but to link up with neighboring communities and become a component of a regional bicycle and pedestrian network. As development continues in outlying portions of Jacksonville, the City should work together with neighboring communities to fill in gaps and link their respective bicycle and pedestrian networks. According to 2000 US Census data, Holly Ridge and Topsail Beach rank in the North Carolina Top 10 in bicycle commuting percentages. Connectivity to beach areas through rural roadways would encourage recreational bicycling.

The most important and significant regional effort is the East Coast Greenway which runs from Maine to Florida. While in its conceptual phase, the

East Coast Greenway could run through or near the Jacksonville area (refer to Map PEM-3 on the facing page), taking advantage of the existing Rail Trail corridor. It is important that the City of Jacksonville take advantage of this economic and recreational opportunity by providing passage of the East Coast Greenway through the City along one of its greenway routes or at least providing a connection to the long distance greenway.

North Carolina state bicycling route #3 (Ports of Call) runs north-south just east of Jacksonville. Providing connections along more rural roadways to this bicycling route will provide recreational cyclist a means to connect to the route.


Jones County
Craven County
Duplin County
MPO Boundary
Rail-Trail
City of Jacksonville
Carteret County
Camp Lejeune
Onslow County
Pender County
Atlantic Ocean
Legend
Conceptual East Coast Greenway
NC Bicycle Highway #3
9
Miles

Map PEM-3

Environmental Element

Section Overview

- Introduction
- Natural and Built Environment
- The Pedestrian Network
- Environmental Justice
- Planning Guidelines

Introduction

The screening of potential environmental and community impacts at the system planning level is intended to identify potentially negative impacts at the earliest possible stage. This may help minimize or even avoid these impacts through revisions to the preliminary plans. If this is not feasible it may be preferable to eliminate the proposed project. Because individual projects can significantly affect other projects, these issues must be resolved as early as possible to avoid wasting valuable time and resources. The result is a transportation plan that not only minimizes negative impacts on the natural and manufactured environments, but also is timely and cost-effective in its implementation.

The overwhelming majority of environmental impacts are associated with roadway projects in the transportation plan. This is understandable given the extensive disruption caused by the construction of so much permanent roadway infrastructure. Sidewalks and bicycle facilities are much more limited in the magnitude of their impacts due to smaller cross sections and greater flexibility in being able to avoid problem areas. Furthermore, pedestrian and bicycle facilities are most often built in conjunction with roadway facilities and create only marginal additional impacts beyond those of the roadway itself.

The vast majority of transit projects in the Jacksonville Urban Area 2035 Transportation Plan are associated with bus route and service expansions, which typically involve no new construction and have minimal negative impacts on either the natural or built environments. In general, transit impacts tend to be positive in that increased service can reduce vehicle miles traveled (VMT) and improve accessibility in disadvantaged neighborhoods.

The following discussion of the plan's environmental screening process is divided into two parts. The first focuses on overall impacts on the natural and cultural environment. The second section addresses specific issues related to environmental justice.

Natural and Built Environment

The Jacksonville area continues to urbanize and impacts to the environment are inevitable. As new infrastructure develops it will be important to manage and minimize impacts resulting from transportation improvements. Some natural features should be maintained not only to satisfy residents' desire for a high quality of life and meet State and federal environmental policies and regulations. The map shows wetlands, flood zones, bodies of water, historic sites, parks, schools, game lands, and hazardous waste sites.

The study area includes a large number of wetlands and flood zones, including the New River on the south side of Jacksonville. Three military bases are located on the south side of the study area: Camp Johnson, Camp Geiger, and Camp Lejeune. The primary residential areas within the study area are located within central and north Jacksonville.

Environmental Justice

Environmental justice describes practices intended to avoid the use of federal funds for projects that generate disproportionate or discriminatory adverse impacts on minority or low-income populations. This effort is consistent with Title IV 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 Jacksonville Urban Area 2035 Transportation Plan was based on three basic principles, derived from guidance issued by the USDOT:

- The planning process should avoid, minimize, or mitigate environmental impacts (including economic, social, and human health impacts) that affect minority and low-income populations with disproportionate severity
- Transportation benefits 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 transportation plan, the Jacksonville MPO identified the geographic distribution of low-income and minority populations, so that the positive and negative effects of various transportation investments in the transportation plan could be assessed. This information is based on the 2000 Census. Participants of the census have unlimited choices for race, and the Bureau defines minorities as any race that is not White, including African-American, Asian, Native American, or people who consider themselves to be two or more races.

Developing the Jacksonville Urban Area 2035 Transportation Plan involved developing and carrying out a pub-

lic involvement process that not only reduced obstacles to participation by minority and low-income communities, but also actively sought out meaningful input. As part of this process, stakeholder interviews were conducted with the Georgetown Renaissance Association to glean their insight on the transportation issues concerning the minority community.

Through careful planning and ongoing consideration of the built and natural environment, community impacts as a result of transportation proj cts in this plan can be avoided or minimized. Rather than an ad hoc approach to environmental justice planning, the Jacksonville Urban Area 2035 Transportation Plan identified sensitive communities early in the process. This early identification allowed for an assessment of the existing Thoroughfare Plan and influenced the selection and alignment of future transportation improvements. An example of this proactive planning process occurred after assessing the previous Thoroughfare Plan. Several projects, including the extension of Country Club Road from Duff Court to Thomas Humphrey Road, were eliminated because of potential adverse impacts. Environmental justice screening conducted for this study is intended to provide guidance during plan development to make sure it is equitable in terms of both costs and benefits. This screening identifies projects in the transportation plans that, due to proximity, have the potential to affect communities of special interest. When individual studies are begun as part of project implementation more detailed analyses that include field surveys, will be needed to identify and minimize specific community impacts on a project-by-project basis.

Planning Guidelines

During the transportation plan development, the project team used the data available to avoid and minimize impacts to known environmental features. The collection and consideration of this data early in the planning process is intended to lessen environmental impacts and reduce potential conflicts during the permitting process. In addition, when considering new roadway alignments and extensions, planners used a guiding set of principles to make sure that the following environmental considerations were adhered to:

- Avoid steep slopes and otherwise unsuitable topography
- Minimize impacts to the built environment
- Avoid FEMA designated floodplains
- Minimize wetland impacts
- Minimize the length and number of stream crossings
- Minimize impacts to school sites
- Minimize the number and size of impacts to historic features and districts
- Minimize the number and size of impacts to threatened and endangered species
- Minimize the number and size of impacts to hazardous waste sites
- Minimize the number and size of impacts to superfund sites
- Minimize/avoid impacts to neighborhoods
- Avoid unnecessary or disproportionate impacts to minority communities
- Do not impact parks and designated open spaces
- Minimize gameland impacts
- Minimize the number of new facilities in critical watershed areas
- Be aware of existing development patterns
- Look for existing stub streets and improve connectivity of the existing transportation network

Transit Element

Element Overview

- Introduction
- Proposed New Routes for Jacksonville Transit
- Cost Estimates for Proposed Routes
- Demographic Performance Measures
- Coordination with OUTS
- Alternative Service Devivery Options
- Local Considerations for OUTS
- Cost Comparisons
- PArk and Ride Opportunities
- Using Technology
- Funding Future Tansit Services

Introduction

Public transportation is a critical, but often overlooked, component to providing social and urban services to a community. As the Jacksonville region has evolved with the Growth of Camp Lejeune, its citizens have sought greater mobility options to provide them with options other than driving for their daily commute, to medical appointments, and for shopping. Jacksonville also has a sizable population that is almost completely dependent upon local public transportation services for them to conduct their daily lives.

The challenges in developing a new transit system, as Jacksonville begun in 2001 with The Loop service and in 2007 with the establishment of the region's first fixed route system, is to serve diverse communities that include choice and non-choice riders, commuters, the mobility-impaired, military personnel and visitors. Each rider has a different need and fitting a fixed route bus services to those needs is the goal of the Jacksonville Transit Plan.

Currently, the combination of Jacksonville Transit's bus routes and Onslow United Transit System's (OUTS) demand response service constitutes a county-wide public transportation system that is structured primarily for the provision of human services transportation, not for diverse ridership interests.

The City of Jacksonville bus system was re-organized in 2007 from a single-route city loop to a two-route urban bus operation with three weekend express routes to and from area military operations. The City services provide for some commuter services, however, the current route structure is not organized to service key commuter origins and destinations.

Community transportation providers such as OUTS are typically geared toward human services due to their role in providing point-to-point transportation for all residents who are in need of this service. Their funding is derived from a combination of state and federal transportation programs, social service agencies providing for the cost of the fully allocated cost, and fare-paying individuals.

Proposed New Routes for Jacksonville Transit

The information contained in this section outlines the proposed bus routes to be considered by Jacksonville Transit as the City's population and ridership continue to increase. The routes have been developed through a combination of a feedback from the general public, analysis of demographic data for the City of Jacksonville and Onslow County, and the results of the February 2009 workshop for the Coordination Human Service Transportation Plan.

The routes proposed are intended to indicate general corridors and services areas. Where possible the proposed routes have been designed to loop at their terminus in order to provide for more efficient operations. Two of the routes (US Highway 258 & Piney Green Corridor) provide opportunities for Onslow United Transit System (OUTS) and Jacksonville Transit to continue their history of coordination by operating either linked services or consolidated express routes through the Job Access / Reverse Commute (JARC) program or other funding mechanism.

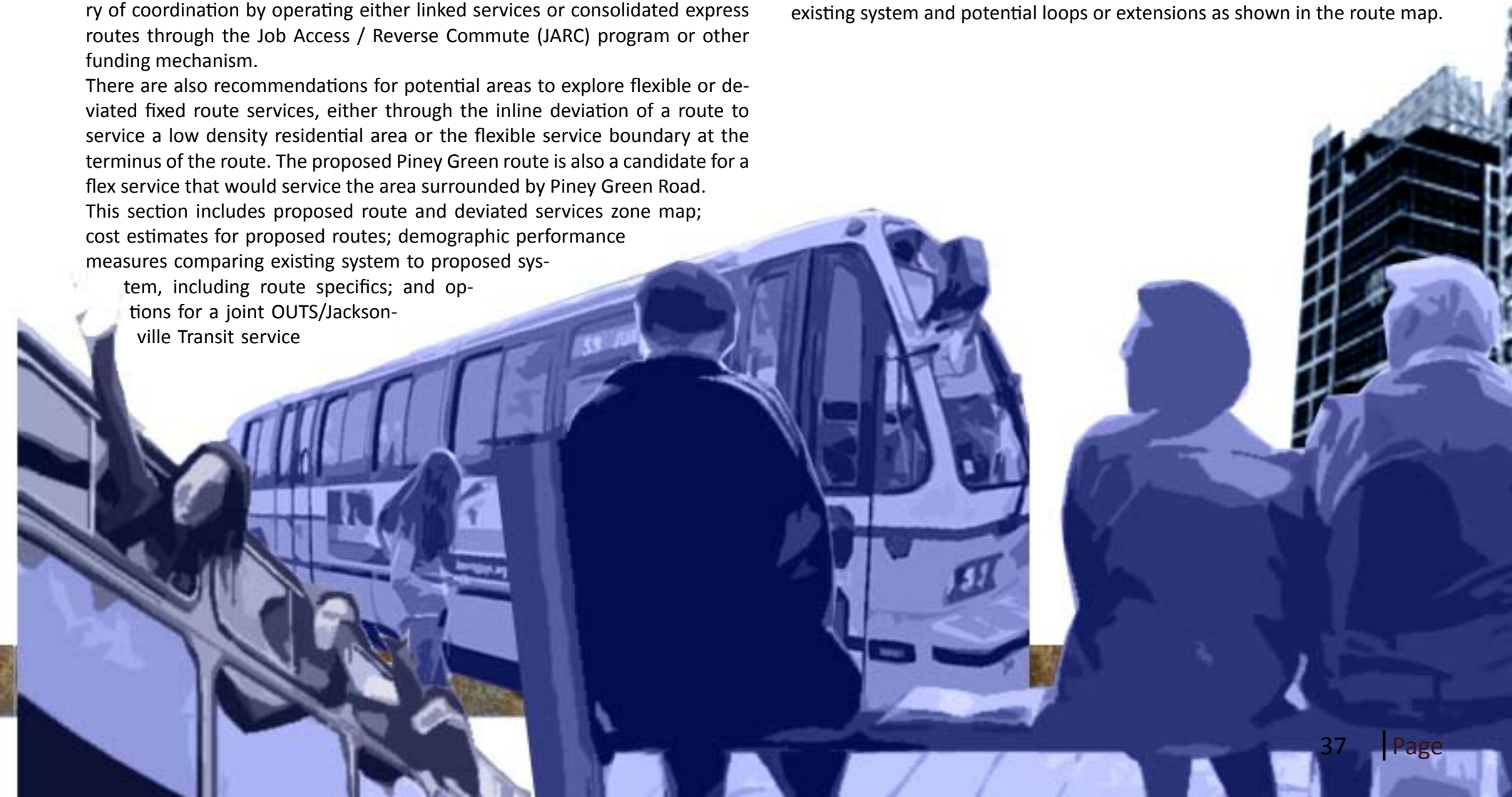
There are also recommendations for potential areas to explore flexible or deviated fixed route services, either through the inline deviation of a route to service a low density residential area or the flexible service boundary at the terminus of the route. The proposed Piney Green route is also a candidate for a flex service that would service the area surrounded by Piney Green Road.

This section includes proposed route and deviated services zone map; cost estimates for proposed routes; demographic performance measures comparing existing system to proposed system, including route specifics; and options for a joint OUTS/Jacksonville Transit service along Richlands Highway (US 258).

Note these are planning level route and cost estimates and are subject to change over time as the system evolves, new technologies are incorporated in route planning and administration, and changes occur in costs due to fuel, labor increases and other factors.

Cost estimates for proposed routes

These cost estimates were developed based on operational cost information supplied through JUMPO for Jacksonville Transit and represent a range of potential costs to account for variations in route characteristics that could result from specific run-cutting measures to incorporate these routes into the existing system and potential loops or extensions as shown in the route map.



These estimates also used the following assumptions:

- 12 runs per route per weekday service to align with one-hour headways and 12 hour service day of existing routes;
- 8 runs per route per weekend service day to align with 1-hour headways and 12 hours service day of existing routes;
- 255 operating weekdays per year;
- 52 operating Saturdays per year;
- 58 operating Sundays/Holidays per year; an
- Cost per revenue hour of $60/hour for low estimate and $70/hour for high estimate.

Jacksonville TRANSIT

Table TE-1

Proposed Route	Distance (roundtrip miles)	Run Time (roundtrip min.)	Revenue Hours per Weekday	Revenue Hours per Weekend day	Total Revenue Hours Per Year	Total Annual Oper. Cost (Low Est.)	Total Annual Oper. Cost (High Est.)
Mall to Camp Lejeune Hospital and CBD	23.0	90	18	12.0	4,590	$ 280,000	$ 320,000
Downtown to Wal-Mart, Sr. Center / County Complex	18.2	80	16	10.7	4,080	$ 240,000	$ 290,000
Mall to Piney Green Corridor	14.7	75	15	10.0	3,825	$ 230,000	$ 270,000
Downtown / Gum Branch	13.0	75	15	10.0	4,925	$ 300,000	$ 340,000
Downtown to Mall	13.7	80	16	10.7	5,253	$ 320,000	$ 370,000

Demographic Performance Measures for the Existing and Proposed Jacksonville Transit System

Using 2000 Census data and 2007 population estimates for the City of Jacksonville and Onslow County, the consultant utilized GIS to evaluate the performance of the existing and proposed Jacksonville Transit System as it relates to various populations within the region (Figure 3). The measure of ¼-mile from the route was used as this is generally an acceptable walking distance to a fixed route transit service (note: ¾-mile is the threshold to provide complementary paratransit service; disabled persons within ¼-mile does not necessarily represent those that would be able to access the system).

The populations evaluated included those also assessed for purposes of developing the Coordinated Human Service Transportation Plan, which includes:

- Persons 60 years of age or older;
- Persons with a disability;
- Persons below the poverty level; and
- Persons that have no access to a vehicle.

The existing Jacksonville Transit system provides service within ¼-mile of approximately 52% of the City's population. The addition of the proposed routes would increase the service area population to 67% of the City's residents. For Onslow County, the service proportion would increase from 16% of the total population to 26% of the total population. Below are other notable characteristics of the proposed services.

- The proposed Downtown/Gum Branch has the highest proportion of populations served among the proposed routes;
- The Downtown to Jacksonville Mill routes provides proximate service to the most OUTS origins/destinations (29%);
- 63% of OUTS origins/destinations are within ¼-mile, compared to 46% for existing routes;
- 75% of the City's population with no access to a vehicle within ¼-mile, compared to 55% for existing routes; and
- 32% of the County's population with no access to a vehicle within ¼-mile, compared to 22% for existing routes.

This data is intended to be used for planning purposes as they do not represent the exact address of the populations included in Table 14. The methodologies employed in this assessment represent the best planning judgment of the GIS technicians and planners, who utilized 2000 Census block group data then assigned an equal distribution of the populations within those block groups.

Table TE-2: Performance Measures of Proposed and Existing Jacksonville Transit Routes

Coordination with OUTS on Downtown to Senior Center / County Complex Service

The potential exists for OUTS and Jacksonville Transit to coordinate services on select corridors within the region that include destinations along a common corridor within the city limits and in the unincorporated areas. One such potential route serves the western sections of the City and areas of the County along Richlands Highway (US Highway 258).

Currently, this area is served only by OUTS demand response services, however, there is increasing demand for fixed route services in this area due to growth in number of residences and the recent completion of the new shopping center on Yopp Road, which contains a Wal-Mart and Lowe's and is slated for more commercial uses. The existing Senior Center & County Complex along US Highway 258 near the intersection with the Northwest Corridor is one of the most popular origin and destination points for OUTS patrons. The complex is also planned to become more of an employment center for Onslow County employees that are being relocated from offices currently in downtown Jacksonville. The combination of these factors, along with the potential for acquiring Job Access & Reverse Commute Funding, have warranted a more detailed examination of service options within the US Highway 258 corridor. Additionally, there may be options for future routes in this

	Proposed Bus Routes						Existing Weekday Bus Routes			Total System (Existing Weekday + New Bus Routes) ****
	Mall to Camp Lejeune Hospital and Mainside	Downtown to Senior Center/ County Complex	Mall to Piney Green Corridor	Downtown/ Gum Branch	Downtown to Mall	System of New Bus Routes ****	Route B	Route A	System of Existing Weekday Bus Routes ****	
Route Length* (miles)	23.0	18.2	14.7	13.0	13.7	82.7	23.4	18.9	42.3	124.9
Jacksonville Demographics **	(portions within City of Jacksonville)									
Estimated 2007 population within 1/4 mile of route	12,448	3,473	6,051	9,997	8,539	32,666	14,405	12,750	26,683	44,119
Estimated 2007 population % within 1/4 mile of route	12%	4%	5%	26%	21%	**47%**	21%	32%	**52%**	**67%**
2000 population that is 60 years or older within 1/4 mile of route	10%	4%	4%	22%	18%	41%	16%	26%	42%	58%
2000 population that is disabled within 1/4 mile of route	12%	5%	3%	26%	17%	47%	18%	30%	48%	66%
2000 population that is below poverty level within 1/4 mile of route	17%	4%	3%	29%	22%	55%	25%	33%	57%	74%
2000 households that have no access to a vehicle within 1/4 mile of route	13%	7%	3%	33%	25%	59%	20%	35%	55%	75%

Table TE-2

	Proposed Bus Routes						Existing Weekday Bus Routes			Total System (Existing Weekday + New Bus Routes) ****
	Mall to Camp Lejeune Hospital and Mainside	Downtown to Senior Center/ County Complex	Mall to Piney Green Corridor	Downtown/ Gum Branch	Downtown to Mall	System of New Bus Routes ****	Route B	Route A	System of Existing Weekday Bus Routes ****	
Onslow County Demographics **										
Estimated 2007 population within 1/4 mile of route	7%	2%	4%	6%	5%	**20%**	9%	8%	**16%**	**26%**
2000 population that is 60 years or older within 1/4 mile of route	3%	2%	3%	7%	6%	15%	5%	8%	13%	20%
2000 population that is disabled within 1/4 mile of route	4%	2%	3%	7%	4%	16%	5%	8%	13%	21%
2000 population that is below poverty level within 1/4 mile of route	7%	2%	3%	9%	6%	22%	11%	10%	20%	29%
2000 households that have no access to a vehicle within 1/4 mile of route	5%	4%	3%	12%	9%	25%	9%	13%	22%	32%
Relationship to OUTS Services***										
OUTS origins and destinations within a 1/4 mile of route (6/20/05 - 3/20/09)	49,155	18,656	33,595	31,417	56,969	111,463	54,526	37,922	90,650	122,961
OUTS origins and destinations within a 1/4 mile of route as % of all OUTS origins and destinations (6/20/05 - 3/20/09)	25%	9%	17%	16%	29%	57%	28%	19%	46%	63%

area to serve the Jacksonville airport and the Town of Richlands.

Funding is and will likely continue to be an issue for such a route. Even though there is strong potential for JARC funding for such a service, the continued use of JARC as the funding source is tenuous due to the application cycle through NCDOT. The willingness of Onslow County to contribute to the continued operation of the route would also be a factor, as the county has pledged $7,500 to OUTS for services in FY 2009/2010.

Service Potential

As noted, locations within the US Highway 258 corridor are already popular destinations for existing OUTS riders and citizens of Onslow County and the City of Jacksonville. There are several service options that could be considered for this corridor and each option would be a showcase of the potential for more coordinated services between Jacksonville Transit and OUTS. These options have been outlined in Table 15.

Alternative Service Delivery Options

Traditional public transportation service has focused on higher density population centers concentrated along high travel corridors, served by fixed routes with fixed stops on a regular schedule. Though this model works well in many circumstances, most communities operating a traditional transit system are also servicing elderly and disabled citizens with a separate paratransit or "dial-a-ride" service, such as OUTS.

Some communities are exploring alternative means of integrating this binary model into a flexible transit service model. According to a 2004 report by the Transit Cooperative Research Program (TCRP) , more than 50 transit systems of all types and sizes operate flexible transit service models, such as deviated fixed route or zone route systems. This report is used as the basis for the OUTS Community Transportation Service Plan examination of the potential for flexible route, or deviated fixed route, services.

Often, a transit system will operate flexible service as a way to combine fixed route service with demand responsive service in order to increase efficiencies and service additional patrons. The TCRP report identified three common circumstances under which flexible transit service is used by many transit agencies:

- To provide service in limited areas considered hard to serve for reasons of demographics, street layout, or community preferences;
- To provide service in low-demand time periods. In cities with ample fixed-route service, flexible operation typically substitutes for fixed-route operation in limited areas. In some cities with more limited fixed-route service, flexible operation replaces the entire fixed-route network at certain times; or
- To provide the entire transit service for a small city, low-density suburban area, or rural area. In these cases, coordination or consolidation with paratransit service is a key feature of the flexible service.

Flexible transit service models include those that use flexible-route segments, route deviation, request stops, demand-responsive connectors, zone routes and point deviation. Of all flexible service models, deviated fixed route systems are the most commonly used, however some transit agencies utilize more than one type of flexible route service. Each service type varies in the degree of flexibility it offers, which can impact choice. The following definitions are given by the TCRP for each service type:

- Route deviation—Vehicles operate on a regular schedule along a well-defined path, with or without marked bus stops, and deviate to serve demand-responsive requests within a zone around the path. The width or extent of the zone may be precisely established or flexible.
- Point deviation—Vehicles serve demand-responsive requests within a zone and also serve a limited number of stops within the zone without any regular path between the stops.
- Demand-responsive connector—Vehicles operate in demand-responsive mode within a zone, with one or more scheduled transfer points that connect with a fixed-route network. A high percentage of ridership consists of trips to or from the transfer points.
- Request stops—Vehicles operate in conventional fixed-route, fixed-schedule mode and also serve a limited number of defined stops near the route in response to passenger requests. (Request stops differ from flag stops in not being directly on the

Service Option	Pros / Cons
A. Consolidated Express Route: Through agreement between JT and OUTS, the route would run from downtown Jacksonville and serve the Wal-Mart, Senior Center/County Complex and potentially the airport through a "one seat" service to be provided by either JT or OUTS vehicles without requiring a transfer or local stops. Express route service times would likely be hourly during AM and PM peak periods and potentially a lunchtime run, depending on needs and demand at the County Complex. Airport runs could coincide with common flight arrival/ departure times.	**Pros:** ▪ *Provides the most convenient ride for non-stop riders who begin their trip downtown and end at the County Complex.* ▪ *Begins to reinforce concept that OUTS and JT are one coordinated service regarding of vehicle type, particularly as it relates to potential County contribution.* ▪ *Easiest route for potential riders to interpret and understand.* ▪ *Does not require agreement with Wal-Mart to place transfer point on-site if it cannot be done on Yopp Road.* ▪ *Does not require "pulsing" of OUTS and JT services for transfer or common fare media.* **Cons:** ▪ *Requires agreement between OUTS/JT.* ▪ *Could complicate existing JT operating agreement with MV.* *Require regular funding through JARC or other agreed-upon Federal source to avoid transfer of existing funds from one operating agency to the other.*
B: JT Local / OUTS Express Jacksonville Transit adds a leg to existing "A" route to begin/terminate at the Wal-Mart complex, which could be potentially accomplished at the beginning of its deadhead run from the bus garage. In response to demand in the corridor and at the Senior Center / County Complex, OUTS begins a new express route between the Wal-Mart and the complex or Richlands (could vary by time of day to run AM and PM peak services to/from Richlands and provide midday service between Wal-Mart and County Complex).	**Pros:** ▪ *Does not require JT to provide services beyond city limits.* ▪ *Expands JT services to an un-served area of the City.* ▪ *Provides avenue for OUTS to examine potential for express routes in high volume corridor and to popular destinations.* ▪ *Serves as a test for coordination of service points between JT/OUTS that can be replicated in other areas (Piney Green, Gum Branch, etc.)* **Cons:** ▪ *Requires a transfer to a different service, which could be deterrent for choice riders.* ▪ *May require on-site agreement for services within the Wal-Mart complex if transfer cannot be made on Yopp Road.* ▪ *Service times for JT could deter County workers if there are additional stops between downtown and Wal-Mart.*

Service Option	Pros / Cons
C: JT Local / OUTS Demand Response Jacksonville Transit adds a leg to existing "A" route to begin/ terminate at the Wal-Mart complex, which could be potentially accomplished at the beginning of its deadhead run from the bus garage. OUTS continues to operate demand response services in the corridor through potential subscription of riders to transfer at Wal-Mart or use point-to-point services.	**Pros:** ▪ *Does not require JT to provide services beyond city limits.* ▪ *Does not require changes to existing OUTS services.* ▪ *Expands JT services to an un-served area of the City.* ▪ *Serves as a test for coordination of service points between JT/OUTS that can be replicated in other areas (Piney Green, Gum Branch, etc.)* **Cons:** ▪ *Demand response not as conducive to commuter rides.* ▪ *Does not provide incubator for future coordinated JT/OUTS or express services.* ▪ *Requires a transfer to a different service, which could be deterrent for choice riders.* ▪ *May require on-site agreement for services within the Wal-Mart complex if transfer cannot be made on Yopp Road.* ▪ *Service times for JT could deter County workers if there are additional stops between downtown and Wal-Mart.*
D: OUTS Deviated Fixed Route / Express *Through agreement between JT and OUTS, OUTS provides a combination of express and deviated fixed route services to the western sectors of the City and northwestern areas of the County.* *Similar to option A, the route runs express between downtown and the County Complex and/or Richlands and serves as a deviated fixed route service to residential areas along the US Highway 258 corridor and areas of western Jacksonville.*	**Pros:** ▪ *Could evolve from Option A over time depending on success and demand from residential or commercial areas not adjacent to the route.* ▪ *Provides the most convenient ride for non-stop riders who begin their trip downtown and end at the County Complex.* ▪ *Begins to reinforce concept that OUTS and JT are one coordinated service regarding of vehicle type, particularly as it relates to potential County contribution.* **Cons:** ▪ *Difficult to implement as the first service type in the region.* ▪ *Deviated fixed route could deter commuters who are uncomfortable with less predictable travel times.* ▪ *Requires agreement between OUTS/JT.* ▪ *Could complicate existing JT agreement with MV.* *Require regular funding through JARC or other agreed-upon Federal source to avoid transfer of existing funds from one operating agency to the other.*

route.)

- Flexible-route segments—Vehicles operate in conventional fixed-route, fixed-schedule mode, but switch to demand-responsive operation for a limited portion of the route.
- Zone route—Vehicles operate in demand-responsive mode along a corridor with established departure and arrival times at one or more end points.

Local Considerations for OUTS and Jacksonville Transit.

In order to implement a flexible transit service, OUTS and Jacksonville Transit, as well as its partners will need to assess current and desired outcomes of the transit system in terms of the area where transit vehicles should operate, boarding and alighting locations, schedule and advanced notice requirements (Table 16). Each of these factors will contribute to the type of flexible service most appropriate for the community.

	Service Type		
Elements of Service	***Fixed Route***	***Flexible***	***Dial-a-Ride or Paratransit***
Where vehicles operate	On the defined route	A route plus off-route locations or areas, or a geographic area	A geographic area
Boarding and lighting locations	Fixed or flag stops	Some fixed stops plus other locations	Any safe location in the service area
Schedule	Fixed	Fixed at end points or time points on the route, demand- responsive at other locations	Depends entirely on trips requested

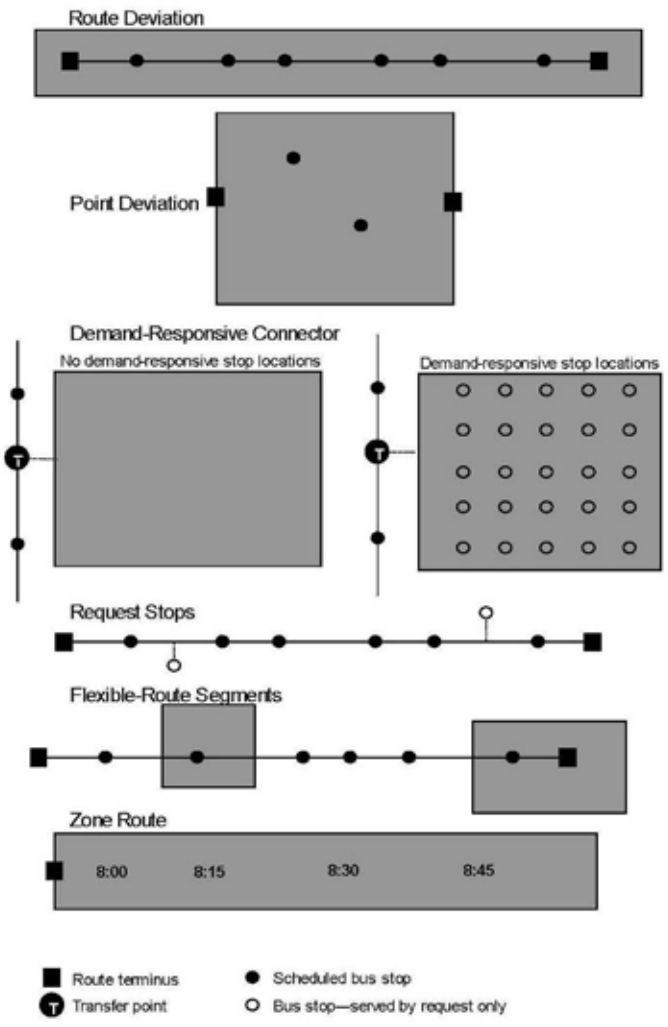
Deviated fixed route service is one flexible transit service model that could work well for Jacksonville, as it falls in between the conventional fixed route, fixed schedule model and demand-response model (e.g. dial-a-ride or paratransit service). Vehicles would operate on a
regular schedule along a defined path, but deviate on occasion to serve demand-responsive requests within a zone around/near that path.

In Onslow County, a deviated route system could be used to expand Jacksonville Transit or OUTS service into additional areas identified by both transit service providers and Jacksonville or Onslow County residents as current gaps in the system. Similarly, flexible route segments could work well for certain future routes in Jacksonville, such as in areas with low density around a higher use transit corridor.

Once a flexible transit service model is chosen, the transit providers and their partners will need to establish policies on matters such as distance or frequency of route deviation, advanced notice requirements for passengers, boarding and alighting locations, and other common considerations such as:

- Determination of the amount of time allocated for demand responsive operation in relation to fixed route service (e.g. deviation occurrences per hour);
- Importance of defining how far a route could deviate (e.g. how many miles or within what set radius will a bus deviate from the fixed transit route);
- Potential fare surcharges for off-route service and/or fixed route fare incentives for paratransit riders ;
- Level of coordination with paratransit and regional service provider(s);
- Special driver and dispatcher training for flexible service operation, especially regarding differences in passenger communication and level of independent decision-making involved;
- Amount of advance notice can vary for pick-ups and drop-offs, as will use of advanced technology;
- Land-use, densities and geographic circumstances in which flexible transit service will be most appropriate, best used, and most efficient;
- Types of vehicles to be used in flexible service operation; and
- Maximum thresholds for flexible operation (i.e. what are maximum ridership thresholds and/or at what point will flexible transit service become impractical for a given route or service area).

Cost Comparisons for Flexible and Conventional (Fixed Route) Transit Services.



Transit operators typically choose a flexible service model to provide cost-effective coverage to spread-out, low-density areas, reduce or eliminate the expense of a separate paratransit service, and/or serve low-demand time periods. The efficiencies gained in all of these actions result in a transit operation that can be leaner and more cost-effective.

Potential Flexible Service Zones. As noted previously, the most likely candidate for short-term flexible is the US Highway 258 corridor. Depending on the ability of Jacksonville Transit to implement recommendations contained in the Jacksonville Transit Plan, there are other areas of the city and county that could benefit from such a service. These locations have been identified as:

- Areas outside the City limits on the north end of Gum Branch Road;
- The Piney Green Road corridor;
- Residential areas within the City limits northwest of Henderson Drive; and
- Residential areas within the City limits southeast of the Jacksonville Mall between Country Club Drive and NC 24 – Lejeune Boulevard.

Park-and-Ride Opportunities

Several of the discussions during the Coordinated Plan workshop and public open houses included the idea of establishing park-n-ride lots in both Jacksonville and outlying communities in Onslow County. Through lease agreements with entities such as shopping centers, churches and municipal complexes, OUTS and Jacksonville Transit could pursue the designation of park-n-ride spaces within existing parking lots of already developed properties.

Typically, such lease agreements consist of a modest payment negotiated with the land owner and designation of five to 10 parking spaces on the fringe of the development that are accessible to van and bus services. Carpoolers may also use these designated parking spaces.

It can also be advantageous to work with entities such as NCDOT to identify publicly-owned parcels, perhaps remnants from previous road projects, which could be cleared and improved with asphalt or gravel to provide for park-n-ride lots. Several unofficial park-n-ride lots of this type exist around the State. The City or County could also pursue acquisition or transfer of ownership of such lots if

there was determined to be a long-term need for such a facility at a specific location.

OUTS can also pursue arrangements with Onslow County's Planning Department to determine whether the County is willing to require commercial or church developments to designate park-n-ride spaces within their parking lots as a condition of approval.

Potential park-n-ride lot locations outside of the City of Jacksonville should be pursued by OUTS in the following communities: Richlands; Sneads Ferry; Swansboro; and Holly Ridge. As noted, these lots can be used by carpoolers combined with or in the absence of OUTS services.

Using Technology

Growth in its vehicle fleet, increased demand with Jacksonville Transit, and the evolution of the region from a small- or medium-sized city to a large metropolitan region will require OUTS to examine the incorporation of various technologies available to the public transportation industry. As this plan has noted, OUTS and Jacksonville Transit are examining the possibilities of embarking on a marketing and technology integration effort that will provide a one-stop shop for public transportation information to citizens of Onslow County.

JUMPO has recently begun providing links and feeds from its web site to interested citizens regarding travel time information. Recent technological advances have allowed government entities to use existing in-the-field data to help feed this information. JUMPO is also pursuing a regional Intelligent Transportation System (ITS) Plan that will identify various technological enhancements to the region's traffic signal timing systems, closed circuit television traffic cameras, and traffic management capabilities.

There exists the potential, due to the nature of OUTS services throughout the county and along major corridors, that an AVL system on the OUTS fleet could potentially integrate with a regional ITS system to provide real-time information to a regional traffic management center and allow OUTS vehicles to serve as in-the-field measures of travel performance. Such systems are becoming more commonplace in North Carolina; Raleigh's CAT service is implementing such a system now, for example. For instance, AVL on an OUTS van traveling along US Highway 258 could relay real-time travel information between Richlands and Jacksonville during a morning peak house. With that, OUTS should work closely with JUMPO on the ITS Plan process to identify future coordination possibilities.

JT & OUTS Coordination & Regional Governance

As Onslow County has grown in population and reliance upon services and activities within the City of Jacksonville have increased; there has been increasing discussion regarding the potential for establishing some type of regional transportation authority that could oversee OUTS and Jacksonville Transit Services. The State of North Carolina, through General Statute 25 – Public Transportation Authorities, allows for the establishment of regional transit authorities (RTA) to provide for "safe, adequate, and convenient" public transit systems for municipalities and their immediate environs.

By law and the existing circumstances within Jacksonville and Onslow County, the City of Jacksonville or Onslow County would be the municipality required by law to take the lead in establishment of such an authority. The law states that a municipality "may, by resolution or ordinance, create a transportation authority." The establishment of a RTA extends its powers to include "all local public passenger transportation" services that operate within the corporate boundaries of the municipality. The law also states that the boundaries of the RTA "shall also extend up to 30 miles outside of the corporate limits of the municipality where the municipality is a town or a city, and up to five miles outside of the boundaries" of the county. If initiated by the City of Jacksonville, the establishment of a RTA would require the consent of Onslow County. A RTA established by the County would require the consent of municipalities within Onslow County.

There are several advantages and disadvantages (Table 17) to RTAs that should be thoroughly examined before one is established. While operating and funding efficiencies can be recognized to provide more streamlined and coordinated services, RTAs can also lead to selective distribution of funding to preferred services or those services perceived as more of a benefit to the system by Board members or elected officials, thus cutting funding to other services that may serve vital needs within the community.

Potential Advantages	Potential Disadvantages
▪ *Allows one entity to focus solely on public transportation.* ▪ *Better coordination of services.* ▪ *Consolidated administrative, planning and service functions, including staffing, maintenance facilities, and contracts.* ▪ *Establishment of regionwide funding sources, where allowed by general statutes, and coordinated pursuit of state and federal sources.* ▪ *Transit does not have to compete for funding with other city or county programs.* ▪ *Can create a common identify for all transit and eliminate negative perceptions associated with particular service types (e.g. "the welfare wagon").* ▪ *Service decisions are typically made from a regional perspective.*	▪ *Loss of local control.* ▪ *Removes authority from existing policy boards and RTA boards are chosen, not elected.* ▪ *Since different parties are required to contribute to a regional authority's financing program, they are more vulnerable to shifts or delays in funding.* ▪ *Regional authority may transfer funding to popular service types based on politics or perception instead of operating efficiencies or public need (e.g. reducing funding for bus services to provide rail services).* ▪ *Regional authority may transfer services from some sectors of the region in favor of others.* ▪ *Potential for short-term loss of jobs due to consolidated functions.* ▪ *Loss of ability for unique services to be able to provide specialized services (e.g. demand response business model vs. fixed route business model).*

See Table Potential Advantages & Disadvantages of a Regional Transportation Authority

In the absence of a regional authority there are several other options to provide coordinated services, including joint powers agreements, inter-jurisdictional agreements or joint funding agreements among municipalities.

Funding Future Transit Services

Below are summaries of various Federal and State funding programs that can be pursued to fund future transit services and planning efforts for Jacksonville Transit. Note that Jacksonville Transit and the City of Jacksonville may not be eligible for all funding programs under existing rules established by the Federal Transit Administration or the North Carolina Department of Transportation.

The funding summaries listed below were developed by North Carolina Department of Transportation.

Section 5303, 5304, 5305 – Metropolitan & Statewide Planning

Program Description: These programs provide funding to support transportation/transit in metropolitan areas and statewide.

Eligible Recipients: State Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs). Federal planning funds are first apportioned to State DOTs. State DOTs then allocate planning funding to MPOs.

Eligible Purposes: For planning activities that (A) support the economic vitality of the metropolitan area; (B) increase the safety and security of the transportation system; (C) increase the accessibility and mobility of people and freight; (D) protect and enhance the environment, promote energy conservation, and promote consistency between transportation improvements and State and local planned growth and economic development patterns; (E) enhance the integration and connectivity of the transportation system; (F) promote efficient system management and operation; and (G) emphasize the preservation of the existing transportation system.

Funding Allocation: Funds are apportioned by a formula to states. These funds, in turn, are sub-allocated by states to MPOs by a formula that considers each MPO's urbanized area population, their individual planning needs, and a minimum distribution.

Federal/Local Share: The federal share is 80 percent and the local share is 20 percent.

Section 5307 – Large Urban Cities

Program Description: This program (49 U.S.C. 5307) makes Federal resources available for transit capital and operating assistance in urbanized areas and for transportation related planning. An urbanized area is an incorporated area with a population of 50,000 or more that is designated as such by the U.S. Department of Commerce, Bureau of the Census.

Eligible Purposes: Include planning, engineering design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement of buses, overhaul of buses, rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software. All preventive maintenance and some Americans with Disabilities Act complementary paratransit service costs are considered capital costs.

For urbanized areas with 200,000 population and over, funds are apportioned directly to a designated recipient. For urbanized areas under 200,000 in population, the funds are apportioned to the Governor of each state for distribution. A few areas under 200,000 in population have been designated as transportation management areas and receive apportionments directly.

For urbanized areas with populations of 200,000 or more, operating assistance is not an eligible expense. In these areas, at least one percent of the funding apportioned to each area must be used for transit enhancement activities such as historic preservation, landscaping, public art, pedestrian access, bicycle access, and enhanced access for persons with disabilities.

Appropriation: Funded under Formula Grants

Description: Grants to urbanized areas and states for transit-related purposes

Eligible Recipients: Funding is available to designated recipients that must be public bodies with the legal authority to receive and dispense Federal funds. Generally, a transportation management area is an urbanized area with a population of 200,000 or over. The Governor or Governor's designee is the designated recipient for urbanized areas between 50,000 and 200,000.

Eligible Purposes: Planning, engineering design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement of buses, overhaul of buses, rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software. All preventive maintenance and some Americans With Disabilities Act complementary paratransit service are considered capital costs.

Allocation of Funding: Funding is apportioned on the basis of legislative formulas. For areas of 50,000 to 199,999 in population, the formula is based on population and population density. For areas with populations of 200,000 and more, the formula is based on a combination of bus revenue vehicle miles, bus passenger miles, fixed guideway revenue vehicle miles, and fixed guideway route miles as well as population and population density.

Match: The Federal share is not to exceed 80 percent of the net project cost. The Federal share may be 90 percent for the cost of vehicle-related equip-

ment attributable to compliance with the Americans With Disabilities Act and the Clean Air Act. The Federal share may also be 90 percent for projects or portions of projects related to bicycles. The Federal share may not exceed 50 percent of the net project cost of operating assistance.

Sections 5309 & 5318 - Bus and Bus Facilities

The Buses and Bus Related Equipment and Facilities program provides capital assistance for new and replacement buses, related equipment, and facilities.

Eligible capital projects include: the purchasing of buses for fleet and service expansion, bus maintenance and administrative facilities, transfer facilities, bus malls, transportation centers, intermodal terminals, park-and-ride stations, acquisition of replacement vehicles, bus rebuilds, bus preventive maintenance, passenger amenities such as passenger shelters and bus stop signs, accessory and miscellaneous equipment such as mobile radio units, supervisory vehicles, fare boxes, computers and shop and garage equipment.

Eligible recipients: transit authorities and other state and local public bodies including states, municipalities, other political subdivisions of states. Funds are allocated on a discretionary basis.

Private companies engaged in public transportation and private non-profit organizations are eligible sub recipients of FTA grants. Private operators may now receive FTA funds as a pass through without competition if they are included in a program of projects submitted by the designated public authority acting as the direct recipient of a grant.

Section 5318 is the Bus Testing Facility program.

Under this program, one facility is used for testing a new bus model for maintainability, reliability, safety, performance (including braking performance), structural integrity, fuel economy, emissions, and noise. The program is administered under the Section 5309 Bus and Bus Related Facilities program.

Allocation of Funding: The Secretary has the discretion to allocate funds, although Congress fully earmarks all available funding.

Funds Availability: Funds remain available for obligation for three fiscal years. This includes the fiscal year in which the amount is made available or appropriated plus two additional years.

Section 5310 – Transportation for Elderly Persons and Persons with Disabilities

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

Funds are obligated based on the annual program of projects included in a statewide grant application. The State agency ensures that local applicants and project activities are eligible and in compliance with Federal requirements, that private not-for-profit transportation providers have an opportunity to participate as feasible, and that the program provides for as much coordination of Federally-assisted transportation services, assisted by other Federal sources. Once FTA approves the application, funds are available for state administration of its program and for allocation to individual subrecipients within the state.

Section 5311 – Rural and Small Urban Areas

This program (49 U.S.C. 5311) provides formula funding to states for the purpose of supporting public transportation in areas of less than 50,000 populations. Eighty percent of the statutory formula is based on the nonurbanized population of the States; twenty percent of the formula is based on land area.

Funds may be used for capital, operating, and administrative assistance to state agencies, local public bodies,

Indian tribes, and nonprofit organizations, and operators of public transportation services.

Appropriation: Funded under Formula Grants

Description: The goals of the nonurbanized formula program are: 1) to enhance the access of people in nonurbanized areas to health care, shopping, education, employment, public services, and recreation; 2) to assist in the maintenance, development, improvement, and use of public transportation systems in rural and small urban areas; 3) to encourage and facilitate the most efficient use of all Federal funds used to provide passenger transportation in nonurbanized areas through the coordination of programs and services; 4) to assist in the development and support of intercity bus transportation; and 5) to provide for the participation of private transportation providers in nonurbanized transportation to the maximum extent feasible.

Eligible Recipients: State and local governments, Indian tribes, nonprofit organizations and public transit operators.

Eligible Purposes: Funds may be used for capital, operating, and administrative purposes.

Allocation of Funding: Funding is apportioned by a statutory formula that is based on the latest U.S. Census figures of areas with a population less than 50,000.

Match: The maximum Federal share for capital and project administration is 80 percent (except for projects to meet the requirement of the Americans with Disabilities Act (ADA), the Clean Air Act, or bicycle access projects, which may be funded at 90 percent.) The maximum Federal share for operating assistance is 50 percent of the net operating costs. The local share is 50 percent, which shall come from an undistributed cash surplus, a replacement or depreciation cash fund or reserve, or new capital.

Funding Availability: Year appropriated plus two years (total of three years).

Section 5311(b)(3) – Rural Transit Assistance Program

The Rural Transit Assistance Program (RTAP) provides a source of funding to assist in the design and implementation of training and technical assistance projects and other support services tailored to meet the needs of tranperators in nonurbanized areas. RTAP has both State and national program components. The State program provides an annual allocation to each State to develop and implement training and technical assistance programs in conjunction with the State's administration of the Section 5311 formula assistance program. The national program provides for the development of information and materials for use by local operators and State administering agencies and supports research and technical assistance projects of national interest. There is no Federal requirement for a local match.

Appropriation: Funded under Formula Grants

Description: Provides a source of funding to assist in the design and implementation of training and technical assistance projects and other support services tailored to meet the specific needs of transit operators in nonurbanized areas. RTAP has both state and national program components. The state program provides an annual allocation to each state to develop and implement training and technical assistance programs in conjunction with the state's administration of the Section 5311 formula assistance program. The national program provides for the development of information and materials for use by local operators and state administering agencies and supports research and technical assistance projects of national interest.

Eligible Recipients: States and local governments, and local transit operators

Eligible Purposes: Funds are to be used for training, technical assistance, research and related support activities.

Allocation of Funding: FTA allocates RTAP funds to the states based on an administrative formula.

Program	Eligible Recipients	Funding Source	Purpose
State Maintenance Assistance Program (SMAP)	Fixed route and demand response urban, small urban, and regional transit system services.	State	Funding operating costs for urban, small urban, and regional transit systems. Allocations are based on a formula approved by the State Board of Transportation. Local Governments or authorities must provide funds equal to or greater than the State allocation.
Urban/Regional Bus and Facility Program	Local governments and regional transportation authorities.	State	Provides state match to direct recipients of FTA grants under Sections 5307, 5309 and 5313.
Urban/Regional Technology Program	Local governments in areas with fixed route transit systems and transportation authorities.	State; funding up to 90% of State funds or 1/2 of local match for areas using Section 5307 funds.	Funds advanced technology needs of public transportation systems.
Urbanized Area Formula Program (FTA Section 5307)	Designated public agencies in urbanized areas.	Federal with State matching funds; NCDOT provides up to 1/2 of local match for planning and eligible major capital costs.	Funds for urban transit system operating assistance, planning activities and major capital purchases, such as buses and transit centers.

Match: There is no Federal requirement for a local match.

Funding Availability: Year appropriated plus two years (total of three years).

Section 5316 – Job Access and Reverse Commute Program (JARC)

The Job Access and Reverse Commute (JARC) program was established to address the unique transportation challenges faced by welfare recipients and low-income persons seeking to obtain and maintain employment. Many new entry-level jobs are located in suburban areas, and low-income individuals have difficulty accessing these jobs from their neighborhoods. In addition, many entry level-jobs require working late at night or on weekends when conventional transit services are either reduced or non-existent. Finally, many employment related-trips are complex and involve multiple destinations including reaching childcare facilities or other services.

Section 5317 – New Freedom Program (NF)

The New Freedom formula grant program aims to provide additional tools to overcome existing barriers facing Americans with disabilities seeking integration into the work force and full participation in society. The 2000 Census showed that only 60 percent of people between the ages of 16 and 64 with disabilities are employed.

The New Freedom formula grant program seeks to reduce barriers to transportation services and expand the transportation mobility options available to people with disabilities beyond the requirements of the Americans with Disabilities Act (ADA) of 1990.

State of North Carolina Funding Programs

Table 18 contains funding programs wholly or partially funded through the North Carolina Department of Transportation. Some NCDOT programs are intended to provide additional matching assistance for Federal programs to the local transportation agency.

OUTS Funding & Financial Management

OUTS is solely reliant upon local and state funding sources to conduct its operations and must re-coup the full cost of their trips through these sources. Over the past 11 years OUTS has experienced a more than doubling of their annual budget (Figure 16), reflective of the growing need and demand for its services within Onslow County.

Program	Eligible Recipients	Funding Source	Purpose
Public Transportation Grant Program	Local governments, nonprofit organizations, community transportation systems, transportation authorities and institutions of higher education.	State; funding of short-term demonstration projects and those ineligible for Federal funding.	Matches NCDOT statewide grants and local federal capital and planning grants. Also funds the Apprentice and Intern Programs and the Transportation Demand Management Program (see below).
Apprentice and Intern Programs	All state transit systems are eligible to receive reimbursement of project costs for salary, benefits and travel within specified guidelines.	State; funding up to 90% of eligible costs.	Fund the work experience for select recent graduates and graduate students in public transportation. Apprentices, who are recent graduates, work full time for a 12-month period. Interns, who are graduate students, work approximately 12 weeks full-time during the summer between their two years of graduate school and approximately 10 hours per week during the fall and springs semesters of their second year.

OUTS relies on a variety of local and state funding sources to operate its system. Below are summaries of major local funding sources, followed by a review of State funding sources. The summaries of local sources do not reference every OUTS source, only those that account for more than 5% of OUTS annual trips.

Onslow County Senior Services (OCSS). Onslow County Senior Services is a county department and located at 4022 Richlands Highway, Jacksonville, NC and provides services for the elderly citizens of Onslow County who are 60 years and older. Their objective is to provide socialization, education, and training, rehabilitation, organized recreation, nutrition services, social services, personal care, transportation, and lifeline planning. Onslow County Senior Services contracts 100 percent of its transportation from OUTS to nutrition sites in Jacksonville, Sneads Ferry, Swansboro, and Richlands. Some other destinations include doctors, dentist, and rehabilitation offices in Jack ville, Onslow Memorial Hospital and other medical facilities and social service agencies. Onslow United Transit System, Inc. (OUTS) provided over 20,000 trips (approximately 34%) for Onslow County Senior Services for FY 09. Approximately 10-15% of the trips provided need lift equipped vehicles.

Coastal Enterprises. Coastal Enterprises (CE) is a private, non-profit human service agency that provides counseling, rehabilitation and transportation services for residents of Onslow County. These residents must be 16 years or older, and physically, emotionally, and/or mentally disabled. The main office is located in Jacksonville. Operations houses are Monday through Friday from 8:00 a.m. until 4:30 p.m. Coastal Enterprises contracts with OUTS to provide transportation for their clients. Clients are transported to the main office and to work sites in Onslow County including Camp Lejeune. OUTS provided approximately 4500 trips for Coastal Enterprises (approximately 8%) for FY 09.

Onslow County Department of Social Services. Onslow County Department of Social Services is located at 1915 Onslow Drive Extension. OC-DSS provides social services for county residents, who meet low income requirements. The DSS's main objective are to improve self-sufficiency amount clients, to provide assistance to low income persons, to protect vulnerable children and adults from neglect, abuse, or exploitation, to provide foster and child care, to pay medical expenses for the impoverished, and to maximize the potential and ability of the disabled and elderly to function in and contribute to their communities. In an effort to achieve these goals, DSS provides services for transportation, jobs, day care, medical appointments, and counseling. DSS contracts with OUTS to provide transportation for their clients. OUTS

Table 19: OUTS Trips by Funding Source (FY 2007/2008)

Source	Total	%
OCSS Nutrition	16,948	**27.9%**
DSS - JOBS	8,610	**14.2%**
Rural General Public (RGP)	7,331	**12.1%**
Coastal Enterprises	5,699	**9.4%**
Medicaid (City)	5,109	**8.4%**
Elderly & Disabled Transportation Assistance Program (EDTAP)	4,735	**7.8%**
DSS - Medicaid	4,495	**7.4%**
Coastal Carolina Community College	2,886	**4.8%**
All Others	4,851	**8.0%**
Total	***60,664***	***100%***

provided the following for FY 09:

- DSS – Work First 8463 trips (this funding was depleted in 2/28/09 (15%)
- DSS – Medicaid 7754 trips (13%)
- DSS – Adult Services 109 trips (.19%)
- Services for the Blind 449 trips (.77%)

State Funding Sources

The State of North Carolina provides three key funding sources for OUTS: the Elderly & Disabled Transportation Assistance Program (EDTAP), Employment Transitional / Employment Transportation Program (EMPL) and the Rural General Public (RGP) program. These programs are part of the broader Rural Operating Assistance Program (ROAP), which is administered by the Public Transportation Division of NCDOT. Local recipients are county governments, who then distribute fund to designated recipients such as OUTS, that must submit grant applications and meet program requirements. ROAP funds are to be used for trips or other services; not for capital or administrative expenses.

All 100 North Carolina counties are eligible to receive a formula-based allocation for EDTAP and Employment Transitional/Employment Transportation. Only those counties providing transportation services to the general public are eligible to receive RGP allocations. Counties have the ability to transfer Employment Transportation Assistance funds, all or in part, to the EDTAP and/or RGP programs provided such funds are not needed to provide employment trips or eligible other services. OUTS FY 2010 funding allocation for these programs is shown in Table 20.

A matrix of eligible uses for these programs is depicted in Table 21.

The Elderly and Disabled Transportation Assistance Program (EDTAP) provides operating assistance funds for the transportation of the state's elderly and disabled citizens. This transportation assistance allows these individuals to reside for a longer period in their homes, thereby enhancing their quality of life. Program funds may only be used to purchase additional trips and are not to be used to supplant existing funds used for client transportation. These funds are available at 100% of the program allocation and do not require a local funding match.

The Employment Transitional/Employment Transportation (EMPL) program is intended to provide operating assistance for transitional Employment and general public employment transportation needs. The funds should be used to support the employment transportation needs of individuals who are not eligible to receive benefits from the Temporary Assistance for Needy Families (TANF) program as well as employment trips for the general public. These funds are also available at 100% of the program allocation and do not require a local funding match.

The rules of the program stipulate priority be given to the employment transportation needs of individuals that are not eligible to receive benefits from the Temporary Assistance for Needy Families (TANF) program or to participants in Workforce Development Programs, but the transportation disadvantage public with employment-related transportation needs can also be served with EMPL funding. Certification of this eligibility is the responsibility of OUTS.

The Rural General Public Program (RGP) operating funds are intended to provide transportation services to individuals who are not human service agency clients. The funds must be utilized in a manner consistent with the respective RGP Service Plan for the county/service area. OUTS is required to match the allocated program funding with 10% local funds from fares or other sources, with the state allocation paying for 90% of the program costs. To use RGP funds, the passenger must live in the non-urbanized area of a county and either the origin or destination of the trip must be in the non-urbanized area.

System Fare Structure

OUTS has adopted the following fully-allocated cost structure for fares, which will be in effect from July 1, 2009 through June 30, 2010. These fares are based on the actual and projected costs for OUTS to operate its fleet to customers within Onslow County. Agencies may choose to pay a flat rate or a per mile charge for trips. OUTS does not have a locally- or federally-dedicated funding sources and therefore must calculate fares based on capital and operations costs in order for the service to re-coup the full cost of its transportation services. OUTS does not currently have any third party con-

tracts with private service providers to supplement their services.

Agencies may pay either $1.48 per mile for trips that take place in Onslow County; or they may choose to pay a flat rate for OUTS services. The fees for flat rates one-way trips are as follows:

- $12.00 within Jacksonville city limits and defined limits of the surrounding Extraterritorial Jurisdiction (ETJ); and
- $23.00 for areas in Onslow County outside the city limits or ETJ.

Client's whose transportation is provided through one of OUTS grant programs are charged a fixed fare per one way trip, as outlined below by funding source.

- EDTAP (Elderly, Disabled Transportation Assistance Program)
  - Medical: $1.00;
  - Work: $3.00; or
  - Out of County Medical: $6.00 to $12.00 per one way trip depending on destination.

- RGP (Rural General Public)
  - Adults:$4.00; or
  - Children (12 years and under): $1.00.
- Work First
  - Adults: $3.00; or
  - Children (12 years and under): $1.00.

OUTS also provides rates for trips to destinations outside of Onslow County. These are calculated on a per van instead of a per rider, per trip basis. The rates are as follows:

- Chapel Hill: $250.00
- Durham: $250.00
- Greenville: $120.00
- Kinston: $90.00
- Morehead City: $90.00
- New Bern: $90.00
- Pollocksville: $65.00
- Wilmington: $100.00

Local Funding Opportunities & Availability

While much of OUTS funding is allocated from the State of North Carolina and various social service agencies, the long-term viability of the system, including the region's transit system, will be reliant upon local contributions. These locally-generated funding sources may come from a variety of funding strategies, including the potential for a local-option sales tax to fund public transportation.

Strategies, Activities, Projects & Priorities for Implementation

The results of the workshop and subsequent work have identified common themes that provide direction for Jacksonville Transit and OUTS to pursue funding through the human service transportation programs. The organization of these initiatives is divided into two separate efforts: 1) Organization and Marketing Program Priorities; and 2) Capital and Operations Program Priorities.

While the initiatives listed in this section are in priority order, it is important to understand that available resources, both at the funding program and agency level, will ultimately dictate the order and manner in which these initiatives are implemented. The priority order of these initiatives is intended to represent both the priorities as identified through the public workshop and a strategic approach to creating a more established collection of transit services to provide mobility to various sectors of the population of Onslow County. There is a strong likelihood that each of these initiatives will require supplemental funding or staff commitments from resources

other than human service transportation programs.
Based on analysis of the human service transportation program, these priorities are eligible for full or partial funding through Elderly and Persons with Disabilities, Job Access and Reverse Commute, or New Freedom.

Coordination with Camp Lejeune

The City of Jacksonville is reliant on Camp Lejeune as an employment base and economic engine for the region. The concentration of housing, commercial services and employment that existing on the Base, and associated military installations such as Camp Johnson, New River Air Station and Camp Geiger, create a unique demand for transit services that also presents several difficulties related to security and service efficiency.

Presently, Jacksonville Transit's only daytime weekday service to Camp Lejeune is to the residential areas in Tarawa Terrace and Midway Park. The main residential and employment areas of the base, including the Exchange, French Creek and Courthouse Bay, are served only by express services on the weekends.

The mainside of Camp Lejeune has the characteristics of a regional central business district, albeit for military uses. These characteristics (e.g. commuter destination, employment, commercial, residential, hospital) combined with a captive audience and sizable transit-dependent population, both on-base and off-base, provide Jacksonville Transit with the opportunity to greatly expand services to the central areas of the Base from off-base locations, providing the City and Base can overcome challenges related to security and congestion at the main access point to the Base.

The *Transit Master Plan* contains recommendations for establishing a new bus route to serve the central area of the Base as well as the hospital as a regular weekday service with connections to the Jacksonville Mall and Western Boulevard corridor. While there is presently no manner in which buses can completely avoid congestion related to the main base access, there are plans for a new base access closer to downtown Jacksonville that will provide opportunities to provide a more efficiently means of transportation for commuters to the base. With that, Jacksonville Transit should pursue options with Camp Lejeune for the installation of "diamond" lanes or other features at the new base access point to allow for various transit services, includes Jacksonville Transit, OUTS, and potentially vanpools, to bypass single-occupant vehicles to gain access. These lanes could potentially also provide an incentive to carpoolers.

Further, the Department of the Navy operates a nationwide Transit Incentive Program aimed at encouraging transit use and reducing congestion at base access points. The program provides for monthly incentives up to $130 per person to pay for bus or vanpool fares. Camp Lejeune's west coast counterpart, Camp Pendleton, currently employs this incentive program.

The program stems from Executive Order 13150, signed by President Clinton in April 2000, to create a Mass Transportation and Vanpool Transportation Fringe Benefit Program. The purpose of the order was to provide a program for Federal employees to reduce congestion and air pollution as well as expand commuting alternatives.

As marketing and incentive programs are developed for regional transit services, Jacksonville Transit and OUTS should be mindful of the unique market that exists within military personnel, their families and civilian employees. Programs such as the Single Marines provide an opportunity for outreach to these on-base populations who are dependent on such services for off-base mobility while they are unable to keep a personal vehicle on-base.

Organization and Marketing Program Priorities

Priorities one through three have common ties but may not be able to be funded or accomplished through a single effort or action. They are also based on existing programs and the ability of JUMPO, OUTS and Jacksonville Transit to pursue these tasks with existing personnel.

1: Establish a One-Stop Shop and Mobility Management Program

To enhance work already being conducted by OUTS, Jacksonville Transit and OUTS can pursue the formal establishment of a mobility management and coordination program for transit services in the region. The functions of this program would consist of:

- An information clearinghouse for local transit services;
- Creation of a mobility management and coordination program through a formal agreement between OUTS, Jacksonville Transit, the City of Jacksonville and Onslow County;
- Utilization of the already established 938-RIDE number for transit-related calls;
- Training for staff members as well as the addition of software and technology to determine best route and service for individuals needing a ride;
- Establishing an online ridematching service, possibly through www.sharetheridenc.org;
- Designing a common web site portal for Jacksonville Transit and OUTS information;
- Branding and marketing of the one-stop shop phone number and website, possibly as part of Priority 2: Conduct a Marketing & Outreach Study;
- Managing incentive programs and guaranteed ride home programs through the one-stop shop;
- Potentially distribution and sales of passes for both services; and
- Ability to transfer calls to appropriate OUTS, Jacksonville Transit or MV operations management.

The one-stop shop concept would likely require a commitment to staffing and continued development of the clearinghouse and mobility management program beyond the funding reach of human service programs, but future funding could be pursued through other state or federal programs.

2: Marketing Analysis and Outreach Program

There were several references during the Coordinated Plan workshop on the need to educate the public and elected officials on the existence and benefits of the region's transit system. Beyond this need, OUTS and Jacksonville Transit staff have expressed a desire to "brand" the region's transit services as one transportation resource. While the establishment of the one-stop shop is a first step toward achieving this goal, a more robust marketing and outreach effort is necessary to fully achieve the vision as established through the workshop.

The goal of a consolidated branding effort would, in combination with the one-stop shop, allow OUTS and Jacksonville Transit to appear to the public as one operation even as they continue to function as separate operations. A marketing analysis and outreach program would likely consist of:

- Identification of target markets for both ridership and information dissemination;
- Utilizing existing transit data to design outreach materials for local elected officials, social service agencies and employers to showcase the value of transit to the region;
- Establishing a common brand or theme for the region's services;
- Designing a common website to access OUTS and Jacksonville Transit information;
- Developing public service announcements for broadcast on local public access television stations;
- Determining the best approaches to market the services;
- Identifying specialized methods to reach military personnel and base employees;
- Developing outreach programs to market services and incentive programs to area employers; and
- Designing a common look for transit media, such as press releases, fare cards, advertising and vehicle wraps.

3: Establish Incentive Programs

While the marketing and outreach efforts will identify the type of programs needed to incentivize transit, the establishment of those programs will likely require a separate effort. With the employment base of Onslow County and the City of Jacksonville provided primarily by the military, the capacity to incentivize transit ridership rests with both the abilities of the transit agencies to manage programs and the willingness of the military installations to allow increased services on-base and pursue incentive programs available through the federal government for military and federal employees.

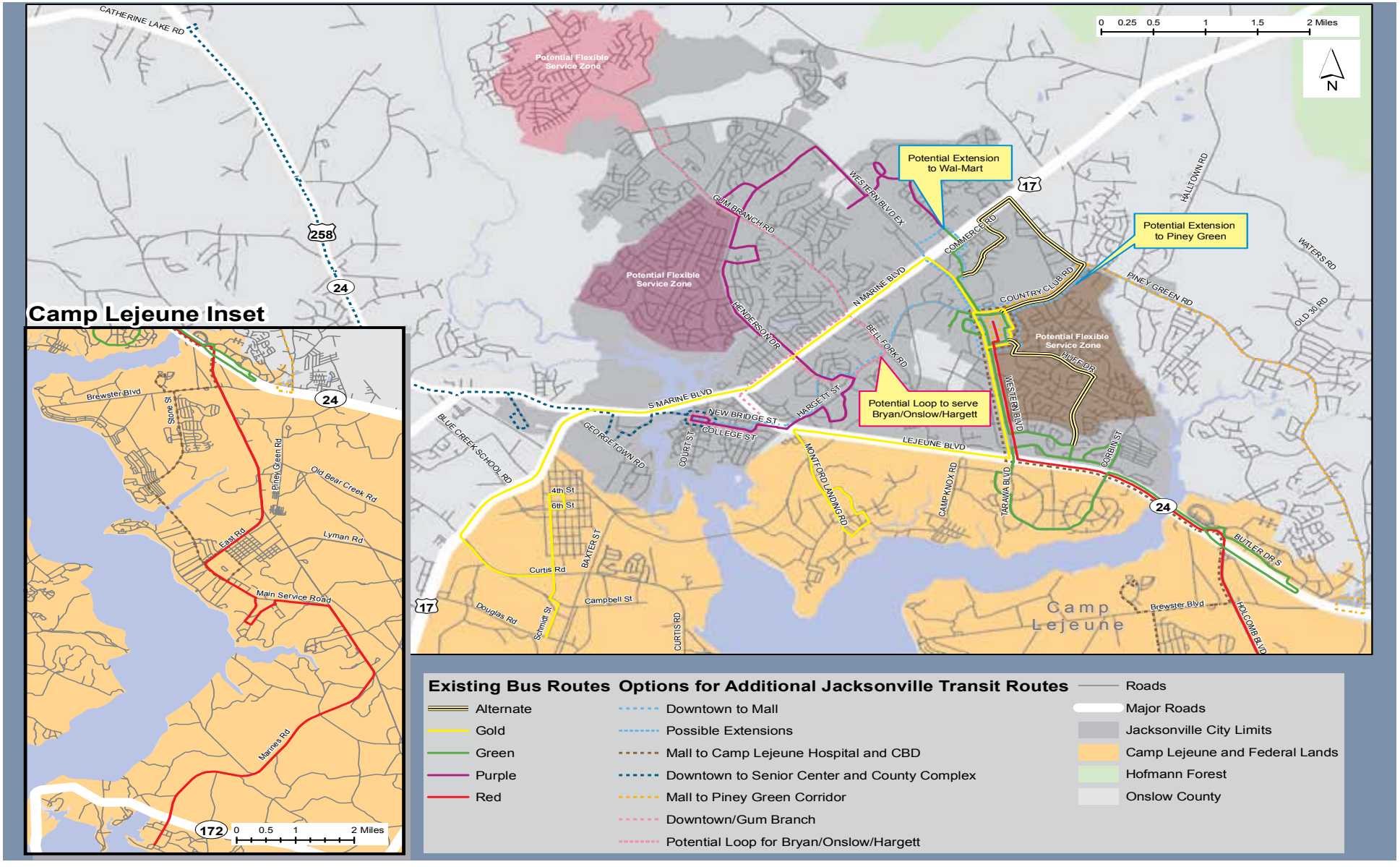
The first step could be to establish a Guaranteed or Emergency Ride Home Program through which registered riders of the region's transit services would be able to utilize the services of a taxi in the event that an emergency requires them to go home or to the doctor during the course of their work day. There is typically some trepidation by service agencies in the establishment of such a program due to fears of abuse. In reality, these can be low cost programs that provide piece of mind to regular riders. Program abuse can be minimized through the institution of several policies, including: requiring riders to register with the service agencies; limiting the dollar amount available to each person during the calendar year; and potentially requiring request for reimbursement of taxi fares through the service agencies.

Other incentive programs include:

- First ride free programs;
- Reduced rates for monthly passes;
- Establishing incentive programs administered by area employers; or
- An annual event, such as a "Strive Not to Drive" week or "May in Motion" campaign.

Capital and Operations Program Priorities

#1: Pursue Reverse Commute Services to Camp Lejeune
#2: Designate Park-n-Ride Lots
#3: Expand Geography of Existing Routes
#4: Create Express Routes/Vanpools for Onslow County communities


Camp Lejeune Inset
Potential Flexible Service Zone
Potential Extension to Wal-Mart
Potential Extension to Piney Green
Potential Loop to serve Bryan/Onslow/Hargett
Camp Lejeune
0 0.25 0.5 1 1.5 2 Miles
N
Existing Bus Routes
Alternate
Gold
Green
Purple
Red
Options for Additional Jacksonville Transit Routes
Downtown to Mall
Possible Extensions
Mall to Camp Lejeune Hospital and CBD
Downtown to Senior Center and County Complex
Mall to Piney Green Corridor
Downtown/Gum Branch
Potential Loop for Bryan/Onslow/Hargett
Roads
Major Roads
Jacksonville City Limits
Camp Lejeune and Federal Lands
Hofmann Forest
Onslow County

Aviation Element

Element Overview

- Introduction
- General Aviation
- AIr Cargo
- Scheduled Passenger Service
- Airport Growth

Introduction

Throughout North Carolina a system of airports serves the public's needs for passenger service, piloting a private aircraft, or moving goods from producer to consumer. These airports are an important part of the statewide multimodal transportation system and North Carolina's economy. While the majority of travelers and cargo in North Carolina originate from and are destined for the three largest airports, Charlotte-Douglas International, Raleigh-Durham International, and Piedmont Triad International, numerous trips are made each day by private citizens and businesses. Tons of cargo shipped to and from the network of smaller tier facilities are distributed throughout the state. Airport facilities in the state can be divided into two major categories:

Air Carrier — These include the group of facilities that serve regularly scheduled passenger service. They are typically larger facilities with the capacity and facilities to handle significant volumes of cargo and passengers. The state's three largest airports — Charlotte-Douglas, Raleigh-Durham, and Piedmont-Triad — account for the majority of revenue and traffic generated by airports within this classification; however, airports such as Albert J. Ellis (Jacksonville), Asheville Regional, Fayetteville Regional, and Craven County Regional also play significant roles in the state's airport system.

General Aviation (GA) — This category includes the network of smaller facilities located in counties throughout the state. They typically have paved runways 2,000 feet to 5,500 feet in length and accommodate small (single engine) and medium sized (multi-engine) propeller and jet aircraft. Many of these airports provide opportunities for businesses and individuals with access to private aircraft to expedite travel and bypass delays common to the larger commercial airports. Statewide general aviation airports also have proven to be effective in attracting business to communities.

Existing Facilities

The Federal Aviation Administration recognizes four airports in Onslow County:

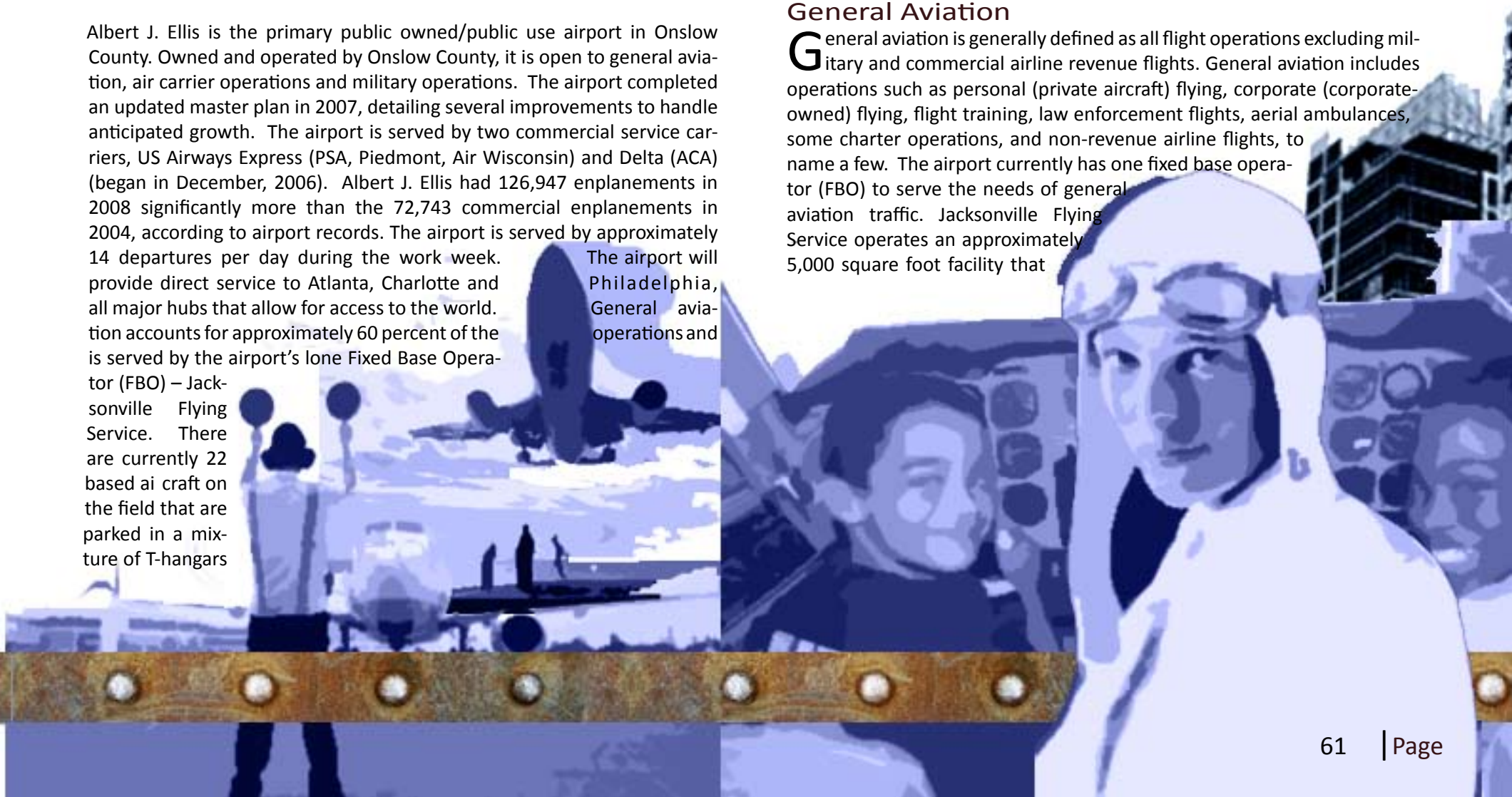
- Albert J. Ellis (OAJ) — Publicly-owned/public-use air carrier airport.
- Sky Manor (N22) — Privately-owned/public-use general aviation airport with a turf runway facility.
- Epley (52NC) — Privately-owned/private-use general aviation airport with a turf runway facility
- Marine Corps Air Station New River (NCA) — Publicly-owned (U.S. Department of Defense)/military-use facility

Sky Manor and Epley are privately-owned turf runway facilities. Sky Manor is located west of Jacksonville and Epley is located northeast of Jacksonville in the vicinity of Maysville. MCAS New River is located in the southern portion of the City of Jacksonville.

Albert J. Ellis is the primary public owned/public use airport in Onslow County. Owned and operated by Onslow County, it is open to general aviation, air carrier operations and military operations. The airport completed an updated master plan in 2007, detailing several improvements to handle anticipated growth. The airport is served by two commercial service carriers, US Airways Express (PSA, Piedmont, Air Wisconsin) and Delta (ACA) (began in December, 2006). Albert J. Ellis had 126,947 enplanements in 2008 significantly more than the 72,743 commercial enplanements in 2004, according to airport records. The airport is served by approximately 14 departures per day during the work week. The airport will provide direct service to Atlanta, Charlotte and Philadelphia, all major hubs that allow for access to the world. General aviation accounts for approximately 60 percent of the operations and is served by the airport's lone Fixed Base Operator (FBO) – Jacksonville Flying Service. There are currently 22 based ai craft on the field that are parked in a mixture of T-hangars and tie-downs. In addition, a relatively high level of military operations occur at the field as aircraft from nearby military installations take advantage of the relatively calm airspace activity in the area. Military aircraft account for approximately 22 percent of the Airport's operations. To support the mixture of operations that occur, the airport provides commercial passenger related facilities and amenities, cargo facilities, and houses a fixed-base operator to serve general aviation traffic. The airport is located approximately 12 miles northwest of the City of Jacksonville and is shown in Figure XX. Albert J. Ellis Airport has a single runway with a full parallel taxiway and an apron area that serves general aviation and commercial aircraft. Characteristics of the existing facility include:

General Aviation

General aviation is generally defined as all flight operations excluding military and commercial airline revenue flights. General aviation includes operations such as personal (private aircraft) flying, corporate (corporate-owned) flying, flight training, law enforcement flights, aerial ambulances, some charter operations, and non-revenue airline flights, to name a few. The airport currently has one fixed base operator (FBO) to serve the needs of general aviation traffic. Jacksonville Flying Service operates an approximately 5,000 square foot facility that



Runway	Taxiway	Aprons	Lighting and Approach Aids
Designation - 5/23	Type - Full (parallel lighted)	Air Carrier	Runway edge lights - Runway 23: high intesity runway lights (HIRL); Runway 5: MALSR
Length - 7,100 feet	Width - 75 feet	Area - 19,000 square yards	Runway markings - good condition
Width - 150 feet	Surface - Asphalt	Surface - Asphalt in good condition	Instrument approaches - ILS to Runway 5 and non-directional beacon (NDB); GPS to Runway 5
Surface - Grooved asphalt in good condition		General Aviation	Visual glide slope indicators - Precision approach slop indicator -4 (PASI-4) on Runways 5 and 23
		Area - 12,820 square yards	Air traffic control (ATC) - Facilitated by the Automated Flight Service Station in Raleigh
		Surface - Asphal in good condition	

Passenger Terminal Amenities	Description
Terminal	50,000 square feet
Rental Cars	Avis, Enterprise, Hertz, and National
Food Service	Airport Grille and Lounge
Ground Transportation	Taxi services (independent, local operators); Limousine by Ellis Airport Limousine
Public Parking	Approximately 325 spaces
Curbside drop-off and pick-up	Yes

TOP: Table AE-1 (Runway Characterists)
BOTTOM: Table AE-2 (Passenger Terminal Characteristics)

consists of maintenance hangers, flight planning room, pilot lounge, reception desk and classrooms. The FBO provides the following services:

- Fuel — Jet A and AvGas (100 low-lead)
- Flight instruction
- Airframe and power plant maintenance
- Aircraft rental and sales
- Aircraft tie-downs
- T-hangars — 10
- Automobile parking

Air Cargo

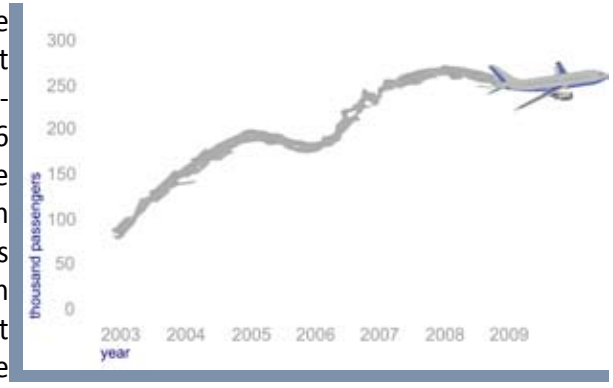
Facilities to support the logistics of air cargo are shared within the air carrier baggage makeup area. Albert J. Ellis Airport hosts the regular air cargo operations of two (2) aircraft operators; Ram Air Freight, based in Raleigh, and Package Express, based in Charlotte. Ram Air Freight, an aircraft operator with a TSA-approved security program, transports cargo that is delivered planeside by the United Parcel Service. Package Express, also an aircraft operator with a TSA approved security program, transports cargo that is delivered to the Airport by ground transporters BeavEx and CDL that are not TSA-regulated, and that are engaged by Package Express' customers. The Airport uses the general aviation apron to load and unload cargo by contract carriers and in total transported approximately 15,000 lbs. of cargo in 2005.

Scheduled Passenger Service

Scheduled passenger service between Jacksonville and Charlotte is provided by US Airways Express. Passenger service between Jacksonville and Atlanta is provided by Delta Connection. Tables AE-1 and AE-2 describe the amenities provided to passengers in the main terminal at Albert J. Ellis as well as facilities necessary for commercial operations. As a part of the scheduled passenger service operation, space also is provided for maintenance and rescue personnel and operations in two separate facilities.

Airport Growth

In 2006 RS&H prepared the Master Plan update for the Albert J. Ellis Airport. Airport travel demand forecasts prepared as a part of that 2006 master plan update indicate that there will be growth in passenger enplanements (traffic) and general aviation aircraft traffic at the airport in the next 20 years. These forecasts were based on field data collected, Federal Aviation Administration and State (NCDOT-Division of Aviation) forecasts, historical trends, airport records, and discussions with airport personnel. A number of forecasts



were prepared by RS&H in the master planning process, some of which include:

Based Aircraft — In 2009, the airport had 23 based aircraft; forecasts indicate that by 2027, the airport is likely to have approximately 50 based aircraft. The number of aircraft and operations declined between 2008 and 2009 due to a general downturn in commercial air travel.

General Aviation Operations — In 2009, the airport reported 251,000 passengers arrived or departed annually Using a comparative analysis (local and statewide) between based aircraft and type of operation, RS&H estimated that by 2027 the airport could have as many as 40,500 general aviation operations annually.

Air Carrier Passengers — In 2001, the airport reported 29,500 annual enplaned passengers, which continued the trend of a steady decline in passenger enplanements dating to 1992. In 2002, the trend in the number of enplaned passengers began to reverse. In 2003, the airport experienced over 30,000 enplaned passengers, approximately equal to 2002. In support of the reversal of this trend, enplanements grew to approximately 73,000 in 2004. In 2009, the airport experienced nearly 263,000 passengers.

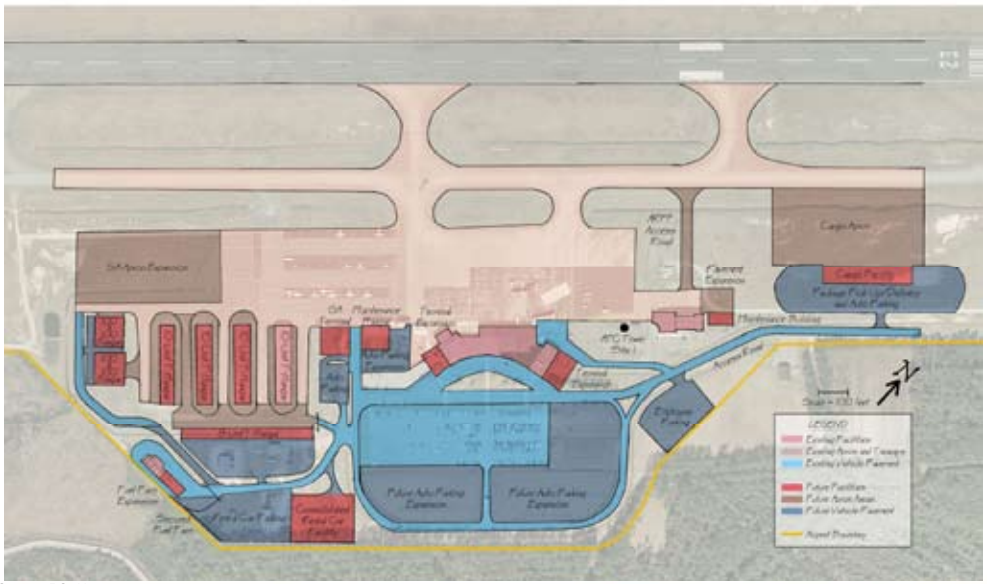
The master plan projects continued growth continuing through at least 2027. It should be noted that a disproportionate number are deployed Marines traveling to and from assignments are included in these projections. As these forces continue to be on duty at home and abroad, related enplanement projections are likely to be stable and may grow. When these forces return to a more normalized state of deployment, related enplanements may decrease.

Consistent with aviation passenger enplanement forecasting methodologies, four sets of 2020 forecasts were prepared and ranged from 200,900 to 67,000 annual enplanements. With additions of air service and improvements to existing service, the airport has the potential to reach the plan's "preferred enplanement forecast" of 3.7 percent annual growth thru 2027. Should additional or improved service not be available o feasible, it is less

Table AE-1

Source: RS&H Analysis, 2007

Minimal Development Alternative



likely that enplanements will grow considerably.

Total Operations — This forecast includes general aviation (40,500), air carrier (20,000), and military operations (10,000), which are forecast to increase to 90,500 annual operations by 2027.

Future Facility Recommendations

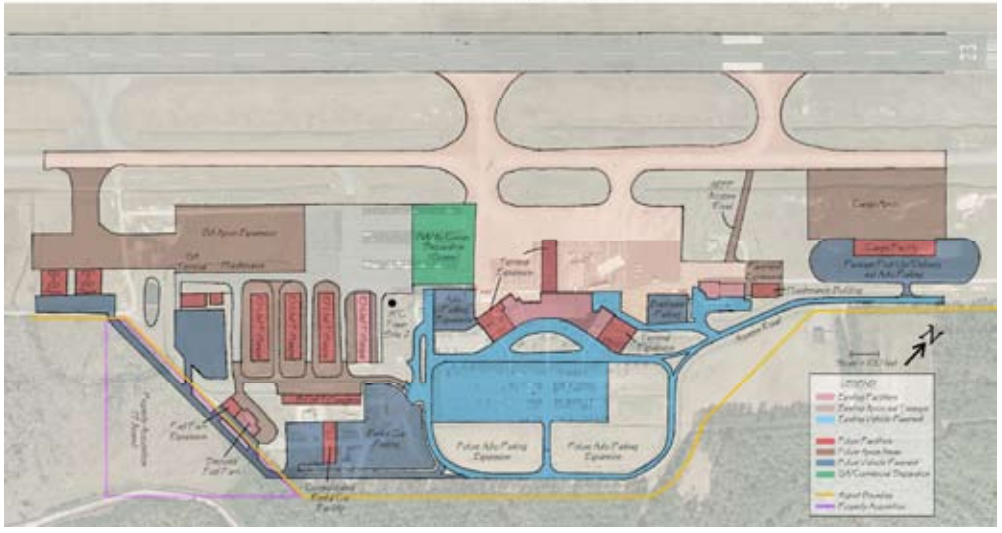
Parking is the primary issue at the airport. Currently, approximately 325 spaces are available—300 are typically occupied. This equates to a 90 percent occupancy rate. The master plan anticipates demand for an additional 328 spaces by 2027.

Additionally, the main passenger terminal is in need up upgrades and renovation or outright replacement. The existing passenger terminal at Albert J. Ellis Airport has approximately 32,296 square feet. The overall size of the building required to meet the demands placed upon it by the projected number of people that will use the building during 2007 is anticipated to be approximately 29,200 square feet. By the year 2010, approximately 39,200 square feet will be required; by the year 2017, 43,800 square feet and in 2027, 55,500 square feet are anticipated to be required. In anticipation of the projected growth in passenger traffic, it is anticipated that the existing passenger terminal would need to be expanded in 2010.

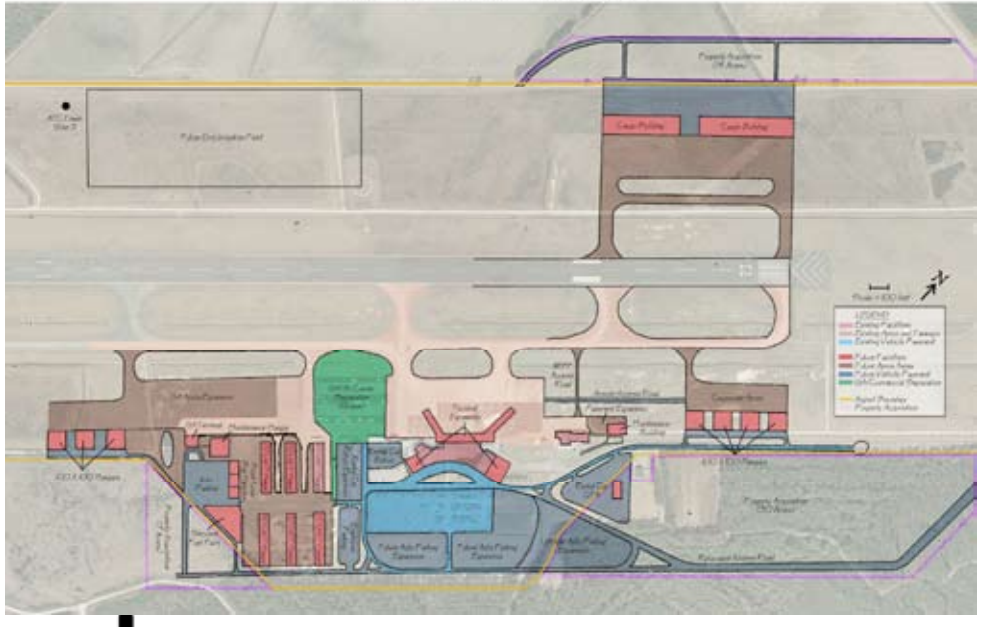
Based on an understanding of existing airport conditions and future forecasts prepared as a part of the planning process, RS&H developed recommendations to address existing challenges, provide facilities for the anticipated service expansions and meet the projected travel demand. Recommendations of the 2006 master plan include aircraft operations related improvements such as runway, taxiway, apron, and support equipment as well as terminal improvements.

The 2006 master plan identifies three future facility development options, a minimal, moderate and maximum alternative. The facility requirements provide the basis for the alternatives development. The genesis of each of the specific parameters for the alternative development evolved around the following:

Moderate Development Alternative



Aggressive Development Alternative



- A “minimal” development alternative used the parameters for maintaining all future development within the current Airport boundary and on the same side of the runway.
- The “moderate” development alternative allowed for future land acquisition to accommodate the development program, but required all development to remain on the same side of the runway.
- The “aggressive” development program also allowed for future land acquisition, but also evaluated the possibility of expanding the development across the runway.

Alternative 1 (Minimal Development) was developed with the goal of providing prudent, cost effective development solutions that included no additional land acquisition while improving the functionality of the Airport. The resulting development alternatives are provided in Figure 4-4 of the 2006 airport master plan.

Alternative 2 (Moderate Development) was developed to provide increased flexibility and efficiency with limited land acquisition by keeping future development in the general vicinity of current facilities, while providing room for growth. The resulting development is described here and depicted graphically in Figure 4-5 of the 2006 airport master plan.

Alternative 3 (Aggressive Development) is intended to address the potential that Albert J. Ellis Airport has over the next 20 years to become a vital transportation interface and economic engine for the region. This alternative considers property acquisition north of the Runway as well as more efficient Airport access through limited property acquisition on the terminal area side of the airfield. Alternative 3 is depicted graphically in Figure 4-6 of the 2006 airport master plan.

Stage I (0 to 5 years)	Stage II (6 to 20 years)
Rehabilitate general aviation apron	Rehabilitate parallel taxiway
Rehabilitate taxiway lighting	Acquire land (in approaches)
Rehabilitate electrical vault equipment	Extend runway to 7,500 feet and construct parallel taxiway to serve extension
Improve runway 23 drainage	Relocate localizer
	Construct a blast pad and holding bay on Runway 23

JACKSONVILLE, NORTH CAROLINA AL-5880 (FAA)

LOC/DME I-OAJ 108.7 Chan 24	APP CRS 052°	Rwy ldg 7100 TDZE 90 Apt Elev 94

ILS or LOC RWY 5

JACKSONVILLE/ALBERT J. ELLIS (OAJ)

ADF REQUIRED. When local altimeter setting not received, use Wilmington altimeter setting and increase all DA/MDA 100 feet, increase S-ILS all Cats and S-LOC Cats C/D visibility ¼ mile. VDP NA when using Wilmington altimeter setting.

MALSR

MISSED APPROACH: Climb to 600 then climbing left turn to 2100 direct ELLAS LOM/I-OAJ 7.3 DME and hold.

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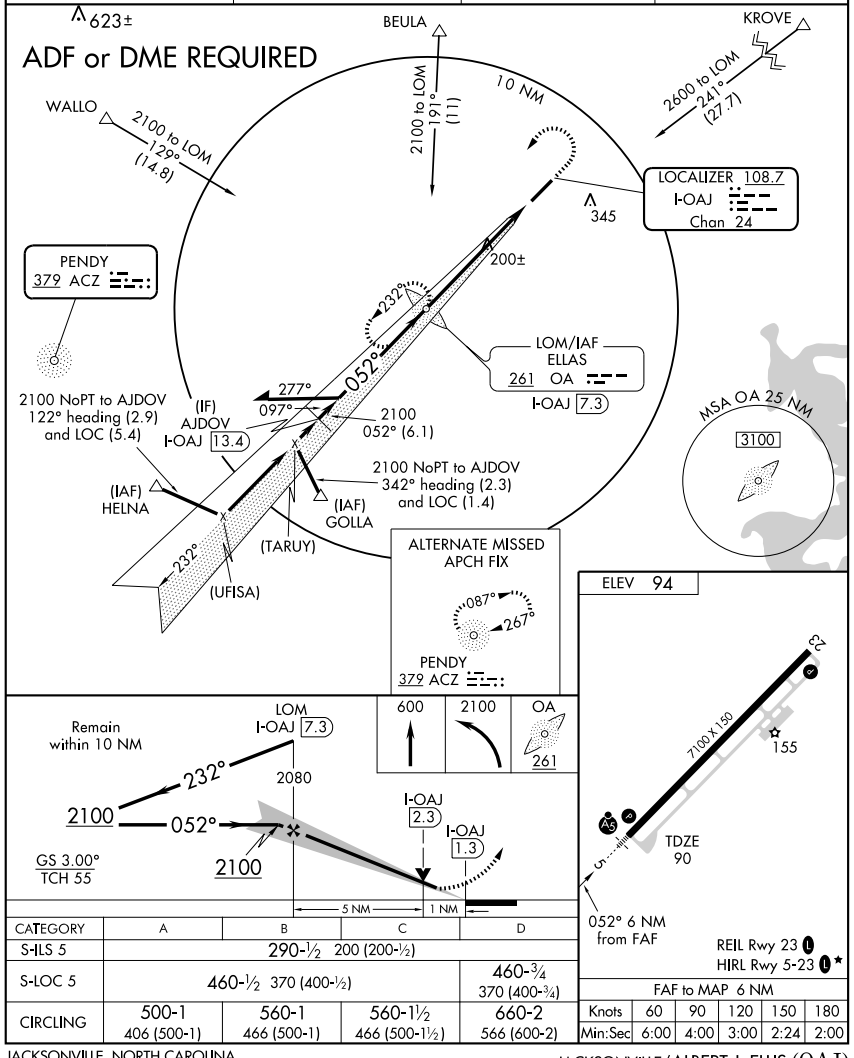


CATEGORY	A	B	C	D
S-ILS 5	290-½ 200 (200-½)			
S-LOC 5	460-½ 370 (400-½)			460-¾ 370 (400-¾)
CIRCLING	500-1 406 (500-1)	560-1 466 (500-1)	560-1½ 466 (500-1½)	660-2 566 (600-2)

FAF to MAP 6 NM

Knots	60	90	120	150	180
Min:Sec	6:00	4:00	3:00	2:24	2:00

JACKSONVILLE, NORTH CAROLINA
Amdt 8A 09295

34° 50′N - 77° 37′W

JACKSONVILLE/ALBERT J. ELLIS (OAJ)
ILS or LOC RWY 5

SE-2, 11 FEB 2010 to 11 MAR 2010

SE-2, 11 FEB 2010 to 11 MAR 2010

Freight Element

Element Overview

- Introduction
- Highway and Rail Freight Trends
- Review of Existing Conditions
- Existing Conditions
- Future Conditions
- Street Design Considerations

Introduction

The movement of goods is often overlooked by the general public. Freight activities play a vital role in our economy, which is increasingly dependent on our ability to move goods to market efficiently. Freight trips also have a higher impact per mile on our transportation network than other modes. Identifying elements of the transportation system to facilitate safe and efficient movement of freight is an important activity within the long-range transportation planning process. The movement of freight often occurs via different modes and transportation conduits that include:

- Highways (trucks, vans, cars)
- Railroads
- Airports (air transport)
- Maritime Ports (ships)
- Pipelines

Freight handlers have often believed that Metropolitan Planning Organizations may not understand what is needed for a successful business model for participants in the freight industry. At the same time shippers and carriers may not understand the planning process, along with its value and protocol. Communication between Metropolitan Planning Organizations and stakeholders in the freight industry can be difficult. This is due to the fact that desired planning data of interest to an MPO raises suspicions among freight industry stakeholders that the release of proprietary information may result in the loss of competitive position. This is compounded in the Jacksonville area due to the fact that many of the regular freight operators are not based in the region but provide regular or contract services to the region's military installations.

Historically, freight movement in the Jacksonville area has been by highway, rail and air transport. Jacksonville's primary highway freight routes to and from Jacksonville are the US 17 and US 258 corridors for north-south movement and NC 24 for east-west movement.

Rail access to Jacksonville is exclusively through the spur owned by the Department of Defense and affiliated with Norfolk Southern Corporation that runs between the North Carolina Railroad (Norfolk Southern corridor) in Havelock and MCB Camp Lejeune in Jacksonville and provides military related freight shipments only. Area military operations will continue to be the primary driver of freight by rail operations.

Air transport access is via the Albert J. Ellis Airport, located to the northwest of Jacksonville. Onslow County and the City of Jacksonville have a strong interest in improving their individual and collective economic outlooks. A portion of the local economy that is already dependent on access to a good transportation system includes local logistics companies and manufacturers as well as local and national retailers. For future uses, the City of Jacksonville has set aside a 55-acre industrial site on Western Boulevard, and the City and County are working collectively to promote the development of a 730-acre industrial park in the County. Continuing to provide a transportation system that is efficient and has the ability and capacity to move freight will be vital to the future success of these two development areas.

Highway and Rail Freight Trends

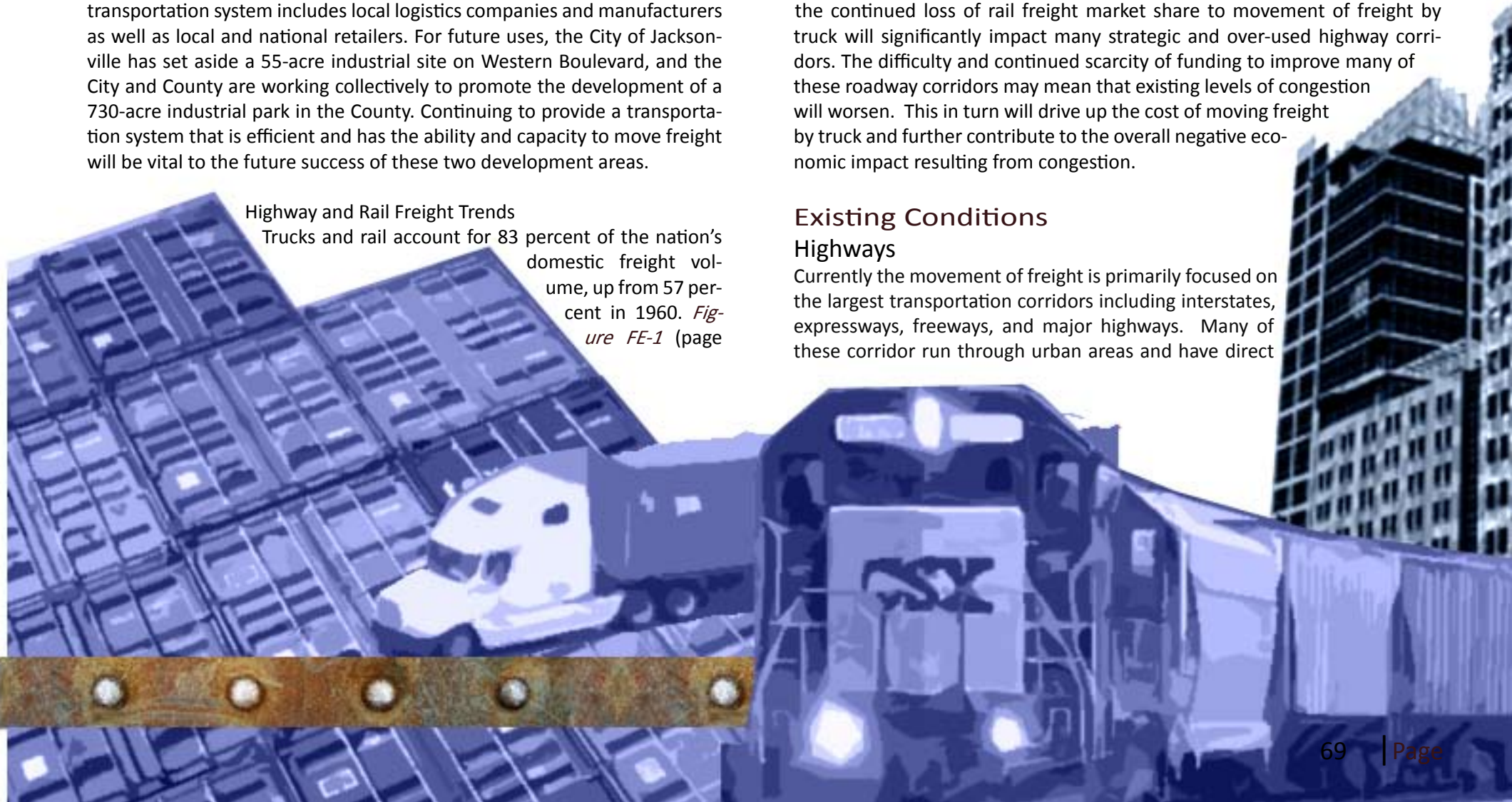
Trucks and rail account for 83 percent of the nation's domestic freight volume, up from 57 percent in 1960. *Figure FE-1* (page 71) illustrates that the balance is carried by other modal operations. Over the same period, the share of freight carried by rail has grown by five percent to 43 percent of the overall volume. At the same time truck transported freight has increased from 19 percent to 40 percent.

In terms of total ton mileage, freight carried by railroads has increased more than the other modes. *Figure FE-1* illustrates 2007 ton-miles by mode of transport. Despite recent resurgence in rail transportation, freight railroads have been experiencing a decreasing market share as a result of movement of freight by truck. The trend of freight movement by truck has facilitated "just in time" delivery; it has increased truck traffic, however, and correspondingly worsened traffic congestion on many highways. It is logical to assume that the continued loss of rail freight market share to movement of freight by truck will significantly impact many strategic and over-used highway corridors. The difficulty and continued scarcity of funding to improve many of these roadway corridors may mean that existing levels of congestion will worsen. This in turn will drive up the cost of moving freight by truck and further contribute to the overall negative economic impact resulting from congestion.

Existing Conditions

Highways

Currently the movement of freight is primarily focused on the largest transportation corridors including interstates, expressways, freeways, and major highways. Many of these corridor run through urban areas and have direct



access to railroads. In Jacksonville metropolitan area US 17, US 258, and NC 24 are the primary highway routes for freight movement. US 17 runs predominantly north-south and connects numerous coastal North Carolina communities as well as to eastern South Carolina and Virginia. In New Bern US 17 connects to US 70, which is a direct route to the west and to I-95. In Wilmington, US 17 connects to I-40. US 258 also runs predominantly north/south and connects to US 70 in Kinston. NC 24 provides a subregional connector to communities along the Crystal Coast and US 70 in Morehead City as well as a direct link to I-40 at Warsaw.

Rail

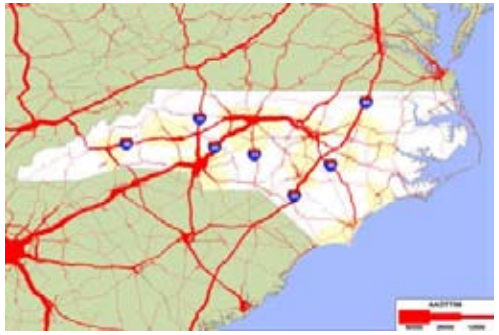
Currently, rail freight service to Jacksonville is limited to a spur line from MCAS Cherry Point in Havelock to MCB Camp Lejeune in Jacksonville as shown in Figure XX. The rail spur is affiliated with the Norfolk Southern Corporation and is owned by the Department of Defense. No commercial rail freight is moved on this line.

Future Conditions

As the Jacksonville area economy evolves, the volume of truck traffic is likely to increase. Regional partners should identify, designate and make necessary improvement to a network of primary and local truck routes throughout the metropolitan region.

During this process, the following recommendations should be considered.

- Truck Definition — Currently, trucks are defined as vehicles with a manufacturer's gross vehicle weight of 33,000 pounds or more. This definition excludes most single unit trucks, panel trucks, and delivery trucks as well as public service vehicles, such as garbage collection trucks. It includes larger trucks with more than two axles such as tractor-trailers and tandem axle dump trucks.
- Routes — Truck route designations should be sought for major routes and industrial/local delivery corridors. The following streets should be considered for a minimum two tier truck network designation: US 17, US 17 Business, US 258, NC 24, NC 53, NC 172, Lejeune Boulevard, Western Boulevard, Gum Branch Rd, and Piney Green Road upon completion of TIP Project U-3810. In addition, truck access to Camp Lejeune should include Holcomb Boulevard, Piney Green Road and the new Base Entrance Road upon completion of U-5132. Truck access to MCAS New River should continue to be managed with the secondary gate.
- Signage — Designated routes should be clearly marked at and within (as appropriate) municipal limits, major intersections, interchanges and other appropriate locations directing truck drivers to permitted routes. This may include limiting travel to US and NC routes and other designated routes through the municipalities. Within municipal limits consideration could be given to amending the local ordinance to specifically prohibit through trucks on non-truck network corridors. Prohibition of trucks on any segment of State maintained roadways requires approval from NCDOT.



Freight Flows in Jacksonvillle Area, 1998

- Industrial Use Areas — Efficient truck access is necessary and should be a part of the process from the outset of planning for future industrial areas. Adequate access that can accommodate unimpeded movement of freight without creating unwanted cut-through traffic.

Additional tasks associated with the establishment of truck routes through the metropolitan area should include:

- Adjusting signal timing (coordination) along high priority routes to reduce vehicle delay and maintain vehicle speeds within an acceptable range of the posted speed limit. Results of this could include travel time (and reliability), reduced noise (from accelerating and braking vehicles), and air pollution.
- Publishing and distributing educational materials to businesses and industries concerning truck routes.
- Working with NCDOT to prioritize resurfacing on designated routes in an effort to reduce noise and vibration from trucks.
- Working with NCDOT to make improvements to critical intersections on truck routes to more easily facilitate large vehicle movements and encour-

age their use by truckers. Improvements include providing adequate curb radii, lane width, and exclusive turn lanes.

Street Design Considerations

The design of all roadways should be consistent with their intended function and be responsive to the environment through which they pass. Streets serving as truck routes are not an exception. Common high priority design elements include adequate lane width, turning radii, horizontal and vertical transitions, and adequate space between the edge of the traveled way and adjacent pedestrian facilities. A general set of design considerations for truck routes and industrial streets include:

- Edge Treatment — Curb and gutter preferred in incorporated areas and a ditch or swale in unincorporated areas
- Median — Paved, flush with travel lanes
- Lane Widths — 12 feet
- Multimodal Accommodations — 5-foot sidewalks (minimum), 5-foot verge (minimum), coordination with transit stop placement
- Design/Posted Speed — 30-55 mph
- Curb Radius — 40 feet (minimum)
- On-Street Parking — Prohibited within 30 feet of intersections

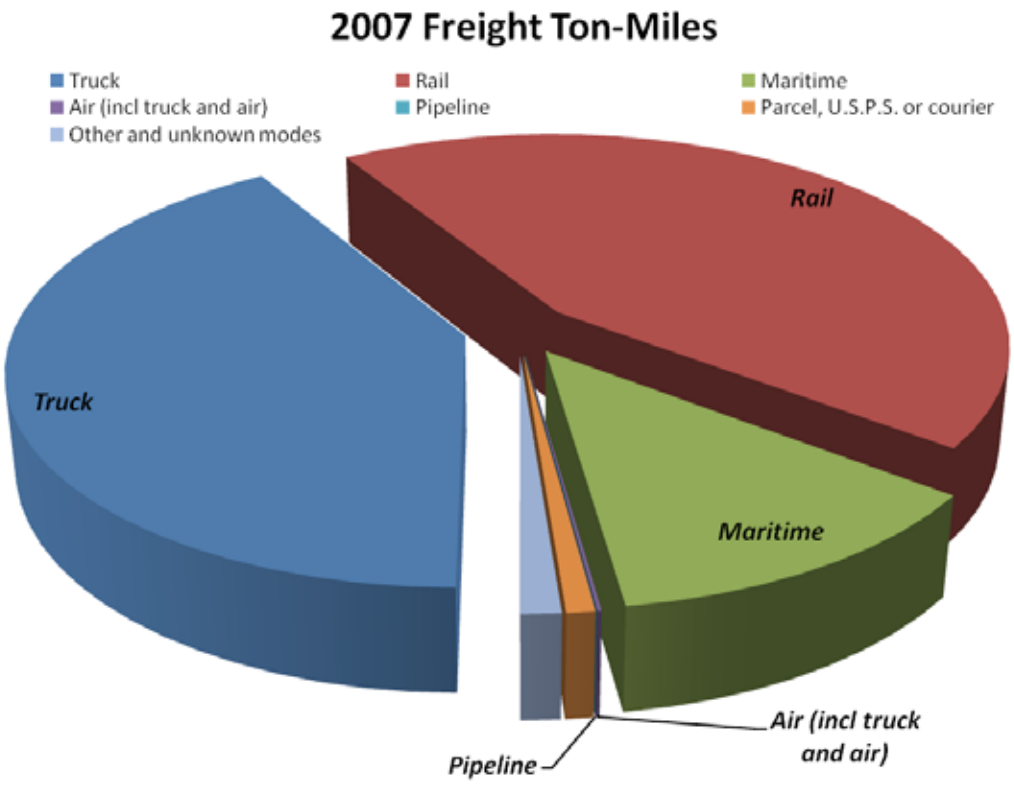
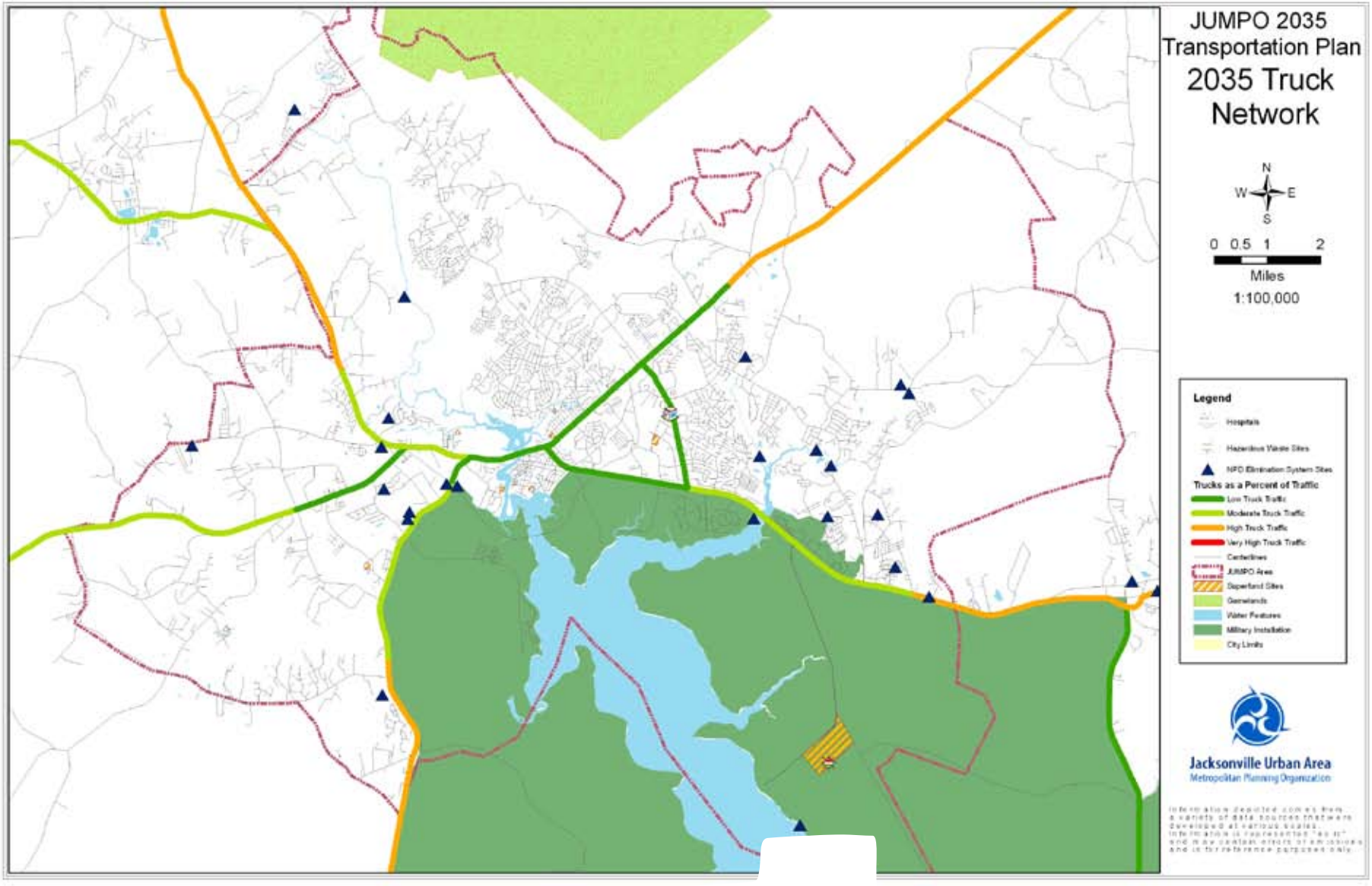


Table FE-1


JUMPO 2035
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Hazardous Waste Sites
NPD Elimination System Sites
Trucks as a Percent of Traffic
Low Truck Traffic
Moderate Truck Traffic
High Truck Traffic
Very High Truck Traffic
Centerlines
JUMPO Area
Superfund Sites
Wetlands
Water Features
Military Installation
City Limits
Jacksonville Urban Area
Metropolitan Planning Organization

Roadway Element

Element Overview

- Introduction
- Vehicle Miles of Travel Changes
- Vehicle Hours of Travel
- Vehicle Hours of Delay

Introduction

The principal method of assessing travel times and performance of the roadway system is through the practice of travel demand modeling. A travel model uses existing and forecasted estimates of population, employment and travel characteristics of the population combined with anticipated roadway improvements in the study area. The travel model then assesses the number of vehicle trips that are generated, their destinations, and their paths. The Jacksonville travel model does not assume variations according to times of day or different modes of travel like riding the bus or walking, but does account for differences in 2008 (the base year), 2020, and 2035 roadway networks. Performance measures such as level of services (based on delay calculated between the difference in free-flow travel time on every roadway "link" compared to the congested travel time on that same link), travel times, and speeds are used to analyze the performance of the roadway networks at different time periods and under different development conditions. This helps in determining the kinds of roadway expansions that may be need to produce a better level-of-service.

For this assessment, the 2020 Existing and Committed (written as 2020 E+C) and 2035 Transportation Plan (shown as 2035 TP) models were prepared by the North Carolina Department of Transportation (NCDOT). The following tables indicate the performance of the roadway system for 2002 (previous model), 2008, 2020, and 2035. Figure REM-1 (page 77) showns the major roadway capacity improvements forecasted and modeled for these time periods.

Table RE-1 (page 75) indicates the performance by the type of roadway (from "largest" to "smallest") and then by the assigned traffic volume (by link). Note that smaller-volume streets become increasingly rare in the later years of the modeling study (2020 and 2035). Also note (in Tables RE-2 and RE-3, page 76) that the major arterials, while comprising 17% of the model's roadway links in number, account for over 50% of the vehicle miles and hours of travel – and over 80% of the time spent in delay.

Table RE-1

Table RE-1. Vehicle Miles of Travel Changes					
Vehicle Miles of Travel	2002	2008	2020	2035	Trend
Total	2,133,699	2,273,417	2,741,409	3,270,223	
Freeway	-	-	369,892	413,805	
Major Arterial	1,447,222	1,542,797	1,565,168	1,840,002	
Minor Arterial	130,012	138,269	147,744	223,150	
Collector	153,728	167,845	181,929	206,934	
Ramp	352,579	370,582	409,109	508,535	
Local	50,157	53,924	67,567	77,797	
< 1,000 vpd	30,520	31,630	29,846	22,336	
1,000 - 2,500 vpd	113,582	108,567	109,975	100,654	
2,500 - 5,000 vpd	179,317	175,709	194,205	224,055	
5,000 - 10,000 vpd	239,592	215,722	249,407	332,363	
10,000 - 25,000 vpd	849,533	965,904	1,098,161	1,103,887	
25,000 - 50,000 vpd	602,399	651,341	1,027,187	1,299,844	
> 50,000 vpd	139,729	146,234	63,115	229,098	

Table RE-2. Vehicle Hours of Travel					
Vehicle Hours of Travel	2002	2008	2020	2035	Trend
Total	61,963	67,463	72,703	87,961	
Freeway	-	-	7,194	8,373	
Major Arterial	42,294	46,386	42,483	50,886	
Minor Arterial	3,652	3,951	4,363	6,108	
Collector	4,407	4,875	4,816	5,517	
Ramp	10,335	10,864	12,013	14,887	
Local	1,275	1,387	1,835	2,190	
< 1,000 vpd	780	805	787	616	
1,000 - 2,500 vpd	2,993	2,869	2,926	2,631	
2,500 - 5,000 vpd	4,840	4,783	5,228	6,129	
5,000 - 10,000 vpd	6,892	6,404	7,157	9,469	
10,000 - 25,000 vpd	22,087	25,633	28,647	29,552	
25,000 - 50,000 vpd	18,360	20,274	27,171	35,026	
> 50,000 vpd	6,900	7,641	2,032	6,726	

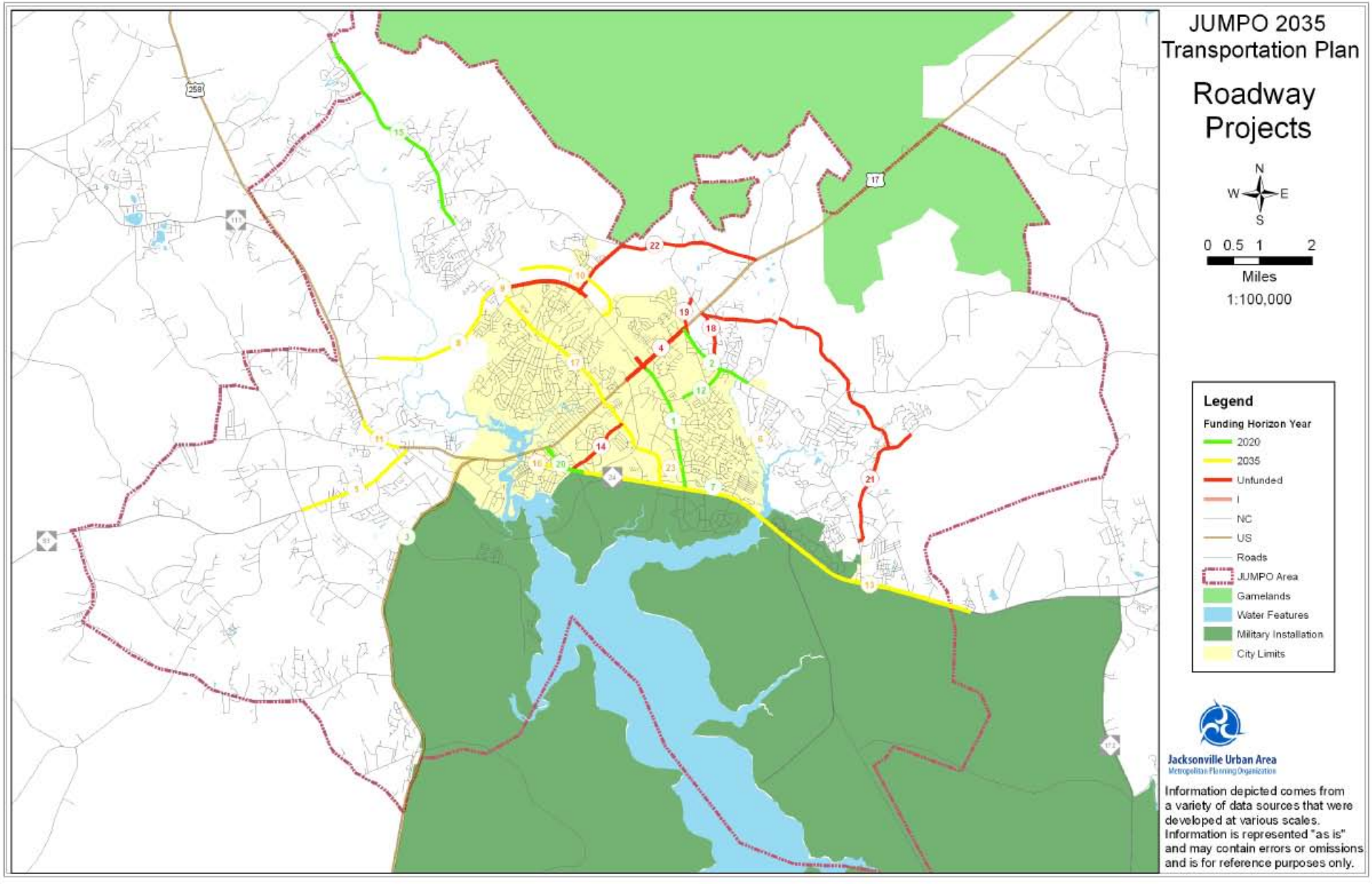
Table RE-3. Vehicle Hours of Delay (Congested Travel)					
Hours of Delay	2002	2008	2020	2035	Trend
Total	14,607	17,116	14,227	17,775	
Freeway	-	-	568	919	
Major Arterial	13,194	15,448	11,617	14,555	
Minor Arterial	733	847	1,126	1,075	
Collector	518	627	567	722	
Ramp	74	84	114	152	
Local	88	110	234	350	
< 1,000 vpd	1	1	1	1	
1,000 - 2,500 vpd	37	37	27	24	
2,500 - 5,000 vpd	288	304	381	378	
5,000 - 10,000 vpd	796	867	870	1,366	
10,000 - 25,000 vpd	4,752	5,744	5,882	6,150	
25,000 - 50,000 vpd	5,178	6,045	6,778	9,937	
> 50,000 vpd	3,927	4,529	689	1,010	

Table RE-4 (below) show the LOS changes in 2008, 2020, and 2035 networks from the travel demand model, which indicate a general degradation of performance over time even with the proposed improvements in place. Providing sufficient capacity to actually improve the performance of this system over time would require considerably more capital expenditures, environmental impact, and disruption to communities than the Transportation Plan system projects.

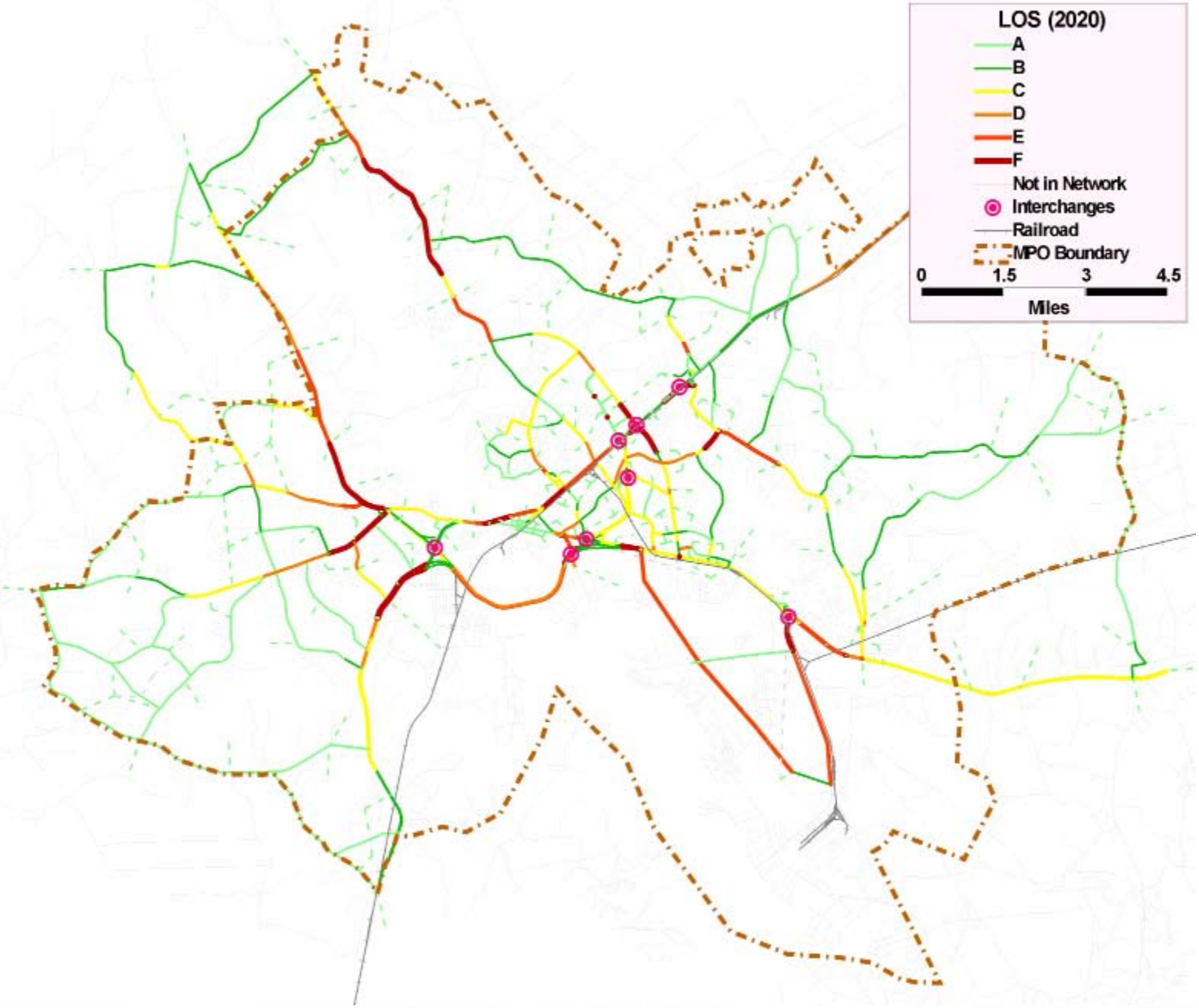
Table RE-4. LOS Changes in Model Network

LOS	2008	%	2020	%	2035	%
A	545	40	549	40	556	40
B	255	19	279	20	224	16
C	13	13	247	18	213	15
D	107	8	76	6	160	12
E	46	3	83	6	90	7
F	78	6	86	6	133	10

The maps in the figures at on the following pages (REM-2 and REM-3) indicate the Level-of-Service for both the 2020E+C (bottom) and 2035TP transportation networks, as they appear coming directly from the Jacksonville Regional Travel Demand Model. Note that by 2035, even newer roads such as the new MCB Camp Lejeune entrance road and Holcomb have started to realize congested conditions due in part to the growth associated with the Base and in part due to additional growth occurring throughout the region.

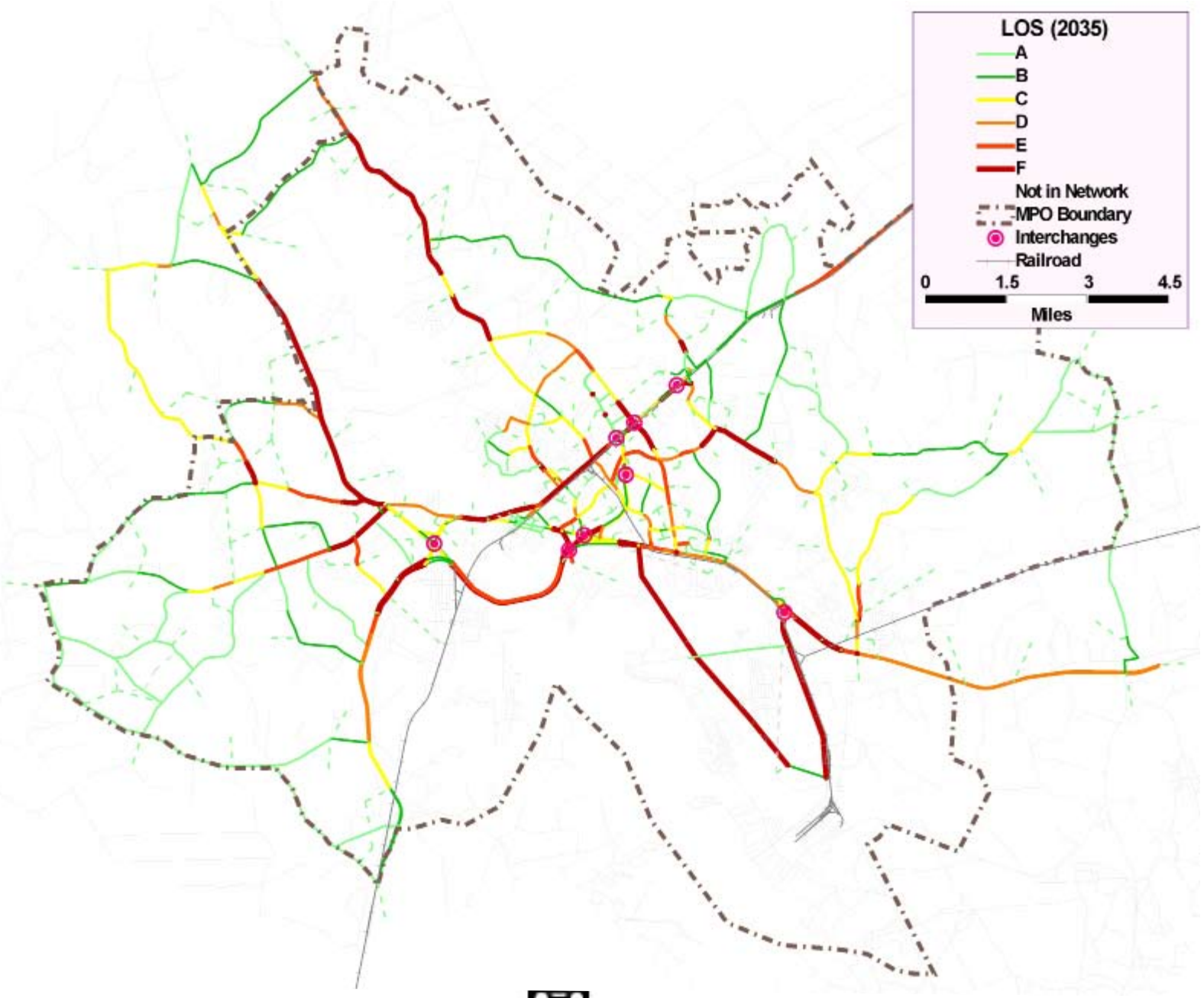


REM-1 : Major Roadway Projects



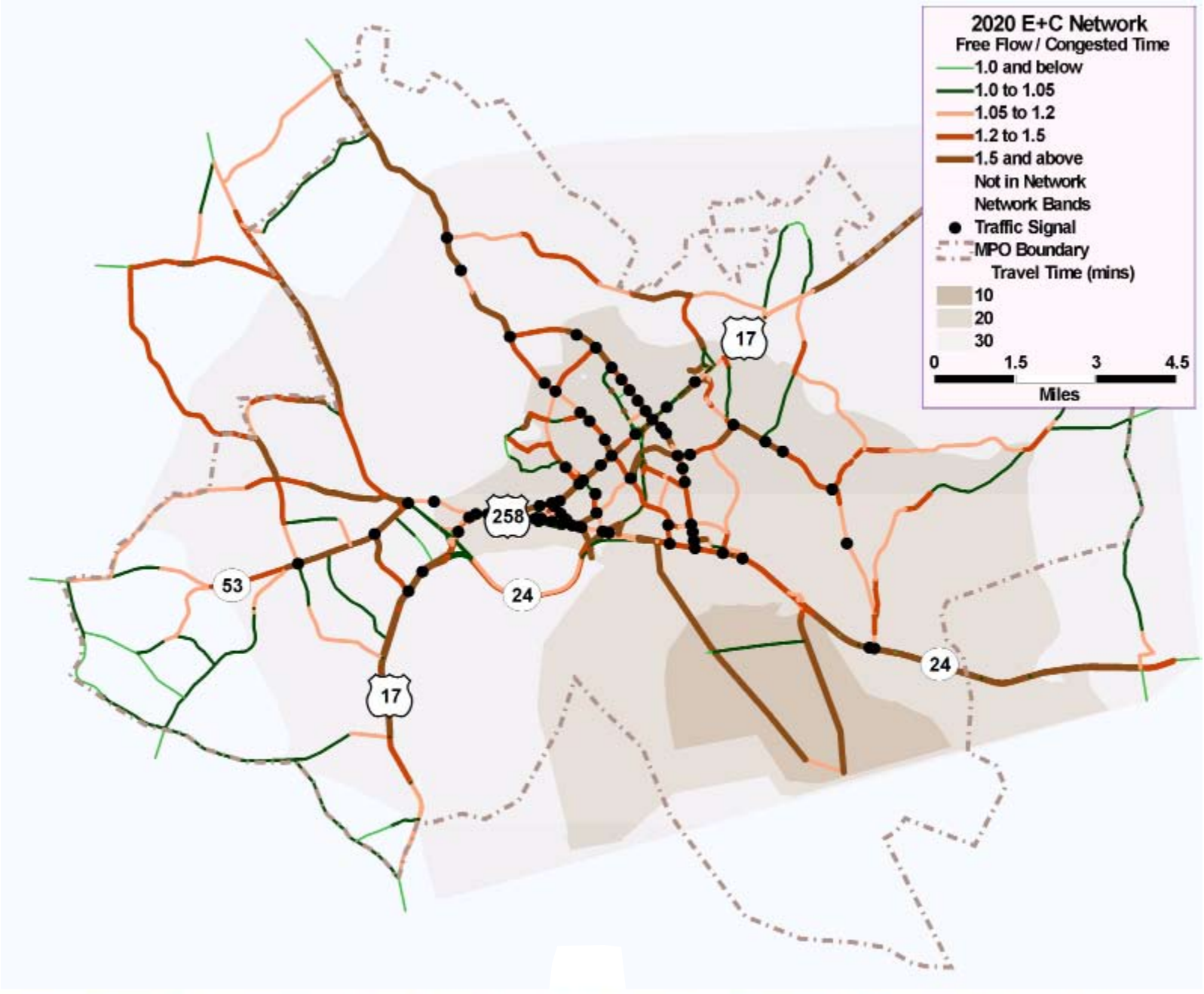
REM-2 : Level-of-Service Map (2020)

REM-3 : Level-of-Service Map (2035)



Finally, the figure at right (REM-4) exemplifies the how free-flow and congestion can be used to assess the deficiencies in the travel model. Here we are comparing the free flow travel compared to the congested travel time for each roadway "link" in the travel demand model network (2020E+C). Each of the small black dots indicates the location of an existing traffic signal. The delay encountered at traffic signals due to accommodating opposing turning movements safely and efficiently is a major source of delay, and not well-represented in many travel models except indirectly through assumptions about signal density/delay relationships. A value of 1.5 in this graphic indicates, for example, that free-flow travel speeds and times are 50% greater than the congested travel times, indicating a considerable degree of delay. This amount of delay is evident on a number of streets in the 2020 network, including the Base access roads, NC 53 and several center-city streets. On this same figure is a travel time isochrone in 10-minute increments represent how far a car could travel under congested conditions from a point located at the main Base entrance; these travel times are distended towards roadways and particularly along roadways with lower levels of congestion/delay.

Facing Page - REM-4: Comparison of Free-Flow and Congested Travel Times (2020 Existing and Committed Networks)


2020 E+C Network
Free Flow / Congested Time
1.0 and below
1.0 to 1.05
1.05 to 1.2
1.2 to 1.5
1.5 and above
Not in Network
Network Bands
Traffic Signal
MPO Boundary
Travel Time (mins)
10
20
30
0
1.5
3
4.5
Miles
17
258
53
24
17
24

Financial Element

Element Overview

- Requirements for and Purpose of Fiscal Constraint
- Methodology and General Considerations
- Roadway Investments
- Project Revenue Methodology
- Project Cost Methodology
- Results and Comparison of Revenues to Project Costs

Requirements for and Purpose of Fiscal Constraint

According to federal law, the long-range transportation plan of the MPO must contain

"a financial plan that demonstrates how the long-range transportation plan can be implemented, indicates resources from public and private sources that are reasonably expected to be made available to carry out the plan, and recommends any additional financing strategies for needed projects and programs." (23 U.S.C. 134(g)(2)(B) and 49 U.S.C. 5303(f)(B))

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) made numerous changes to the way in which fiscal conformity is to be conducted for the long-range transportation plan (LRTP).

The key considerations in the financial component – both revenues and costs – of the LRTP are as follows:

- Cooperation. The financial component and its assumptions should be reviewed with the appropriate State Department of Transportation, as well as transit operators within the Region (specifically, the Jacksonville Transit and Onslow United systems representatives).
- Reasonableness of Assumptions. The revenue streams should be forecasted from sources that are reasonably expected to be available. For instance, a future bond program where advance polling has indicated majority support from the populace could be reasonably included.
- Non-Construction Costs. Appendix B of the Statewide and Metropolitan Planning Rule (72 Fed. Reg. 7224), which dealt extensively with the Financial Plan and fiscal constraint, was removed from the final rule. However, operations, maintenance, modernization, and intelligent transportation system (ITS) measures should still

be included as project costs, although the content may be as simple as a review of "system-level estimates of costs and revenue sources that are reasonably expected to be available to adequately operate and maintain Federal-aid highways." O&M involving local and/or State shown as a "grouped line item" in the financial plans for the TIP and STIP.

- Year-of-Expenditure Dollars. This was included in the Final Ruling on Statewide and Metropolitan Planning (adopted 2.14.2007), and stipulates that all costs must ultimately be shown in Year of Expenditure (YOE) dollars. This is a substantial change, and implies that communicating the costs of projects to decision-makers will be considerably more challenging than the net present value (NPV) approach used previously by the majority of metropolitan planning organizations, including Jacksonville.
- Updating Revenue Sources. Although a determination of fiscal conformity cannot be rescinded if a funding source is subsequently removed, no action will be taken on amended or updated Transportation Improvement Program (TIP). This essentially means that the revenue forecasts must be kept up-to-date with respect to major revenue sources.
- Accuracy of Forecasts. After the first ten years, both project costs and revenues can be estimated in "bands" due to the difficulty in accurately reflecting costs and revenues far into the future. While the challenges inherent in creating cost estimates and revenue forecasts in the current economic climate are more severe than in the past, the practical use of revenue and cost bands still requires a process of individualized annual estimates of revenues and individualized project revenues.

In addition to these federal requirements, it is important to note that the reason that fiscal constraint of the long-range transportation plan is conducted in the first place is to provide credibility to the planning process. The public, elected officials, and other stakeholders should have a degree of surety that the LRTP is not a "wish list" of projects, but has some reasonable expectation of being implemented with future funds. Projects desirable but outside of the planning horizon and fiscal constraint are allowed to be shown in the LRTP as illustrative projects.

Methodology and General Considerations

One of the first decision points in creating a forecasting model for a system as complex as the transportation funding environment is how far to subdivide the revenue source information. The following push-pull diagram (Table FE-1) illustrates some of the competing benefits/dis-benefits that weighed into the process used for creating the model.

Table FE-1. Financial Planning Considerations

Advantage of Additional Detail		Disadvantage of Additional Detail
Provides more information to decision-makers	⇨⇦	*Potential for increasing confusion; more time-consuming to produce answers to questions*
Allows finer differentiation of revenue sources	⇨⇦	*Forecasts become unreliable at increasingly finer levels of detail*
Allows forecasting for specific project types	⇨⇦	*Data acquisition and updating more difficult*
Provides a better picture of current financial opportunities and conditions	⇨⇦	*Makes model changes more challenging; potentially more difficult to apply adjustment factors*

The following discussion highlights some of the factors that have played into, and will continue to influence, the revenue streams for transportation investments in Onslow County and across North Carolina for both new roadway and transit projects.

2.1 Roadway Investments

Roadway investments at the time of this analysis are undergoing considerable changes at the federal, state, and local levels. Federal funding has undergone declines in real expenditures, prompting a renewed interest in financing mechanisms that would supplement the federal gas tax. Congestion pricing and vehicle miles traveled (VMT) fees have received renewed interest, with the former being strongly considered in New York and other cities to alleviate downtown congestion and the latter the subject of a $16.5 million, two-year study by the Iowa Public Policy Center. Altering the fees based on the type of vehicle being driven, where it is being driven, and at what time of day are attractive economic incentives to reduce peak period congestion, but face an uphill battle with the public and elected officials.

North Carolina, after decades of refusing to consider the option, has created a turnpike authority that is sponsoring a number of projects in and around major urbanized areas. This option promises to be one of the only ways that the large capital required to start construction can be acquired for major new roadways, due in part to generally rising environmental and materials costs. Should these projects, implemented under a design-build model, prove to be faster to construct than through traditional methods, the number of projects competing for inclusion in the NCTA's mandate would certainly increase throughout the State as the new reality of fiscal austerity in state and federal sources becomes accepted as the norm.

Locally, Onslow and Jacksonville have generally weathered the current recessionary period fairly well. During the past two years, NCDOT has begun to strongly encourage towns to take over the maintenance of streets inside their jurisdiction. Additionally, legislation was passed that now allows counties in North Carolina to own and maintain their own roadways. Virginia, the only other state to have as comprehensive statewide ownership of its roadways as North Carolina, has seen two counties take over their own roadway systems. However, North Carolina has not established a financing system to reimburse either counties or cities for taking over these streets beyond Powell Bill funding. The venerable Powell Bill fund, first disbursed in 1951, is described in chapters 136-41.1 through 136-41.4 of the NC General Statutes and allows municipalities to get reimbursed for mileage of streets and population. Powell Bill revenues have been declining in real and even absolute terms over the most recent four-year period of record-keeping in Onslow County (Table FE-2). These figures are actually for the only municipality included in JUMPO, the City of Jacksonville.

Table FE-2. Powell Bill Expenditures in the JUMPO Planning Area, 2006 – 2009 (thousands of dollars)

Powell Bill Funds	2006	2007	2008	2009
Onslow County	$1,888	$2,137	$1,968	$1,826
Annual Rate of Change	-	13%	-8%	-7%

Key factors in recent years that have affected revenue forecasts include:

- American Recovery and Reinvestment Act (ARRA). The most significant recent event in revenue sources has been the Transportation sector of ARRA – worth some $30,000,000,000 nationwide. The funds were not spent evenly across modes of travel (only 2.9% were spent on public transportation and less than 1% on bicycle/pedestrian projects), and the majority in the roadway arena were spent on projects that were concerned with maintenance, repairs, or were "shovel-ready," meaning that all planning, design, permitting and right-of-way acquisition were essentially complete. As a sidenote, no other burst of federal revenues has ever been as closely tracked nationwide (across many states) as has ARRA funding due

to the significant reporting requirements that were attached to them.

- Senate Bill 1005 allowed the Department to spend $680 million ($20 million to public transportation) from the excess balance in the Highway Trust Fund.
- The Moving Ahead (House Bill 48) legislation authorized $630 million highway maintenance/modernization/preservation and $70 million for public transit, rail, and bicycle/pedestrian. The combination of both actions produced a cash-poor situation that drove the modeling effort that alerted the Department to start slowing down the construction process in the mid-2000's.
- GARVEE (Grant Anticipated Revenue Vehicles) bonds have not been included in past expenditures; but approximately $140 million (of the $950 million capacity set by state law) are available in any given year. The figure varies depending on how the equity formula affects each Division (i.e., does the Division have any margin in the State equity formula to fund a project now). The GARVEE bond option, which allows project financing at about a 4% interest rate, has been especially appealing in recent years due to the high (13.5%) annual inflation rate for steel and other construction products. However, the global recession has cooled demand for such products and hence changed the relative value of GARVEE financing packages. These bonds aren't "free money," since they will have to be paid back out of the apportionment of the equity fund district in which the project was constructed.
- Private and Public-Private initiatives will become an increasingly important player in the financing of new transportation infrastructure, especially in relationship to declining or flat federal and state revenues. While a single large development can add hundreds of thousands or even millions of dollars into the short-term revenue forecasts, the majority of private actions incur in very small increments. However, generalized assumptions can be applied about the relationship between population and employment growth and the amount of private revenues being used to foster small-scale projects such as intersection improvements, sidewalks, greenways, and signalization upgrades. However, these funds are generally not within the purview of the MPO to direct towards specific projects likely to be contained in the LRTP.

2.2 Transit Investments

A key consideration is the short-term and cyclical nature of transit investments. Transit operators seldom are required to forecast their capital needs beyond a five-year horizon; available state apportionments are seldom known with accuracy even five months before the start of the federal fiscal year (July 1st). Further, capital investments are extremely cyclical due to the wearing of equipment. Rolling stock purchases are made after a bus has reached eight years in operation or 500,000 odometer miles, whichever comes first. Non-periodic costs are incurred during system expansions or contractions, either as service areas (route lengths or number of routes), operating periods (length of service day, adding weekend service), or performance standards (decreasing headways) increase to accommodate new demands or simply as a result of policy decisions.

As noted in the previous section, the Moving Ahead legislation temporarily increased the transit allotment to the operators in the Region. Partly as a result, the trend figures for transit investments are highly variable.

3.0 Project Revenue Methodology

All of the forecasts were produced in the following manner. The philosophy behind the forecasting methodology recognizes that the tool needed to be flexible to allow various scenarios; be able to reflect both inflation and other factors that may influence the revenue streams; and provide output that could be related to the project costs.

Historical data was gathered from the following sources:

a. NCDOT – Most of the primary revenue streams for everything but transit, local, and private revenues were gathered from NCDOT sources. Staff also coordinated with NCDOT (Mike Stanley, Programming Branch) on 12.15.2010) to determine inflation rates and future conditions that may influence state- and federal-level funding practices.

b. Transit Operators – Staff worked with the MPO staff to gather revenue information about the five-year plans that all transit operators receiving federal dollars have to prepare and update. While not "historical," this information was thought to produce better forecasting estimates than prior year data, particularly in the more important early years of the forecast.

c. Municipalities – Staff gathered information from the City of Jacksonville to ascertain the level of local government spending on transportation

projects. The information was primarily derived from (1) Capital Improvement Programs (CIPs); and (2) Comprehensive Annual Financial Report (CAFRs).

d. Private Sector Participation – No jurisdiction in North Carolina keeps accurate and detailed historic revenue information from private development actions, which tend to be sporadic, unpredictable, and fast-paced. Forecasting private sector revenues is therefore highly problematic and unreliable. Hence, the determination was made to consider how each major capital project was likely to be funded, in part, by private sector financing. This determination was made if the project was to be constructed through an undeveloped area hat was considered likely for private development action or if private sector participation was already known to be committed for the project.

Historical spending figures were inserted into a MS-Excel workbook in the following manner:

a. Base Forecast. A Base Forecast sheet using trend functions to produce reasonable funding increases from the historical data that was gathered.

b. Forecast Management Options. A new sheet was created that allows a user to create various future forecasts based on different inflation factors and future conditions. The inflation factors were set

c. Adjusted Forecast. A new sheet was created that applies the adjustments from the Forecast Management sheet to the Base Forecast sheet. This is done in two steps (both on the same sheet): First, the inflation-adjusted figures are created on the left set of figures on this sheet; second, the right-hand table on this sheet depicts any additional adjustments that the user makes in the Forecast Management sheet. Revenue adjustments were conducted in "bands" of 1% to 2% to reflect uncertainty around inflationary effects that increase with the passage of time. Generally, inflationary effects are already accounted for in the projections of revenue, since each historic year is not set to a standard year. However, the additional 1%-2% applied provides a historically more accurate forecast due to increases in materials not typically accounted for in every past year.

Project Cost Methodology

Many of the roadway costs were calculated through efforts previously made by NCDOT or through ARRA applications in 2008-2009. The transit capital and annual operating expenses were calculated with the assistance of the Jacksonville Transit Division (under City Manager's Office). A typical revenue/hour figure of $60 to $70 was the foundation for these estimates.

In accordance with federal requirements, Current Year (Net Present Value) and Year of Expenditure (YOE) costs are shown for both 2020 and 2035. In both cases, a compounded inflation adjustment factor of 4% annually was applied to the current project costs to arrive at either 2020 or 2035 project cost estimates. A worst-case scenario was applied to each horizon year, with the costs assumed to be "lumped" towards the end of each horizon year period, thus incurring the maximum increase from inflation. This has the result of making the cost estimates considerably more conservative; however, histories of project delays and unexpected/rising expenses may well offset this conservative element of the project costs.

The table and charts on the facing page illustrate the financial forecasts by mode (Figures FE-1 and FE-2) and actual costs and revenue estimates by five-year horizon period and mode of travel (Table FE-3).

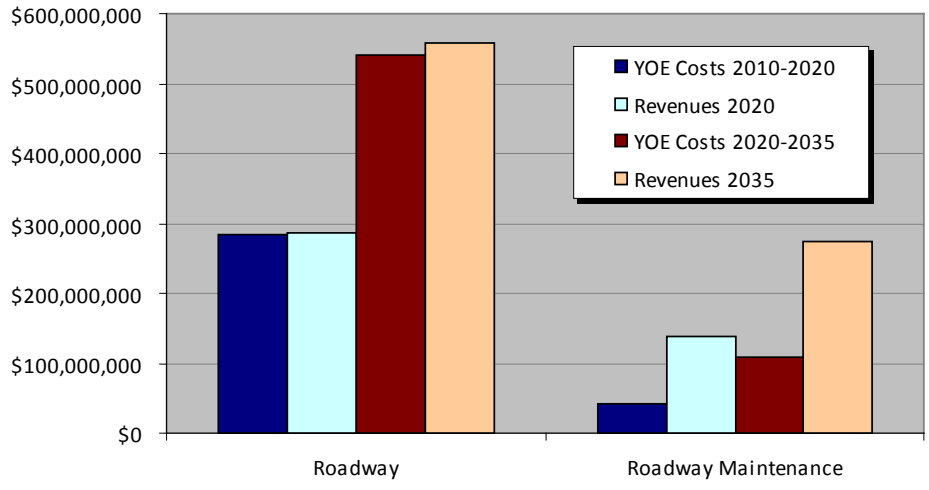
Comparison of Revenues to Project Costs

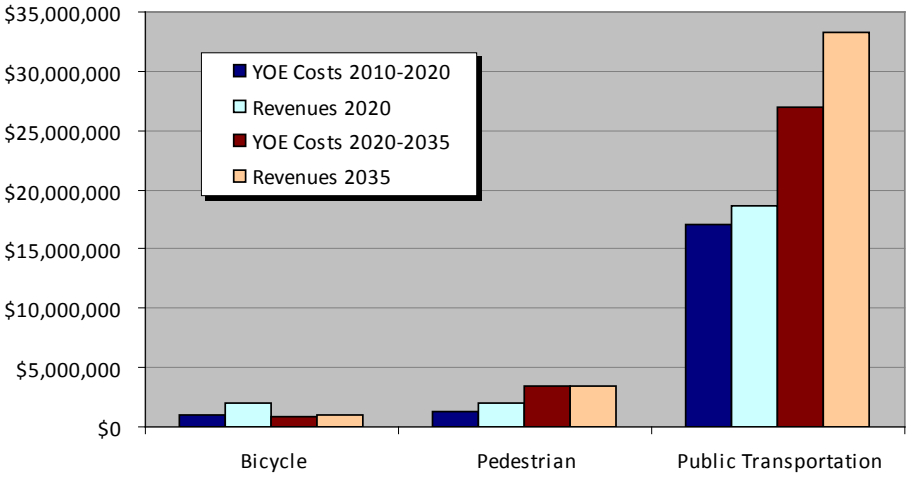
Table 4 illustrates the results of the annualized forecasts for both revenues and project, operating, and maintenance costs. Maintenance for roadways was assumed to be 15% of the total capital expenditures in 2020, and 20% of the 2035 horizon year capital due to the positive relationship between facility age and maintenance expenditures. Transit operating costs were derived from the Fiscal Year 2010 operating report and assumed to be held constant for each year of the two horizon periods (plus an additional amount for the new services. Note that project revenues for bicycle, pedestrian, and roadway were aggregated together due to the flexibility of funding sources inherent in the post-ISTEA environment. Similarly, public transportation services and operations are aggregated together.

The results of this assessment indicate that revenues are barely sufficient to cover the anticipated costs, assuming that 67% of state/federal revenues are used in TIP projects through 2020, and 75% of state/federal transportation

revenues are used for TIP development between 2020 and 2035. However, private development interests are expected to account for at least $30 million in construction revenues on the Western Boulevard Extension and Northwest Corridor (U-5106A) projects alone. Large surpluses in roadway maintenance are principally due to the fact that many of these funds never reach the TIP document and are therefore not accurately forecasted.

Figure FE-1 and 2. Cost and Revenue Forecasts, by Mode





Project Mode	YOE Costs 2010-2020	YOE Costs 2020-2035	Revenues 2020	Revenues 2035
Roadway	$284,729,000	$541,874,000	*These funds are viewed as generally flexible across multiple federal and state sources.*	
Bicycle	$1,069,000	$866,000		
Pedestrian	$1,323,000	$3,432,000		
TOTAL	***$287,121,000***	***$546,172,000***	***$290,328,000***	***$603,464,000***
Public Transportation Services	$2,071,000	$5,137,000	*These funds are viewed as generally flexible across multiple federal and state sources.*	
Operations (Public Transportation)	$17,028,862	$27,000,862		
TOTAL	***$2,071,000***	***$5,137,000***	***$18,636,000***	***$33,336,000***
Roadway Maintenance	$43,068,000	$109,234,000	$137,571,000	$273,035,000

Table FE-3. Cost and Revenue Forecasts in YOE Dollars

Modal Rank	Project	TIP #	Current Cost	Horizon Year	YOE Cost	Comments
Roadway Facilities			$598,434,200	Horizon	YOE	
1	Western Boulevard Improvements		$8,300,000	2020	$12,286,028	Construct Median & intersection improvements from US 17 to NC 24. Drainage Improvements at NC 24 & Western BoulevardIntersection are included in this estimate.
2	Piney Green Road Widening	U-3810B	$13,783,000	2020	$20,402,207	U-3810 has been divided into Part A & B. Construction funding is not programmed for Part B construction, which includes segment from Halltown Road to US Hwy 17.
3	Curtis Road Interchange		$20,000,000	2020	$29,604,886	Intersection improvements at MCAS New River main gate.
4	US 17 Bypass	U-4007C	$69,215,000	Unconstrained	$0	U-4007C is in the 09-15 TIP but is unfunded. This phase includes a grade seperated interchange at US Hwy 17 & Western Boulevard. Future phasing may be necessary
5	NC 53		$15,979,292	2035	$42,598,177	Widen to 4-lane, median divided from NC 24 to SR113 (Murrill Hill Road). 2.4 miles
6	Corbin Hemlock Connector	U-4409	$20,320,500	2035	$54,171,127	ROW estimate not available
7	Pine Valley Road		$1,600,000	2020	$2,368,391	Widen from NC 24 to Village Dr. & install dual left at NC 24.
8	Northwest Corridor	U-5106A	$99,200,000	2035	$264,450,964	Cost Estimates developed from NCDOT Feasiblity Study (11/07). Part A: US-258 to Gum Branch Road ; includes a bridge over the New River and Gum Branch/Western Boulevard interim improvements. Part funded by private interests (ROW dedication, two lanes, clearing/grubbing).
9	Northwest Corridor	U-5106C	$3,900,000	2020	$5,772,953	Gum Branch /Western Boulevard Interchange
10	Western Parkway Extension		$19,500,000	2035	$51,983,808	Gateway Drive North to Gum Branch Road. Part funded by private interests
11	US 258/NC24		$6,300,000	2035	$16,794,769	Widen US 258/NC 24 from the Maplehurst Ext. to US 17 Bypass
12	Country Club Road Widening (Bell Fork to Western)	U-4707	$24,219,000	2020	$35,850,036	Country Club Road has been widened to 3-lane facility with bicycle lanes from Bell Fork Road to Greenway Road
13	NC 24 Corridor Improvements		$25,766,408	2035	$68,689,027	Access Management, ITS, Drainage Improvements
14	Hargett Street		$9,900,000	Unconstrained	$0	Widen to 4-lane divided from Bell Fork Road to existing 4-lane section north of NC 24
15	Gum Branch Road	R-2126 (part)	$26,200,000	2020	$38,782,400	Widen from Summersill School Road to UAB (ultimately US258 in Richlands)
16	New Bridge Street Improvements		$2,500,000	2035	$6,664,591	Construct median & intersection improvements from Railroad to Lejeune Blvd.

17	Gum Branch Road / Bell Fork Road Improvements		$11,000,000	2035	$29,324,200	Construct Median & intersection improvements from Western Boulevardto US 17 Bus.
18	Wolf Swamp Road		$9,100,000	Unconstrained	$0	Widen to 4-lane divided from Piney Green to Fox Run Road new location Fox Run to Drummer Kellum
19	US 17 Bypass	U-4007D	$48,345,000	Unconstrained	$0	U-4007D is in the 09-15 TIP but is unfunded. This phase includes a grade seperated interchange at US Hwy 17 & Piney Green Road Future phasing may be necessary
20	Johnson BoulevardImprovements		$2,500,000	2020	$3,700,611	Construct median & intersection improvements from US 17 Bus. to Lejeune Blvd.
21	Thomas Humphrey/ Waters/Rocky Run Connection		$20,255,000	Unconstrained	$0	
22	Northwest Corridor	U-5106B	$46,000,000	Unconstrained	$0	Cost Estimates developed from NCDOT Feasiblity Study (11/07). Part B: Gum Branch Road to US Hwy 17 North; includes a grade sperated interchange at Western Boulevardand at US Hwy 17 North.
23	Brynn Marr Road		$2,700,000	2035	$7,197,758	Widen to 3-lanes from Western to Bell Fork
24	Priority Intersection Improvements		$7,000,000	2020	$10,361,710	Seven Locations including US 17 N. Superstreet Improvements
25	Drainage Improvements		$1,500,000	2020	$2,220,366	Onslow Dr. Bridge & Sandy Run Drainage Improvements
Obligated	Piney Green Road Widening	U-3810A	$50,151,000	2020	$74,235,731	Widening of Piney Green Road to four-lane, median-divided facility from NC 24 to Halltown Road. Note: Funds already obligated
Obligated	NC 24 Interchange New Base Road	U-5132	$26,000,000	2020	$38,486,351	New Interchange access point to Camp Lejeune. Note: Funds already obligated.
Obligated	Intelligent Transportation Systems (Signal System Coordination)	U-5168	$7,200,000	2020	$10,657,759	Traffic management and driver notification system; costs are for capital initiation only. Note: Funds already obligated
Bicycle Facilities			$1,047,273	Horizon	YOE	

1	Bike Lanes from Henderson Drive (River - Doris)		$250,000	2020	$370,061	Reconstruction/Widening (0.83 miles)
2	Bike Lanes from Henderson Drive (US17 - River)		$170,455	2020	$252,315	Reconstruction/Widening (0.57 miles)
3	Multi-Use Trail from Western Blvd. (Gateway N - US17)		$325,000	2035	$866,397	Multi-Use Trail (1.23 miles)
4	Bike Lanes from Western Blvd. (US17 - Huff)		$63,636	2020	$94,197	Reconfiguration (lane restriping) (1.33 miles)
5	Bike Lanes from Gum Branch Road (E. Doris - US17)		$47,273	2020	$69,976	ROW estimate not available (0.98 miles)
6	Bike Lanes from Hargett Street (NC24 - Bell Fork)		$63,636	2020	$94,197	Reconfiguration (lane restriping) (1.33 miles)
7	Bike Lanes from E. Railroad Street / Chaney Ave. (College - US17)		$28,182	2020	$41,716	Reconfiguration (lane restriping) (0.59 miles)
8	Bike Lanes from Gum Branch Road (Indian - E. Doris)		$42,727	2020	$63,246	Reconfiguration (lane restriping) (0.89 miles)
9	Bike Lanes from Johnson Blvd. (Chaney - Hargett)		$25,455	2020	$37,680	Reconfiguration (lane restriping) (0.53 miles)
10	Bike Lanes from Doris Ave. (Henderson - Gum Branch)		$30,909	2020	$45,753	Reconfiguration (lane restriping) (0.64 miles)

Pedestrian Facilities			$2,181,300	Horizon	YOE	
1	Sidewalk & Crosswalks on US17 (Henderson - Gum Branch)			2020	$0	Both Sides (feet)
2	Sidewalk & Crosswalks on NC24 (Sybil - Chaney)		$542,500	2035	$1,446,216	Both Sides (10850 feet)
3	Sidewalk & Crosswalks on Henderson Dr. (River - Doris)			2020	$0	Both Sides (feet)
4	Sidewalk & Crosswalks on Henderson Dr. (US 17 - River)		$225,000	2020	$333,055	Both Sides (4500 feet)
5	Sidewalk & Crosswalks on Western (US17 - Huff)		$239,000	2020	$353,778	Both Sides (4780 feet)
6	Sidewalk & Crosswalks on Hargett (NC24 - Bell Fork)		$42,500	2020	$62,910	Partial Both Sides (850 feet)
7	Multi-Use Trail on Western (Gateway N - US17)		$120,000	2020	$177,629	One Side Sidewalk/Double Side Trail (2400 feet)
8	Sidewalk & Crosswalks on Dewitt Street (Onslow - Gum Branch		$30,000	2020	$44,407	One Side (600 feet)
9	Multi-Use Trail on New River Greenway (Old Bridge - Phillips)		$744,800	2035	$1,985,515	Multi-Use Trail (5600 feet)

10	Sidewalk & Cross-walks on Gum Branch (E. Doris - US 17)		$237,500	2020	$351,558	Both Sides (4750 feet)
Public Transportation Services			$4,724,054	Horizon	YOE	
1	Mall to Camp Lejuene Hospital and Central Business District		$300,000	2020	$444,073	Roundtrip: 23 miles and 90 minutes
2	Downtown to Walmart and Senior Center/County Complex		$265,000	2020	$392,265	Roundtrip: 18.2 miles and 80 minutes
3	Mall to Piney Green Corridor		$250,000	2020	$370,061	Roundtrip: 14.7 miles and 75 minutes
4	Downtown to Gum Branch Road Corridor		$345,000	2020	$510,684	Roundtrip: 13 miles and 75 minutes
5	Downtown to Mall		$239,000	2020	$353,778	Roundtrip: 13.7 miles and 80 minutes
	Annual Operating and Maintenance		$1,662,527	2020	$2,460,946	One Year of Operating and Maintenance
	Annual Operating and Maintenance		$1,662,527	2035	$4,432,025	One Year of Operating and Maintenance

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