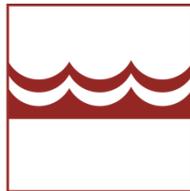


Cleveland Urban Area
METROPOLITAN PLANNING ORGANIZATION

2040 Regional Transportation Plan



DRAFT FINAL PLAN

April 2016

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Chapter 1

Introduction

This document is a Regional Transportation Plan (RTP) that provides a 25-year blueprint for transportation investments in the greater Cleveland area to the year 2040. It is multimodal, addressing the movement of people and goods by private auto and truck, ridesharing, public transportation, bicycling and walking, rail, and air.

The Cleveland area is recognized for its success in retaining and attracting jobs, particularly in manufacturing, at a time when many other parts of the country are finding it challenging to maintain the vitality of their local economies. Continued success depends on the region's ability to plan and adapt to the changing demands on its transportation system – not only its infrastructure such as roads, sidewalks, rail, ports and airport, but also its services, such as public transportation.

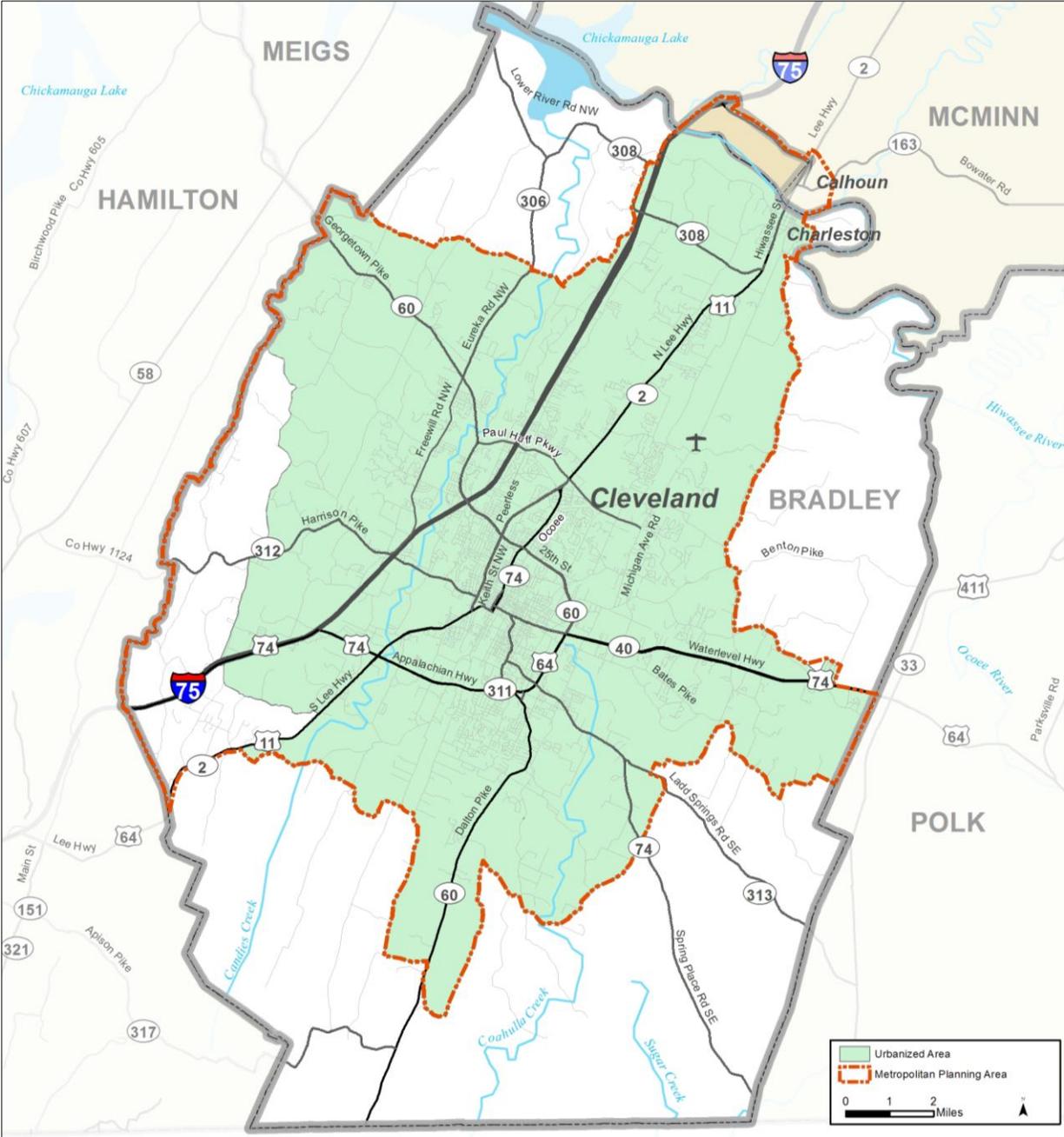
Regional leaders recognize the importance of a comprehensive strategy to actively manage the future, and have adopted various local plans that identify goals for future development, desired services, and quality of life. These plans, discussed further in Chapter 2, have provided guidance for the development of the 2040 Regional Transportation Plan so that its proposed transportation investments will support the implementation of other community goals.

What is the MPO?

The Cleveland MPO is one of more than 400 similar agencies across the U.S. which serve as a forum for cooperative transportation decision-making for a metropolitan planning area. MPOs are responsible for organizing and directing a formal transportation planning process. They follow a set of federal regulations designed to ensure that existing and future expenditures for transportation projects and programs are based on a continuing, cooperative, and comprehensive, or “3-C”, planning process. These regulations are set out by Congress as part of the federal act authorizing funds for surface transportation, which is updated periodically. The current legislation, *Fixing America's Surface Transportation*, also known as the FAST Act, was passed by Congress in December 2015 during the development of this plan. It replaces the previous legislation known as *Moving Ahead for Progress in the 21st Century* (MAP-21).

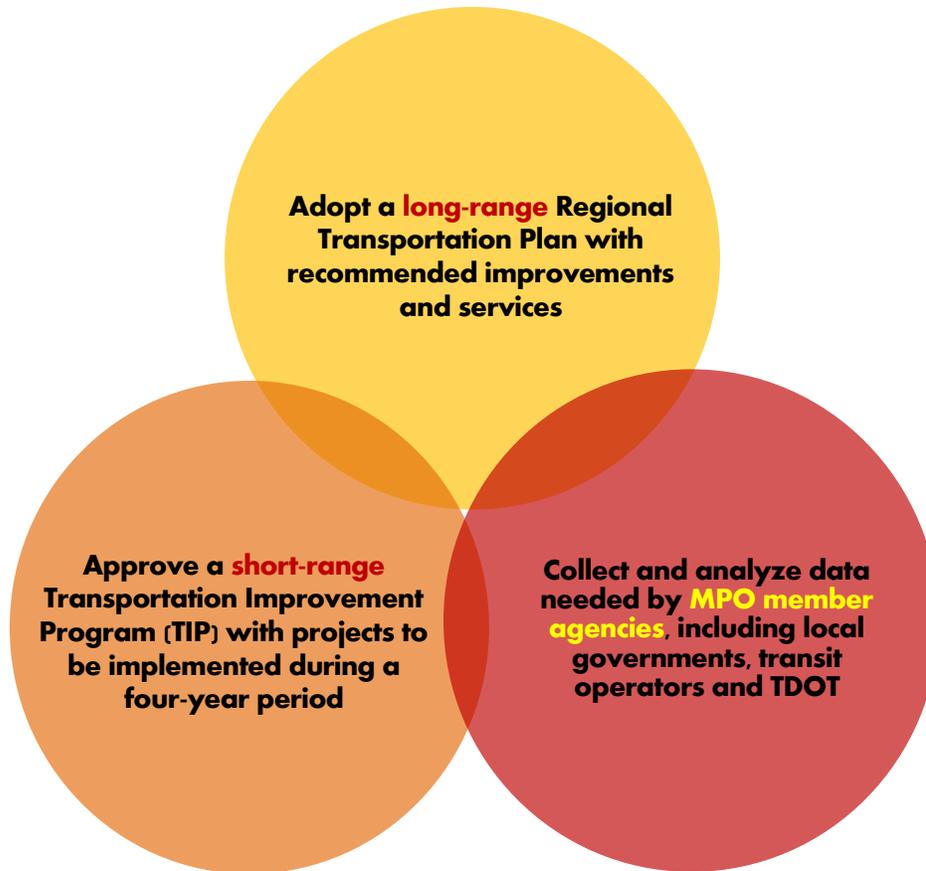
In 2000, the U.S. Census defined portions of Cleveland and Bradley County as an urbanized area with a population exceeding 50,000. In accordance with federal law, the Cleveland MPO was formed in 2003 to carry out transportation planning in Cleveland and the adjoining urbanized portions of Bradley County. When the decennial Census was updated in 2010, strong growth in the greater Cleveland area resulted in expansion of the urbanized area along the North Lee Highway corridor through the City of Charleston, crossing the Hiwassee River into McMinn County. To ensure that the entire urbanized area was encompassed, as federally required, the MPO's urbanized area was expanded in 2014. It now includes a larger portion of unincorporated Bradley County, the cities of Charleston and Calhoun, and a small unincorporated area of McMinn County where Resolute Forest Products is located. The MPO also expanded its metropolitan planning area, which is supposed to cover not only the current urbanized area but additional areas that are expected to become urbanized within the next 20-25 years. **Figure 1.1** shows both boundaries.

Figure 1.1: Boundary Map of the Cleveland Urban Area MPO



The MPO is responsible for carrying out the “3-C” transportation planning process and producing key documents that reflect the region’s transportation goals, plans, and services. Its core functions, shown in **Figure 1.2**, address both short-term and long-term planning that is based on ongoing analysis of regional conditions and trends. The MPO is also responsible for transportation programming, i.e. the decisions about which projects from the Regional Transportation Plan will be selected for near-term funding.

Figure 1.2: Core Functions of the Cleveland MPO



How the MPO is Organized

MPO members include the City of Cleveland, Bradley County, Cleveland/Bradley Chamber of Commerce, TDOT and other transportation-related agencies such as the Cleveland Urban Area Transit System and the Southeast Tennessee Development District. Through the MPO, some of those members receive and program federal funds for various transportation projects and programs.

The MPO is led by an Executive Board, which is the policy board of the MPO, a Technical Coordinating Committee (TCC) that provides recommendations to the Executive Board, and a professional MPO staff.

Executive Board

The Executive Board is responsible for carrying out the provisions of federal regulations which call for a continuing, comprehensive, and coordinated transportation planning and programming process. The Board provides administrative and fiscal oversight, reviews and approves all transportation planning and programming decisions, establishes study committees, and ensures proper allocation of planning and program funds.

The current composition of the Executive Board includes six elected and appointed officials from local governments, regional agencies, and the State of Tennessee. The Federal Highway Administration and the Federal Transit Administration are also represented on the Executive Board as ex-officio, non-voting members.

Members of the MPO Executive Board

- Governor, State of Tennessee
- Executive Director, Southeast Tennessee Human Resources Agency
- Bradley County Mayor
- City of Cleveland Mayor
- City of Cleveland Vice-Mayor
- McMinn County Mayor (currently; seat rotates annually to also include the mayors of Calhoun and Charleston)
- Federal Highway Administration (ex officio, non-voting)
- Federal Transit Administration (ex-officio, non-voting)

Technical Coordinating Committee

The Technical Coordinating Committee (TCC) is responsible for implementing all planning activities, based on the Executive Board's policy direction. Members provide input and review transportation plans, programs, and documentation in order to provide recommendations to the Executive Board for action.

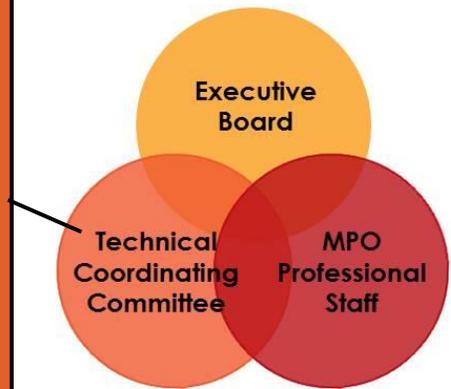
The TCC is comprised of a diverse group of transportation professionals, and advises the Executive Board members on all aspects of the planning process. It includes engineers, community and transportation planners, transit operators, and other professionals from federal, state, and local agencies.

The Chairman of the TCC is the Public Works Director for the City of Cleveland. The chairman, along with the MPO Transportation Planning Coordinator, is responsible for ensuring the coordination, direction, and supervision of the transportation planning process.

Technical Coordinating Committee

- City of Cleveland Development & Engineering Services Department
- City of Cleveland Finance Department
- City of Cleveland Public Works Department
- Bradley County Planning Department
- Bradley County Highway Department
- Bradley County appointee
- MPO appointee for Bicycle/Pedestrian Issues
- MPO appointee for Charleston/Bradley County
- MPO appointee for Calhoun/McMinn County
- Cleveland/Bradley County Chamber of Commerce
- Southeast Tennessee Development District and Rural Planning Organization (RPO)
- Southeast Tennessee Human Resource Agency (SETHRA) and Cleveland Urban Area Transit System (CUATS)
- Tennessee Department of Transportation
- Federal Highway Administration – Tennessee Division*
- Federal Transit Administration*

** Ex officio members*



MPO Professional Staff

The MPO is also served by professional staff including the MPO Coordinator, who is housed within the City of Cleveland’s Development and Engineering Services Department. The MPO Coordinator is responsible for all planning and administrative functions of the MPO. Staff works closely with the TCC and MPO Executive Board and performs many of the day-to-day planning duties and functions.

MPO Transportation Planning Process

The MPO is bound by its operating procedures, which are documented in the MPO’s Transportation Planning Prospectus. The Prospectus includes a brief history of the MPO, a listing of Executive Board and TCC members, and operating procedures. The Prospectus can be found on the MPO’s website and is periodically updated as needed to ensure the region maintains a continuous and comprehensive transportation planning process.

Unified Planning Work Program

The Unified Planning Work Program (UPWP) is a one to two-year plan containing work tasks and planning studies that will be carried out by the MPO to ensure that the region meets all federal and state mandates pertaining to transportation planning and programming.

Transportation Improvement Program

The Transportation Improvement Program (TIP) is a programming document that details a four-year budget of transportation projects. The TIP provides the opportunity to select projects from the RTP that are most suitable to the region’s current or short-term needs. The various agencies that are represented on the

Executive Board and TCC work through a cooperative process, including public involvement, to create the TIP document.

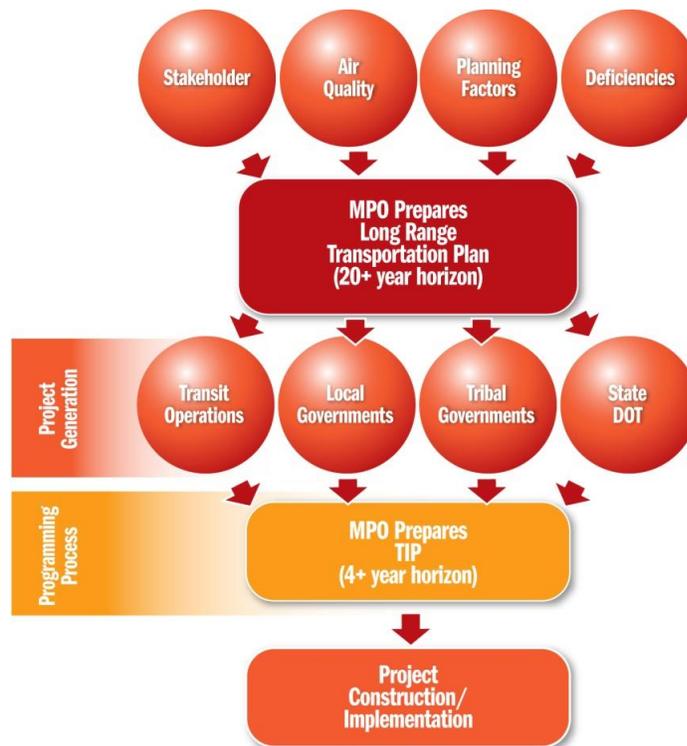
Regional Transportation Plan

The Regional Transportation Plan (RTP) is a long range (20+ years) multimodal program of strategies, capital projects and programs to guide the effective investment of public funds in transportation facilities in order to help manage congestion, increase regional mobility options, and conform to national air quality standards. The RTP is updated at least every five years and may be amended as a result of changes in projected federal, state, and local funding, major study findings, or significant changes in federal or state legislation.

The MPO is committed to a comprehensive transportation planning approach and has developed the 2040 Regional Transportation Plan in compliance with all applicable federal and state requirements for metropolitan transportation planning.

Figure 1.3 depicts the relationship between the RTP and the TIP as well as the Continuing, Comprehensive, and Cooperative (“3-C”) process that the MPO facilitates with all agencies represented on the TCC, during the development of the RTP and TIP. Once both the RTP and TIP are developed and adopted, the next phase is the construction/implementation of projects.

Figure 1.3: How the Regional Transportation Plan Relates to Project Funding and Implementation



Chapter 2

Local Plans & Development Trends

This chapter outlines development trends in the Cleveland MPO region, including projected changes in population and employment as well as the expected land use changes based on adopted local and regional plans. This information provides a foundation for understanding the region's growth patterns and their influence on transportation demand.

Area Covered by the Regional Transportation Plan

When the 2035 RTP was developed, the Cleveland Metropolitan Planning Organization (MPO) included the City of Cleveland and adjoining urbanized portions of Bradley County. Following the 2010 Census, strong growth in the greater Cleveland area led the U.S. Census to classify additional areas as urbanized. This includes the North Lee Highway corridor from Cleveland north through the City of Charleston, crossing the Hiwassee River into McMinn County. To ensure that the entire urbanized area was encompassed, as federally required, the MPO planning area (**Figure 2.1**) was expanded in 2014. It now includes a larger portion of unincorporated Bradley County, the cities of Charleston and Calhoun, and a small unincorporated area of McMinn County west of US 11/SR 2 where Resolute Forest Products (formerly Bowater) is located.

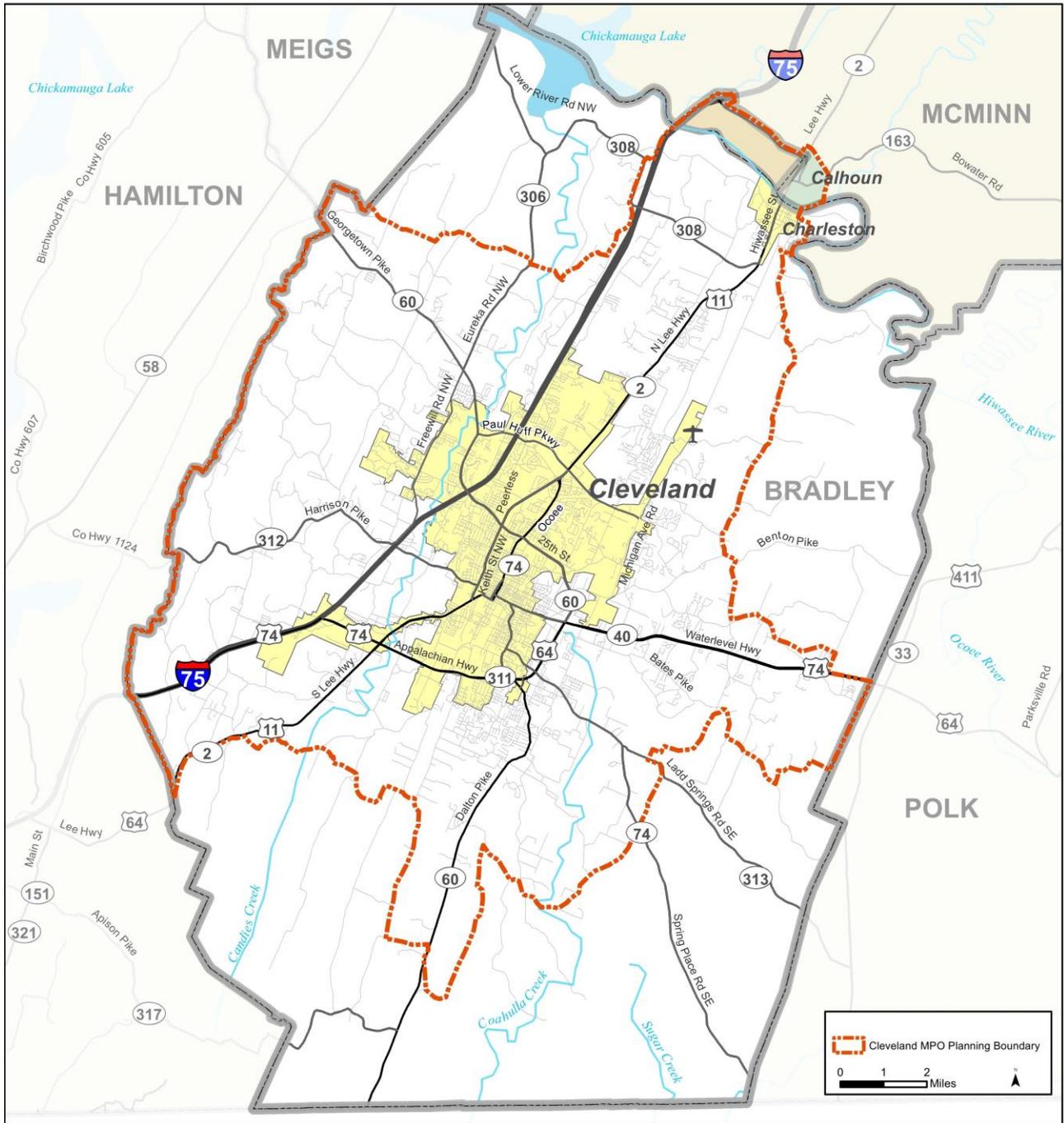
Overview

The greater Cleveland area is characterized by a traditional central business district (CBD)/government center with an adjacent medical and professional office area, a large private university, an older but vibrant urban industrial area, and strong downtown neighborhoods. Urban development has occurred in a fairly dense concentric fashion around the original downtown with a more recent spoke-like pattern along valleys and ridge lines. Substantial commercial development has occurred immediately west of the downtown on Keith Street, the first US 11 bypass and its subsequent connector to Interstate 75 (Exit 25), and the 25th Street/Georgetown Road corridor. More recent commercial development has occurred along the Paul Huff Parkway/Stuart Road Corridor that connects to Interstate 75 (Exit 27), along the APD 40 bypass near its intersection with SR 60/Dalton Pike, and at the western terminus of APD 40 at I-75 (Exit 20).

Much of the area's industrial development has occurred primarily in two places: along a corridor in northeast Cleveland generally defined by Old Tasso Road and Michigan Avenue Road/Dry Valley Road, and in south Cleveland near APD 40 and Westland Drive. Further industrial development is likely to continue along APD 40 in the next several years as the region completes a new interchange located between I-75 and North Lee Highway.

Significant growth has also occurred in the northern part of the MPO planning region, particularly in the vicinity of I-75 and SR 308 (Lauderdale Memorial Highway). Since the adoption of the 2035 Regional Transportation Plan this area has now become home to an Amazon distribution facility and the Wacker Polychemie manufacturing facility, which produces materials used to make solar panels and semiconductors. Major employers Olin, Lonza, and Resolute Forest Products are also located in this area along either side of the Hiwassee River, at the Bradley/McMinn county line.

Figure 2.1: Cleveland MPO Planning Area Boundary (effective 2014)



Local/Regional Plans that Guide Development

The Cleveland MPO has worked to integrate livability principles into the transportation planning process, including:

- More transportation choices
- Equitable/affordable housing
- Enhanced economic competitiveness
- Support for existing communities
- Policy coordination across issues and jurisdictions
- Leveraging investments
- Valuing communities and neighborhoods

The cities of Cleveland and Charleston, along with Bradley County, developed a joint *BCC 2035 Strategic Plan* in 2010, in which the MPO and TDOT also participated. The Strategic Plan envisions that future development will be focused on increasing densities where supporting infrastructure already exists (including transportation). The plan also calls for meeting housing needs across the income spectrum, supporting existing neighborhoods, and addressing economic development and freight needs.

Of particular relevance for the MPO's 2040 RTP are the three types of growth policies designated by the Strategic Plan:

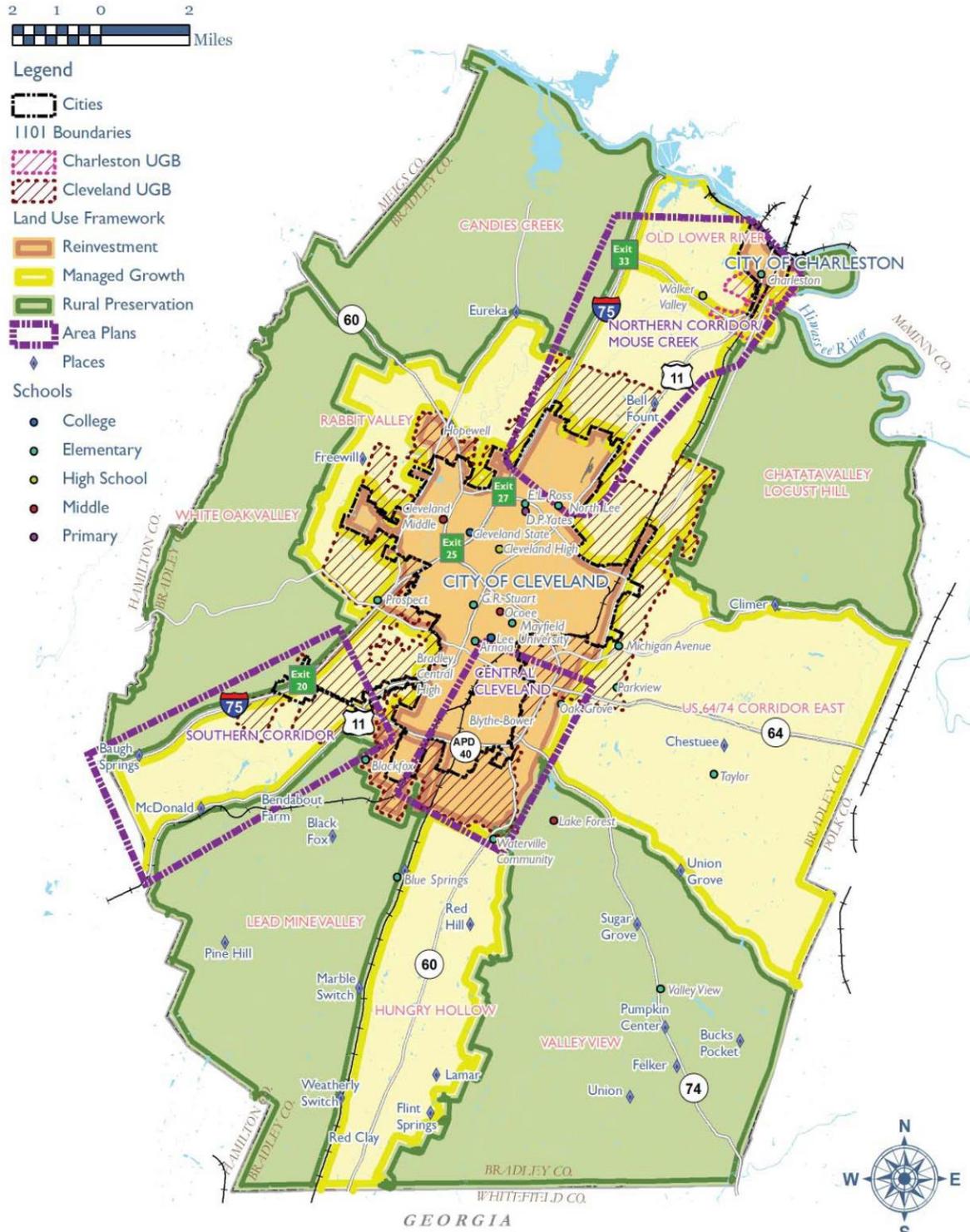
- **Reinvestment Areas:** Areas where growth will occur primarily as infill and redevelopment, with mixes of land use including multi-use buildings and residential densities that support *walkable neighborhoods* and *multimodal travel options*.
- **Managed Growth Areas:** Areas along major regional corridors and at the perimeter of the urbanized areas where the greatest development pressures are anticipated. These are targeted for coordinated planning of services, infrastructure and land use in the form of mixed-use town centers, traditional village style, and suburban neighborhoods.
- **Rural Preservation Areas:** Areas where the traditional agricultural and wooded landscape contributes both culturally and economically to the region's character and livability.

Figure 2.2 shows the planned application of these development policies within Bradley County. Nearly half of the future population is projected to locate within the Reinvestment Area designed as the Central City area of Cleveland. The remaining growth is planned to occur within Managed Growth Areas that are generally bounded by, or centered on, major transportation corridors. Focused development is planned for the areas between Interstate 75 and US 11/SR 2 (Lee Highway) on both the north and south side of Cleveland, extending to the county lines. Managed growth is also planned west of Cleveland along SR 60 (Georgetown Road), directly south of Cleveland along SR 60 (Dalton Pike) and for a large unincorporated area east of Cleveland, centered along US Highway 64/74.

Specific small area plans have been jointly adopted by Cleveland and Bradley County for the three areas where most new growth is expected to occur: the Central City Area, Northern Corridor, and Southern Corridor.

To ensure consistency with these locally adopted plans for development, the population and employment data used in the MPO's travel demand model were allocated geographically to reflect growth based on the development policies described above for each area.

Figure 2.2: BCC 2035 Strategic Plan Growth Framework



Future Population and Employment Growth

Regional control totals for future population and employment were developed in consultation with MPO and local staff, along with the use of traditional sources such as the University of Tennessee’s State Data Center and Woods & Poole.

Cleveland and the surrounding area is an active community attracting new residents and playing an increasing important role in the greater Chattanooga metropolitan area. The establishment of the Enterprise South industrial park in northeast Hamilton County, along with a strong development market in the suburbs of Ooltewah and Collegedale, is driving growth in the direction of Cleveland and is quickly beginning to fill in the previously undeveloped I-75 corridor between the Chattanooga and Cleveland urban areas. Between now and the year 2040, the Cleveland MPO region’s population is expected to grow by more than 25 percent, as shown in **Table 2.1**.

Table 2.1: Population Change in the Cleveland MPO region, 2010-2040

	2013 (model base year)	2040 (Projected)	Change, 2013-2040
Bradley County	102,293	128,343	25.5%
McMinn County (model portion)	3,219	4,342	34.9%

Although a notable proportion of Bradley County’s workforce commutes to Chattanooga (discussed in Chapter 4), the Cleveland area maintains a very strong job base of its own. **Table 2.2** shows the largest employers in the MPO region (those with more than 300 employees). While most are located in Cleveland, three companies are based in the northern part of the region in Charleston and Calhoun.

Table 2.2: Major Employers in the Cleveland MPO Region

Employer	Location	Employees
Whirlpool Corporation	Cleveland	1,503
Bradley County Schools	Throughout Bradley Co.	1,200
Skyridge Medical Center	Cleveland	1,157
Peyton’s Southeastern	Cleveland	950
Lee University	Cleveland	815
Jackson Furniture	Cleveland	800
Cleveland City Schools	Cleveland	664
Walmart (2 stores)	Cleveland	640
Amazon	Charleston	600
Mars Chocolate North America	Cleveland	575
Resolute Forest Products	Calhoun	548

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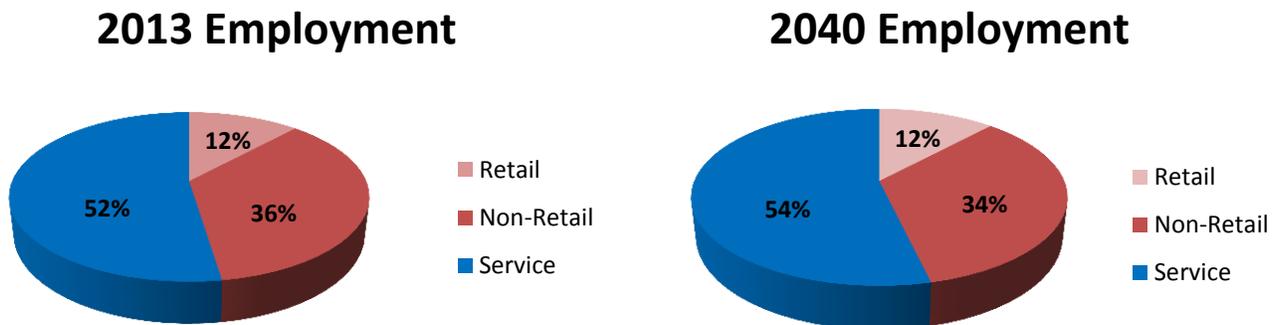
Table 2.2: Major Employers in the Cleveland MPO Region (cont.)

Employer	Location	Employees
Merck Consumer Care	Cleveland	537
Olin Corporation	Charleston	384
Whirlpool Xperience (call center)	Cleveland	375
Proctor & Gamble (Duracell)	Cleveland	350
Exel, Inc.	Cleveland	340
City of Cleveland	Cleveland	340

Table 2.3: Employment Change in the Cleveland MPO region, 2013-2040

	2013 (model base year)	2040 (Projected)	Change, 2013-2040
Bradley County	48,174	68,083	41.3%
McMinn County (model portion)	1,209	1,770	46.4%

Figure 2.3: Employment Composition in the Cleveland MPO region, 2013 and 2040



Accommodating these new residents and expanded workforce will require additional investment in various aspects of the region’s transportation system. The projects and services proposed in the 2040 RTP are designed to meet the growing needs, and the nature of those needs based on the guidance provided by locally adopted development plans.

Chapter 3

Plan Goals & Objectives

This chapter outlines the goals and objectives on which the 2040 Regional Transportation Plan is structured, and describes how performance measures will be used to monitor progress in implementing the plan.

Performance-Based Planning Framework

MAP-21 initiated a federal requirement for MPOs to incorporate the use of performance measures in their planning processes, including the RTP. The requirement is still applicable under the newly enacted FAST legislation and the U.S. Department of Transportation (U.S. DOT) is close to completing the federal rulemaking process which will provide guidance to state DOTs and MPOs.

The terms “goals” and “objectives” are used in many settings but have a very specific meaning in the planning profession. *Goals* are broad statements which tend to be qualitative or descriptive in nature, indicating a general direction for a plan. *Objectives* are intermediate steps that will be taken to reach a goal, and are more focused on specific actions. Goals typically have multiple objectives, each of which helps to define its intent and how the goal can be attained.

MPOs have always used goals and objectives in the development of their RTPs and other planning activities. What is relatively new in some regions is the expanded use of *performance measures*. These help to further refine or “operationalize” objectives by providing a quantifiable way to track their progress. In long-range planning they are also used to compare current performance to the projected future.

Most MPOs already have some form of performance measurement in their RTPs. These include common measures such as roadway level of service (a measure of how freely traffic is flowing) and volume to capacity ratio (which measures the volume of traffic relative to the number of roadway lanes). Regional travel demand models are used to generate these measures, along with the number of vehicle-miles traveled, vehicle-hours traveled, and vehicle-hours of delay. Several of these measures for the Cleveland region are presented in Chapter 4, providing a comparison of how well the roadway system functions under current conditions versus the conditions that are expected by the year 2040. Proposed transportation improvements can then be evaluated in terms of how much they are expected to improve future system performance.

Performance targets can also be set to indicate the maximum or minimum value desired. For example, a city may aim to have sidewalks along at least 75% of its roads, or a transit system may set a target to have at least 90% of its buses arrive within 2 minutes of their scheduled time.

The 2040 RTP includes a preliminary set of performance measures that may be updated or amended after U.S. DOT issues its guidance to states and MPOs. Once it is established what the specific measures will be, TDOT and the Cleveland MPO will work together to agree on specific target values. Local and regional transit agencies will also participate in setting targets for performance related to transit.

Federal Planning Factors Included in the RTP

Transportation investments that use federal funds – which includes the majority of investments in the Cleveland MPO area – must be guided by a long range plan that addresses multiple modes of transportation and specific factors such as mobility, safety, and others. These factors, shown in **Figure 3.1**, are outlined in the *Moving Ahead for Progress in the 21st Century* (MAP-21) federal legislation, which was in effect during the development of this plan, and have remained largely the same in the subsequent legislation that was enacted by Congress in December 2015, called *Fixing America’s Surface Transportation* (the FAST Act). Two additional planning factors were added by the FAST Act: considering the transportation’s system’s resiliency, i.e. its ability to withstand unexpected impacts, as well as addressing stormwater impacts.

U.S. DOT also identifies “planning emphasis areas” (PEAs) for which MPOs should focus additional efforts in order to advance certain Department priorities. **Figure 3.2** shows the current PEAs (as of FY16) and the ways in which they have been incorporated into the development of the Cleveland 2040 RTP.

Other laws that shape the RTP include Title VI of the Civil Rights Act of 1964, the Americans with Disabilities Act of 1990, and the National Environmental Policy Act (NEPA) of 1969. Each of these laws in some way has an impact on the type, location, and design of transportation facilities and services contained in the RTP.

Figure 3.1: Federal Metropolitan 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 nonmotorized users
Increase the security of the transportation system for motorized and nonmotorized users
Increase the accessibility and mobility of people and for freight
Protect and enhance the environment , promote energy conservation , and improve quality of life ; and promote consistency between transportation improvements and State and local planning growth and economic development patterns
Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight
Promote efficient system management and operations
Emphasize the preservation of the existing transportation system
Improve transportation system resiliency and reliability
Reduce or mitigate stormwater impacts on the surface transportation system

Figure 3.2: Federal Transportation Planning Emphasis Areas

<p>Transition to Performance-Based Planning and Programming</p> <p><i>Begin to integrate the measurement and reporting of transportation system performance into the MPO’s planning process, in preparation for the federal requirements that will be issued.</i></p>	<p>With the development of the 2040 RTP, the Cleveland MPO has identified a set of measures for congestion, safety and multimodal access that are based on data reasonably available to the MPO through its travel demand model, crash data, and ongoing inventory of transit routes and bicycle/pedestrian infrastructure. These measures can be replicated in the next LRTP update, allowing the public to track progress. Additional performance measures issued by U.S. DOT will be incorporated into the RTP as needed.</p>
<p>Promote Regional Cooperation</p> <p><i>Improve the effectiveness of transportation decision-making by encouraging coordination and communication among MPOs, RPOs, state DOTs, transit operators and similar agencies.</i></p>	<p>The Cleveland MPO participates in a number of important regional initiatives beyond its own boundaries. THRIVE 2055 is a regional strategic plan that involves counties from Tennessee, Georgia and Alabama. The MPO coordinates with its counterpart for the Chattanooga region on transit and rideshare planning issues. The MPO also communicates with the adjacent RPO, whose coordinator has been a member of the Technical Coordinating Committee for several years.</p>
<p>Ladders of Opportunity</p> <p><i>Ensure access to essential services such as employment, health care, education and recreation. Identify gaps in transportation connections to these services, particularly for traditionally underserved populations.</i></p>	<p>One of the adopted goals of the 2040 RTP is to increase citizens’ access to transportation choices that connect them with essential services and community activities. The plan devotes considerable analysis to the MPO population’s level of access to transit and bicycle/pedestrian facilities, and to identifying needs, including gaps.</p>

RTP Goals and Objectives

The adopted goals of the Cleveland MPO’s 2040 RTP, presented at the July 2015 Executive Board meeting and shown in **Figure 3.3**, incorporate the federal planning factors discussed above. Each goal is also accompanied by a set of objectives, many of which are oriented to key issues that have been identified through the analysis of transportation system needs, public and stakeholder input, and the region’s foundational planning activities described in Chapter 2.

For example, the City of Cleveland’s *Central City Subarea Plan* aims to attract infill development and redevelopment to the area just south of the downtown district, bringing additional residents and jobs to this area. The vision is to create a multimodal environment where people are comfortable walking, and destinations are close enough to accomplish most daily activities on foot or by taking transit. Some of the transportation-related decisions needed to support this vision include completing sidewalk gaps,

maintaining existing sidewalks in good condition, and increasing the hours that transit service is available.

Figure 3.3: Goals of the 2040 Regional Transportation Plan

1	Increase access to safe, convenient transportation choices that connect citizens with jobs, essential services, and community activities.
2	Prioritize funding to maintain the existing system of roads, transit, and non-motorized transportation facilities.
3	Select transportation investments that maintain economic vitality by enhancing the character and goals of the areas they serve.
4	Improve the safety and security of all transportation system users.
5	Promote efficient operation and management of the system, including the ability to maintain adequate operations when major incidents occur.
6	Make transportation decisions that are economically and environmentally sustainable and promote equitable access to community resources.

Figure 3.4 demonstrates the relationship between the goals and objectives of the 2040 RTP and the federally required transportation planning factors.

Figure 3.4: Relationship of National FAST Act Planning Factors to 2040 RTP Goals

FAST Act Planning Factor	2040 RTP Goal(s)
Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency	3, 5, 6
Increase the safety of the transportation system for motorized and nonmotorized users	1, 4
Increase the security of the transportation system for motorized and nonmotorized users	4
Increase the accessibility and mobility of people and for freight	1, 3
Protect and enhance the environment , promote energy conservation , and improve quality of life ; and promote consistency between transportation improvements and State and local planning growth and economic development patterns	6
Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight	1, 5
Promote efficient system management and operations	5
Emphasize the preservation of the existing transportation system	2
Improve transportation system resiliency and reliability	5, 6
Reduce or mitigate stormwater impacts on the surface transportation system	5, 6

Below are specific objectives representing action steps to be taken to implement each goal of the 2040 RTP. These objectives do not represent every possible action that could be taken; rather, they are focused to correspond to the issues most relevant to the Cleveland MPO region based on analysis, input and other local/regional plans.

Potential performance measures are also shown for certain sets of objectives. Once the federal guidance is available, these may be amended, as previously noted. Further work between TDOT and the MPO will also help address questions about what agency will be responsible for monitoring certain performance measures, such as pavement and bridge condition on the National Highway System (NHS).

Goal 1: Increase the availability of safe, convenient transportation choices that citizens can use to access jobs, essential services, and community activities.

OBJECTIVES

- Expand and connect the existing pedestrian and bicycle network as part of new development and redevelopment.
- Expand transit hours and service, both in areas with existing ridership and in new areas with strong ridership potential.
- Prioritize filling sidewalk gaps along routes with regular transit service and in other areas where people are frequently on foot.
- Create improved connectivity with Chattanooga and other parts of the greater metropolitan region.

Potential performance measure:

- Percent of population within a quarter-mile of fixed route transit service

Goal 2: Prioritize resources needed to maintain the existing system of roads, transit, and non-motorized transportation facilities.

OBJECTIVES

- Work cooperatively at the local, regional and state level to establish and maintain standards for the condition of various transportation assets.
- Track and report the condition of roads, sidewalks, and transit vehicles/infrastructure so that decision-makers have information and can anticipate needs before they become urgent
- Adopt and maintain regular schedules and budgets for maintenance of storm drains, street sweeping, transit vehicle maintenance/replacement, trimming of sidewalk trees, and similar activities.

Potential performance measures:

- Rating for pavement condition on NHS facilities
- Bridge rating on NHS facilities
- Percent of transit vehicles beyond their useful life

Goal 3: Select transportation investments that maintain economic vitality by enhancing the character and goals of the areas they serve.

OBJECTIVES

- In areas designated for infill and redevelopment, give priority to the creation/improvement of multimodal transportation facilities over adding roadway capacity.
- Maintain mobility by limiting new access points on major corridors such as APD 40 and SR 308, so that truck-dependent industries can continue to thrive. Encourage other types of growth to locate along corridors that emphasize access rather than speed.

Goal 4: Improve the safety and security of all transportation system users.

OBJECTIVES

- Focus on both near-term and long-term solutions to improve transportation safety along roads that are narrow or have no/limited shoulder width.
- Reduce the risks to motorists and road/utility workers by training local agencies and contractors on proper work zone management; ensure compliance through regular enforcement.
- Cooperate with local law enforcement agencies to enhance management and analysis of crash records, so that safety problems can be promptly identified and addressed.
- Emphasize projects that help reduce potential conflicts between modes of transportation, including roadway and rail, and motorized and non-motorized users.
- Continue to carry out emergency preparedness plans and update them regularly.

Potential performance measures:

- Number of fatal or serious injury crashes, motorized users
- Number of fatal or serious injury crashes involving pedestrians or cyclists

Goal 5: Promote efficient operation and management of the system, including the ability to maintain adequate operations when major incidents occur.

OBJECTIVES

- Update and continue to implement the Regional ITS Architecture.
- Promote development policies and other initiatives that manage traffic congestion, without adding new road-miles if possible.
- Encourage an interconnected transportation network that minimizes the number of miles needed to complete a trip, and provides multiple routes to reach the same destinations.

Potential performance measures:

- Annual vehicle-hours of delay based on MPO travel demand model

Goal 6: Make transportation decisions that are economically and environmentally sustainable and promote equitable access to community resources.

OBJECTIVES

- Minimize transportation projects that adversely affect environmentally sensitive resources and/or identified environmental justice communities.
- When designing transportation facilities, purchasing transportation equipment, and providing transportation services, promote economic and environmental sustainability by considering factors such as:
 - Lifecycle costs;
 - Energy efficiency;
 - Opportunities to create redundancy (i.e. backup systems and alternative routes);
 - Resistance to the potential impacts of climate change; and
 - Potential benefits for other infrastructure, such as stormwater drainage.
- Continue to expand the number of people in the region who have safe and convenient access to multiple modes of transportation.

Potential performance measures:

- Number of transportation projects requiring an environmental impact statement

Each of the transportation investments recommended in Chapter 5 contributes to the achievement of the goals and objectives outlined here. In many cases a proposed project or service will accomplish multiple goals and objectives. For example, improving transit service expands the availability of transportation choices, it has environmental benefits, and it helps to maintain economic vitality by providing more people with access to jobs.

Chapter 4

Analysis of the Transportation System

This chapter provides an overview of the region's transportation system and outlines the key transportation planning issues that face the MPO area. All major elements of the transportation network are addressed, including roads, transit, bicycle/pedestrian facilities, air, rail and waterways. This chapter also discusses the transportation issues that cut across multiple modes: freight movement, systems operations and management, safety, and security.

Roads & Bridges

Roadways are the foundation of the transportation system for the movement of people and freight throughout the greater Cleveland region. They serve as the backbone for transit operations and bicycle and pedestrian travel as well.

For planning purposes, roads are often designated in terms of their functional classification, which is based on the character of the transportation service they are intended to provide.

The MPO's functional classification map (**Figure 4.1**) designates urban roads in the area as interstates, freeways/expressways, principal arterials, major arterials, or major and minor collectors. Functional classifications for area roadways were updated as necessary by TDOT and the MPO following the expansion of the MPO's urbanized area boundary to reflect 2010 Census data.

Interstates and Freeways

Interstates/Freeways are limited access divided highways with grade separated junctions and without traffic lights or stop signs.

Examples of Interstates/Freeways:

- Interstate 75 at Exit 20 (APD 40) to Exit 33 (Lauderdale Highway); and
- APD 40 from Waterlevel Highway (US 64) to Interstate 75 at Exit 20 to the MPO boundary.

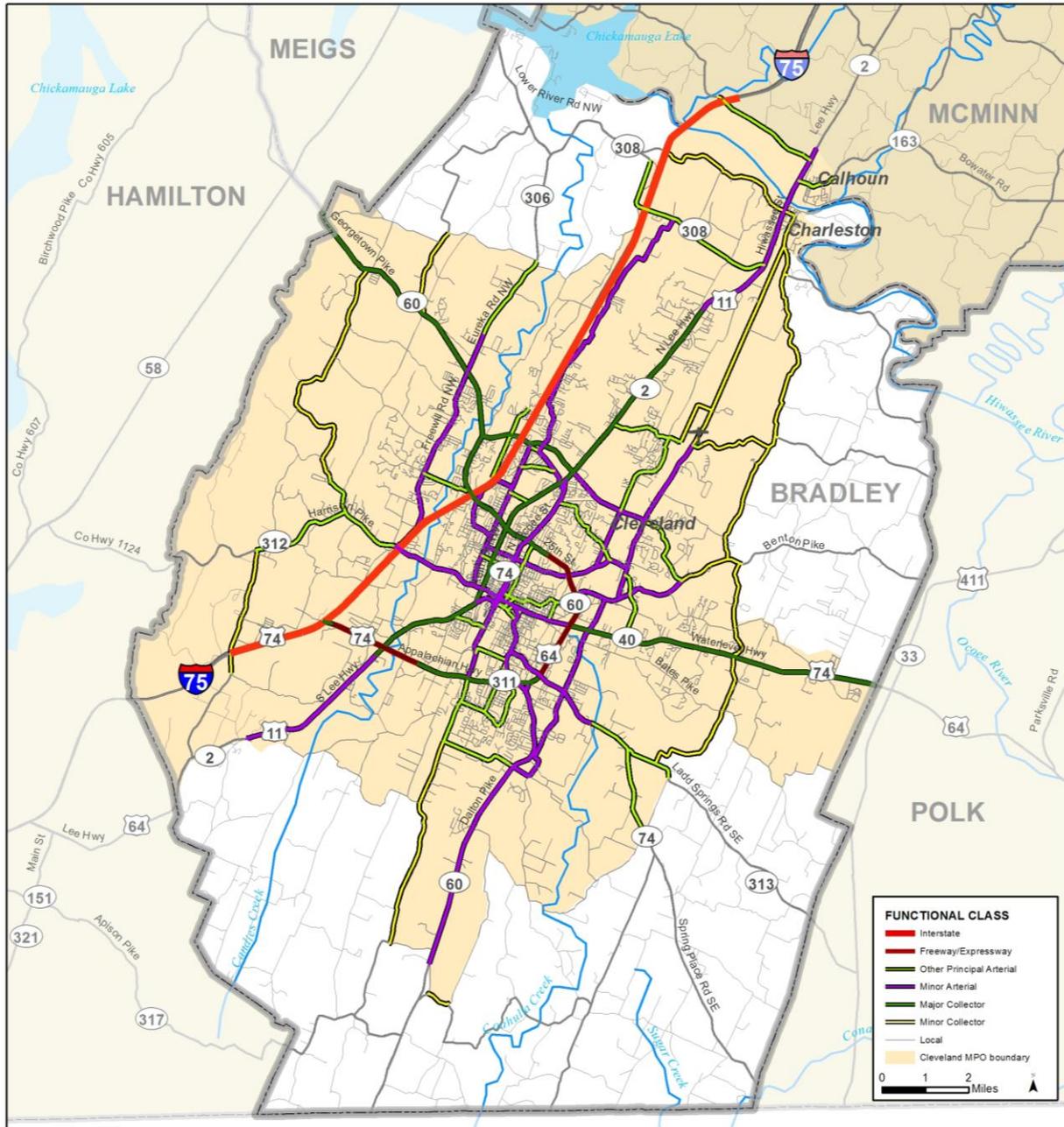
Principal Arterials

The principal arterial system serves the major centers of activity of the MPO area, the highest traffic volume corridors, and the longest trip destinations. These roads carry most of the trips entering and leaving the urban area, as well as the majority of thru-movements desiring to bypass the central city. These roads link to the interstates and freeways. With the passage of MAP-21 in 2012, all principal arterials also became part of the National Highway System.

Examples of Principal Arterials:

- US 64/APD 40/25th Street/ Georgetown Road
- Paul Huff Parkway from North Lee Highway to Georgetown Road
- North Lee Highway/Keith Street/South Lee Highway

Figure 4.1: Cleveland MPO Area Roadway Functional Classifications



Minor Arterials

Minor arterials are intended for trips of more moderate length and serve smaller geographic areas, providing connections within a community. They supplement and link to the higher arterial system.

Examples of Minor Arterials:

- Blue Springs Road/South Ocoee Street/North Ocoee Street from Keith Street to APD 40
- Dry Valley Road/Michigan Avenue Road
- Georgetown Road/Westside Drive/Norman Chapel Road loop

Collectors

The collector street system provides both access to land and traffic circulation within residential neighborhoods, commercial and industrial areas. Unlike arterial roads, it is common for collector roads to pass through residential neighborhoods to “collect” traffic from local neighborhood streets and channel it into the arterial system. In the central business district and other areas of similar development and traffic density, the collector system may include the street grid which forms a logical entity for traffic circulation.

Examples of Urban Collectors:

- Benton Pike/6th Street/Gaut Street/Central Avenue from APD 40 to Broad Street
- South Lee Highway from APD 40 to south end of MPO boundary
- Tasso Lane

Local Streets

The local street system is made up of all other facilities. Local streets’ primary function is to provide direct access to properties. Buses typically do not run on local roads.

Daily Traffic

Traffic counts across the Bradley and McMinn portions of the MPO are shown in **Figure 4.2**. These represent locations where TDOT collects annual data to estimate the number of vehicles traveling those routes on a daily basis. As one would expect, the highest traffic volumes in the region occur on Interstate 75, with volumes between 40,000 and 50,000 vehicles per day. Next highest are 25th Street and Paul Huff Parkway, which range from 25,000 to 35,000 vehicles per day, then Keith Street (US 11/SR 2) and the APD-40 bypass (SR 311).

Figure 4.3 and **Table 4.1** show locations where traffic volumes have increased significantly since the last Regional Transportation Plan. High growth areas include 25th Street (SR 60) at US 11/SR 2 (Keith Street); recently developed commercial areas along Paul Huff Parkway near I-75; and the roads in the vicinity of Whirlpool, which has relocated to Benton Pike near 25th Street since the 2035 RTP was prepared.

Table 4.1: Top 10 Locations with the Highest Traffic Growth, 2010 to 2014

Station	Route	Section	2014 AADT	2010 AADT	Change	Pct Change
63	25th St (SR 60)	at US 11/SR2 (Keith St)	30,219	25,711	5,257	18%
80	SR 60	Inman St to SR 74 (Spring Place Rd S.E.)	33,390	30,910	3,912	8%
167	I-75	SR 60 (25 th St) to Paul Huff Pkwy	48,437	44,341	3,684	9%
60	I-75	APD-40 to SR 60 (25 th St)	50,639	47,109	3,291	7%
62	APD-40 (SR 311)	I-75 to US 11/SR 2 (S. Lee Hwy)	21,483	19,701	3,254	9%
119	20 th St N.E.	SR 60 (25 th St) to Old Tasso Rd	14,418	11,349	3,180	27%
96	25 th St (SR 60)	20 th St N.E. to Benton Pk	30,992	27,367	2,732	13%
78	I-75	Paul Huff Pkwy to SR-308 (Exit 33)	44,498	41,426	2,584	7%
31	US 64/74	APD-40 to Durkee Rd	23,969	21,671	2,298	11%
79	APD-40 (SR 311)	Varnell Rd to Industrial Dr S.W.	21,216	19,602	2,185	8%

Figure 4.2: Adjusted Average Daily Traffic in the Cleveland region, 2014

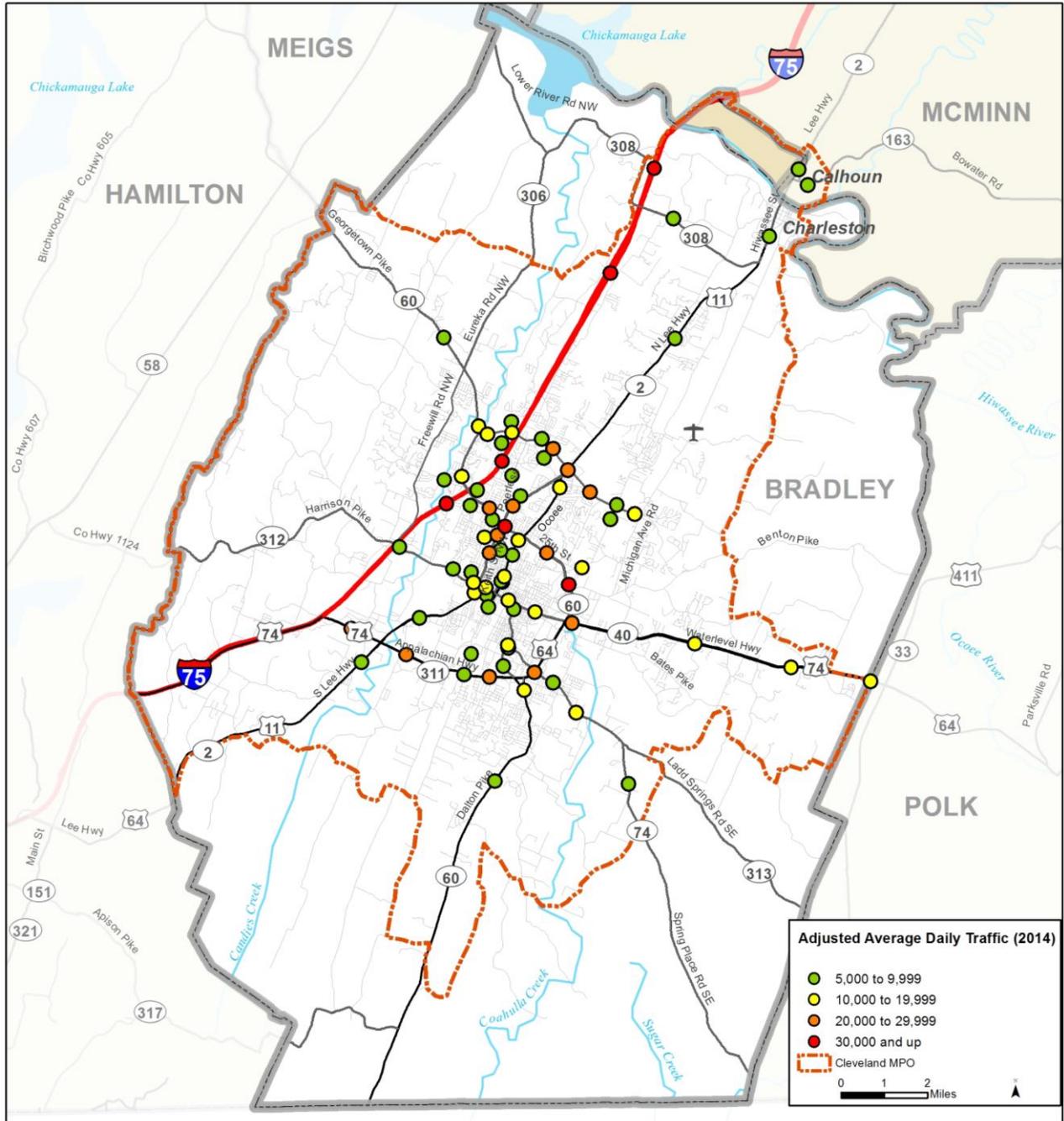
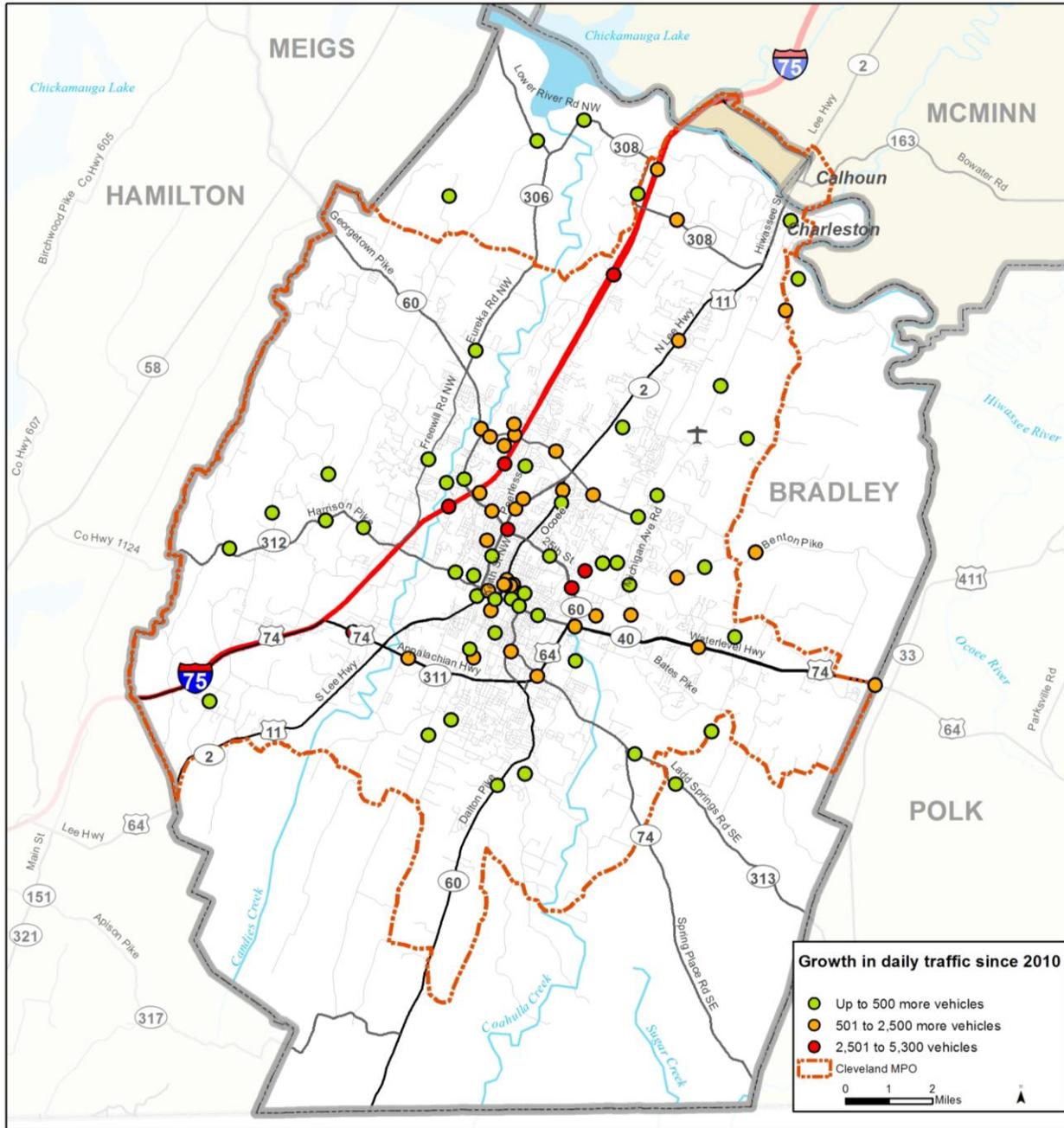


Figure 4.3: Growth in Daily Traffic since 2010



Roadway Performance

Level of service, or LOS, is a term used to describe how well traffic flows along a given roadway. It is presented in terms of grades A through F, similar to a school report card, where A is the best possible traffic flow and F represents the worst conditions.

Figure 4.4 shows graphically how the level of service changes as the number of cars on the road increases. Level of service is based on volume-to-capacity ratio, or V/C. In other words, it indicates what volume of traffic the road is carrying compared to its maximum capacity. A roadway's capacity is based on its functional classification, number of lanes, posted speed limit, percent of truck traffic, and geometric characteristics. Volume-to-capacity thresholds vary by the functional class of the facility and whether it is classified as urban or rural.

Figure 4.4: Roadway Levels of Service (LOS)

	A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver with the traffic stream. The general level of physical and psychological comfort provided to the driver is high.
	B	Reasonable free flow operations. The ability to maneuver with the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided to the driver is high.
	C	Flow with speeds at or near free flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more vigilance on the part of the driver. The driver notices an increase in tension.
	D	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is more noticeably limited. The driver experiences reduced physical and psychological comfort levels.
	E	At lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.
	F	Breakdowns in traffic flow. The number of vehicles entering the highway section exceeds the capacity or ability of the highway to accommodate that number of vehicles. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.

Figure 4.5 illustrates current traffic conditions for the Cleveland MPO area transportation system. This map shows Level of Service in terms of roadway volume to capacity ratio. Segments shown in orange and red represent areas where roadway level of service is beginning to fall below minimum acceptable conditions. Yellow indicates that a road segment has exceeded a volume/capacity ratio of 0.7 (roughly at 70% of its capacity) but is still performing at an acceptable level of service. It should be noted that these model results reflect the highest peak traffic – usually morning or afternoon rush hour – and do not necessarily mean that traffic congestion is present at all times throughout the day.

Roads currently experiencing high levels of traffic congestion include SR 60 (Georgetown Road) in the vicinity of I-75 as well as the section just north of Paul Huff Parkway, where a project is under development to widen the road to 5 lanes during the next few years. Significant delays also occur along nearly all of 25th Street, a major commercial corridor in the City of Cleveland, from I-75 to the APD-40 bypass.

Drivers in the northern portion of the MPO region experience heavy traffic on US 11/SR 2, known as Hiwassee Street as it passes through the center of Charleston. This section of US 11/SR 2 is one of only two major river crossings for north/south travelers; the other opportunity to cross the Hiwassee River is on I-75 about three miles to the west. This area along the river is home to several large industries on both sides of the Bradley/McMinn county line, generating employment as well as a considerable number of daily truck trips.

Future Traffic Conditions

In coordination with TDOT, the MPO uses a travel demand forecasting model to assess current and future transportation demands within the region. The model provides quantifiable data on current and future roadway deficiencies and was used to assist the MPO in the development of the 2040 regional transportation plan. The Cleveland regional travel demand model (TDM) follows the traditional four-step planning process. As its name implies, this process has four basic phases:

- **Trip generation** (the number of trips expected, based on socioeconomic factors);
- **Trip distribution** (where those trips go);
- **Mode choice** (how the trips will be divided among the available modes of travel); and
- **Trip assignment** (predicting the route trips will take).

For the full Travel Demand Model Documentation Report and Analysis, refer to **Appendix A**.

Existing + Committed Network

Even when a new transportation plan is developed, there are always some roadway improvements that are already in some stage of being constructed, or are far enough along in development that they are essentially “committed” to be completed. When a travel demand model is being used, the first step in analyzing future roadway conditions is to identify the “Existing + Committed” (E+C) transportation network. The E+C network consists of existing roads and those that are committed for completion. This establishes a no-build condition which serves as the benchmark for identifying future roadway capacity needs and for evaluating the performance of planned projects. In this case, the model’s base year is 2013, so the E+C network consists of new or modified roads completed since 2013, plus projects that are funded for construction in the MPO’s Transportation Improvement Program. **Table 4.2** shows the list of committed projects that are part of the E+C network.

Figure 4.5: Current Traffic Conditions on Area Roadways

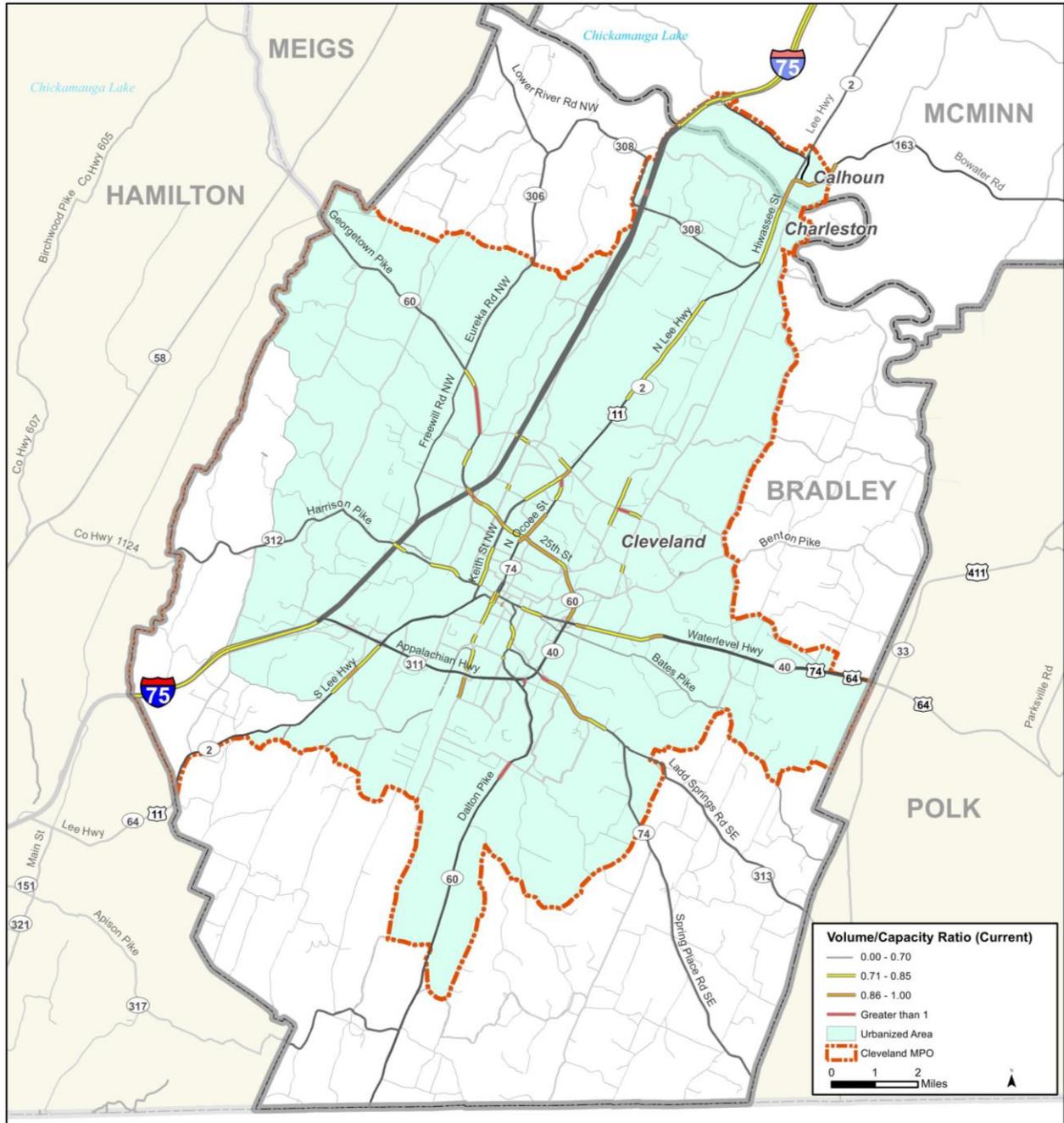


Table 4.2: Committed Projects for the Cleveland MPO Region

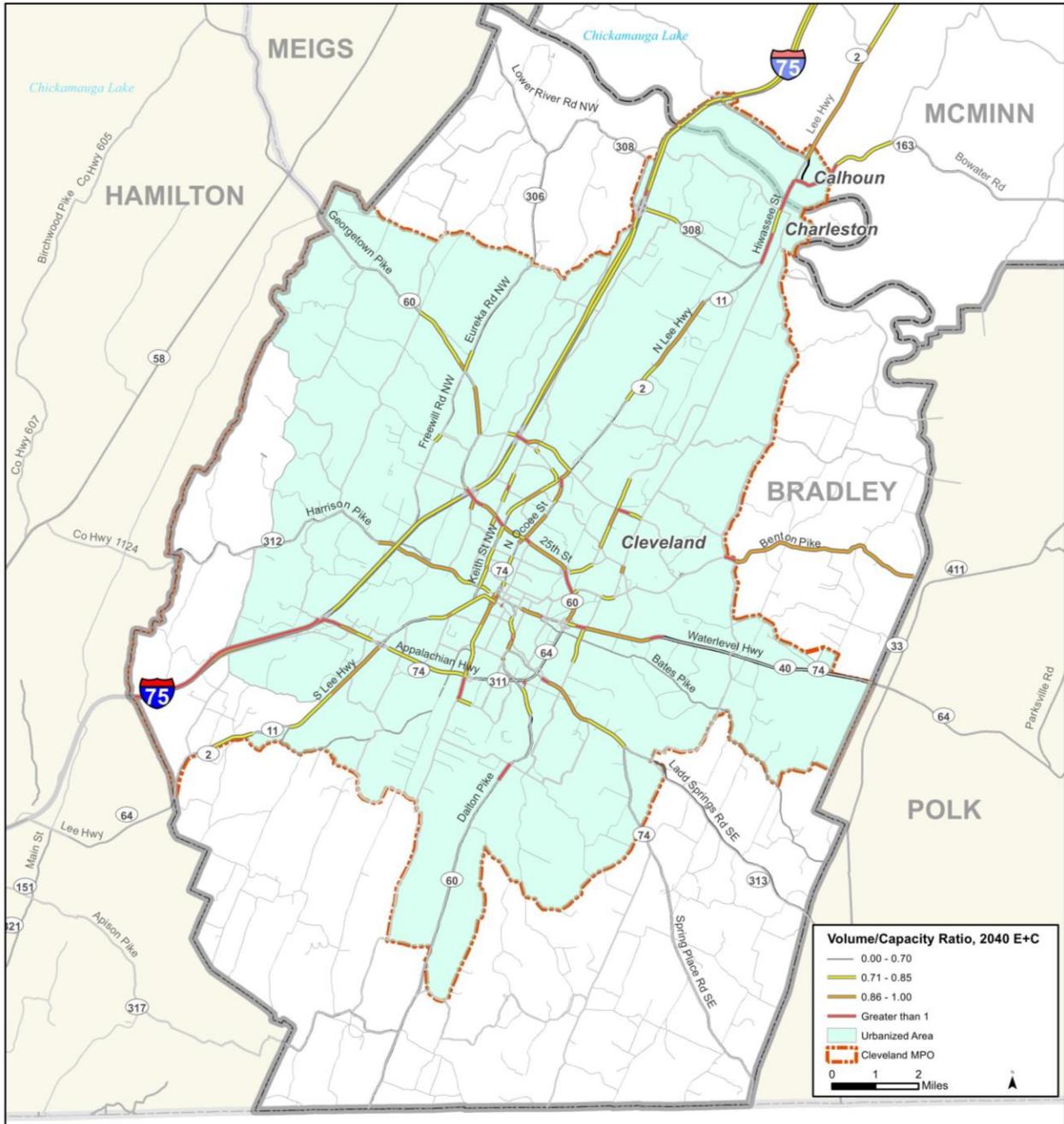
Route	Termini	Miles	Description
US 64/74 (SR 311, APD-40)	Between I-75 Exit 20 and S. Lee Highway (US 11/SR 2)	-	New interchange
I-75	At Exit 20 (SR 311/US 74/ APD-40)	-	Interchange improvements
I-75	At Exit 25 (SR 60 / 25 th Street)	-	Interchange improvements
SR 60 (25 th Street)	At Benton Pike	-	Safety improvements
Adkisson Drive	Norman Chapel Rd to Paul Huff Pkwy	1.1	Widen from 2 to 3 lanes
SR 60 (25 th Street)	At Georgetown Road	-	Intersection improvements
SR 60 (Georgetown Rd)	Westlake Dr to SR 306 (Freewill Rd)	3.2	Widen from 4 to 5 lanes
SR 308 (Lauderdale Memorial Hwy)	At Walker Valley Road	-	Safety improvements

Based on the assumption that the projects in Table 4.2 will be completed, and based on the forecasted population and employment growth, the MPO’s model was used to project roadway system deficiencies in the year 2040. These deficiencies serve as a starting point for identifying transportation improvements beyond those currently programmed for completion.

Figure 4.6 identifies roads that are projected by the year 2040 to have a volume/capacity exceeding 0.7. Most of the serious congestion is projected to occur within the urbanized portion of the MPO region, as shown in Figure 4.6. Worsening traffic conditions are anticipated along 25th Street, as well as on Interstate 75 between the Hamilton County line and Exit 20 (US 74/APD-40). Sections of the Lee Highway corridor (US 11/SR 2) are also a future concern; this includes South Lee Highway between APD-40 and the Cleveland city limits; and North Lee Highway outside the Cleveland city limits, between Jenkins Road and SR 308 (Lauderdale Memorial Highway).

Growth expected to result from the new interchange currently being built on APD-40 (SR 311) will also bring additional traffic and possible delays to that critical freight route. In particular, the section between I-75 Exit 20 and the new interchange will need careful management to avoid degraded traffic operations. As the area grows, local governments and TDOT should work together to promote the use of frontage roads and other approaches to limit the number of new access points along APD-40. The experience gained from working together on the SR 60 corridor management plan (discussed later in this chapter) may be applied to APD-40 as well.

Figure 4.6: Projected Traffic Conditions on Area Roadways, 2040 (without further improvements)



Tables 4-3 through 4-5 show the measures associated with the roadway system’s performance in the base year (2013), compared with its performance in 2040 if no further improvements are made.

By 2040, the number of total hours being driven on the region’s roads is projected to increase by nearly half. This is partly due to having a greater number of automobiles and drivers as the population and job base expands. However, 2040 also brings a dramatic increase in the number of vehicle-hours of delay on the region’s transportation system. This number, defined as the difference between traveling in

congested versus non-congested conditions, will more than double for travel on the arterial and collector road systems.

Table 4.3: Change in Vehicle-Miles Traveled, 2013 to 2040 (without improvements)

	2013	2040 (without improvements)	Difference	Pct Change
Freeways	1,328,185	1,723,600	395,415	30%
Arterials	1,070,348	1,474,257	403,909	38%
Collectors	325,615	473,241	147,625	45%

Table 4.4: Change in Total Vehicle-Hours Traveled, 2013 to 2040 (without improvements)

	2013	2040 (without improvements)	Difference	Pct Change
Freeways	19,661	25,796	6,135	31%
Arterials	26,326	38,199	11,873	45%
Collectors	9,363	14,394	5,032	54%

Table 4.5: Change in Vehicle-Hours of Delay, 2013 to 2040 (without improvements)

	2013	2040 (without improvements)	Difference	Pct Change
Freeways	1,382	1,964	583	42%
Arterials	2,801	6,638	3,837	137%
Collectors	993	2,244	1,251	126%

Recommended Roadway Projects

The list of projects on the following pages (**Tables 4.6** through **4.8**) is proposed to address the future roadway capacity deficiencies identified through the modeling and evaluation process. (This list does not include the existing + committed projects already listed in Table 4.2.) The projects have been organized by horizon according to the timeframe by which they should be completed in order to maintain satisfactory mobility on the region’s major roadways, or if the projects are already under development, the earliest timeframe by which they may be completed.

- **Table 4.6** lists projects for completion during 2016-2025.
- **Table 4.7** lists projects for completion during 2026-2040.
- **Table 4.8** lists project types that are expected to be implemented throughout the life of the Plan, such as bridge work, safety projects, sidewalks and greenways, etc.

Table 4.6: Proposed Roadway Projects, 2016-2025

ID	Type of Improvement	Roadway	From	To	Miles	Description
82	New Roadway	Paul Huff Parkway Extension	Freewill Road	SR 60 (Georgetown Road)	0.8	Construct new 3-lane road
7	Intersection Improvements	25th Street (SR 60)	@ Peerless Road			Widen North and South approaches from 4 to 5 lanes
94	Intersection Improvements	20th Street	@ Michigan Avenue Road			Safety improvements
62	Road Widening	20th Street	Shady Lane	Old Tasso Road	0.7	Widen from 2 to 3 lanes
63	Road Widening	20 th Street	Old Tasso Road	Michigan Avenue Road		Widen from 2 to 3 lanes
108	Road Widening	Michigan Avenue Road	Minnis Road	20th Street	0.2	Widen from 2 to 3 lanes
95	Intersection Improvements	Georgetown Rd (SR 60)	@ Candies Lane			Realign intersection
96	Intersection Improvements	N Ocoee Street (SR 74)	8th Street			Construct roundabout
93	Safety Improvements	SR 308 (Lower River Rd)	Bowater Logging Rd	I-75	0.9	Safety improvements
99	Intersection Improvements	6 th Street N.E.	@ Gaut Street			Safety improvements
110	Intersection Improvements	Mouse Creek Road	@ Paul Huff Pkwy			Add lane to NB approach on Mouse Creek Rd
111	Intersection Improvements	Peerless Road	@ Paul Huff Pkwy			Improve NB approach on Peerless Road from intersection to Valleyhead Road
112	Road Widening	Georgetown Road N.W.	25 th Street	20 th Street	1.3	Widen from 2 to 3 lanes, including roundabouts at major intersections

Table 4.7: Proposed Roadway Projects, 2026-2040

ID	Type of Improvement	Roadway	From	To	Miles	Description
100	New Roadway	Midtown Connector				Construct bridge over railroad in downtown Cleveland
92	New Roadway	SR 308 Extension	SR 2/US 11 (N. Lee Hwy.)	Chatata Valley Dr	0.5	Extend as 3-lane roadway, including RR overpass. Eastern terminus aligns with Upper River Rd N.E.
113	Road Widening	Mouse Creek Road	Robin Hood Drive	Wedgewood Drive	0.1	Widen from 2 to 3 lanes
114	Road Widening	Mouse Creek Road	Wedgewood Dr	East Circle	0.4	Widen from 2 to 3 lanes
115	Road Widening	Mouse Creek Road	East Circle	Hunters Run	1.0	Reconstruct 2-lane road
59	Road Widening	20th Street	APD-40 (Bypass)	Ocoee Street	1.3	Widen from 2 to 3 lanes
20	Road Widening	Benton Pike	APD-40 (Bypass)	Michigan Avenue Rd	1.0	Widen from 2 to 3 lanes

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ID	Type of Improvement	Roadway	From	To	Miles	Description
60	Road widening	Peerless Road	25th Street	Georgetown Road	0.5	Widen from 2 to 3 lanes
55	Road Widening	Georgetown Road	20 th Street	Harrison Pike (SR 312)	1.0	Widen from 2 to 3 lanes
72	Road Widening	Spring Place Road (SR 74)	APD 40	Kile Lake Road	1.7	Widen from 2 to 3 lanes
104	Road Widening	SR 163 (Etowah Rd)	Lee Highway (US 11/SR 2)	Lynncrest Ave in Calhoun	0.6	Widen from 2 to 3 lanes, including improvements to narrow RR underpass
105	Road Widening	I-75	Hamilton Co. line	APD-40	2.5	Widen from 4 to 6 lanes
101	Road Widening	I-75	APD-40 (SR 311)	Bradley/McMinn co line	14.4	Widen from 4 to 6 lanes
86	Road Widening	Georgetown Road (SR 60)	Eureka Road	Rabbit Valley Road	1.7	Widen from 2 to 5 lanes
70	Road Widening	N. Lee Highway (US 11/SR 2)	Near Anatole Ln	SR 308 (Lauderdale Mem Hwy)	4.3	Widen from 2 to 5 lanes
17	Reconstruction	Mouse Creek Road	City Limits	Hoopers Gap	1.1	Reconstruct 2-lane road, turn lanes at Hoopers Gap
58	Reconstruction	20th Street	Ocoee Street	Georgetown Road	0.7	Upgrade lane width, shoulders; add left turns at intersections
23	Reconstruction	Hoopers Gap Road	Frontage Road	Mouse Creek Road	0.3	Upgrade lane width, shoulders; add turn lanes at Mouse Creek Road
98	Reconstruction	9th Street S.E.	Euclid Avenue S.E.	Church Street	0.2	Align offset intersection at Euclid Ave. S.E.
6	Intersection Improvements	25th Street (SR 60)	@ N Ocoee Street (SR 74)			Widen N & S approaches, add dual left-turn lanes
10	Intersection Improvements	Westside Drive	@ Harrison Pike (SR 312)			Widen approaches; consider signalization
9	Intersection Improvements	20th Street	@ Parker Street			20th St - Widen approaches to 5 lanes; Parker St - Widen approaches to 3 lanes
1	Intersection Improvements	20th Street	@ N. Ocoee Street (SR 74)			Widen from 4 to 5 lanes, signalize
3	Intersection Improvements	20th Street	@ Keith Street (US 11/SR 2)			Widen and relocate existing signal
2	Intersection Improvements	20th Street	@ Georgetown Road			Signalize and widen all approaches
8	Intersection Improvements	Peerless Road	@ Norman Chapel Road			Widen west approach from 2 to 3 lanes
11	Intersection Improvements	Keith Street (US 11/SR 2)	@ N Ocoee Street (SR 74)			Intersection improvement with "flyover"; remove traffic signals and add lanes
83	Interchange Improvements	I-75	@ SR 308 (Lauderdale Memorial Hwy.)			Interchange modifications for increased capacity
111	Intersection Improvements	Peerless Road	@ Paul Huff Pkwy			Improve NB approach on Peerless Rd from intersection back to Valleyhead Rd
97	Intersection Improvements	Industrial Drive S.W.	@ Old Chattanooga Pike			Realign and improve rail crossing
5	Intersection Improvements	Spring Place Road (SR 74)	@ Wildwood Ave (SR 311)			Widen to 4 lanes on all approaches; modify signal

Table 4.8: Additional Projects Anticipated Throughout the Planning Period

ID	Type of Improvement	Location	Sponsor	Description
-	Operations, Transportation Systems Management (TSM), Intelligent Transportation Systems (ITS) improvements	Various routes	TDOT, MPO member agencies	Projects may include intersection improvements (e.g. additional turn lanes and/or signals, signage and lighting; other operational improvements such as signal timing, access management, and projects based on the MPO's Regional ITS Architecture.
-	Safety improvements	Various routes	TDOT, MPO member agencies	Safety improvements such as installation of guardrail, traffic signs, signals and lights, warning devices, and geometric improvements for safety purposes; roadside hazard elimination; systemic safety improvements
-	Bridge improvements	Various routes	TDOT, MPO member agencies	Bridge Replacement / Bridge Rehabilitation (some work will also occur as part of scheduled roadway capacity projects)
-	Transportation alternatives and enhancements	Various routes	TDOT, MPO member agencies	Provision of alternatives and enhancements to various routes and locations throughout the MPO planning area. Includes projects such as improvements to the bicycle/pedestrian network, trails, scenic byways, landscaping and beautification, mitigation of environmental impacts caused by transportation projects.
-	Transit infrastructure improvements	Various routes	TDOT, MPO member agencies	Transit infrastructure, including bus stops, benches, shelters and related amenities

Figure 4.7 shows the resulting volume/capacity ratios for the MPO’s roadway network in 2040, reflecting conditions after implementation of the proposed projects. By 2040 many of the worst delays have been addressed on Interstate 75 and Georgetown Road, although 25th Street remains a heavily congested route. Some travel delays are also expected to continue along Hiwassee Street (US 11/SR 2) through Charleston, where physical constraints make it undesirable to add new lanes.

Tables 4.9 through 4.11 compare the performance of the regional transportation system in the base year (2013) and 2040 after the implementation of the roadway projects in the RTP. The improved roadway system is able to accommodate more vehicle-miles traveled (and vehicle-hours traveled) with less delay than was projected under the no-build scenario. In fact, the number of vehicle-hours of delay on freeways actually decreases although the overall number of vehicle-miles and vehicle-hours has grown. Travel times on arterial and collector roads are still expected to grow in future years, but not to the same degree they would without the improvements in the 2040 RTP.

Table 4.9: Change in Vehicle-Miles Traveled, 2013 compared to 2040 RTP

	2013	2040 RTP	Difference	Pct Change
Freeways	1,328,185	1,718,022	389,838	24%
Arterials	1,070,348	1,490,227	419,879	39%
Collectors	325,615	469,660	144,045	44%

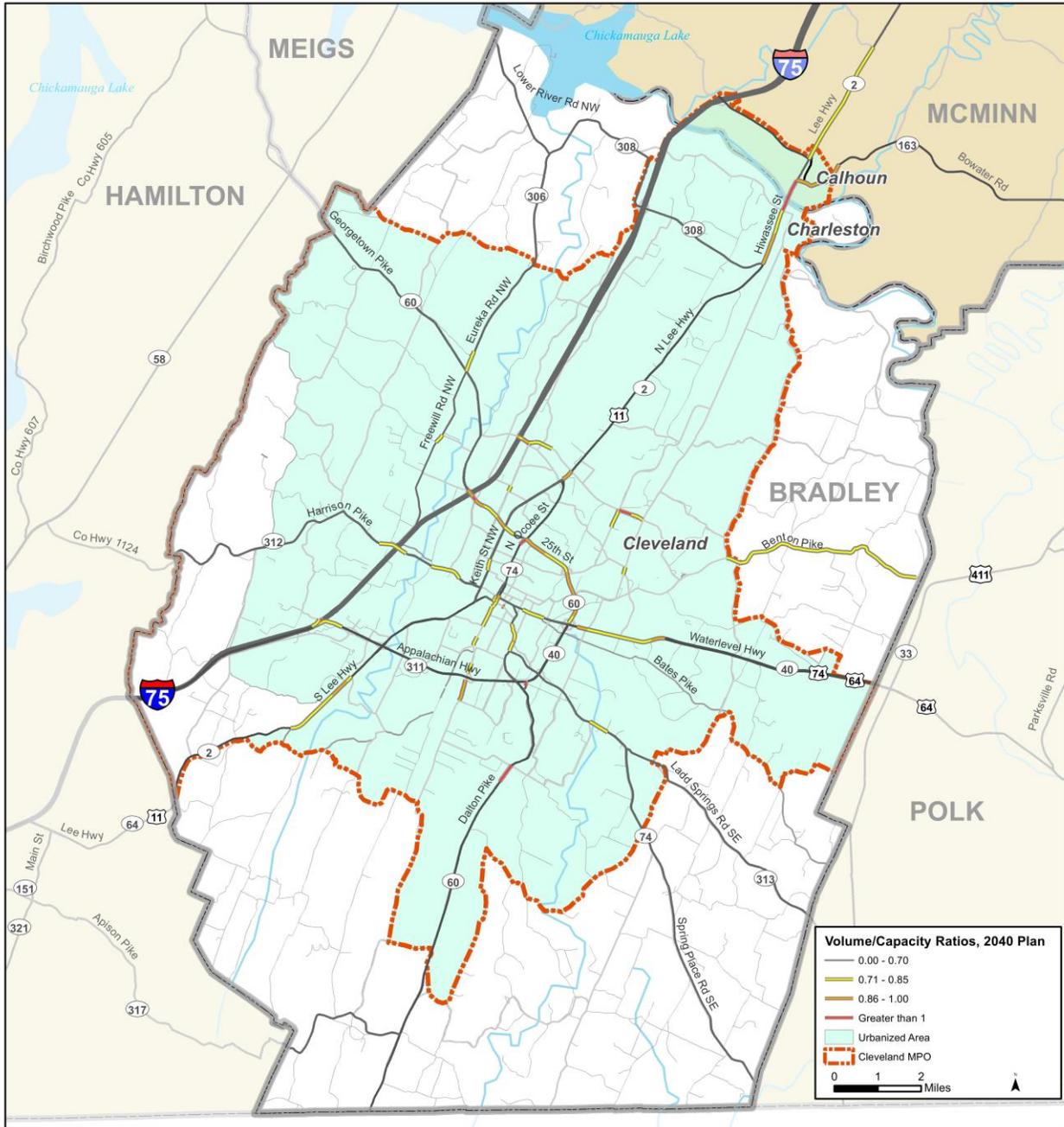
Table 4.10: Change in Vehicle-Hours Traveled, 2013 compared to 2040 RTP

	2013	2040 RTP	Difference	Pct Change
Freeways	19,661	24,830	5,169	26%
Arterials	26,326	37,873	11,547	44%
Collectors	9,363	14,216	4,853	52%

Table 4.11: Change in Vehicle-Hours of Delay, 2013 compared to 2040 RTP

	2013	2040 RTP	Difference	Pct Change
Freeways	1,382	1,075	-307	-22%
Arterials	2,801	5,921	3,121	111%
Collectors	993	2,202	1,209	122%

Figure 4.7: Projected Traffic Conditions on Area Roadways With Implementation of the 2040 RTP



Safety

An important goal of the 2040 RTP is to make investments that increase the safety of the transportation system for both motorized and non-motorized users. Some of the proposed road improvements in this plan will include widening shoulders and straightening curves. Additional improvements, such as adding turning lanes and signals, will also serve to create safer traveling conditions. Also, there are specific areas, particularly intersections, which have been identified as high priority problem areas. Special attention will be given to these in the evaluation process.

High-Crash Locations

Tables 4.12 and 4.13 present the top 20 high-crash intersections and road segments in the MPO region, based on analysis of the past five years of crash data available (2010-2014) from TITAN, the state’s comprehensive crash database. The analysis takes into account the typical number of crashes on a particular facility type to identify locations where the crash rate is higher than typically expected.

Table 4.12: Top 20 High-Crash Intersections (2010-2014)

	Location	Crashes	Entering ADT	Intersection Critical Crash Rate Factor (A/C)
1	Dalton Pike / Treasury Drive	83	12,286	6.834
2	25 th Street (SR 60) / Keith Street (US 11/SR 2)	114	48,986	4.543
3	Paul Huff Parkway / Keith Street (US 11/SR 2)	134	39,610	4.479
4	Keith Street (US 11/SR 2) / 1st Street	23	4,254	4.101
5	Central Avenue / Parker Street NE	15	2,556	3.634
6	Michigan Avenue / Minnis Road NE	83	30,037	3.465
7	Keith Street (US 11/SR 2) / Mouse Creek Road NW	64	21,711	3.444
8	N Ocoee Street (SR 74) / 8th Street	17	3,537	3.397
9	Georgetown Road / Green Drive / Westside Drive	11	1,784	3.260
10	Paul Huff Parkway / Georgetown Road NW	52	18,531	3.158
11	Georgetown Road (SR 60) / Candies Lane	58	21,417	3.154
12	Paul Huff Parkway / Mouse Creek Road	61	23,227	3.116
13	25 th Street (SR 60) / N Ocoee Street	81	34,228	3.047
14	Spring Place Road / Perry Street	11	2,214	2.892
15	Paul Huff Parkway / Adkisson Drive NW	48	19,690	2.784
16	Keith Street (US 11/SR 2) / Raider Drive	59	26,160	2.747
17	Inman Street / Edwards Street	50	21,453	2.715
18	N Ocoee Street (SR 74)/ Ocoee Crossing NW	33	13,544	2.688
19	I-75 NB Off-Ramp / US 74	41	25,858	2.632
20	25 th Street (SR 60) / Peerless Road	74	37,477	2.587

Table 4.13: Top 20 High-Crash Road Segments (2010-2014)

	Route	Location	Crashes	AADT	Critical Crash Rate Factor (A/C)
1	8th Street N.E.	N Ocoee St to Church St N.E.	31	4,253	8.486
2	Henderson Ave	Raider Dr to Keith St N.W.	49	3,078	7.019
3	8th Street N.W.	Broad St N.W. to N Ocoee St	7	4,253	3.809
4	SR 308 (Lower River Rd)	Bowater Logging Rd to Frontage Rd N.W.	46	2,066	6.748
5	Golf Drive S.E.	West of S.E. Hunt Rd	5	481	5.752
6	SR 60 (Georgetown Rd)	Near Westside Dr	16	1,111	5.319
7	N Ocoee Street (SR 74)	South of 25 th St	40	13,217	4.039
8	20th Street	From N Ocoee St to Harle Ave N.W.	23	5,552	2.681
9	Paul Huff Parkway	Bradley Square Mall entrance to N Lee Hwy	66	19,088	4.413
10	Pleasant Grove Road	Village N. Blvd to I-75 ramp at Exit 20	24	14,186	4.277
11	N Ocoee Street (SR 74)	1 st St N.E. to Central Ave N.E.	16	3,496	4.155
12	Pleasant Grove Road	From KOA area to Village N. Blvd	59	3,523	4.091
13	Mouse Creek Road	Hooper Gap Rd N.W. to Heatherwood Ct	33	1,664	3.161
14	Westside Drive	25 th St N.W. to Skyridge Hospital area	32	5,591	3.679
15	Broad Street	Inman St W to 1 st St N.W.	9	3,645	3.365
16	Buchanan Road S.E.	King St. S.E. to 28 th St. S.E. (Walmart area)	31	3,026	3.167
17	N Lee Highway (US 11/SR 2)	Paul Huff Pkwy to North St	75	11,417	3.060
18	Peach Orchard Hill Rd	Benton Pk N.E. to Cynthia Dr	41	2,689	3.027
19	Paul Huff Parkway	Bernham Dr. to I-75 ramp	140	24,947	2.753
20	Keith Street N.W.	25 th St N.W. to Sahara Dr	52	21,115	2.392

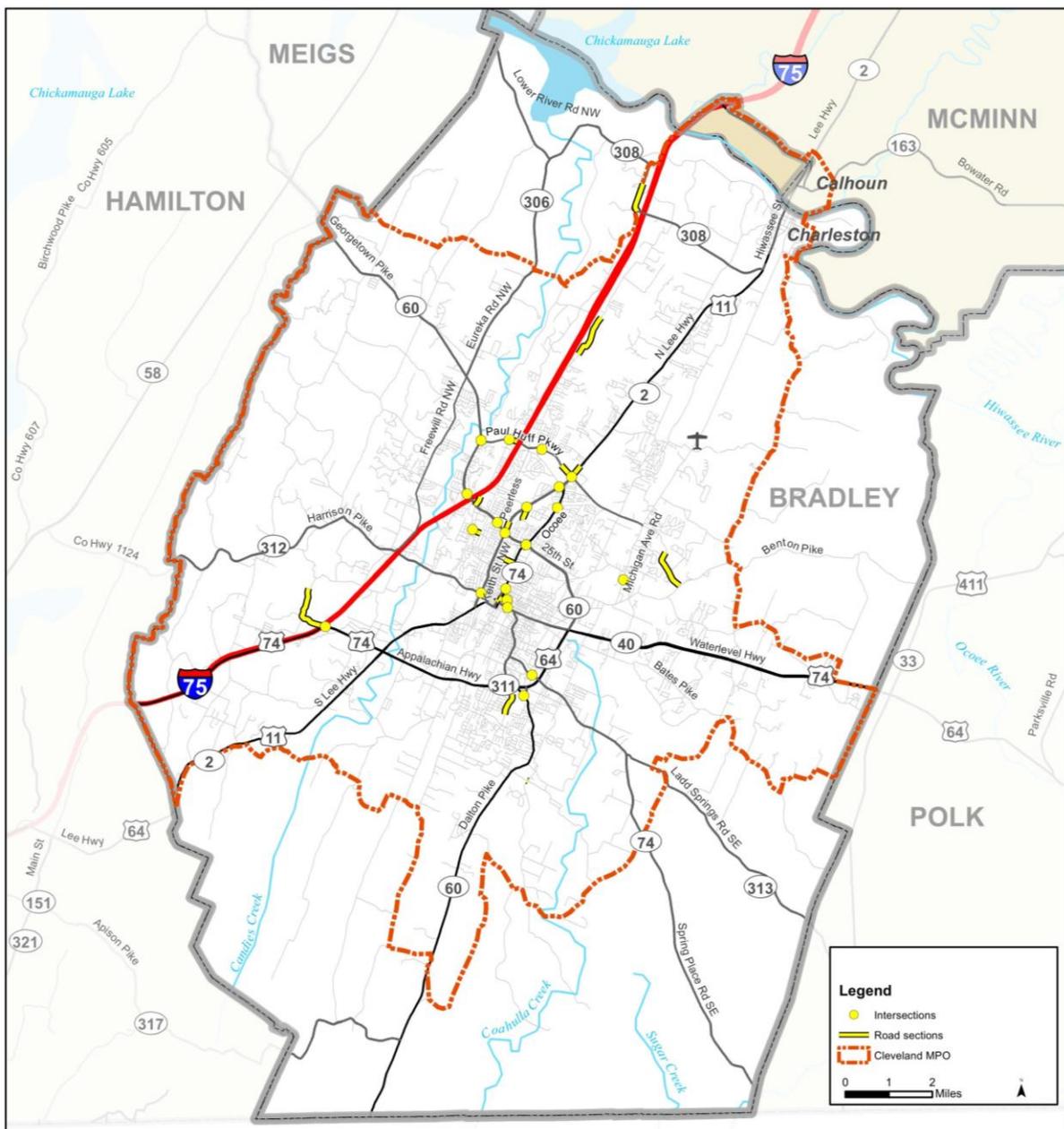
All high-crash locations – both intersections and road segments – are shown together in **Figure 4.8**. As can be seen from the map, many of the road segments that appear on the list are in close proximity to one or more of the high-crash intersections. This could indicate that the crashes are related to intersection traffic delays; however, it could also reflect imprecise locations in the crash data. This can be determined through individual safety studies of each site. As part of a safety study, crash reports for the site are assembled and reviewed, verifying and correcting each mapped location if necessary based on the details of the law enforcement official’s report, and performing more detailed analysis of the contributing factors to crashes at that site.

Studies have already been performed for some of the high-crash locations identified, such as the 20th Street N.E. and Michigan Avenue Road corridors, whose recommendations to improve roadway

geometry are included in the proposed projects for the 2040 RTP. The Ocoee Street/8th Street intersection in downtown Cleveland has also been studied for options to reduce crashes and improve traffic flow.

Even without the more detailed level of analysis, it can be seen from Tables 4.12 and 4.13 that the region's major shopping areas tend to experience a much higher frequency of crashes. This can be partially explained by the increased volume of traffic in these locations, but may also be influenced by whether access is well-managed in these areas. Research has demonstrated that an arterial highway with 10 driveways per mile has 30 percent fewer crashes than a similar road that has 20 driveways per mile. The statistical relationship between "access density" (driveways per mile) and crashes is shown in **Figure 4.9**.

Figure 4.8: High-Crash Locations (Intersections and Road Segments)



The Cleveland MPO recently participated in a pilot program with TDOT to form a corridor management agreement for SR 60 through Bradley County. As part of that agreement, a corridor management plan was developed with recommendations for managing access along various sections of the route. The primary purpose of the initiative is to ensure that efficient traffic operations are maintained along major state routes, particularly those where new roadway capacity is currently being added. (Driveway management on arterial routes can yield considerable operational benefits, allowing traffic speeds to improve as much as 15 to 20 miles per hour.) However, as shown in Figure 4.9, significant improvements in roadway safety may also result.

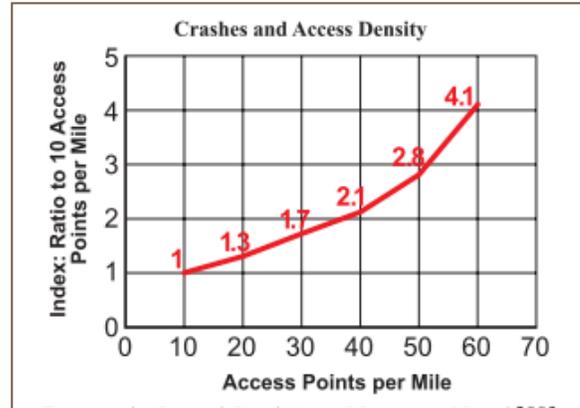


Figure 4.9: Relationship between a road’s crash rate and the number of access points per mile. From the Transportation Research Board’s *Access Management Manual* (2003).

Some of the region’s high-crash locations could also benefit from improved signage and wayfinding, particularly where a large number of drivers may not be familiar with the area. One potential area is Lee University. Another is the section of Westside Drive north of 25th Street, which is home to several hotels as well as Skyridge Hospital and associated medical offices. Drivers looking along the roadside to find their destination are less likely to be watching the road in front of them.

Roles in Safety Planning

Identifying and addressing transportation system safety issues involves a broad range of federal, state and local agencies. Not all safety issues are related to engineering and design. Driver behavior plays a role as well, meaning education and enforcement are important activities to include in transportation planning. The Cleveland MPO can serve as a facilitator and an advocate for bringing these agencies together to address the common goal of safety.

State DOTs have a large role in implementing safety strategies as they conduct ongoing highway construction programs. They also manage the federally mandated Highway Safety Improvement Program (HSIP), which authorizes federal-aid funding to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

Enforcement occurs at both the state level with state troopers, and at the local level with municipal and county police departments. Safety is often an issue that local residents find very personal and compelling. Local jurisdictions can implement transportation safety improvements, such as signage, pavement markings, and pedestrian and bicycle facility programs to name a few.

Coordination with the Tennessee Strategic Highway Safety Plan (SHSP)

All states are required to prepare a Strategic Highway Safety Plan (SHSP) that provides a comprehensive framework for reducing fatalities and injuries on all public roads in that state. MPOs must then incorporate relevant priorities, goals, countermeasures, or projects that fall within their planning boundaries into their regional transportation plans.

The second edition of the Tennessee SHSP was published in January 2015. Its mission is: “through coordination of education, enforcement, engineering, and emergency response initiatives, [to] reduce the

number of crashes that result in fatalities, injuries, and related economic losses on Tennessee’s roadways.”

The SHSP lists six critical emphasis areas, shown in **Figure 4.10**, that represent the greatest potential for reducing the number of severe crashes in the state. The figure also shows which of these emphasis areas has the most relevance to the Cleveland MPO area, based on a review of available crash data. More than 16,000 crash records were analyzed to determine the patterns, locations and factors involved in crashes that occurred in the Cleveland MPO area during the past five years.

The region is fortunate to rank low in many of the types of crashes that occur in other areas of Tennessee and the rest of the nation. This is not to say that these crash types do not occur, but analysis indicates they occur in the Cleveland MPO area with less frequency than is typical for the rest of the state and/or the U.S.

Figure 4.10: Statewide Safety Critical Emphasis Areas and Corresponding MPO Safety Issues

Tennessee SHSP Critical Emphasis Areas	Corresponding Key Safety Issues for Cleveland MPO
Data collection and analysis Including crash records, bridge inspection records, supplemental data, and work zone data	Crash data collection
Driver behavior Including occupant protection, teen drivers, alcohol-impaired driving, distracted driving, and aggressive driving	Aggressive driving
Infrastructure improvements Including roadway departure crashes, intersections, highway-rail grade crossings, and other infrastructure considerations	Roadway departure crashes Head-on crashes
Vulnerable road users Including senior drivers, motorcycles, non-motorized road users, bicyclists, and pedestrians	Senior drivers
Operational improvements Including work zone safety and incident management	Work zone safety
Motor carrier safety	---

DATA COLLECTION AND ANALYSIS

Crash Records

In order to accurately identify transportation safety problems and address them, the MPO and its partners rely on crash data. It is vital to ensure that crashes – particularly those involving serious injury or death – are documented and described with sufficient detail to understand the larger picture of what factors are most critical to address. Some of the charts in this chapter illustrate the fact that it is difficult to say with certainty whether a particular factor was involved because not all crash reports in the Cleveland MPO area contained the necessary information.

Both state and local law enforcement officials are now asked to report crashes electronically in a statewide database called the **Tennessee Integrated Traffic Analysis Network (TITAN)**. In agencies where resources are stretched thin, it can be challenging for officers to learn new software and dedicate time to filling out a complete crash report while still performing their other duties. Many of the strategies in the Tennessee SHSP (listed below) focus on helping to get sufficient resources for these agencies, as well as showing them how the crash reporting system benefits their own work.

Relevant strategies listed in the Tennessee SHSP include:

- **Ensuring adequate computers** are available to the law enforcement officials responsible for responding to crashes and filing crash reports;
- **Improving local participation in TITAN**, the statewide computerized database in which all crash reports are supposed to be filed;
- **Training law enforcement agencies on data collection, submission, analysis**, definitions, importance, and appropriate uses for safety data;
- **Improving consistency of crash reports** by developing an online crash instructional manual with data definitions based on national standards; and
- Training law enforcement agencies to develop and use **enforcement plans based on traffic records data**;
- Expanding the data collection of **work zone related crashes**.

DRIVER BEHAVIOR

Aggressive Driving

The most frequently mentioned contributing factor to crashes in the Cleveland MPO area, as reported by law enforcement, is following improperly (tailgating).

Strategies listed in the Tennessee SHSP to reduce the number of crashes involving aggressive driving include:

- **Developing and implementing enforcement programs** aimed at high-frequency areas;
- **Evaluating the adoption of a statutory traffic law** to clearly define aggressive driving for enhanced enforcement efforts;

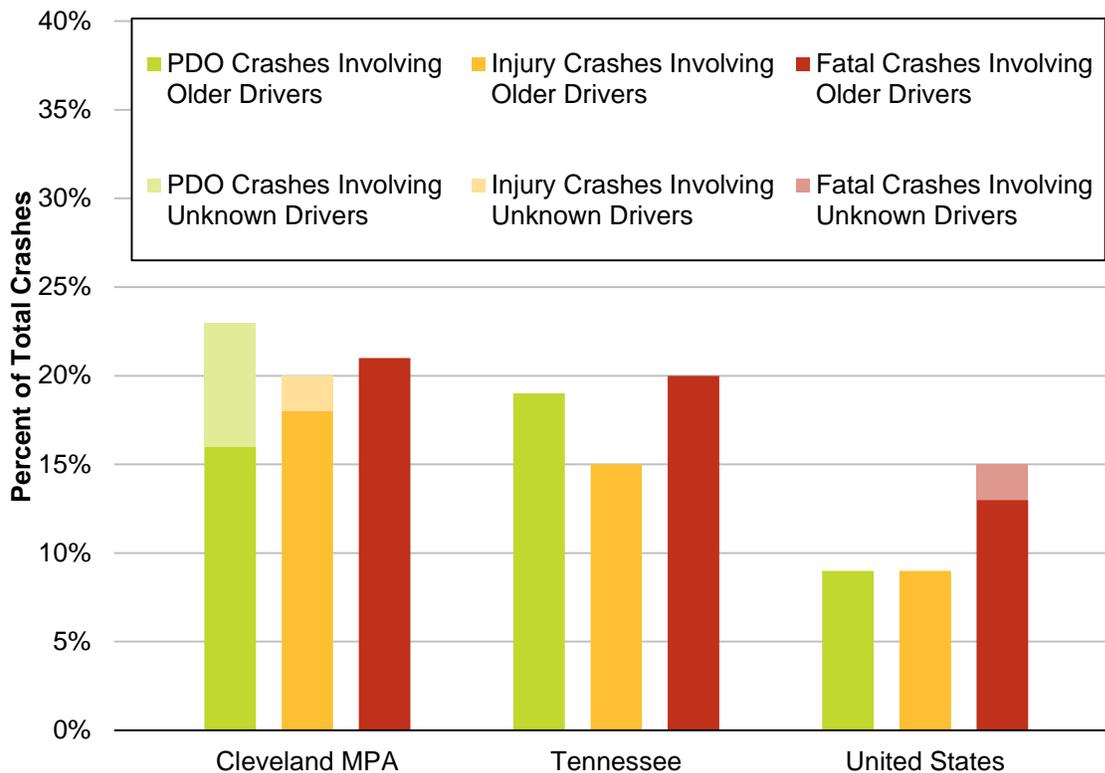
- **Evaluating the adoption of a uniform citation** for enforcement to serve as a tracking mechanism for courts and traffic records analysis; and
- **Using engineering measures** to effectively manage speeds through design and safety improvements.

VULNERABLE ROAD USERS

Older Drivers

Older drivers (defined as drivers 65 years or more in age) generally have a higher likelihood of being involved in crashes, particularly fatal ones. This is true in Tennessee and throughout the U.S., but is a particularly notable trend in the Cleveland MPO area as shown in **Figure 4.11**.

Figure 4.11: Crashes Involving Older Drivers (2010-2014)



Strategies listed in the SHSP to help reduce crashes involving older drivers include:

- **Incorporating geometric and visual improvements** recommended in the Federal Highway Administration’s (FHWA) *Highway Design Handbook for Older Drivers and Pedestrians*, especially at high-crash locations and as part of road improvements or new roads under construction;
- Taking inventory of **signs used on area roadways** for regulation, warning, and guidance and bringing them to the standards of the *Manual of Uniform Traffic Control Devices (MUTCD)*

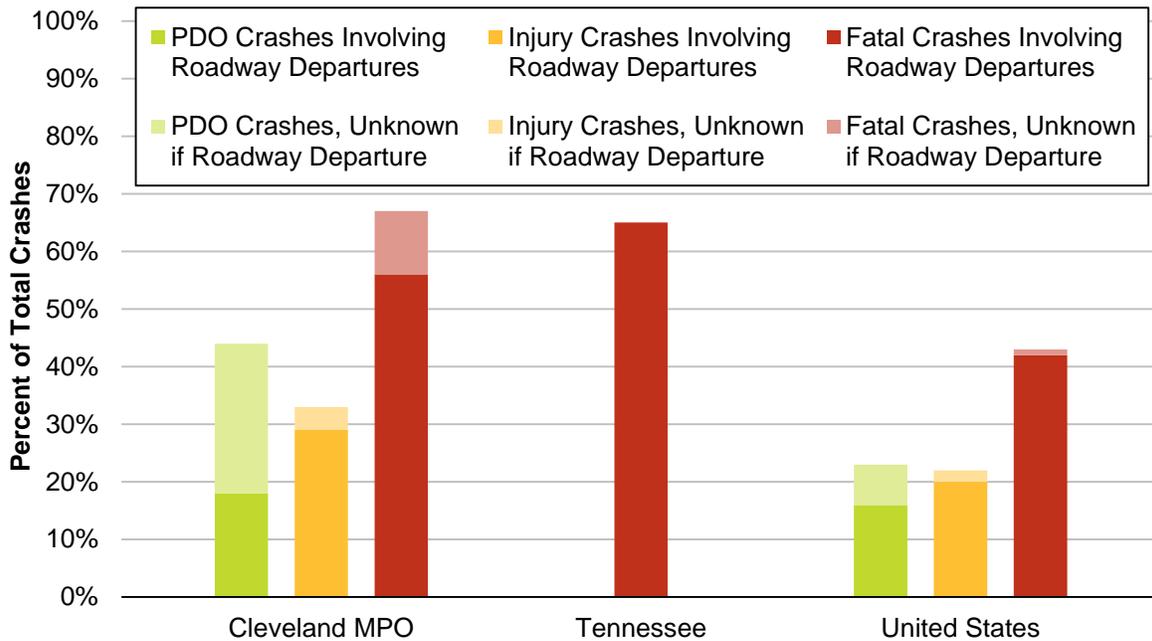
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INFRASTRUCTURE IMPROVEMENTS

Roadway Departure Crashes

More than 50 percent of fatal crashes in the Cleveland MPO area involve roadway departure, which is notably higher than the national average. As shown in **Figure 4.12**, the actual percentage may be even higher, since not all crash reports indicated contributing factors.

Figure 4.12: Crashes Involving Roadway Departure (2010-2014)

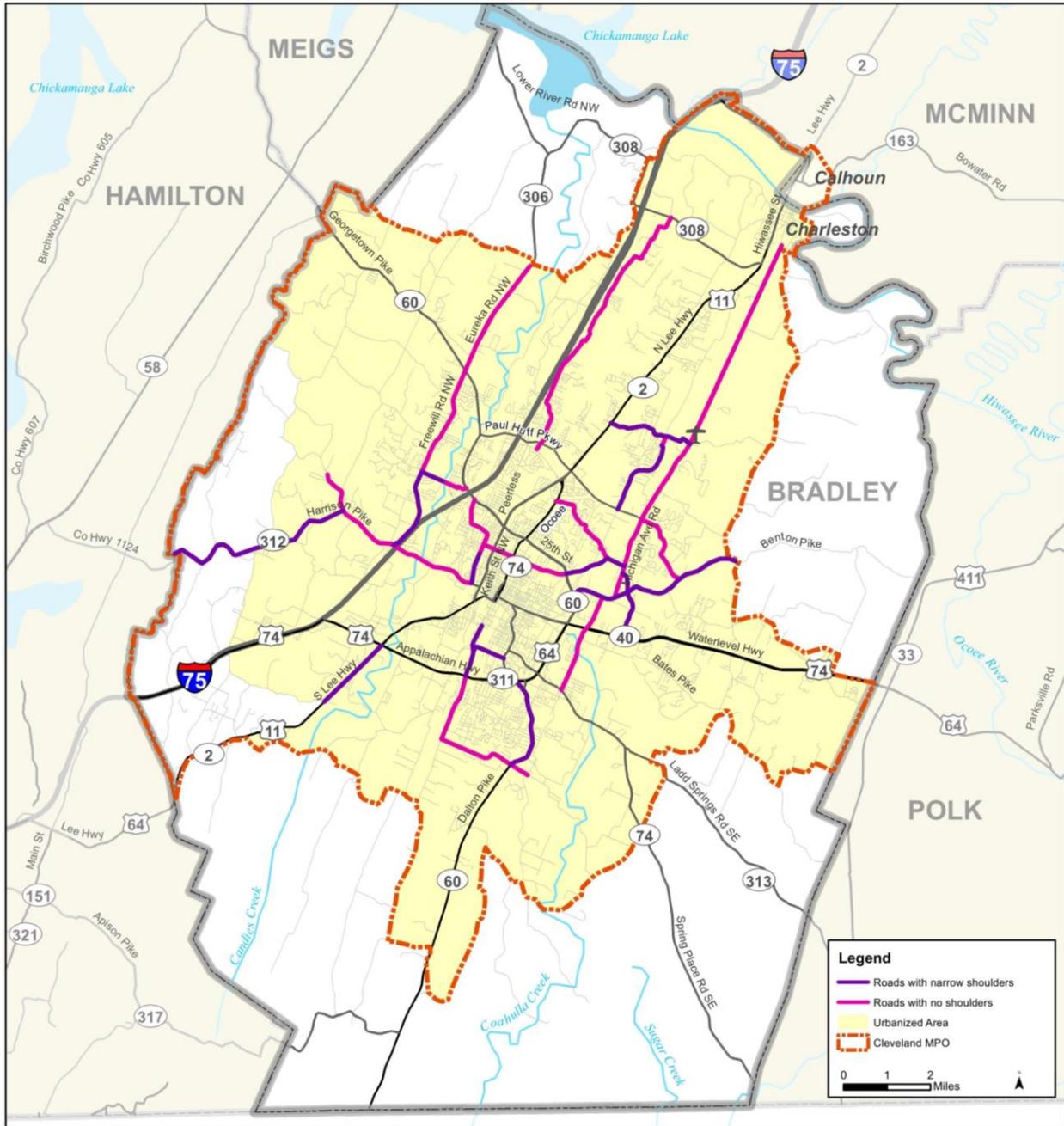


There are many possible reasons that a driver’s vehicle may leave the proper lane, including distracted driving, driving under the influence, swerving to avoid an object, or difficulty in seeing lane markings. Regardless of the reason, the design of the roadway can have some influence on whether a driver has time to recover before running off the road completely.

A report by the National Cooperative Highway Research Program estimates that two-lane road crashes increase 15 percent on roads that have narrow shoulders and 21 percent on roads that have no shoulders. (NCHRP Report 500, Volume 6, Exhibit V-11)

This is a significant issue in the Cleveland MPO area, where a number of two-lane facilities have no shoulders or very narrow shoulders, even though they are designated as collectors rather than local roads. **Figure 4.13** shows the locations of two-lane roadways having no shoulders or narrow shoulders.

Figure 4.13: Two-Lane Roadways With No Shoulders or Narrow Shoulders



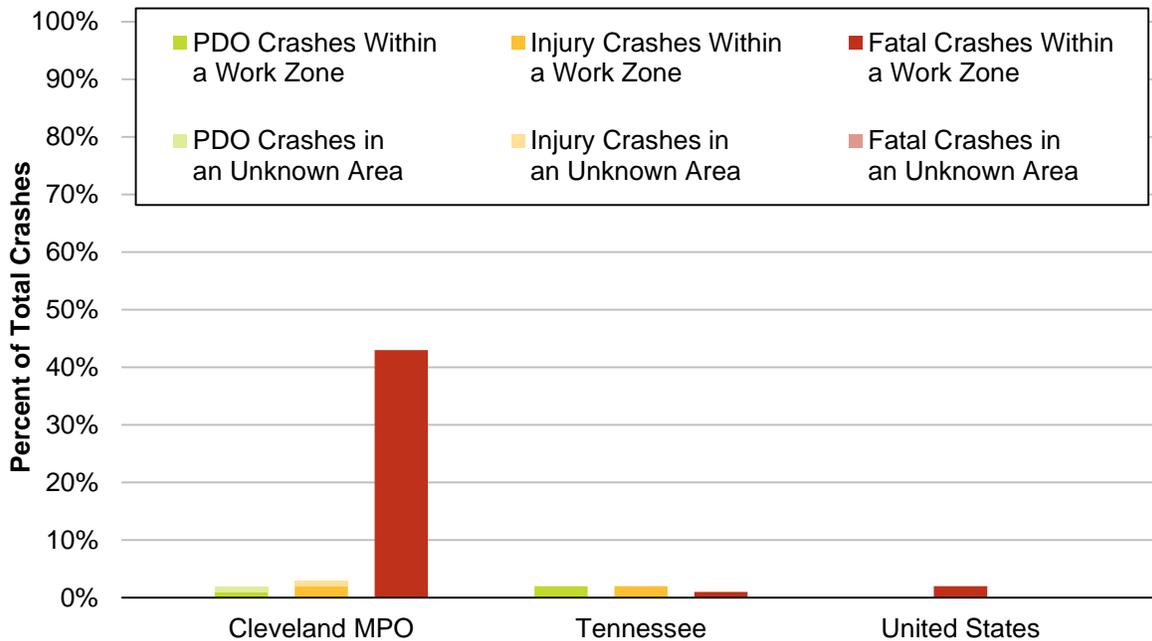
The 2035 RTP recommended improvements for several of these substandard roads, including Mouse Creek Road in northwest Cleveland/Bradley County. However, implementing those projects has proven more difficult than expected. In most cases the the public right-of-way is not much wider than the existing pavement width, meaning the city must acquire additional right-of-way from adjoining property owners. Even more problematic, most of these existing roadways were built without the curb and gutter system typically included on a city street. Widening the road therefore means the installation of an underground storm drainage system. Such a project is much more costly and requires much more earthwork than simply grading to create a wider shoulder.

As the region’s population and traffic continues to grow, it is critical to upgrade the most heavily traveled substandard roads, recognizing the cost and impact to adjoining property could be significant. It is important to establish urban cross-sections for road improvements that are made within the Cleveland MPO’s urbanized area boundary, even if the area is not located within an incorporated area at that time. Otherwise, the MPO’s cities will continue to struggle with major road upgrades as they expand their boundaries to serve new growth.

Work Zone Crashes

Safety in and around work zones appears to be a significant issue in the Cleveland MPO area. As **Figure 4.14** shows, the percentage of work zone-related fatal crashes far exceeds the statewide and national averages. It should be noted that during the past five years, major road construction has occurred at the Exit 20 and Exit 25 interchanges of Interstate 75, as well as along the APD-40 bypass. All of these locations are on or near high-speed roadways with a very high volume of traffic, which could also contribute to higher risk of fatal crashes. The strategies outlined here should be strongly considered for all current work zones in the area. As these construction projects move toward completion, the region should also continue to monitor the rate of work zone crashes and evaluate whether further steps are needed.

Figure 4.14: Crashes Within a Work Zone (2010-2014)



Strategies listed in the SHSP to help reduce work zone-related crashes include:

- Refining standardized procedures for the use of law enforcement in work zones;
- Developing in-house training programs for TDOT staff and related partners, with a focus on Tennessee procedures;
- Continuing and refining standard inspections for work zones;

- Refining speed limit policies for work zones and improving standard procedures for reducing speed in work zones;
- Enhancing visual measures for assisting senior drivers through work zones as recommended in the *Highway Design Handbook for Older Drivers and Pedestrians*.
- Refining procedures to comply with the *Final Rule on Work Zones* [Code of Federal Regulations (CFR) Title 23, Section 630, Subpart J) and the *Final Rule on Temporary Traffic Control* (23 CFR 630 Subpart K); and
- Installing truck- and trailer-mounted attenuators within work zones to increase work zone safety.

Highway/Rail Grade Crossing Safety

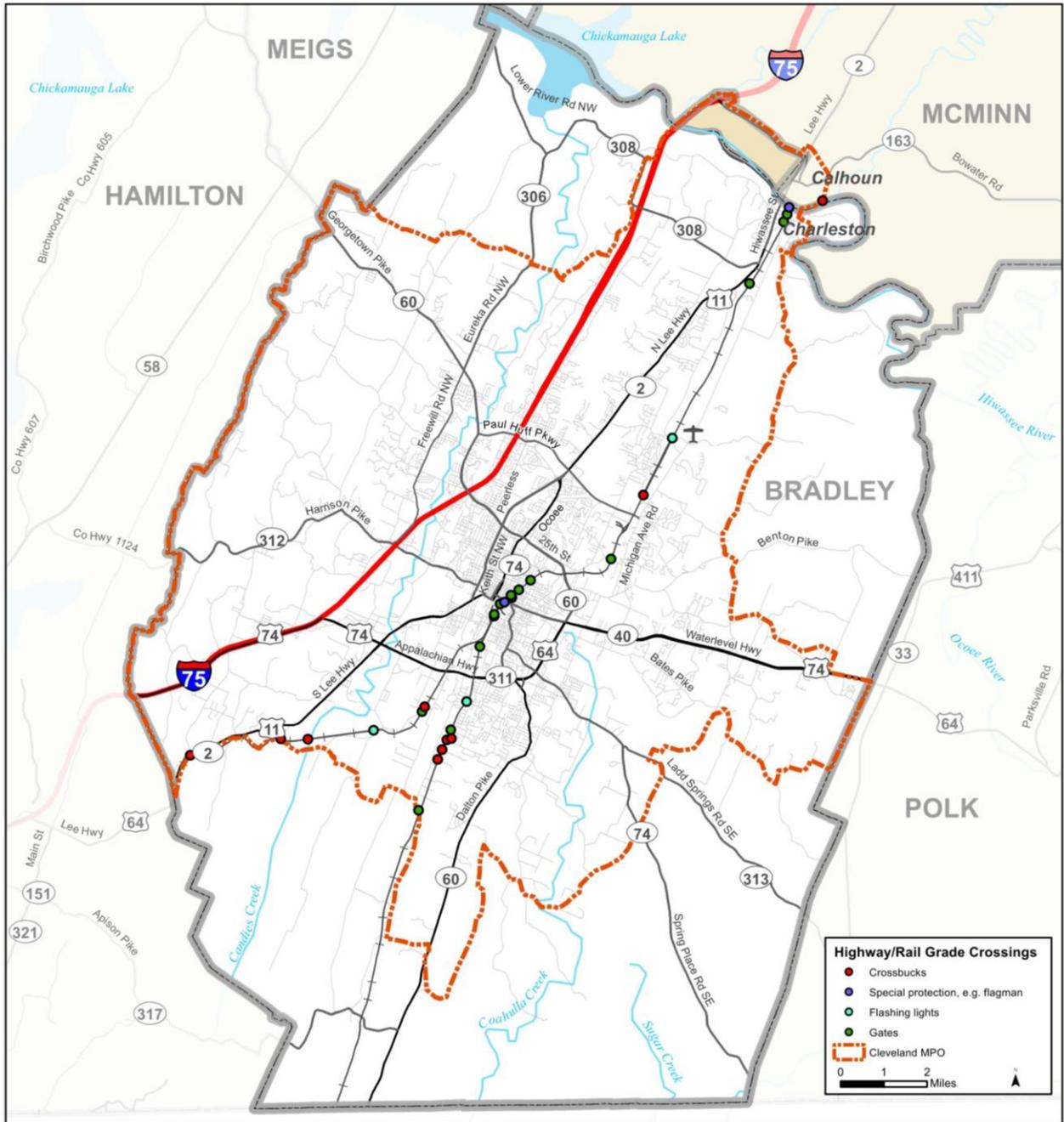
There are 30 public at-grade rail crossings in the Cleveland MPO region, as shown in **Figure 4.15**, including four crossings in the Calhoun area. Rail traffic at these crossings varies considerably. The location with the heaviest rail traffic is the 20th Street N.E. crossing in Cleveland, which handles about 22 trains per day with speeds averaging between 15 and 30 miles per hour. About 4,350 motor vehicles per day use this crossing, with trucks comprising more than 10 percent of that traffic, due in part to its location near an industrial park. Stakeholder feedback indicates that this crossing also suffers from poor sight distance and grade issues.

The next most heavily used crossings are those at Cass Street, Market Street, Wool Street, and Sheffey Road in Charleston, all of which serve the industrial land uses in that area. Some of these locations lie on important truck freight routes as well.

Only three crashes at grade crossings have been reported in the MPO region over the past five years, with no fatalities. One crash was at the crossings of Central Avenue N.E., where there are gates but the FRA crash report indicates they were not operating. The other crashes were at S. McDonald Street and Bell Road, where there are crossbucks signs but no active warning devices.

Installation of protective devices at grade crossings is a priority in the new FAST Act, which requires each state to set aside half of its annual federal railway-highway grade crossing safety funds for this purpose. Half of the grade crossings in the MPO area have automatic gates, as shown in Figure 4.15. The rest are marked with crossbucks and/or flashing lights, except for three crossings which the FRA describes as having “special protection” such as a flagman: one is the Market Street crossing in Charleston, which is on a main line. The other two are crossings in Cleveland at Mill Street S.E., and Bates St. N.E., which are on sidings.

Figure 4.15: Highway/Rail Grade Crossings and Type of Warning Device



Transit Safety

The Cleveland Urban Area Transit System (CUATS) has not reported any significant safety or security incidents in recent years, based on information in the National Transit Database for 2011 through 2015. This database includes all reports of injury or death of passengers, operators or other staff, as well as collisions or fires involving either the fixed route system or paratransit system.

Although no incidents involving pedestrians or bicyclists have been reported by CUATS, safety conditions could certainly be improved for CUATS passengers walking to and from, and waiting at bus stops. As further discussed in the bicycle/pedestrian section of this chapter, there are no sidewalks available along many of the MPO area's regular bus routes.

CUATS is required to conduct periodic safety training for its staff as well as operating a drug and alcohol testing program as a condition of receiving federal funds.

Security

Security is an important component of the metropolitan transportation planning process. Metropolitan planning organizations are charged with considering ways to increase the security of the transportation system for motorized and non-motorized users. Security is designated in the FAST Act as a stand-alone planning factor. The Cleveland MPO's primary role in planning for the security in the region is to provide support to existing Federal, state and local agencies in the implementation of their security plans.

Agencies Involved in the Security of the Transportation System

Tennessee Emergency Management Agency (TEMA)

The Tennessee Emergency Management Agency (TEMA) is responsible for preparing the Tennessee Emergency Management Plan (TEMP), which provides the foundation for all disaster and emergency response plans and operations conducted within the state of Tennessee. All local emergency management plans, including those for Cleveland/Bradley County and McMinn County, must follow the same structure and purpose as the TEMP.

As noted on TEMA's website, much of the content of emergency management plans "are held as confidential records by state law and not releasable to the public," due to the potential that sensitive information could be revealed about locations of critical facilities or systemic weaknesses or problems. However, there are aspects of transportation system security that can be discussed and considered as part of the MPO's regional transportation plan.

Transportation is the first of 16 "emergency support functions" around which the TEMP is organized. Its importance to emergency response is clear: a functioning transportation system provides the means by emergency responders reach an affected area, bring necessary supplies and equipment, and evacuate people if needed. The responsible agency for this portion of the TEMP is TDOT. TDOT also plays an important role in infrastructure, another of the plan's emergency support functions, by ensuring route clearance and performing bridge inspection.

Tennessee Department of Transportation (TDOT)

TDOT's Office of Emergency Operations is housed within its Maintenance Division and provides a vital role in supporting TEMA's emergency response. TDOT provides a full-time liaison to TEMA and also has several emergency service personnel who help coordinate a response at the regional level.

The department has its own emergency preparedness documents, including the TDOT Emergency Preparedness Plan (TEPP), the Catastrophic Action Plan, Disaster Operational Guides, Continuity of Operations Plan, Special Event Incident Action Plans, and the Rural Highway Incident Management Plan.

"Emergency strike teams" are assigned to handle the following functions:

- Incident management;
- Roadway / runway repair;
- Debris removal;
- Snow removal;
- Bridge inspection;
- Bridge repair; and
- Damage assessment.

Debris clearance is an important activity in the wake of tornadoes and flooding, both of which have been experienced in the MPO region during the past several years.

Since 2004 TDOT has been using an Internet-based program called Bridgewatch that monitors bridge conditions with continuously updated meteorologic and hydrologic data. Many are linked to stream gauges that monitor rising water levels and rainfall events, and can alert the bridge owner by e-mail, fax or text message when a bridge needs to be inspected and potentially closed based on flooding or scour. As discussed in the climate change section of Chapter 7, the faster rate of rainfall seen in recent years underscores the importance of bridge monitoring.

TDOT has also been developing an initial assessment of the vulnerability of the state's transportation system to extreme weather events, a pilot project sponsored by the Federal Highway Administration. Four critical transportation assets in the Cleveland MPO region were identified in a high-level screening through this effort:

- US 11/SR 2 (Lee Highway) bridge over the Hiwassee River at the Bradley/McMinn county line;
- Norfolk Southern rail line that runs generally north-south through the region;
- SR 60 (Georgetown Road) northwest of Cleveland, which is designated as a Sequoyah Nuclear Plant evacuation route; and
- APD-40 in Bradley County. This section of highway is also co-designated as US 64 and US 74, indicating the number of systems in which it plays a critical role.

TDOT anticipates selecting a small number of critical facilities identified statewide and developing potential adaptation strategies, with the ultimate goal of adopting an asset management plan to minimize the risk of extreme weather-related damage to all critical facilities across the state.

Local Emergency Management Agencies

Both Bradley and McMinn counties have a Local Emergency Planning Committee (LEPC) which includes local fire, police and medical emergency responders as well as other relevant local agencies such as the public school system. There is also representation from private industry, particularly larger companies such as Olin, Resolute Forest Products and others who have their own emergency response plans to handle potential chemical releases. Such companies often locate near interstates, major rivers, and rail because of the transportation benefits, and it is important to recognize that a company emergency may also have the potential to quickly impact those transportation facilities.

Real-time emergency notifications are available to citizens who have opted to receive messages by cell phone text or e-mail through a system called Nixle, coordinated through TEMA. Citizens who sign up receive notifications based on their geographic location. In addition to the Nixle messaging system available to citizens through TEMA, the Cleveland/Bradley County EMA uses a Facebook page to post emergency information for area residents, including road conditions and weather-related closings for area schools, public offices and other agencies.

Sequoyah Evacuation Planning

The western portion of Bradley County lies within the 10-mile Emergency Planning Zone (EPZ) for the Sequoyah Nuclear Power Plant located in Hamilton County. Two state highways in the MPO area are designated evacuation routes and signed accordingly: SR 312 (Harrison Pike) directly west of the City of Cleveland, and SR 60 (Georgetown Road) northwest of Cleveland.

Cleveland / Bradley County EMA is actively involved in the planning and exercising of the facilities emergency plans and conducts hands-on drills periodically with Tennessee Valley Authority officials and other affected counties. TEMA and TVA's coordination plan includes the use of the Nixle messaging system to alert residents within the Sequoyah EPZ if it becomes necessary to evacuate. Portions of McMinn County are within the 10-mile EPZ for the Watts Bar Nuclear Plant, but those evacuation routes lie within the northern portion of McMinn County, well outside the MPO planning area.

Tennessee Office of Homeland Security

The Tennessee Office of Homeland Security has the primary responsibility and authority for directing statewide activities pertaining to the prevention of, and protection from, terrorist related events. This responsibility includes the development and implementation of a comprehensive and coordinated strategy to secure the state from terrorist threats and attacks. Further, the office of Homeland Security serves as a liaison between federal, state and local agencies, and private sector on matters relating to the security of our state and citizens.

This agency also has a Critical Infrastructure Division that is charged with enhancing and protecting critical infrastructure and key resources statewide.

Transit Security

The Cleveland Urban Area Transit System (CUATS) maintains a Safety, Security and Emergency Preparedness Plan which outlines responsibilities; processes for identifying, documenting and addressing safety and security issues; and its management system for tracking and monitoring progress. The plan addresses not only physical security but also the agency's role and readiness to support local public safety agencies in responding to emergencies. This includes assisting with emergency evacuations as well as the "BOLO," or "Be On the Lookout" program. The idea is that transit drivers can be the community's eyes and help protect them by reporting suspicious items, vehicles, persons or activities they may note while driving.

Certain equipment currently used or planned for acquisition by CUATS also contributes significantly to the security of drivers and passengers. For example, the agency's transit vehicles are equipped with automatic vehicle location (AVL) which reports their real-time location. This data can be transmitted to, and monitored by, the central dispatch office. This could enhance security under a scenario where a driver is forced to divert from his/her planned route, or if central dispatch becomes aware of an emergency and needs to see which drivers/vehicles are in the affected area. CUATS is also procuring new camera systems to enhance the security of drivers and passengers.

Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) refers to use of technological innovation to manage the existing transportation system more effectively, improve its efficiency, and to make the system more user friendly. A wide variety of ITS technologies are under development or are being used in cities and towns throughout the U.S. and internationally, ranging from motorist message signs to automatic vehicle locator (AVL) systems on transit vehicles.

An ITS architecture is required by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) in order to use federal transportation funding on ITS projects. An intelligent transportation system (ITS) architecture is a high level plan for how ITS can be used to address transportation needs in the region. The current Cleveland ITS Regional Architecture, adopted in 2008, was prepared by TDOT in cooperation with the MPO and is scheduled for update within the next two years. In addition to covering all of Bradley County, the region was defined to include the portion of McMinn County along the I-75 corridor as far north as Riceville to enable comprehensive planning for fog-related closures.

Substantial expansion of ITS has occurred within the MPO area since the adoption of the 2008 ITS architecture. TDOT now operates more than 20 traffic cameras along the I-75 corridor throughout the MPO region as well as dynamic message boards located upstream and downstream of each interchange. This equipment was implemented to help manage the diversion of traffic from I-75 during localized fog events which occur in the area where I-75 crosses the Hiwassee River and have resulted in multi-car collisions in the past. The fog detection/warning system is now being extended further north. The diversion system is also used for other major incidents, such as a January 2016 fatal crash on I-75 between Exits 20 and 25 which necessitated the complete closure of the interstate in both directions. Traffic was diverted through Cleveland along US 11 (Keith Street) for hours in order to keep commerce and travelers moving through the region.

The City of Cleveland continues to maintain and expand its ITS system to manage traffic flow through the city's signalized intersections, mitigating unnecessary stops. A fiber optic backbone links traffic signals and cameras along two major arterials in Cleveland. Cameras along US 11/SR 2 (Lee Highway/Keith Street) are located at Paul Huff Parkway, SR 60 (25th Street), and Inman Street, and along APD 40 at McGrady Drive and Blackburn Road.

Traffic equipment needs to be replaced in downtown Cleveland, where the traffic cabinets date back to 1992. Extreme weather events and unreliable mercury relays now cause these signals to go into flash mode or behave erratically. The city is also experiencing problems with the 900MHz radio signal used for communications in this area. New controllers, conflict monitors and direct fiber optic connections are proposed as part of the equipment upgrade. As an additional benefit, the new cabinets would be much smaller than the ones installed 25 years ago, which would greatly improve visibility for drivers at intersections and give more sidewalk room to pedestrians.

Paul Huff Parkway, which carries some of the region's highest traffic volumes, also lacks the advanced signal technology being used on Keith Street. Cleveland Utilities has proposed communication and controller upgrades for eight intersections to improve traffic signal performance in this corridor.

Vehicle detection is used at various city intersections to actuate the traffic signal, but at some locations the loops embedded in the pavement are no longer working. Damage to loops often occurs due to asphalt rippling, which is particularly prone to occur at intersections where a high volume of truck traffic is stopping and starting. In lieu of loops, the city proposes to use radar which can be mounted overhead, near the signal itself. This will avoid future costs of loop replacement and improve the reliability of signal operations.

There is interest in future expansion of TDOT's freeway patrol, called the HELP program, whose operations in Southeast Tennessee are currently limited to the Chattanooga area. This program offers rapid response to minor motorist incidents, such as running out of gas or a flat tire, in order to minimize disruption to the overall traffic stream on the interstate. As volumes grow on I-75, this service would be helpful to maintaining reliable freight and passenger transportation through the Cleveland region.

Freight Transportation

Cleveland's freight infrastructure is extensive and multimodal. It includes key regional/national truck corridors such as Interstate 75, a Norfolk Southern Railroad trunk line, and an inland waterway link to the Mississippi River system via the Hiwassee River. This section describes the region's freight infrastructure by mode and analyzes the key trends that could impact regional freight demand in the future.

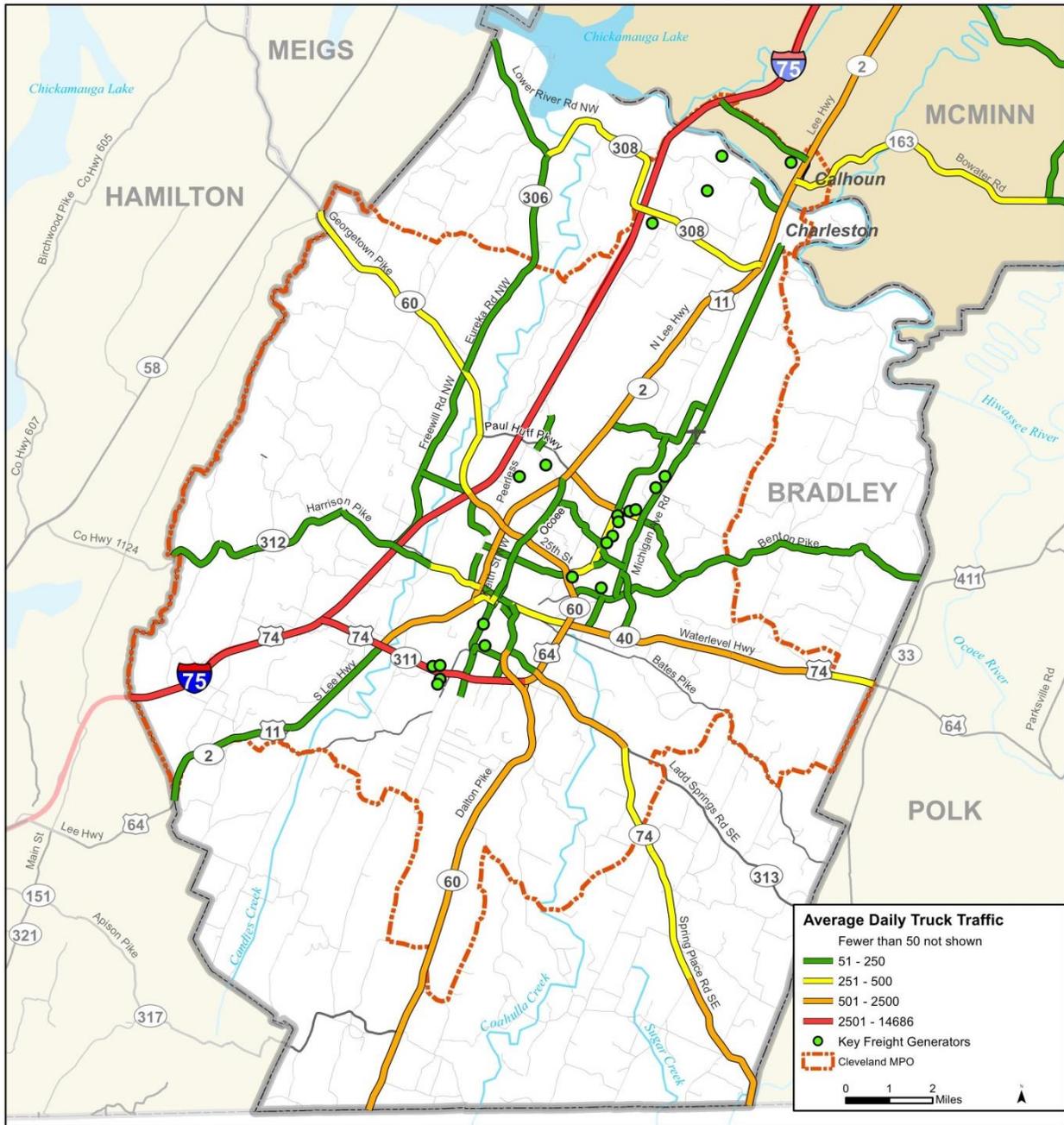
Truck Activity in the Region

Trucks handle more than 90 percent of freight shipments by weight in Cleveland and Bradley County, so understanding truck traffic patterns is crucial to freight transportation decision-making in the region. This section describes truck volumes and traffic patterns in Cleveland and identifies major truck generators and key commodities moving by truck.

Figure 4.16 shows average daily truck traffic by route throughout the MPO area. Also shown are the locations of major truck freight generators. These are companies in freight-dependent industries that have at least 150 employees, as identified in the latest data from the Cleveland-Bradley Chamber of Commerce. Truck traffic originates from, and is destined for, businesses in these primary categories:

- **Manufacturers**, including Whirlpool, M&M Mars, Olin Corporation, Wacker Polysilicon, Lonza, and Duracell (among others) are located throughout the MPO region;
- **Warehouses and Distribution Centers**, such as Amazon, which recently built a distribution center near the I-75/SR 308 interchange (Exit 33), and Peyton's Southeastern, which is the contract distributor for Kroger's grocery stores; and
- **Trucking Firms**, including First Fleet which has two truck terminals in the area.

Figure 4.16: Major Freight Generators and Average Daily Truck Traffic



Another way to look at truck freight flows is to consider the *percentage* of trucks in the overall traffic stream on a given road. Many roads experience relatively low-overall volumes, but if a large share of total traffic is composed of heavy-duty trucks this indicates that the road is an important freight link. Oftentimes these roads serve as the primary link between local freight-generating businesses and the regional or national transportation network.

Figure 4.17 shows truck traffic percentages for major roadways in the Cleveland area and Table 4.14 shows truck percentages at selected locations. These locations correspond to TDOT traffic recording stations and therefore may not include every road in Cleveland where trucks form a large share of the traffic mix. However, they provide an overall view of where trucks form a significant proportion of total traffic.

Figure 4.17: Routes with a High Percentage of Truck Traffic

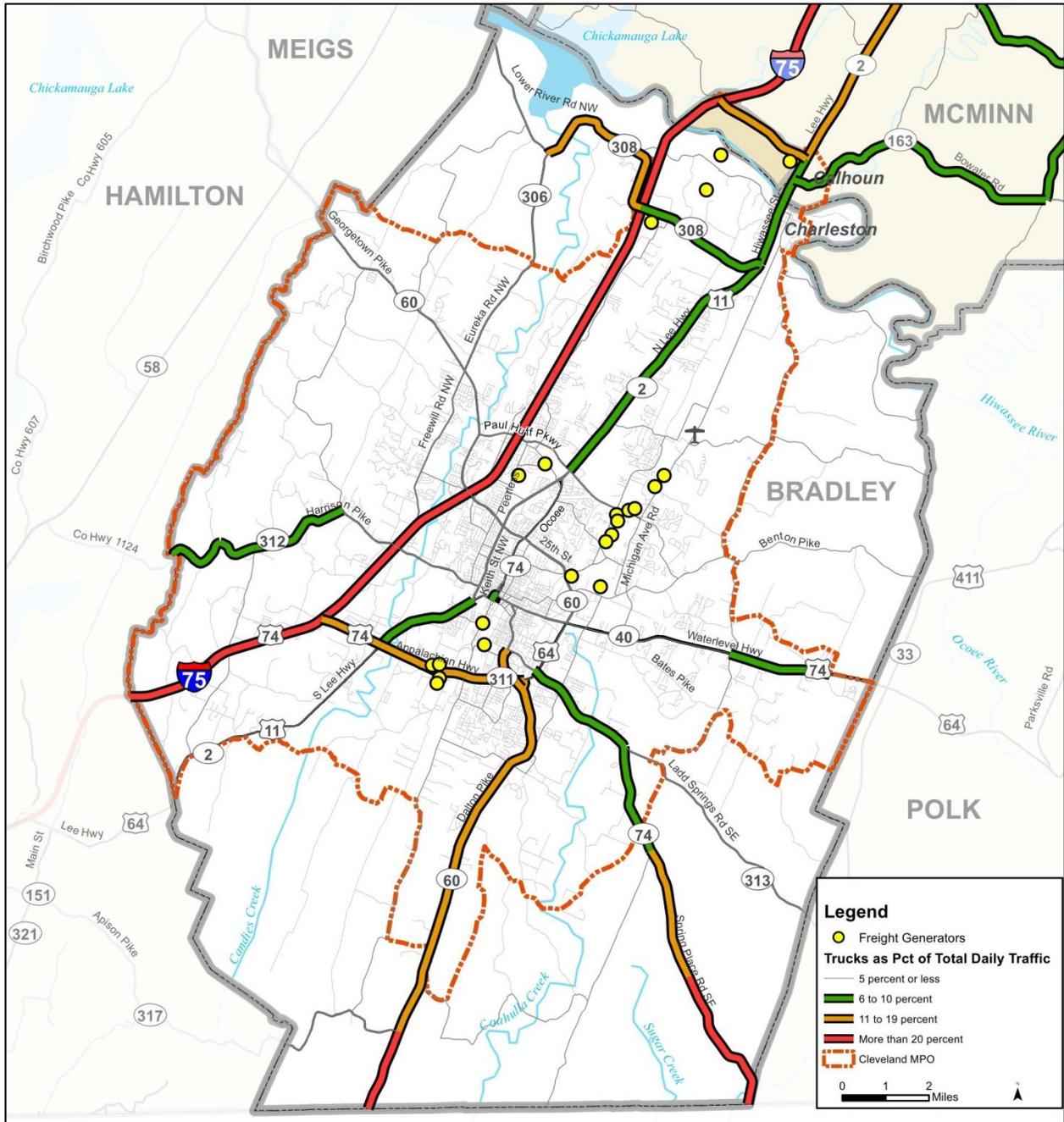


Table 4.14: Truck Traffic Percentages at Selected Locations

Location	Adjusted Avg Daily Traffic (Total)	Adjusted Avg Daily Traffic (Trucks)	Percentage of Trucks
SR 308 (Lower River Road) between Ledford Island Road and SR 306 (Eureka Road)	1,930	290	15%
US 74/APD 40 between Interstate 75 and US 11/SR 2 (Lee Highway)	21,480	3,007	14%
Cass Lane between Swafford Lane and US 11/SR 2 (Hiwassee Street)	1,710	51	3%
SR 308 (Lauderdale Memorial Highway) between Mouse Creek Road and Hughes Avenue	5,900	354	6%
SR 74 (Spring Place Road) between Stinnet Road and Million Drive	4,130	496	12%
SR 60 (Dalton Pike) between Bell Road and APD-40	10,270	1,130	11%
APD-40/US 64 (Waterlevel Highway) between Hancock Road N.E. and Chestuee Road	14,050	843	6%
SR 74 (Spring Place Road) between Gap Springs Road and Easley Ford Road	1,530	643	42%

Since the last Regional Transportation Plan was prepared, the northern portion of the MPO region has seen significant growth in manufacturing and distribution, with the addition of Wacker Polysilicon and an Amazon distribution center just off I-75 along SR 308 (Lauderdale Memorial Highway). This state highway and SR 163 just across the river in southern McMinn County are becoming increasingly busy freight routes. Cass Lane has lessened in importance since completion of the state industrial access road for Wacker Polysilicon, which provides a better connection to I-75 via SR 308 for many of the trucks that formerly used Cass Lane and Hiwassee Street in Charleston. Although it is still a busy route, the percentage of trucks on Cass Lane has dropped since 2009 from 13 percent to only 3 percent.

Within the city of Cleveland, many freight-intensive companies are located near I-75, particularly around APD 40 and Old Tasso Road, both of which offer convenient access to the interstate. However, several companies are located in areas with a mix of residential, commercial and institutional uses. Trucks serving these locations must navigate along roads that are also crowded with passenger and/or pedestrian traffic. Peerless Road and Mouse Creek Road N.W. are examples where such potential conflicts may occur. Major routes such as US 74/APD 40 and 20th Street also tend to be important for both freight and passenger movements.

These routes are critical for many area businesses. For example, Peyton’s distributes dry grocery goods to about 800 stores throughout the Southeast and Mid-Atlantic regions, making more than 600 outbound truck trips weekly. All of those trips begin and end on the APD-40 bypass, and most use the

Exit 20 interchange to access I-75. Dalton Pike (SR 60) also serves as an alternative for southbound truck trips, particularly since the completion of road improvements on that corridor.

On the east side of Cleveland, Bayer Corporation manufactures Coppertone suntan lotion and transports it from its location on Michigan Avenue Road to the company's primary distribution center in Georgia. Regular trips are also made from Cleveland to distribution centers in Ontario and in Texas at the U.S./Mexico border. Although rail is available to some of the manufacturers along Old Tasso Road and Michigan Avenue Road, trucking is by far the primary mode of transport.

Some manufacturers, such as Lonza (Arch Chemicals), have multiple facilities in the area and make both short and long-haul truck trips. Lonza's primary manufacturing facility is located in northern Bradley County on Lower River Road, where it receives some raw materials by rail. Several daily truck trips are made between this facility and a company warehouse in Cleveland. Regular truck shipments also leave the plant to take products to a repacking facility in Dayton, using SR 60 (Georgetown Road) for the 30-mile trip. A new state industrial access road built for Wacker Polysilicon has also been of significant benefit to Lonza by providing direct access to SR 308 (Lauderdale Memorial Highway) without driving along Cass Lane and Hiwassee Street through the city of Charleston.

Most freight stakeholders who participated in an interview reported they are generally pleased with transportation in the greater Cleveland area. They said the traffic bottlenecks that cause the greatest concern and impact their schedules are actually outside the region: interstate delays through the Chattanooga area were mentioned as a serious problem, as well as severe traffic congestion throughout metropolitan Atlanta. This underscores the importance of continued coordination between the Cleveland MPO and its partners, particularly TDOT and the Chattanooga/Hamilton County/North Georgia Transportation Planning Organization.

Discussions of this nature have been occurring through *THRIVE 2055*, the regional planning initiative for a 16-county area covering southeast Tennessee, northeast Alabama and northwest Georgia. Although the public/private initiative addresses multiple aspects of the region's future, transportation is recognized as a major issue and freight is a key topic. The tri-state region is identified as a "top ten" center for freight transportation, of which 80 percent is said to be thru-traffic. Cleveland area leaders have expressed support for a number of roadway projects which extend beyond their MPO boundaries but could help relieve major bottlenecks affecting commerce in Bradley and McMinn counties:

- **Dedicated truck-only lanes along I-75 and I-24** for thru-trucks, to be included in discussions of widening I-75 and I-24.
- **Widening SR 60 (Dalton Pike)** to Dalton, Ga. to enhance its function as an alternative corridor to the interstate.
- **Expansion of Intelligent Transportation Systems** to divert passenger and freight traffic onto major connectors (e.g. the APD-40 bypass) when I-75 is blocked between Cleveland and Chattanooga.
- **Completion of Corridor K** improvements to US 64 through the Ocoee River Gorge in Polk County, located east of Bradley County. US 64 is the only east-west arterial route in the region providing access between Tennessee and North Carolina.
- **New Tennessee River bridge to the west of Bradley County.** This project would extend SR 312 from SR 58 in Hamilton County to US 27 via a new Tennessee River crossing in the vicinity of

Soddy-Daisy. The new bridge would be located north of SR153 in Hamilton County, essentially connecting Appalachian Development corridors K and J. TDOT reviewed this location and a small number of other alternatives as part of a toll feasibility study in 2012.

- **Tennessee/Georgia I-75 Bypass.** Regional corridor loop connecting I-75 from near Dalton to I-75 near Cleveland to avoid the I-75/I-24 bottleneck in Chattanooga. Existing routes such as SR60 Dalton Pike and the APD-40 bypass should be considered among the alternatives. The Cleveland-Dalton leg of the system could be connected across I-59 to I-24 west of Chattanooga as envisioned in the Thrive 2055 concept maps

The state's long-range freight plan includes several of the projects on local leaders' list. Those with partial funding include the completion of Corridor K and modifications at the I-75/24 interchange in Chattanooga (which, as mentioned earlier, heavily influences freight movements in the region although it lies outside the Cleveland MPO area).

Other truck-related projects identified in the state's freight plan that have no designated funding yet include:

- Widening I-75 from the Hamilton County line to US 74/APD-40 (Exit 20);
- Widening the remaining portion of I-75 in Bradley County, from US 74/APD-40 northward to the McMinn County line; and
- The Tennessee/Georgia I-75 Bypass, including the potential alternative suggested by local leaders to use existing routes.

Rail

Freight rail service in the MPO region is provided by Norfolk Southern (NS), which is one of the seven North American Class I freight railroads. NS operates about 21,000 route miles of track in 22 states; primarily in the Eastern half of the country (See **Figure 4.18**). Within Tennessee, their tracks are chiefly located in the eastern part of the state around Chattanooga, Knoxville, and Johnson City.

Figure 4.19 shows the rail network in the MPO region. NS is the only railroad operating in Bradley County, although CSX operates tracks in neighboring McMinn and Polk Counties. NS has two lines that converge in the Cleveland MPO area from the southwest; the consolidated line then runs northeasterly through Bradley County before crossing the Hiwassee River into McMinn County. There is a spur that serves the Olin Chemical facility.

The NS lines in Bradley County are part of Norfolk Southern's Crescent Corridor, which has been one of the railroad's chief capacity investments in the past decade. The goal is to make improvements needed to develop high-speed intermodal service linking the Gulf Coast to the Northeast, roughly in parallel with the I-75/I-81 corridor through Tennessee.

The list of Crescent Corridor projects includes straightening curves, signal upgrades, new intermodal terminals (including a possible location in Eastern Tennessee), and adding passing tracks. Since the adoption of the 2035 RTP, new intermodal facilities have been completed in the Memphis and Birmingham areas as part of Norfolk Southern's Phase 1 improvements. The proposed East Tennessee facility is part of Phase 2 plans and is currently still in the planning stages. Its likely location will be in

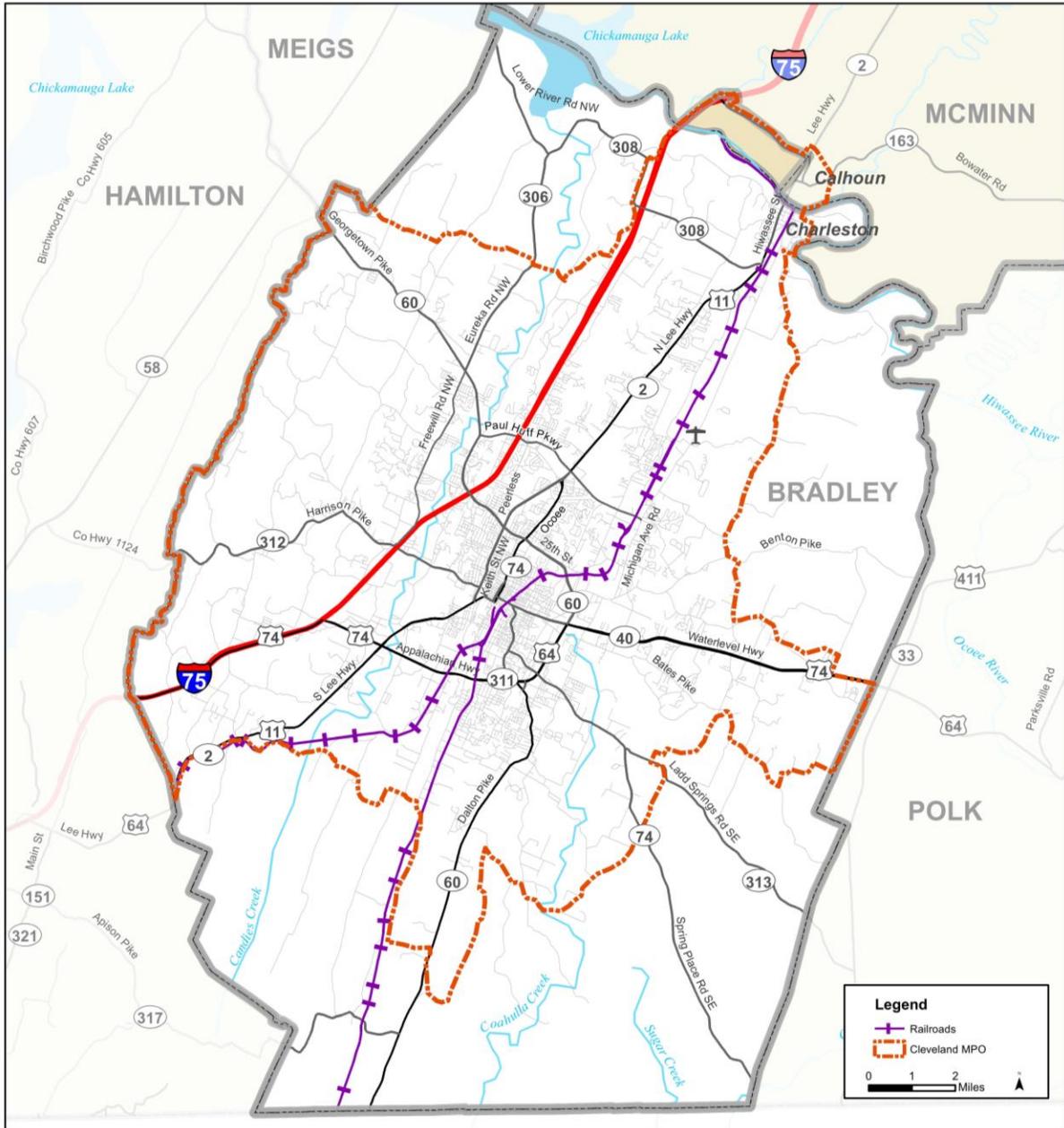
western Jefferson County, about 25 miles east of Knoxville, placing it between the interstate junctions of I-75/I-40 to the west, and I-40/I-81 to the east.

Figure 4.18: Norfolk Southern rail network



Another new truck-rail intermodal facility is coming on line to the south of the MPO in Chatsworth, GA, this one to be served by CSX. State and local leaders anticipate the automotive industry will be one of the heaviest users of the facility, at least in the short to mid-term. Given the large role that the automotive industry plays in Tennessee’s economy, some increase in truck traffic could be expected on routes that connect Tennessee’s auto industry to the Chatsworth facility. Truck trips to and from between Volkswagen would occur downstream of the Cleveland region, but economic activity spurred by the presence of the new intermodal center could certainly spill over to the Cleveland area. Affected routes would depend partly on where new or expanded businesses are located, but would likely include SR 60 (Dalton Pike), already identified as a freight route, and possibly US 411, which lies just to the east of Bradley County.

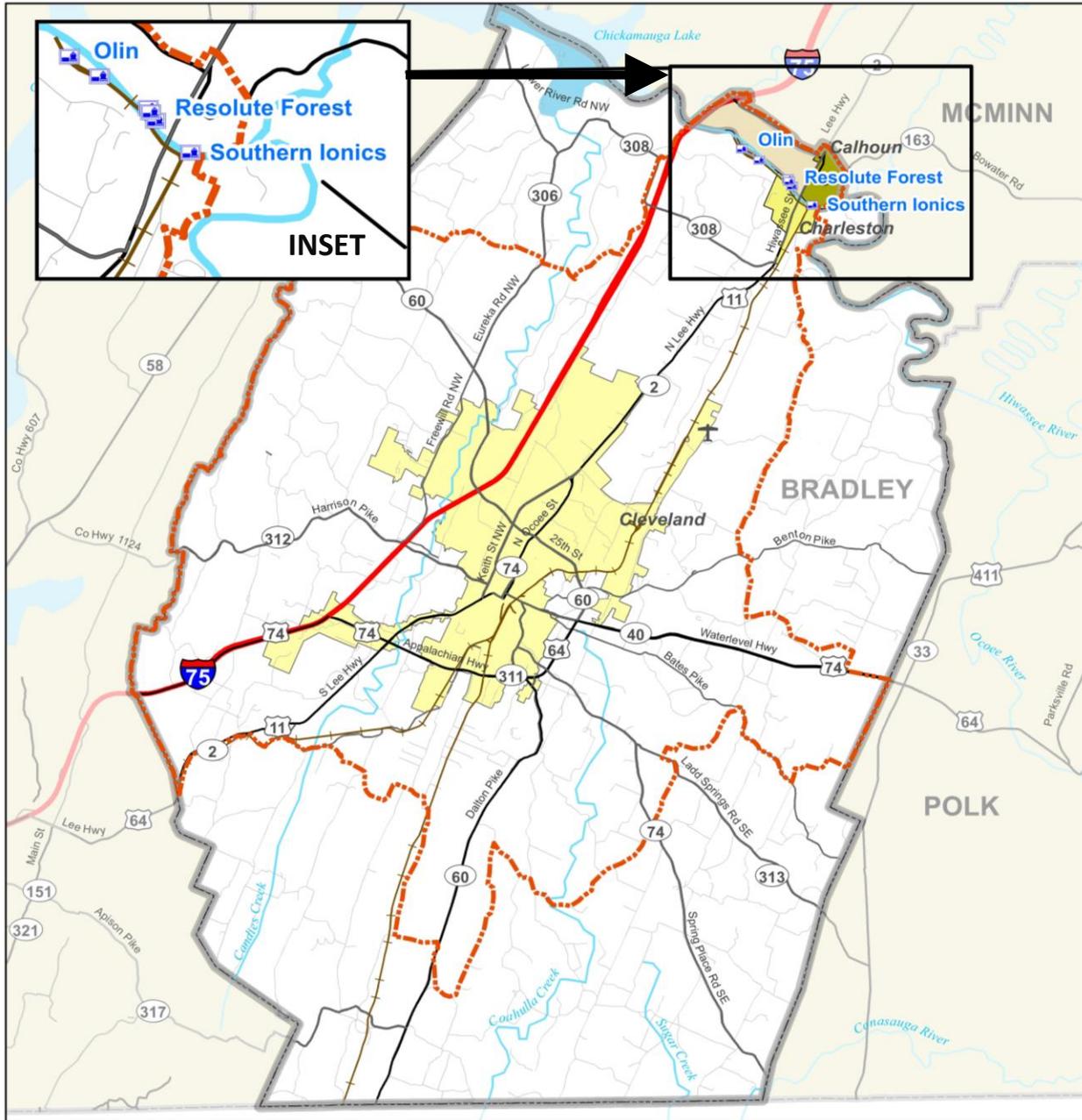
Figure 4.19: Rail Network in the Cleveland MPO Region



Waterway Facilities

Inland waterway access in Bradley County is provided by the Hiwassee River, which is maintained by the Tennessee Valley Authority (TVA) at an authorized depth of ten feet. The river forms the boundary between Bradley County and McMinn County, and connects the region to the Tennessee River approximately 22 miles to the west. The Tennessee River serves as a critical river corridor for shipments of aggregates, petroleum, grain/feed, metals, and chemicals.

Figure 4.20: Location of River Ports in the Cleveland MPO Region



As shown in **Figure 4.20**, there currently are six intermodal port facilities on the Hiwassee River, two of which are located in Bradley County (the other four are in McMinn County). The Olin Chemical Corporation owns and operates both of the Bradley County terminals, which are used to ship and receive liquid caustic soda, chlorine, dry sulfur, salt and related chemical products, as well as primary iron and steel products. Each has access to Interstate 75 as well as Norfolk Southern rail service. Resolute Forest Products (formerly Bowater) uses its river port facilities in McMinn County to handle include pulpwood and related products and the other port is owned by Southern Ionics, another chemical manufacturer.

As with truck freight, the Cleveland region's waterway system is heavily influenced by the state of transportation facilities in the Chattanooga area. The Chickamauga Lock, located at Mile 471 of the Tennessee River in Chattanooga, is a strategic link between the Hiwassee River and the rest of the inland waterway system. This lock provides Bradley County shippers access to 318 miles of navigable waterways upstream of the lock, ultimately connecting to the Mississippi and Ohio River systems. Closure of the lock would shift these loads to truck transportation, and would effectively eliminate one of the competitive shipping options from the market.

The Chickamauga Lock is owned by the TVA and operated by the US Army Corps of Engineers. Although the lock has served its function well for decades, it suffers from structural concerns and capacity constraints. To deal with these problems, the Corps' Nashville District has undertaken a project to rebuild Chickamauga Lock. The project has experienced considerable delays and the state's elected representatives have battled publicly for the necessary federal funding to complete the work. Additional funds for the project were included in legislation passed during the last half of 2015, raising hopes that it will soon be nearing completion. The project is also included in the statewide freight plan.

Aviation

Air transportation plays an important role within the local economy of the region and offers a diversity of transportation options to industry and private individuals. Integration of the new airport and aviation transport within the region is considered essential to serve existing and attract new industry.

Since the adoption of the last regional transportation plan, the Cleveland Municipal Airport Authority has achieved a major goal nearly 40 years in the making, to construct and open a new regional Jetport. The new facility, officially commissioned in 2013, is located on Dry Valley Road NE about two miles southeast of the original airport's location. It replaces Hardwick Field, which did not meet the design standards for a C-II aircraft (including business jets) and was limited in expansion due to the slope and length of its runway and surrounding residential development.

The new Jetport was constructed with 5,500 feet of runway with state of the art LED lighting. Soon after opening, however, it was determined there was inadequate operating space for the larger corporate jets used by some of the area's major companies. A 700-foot runway extension is now underway. The Jetport is also constructing additional T-hangar space for use by area owners and operators. Nearly 50 aircraft are currently based there.



Cleveland Regional Jetport's terminal

Fixed-base operator (FBO) services are currently provided through contract with Crystal Air. The new 8,000 square-foot terminal building offers a pilot lounge as well as conference and meeting rooms that can be used by visitors and on a rental basis for community events.

Transit

Local Transit Service

Agencies Providing Service

Fixed-route transit service within the Cleveland MPO's urbanized area is provided by the Cleveland Urban Area Transit System (CUATS), which has been operating since 2005. The service includes a deviated service which is available to ADA-eligible passengers. In other words, CUATS operates a "deviated fixed-route system," meaning that the buses operate on established routes and serve regular bus stops, but can also pick up and drop off riders elsewhere within the urbanized area boundary. Riders who wish to be picked up within that distance must call 48 hours in advance to schedule pickup and dropoff times.

Outside the urbanized area, curb-to-curb paratransit service is provided by the Southeast Tennessee Human Resource Agency (SETHRA), which provides public transportation within Bradley, McMinn and seven other counties in Southeast Tennessee. In Bradley County and the portion of McMinn County that lies within the MPO, SETHRA's service is provided on a demand-response basis, meaning riders contact the agency in advance for an appointment. Rides are scheduled on a first-come, first-served basis. Reservations for local trips must be made 24 hours in advance, or 72 hours in advance for non-local trips, including trips to Chattanooga.

The SETHRA service operates Monday through Friday, from 6:00 AM to 6:00 PM and costs \$1 per trip within a single county. Trips to neighboring counties are \$3, and \$5 each way for trips to Chattanooga. SETHRA's service is provided using both regular and lift-equipped vehicles. Currently the agency reports that more than 80% of its fleet is lift-equipped.

CUATS Routes and Operations

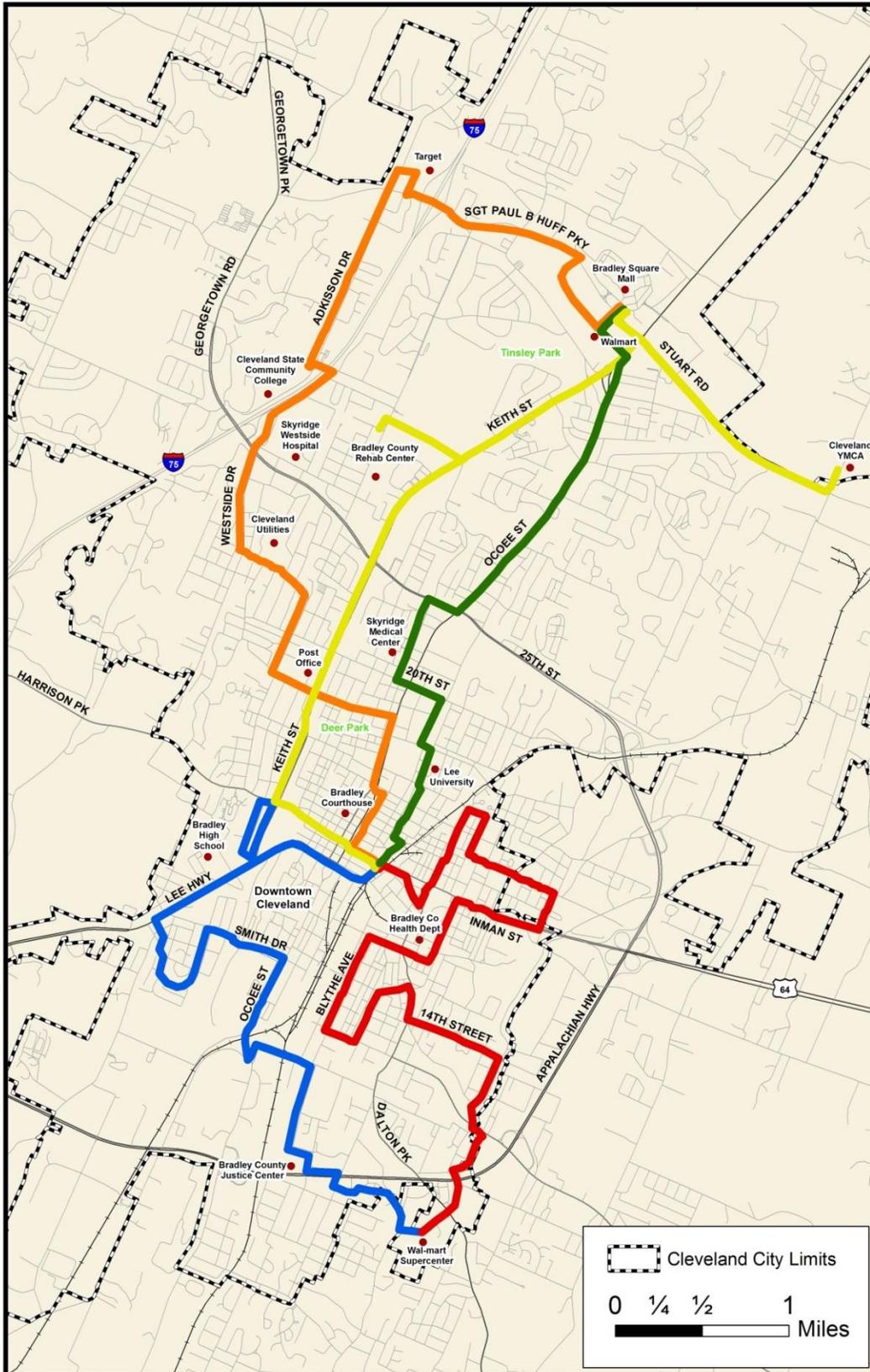
The CUATS system is comprised of five routes, shown in **Figure 4.21**, consisting of the Orange, Green, Blue, Red and Gold lines. Each route originates at the Cleveland Depot, a transfer point located near the intersection of Edwards and Inman Streets, adjacent to the railway. Transfers among the Green, Orange and Gold lines can be made at Bradley Square Mall. The other transfer point in the system is between the Blue and Red Routes, at the Dalton Pike Walmart Super Center.

The routes operate thirteen hours a day from 6:00 AM to 7:00 PM, departing every 60 minutes from the Cleveland Depot.

Tickets for use on the CUATS fixed-route system can be purchased at the Old Chattanooga Pike Transit Center, the Municipal Building, or the Medical Center Pharmacy. The regular fare is \$1.00, with a discounted fare of \$0.75 for students and \$0.50 for seniors. A monthly Eagle Pass costs \$20.00 and \$10.00 for seniors and the disabled. A day pass costs \$2.00.

The CUATS fleet consists of fourteen cut-away buses, all of which are equipped to carry wheelchair passengers. Eleven of the buses are in active use, with three available as backup vehicles. As the system grows, CUATS should consider replacing its fleet with larger, purpose-built buses. Although the smaller vehicles are less expensive to purchase, they are not built to the same standards and must be replaced more often than larger vehicles. Purpose-built buses, perhaps around 25 feet in length, have a longer useful life and fewer maintenance issues.

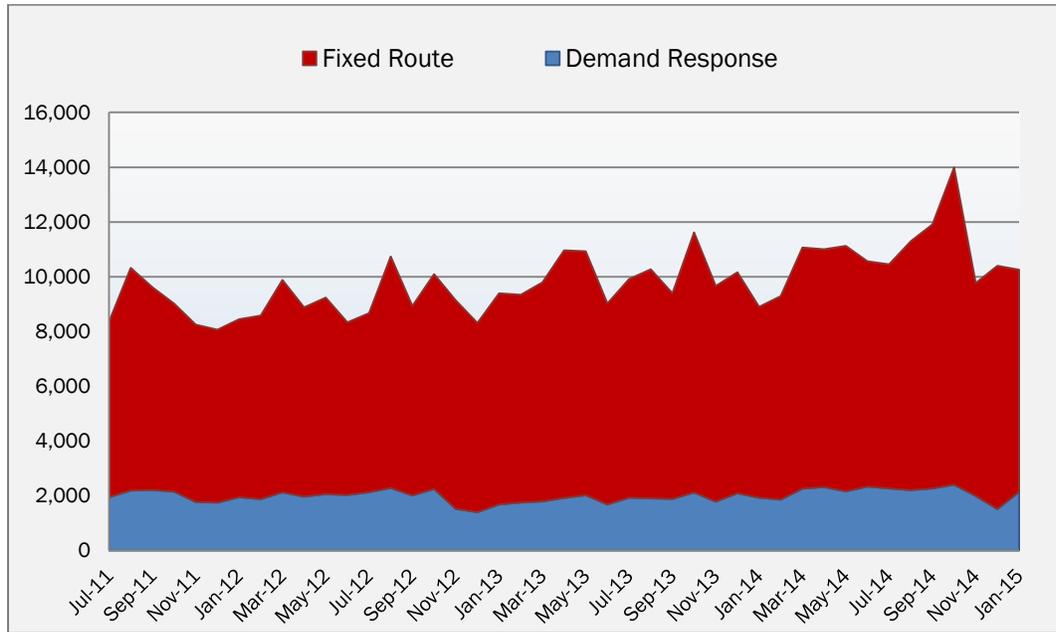
Figure 4.21: Cleveland Urban Area Transit System Service Area



Ridership

Based on ridership data provided by CUATS, fixed-route ridership has comprised 75 to 85% of the total trips over the past five years (**Figure 4.22**), reaching a high of about 14,000 passenger trips in 2014. Although fluctuations occur based on gas prices, employment levels, weather, and other factors, overall ridership has increased on the fixed-route system. Paratransit ridership, while increasing as a total number, has seen a decline in growth since 2009.

Figure 4.22: CUATS Ridership (FY 2011-2015)



Analysis of available NTD data (**Figure 4.23**) shows that CUATS’ paratransit program compares very favorably with its peers in terms of operating costs per trip, cost per revenue-mile, and cost per revenue-hour. As the growth of CUATS’ paratransit ridership has declined, so have the program’s operating costs. While this is clearly the desirable outcome, there is not always such a direct relationship between the number of paratransit riders and the cost of serving them. For example, transit agencies with a large, thinly populated service area must make longer trips to serve a relatively small number of riders.

In fact, the data indicate that CUATS has benefited from a relatively small paratransit service area in which the rider population is fairly concentrated. For example, **Figure 4.24** shows the Cleveland area system has been serving about the same size population as Jackson with a service area of about 55 square miles – about half the size of Jackson’s. This is a crucial point because circumstances are now changing. The successful operating scenario shown in these charts is based on the MPO’s previous urbanized area boundary. When the MPO boundary expanded in 2014, CUATS maintained its current paratransit policy of serving the entire urbanized area – which more than tripled the size of its paratransit service area.

Figure 4.23: Paratransit Operating Costs, CUATS and Peer Comparison

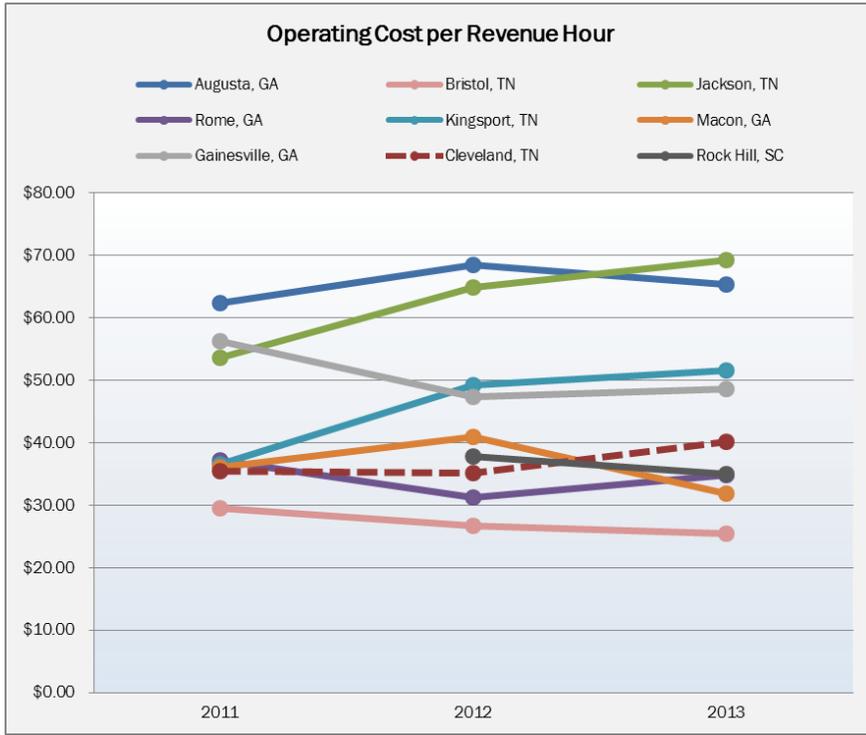
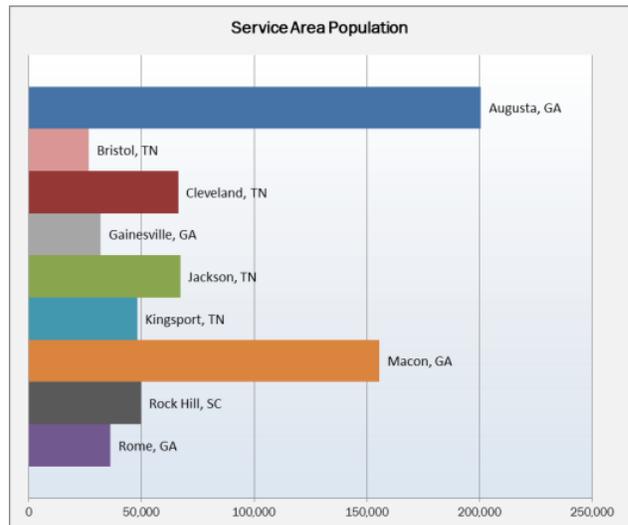
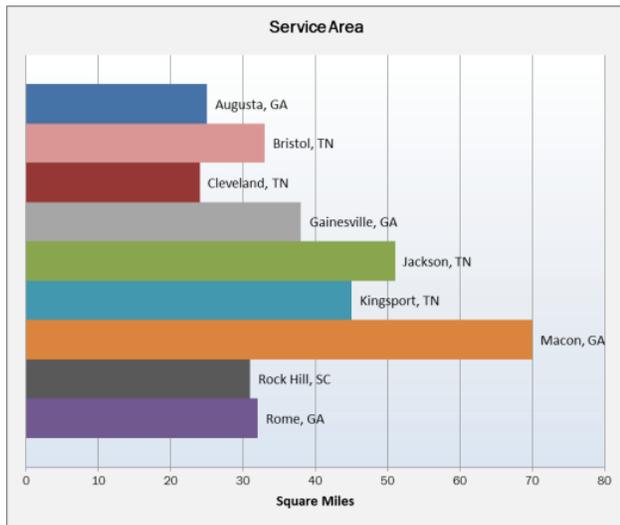
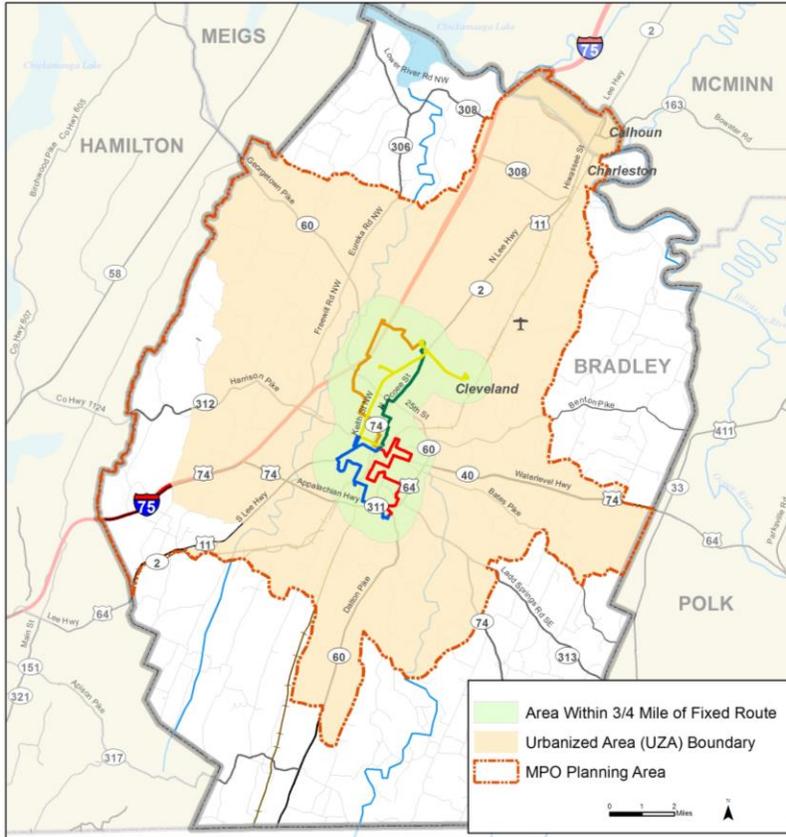


Figure 4.24: Paratransit Service Area and Population, CUATS and Peer Comparison



By contrast, the minimum boundary federally required for public paratransit service is the area within three-quarters of a mile of existing fixed route service. **Figure 4.25** shows the substantial difference in size between the area that CUATS is required to serve at a minimum (about 55 square miles), versus what its policy currently dictates (about 172 square miles).

Figure 4.25: Current Paratransit Service Area Versus Minimum 3/4–Mile Requirement



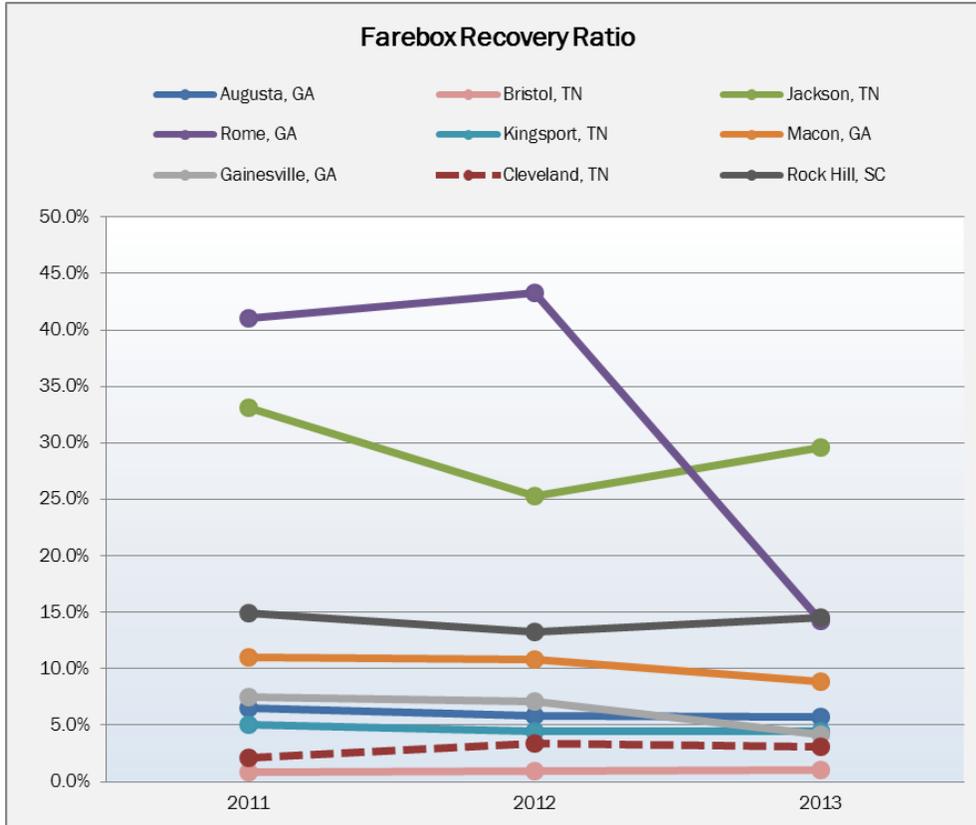
Many transit agencies are currently struggling with rising costs for their paratransit service and are developing strategies to better control those expenses. CUATS has an excellent management record, as demonstrated by the peer comparison, but the greatly increased size of its new paratransit service area could prove to be a significant budget challenge. Cost trends should be carefully monitored in the near term to determine the effect on paratransit operating expenses.

There are several options available to help manage rising costs. One is to reconsider the service area policy. Some communities use the minimum three-quarter mile buffer area; others provide broader service than the minimum but do not attempt to serve the entire urbanized area. Another option is to consider scaling the fare based on distance. SETHRA’s paratransit service takes this approach by charging a higher fare for out-of-county trips. This approach may be preferable to changing the service boundary, particularly when riders have already become accustomed to receiving the service.

A third option could include raising the fare across the board, regardless of whether it is scaled according to distance. As shown in **Figure 4.26**, CUATS’ farebox recovery ratio is extremely low compared to peer agencies, ranking next to last. Raising fares is a difficult decision and the possible

impacts on vulnerable community members (such as seniors or persons with disabilities) should be considered very carefully. However, a fare study could help evaluate those potential impacts and provide guidance for decision-makers.

Figure 4.26: Paratransit Farebox Recovery Ratio, CUATS and Peer Comparison



Transit Accessibility and Potential

One of the MPO’s goals is to increase the proportion of people with reasonable access to fixed-route transit service, defined as being located within a half-mile of a fixed bus route. About 37 percent of the people living within the MPO planning boundary fall into that category, based on a review of the CUATS route system and current population data. Within the Cleveland city limits, where the transit system is centered, an estimated 85 percent of residents have access to fixed route service. These are much better results than might be seen in some larger metropolitan areas, although living within a half-mile of a bus route does not necessarily mean a person has a safe way to get there, as discussed in the Bicycle/Pedestrian section. Still, the Cleveland area can work on sidewalk improvements with the satisfaction of knowing that making those links will pay off in true multimodal access, giving residents access not only to the nearest major street, but to cross-town travel.

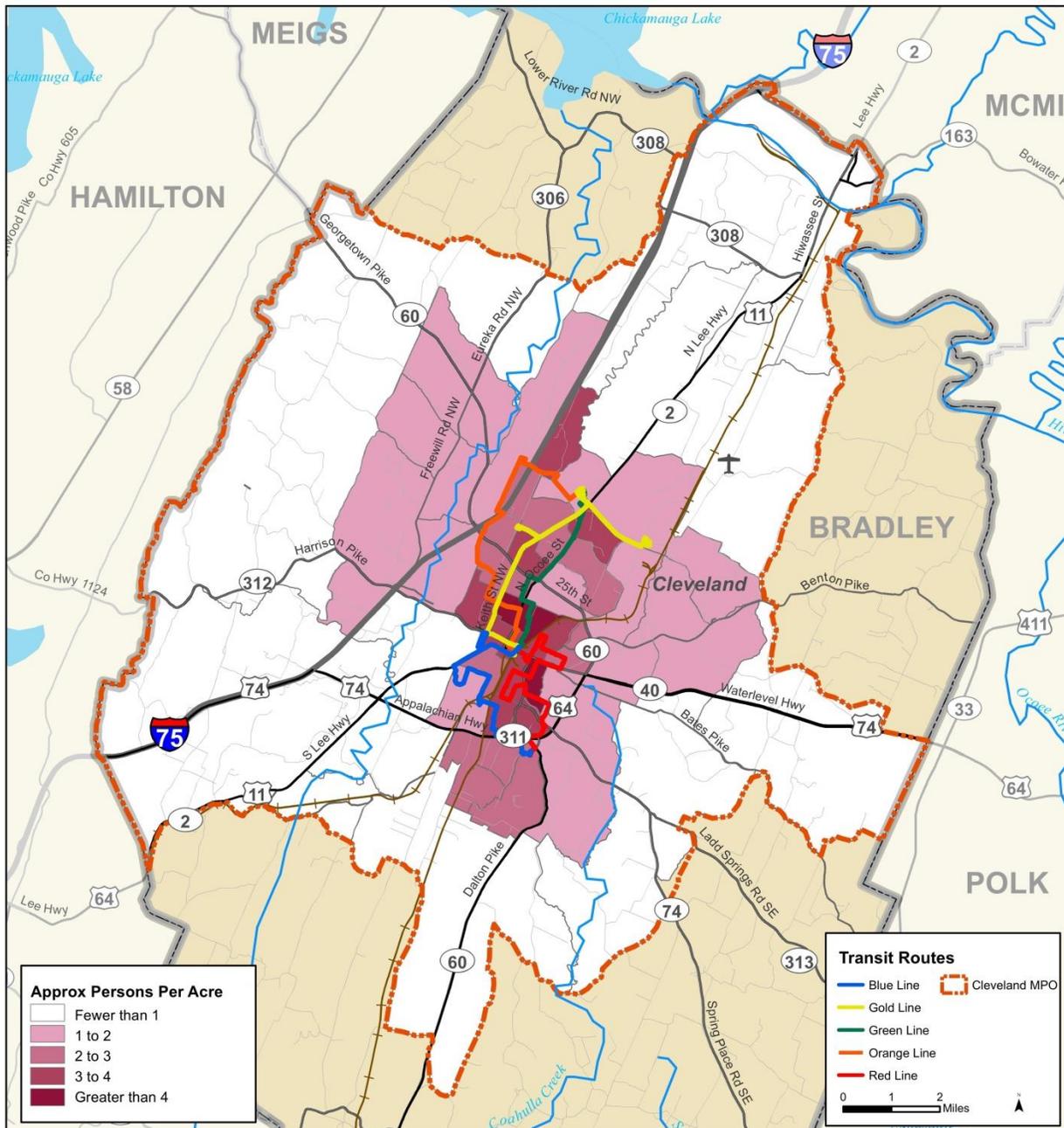
In looking at areas with the best potential for establishing new or expanded transit service, important indicators include population density and socioeconomic characteristics. In 2013 CUATS completed a systemwide performance assessment and made a series of route adjustments to respond to development changes and ridership patterns. A review of its current service in relation to socioeconomic characteristics, discussed below, shows the value of conducting a transit operational

assessment at least every five years. CUATS is serving a significant portion of the areas where transit is most feasible, to the extent possible given funding constraints and other limiting factors.

Population Density

Higher population densities are generally associated with higher transit usage, and are more cost-efficient to serve as well. **Figure 4.27** shows approximate density in persons per acre for the Cleveland MPO region, based on Census block group data. The map indicates that most of the higher density areas are already served by one or more CUATS fixed-route buses.

Figure 4.27: Approximate Persons Per Acre, Cleveland MPO Region



One potential place for expansion is the neighborhoods located along Mouse Creek Road north of Paul Huff Parkway. The Orange Route in this area currently runs as far north as Paul Huff Parkway. However, providing additional service to these residents would require running a bus along Mouse Creek Road, identified in the plan as a concern due to its narrowness and geometric deficiencies. A significant number of the people in the area live within a half-mile of the route, but again, conditions for pedestrians along Mouse Creek Road are poor and previous improvement efforts have stalled due to very high cost estimates. Northward extension of the Cleveland Greenway, which has a trailhead just north of Paul Huff Parkway in this area, could be a potential alternative to link these neighborhoods to the Orange Route.

While the goal is to make fixed-route transit accessible and used by any citizen, it is particularly important to ensure that service is available to groups of people who do not have other transportation options. Demographic information can be used as indicators of potential for transit ridership. Key indicators include household income, access to private vehicles, and groups that traditionally use transit in greater numbers than the population at large, including minorities, seniors, and the disabled. This analysis uses these demographic indicators to identify the geographic areas with the most potential for transit ridership in the Cleveland Urban Area. All demographic information is derived from the Census Bureau's 5-year American Community Survey estimates, which are available at the block group level.

Households at or Below the Poverty Level and Zero Vehicle Households

Household income and zero car households measure different things, but are both indicators of households that may use public transportation because they do not have access to a private automobile. Low household income does not necessarily equate to lack of access to a private automobile, but there is a strong correlation between low income and transit use.

Figure 4.28 shows locations with a relatively high concentration of persons living below the poverty level. An estimated 50 percent of low-income people across the MPO area currently have access to transit, although it should be noted that the precision of planners' analysis is affected by the fact that the Census no longer reports such data below the block group level. Within the City of Cleveland, an estimated 86 percent of low-income persons have access to fixed-route transit. **Figure 4.29** shows locations with a relatively high number of households that do not have access to a private automobile, which total about 2,000 throughout the MPO area. About 61 percent of those households have access to fixed-route transit; nearly all of those who do not have access live outside the Cleveland city limits.

Figure 4.28: Persons Living Below the Poverty Level, by Census Block Group

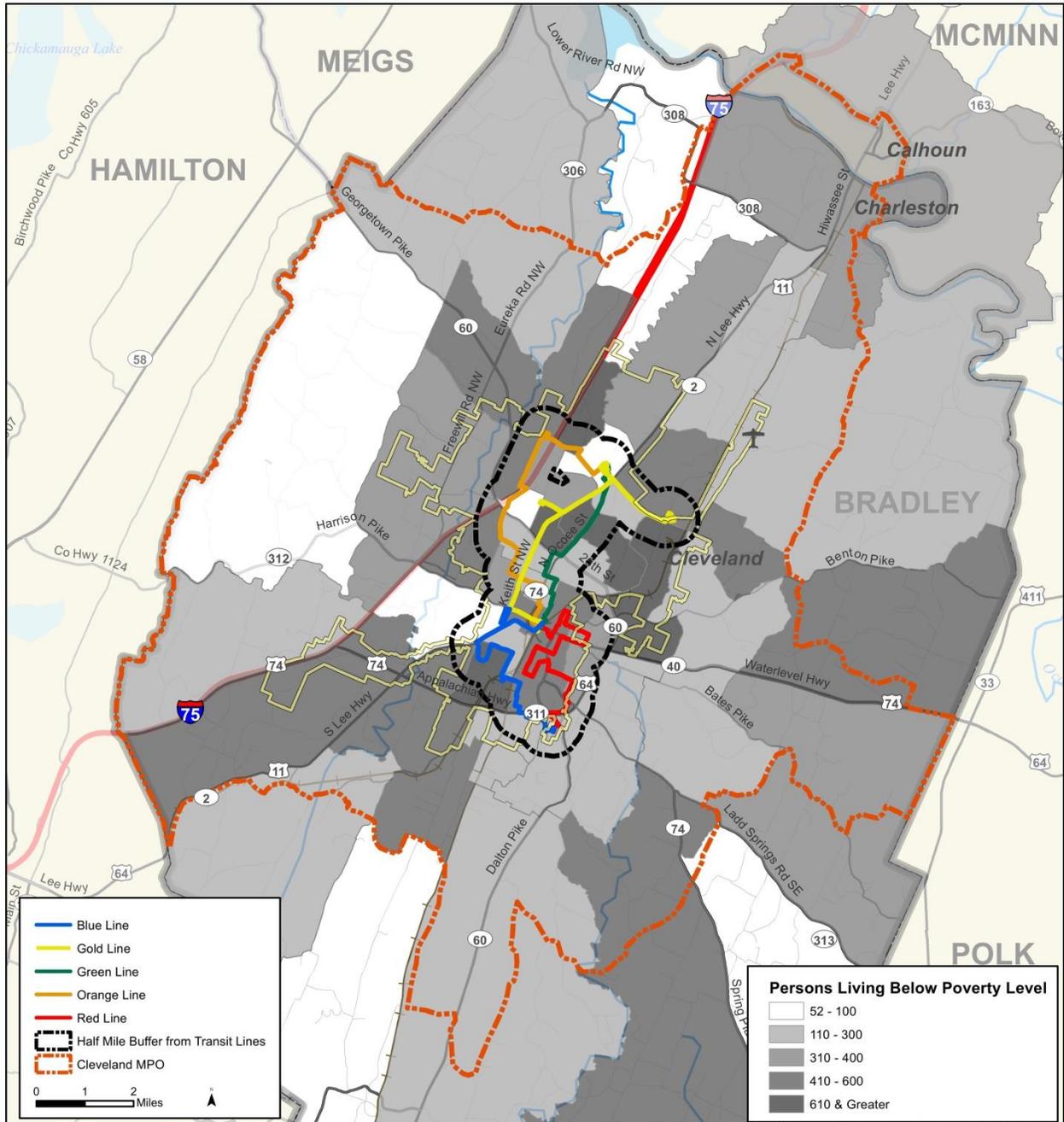
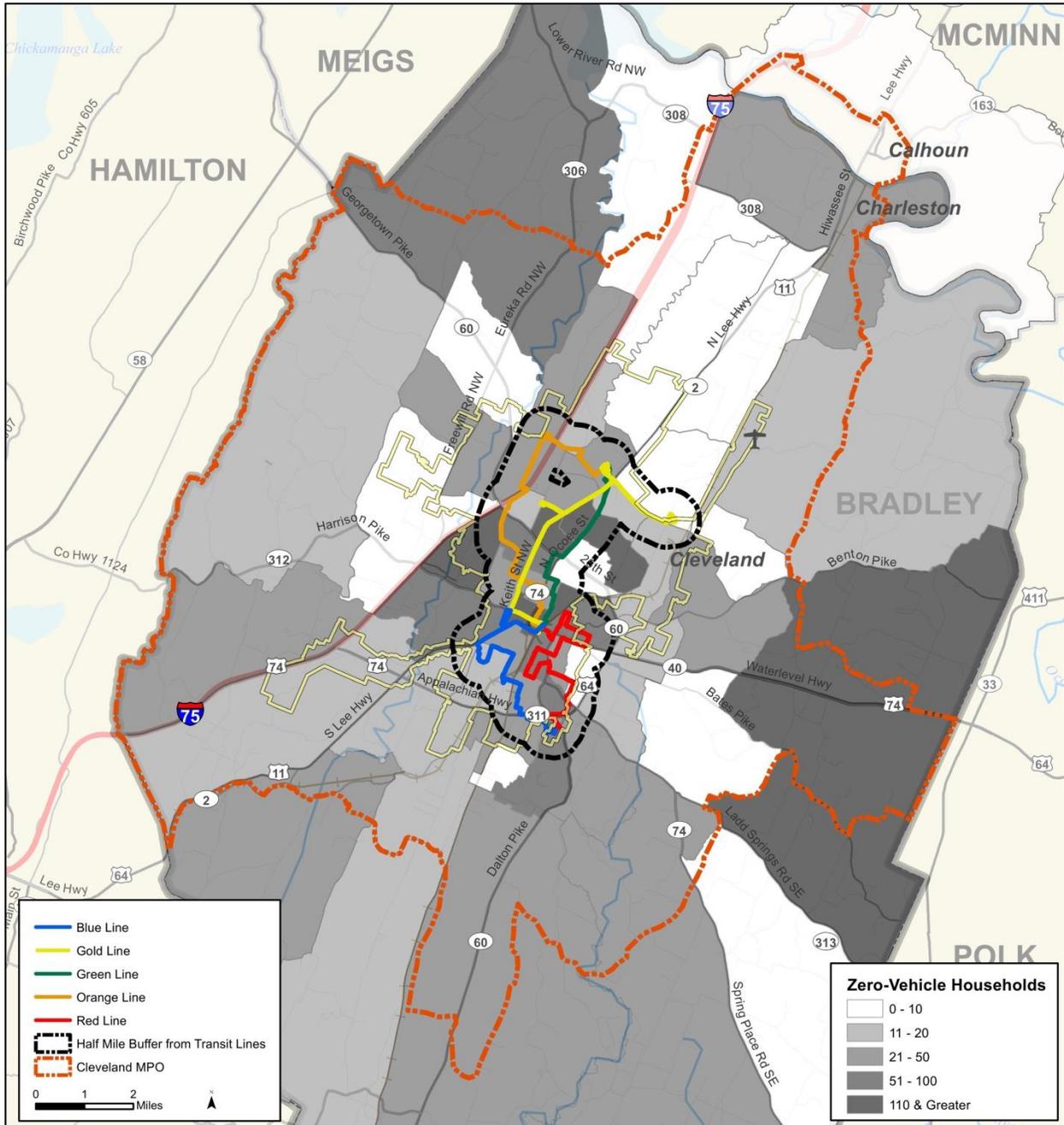


Figure 4.29: Zero-Vehicle Households (No Access to Private Auto)



Senior Population

Seniors, defined as people age 65 and older, are another group that rides public transportation in greater numbers than the population at large. Seniors may have physical issues which make operating a private vehicle difficult and which make public transportation a more likely transportation choice. **Figure 4.30** maps the percentage of the population that is 65 years or older in the Cleveland MPO area. The map shows that the senior population is fairly evenly distributed across the MPO area, with a fairly large percentage of seniors living outside the City of Cleveland. Since the senior population is so dispersed, only about 35 percent within the MPO area have access to fixed-route transit. Within the City of Cleveland, that number rises to about 80 percent. Figure 4.30 also shows the locations of assisted living and other senior-oriented facilities, most of which are located in Cleveland and are accessible by fixed-route transit. Although not all seniors at these locations may be able to use transit, it provides important community connections for those who can.

Minority Population

For the purposes of this analysis, minority population is the non-white population as defined by the U.S. Census. For a variety of social and economic reasons, minorities tend to ride public transportation in greater numbers than the population at large. **Figure 4.31** maps the percentage of the population that is non-white. An estimated 56 percent of minority persons in the MPO area have access to fixed-route transit; within the City of Cleveland the estimate is 79 percent.

Persons with Disabilities

The disabled population rides public transportation in greater numbers than the general public because of the barriers that their disabilities present to operating a private automobile. **Figure 4.32** maps the percentage of persons reporting one or more disabilities in the Cleveland MPO Area. The map indicates a significant number of persons with disabilities live in more rural areas of Bradley County, particularly the northwest and southeast portions of the county. Access to fixed-route transit is estimated to be available to about 37 percent of the persons with disabilities living within the MPO area and about 67 percent of those living in the City of Cleveland. Those who do not have access or are not able to use the fixed-route service, of course, are served through paratransit either by CUATS or SETHRA.

Figure 4.30: Senior Population, by Census Block Group

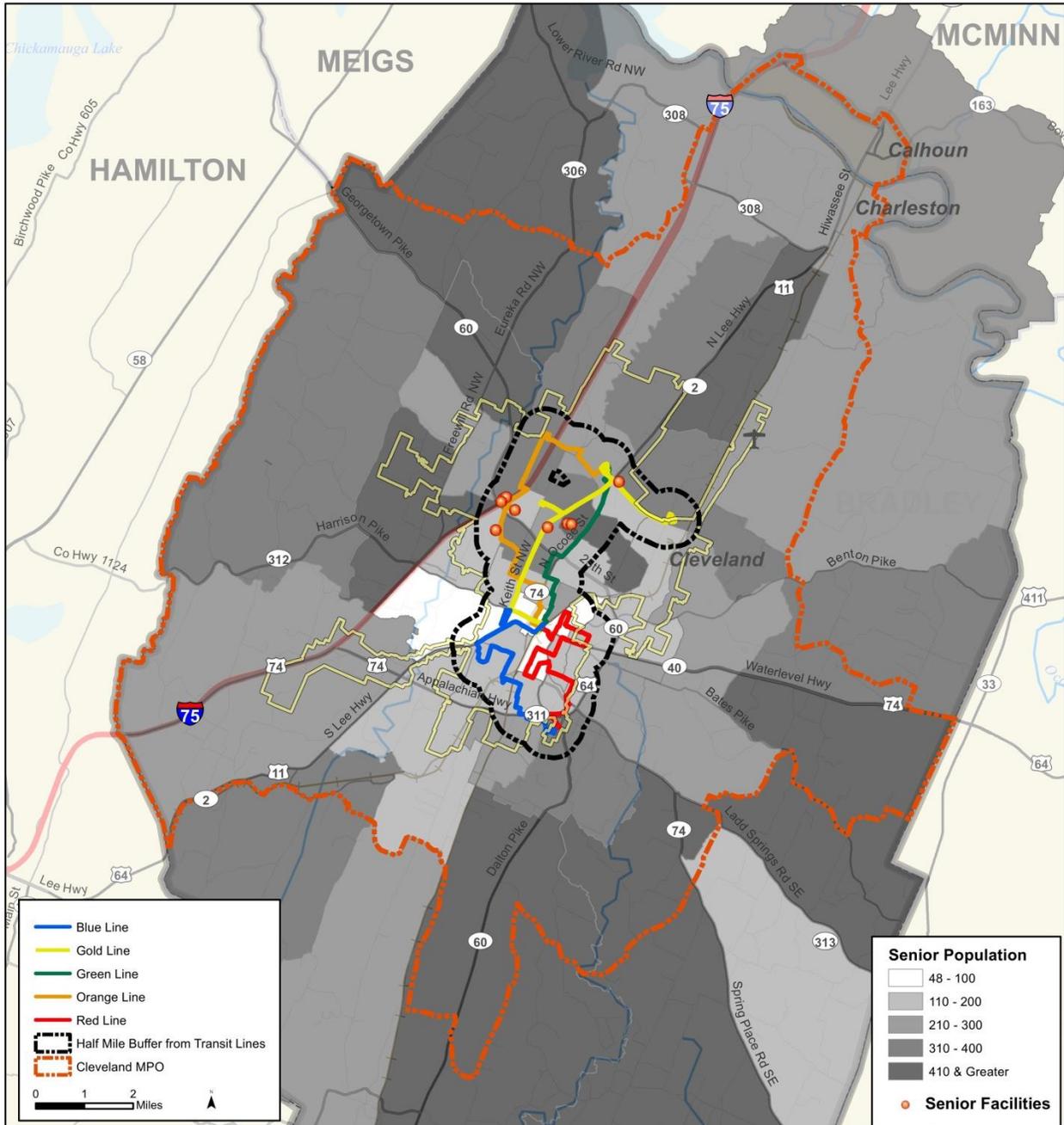
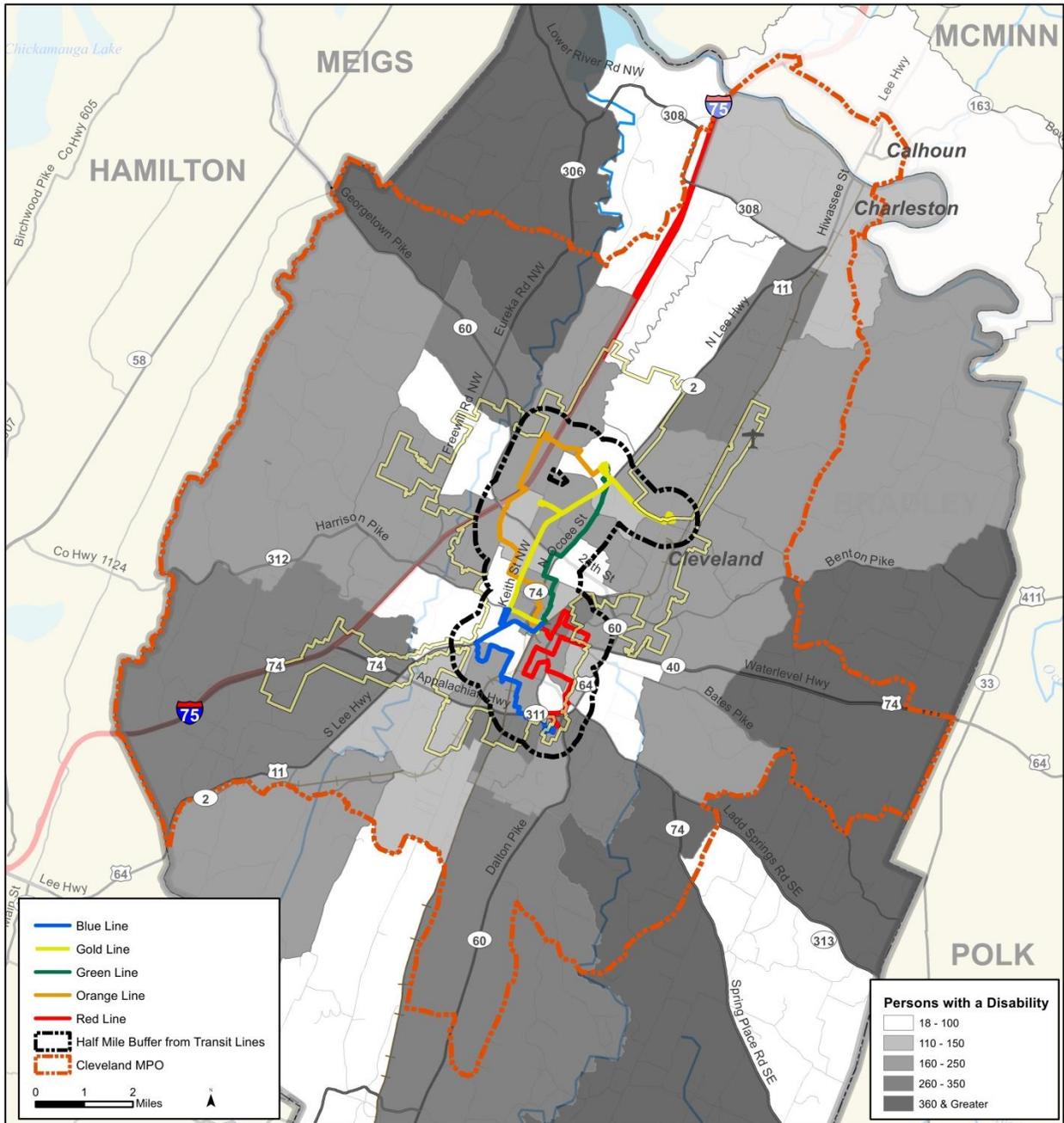


Figure 4.32: Persons With Disabilities, by Census Block Group



Coordinated Human Services/Public Transit Plan

The current Coordinated Human Services/Public Transit Plan (CHSPTP) was developed in late 2012 by the Cleveland MPO in coordination with key stakeholders and the public. The plan identifies current and potential coordination efforts between public transit agencies and other entities, such as social services agencies and other nonprofit organizations. It also identifies current gaps in public transportation service and outlines strategies to address those gaps. In lieu of MPOs updating their individual CHSPTPs, TDOT is leading a series of nine regional coordination workshops across the state that will address the same issues. The agencies within the Cleveland MPO will meet in a combined workshop with others in the greater Chattanooga region. Initial meetings will occur during 2016.

Some of the chief needs identified by the current Coordinated Plan include longer transit operating hours, i.e. evenings and weekends. CUATS currently provides service until 7 p.m., which is longer than operating hours in some other Tennessee communities, but it still may not provide adequate service for people who work second or third shift. Someone who wants to enroll in community college or advanced workforce training may find the current bus schedule allows them to get to class, but it stops operating by the time they need to go home. Stakeholders also noted there are people who could greatly benefit from classes on financial planning or parenting – or may even be court-mandated to take a class – but are unable to arrange evening or weekend transportation.

As mentioned earlier, seniors and the disabled are often among the most frequent users of public transit, and the Coordinated Plan found that these groups still have significant unmet needs in the Cleveland area. However, the findings also indicate another important group whose needs are not being fully met: working people whose circumstances make it difficult to own/operate a personal vehicle. This includes one-car households with more than one person who works outside the home.

Employment-Oriented Transit Opportunities

As noted in Chapter 2, many of the region's largest employers are focused in east and south Cleveland, and in far northern Bradley County in the Charleston area. Discussions about establishing a shuttle service which would run between Cleveland and the Charleston area, using the North Lee Highway corridor, has received some interest from the public, local officials and some employers. CUATS is also exploring the addition of a Silver Route which would serve downtown and extend eastward along Benton Pike to the Whirlpool facility, one of the region's largest employers. Such a route might also turn northward to serve the employers along Old Tasso Road, another area currently not served by fixed-route transit.

Identifying funding – for the additional vehicles needed, as well as ongoing expenses for drivers and maintenance – is the primary issue yet to be addressed. Local match for the federal and state transit funds that CUATS receives is currently provided by the City of Cleveland and Bradley County. Participation from additional local governments could help expand the available funds. Private employer participation can also be a particularly valuable resource since it qualifies as match for the agency's federal funding. Employer support can take a variety of forms. Monetary participation could include subsidizing employee bus passes or contracting directly with the transit agency to run a dedicated route. Non-monetary support could include cooperation with other nearby employers to coordinate shifts, so that workers in the area have similar arrival/departure times (or if bus overcrowding becomes an issue, coordinating so that the load is spread).

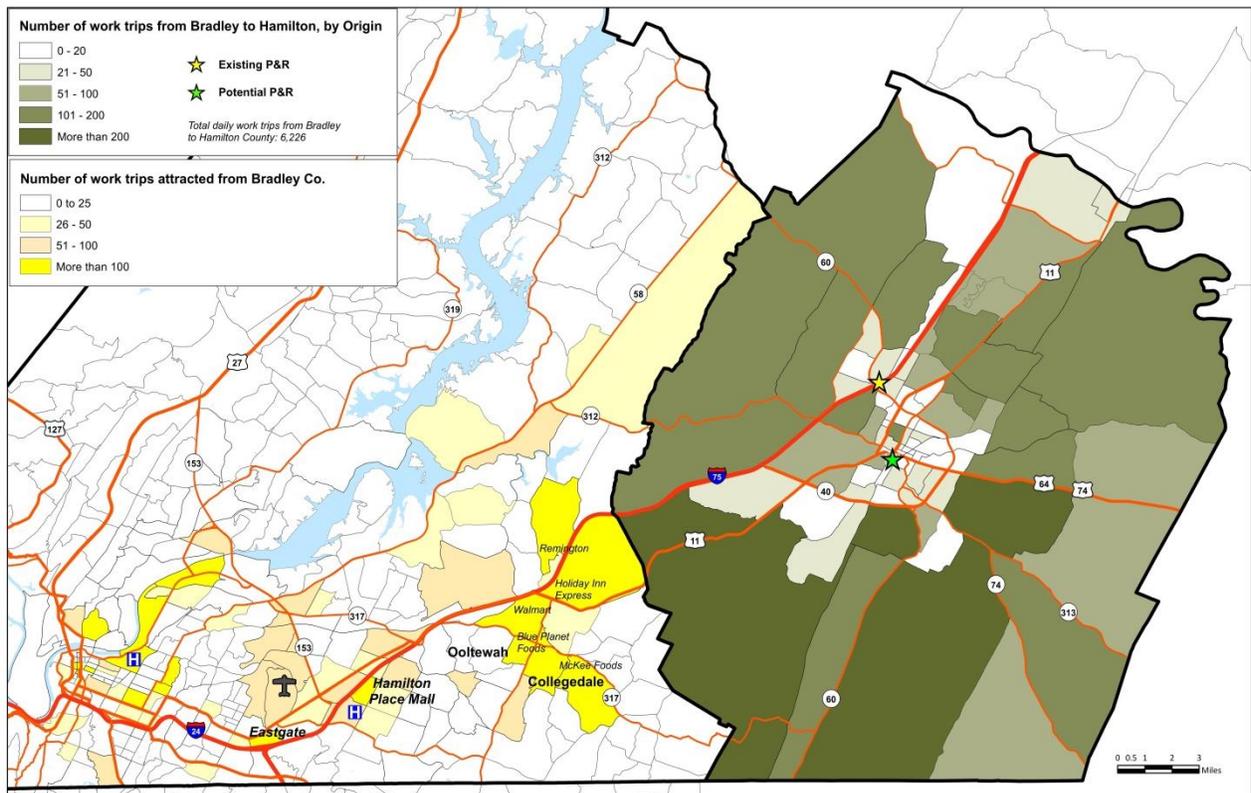
Regional Commuting

Strong interest has been expressed by Cleveland MPO officials and the general public in developing better transit linkages between CUATS and the Chattanooga Area Regional Transit Authority (ARTA) system. A significant number of Bradley County residents commute to work in Chattanooga, particularly in the southwest portion of the county. **Figure 4.33** shows the top origins and destinations of work trips being made from Bradley County to the Chattanooga area.

There is currently no formal commuter vanpool program or provider in the MPO region. However, informal carpooling occurs at a state-owned park & ride lot at Candies Lane near the I-75 Exit 25 interchange. About 30 spaces are available at this paved lot. Anecdotal reports indicate that many of the people carpooling from this lot are traveling to Chattanooga for work, and that there is sometimes a need for additional parking spaces.

Local officials are discussing a proposal to develop a second public park & ride lot in downtown Cleveland in the Old Woolen Mill redevelopment area. This lot might also serve as a future pickup point for a regular shuttle route to the Chattanooga area, particularly since its location near the downtown CUATS transit hub would make it widely accessible to those without a car.

Figure 4.33: Top Origins and Destinations of Work Trips From Bradley County to Hamilton County



CARTA has recently begun to extend its fixed-route transit service northeast, further toward the Cleveland MPO area. A new bus route has been established between downtown Chattanooga and the Enterprise South Industrial Park, which is now home to a Volkswagen manufacturing plant, an Amazon distribution center and several other major employers. This includes a feeder route linking Enterprise South to a major shopping center in the Ooltewah community, near the Bradley/Hamilton county line.

Future CARTA plans may include connecting Ooltewah more directly to the system’s main line along Lee Highway (US 11).

With CUATS/CARTA coordination, it could be possible to run a peak-hour shuttle from downtown Cleveland to Ooltewah, where riders could then transfer to CARTA’s Lee Highway route. This would provide Bradley County residents with transit links to top work destinations such as Hamilton Place Mall, Eastgate, and hospitals in downtown Chattanooga, as shown in Figure 4.33.

Intercity Transit Service

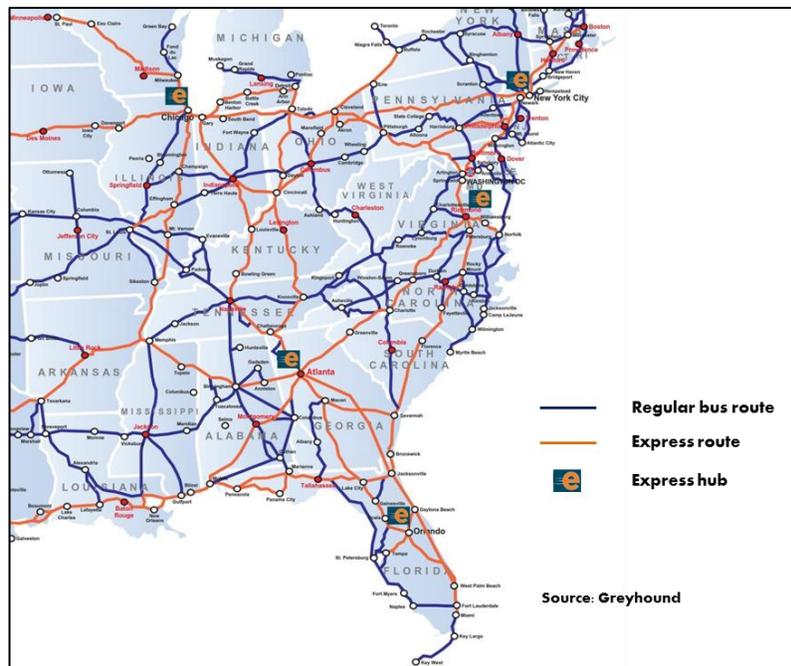
With the passage of the FAST Act, MPOs are asked to consider intermodal facilities that support intercity transportation. This includes intercity buses and bus facilities, as well as commuter vanpool providers.

Intercity bus service in the Cleveland area is currently available from Greyhound, which has a “partner station” located on Bernham Drive in Cleveland, close to the I-75/Paul Huff Parkway interchange. Partner stations are co-located with other establishments such as a service center or gas station, as opposed to a full-service, standalone Greyhound bus station which would also offer seating, restrooms and other amenities. Tickets can be purchased at the Cleveland partner station on weekdays from 8:30 a.m. to 5 p.m., with a lunchtime closure from 11 a.m. to noon, and on Saturdays from 9 to 11 a.m.

Key intercity bus routes connecting Cleveland to other regions (Figure 4.34) include daily service to Atlanta, departing daily about 2:15 p.m. Since Atlanta is one of Greyhound’s Express Hubs, making the 3-hour trip from Cleveland allows travelers to access special limited-stop service to a number of other major cities: New York, Washington D.C., Orlando, Chicago, Dallas, El Paso and Los Angeles. Although the time savings is not always significant, traveling through the Atlanta hub can be less expensive and involve fewer transfers when traveling to these cities.

A future CUATS/CARTA connection, as described earlier, could give Cleveland MPO area residents an additional option for intercity travel since downtown Chattanooga currently has two intercity bus providers: Greyhound and MegaBus.

Figure 4.34: Intercity Bus Service Connections, Cleveland MPO Area



Proposed Transit Capital Investments

In order to serve the region’s growing population and employment base, as well as expand service in the ways described above, CUATS will need to extend routes and hours of operation, as well as expand and adapt its vehicle fleet. As mentioned earlier, the small cutaway buses currently being used are not as cost-efficient to operate and must be replaced on a shorter life-cycle. The 2040 RTP anticipates that CUATS will begin to purchase the larger, purpose-built buses as it adds new vehicles for service during the next 20 to 25 years.

Funds are also needed to install additional bus stop signs, add benches and construct shelters at major bus stops. This not only increases safety and comfort for bus riders, but helps to market the availability of transit by making it a more visible part of the community’s infrastructure. Technological investments will help the local transit system operate efficiently and communicate with its riders in an age where it is expected that information will be exchanged by smartphone.

The current administrative and maintenance facility, housed in the historic rail depot in downtown Cleveland, is adequate for the agency’s needs now. However, as CUATS adds new, larger vehicles to its fleet, it will outgrow this location and will need an annex where vehicles can be maintained and stored when not in service. A future location should be identified in the next five to seven years.

Table 4.15 shows the future capital investments needed to support the region’s transit system during the life of the 2040 RTP. These should be considered a minimum. In order to keep pace with the area’s growing population, and to provide the connections to CARTA discussed earlier in this section, CUATS’ funding base needs to expand. Until recently, CUATS was able to use state operating assistance for 25 percent of the required match for its federal transit funds, using locally generated funds for the other 25 percent. Due to changes in TDOT policy, CUATS is now responsible for the full 50 percent match. In addition, state assistance is now available only when agencies have fully matched all of the federal transit funds available to them. Without a broader locally generated funding base, CUATS is not projected to be able to budget all of its available federal funds.

Table 4.15: Proposed Transit Capital Investments, 2016 to 2040

Horizon	Project Description	Estimated Cost*
2016-2025	Vehicle Replacement (cutaway vehicles)	\$344,000
	New Vehicles (buses)	\$2,800,000
	Repairs to administrative/maintenance facility	\$250,000
	Support Equipment, Misc. Capital Expenditures and Transit Enhancements**	\$550,000
2026-2040	Vehicle Replacement	\$3,850,000
	New Vehicles	\$700,000
	New Maintenance Site and Facilities	\$1,000,000
	Support Equipment, Misc. Capital Expenditures and Transit Enhancements	\$570,000

* Costs shown are in 2015 dollars.

** Includes projects such as bus shelters, signage, pedestrian access and walkways, software, etc.

Bicycle and Pedestrian Network

Pedestrian facilities within the MPO region are very limited outside the City of Cleveland. In Charleston, sidewalks are available only on North Lee Highway (US 11/SR 2) in the area of Charleston Elementary School, starting at Newport Drive and extending to the highway bridge at the Hiwassee River. Calhoun has a sidewalk along South Main Street, running from 3rd Street nearly to SR 163 (Etowah Highway), and for a short distance along Church Street near SR 163. Crosswalks are also marked at some of the intersections in Calhoun but do not connect to any sidewalks. Calhoun has also developed a walking path around the Hiwassee Meadowlands Park, located at the intersection of SR 163 and Main Street adjacent to Calhoun Elementary School, and has plans for expanding that system.

Within the Cleveland area, the pedestrian system is comprised of sidewalks and the greenway system. Sidewalks are commonly found within the downtown central business district, as well as along various residential neighborhoods, along Ocoee Street toward 25th Street, along 25th Street between Keith Street and Ocoee Street, and along Stuart Road from Urbane/Old Tasso Road to North Lee Highway.

Public sidewalk construction has been primarily focused on areas around schools and parks, and low-and moderate-income neighborhoods in the southeastern area of the city. Cleveland was also recently awarded grant funds by TDOT to construct new sidewalks along a portion of SR 311 between 20th Street and APD-40 and linkages between the Blythe Avenue neighborhood and SR 311.

One of the area's primary pedestrian corridors is the Cleveland Greenway. It provides an excellent example of a greenway that serves not only recreational use, but also provides access to employment, shopping, residences, schools, parks, etc. along a broad and densely developed area running north and south through the city. The greenway, generally a 10-foot wide paved path, runs along South Mouse Creek and has been built over a period of nearly 15 years. It currently extends from Mohawk Drive, just north of Paul Huff Parkway, to Willow Street near downtown. Restrooms and parking are available at the Harris Circle trailhead, just north of 25th Street. A new phase of the Cleveland Greenway will extend it to the south side of downtown, running from Willow Street to the Village Green Town Center on the south side of Inman Street.

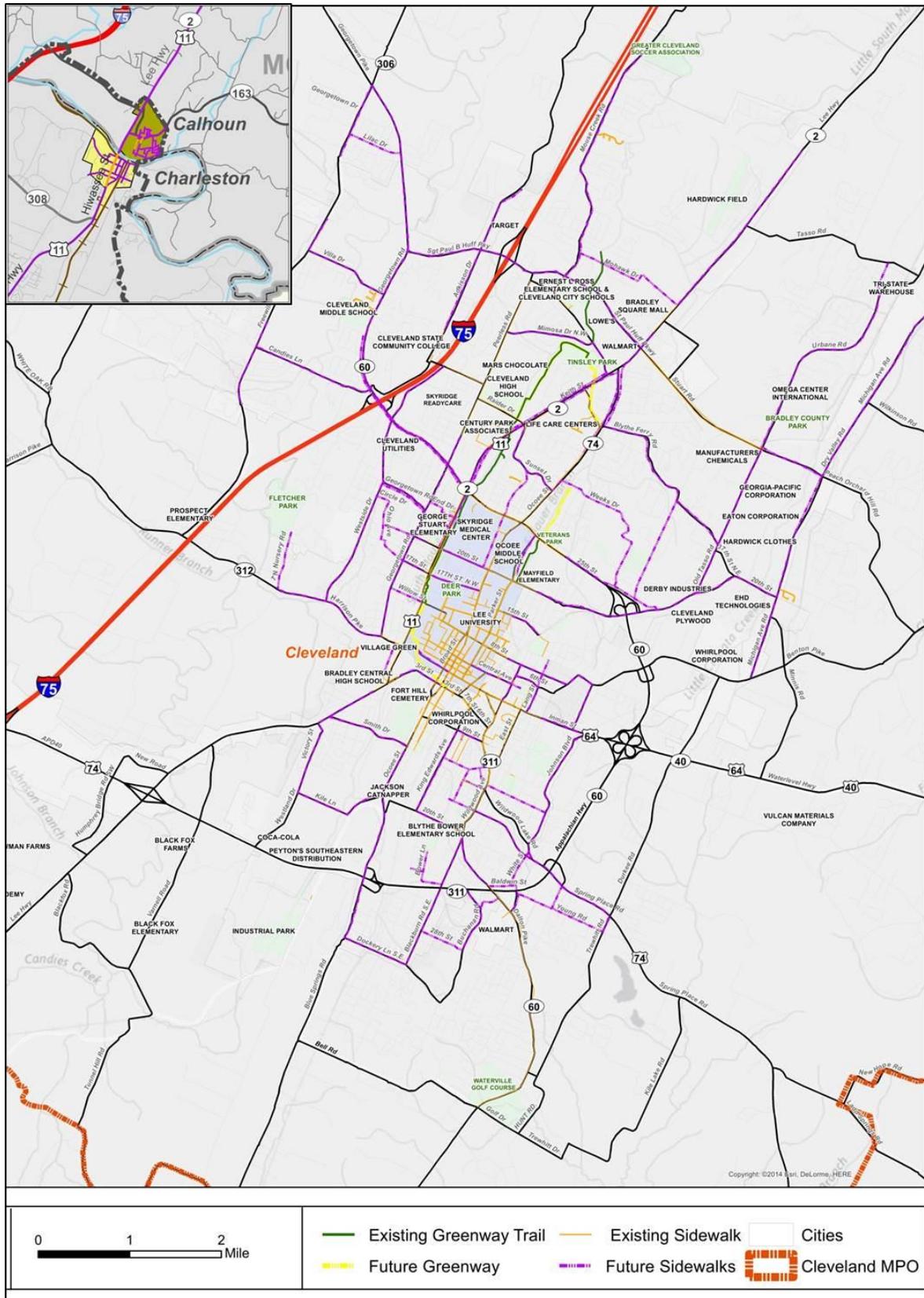
There are also plans to extend the Fillauer Branch Greenway, which currently links 20th Street near Mayfield Elementary School to the proposed Veterans Park just north of 25th Street. The new phase will extend northward to Weeks Drive near its intersection with N. Ocoee Street (SR 74).

Cleveland is now underway on the Ocoee Greenway Connector project, which will connect the Mouse Creek Greenway and Fillauer Branch Greenway via sidewalks along Ocoee Street and a short extension of the Mouse Creek Greenway from its existing terminus in Tinsley Park. These routes are depicted in **Figure 4.35**, along with other existing and proposed non-motorized facilities in the area.

The Cleveland MPO's Bicycle & Pedestrian Plan identifies a future network that will continue to build connections between neighborhoods, employment and community facilities and provide access to transit. This Plan incorporates those proposed facilities, as well as additional links based on needs identified through recent community input as development continues to occur. Lack of sidewalks along Georgetown Road and 20th Street is a concern mentioned frequently by citizens, along with the need for bus stops to provide a safe place for passengers to wait. The busy Georgetown/20th Street intersection has been named as a particular concern. Residents in East Cleveland identified sidewalk needs along Gaut Street, 6th Street and East Street to improve the safety of children on schoolbus routes. Proposed

improvements to the sidewalk network near Bradley County High School have multiple benefits, including safer access for students to reach afterschool activities such as the Boys and Girls Club.

Figure 4.35: Pedestrian and Bicycle System (Existing and Proposed)

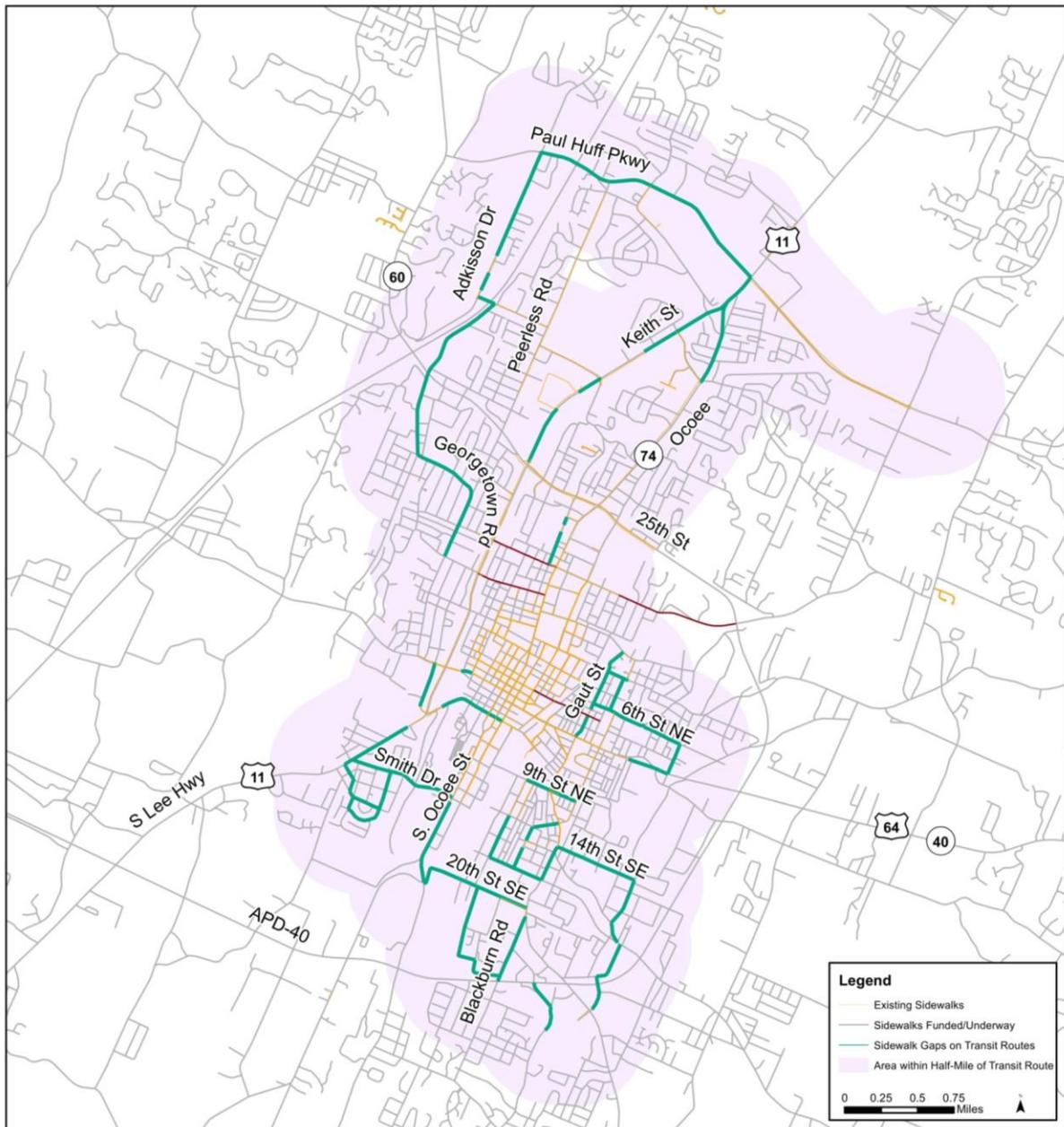


Pedestrian connections to transit routes

As mentioned in the Transit section, there are densely populated areas in North Cleveland where bus service could be extended if better pedestrian facilities were available, including Mouse Creek Road and Frontage Road. The Paul Huff Parkway corridor is another area that generates a large number of the sidewalk requests received by the city. CUATS provides transit service to the area through the Orange Route, including a major transfer point to two other routes at Bradley Square Mall, which is inaccessible by foot except by walking through parking lots, grass shoulders and landscaped areas.

Figure 4.36 shows sidewalk gaps along the existing fixed-route transit system. A number of the areas where sidewalks are needed have also been identified in other contexts, such as the school related

Figure 4.36: Gaps in Pedestrian Network along Existing Fixed-Route Transit



safety concerns on Gaut Street, 20th Street and South Lee Highway. Other gaps may be addressed by the greenway extension projects underway and in the planning phases.

Implementation

Funding for pedestrian and bicycle facilities can come from a variety of sources. Federal funds include the Transportation Alternatives Program grants (formerly called transportation enhancements); safety funds for spot improvements such as pedestrian crossings; and the Surface Transportation Block Grant (U-STBG) funds allocated to the MPO. The City of Cleveland also uses local funds to meet sidewalk needs.

Many of the proposed facilities can be built as part of the roadway projects included in the 2040 Plan. In accordance with Federal Highway Administration requirements, bicycle/pedestrian facilities will be incorporated into all federally-funded projects in the MPO area that reconstruct or widen a road. The recent widening of SR 60 (Dalton Pike) in South Cleveland is an example in which a road project resulted in new sidewalks adjacent to a major commercial area. The city's plans to widen Adkisson Drive will also provide the opportunity to fill sidewalk gaps in an area frequented by community college students and visitors.

Bicycle and pedestrian facilities can sometimes be incorporated into roadway resurfacing projects. During the past several years, TDOT has added bicycle facilities to some roadways through a combination of restriping, reconfiguration of travel lanes and shoulder widening. Such opportunities are regularly reviewed by the state's bicycle/pedestrian coordinator and the TDOT region office as part of the design process for resurfacing projects. TDOT's bicycle/pedestrian coordinator also participated in the development of a FHWA guide called *Incorporating On-Road Bicycle Networks into Resurfacing Projects* (2016), which provides resources for local government staff and other interested parties.

Local development regulations also help to ensure the pedestrian and bicycle system expands as the area grows. Within the City of Cleveland, sidewalks must be provided on at least one side of all new roads that are built. In light of the local goals for infill described in Chapter 2, redevelopment will also be a very important opportunity to improve non-motorized traveling conditions as areas of town experience renewal.

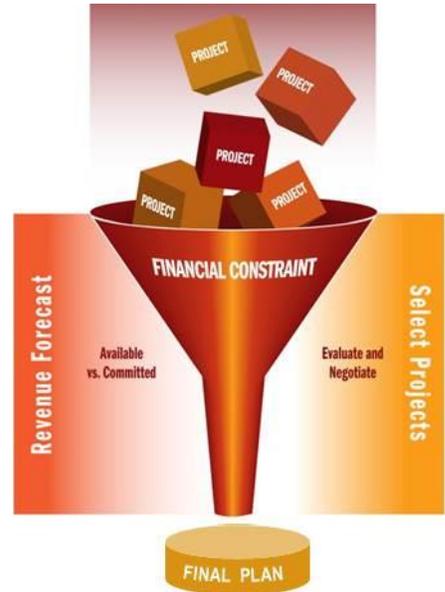
Chapter 5

Recommended Plan and Funding

This chapter consolidates the project and program recommendations made in previous chapters to present a financially feasible plan that meets the needs of the Cleveland area’s transportation system over the next 20 to 25 years. Available funding sources are identified and described here, along with the range of transportation investments that are eligible for various types of funding. Forecasts are presented for the level of funding anticipated to be available from each source through the year 2040.

The projected revenue is then compared to the recommended projects and programs to demonstrate that the anticipated level of funding will be sufficient to cover the cost of implementing the recommended Plan. This chapter also identifies projects and services that have been identified in the region as transportation needs, but cannot currently be funded.

Most of the funds spent on public roads and transit come from federal, state and local sources, as discussed below.



Sources of Transportation Funding

Federal Transportation Funding

Table 5.1 provides a summary of the major federal funding programs that are authorized in current transportation legislation and available to the Cleveland Area MPO. Nearly all require non-federal matching funds, usually either state or local dollars. The typical funding ratio is shown for each of the federal programs, although it should be noted that the required non-federal match may vary depending on the details of a particular project.

State Transportation Funding

The State of Tennessee also has dedicated funding sources for transportation projects, primarily made up of revenue from the state gasoline tax as well as a motor fuel tax on diesel sales and a gasoline inspection tax. The current state gas tax is 20 cents per gallon, and the motor fuel tax is 17 cents per gallon. Neither of these rates has changed in more than 25 years. All revenue generated from these two sources is restricted to spending on roadways and/or mass transit. The gasoline inspection tax rate is 1.7 cents per gallon, with 98% of the revenue used for transportation funding; the remaining 2 percent goes to the state’s general fund.

The state gasoline tax generates about \$658 million annually. This revenue is divided among the Tennessee Department of Transportation (60%), local governments (37%) and the state’s general fund (3%). The majority of the state’s share of the gasoline tax is spent to match the federal funding obtained

Table 5.1: Federal Transportation Funding Programs

Federal Programs	Description	Funding Ratio
National Highway Performance Program (NHPP)	Combines former funding programs for Interstate Maintenance (IM), National Highway System (NHS) and the portion of the Bridge Replacement & Rehabilitation (BRR) used for bridges on the federal-aid system. Provides funding for construction, reconstruction, resurfacing, restoration, rehabilitation, preservation, or operational improvement of segments of the National Highway System. This includes Interstate highways and bridges on the NHS. Projects must support progress toward national goals for the condition and performance of the system.	Interstates: 90% federal, 10% non-federal Other roads: 80% federal, 20% non-federal 90 to 95% federal match available for projects in the state’s freight plan.
Surface Transportation Block Grant (STBG or S-STBG)	(Known under MAP-21 as the STP program.) Provides funding for roads functionally classified as rural major collector and above. Funds may be utilized on projects in Rural Areas, Urbanized Areas, Small Urban Areas, Enhancement, Safety and Rail-Highway Crossings. Also funds bridge replacement & rehabilitation on non-federal aid routes (activities previously under the BRR local program of SAFETEA-LU).	80% federal 20% non-federal
Urban Surface Transportation Block Grant (U-STBG)	Provides funding for small urban areas (5,000 to 50,000 persons) and urbanized areas (50,000 and greater in population) for projects on roads functionally classified as urban collectors or higher. Funds may also be used for bicycle/pedestrian projects or “flexed” for transit use.	80% federal 20% non-federal
Transportation Alternatives Program (TAP)	Combines former funding programs for Enhancements, Safe Routes to Schools, Scenic Byways, and Recreational Trails. Eligible activities include bicycle and pedestrian facilities, sidewalks near elementary and middle schools, main street and boulevard projects, and environmental mitigation to address impacts of the transportation system.	80% federal 20% non-federal
Highway Safety Improvement Program (HSIP)	Provides funds to make improvements to high hazard locations on eligible roadways, including highway-rail grade crossings. Projects are selected based on crash rate and crash frequency.	90% federal 10% non-federal
Federal Transit Administration (FTA) 5307	Section 5307 is a formula grant program for urbanized areas providing capital, operating, and planning assistance for mass transportation. This program now includes funds previously available through the Job Access/Reverse Commute program (FTA-5316), which provided funds for new or expanded transportation service to help link people to jobs and other employment-related services.	Capital: 80% federal 20% non-federal Operating: 50% federal 50% non-federal
FTA-5310	Section 5310 is a formula grant program for the special needs of elderly individuals with disabilities. Funds (which are subject to annual appropriations) are appropriated annually based on an administrative formula that considers the number of elderly individuals with disabilities in each State. Funds available through the former New Freedoms program (FTA-5317), which encouraged services and facility improvements that go beyond those required by the Americans with Disabilities Act, are now combined with this program.	80% federal 20% non-federal
FTA-5339	Section 5339 is a formula grant program that provides capital funding to replace, rehabilitate and purchase buses and related equipment, and to construct bus-related facilities.	80% federal 20% non-federal

through the programs listed in Table 5.1. Much of the remainder is used to fund highway operations and maintenance activities across the state, as well as the Tennessee Department of Transportation's administrative functions.

Revenue from the motor fuel tax is shared among the Tennessee Department of Transportation (66.8%), county governments (21.3%), municipal governments (10.7%), and the state's general fund (1.2%). In recent years, most of the state's share of the motor fuel tax has been spent for grants to local public transit systems and shortline railroads across the state. A portion is made available by TDOT to local transit agencies under the Urban Operating Assistance Program (UROP) program. About \$22 million in state funds was available in FY2016 to seventeen local transit agencies statewide. However, an agency is only eligible to receive these funds once it has already obligated all of its available federal transit funds.

Local Transportation Funding

As noted, both the City of Cleveland and Bradley County receive an annual share of the fuel taxes collected by the state. In addition to the state-shared revenues, there are several exclusive local taxes that provide revenue to cities and counties which can be used for transportation investments. These revenue sources include:

- Property Taxes
- Beer and Liquor Taxes
- Hotel/Motel Taxes
- In Lieu of Tax Payments
- Business Taxes
- Sales Taxes

In Bradley County, a portion of the property taxes are dedicated exclusively for transportation purposes (0.14304 cents per \$100 of assessed value). The other revenue sources are not dedicated for transportation purposes wholly; however, they can and often are used to fund various transportation operations, maintenance, and capital expenditures, including providing local matching funds associated with the various state and federal funding programs previously described.

The City of Cleveland uses state-shared revenue as well as property tax and other revenues to fund transportation expenditures. As noted in Chapter 4, a newly adopted stormwater fee for city residents will also benefit the transportation system by augmenting resources available to maintain and improve drainage along and near roads.

There are no locally dedicated funding sources for transportation within the remainder of the Cleveland MPO area.

Transportation Revenue Forecasts

Highway Revenue Forecast

The revenue estimates used for the 2040 RTP are trend projections based on historic average expenditures in the region over the past several years. The exception is the High Priority Funds (HPP) program, which served as a source of funding for some of the area's recent projects. The program was not re-authorized in MAP-21 or FAST; therefore the Plan assumes no additional HPP revenue will be available.

Table 5.2 shows the projected highway capital funding available to implement the Plan, listed by funding category. Funding estimates for federal fiscal years 2017 through 2020 assume a 2.1% annual increase based on the FAST legislation. Estimates for later years are based on a 2.5% annual growth rate for federal, state and local funds.

The revenue forecasts also reflect some anticipated growth in the base amount allocated to the MPO through federal funding formulas based on Tennessee State Data Center projections that the region’s population will grow more than 25% between now and 2040. Projections for the MPO’s allocation of urban Surface Transportation Block Grant (U-STBG) funds reflect a moderate increase in the base amount following the 2020 and 2030 decennial census.

Interstate 75 is a corridor of statewide importance that serves people and freight from far beyond the Cleveland MPO region. The state’s I-75 Corridor Plan, completed in 2010, includes a project to widen the route from Exit 20 to the Hamilton County line, and a recently circulated list of “Identified Needs” lists a project to widen the portion of I-75 from Exit 20 to the Bradley/McMinn county line. It is therefore assumed that the funds needed for projects on I-75 will be allocated by the state when needed, rather than being directed by historic spending levels.

The MPO has consulted with TDOT on these revenue assumptions and will continue to revisit them with each RTP amendment or update.

Table 5.2: Projected Funding for Highway Capital Projects, 2016-2040

Revenue Source	Annual Base Funds*	Projected Funds (in millions) **		
		2016-2025	2026-2040	Total (2016-2040)
National Highway Performance Program (NHPP)	\$11,470,000	\$126.0	\$252.9	\$378.9
State Surface Transportation Block Grant (S-STBG)	\$612,200	\$6.7	\$13.5	\$20.2
State (100% State Funds)	\$1,824,000	\$20.0	\$40.2	\$60.3
Highway Safety Improvement Program	\$1,800,000	\$19.8	\$39.7	\$59.5
Urban Surface Transportation Block Grant (U-STBG) †	\$1,018,000	\$19.5	\$26.4	\$45.9
Transportation Alternatives Program (TAP)	\$318,200	\$3.5	\$7.0	\$10.5
City of Cleveland (100% Local)	\$755,000	\$9.2	\$16.7	\$25.9
Bradley County (100% Local)	\$643,750	\$7.9	\$14.2	\$22.1
Total	\$18,429,030	\$212.5	\$410.6	\$623.1

* All totals are based on historic trends over the last three to six years and include matching funds.

** Reflects annual growth rate of 2.1% from FY2017-2020 and 2.5% for FY2021-2040. Includes matching funds.

† 2016-2025 projection for U-STBG includes \$7.9 million unprogrammed balance from prior years. See text in this section for additional details on assumptions.

In addition to projects that add capacity, the region’s roadway system will need ongoing operations and maintenance to meet future transportation needs.

The City of Cleveland and Bradley County typically spend about \$4.5 million and \$6.3 million, respectively, on an annual basis for basic roadway operations and maintenance activities. These funds support activities such as road paving and sidewalk repair, as well as maintenance of streetlights, signs and striping, traffic signals, mowing and street sweeping. In Bradley County recent activities have also included significant local bridge repairs and replacements.

The largest share of roadway maintenance and operations spending in the region is by TDOT, which averaged about \$6 million annually during the past 5 years. This included activities performed by its own regional staff as well as a number of maintenance contracts. Expenditures included pavement preservation, traffic signal maintenance and traffic management, signs and pavement markings, mowing and other ROW maintenance, and equipment/facility maintenance.

Based on these average expenditures, as shown in **Table 5.3** below, there are adequate resources available to operate and maintain the roadway system during the period covered by this Plan.

Table 5.3: Projected Funding Available for Highway Operations & Maintenance, 2016-2040

Revenue Source	Annual Base Funds*	Projected Funds (in millions) †		
		2016-2025	2026-2040	Total (2016-2040)
TDOT (various state sources)	\$5,979,000	\$63.3	\$121.2	\$184.4
City of Cleveland (portion of gas tax)	\$4,496,000	\$47.6	\$91.1	\$138.7
Bradley County (portion of gas tax)	\$6,307,000	\$66.8	\$127.8	\$194.5
Total	\$12,736,000	\$177.6	\$340.0	\$517.7

* All totals are based on historic trends over the past five years and include federal and non-federal share.

† Reflects annual growth rate of 2%.

Transit Revenue Forecast

Capital and operating revenue projections for public transit were developed in consultation with the Cleveland Urban Area Transit System (CUATS) using the trend forecasting method discussed earlier, and are presented in **Tables 5.4** and **5.5**, respectively.

Recent revenue history was established through consultation with CUATS and budget information in the MPO’s Transportation Improvement Programs (TIP). Projected operating revenue for later years is based on a 3 percent annual growth rate. Projected capital funds are based on a more conservative 2 percent annual growth rate, recognizing that expenditures for major capital projects (such as vehicle replacement or a new transit facility) are larger and local agencies must often accumulate funds for a few years in order to fund the required match.

The projected operating revenue does not include any UROP funds. As discussed earlier, without an expanded local funding base, it is not expected that CUATS will be able to match all of the federal funds available, and therefore would not be eligible for UROP.

Table 5.4: Projected Capital Funding Available for Transit, 2016-2040

Revenue Source	Projected Funds*		
	2016-2025	2026-2040	Total (2016-2040)
FTA-5307 federal (80%)	\$2.7	\$5.2	\$7.9
FTA-5307 state (10%)	\$0.3	\$0.5	\$0.8
FTA-5307 local match (10%)	\$0.3	\$0.5	\$0.8
FTA-5339 federal (80%)	\$0.3	\$0.6	\$0.9
FTA-5339 state match (10%)	\$0.04	\$0.08	\$0.1
FTA-5339 local match (10%)	\$0.04	\$0.08	\$0.1
FTA-5310 federal (80%)	\$1.3	\$2.6	\$3.9
FTA-5310 state match (10%)	\$0.2	\$0.3	\$0.5
FTA-5310 local match (10%)	\$0.2	\$0.3	\$0.5
Total	\$5.4	\$10.2	\$15.5

* Capital assistance is difference of federal 5307 allocation minus operating needs. Projections for 2016-2017 are from the MPO's FY2014-2017 TIP. Projections for 2018-2040 assume 2% annual growth.

Table 5.5: Projected Funding Available for Transit Operations and Maintenance, 2016-2040

Revenue Source	Projected Funds (in millions) *		
	2016-2025	2026-2040	Total (2016-2040)
FTA-5307 federal (50%)	\$5.5	\$11.9	\$17.4
Local operating assistance	\$4.6	\$10.4	\$15.0
Farebox & Misc. Revenue	\$0.9	\$2.4	\$3.3
Total	\$11.0	\$24.7	\$35.7

* Estimates for 2016-2017 from consultation with CUATS. Projections for 2018-2020 assume 2.1% annual growth rate and 3% thereafter.

Projected Cost of Recommended Transportation Projects and Services

Planning-level cost estimates were developed and presented in Chapter 4 in 2015 dollars. In this chapter, each project's cost has been expressed in year of expenditure, i.e. it is assumed that inflation will occur and that projects constructed later will cost more than if they were built now.

The methodology used for estimating highway project costs for this Plan was developed in consultation with TDOT. Unit costs were based on TDOT's current cost-per-mile data and planning-level formulas. To account for future inflation, the cost of projects in Tennessee was assumed to increase by 3.6 percent annually.

Tables 5.6 and **5.7** summarize the estimated costs for the highway projects recommended in the 2040 RTP. The tables reflect the agency and funding source(s) considered most likely to be applicable to each project. It should be noted that certain projects are eligible for more than one funding source, and it may be necessary to combine multiple funding sources in order to complete large highway projects within the given timeframe. (For the projected percentage of each funding source to be used for individual projects, see **Appendix D.**)

A strong partnership between TDOT and the MPO will be essential in order to complete many of the projects that are needed during the next 25 years in order to maintain safety and mobility on the regional transportation system. In the past, MPOs in Tennessee typically have not spent their urbanized area allocation of STBG (U-STBG) funds on major capacity improvements to state routes; likewise, local governments have often assumed responsibility for funding signal and intersection improvements on state routes.

However, many of the roads identified in this plan that have safety and operational needs are non-state routes for which federal funding eligibility is relatively limited. The MPO will need to commit a major proportion of its U-STBG allocation, supplemented by local funds, to ensure these non-state road projects are completed. This will not leave many dollars available for the MPO to commit to the proposed intersection improvements on state routes. This plan proposes a partnership between TDOT and the MPO in which the cost of such projects will be shared. This approach recognizes that both TDOT and the region benefit when congestion is addressed with lower-cost, lower-impact operational improvements instead of major road widenings. Other than increasing capacity on I-75, a corridor of statewide importance, the 2040 RTP emphasizes such operational investments. Of course, this smaller-scale approach works to preserve capacity only if future access is carefully managed. The MPO's recent participation in the state's corridor access management initiative shows its commitment to partner with TDOT on this issue.

Finally, **Table 5.8** lists various transportation enhancements, operational improvements, and bridge replacement and rehabilitation anticipated to occur during the period covered by this Plan. It should be noted that some of these activities will not always occur as standalone projects, but will instead be implemented as part of scheduled roadway capacity projects in this Plan.

Table 5.6: Proposed Roadway Projects, 2016-2025

ID	Type of Improvement	Roadway	From	To	Miles	Description	Agency	Anticipated Funding	Cost (YOE, millions)
82	New Roadway	Paul Huff Parkway Extension	Freewill Road	SR 60 (Georgetown Road)	0.8	Construct new 3-lane road	Cleveland	U-STBG	10.5
62	Road Widening	20th Street	Shady Lane	Old Tasso Road	0.7	Widen from 2 to 3 lanes	Cleveland	U-STBG	11.2
112	Road Widening	Georgetown Road N.W.	25 th Street	20 th Street	1.3	Widen from 2 to 3 lanes, including roundabouts at major intersections	Cleveland	U-STBG	9.4
108	Reconstruction	Michigan Avenue Road	Minnis Road	20th Street	0.2	Reconstruct 2-lane road	Cleveland	HSIP, U-STBG	1.2
63	Road Widening	20 th Street	Old Tasso Road	Michigan Avenue Road		Widen from 2 to 3 lanes	Cleveland	HSIP, U-STBG	2.7
7	Intersection Improvements	25th Street (SR 60)	@ Peerless Road			Widen North and South approaches from 4 to 5 lanes	Cleveland/TDOT	U-STBG, S-STBG	0.5
94	Intersection Improvements	20th Street	@ Michigan Avenue Road			Safety improvements	Cleveland	HSIP, U-STBG	0.4
95	Intersection Improvements	Georgetown Rd (SR 60)	@ Candies Lane			Realign intersection	TDOT	HSIP, S-STBG	3.2
96	Intersection Improvements	N Ocoee Street (SR 74)	8th Street			Construct roundabout	TDOT	HSIP, S-STBG	1.7
99	Intersection Improvements	6 th Street N.E.	@ Gaut Street			Safety improvements	Cleveland	U-STBG	0.6
110	Intersection Improvements	Mouse Creek Road	@ Paul Huff Pkwy			Add lane to NB approach on Mouse Creek Rd	Cleveland	U-STBG	0.1
111	Intersection Improvements	Peerless Road	@ Paul Huff Pkwy			Improve NB approach on Peerless Road from intersection to Valleyhead Road	Cleveland	U-STBG	0.5
93	Safety Improvements	SR 308 (Lower River Rd)	Bowater Logging Rd	I-75	0.9	Safety improvements	TDOT	HSIP, S-STBG	0.5

Table 5.7: Proposed Roadway Projects, 2026-2040

ID	Type of Improvement	Roadway	From	To	Miles	Description	Agency	Anticipated Funding	Cost (YOE, millions)
100	New Roadway	Midtown Connector				Construct bridge over railroad in downtown Cleveland	Cleveland	U-STBG	2.2
92	New Roadway	SR 308 Extension	SR 2/US 11 (N. Lee Hwy.)	Chatata Valley Dr	0.5	Extend as 3-lane roadway, including RR overpass. Eastern terminus aligns with Upper River Rd N.E.	TDOT	S-STBG	18.2
113	Road Widening	Mouse Creek Road	Robin Hood Drive	Wedgewood Drive	0.1	Widen from 2 to 3 lanes	Cleveland	U-STBG, Local	2.1
114	Road Widening	Mouse Creek Road	Wedgewood Dr	East Circle	0.4	Widen from 2 to 3 lanes	Cleveland	U-STBG, Local	7.4
115	Road Widening	Mouse Creek Road	East Circle	Hunters Run	1.0	Reconstruct 2-lane road	Cleveland	U-STBG, Local	6.8
59	Road Widening	20th Street	APD-40 (Bypass)	Ocoee Street	1.3	Widen from 2 to 3 lanes	Cleveland	U-STBG	21.5
20	Road Widening	Benton Pike	APD-40 (Bypass)	Michigan Avenue Rd	1.0	Widen from 2 to 3 lanes	Cleveland	U-STBG	16.5

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ID	Type of Improvement	Roadway	From	To	Miles	Description	Agency	Anticipated Funding	Cost (YOE, millions)
60	Road widening	Peerless Road	25th Street	Georgetown Road	0.5	Widen from 2 to 3 lanes	Cleveland	U-STBG	8.6
55	Road Widening	Georgetown Road	20 th Street	Harrison Pike (SR 312)	1.0	Widen from 2 to 3 lanes	Cleveland	U-STBG	9.6
72	Road Widening	Spring Place Road (SR 74)	APD 40	Kile Lake Road	1.7	Widen from 2 to 3 lanes	TDOT	S-STBG	35.2
104	Road Widening	SR 163 (Etowah Rd)	Lee Highway (US 11/SR 2)	Lynncrest Ave in Calhoun	0.6	Widen from 2 to 3 lanes, including improvements to narrow RR underpass	TDOT	S-STBG	13.3
105	Road Widening	I-75	Hamilton Co. line	APD-40	2.5	Widen from 4 to 6 lanes	TDOT	NHPP, S-STBG	129.2
101	Road Widening	I-75	APD-40 (SR 311)	Bradley/McMinn co line	14.4	Widen from 4 to 6 lanes	TDOT	NHPP, S-STBG	242.9
86	Road Widening	Georgetown Road (SR 60)	Eureka Road	Rabbit Valley Road	1.7	Widen from 2 to 5 lanes	TDOT	NHPP, S-STBG	60.5
70	Road Widening	N. Lee Highway (US 11/SR 2)	Near Anatole Ln	SR 308 (Lauderdale Mem Hwy)	4.3	Widen from 2 to 5 lanes	TDOT	NHPP, S-STBG	50.5
17	Reconstruction	Mouse Creek Road	City Limits	Hoopers Gap	1.1	Reconstruct 2-lane road, turn lanes at Hoopers Gap	Cleveland/Bradley County	HSIP, U-STBG	14.5
58	Reconstruction	20th Street	Ocoee Street	Georgetown Road	0.7	Upgrade lane width, shoulders; add left turns at intersections	Cleveland	HSIP, U-STBG	9.6
23	Reconstruction	Hoopers Gap Road	Frontage Road	Mouse Creek Road	0.3	Upgrade lane width, shoulders; add turn lanes at Mouse Creek Road	Bradley County	U-STBG, Local	3.6
98	Reconstruction	9th Street S.E.	Euclid Avenue S.E.	Church Street	0.2	Align offset intersection at Euclid Ave. S.E.	Cleveland	Local	3.0
6	Intersection Improvements	25th Street (SR 60)	@ N Ocoee Street (SR 74)			Widen N & S approaches, add dual left-turn lanes	Cleveland/TDOT	HSIP, U-STBG, NHPP	11.8
10	Intersection Improvements	Westside Drive	@ Harrison Pike (SR 312)			Widen approaches; consider signalization	Cleveland	U-STBG	0.4
9	Intersection Improvements	20th Street	@ Parker Street			20th St - Widen approaches to 5 lanes; Parker St - Widen approaches to 3 lanes	Cleveland	U-STBG	0.9
1	Intersection Improvements	20th Street	@ N. Ocoee Street (SR 74)			Widen from 4 to 5 lanes, signalize	Cleveland/TDOT	U-STBG, S-STBG	0.3
3	Intersection Improvements	20th Street	@ Keith Street (US 11/SR 2)			Widen and relocate existing signal	Cleveland/TDOT	U-STBG, S-STBG	0.3
8	Intersection Improvements	Peerless Road	@ Norman Chapel Road			Widen west approach from 2 to 3 lanes	Cleveland	U-STBG	0.3
11	Intersection Improvements	Keith Street (US 11/SR 2)	@ N Ocoee Street (SR 74)			Intersection improvement with "flyover"; remove traffic signals and add lanes	TDOT/Cleveland	NHPP, S-STBG, U-STBG	10.3
83	Interchange Improvements	I-75	@ SR 308 (Lauderdale Memorial Hwy.)			Interchange modifications for increased capacity	TDOT	NHPP, S-STBG	19.3
111	Intersection Improvements	Peerless Road	@ Paul Huff Pkwy			Improve NB approach on Peerless Rd from intersection back to Valleyhead Rd	Cleveland	U-STBG	0.3
97	Intersection Improvements	Industrial Drive S.W.	@ Old Chattanooga Pike			Realign and improve rail crossing	Cleveland	Local	0.3
5	Intersection Improvements	Spring Place Road (SR 74)	@ Wildwood Ave (SR 311)			Widen to 4 lanes on all approaches; modify signal	Cleveland/TDOT	S-STBG	0.8

Table 5.8: Additional Projects Anticipated Throughout the Planning Period

ID	Type of Project	Description	Agency	Anticipated Funding	Cost (YOE, millions)		
					2026-2025	2026-2040	TOTAL
-	Various Transportation Systems Management (TSM), Intelligent Transportation Systems and other operational improvements	Projects may include intersection improvements (e.g., additional turn lanes and/or signals); signage and lighting; other operational improvements such as signal timing, access management, and projects based on the Regional ITS Architecture	TDOT and MPO member agencies	NHPP, S-STBG, State, U-STBG, Local	\$0.5	\$1.8	\$2.3
-	Various safety improvements	Strategies, activities and projects to improve a hazardous road location or feature or otherwise address a highway safety problem. Projects could include, but are not limited to, signalization, guardrail, lighting, marking, railroad crossing safety equipment, and inspections	TDOT and MPO member agencies	HSIP, NHPP, S-STBG, U-STBG, State, Local	\$9.0	\$13.0	\$22.0
-	Various bridge projects	Bridge Replacement/Bridge Rehabilitation (some work will also occur as part of scheduled roadway capacity projects)	TDOT and MPO member agencies	NHPP, S-STBG, U-STBG, State, Local	\$3.5	\$4.0	\$7.5
-	Various transportation alternatives and enhancement projects	Provision of transportation alternatives and enhancements to various routes and locations throughout the MPO area. Includes projects such as improvements to the bicycle and pedestrian network, trails, scenic byways, landscaping and beautification, and mitigation of environmental impacts caused by transportation projects.	TDOT and MPO member agencies	TAP, Local, State, U-STBG, HSIP	\$4.5	\$8.5	\$13.0
-	Various transit amenities	Provision of, or improvements to, facilities to enhance the safety and comfort of transit riders. Includes shelters, benches, signage, lighting, etc.	TDOT and MPO member agencies	U-STBG, Local, State, HSIP	\$0.5	\$2.5	\$3.0

Transit Projects and Service Costs

Cost estimates for the transit capital projects identified in Chapter 4 were presented in 2015 dollars. In **Table 5.9** below, the costs have been adjusted to year of expenditure using an assumed 3 percent annual inflation rate. This level of investment permits gradual conversion of the transit fleet from cutaway vehicles to full-size buses that have a longer road life; however, it does not provide the increase in the number of vehicles available that would be necessary for significant transit service expansion.

Table 5.9: Proposed Transit Capital Projects by Horizon, 2016-2040 *

Project	2016-2025	2026-2040	Total (2016-2040)
Vehicle replacement	\$0.5	\$6.4	\$6.9
Vehicle fleet expansion	\$3.7	\$1.2	\$4.9
Repairs to admin/maintenance facility	\$0.3	\$0	\$0.3
New maintenance facility	\$0	\$1.7	\$1.7
Support equipment and misc. capital	\$0.7	\$0.9	\$1.6
TOTAL	\$5.2	\$10.2	\$15.4

* Revenues and costs are shown in millions of dollars, and reflect year of expenditure.

The projected cost of future transit operations and maintenance shown in **Table 5.10** includes very limited expansion of service due to the restricted amount of locally generated revenue to match federal and state operating assistance, as discussed in Chapter 4.

Table 5.10: Operating and Maintenance Costs of Transit Service by Horizon, 2016-2040 *

2016-2025*	2026-2040	Total (2016-2040)
\$11.1	\$24.6	\$35.7

* Revenues and costs are shown in millions of dollars, and reflect year of expenditure. Cost trends developed through consultation with CUATS, and assume a 2.5% annual inflation rate.

Demonstration of Fiscal Constraint

Table 5.11 summarizes total roadway project costs by horizon, compared to available revenue. (The 2016-2025 horizon does not include the cost of the proposed roadway projects that are already programmed in the fiscally constrained FY2014-2017 Transportation Improvement Program.)

Table 5.11: Projected Revenue Compared to Total Cost of Roadway Projects, by Horizon *

Funding Source	2016-2025		2026-2040		Total (2016-2040)	
	Revenue	Cost of Projects	Revenue	Cost of Projects	Revenue	Cost of Projects
National Highway Performance Program (NHPP) **	\$126.0	\$0	\$585.2	\$585.2	\$711.2	\$582.2
State Surface Transportation Block Grant (S-STBG)	\$6.7	\$0.5	\$25.2	\$24.9	\$31.9	\$25.4
State Funds (STA)	\$20.0	\$9.0	\$61.0	\$61.0	\$81.0	\$70.0
Highway Safety Improvement Program (HSIP)	\$19.8	\$19.8	\$39.7	\$38.1	\$59.5	\$57.9
Urban Surface Transportation Block Grant (U-STBG)	\$19.5	\$19.5	\$26.5	\$26.5	\$46.0	\$46.0
Transportation Alternatives Program (TAP)	\$3.5	\$3.5	\$7.0	\$7.0	\$10.5	\$10.5
City of Cleveland and Bradley County (Local)	\$17.1	\$8.2	\$47.7	\$47.7	\$64.8	\$55.9
TOTAL	\$212.6	\$60.5	\$792.3	\$790.4	\$1,004.9	\$850.9

* Revenues and costs are shown in millions of dollars, and reflect year of expenditure.

** Assumes NHPP expenditures for 2026-2040 will exceed typical regional spending levels since I-75 is a facility of statewide importance. See text for discussion.

Tables 5.12 and 5.13 illustrate that the recommended transit capital projects and services can be provided, based on regional projections of transit capital and operating funds. Revenue and costs for 2016-2017 are from the MPO's current TIP.

Table 5.12: Projected Revenue Compared to Total Cost of Transit Capital Projects, 2016-2040*

Horizon	Projected Capital Revenue	Estimated Capital Costs
2016-2025	\$5.3	\$5.2
2026-2040	\$10.2	\$10.2
Total (2016-2040)	\$15.5	\$15.4

* Revenue and costs are shown in millions of dollars, and reflect year of expenditure.

Table 5.13: Projected Revenue Compared to Total Cost of Transit Operations, 2016-2040*

Horizon	Projected Operating Revenue	Estimated Operating Costs
2016-2025	\$11.1	\$11.1
2026-2040	\$24.6	\$24.6
Total (2016-2040)	\$35.7	\$35.7

* Revenue and costs are shown in millions of dollars, and reflect year of expenditure.

Table 5.14 provides a summary of total projected revenue and recommended expenditures for each horizon of the fiscal constrained RTP, by funding program.

Table 5.14: Total Projected Revenue and Recommended Expenditures by Planning Horizon and Funding Program, 2016-2040 (in millions)

Funding Source	2016-2025			2026-2040			Total (2016-2040)		
	Revenue	Expenditures	Balance	Revenue	Expenditures	Balance	Revenue	Expenditures	Balance
National Highway Performance Program (NHPP)	\$126.0	-	\$126.0	\$585.2	\$585.2	-	\$711.2	\$585.2	\$126.0
State Surface Transportation Block Grant (S-STBG)	\$6.7	\$0.5	\$6.2	\$25.2	\$24.9	\$0.3	\$31.9	\$25.4	\$6.5
State Funds (STA)	\$20.0	\$9.0	\$11.0	\$61.0	\$61.0	-	\$81.0	\$70.0	\$11.0
Highway Safety Improvement Program (HSIP)	\$19.8	\$19.8	-	\$39.7	\$38.1	\$1.6	\$59.5	\$57.9	\$1.6
Urban Surface Transportation Block Grant (U-STBG)	\$19.5	\$19.5	-	\$26.5	\$26.5	-	\$46.0	\$46.0	-
Transportation Alternatives Program (TAP)	\$3.5	\$3.5	-	\$7.0	\$7.0	-	\$10.5	\$10.5	-
FTA Section 5307 Program	\$14.3	\$14.2	\$0.1	\$23.8	\$23.8	-	\$38.1	\$38.0	\$0.1
FTA Section 5339 Program	\$0.4	\$0.4	-	\$0.8	\$0.8	-	\$1.1	\$1.2	-
FTA Section 5310 Program	\$1.7	\$1.7	-	\$3.2	\$3.2	-	\$4.9	\$4.9	-
Local Sources	\$17.1	\$8.2	\$8.9	\$48.6	\$48.6	-	\$65.7	\$55.9	\$9.8
TOTAL	\$229.0	\$76.8	\$152.2	\$821.0	\$819.1	\$1.9	\$1,049.9	\$895.0	\$155.0

Unfunded (Illustrative) Projects

Several additional projects have been listed separately in **Table 5.15** because they cannot be completed without additional funding beyond what is projected to be available for the 2040 Plan. This list of projects is termed “illustrative,” since it illustrates the system investments that would fully implement the region’s transportation goals. Many of these projects have been proposed as part of other local and regional planning efforts. The projects in Table 5.15 are not currently eligible for federal funds available to the MPO since they are not part of the official fiscally constrained Plan, but they can be considered if additional revenue becomes available, or in future Plan updates.

Table 5.15: Illustrative Projects (Unfunded)

ID	Route	Termini	Description
71	S. Lee Hwy (US 11/SR 2)	APD 40 to Black Fox Rd	Widen from 2 to 5 lanes
102	SR 308 (Lauderdale Memorial Hwy)	Mouse Creek Rd N.W. to N. Lee Hwy (US 11/SR 2)	Widen from 2 to 3 lanes
27	Durkee Rd	Spring Place Rd to US 74/SR 40 (Waterlevel Hwy)	Reconstruct
31	Mouse Creek Rd	Hoopers Gap Rd to SR 308	Reconstruct
56	N. Ocoee St (SR 74)	Keith St (US 11/SR 2) to 25 th St (SR 60)	Widen from 3 to 5 lanes
91	Northwest Connector	Mouse Creek Rd near Hooper Gap Rd to N. Lee Hwy (US 11/SR 2)	Construct new 2-lane road
103	Georgetown Rd (SR 60)	Rabbit Valley Rd to Hamilton Co. line	Widen from 2 to 4 lanes
19	Tasso Ln N.E.	N. Lee Hwy (US 11/SR 2) to Michigan Ave Rd	Widen from 2 to 3 lanes
78	Michigan Ave Rd	20 th St to Stuart Rd	Widen from 2 to 3 lanes
61	Michigan Ave Rd	Stuart Rd to Tasso Ln N.E.	Widen from 2 to 3 lanes
26	Peach Orchard Hill Rd	Benton Pk to Chip Dr	Reconstruct
77	Peach Orchard Hill Rd	Chip Dr to Michigan Ave Rd	Reconstruct
79	Westside Drive	Georgetown Rd to SR 312 (Harrison Pk)	Widen from 2 to 3 lanes

Chapter 6

Potential Impacts

The 2040 Regional Transportation Plan includes projects that vary in scope from signalization, intersection improvements, minor and major reconstruction, to new corridors. This chapter identifies where the projects may impact sensitive natural and/or cultural resources, discusses the potential types of impact, and outlines potential mitigation activities at the policy/strategy level.

This chapter also assesses the extent to which the 2040 RTP fulfills the principles of the U.S. Executive Order on Environmental Justice. A geographic analysis is performed for proposed transportation investments to identify whether there could be disproportionate impacts on minority or low-income populations, either through direct effects or through the lack of transportation investment.

Environmental Considerations

Federal legislation calls for MPOs to consider potential impacts of the regional transportation plans and planning-level strategies for mitigating those potential impacts. In this chapter, the Cleveland MPO has assembled an overview of current environmentally sensitive areas in relation to the proposed projects and programs in the 2040 RTP. This information can be used to assist in the project development process once a project has moved from the planning stage of this document to the programming stage (e.g. the TIP) for ultimate project implementation.

Incorporating environmental considerations early in the transportation planning process helps to streamline project development by providing realistic assumptions about potential environmental considerations, impacts and costs.

Environmental Policies

As part of the development of the 2040 RTP, the Cleveland MPO implemented the following approach to ensure that environmental factors were considered:

- An appropriate level of review was undertaken to assess potential environmental, historic and cultural resource impacts in likely areas for mitigation activities in transportation planning;
- Potential impacts to wildlife and habitat were considered before transportation projects are planned, funded and designed;
- Consultation occurred with federal, state, tribal and local land use management, natural resources, wildlife, environmental protection, conservation and historic preservation agencies in developing the Plan; and,
- As part of the final Plan, the MPO has summarized the disposition of comments identified by the affected agencies.

Review of Proposed Transportation Projects

The MPO compared projects in the RTP with available local, state and federal conservation plans, maps and inventories of historic and natural resources. GIS data was utilized to identify and locate known wetlands, flood zones, historic sites, and historic districts within the MPO boundary, creating a base map of sensitive areas. Locations of the proposed projects in the 2040 RTP were then incorporated onto the base map to identify possible resource impacts.

Based on the data collected, the 2040 RTP does include some projects with the potential to impact sensitive natural and/or cultural resources. The scopes of these projects vary and range from spot or intersection improvements to construction on new alignment. The locations shown for the projects are still at a planning level of detail and do not necessarily represent the final limits or exact design of the project. All federally-funded transportation projects must still go through the more detailed review of potential impacts required by the National Environmental Policy Act (NEPA). As a project is further developed, its footprint will continue to be refined and impacts will be better known.

It is also important to note that while the physical constraints of the project may not directly intersect an identified environmentally sensitive area, it is possible that project-related activities may have an indirect impact on the area. The final environmental impacts associated with each project will be determined only after an environmental study for the project is completed.

The preliminary analysis included here is an important stepping stone in providing transportation planning agencies and resource agencies with preliminary environmental information about a project. By performing this work, the MPO is meeting federal requirements in the Fixing America's Surface Transportation (FAST) Act to ensure the integration of its transportation planning with the environmental review process.

Historic Resources Analysis

Section 106 of the National Historic Preservation Act requires federal agencies that provide assistance or take action on a project to consider the effect on any "district, site, building, structure or object" that is included in or eligible for inclusion in the National Register. This includes the projects that will be developed and constructed as the 2040 RTP is implemented.

In addition, Tennessee has a State Historic Preservation Officer (SHPO) who must be notified of any projects that may encroach upon, damage, or destroy any historic property included on the National Register of Historic Places or the State Register of Historic Places or the environs of such property. In Tennessee, the SHPO works within the Tennessee Historical Commission, a Division of the Tennessee Department of Environment and Conservation (TDEC). Many of the federal Section 106 review responsibilities in Tennessee are transferred to the Tennessee Historical Commission (THC) staff.

Most of the historic resources in the Cleveland MPO region are concentrated in the cities. There is a cultural and historic environment in the Cleveland area with a long history defined by structures and urban forms which are still in place today. The City of Cleveland has an adopted a local Historic Preservation Ordinance and a Locally Designated Historic Zoning Overlay District. Within the overlay there are two National Register Historic Districts: the Centenary Avenue Historic District and the Ocoee Street Historic District. The cities of Charleston and Calhoun also have a number of historic sites.

To identify whether any of the proposed 2040 RTP projects may impact historic resources, their locations were reviewed in conjunction with available data on historic properties. Projects were flagged

if they are in or within 1,000 feet of an identified historic area or place. **Table 6.1** and **Figure 6.1** show the projects which have a potential impact on historic resources.

Table 6.1: Projects with Potential Impact on Historic Resources *

Location	ID	Project	Description
Ocoee Street Historic District	1	20 th Street @ N. Ocoee Street	Intersection Improvement
Local Historic Zoning Overlay	96	N. Ocoee Street @ 8 th Avenue	Intersection Improvement
Ocoee Street Historic District	58	20 th Street from Ocoee St. (SR 74) to Georgetown Rd	Reconstruction
Ocoee Street Historic District	59	20 th Street from Ocoee St. (SR 74) to APD-40	Road Widening

*Historic resource locations are shown if located within 1,000' of the road or intersection proposed for improvement.

Potential impacts to these historic properties will be evaluated in more detail at the time the transportation projects are developed. There are a number of agencies who will need to coordinate at this time: the MPO, the City of Cleveland’s Historic Preservation Commission, and the State Historic Preservation Office. The purpose of coordination is to identify potential issues and/or impacts at an early stage. If deemed necessary, these agencies will also coordinate to develop appropriate mitigation measures.

Natural Resources Analysis

As transportation projects are developed, it is important to be aware of their potential impacts on the physical environment. Two particular areas of environmental concern are wetlands and floodplains. Wetlands can be described as lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on the surface. A floodplain is a low plain adjacent to a river that is formed mainly of river sediment and is subject to flooding.

Within the Cleveland MPO region, wetland areas are fairly limited and are found in the northwestern portion of Bradley County. Floodplains are somewhat more extensive and are found throughout the MPO area. Both environmental areas are primarily attributed to the Hiwassee River, which forms the Bradley/McMinn county line at the far northern end of the MPO planning area. The Hiwassee flows from northern Georgia, runs through North Carolina and into Tennessee, where it then channels into the Tennessee River. Interstate 75 and US 11 (SR 2, North Lee Highway) both bridge the Hiwassee River at the Bradley/McMinn county line, as does the Norfolk Southern rail line.

A spatial analysis indicates that there should be minimal, if any, impacts to known wetlands as a result of transportation improvements in this RTP. However, there are several projects that are in close proximity to small areas of wetlands (generally one acre or less), and various floodplain locations that could be impacted as a result of transportation improvements in this Plan. They should be assessed for potential impacts as these projects progress in the development process.

Figure 6.1: 2040 RTP Projects in Relation to Cultural Resources in the Cleveland MPO Region

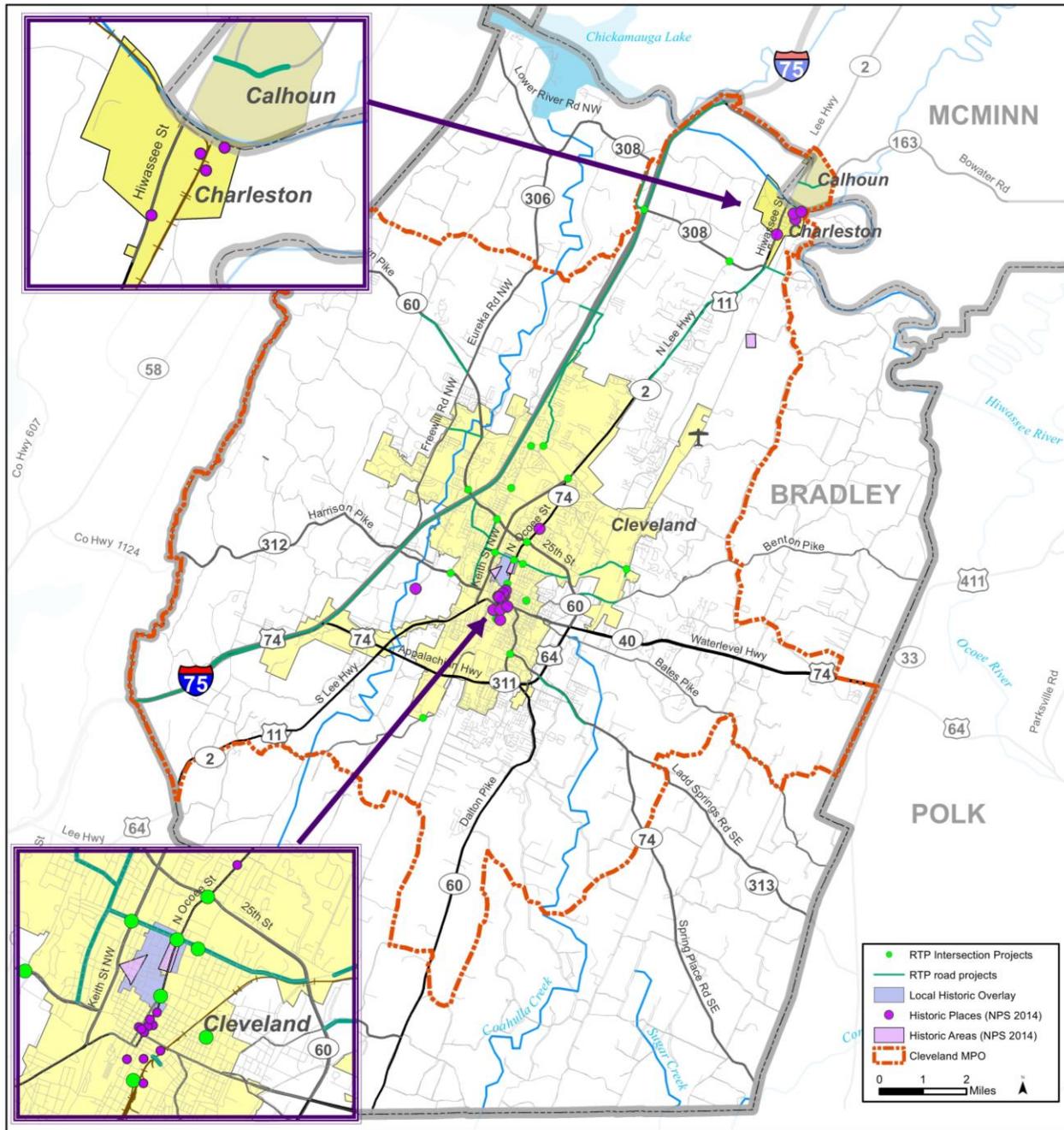


Figure 6.2 illustrates the location of wetland areas and floodplains in relation to the planned improvements in the RTP. Table 6.2 provides a list of projects which will require consultation with the appropriate local, state and Federal agencies as they progress through the planning and design phases.

Figure 6.2: 2040 RTP Projects in Relation to Natural Resources in the Cleveland MPO Region

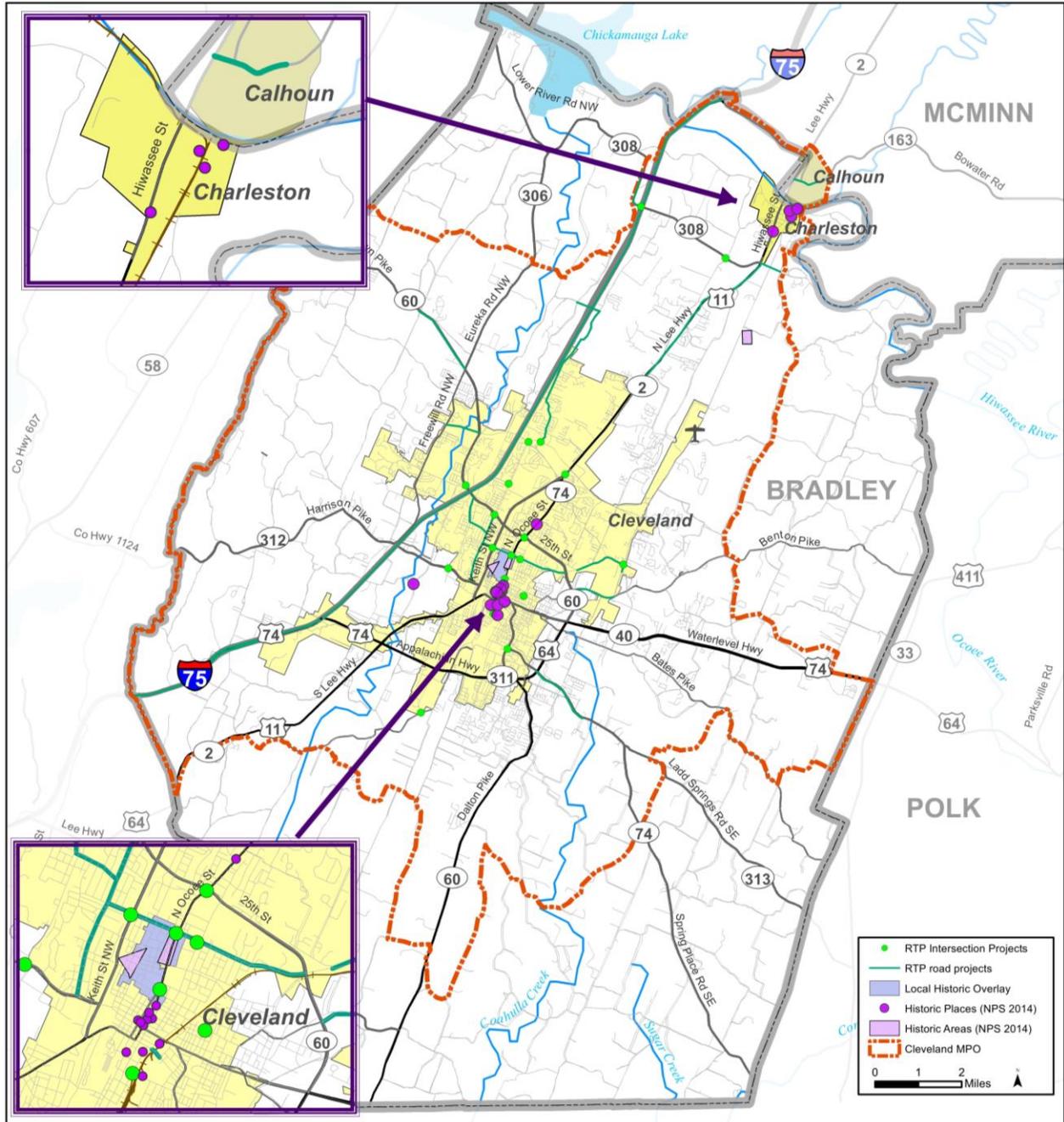


Table 6.2: Projects with Potential Impact on Wetlands and Floodplains

ID	Project	Description
E+C 1	SR-308 (Lauderdale Memorial Hwy) @ Walker Valley Rd	Safety Improvements
3	20 th Street @ Keith Street (US 11/SR 2)	Intersection Improvements
58	20 th Street from Ocoee Street (SR 74) to Georgetown Road	Reconstruction
59	20 th Street from Ocoee Street (SR 74) to APD 40	Road Widening
82	Paul Huff Pkwy Extension from Freewill Rd. to SR 60	New Roadway
83	I-75 @ SR 308 (Lauderdale Memorial Highway)	Interchange Improvements
98	9 th Street S.E. from Euclid Avenue S.E. to Church Street	Reconstruction/realignment
101	Interstate 75 from US 74 (Exit 20) to Bradley/McMinn Co. line	Road Widening
104	Interstate 75 from Bradley/Hamilton Co. line to US 74 (Exit 20)	Road Widening

Other natural resources in the Cleveland MPO region (also shown in Figure 6.2) include the Chickamauga Wildlife Management Area, located in northern Bradley County and along the Hiwassee River that serves as the Bradley/McMinn county border; the Charlotte Ann Finnel Neal Wildlife Management Area, located in eastern Bradley County near the Polk County line; and various public parks located around the area.

A small number of projects, shown in **Table 6.3** and Figure 6.2, are located in or near wildlife management areas or public parks and could potentially have impacts.

Table 6.3: Projects with Potential Impact on Parks or Other Managed Lands

ID	Project	Description
101	Interstate 75 from US 74 (Exit 20) to Bradley/McMinn Co. line	Road Widening
3	20 th Street @ Keith Street (US 11/SR 2)	Intersection Improvements
58	20 th Street from Ocoee Street (SR 74) to Georgetown Road	Reconstruction

Environmental Mitigation Strategies

As previously discussed, federal transportation planning regulations include several provisions intended to enhance the consideration of environmental issues and impacts within the transportation planning process. According to the FAST Act, metropolitan and statewide transportation plans must include a discussion of types of potential environmental mitigation activities as part of their plans. The following strategies have been developed by the MPO to address and consider environmental impacts relative to the decisions of the MPO early in the planning process:

- Minimize the construction of transportation investments that would impact wetlands.
- Consider greenways as a means of preserving environmentally sensitive lands from inappropriate development.

- Continue to utilize the region's GIS to identify environmental features (both natural and cultural) early in the planning process as a means of avoidance and/or to establish early corrective action plans prior to project construction.
- Partner with local, state, and federal resource agencies early in the planning process to identify potential issues for projects in the MPO's plans, and programs to develop appropriate solutions before actually beginning project development.
- Embrace the principles of Context Sensitive Solutions (CSS) as a means of developing transportation facilities that fit their physical setting and preserve scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility.

Steps to take in the project development process include the following in relation to environment impacts:

- **Avoid Impacts** - The first strategy in the environmental process is to avoid adverse impacts altogether.
- **Minimize Impacts** - Minimizing a proposed activity / project size or its involvement may be an option.
- **Mitigate Impacts** (preserve, repair and restore) - Precautionary, special operational management features and / or abatement measures may be used to reduce construction impacts and repair or restore existing resource.
- **Compensate for Impacts** - Compensation for environmental impacts by providing suitable replacement or substitute environmental resources of equivalent or greater value on or off-site could be utilized.

The MPO will continue to work with the agencies in the RTP process and as appropriate, as projects proceed in the project development process. The MPO recognizes that not every project will require the same level of mitigation; different projects may utilize more mitigation while others require very little. All impacts on environmentally sensitive areas will be analyzed on a project by project basis to examine which mitigation strategies are appropriate.

For major construction projects, such as new roadways, or for projects that may have a regionwide environmental impact, a context sensitive solution process should be considered in which significant public participation and alternative design solutions are used to lessen the impact of the project.

Climate Change

Another area of environmental concern relates to the implications of the built environment on the earth's climate. There is general scientific consensus that the earth is experiencing a warming trend and that human-induced increases in atmospheric greenhouse gases (GHGs) are the leading cause. The combustion of fossil fuels is by far the biggest source of GHG emissions. In the United States, approximately 30 percent of GHG emissions are from transportation sources.

Because greenhouse gas emissions from transportation sources (fuel combustion and vehicle air conditioning systems) account for a large percentage of the nation's total GHG emissions, the

transportation sector will likely play a large role in the ongoing discussion of GHG reduction goals. Strategies to reduce transportation GHG emissions include:

- **Introduction of low-carbon fuels**
 - The objective of this group of strategies is to develop and introduce alternative fuels that have lower carbon content and therefore generate fewer transportation GHG emissions. These alternative fuels include ethanol, biodiesel, natural gas, liquefied petroleum gas, low-carbon synthetic fuels (such as biomass-to-liquids), hydrogen, and electricity.
- **Increasing vehicle fuel efficiency**
 - The objective of this group of strategies is to reduce GHG emissions by using less fuel per mile traveled. Fuel efficiency improvements include advanced engine and transmission designs, lighter-weight materials, improved aerodynamics, and reduced rolling resistance.
- **Improving transportation system efficiency**
 - These strategies seek to improve the operation of the transportation system through reduced vehicle travel time, improved traffic flow, decreased idling, and other efficiency of operations; improvements that can also result in lower energy use and GHG emissions. The 2040 RTP includes a number of projects to improve traffic flow through signal system upgrades and intersection modifications. Efficiency can also be improved by shifting travel to more efficient modes, where such shifts are practical in terms of price and convenience—such as passenger vehicle to bus, or truck to rail.
- **Reducing carbon-intensive travel activity**
 - The objective of this group of strategies is to influence travelers' activity patterns to shift travel to more efficient modes, increase vehicle occupancy, eliminate the need for some trips, or take other actions that reduce energy use and GHG emissions associated with personal travel. The 2040 RTP proposes to increase the frequency and availability of public transit as well as support ridesharing and add new park & ride lots. Projects to improve and expand pedestrian and bicycle infrastructure will also provide more opportunities for sustainable travel.

Adaptation to Climate Change Impacts

Climate change is also likely to impact transportation infrastructure through the predicted increases in severe weather events and extreme temperatures. As a result, the MPO and its local governments have considered strategies to mitigate and adapt to these impacts as part of the planning process.

Based on current information and models, the climate change challenges most likely to impact transportation infrastructure are:

- Increases in very hot days and heat waves;
- Increases in Arctic temperatures;
- Rising sea levels;
- Increases in intense precipitation events; and
- Increases in hurricane intensity.

Although the Cleveland MPO will not be directly affected by all of these challenges, more intense and longer lasting heat extremes and heat waves, along with increases in the intensity of precipitation events, will affect short- and long-term transportation system investment decisions.

The Bradley County Natural Hazard Mitigation Plan (NHMP) was prepared and adopted to reduce the impacts of natural hazards in the cities of Cleveland and Charleston and the unincorporated areas of Bradley County. Based on a review of past natural disasters, the plan highlights 14 hazards that present a significant potential risk to the area's communities, many of which may be exacerbated by climate change:

- Flooding (including dam failure)
- Winter storms
- Tornadoes
- Extreme high temperatures
- Landslides and erosion
- Earthquakes
- Drought
- Wildfires
- Fog
- Thunderstorms (hail, lightning, and high winds)

Fog, as mentioned in Chapter 4, has been a continuing concern for roadway safety along the I-75 corridor in Bradley and McMinn counties, leading to the implementation of an I-75 electronic fog detection system throughout both counties. Tornadoes have also done significant damage to areas of Cleveland during the past several years. As noted in Chapter 4, TDOT and local public works agencies play a critical role in transportation system security by clearing roads in areas where tornado or other storm debris blocks access to emergency responders.

Of all of the potential hazards identified, however, the NHMP indicates that flooding is the most significant concern for the greater Cleveland area.

Managing Stormwater Impacts

One of the new planning factors that MPOs are required to consider under the FAST Act is how to reduce or mitigate stormwater impacts on surface transportation. This is a particularly relevant issue for the Cleveland MPO region. As shown in **Figure 6.3**, climate modeling data from the University of Georgia predicts that Bradley and McMinn counties are among 11 counties in Tennessee expected to experience the greatest increase in precipitation between 2035 and 2045. This information was compiled by TDOT through a FHWA-funded pilot project to assess the vulnerability of the state's infrastructure to extreme weather events.

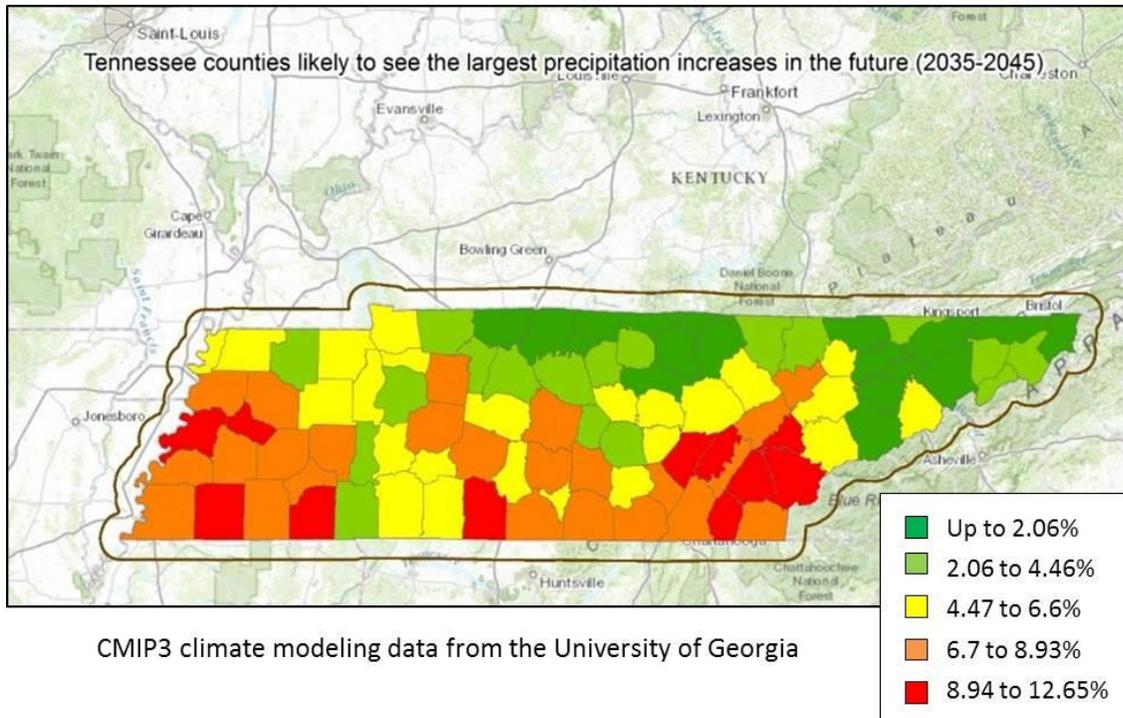
Rapid flooding can result when precipitation falls at an increased rate or quantity. This is particularly likely in urban areas where more of the earth's surface is paved, providing less opportunity for runoff to be absorbed. The Cleveland MPO area has experienced recent flooding and stormwater issues, like many other urban areas across the state. Various steps are being taken at the state and local level to adapt to the stormwater impacts associated with increased flooding, including:

- TDOT's Bridgewatch program (mentioned in Chapter 4), which uses real-time weather and hydrologic data to monitor area bridges and notify the responsible agencies when they may need to check a particular bridge for flooding, scouring or other problems; and
- A local stormwater fee recently adopted by the City of Cleveland to help fund the costs of stormwater management. The additional revenue will help to fund major drainage system

improvements as well as critical ongoing maintenance activities, such as street sweeping and clearing clogged storm drains. Such regular maintenance can help mitigate the risk of road closures or hazards from flooding.

- Restricting use of floodplains along creeks and rivers for open space, greenways and other purposes that can withstand periodic flooding.

Figure 6.3 Projected Increase in Precipitation for Bradley, McMinn and Other Tennessee Counties



Improving Resiliency to Other Transportation System Impacts

Intense heat is damaging to transportation infrastructure, causing kinks in steel rails, placing stress on bridge joints, and softening asphalt. On routes with a large percentage of heavy truck traffic, it is not uncommon to see the roadway become heavily rippled at the approaches to intersections, a type of damage generated from the force of braking trucks on hot asphalt. Sustained heat waves could result in the need for more frequent road maintenance.

Under the FAST Act, MPOs are charged with planning ways to make transportation infrastructure more resilient. This can involve large-scale efforts to rebuild a critical facility that could be impacted by climate change, or build a new road or bridge as an alternative to that facility. However, there are also relatively small decisions that can be made by individual agencies to increase system resiliency as they replace or upgrade equipment.

One example is the project mentioned in the ITS section of Chapter 4, in which the City of Cleveland proposes to replace loop detectors at its signals with video or radar detectors. Loops embedded at

intersections in an asphalt road can be easily damaged and broken on a hot day when the asphalt partially softens. If local temperatures become more extreme, the region could experience more frequent loop damage as the number of very hot days increases. Rather than continue to repair and replace the loops, Cleveland Utilities proposes to change the type of signal actuation being used. This is expected to yield cost savings by avoiding frequent maintenance, but it will also increase the transportation system’s resiliency to the impacts of climate change.

Environmental Consultation Process

[to be updated following the public comment and consultation period]

The following agencies were invited to consult during the development of the Regional Transportation Plan:

Federal Agencies

- Environmental Protection Agency (EPA)
- National Parks Service (NPS)
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Forest Service

State Agencies & Local Agencies

- City of Cleveland Historic Preservation Commission (HPC)
- TN Department of Economic & Community Development (ECD)
- TN Department of Environment and Conservation (TDEC)
- TN State Historic Preservation Office (SHPO)
- TN Wildlife Resources Agency (TWRA)

General Method of Consultation

TDOT has developed a method of consultation that the Cleveland MPO used as a guideline for its environmental consultation process. Each federal, state, and local agency was sent a letter asking them to comment on the plan in relation to consistency with their respective conservation plans, and inventories of natural and historic resources.

The Cleveland MPO compared the proposed transportation improvements in the region to the agencies’ plans, maps, inventories, etc. to assess potential environmental impacts. The RTP document was then circulated to the public and to the environmental agencies prior to adoption, in accordance with the Public Participation Plan.

Additional information and specific contact information for each agency can be found in **Appendix E**.

Title VI and Environmental Justice

Federal laws require that MPOs ensure federal funds are used fairly and without discrimination. Title VI of the Civil Rights Act of 1964 states that “No person in the United States shall, on the ground of race,

color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.”

Environmental Justice Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice (EJ) in Minority and Low-Income Populations*, clarified the need to involve minority and low-income populations in transportation decision-making processes and the need to assess the equity of transportation investments. The EO calls for identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

The intent of EO 12898, and the U.S. Department of Transportation’s corresponding guidance, is to ensure that these groups are included in the transportation decision-making process, and to ensure that they may benefit equally from the transportation system without shouldering a disproportionate share of its burdens.

A disproportionately high and adverse effect is one that is:

- Predominantly borne by a minority and/or low-income population; or
- Suffered by a minority and/or low income population more severely or in greater magnitude than the adverse effect suffered by the non-protected population.

Disproportionately high and adverse effects are not determined solely by the size of the population, but rather the comparative effects on these populations in relation to either non-minority or higher income populations. In this EJ assessment, U.S. Census data was used to identify the demographics of the area in order to recognize potential “communities of concern.” Communities of concern are areas where the percentage of low-income households or minorities is greater than that of the entire MPO area.

It is important to note that impacts from transportation projects can be either positive or negative. For example, positive impacts could be improved traffic conditions, decreased accidents, and new/improved sidewalks and bikeways. In order to construct some of these projects, a negative impact could be disruption to residents and businesses during the construction period and right-of-way that may need to be acquired. As the projects in the 2040 Plan progress through the planning and design stages, these areas should be carefully addressed.

In addition, the determination of what is disproportionately high and adverse human health or environmental effect is context dependent. All block groups/tracts include some members of protected populations, and the approach used in the development of the Plan to identify communities of concern is only based on Census data and the proportion of protected populations that they contain. As each project enters the development process, additional local knowledge of individual neighborhoods should be used to identify potential communities of concern that might have been missed during this Census-based analysis.

Analysis

Low-Income Persons

For purposes of this analysis, low-income persons are defined as those whose median household income is at or below the Department of Health and Human Services poverty guidelines. Although these guidelines are referenced in the EJ Executive Order as the standard, they are actually a simplified version

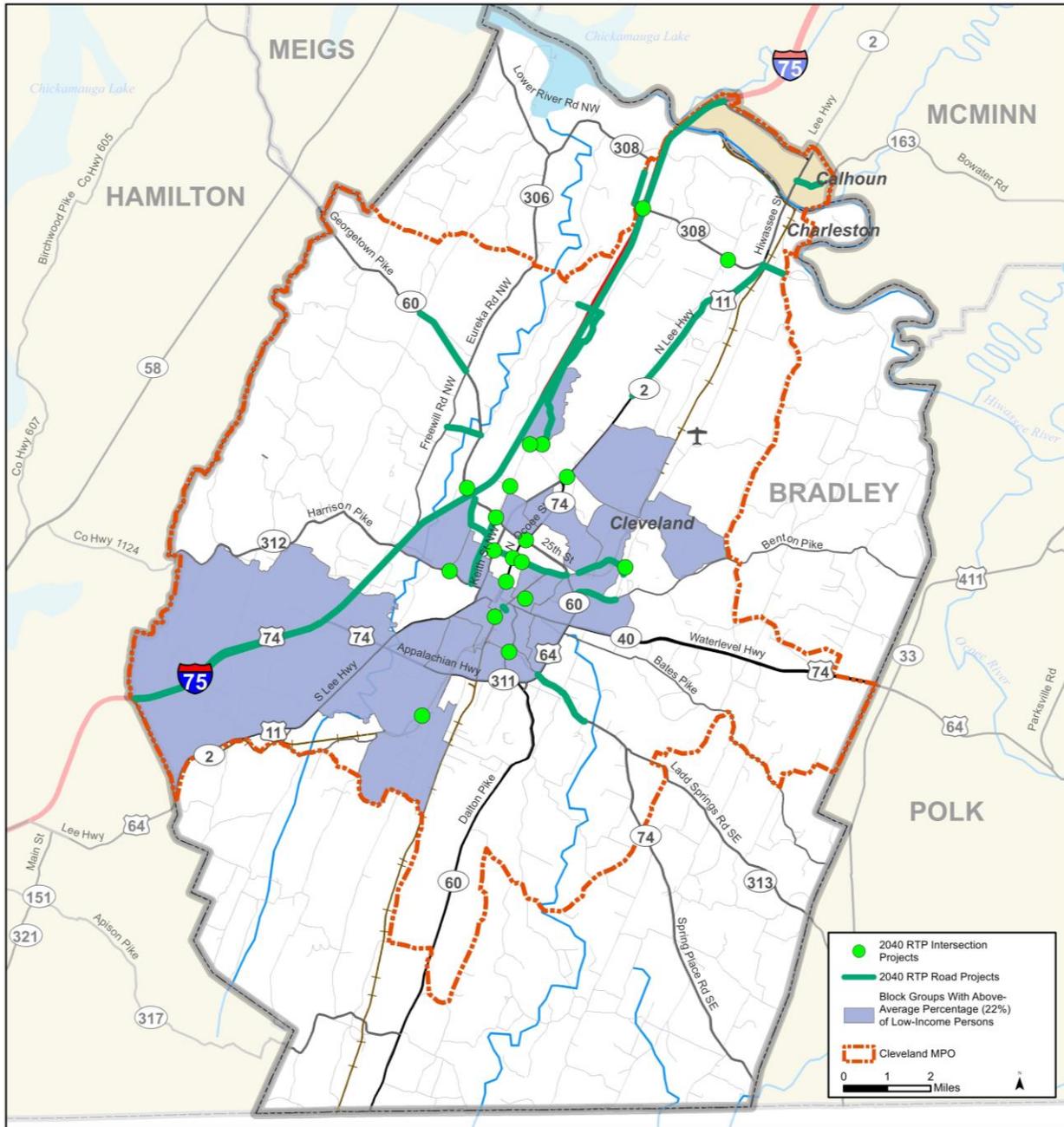
of the U.S. Census Bureau’s poverty thresholds, on which this plan’s analysis is based. The Census Bureau’s determination of whether an individual is living at or below the poverty level uses a set of dollar value thresholds that vary by family size and composition.

About 22 percent of the MPO region’s population are low-income persons. All of the census block groups where the percentage exceeds that regional average are found in central Bradley County and the area southwest of Cleveland on either side of I-75 (Figure 6.4). Proposed projects that could impact low-income persons in these block groups are shown in Table 6.4.

Table 6.4: Projects in Areas with Above-Average Percentage of Low-Income Persons

ID	Project	Description
5	Spring Place Road (SR 74) @ Wildwood Avenue (SR 311)	Intersection Improvements
17	Mouse Creek Road from Cleveland city limits to Hoopers Gap	Reconstruction
20	Benton Pike from APD 40 to Michigan Avenue Road	Road Widening
55	Georgetown Road from 20 th Street to Harrison Pike (SR 312)	Road Widening
59	20 th Street from Ocoee Street (SR 74) to APD 40	Road Widening
62	20 th Street from Shady Lane to Old Tasso Road	Road Widening
63	20 th Street from Old Tasso Road to Michigan Avenue Road	Road Widening
97	Industrial Drive S.W. @ Old Chattanooga Pike	Intersection Improvements
98	9 th Street S.E. from Euclid Avenue S.E. to Church Street	Reconstruction/realignment
99	6 th Street N.E. @ Gaut Street	Intersection Improvements
100	Midtown Connector (downtown Cleveland)	New Railroad Overpass
101	Interstate 75 from US 74 (Exit 20) to Bradley/McMinn Co. line	Road Widening
105	Interstate 75 from Bradley/Hamilton Co. line to US 74 (Exit 20)	Road Widening
111	Peerless Road @ Paul Huff Parkway	Intersection Improvements
112	Georgetown Road from 25 th Street to 20 th Street	Road Widening
113	Mouse Creek Road from Robin Hood Dr to Wedgewood Dr	Road Widening
114	Mouse Creek Road from Wedgewood Dr to East Circle Dr	Road Widening
115	Mouse Creek Road from East Circle Dr to Hunters Run	Reconstruction

Figure 6.4: Areas Where Percentage of Low-Income Persons Exceeds MPO Region Average



Minority Populations

In this analysis, estimates of the minority population were obtained from census data based on two types of survey responses: persons identifying themselves as African American, Asian American, American Indian and Alaskan Native, Native Hawaiian or Other Pacific Islander; and persons identifying themselves as being of Hispanic or Latino origin. The two categories are not mutually exclusive.

Minority populations in the Cleveland MPO area (Figure 6.5) comprise about 13 percent of the total population and are more distributed across the region than low-income persons. The greatest concentrations

of minority persons are in the South Cleveland area, where they comprise upwards of 30% of the population or greater. **Table 6.5** identifies transportation projects that could have impacts to these areas.

Figure 6.5: Areas Where Percentage of Minority Persons Exceeds the MPO Region Average

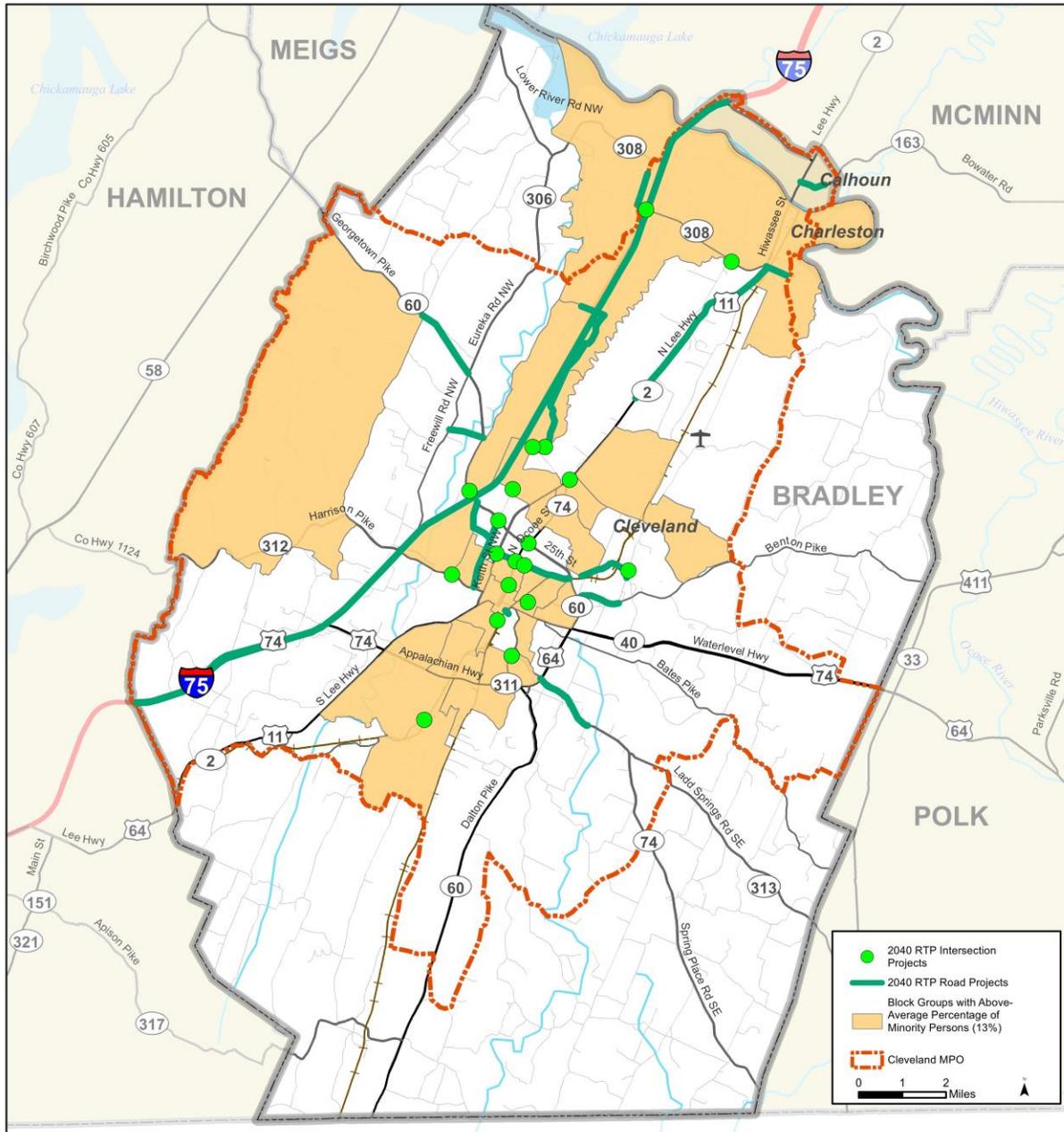


Table 6.5: Projects in Areas with Above-Average Percentage of Minority Persons

ID	Project	Description
1	20 th Street @ N. Ocoee Street (SR 74)	Intersection Improvements
5	Spring Place Road (SR 74) @ Wildwood Avenue (SR 311)	Intersection Improvements
9	20 th Street @ Parker Street	Intersection Improvements
17	Mouse Creek Road from Cleveland city limits to Hoopers Gap	Reconstruction
23	Hoopers Gap Road from Frontage Road to Mouse Creek Road	Reconstruction
55	Georgetown Road from 20 th Street to Harrison Pike (SR 312)	Road Widening
59	20 th Street from Ocoee Street (SR 74) to APD 40	Road Widening
62	20 th Street from Shady Lane to Old Tasso Road	Road Widening
70	N. Lee Highway (US 11/SR 2) from SR 308 to near Anatole Lane	Road Widening
83	I-75 @ SR 308 (Lauderdale Memorial Highway)	Interchange Improvements
92	SR 308 (Lauderdale Memorial Highway) Extension	New Roadway
93	SR 308 (Lower River Rd) from Bowater Logging Rd to I-75	Safety Improvements
95	Georgetown Rd (SR 60) @ Candies Lane	Intersection Improvements
96	N. Ocoee Street (SR 74) @ 8 th Street	Intersection Improvements
97	Industrial Drive S.W. @ Old Chattanooga Pike	Intersection Improvements
98	9 th Street S.E. from Euclid Avenue S.E. to Church Street	Reconstruction/realignment
99	6 th Street N.E. @ Gaut Street	Intersection Improvements
100	Midtown Connector (downtown Cleveland)	New Railroad Overpass
101	Interstate 75 from US 74 (Exit 20) to Bradley/McMinn Co. line	Road Widening
111	Peerless Road @ Paul Huff Parkway	Intersection Improvements
112	Georgetown Road from 25 th Street to 20 th Street	Road Widening
113	Mouse Creek Road from Robin Hood Dr to Wedgewood Dr	Road Widening
114	Mouse Creek Road from Wedgewood Dr to East Circle Dr	Road Widening
115	Mouse Creek Road from East Circle Dr to Hunters Run	Reconstruction

Households with Limited English Proficiency (LEP)

The U.S. Census Bureau defines a limited English-speaking household as “one in which no member 14 years old and over (1) speaks only English or (2) speaks a non-English language and speaks English ‘very well.’ In other words, all members 14 years old and over have at least some difficulty with English.”

The Limited English Proficient (LEP) population (**Figure 6.6**) recorded by the Census Bureau is about 600 households, comprising less than 2 percent of the Cleveland MPO area. They live mostly in or near the City of Cleveland and in eastern Bradley County. The most commonly reported languages were Spanish and Asian languages.

Given the low percentage of LEP households in the region, broad measures such as translating documents and providing interpreters for all of the MPO’s public meetings may not be warranted. However, a review of the data indicates seven block groups where LEP households do make up at least five percent of total households (highlighted in Figure 6.6). When projects are under development in these areas, the MPO, TDOT and local

Table 6.6: Projects in Areas Where At Least 5 Percent of Households Have Limited English Proficiency

ID	Project	Description
5	Spring Place Road (SR 74) @ Wildwood Avenue (SR 311)	Intersection Improvements
10	Westside Drive @ Harrison Pike (SR 312)	Intersection Improvements
55	Georgetown Road from 20 th Street to Harrison Pike (SR 312)	Road Widening
62	20 th Street from Shady Lane to Old Tasso Road	Road Widening
100	Midtown Connector (downtown Cleveland)	New Railroad Overpass
101	Interstate 75 from US 74 (Exit 20) to Bradley/McMinn Co. line	Road Widening

Summary

Although all segments of the population who live adjacent to roadway construction projects may endure some short-term construction related impacts related to visual changes, noise changes, and alterations in access, neither minority or low-income populations in the MPO area are likely to experience disproportionate impacts due to the projects proposed in the Plan.

Because populations shift and change, additional efforts to identify potential communities of concern should be undertaken as part of the future phases of each project. To ensure that all persons are involved, special outreach efforts are made by local and state agencies during the project development process to identify, and either avoid or help mitigate any adverse impacts and/or burdens from transportation improvements for those areas identified as communities of concern.

Many of the projects identified in the Plan will likely utilize federal funding, in which case documentation in compliance with the National Environmental Policy Act (NEPA) will be required. During the NEPA process, a variety of issues will be evaluated, including an EJ analysis pursuant to EO 12898. In addition, the development of the NEPA document will require public participation, and local coordination with potential environmental justice issues can be identified and addressed.

Chapter 7

Stakeholder and Public Involvement

This chapter outlines the MPO's adopted procedures for involving the public and stakeholders in the development of each Regional Transportation Plan. It also describes the process used to seek involvement in the 2040 RTP and summarizes the input and comments received from other agencies, stakeholders, the freight community, and the community at large.

Public Participation Plan

The MPO's formal public participation process for the RTP begins with the endorsement of the draft plan for public review by the MPO Executive Board. This endorsement initiates a 30-day public comment period followed by a second public hearing before the MPO Executive Board. The 30-day comment period is advertised and copies of the draft plan are made available at the Cleveland Public Library. The MPO makes special efforts to reach low-income, minority, and non-English speaking populations through written and/or verbal notices in venues where such populations are likely to be found (churches, community center neighborhood groceries, etc.).

At the second public hearing, comments already received are reported to the MPO Executive Board, a resolution of the comments will be discussed, and additional comments will be heard. If the MPO Executive Board believes that there are substantial unresolved issues, the public comment period is extended for 15 days. At the close of the final public hearing, the MPO Executive Board votes on the adoption of the RTP. Amendments to the RTP follow the same process.

Efforts are made to reach out to a wide range of people, including those traditionally underserved, to notify them of the opportunity for input. Typically notifications are posted in local stores, community gathering places and on buses. Meeting advertisements are also posted on the MPO's website and in local papers. Special efforts are made to host meetings at locations accessible by transit. The MPO also directly contacts community organizations such as Main Street Cleveland, the Chamber of Commerce, trucking companies and major employers to invite them to public meetings.

Stakeholder and Public Participation in the 2040 RTP

Consultation with Local, State and Federal Agencies

The MPO actively engages local, regional and state agencies responsible for planned growth, economic development, environmental protection, airport operations, freight movements, land use management, natural resources, conservation, and historic preservation. Many of these partners are members of either the MPO's Technical Coordinating Committee or Executive Board, as discussed in Chapter 1. Agencies responsible for resource management have also been engaged in the 2040 RTP through the environmental consultation process described in Chapter 6.

Freight stakeholders

In coordination with the Cleveland/Bradley County Chamber of Commerce, interview requests were made to various freight-intensive businesses in the Cleveland and Charleston/Calhoun areas, resulting in a small number who agreed to be interviewed. They described the volume, nature and locations of their shipping activities and commented on their transportation concerns, which are further discussed in the

freight section of Chapter 4. More than one company remarked that their most significant delays were created not by the local transportation system, but by congested interstate conditions in Chattanooga.

General Public

Citizens were invited to an initial public meeting in October 2015 at the Museum at Five Points in downtown Cleveland where the presentation included an overview of the RTP process and a summary of the transportation system's existing conditions, followed by an interactive session in which their input was sought on transportation needs and desired outcomes.

Table-size maps were provided for those in attendance to use in discussing transportation issues in these key areas:

- Safety
- Traffic Congestion
- Bus/Transit Service
- Bicycle and Pedestrian Facilities
- Freight

Citizens were encouraged to mark areas of concern and suggestions directly on the maps, and were also given comment forms on which they could provide additional detail.

Many of the citizens in attendance expressed interest in innovative road treatments and designs such as roundabouts and road diets. Particular interest was shown in a redesign of Inman Street in downtown Cleveland that would reduce the number of thru-lanes while enhancing the pedestrian and bicycling environment and potentially offering more on-street parking.

Traffic concerns included existing and future congestion on Interstate 75, with suggestions to include projects to widen the interstate as part of the 2040 RTP. Peerless Road and Old Tasso Road were also named as corridors where future widening should be considered. Citizens expressed frustration with heavy traffic congestion along the busy 25th Street corridor. They also noted high volumes of both auto and pedestrian traffic in the Lee University campus area. Participants expressed support for some of the major new road projects under discussion in the greater Chattanooga region, including a future I-75 bypass (which they said could be implemented through a private entity with tolls) and the completion of Corridor K.

With regard to transit, citizens said one of the greatest needs is to provide benches and shelters at key bus stops. More visible bus stop signs – potentially color-coded to the route(s) they serve – were also suggested as a way not only to help riders, but also increase general public awareness that the transit system is available. Particular areas where new or additional transit service was proposed include along the 25th Street/SR 60 (Georgetown Road) corridor, the places of employment along Old Tasso Road and APD 40, and a linkage between Cleveland and Chattanooga.

Pedestrian and bicycle needs were one of the most popular topics at the meeting. Some participants said the area greenway system is the most effective use of future bicycle/pedestrian funds, but that sidewalks are also needed to link the greenways to residential and shopping areas. Others identified a critical need for sidewalks on major corridors such as Paul Huff Parkway, Georgetown Road and US 11/SR 2 (Keith Street). Support was expressed for greenway extensions through the former Whirlpool site and to the Old Woolen Mill area, and to the south side of Inman Street along Candies Creek.

For additional detail on citizen comments, see **Appendix B**.

[additional information to be added at the close of the public comment period]

Ongoing Involvement

After the adoption of the 2040 RTP, the MPO will continue to interact with stakeholders and the general public to obtain ongoing input on transportation needs. Additional detailed planning will focus on specific bicycle and pedestrian improvements, modifications to transit routes and services to better meet needs of existing and potential riders, identifying improvements that will better meet existing and future freight needs, and other purposes.

Direct contacts through interest groups, service providers, industry groups, etc. will supplement media, internet, and other public posting efforts to reach the traditionally underserved, special user groups (e.g. freight users, bicyclists) and the general public with news about the transportation planning process and invitations to participate in it.

Special study committees may also be formed periodically to address particular transportation issues as they arise. Recent examples include the SR 60 Corridor Access Management Committee, which consisted of representatives from local government and TDOT and provided guidance for the development of a study recommending access policies for various sections of that corridor.

APPENDIX A

Documentation of the Cleveland MPO Travel Demand Model Update

(Full text reviewed separately by TDOT and not included in this review copy)

APPENDIX B

Public Participation in the 2040 RTP

(additional information will be added after the public comment period)



Cleveland Urban Area
METROPOLITAN PLANNING ORGANIZATION

2040 Regional Transportation Plan



Public Meeting
Museum at Five Points
Thursday, October 15, 2015

SIGN-IN SHEET

Name (Please Print)	Address (Street, City, State, Zip)	E-mail Address (if you would like to receive future correspondence by e-mail)
David Sheely	144 Twin Creeks Dr NW Cleveland TN 37312	dsheely@clevelandtn.gov
Mary Lynn Brown	165 Edwards St, Cleveland	mbrown@sethra.us
Ted Smith	165 Edwards St Cleveland	tsmitl@sethra.us
Reese Graves	219 MacMillan RD NE Cleveland 37323	RGRAVESTJR@USA.COM
JOBEN DUNNARANT	7005 Volkswagen Drive Chattanooga	joben.dunnarant@tn.gov
Ed McIntire	3683 Cove Lake Drive Clev 37312	edmcintire@bellsouth.net
Hulon Dunn	733 41st St NE Clev 37311	hdunn@museumcenter.org
Jerry Brown	253 Toman St East	skbmttn@as1.com



Cleveland Urban Area
METROPOLITAN PLANNING ORGANIZATION

2040 Regional Transportation Plan



Public Meeting
Museum at Five Points
Thursday, October 15, 2015

SIGN-IN SHEET

Name (Please Print)	Address (Street, City, State, Zip)	E-mail Address (if you would like to receive future correspondence by e-mail)
Jeanne Stevens	Parsons Brinckerhoff, 2100 West End, Nashville	stevensje@pbworld.com
MARY BENTON	1023 NORTHVIEW Dr. N.W. CLEVELAND	burning153@hotmail.com
Greg Thomas	Cleveland MPO 185 2nd Street NE Cleveland	gthomas@clevelandtn.gov
David Coulter	2544 Georgetown Rd Cleveland TN 37311	shop@scotts bikes.com
JOE SHARP	2430 CANDIES LANE NW CLEVELAND, TN 37312	JOESHARP@AOL.COM
Sherri Dale	Cathow, TN 37309 CITY OF CLEVELAND	medtentn@msn.com
BRIAN BECK	185 2ND ST NE CLEVELAND, TN	bbeck@CLEVELANDTN.GOV
Brian Moran	190 Church St Cleveland TN	bmoran@clevelandtn.gov

Public Transit

- **Public transportation in the Cleveland area**
 - Are the community's needs being met by the current bus routes and schedule?
 - If not, what do you want to see? Would you support additional funding to put it in place?
- **Transit link between the Cleveland and Chattanooga areas**
 - Do we need it?
 - What kinds of trips would you make? To work? To shop or attend an event? Other?
 - Would it be helpful to run a daily bus from Cleveland to Ooltewah in order to catch a local Chattanooga bus to Enterprise South?

Freight

- **Trucking**
 - What is needed by local businesses that rely heavily on shipping/receiving?
 - What routes are most frequently used by trucks? Is traffic a problem?
 - Are there locations where trucks have difficulty because of road conditions?
- **Rail**
 - Is there an opportunity for Cleveland area businesses to make more use of rail?
 - Could Cleveland benefit from the new rail intermodal transfer center in Chatsworth, Georgia?

Safety

- **Crash locations**
 - Do you have insight on why accidents occur at any of the locations shown on the map?
 - Are there other locations where there are safety concerns? Please add them to the map and offer details if possible.
- **Safety Priorities**
 - What locations would you improve first?
 - Are there other transportation safety issues you're concerned about? Road conditions?

- **Bicycle/Pedestrian Safety**

- Are there locations where it's particularly hazardous for bicyclists or pedestrians?
- Do people know about the 3-Foot Law?

Roads and Traffic

- **Reasons for Traffic Delays**

Which of these cause significant delays for you? Where?

- Too many people trying to make a turn
- Too many cars for the number of lanes available
- School traffic
- Large vehicle(s) on a road that isn't well-designed for them
- Special events
- Drivers unfamiliar with the area
- Other reasons?

- **New Road Connections**

- Are there places that need new road access?
- Areas where we need more than one route to get there?

Sidewalks, Trails and Bike Routes

- **Sidewalks**

- What issues are most important in deciding where to put sidewalks?
- If you were in charge of the funds, how much would you spend on new sidewalks, versus fixing/maintaining our existing sidewalks?
- Any particular areas where sidewalk maintenance or construction is especially needed?

- **Greenways, trails and other pedestrian facilities**

- Do you use the community's existing trails?
- If funds are limited, how do you balance trails with other bike/ped needs?
- Ideas on where to add or extend a trail?

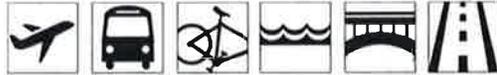
- **Bicycle facilities**

- What issues are most important in deciding where to put bicycle facilities?
- What do you think about on-road bicycle lanes versus separated bicycle paths?

Dustin Tommey



2040 Regional Transportation Plan



IDEAS AND COMMENTS

SAFETY - ^{specifically,} ① Wildwood Ave. — Inman St. intersection, dangerous generally, ② if/when possible, widen roadways or offer safer sidewalks in downtown areas (Blythe Oldfield / SE Cleveland)
③ SCI Streetscape improvements

ROADWAYS / TRAFFIC

TRANSIT ① one of the biggest needs is shelter and/or benches at key stops

BICYCLES / PEDESTRIANS ① the Greenway expansion needs to reach the Old Woolen Mill + ^{old} Whirlpool (once redeveloped)
② bike lanes could be GREATLY Improved

needs sidewalk ③ King Edward Ave. from 9th to 20th; plus, a cut-through from 12th/13th St. SE

FREIGHT

① Around 9th St. SE + King Edward Ave. SE + Wildwood SE
All needs widening/improvement
② crossing r/r tracks - we desperately need a better solution

(Use the back of this page if you need additional space to write ideas and comments.)



Mary Lynn Brown
Cleveland Transit
478-1396

2040 Regional Transportation Plan



IDEAS AND COMMENTS

SAFETY

Concerns @ night on Inman & Edwards Street.
Narrow Streets - Henderson Ave

ROADWAYS / TRAFFIC

TRANSIT Signs Indicating Routes - color of Route
was a suggestion

BICYCLES / PEDESTRIANS

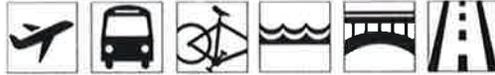
FREIGHT

(Use the back of this page if you need additional space to write ideas and comments.)



Cleveland Urban Area METROPOLITAN PLANNING ORGANIZATION

2040 Regional Transportation Plan



IDEAS AND COMMENTS

SAFETY - see below regarding roundabouts

8th + Ocase - No room for roundabout?

ROADWAYS / TRAFFIC - Would like serious consideration for roundabout usage

TRANSIT - like idea of mass transit opportunity to Chattanooga
what is current volume from Clev to Enterprise South?

BICYCLES / PEDESTRIANS - GREENWAY CONNECTION ACROSS
INMAN TO SOUTH SIDE ALONG CREEK
- Greenway drawn in Blue on Map along Candles

FREIGHT - rerouting of freight off of Inman so
that Inman could have "on street" parking
- 3rd street revamp to accommodate traffic

→ - continued concern re log truck traffic on Ocase → Hwy 11 →

(Use the back of this page if you need additional space to write ideas and comments.)

This 50 yard extension will enable two neighborhoods to have safe access to greenway

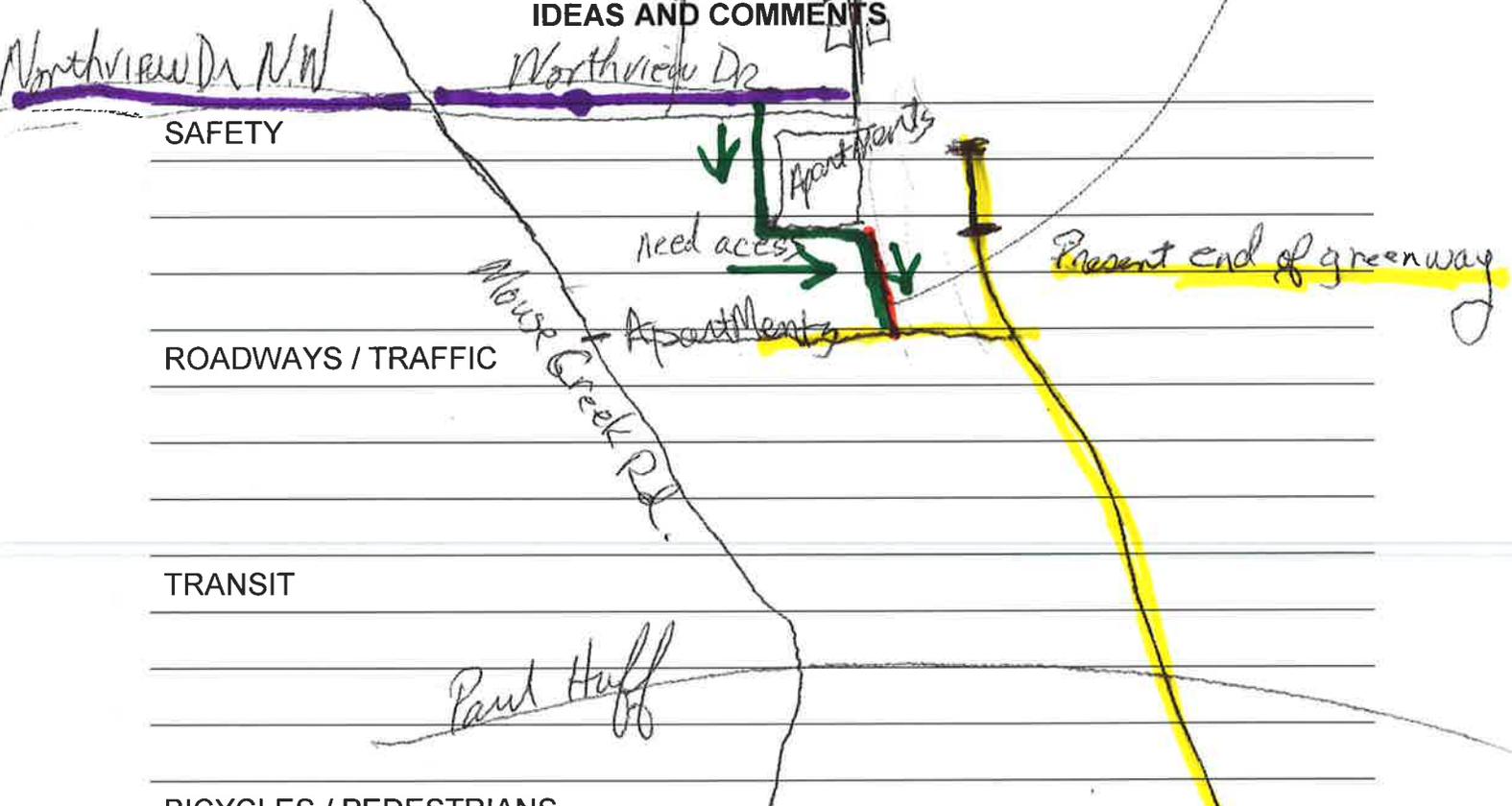


Cleveland Urban Area
METROPOLITAN PLANNING ORGANIZATION

2040 Regional Transportation Plan



IDEAS AND COMMENTS



SAFETY

ROADWAYS / TRAFFIC

TRANSIT

BICYCLES / PEDESTRIANS

I live on Northview Dr. NW. - I can not walk or ride my bike safely to get on the greenway. I would like to propose a 50 yard sidewalk extension to access greenway until the greenway extension to soccer field is complete

MARY BENTON 1023 Northview Dr. N.W. Cleveland

(Use the back of this page if you need additional space to write ideas and comments.)

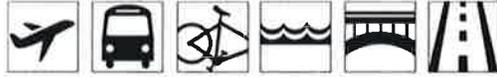
423 244 5012
BURNING6153@dotmail.com



Cleveland Urban Area

METROPOLITAN PLANNING ORGANIZATION

2040 Regional Transportation Plan



IDEAS AND COMMENTS

SAFETY

ROADWAYS / TRAFFIC

Traffic delays. Too many cars, heavy pedestrian traffic and car traffic @ Lee College

TRANSIT

BICYCLES / PEDESTRIANS

FREIGHT

(Use the back of this page if you need additional space to write ideas and comments.)



2040 Regional Transportation Plan



IDEAS AND COMMENTS

SAFETY

Roundabouts !!! Peerless Rd @ Raider Dr. +
Peerless Rd @ Norman Chapel Dr.,
Peerless Rd @ Georgetown Rd.

ROADWAYS / TRAFFIC - I-75 Interchanges (Bancroft + Hooper Gap)

- Wildwood Ave (SR311) Widening
- Sunset Dr. Corridor
- 25th St Improvements (Convert Roadscapes to Widening)
- Georgetown Rd / Peerless Intersection to Keith St.

TRANSIT

BICYCLES / PEDESTRIANS

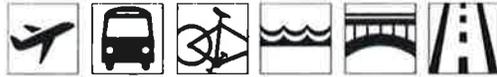
Bike Lanes !!!

FREIGHT

(Use the back of this page if you need additional space to write ideas and comments.)



2040 Regional Transportation Plan



IDEAS AND COMMENTS

SAFETY

ROADWAYS / TRAFFIC Decreasing Inman St from 4 to 2 lanes. Incorporate wider sidewalks, street scape, and bike lanes.

TRANSIT Implementing completed streets

BICYCLES / PEDESTRIANS Need to focus on adding sidewalks to our main road corridors. Ex: Paul Huff / Georgetown Rd / Keith street

FREIGHT

(Use the back of this page if you need additional space to write ideas and comments.)



2040 Regional Transportation Plan



REESE GRAVES
423 584 2414

IDEAS AND COMMENTS

ALSO POWER AND COMMUNICATION CORRIDORS

SAFETY Railroads - NEED STUDY. RR access to EXIT 20 AREA INDUSTRIAL PARK.

→ PIPELINE CORRIDORS - NEED STUDY BETWEEN INDUSTRIAL PARKS and Charleston, Calhoun, ETAWHA and ROADWAYS / TRAFFIC } CHATTANOOGA

- ADDITIONAL LANES FOR I-75 EXIT 25 TO 27, FUTURE EXIT 11 TO EXIT 20 and 20 to 25
- 4 LANE PEERLESS • 5 LANE OLD TASSO RD.

TRANSIT • ENCOURAGE Private Turn PIKE COMMISSIONS (TOLL ROADS) FOR N. Chattanooga Bypass (I-75 TO I 59) AND IN GA FROM I-75 TO 59 FOR S. Bypass.

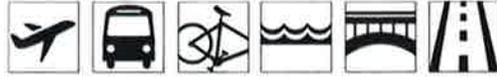
- Toll ROAD Commission for 64/74 From Ocoee to I-40
- BICYCLES / PEDESTRIANS** Through or around BOTH NATIONAL FORESTS

PUBLIC TRANSIT - NEED ROUTE FROM OCOEE to Cleveland along 64/74

FREIGHT



2040 Regional Transportation Plan



IDEAS AND COMMENTS

SAFETY

ROADWAYS / TRAFFIC

TRANSIT

NO Public transit opportunities along
25th st / Georgetown Rd / Candies Creek.
This area is expected to be a high growth Area.

~~BICYCLES / PEDESTRIANS~~

No ^{public} transit options to manufacturing places
of employment along APO-40 and Old Tasso.

FREIGHT

(Use the back of this page if you need additional space to write ideas and comments.)



2040 Regional Transportation Plan



IDEAS AND COMMENTS

SAFETY Westside Dr and Georgetown Rd is an intersection w/o clear signage, and a gas station to boot. And a bar.

ROADWAYS / TRAFFIC Street lights on 25th Street/exit 25. Too many lights and too much traffic to be adequately moved w/ the present system.

TRANSIT efficient, cost effective public transportation is pivotal in easing congestion on our streets. It must also be marketed well to encourage use.

BICYCLES / PEDESTRIANS expansion of the Greenway is the most effective use of \$ going forward, but we also need connecting sidewalks that link the Greenway to residential areas and shopping areas.

FREIGHT

(Use the back of this page if you need additional space to write ideas and comments.)



Cleveland Urban Area

METROPOLITAN PLANNING ORGANIZATION

2040 Regional Transportation Plan



Additional space for ideas and comments

Δ Inman Street to 2 lane; increase sidewalks, add trees,
build for pedestrian/bicycle.
Funnel thru traffic to 3rd Street (from Hwy 64)

Please leave this form with the staff before you go. Thanks for coming!



2040 Regional Transportation Plan



IDEAS AND COMMENTS

SAFETY

accidents @ central & parker b/c of the way stop signs alternate on streets. I think people get confused (despite the obvious signs) which intersections ^{have} stop signs & which are 2 way / at monuments ~~it's~~ it's hard to see b/c of so much ROADWAYS / TRAFFIC

TRANSIT

need met? no - ~~no~~ partially because the routes are obscure unless you do research - Public transportation routes should be marked clearly w/ signs & stop times posted at route stops currently there are no visible stop/pick up locations - this would ^{increase} use of public transit

BICYCLES / PEDESTRIANS

FREIGHT

(Use the back of this page if you need additional space to write ideas and comments.)



2040 Regional Transportation Plan



Additional space for ideas and comments

Transit Cleve - Chatt could be great for business professionals going to work. Cleve Ooltewah etc. to downtown chatt

Sidewalks

Safety: SIDEWALKS need improved need to be made more accessible to handicap & families walking to businesses & public areas.

Please leave this form with the staff before you go. Thanks for coming!



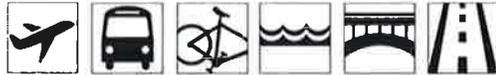
Sherrri Dale

423-435-6006 - cell

423-336-2916 - home

email: ~~me@untn.com~~
me4untn@msn.com

2040 Regional Transportation Plan



IDEAS AND COMMENTS

SAFETY: Left hand turn at interse ction of Hwy 11 and Hwy 163 / Bowater Rd. Hwy 11 and Hwy 163 / Bowater Rd pedestrian and bicycle concerns:

ROADWAYS / TRAFFIC

Calloway Hwy 11 + Hwy 163 / Bowater Rd
More traffic when Hiwassee River Park Project finishes.
Businesses moving to Northbound / east side of Hwy 11.

TRANSIT

Need carpool, bus, or train transportation into Cleveland and Chatanooga.

BICYCLES / PEDESTRIANS

We have quite a few pedestrians that walk on major roads. We are also starting to get joggers. Sidewalks and bicycle lanes both needed on Hwy 11 and Hwy 163

FREIGHT

More freight on Hwy 11 and Hwy 163 / Bowater Rd.
more rail use would be a good possibility.



Cleveland Urban Area METROPOLITAN PLANNING ORGANIZATION

about 1000
The 2040 Regional
Transportation Plan
will be a
major
update to the
1997
Regional
Transportation
Plan

2040 Regional Transportation Plan



Additional space for ideas and comments

Safety - would improve by having sidewalks put in on Hwy 11 and on Hwy 1163 / Bowdler Rd. Highway 1163 has an under pass under the Bay 1st railroad tracks. This under pass is very narrow. Recently some repair work had to be done due to gravel falling onto the road way underneath. Under pass needs widened.

Please leave this form with the staff before you go. Thanks for coming!

APPENDIX C

Frequently Used Acronyms in Transportation Planning

Frequently Used Acronyms in Transportation Planning

CSS	Context Sensitive Solutions
CUATS	Cleveland Urbanized Area Transit System
EJ	Environmental Justice
FAST	Fixing America's Surface Transportation (Act)
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FY	Fiscal Year
ITS	Intelligent Transportation Systems
MAP-21	Moving Ahead for Progress in the 21 st Century
MPO	Metropolitan Planning Organization
NEPA	National Environmental Protection Act
NHPP	National Highway Performance Program
O&M	Operations and Maintenance
PPP	Public Participation Plan
RTP	Regional Transportation Plan
RPO	Rural Planning Organization
SETHRA	Southeast Tennessee Human Resources Agency
SETDD	Southeast Tennessee Development District
STIP	State Transportation Improvement Program
STBG	Surface Transportation Block Grant Program
TAP	Transportation Alternative
TAZ	Traffic Analysis Zone
TCC	Technical Coordinating Committee
TDM	Travel Demand Management or Travel Demand Model
TDOT	Tennessee Department of Transportation
TIP	Transportation Improvement Program
TSM	Transportation System Management
UPWP	Unified Planning Work Program
V/C	Traffic Volume to Capacity Ratio
VHD	Vehicle Hours of Delay
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled
YOE	Year of Expenditure

APPENDIX D

List of Recommended Projects Showing Percentage of Cost Anticipated from Various Funding Sources

PROPOSED ROADWAY PROJECTS, 2016-2025

ID	Type of Improvement	Roadway	From	To	Description	Agency	Cost (YOE, millions)	Anticipated Funding (millions)		
								HSIP	STA	Local
	Safety Improvements	Throughout urbanized area			Funding setaside for various improvements	TDOT, MPO members	\$ 9.0	HSIP \$9.0		
	Bridge Rehab/Replacement	Throughout urbanized area			Funding setaside for various improvements (some work will also occur as part of other scheduled roadway projects)	TDOT, MPO members	\$ 3.5	STA \$3.5		
	ITS and Operational Improvements	Throughout urbanized area			Funding setaside for various improvements	TDOT, MPO members	\$ 0.5	STA \$0.5		
	Transp Alternatives & Enhancements	Throughout urbanized area			Funding setaside for various improvements	TDOT, MPO members	\$ 4.5	TAP \$3.5	STA \$0.5	HSIP \$0.5
	Transit Amenities	Throughout urbanized area			Add shelters at major bus stops to improve passenger safety	TDOT, MPO members	\$ 0.5	HSIP \$0.5		
82	New Roadway	Paul Huff Parkway Extension	Freewill Road	SR 60 (Georgetown Road)	Construct new 3-lane road	Cleveland	\$ 10.5	U-STBG \$10.5		
7	Intersection Improvements	25th Street (SR 60)	@ Peerless Road		Widen North and South approaches from 4 to 5 lanes	Cleveland/TDOT	\$ 0.5	S-STBG \$0.5		
94	Intersection Improvements	20th Street	@ Michigan Avenue Road		Safety improvements	Cleveland	\$ 0.4	HSIP \$0.4		
62	Road widening	20th Street	Shady Lane	Old Tasso Road	Widen from 2 to 3 lanes	Cleveland	\$ 11.2	U-STBG \$3.7	STA \$4.5	Local \$3.0
63	Road Widening	20th Street	Old Tasso Road	Michigan Avenue Rd	Widen from 2 to 3 lanes	Cleveland	\$ 2.7	HSIP \$2.7		
108	Reconstruction	Michigan Avenue Road	Minnis Road	20th Street	Reconstruct 2-lane road	Cleveland	\$ 1.2	HSIP \$1.2		
95	Intersection Improvements	Georgetown Rd (SR 60)	@ Candies Lane		Realign intersection	TDOT	\$ 3.2	HSIP \$3.2		
96	Intersection Improvements	N Ocoee Street (SR 74)	8th Street		Construct roundabout	TDOT/Cleveland	\$ 1.7	HSIP \$1.7		
93	Safety Improvements	SR 308 (Lower River Rd)	Bowater Logging Rd	I-75	Safety improvements	TDOT	\$ 0.5	HSIP \$0.5		
99	Intersection Improvements	6th Street N.E.	@ Gaut Rd		Safety improvements	Cleveland	\$ 0.6	U-STBG \$0.6		
110	Intersection Improvements	Mouse Creek Road	@ Paul Huff Pkwy		Add lane to NB approach on Mouse Creek Rd	Cleveland	\$ 0.1	HSIP \$0.1		
111	Intersection Improvements	Peerless Road	@ Paul Huff Pkwy		Improve NB approach on Peerless Rd from intersection back to Valleyhead Rd	Cleveland	\$ 0.5	U-STBG \$0.5		
112	Road Widening	Georgetown Rd N.W.	25th Street	20th Street	Widen from 2 to 3 lanes, including roundabouts at major intersections	Cleveland	\$ 9.4	U-STBG \$4.2	Local \$5.2	

2016-2025 TOTAL \$ 60.5

PROPOSED ROADWAY PROJECTS, 2026-2040

ID	Type of Improvement	Roadway	From	To	Description	Agency	Cost (YOE, millions)	Anticipated Funding (millions)		
	Safety Improvements	Throughout urbanized area				TDOT, MPO members	\$ 13.0	HSIP \$13.0		
	Bridge Rehab/Replacement	Throughout urbanized area				TDOT, MPO members	\$ 4.0	STA \$4.0		
	ITS and Operational Improvements	Throughout urbanized area				TDOT, MPO members	\$ 1.8	STA \$1.8		
	Transp Alternatives & Enhancements	Throughout urbanized area				TDOT, MPO members	\$ 8.5	TAP \$7.0	STA \$1.0	HSIP \$0.5
	Transit Amenities	Throughout urbanized area				TDOT, MPO members	\$ 2.5	HSIP \$0.5	State \$1.0	Local \$1.0
6	Intersection Improvements	25th Street (SR 60)	@ N Ocoee Street (SR 74)		Widen all N & S approach lanes, add curb & gutter and dual left-turn lanes	Cleveland/TDOT	\$ 11.8	NHPP \$11.8		
11	Intersection Improvements	Keith Street (US 11/SR 2)	@ N Ocoee Street (SR 74)		Intersection improvement with "flyover"; remove traffic signals and add lanes	Cleveland/TDOT	\$ 8.0	NHPP \$8.0		
1	Intersection Improvements	20th Street	@ N. Ocoee Street (SR 74)		Widen from 4 to 5 lanes, signalize	Cleveland/TDOT	\$ 0.3	S-STBG \$0.3		Local \$5.5
3	Intersection Improvements	20th Street	@ Keith Street (US 11/SR 2)		Widen and relocate existing signal	Cleveland/TDOT	\$ 0.3	S-STBG \$0.3		
113	Road Widening	Mouse Creek Road	Robin Hood Rd	Wedgewood Dr	Widen from 2 to 3 lanes	Cleveland	\$ 2.1	Local \$2.1		
58	Reconstruction	20th Street	Ocoee Street (SR 74)	Georgetown Road	Upgrade lane width, shoulders; add left turns at intersections	Cleveland	\$ 9.6	HSIP \$9.6		
59	Road Widening	20th Street	APD-40 (Bypass)	Ocoee Street (SR 74)	Widen from 2 to 3 lanes	Cleveland	\$ 21.5	U-STBG \$3.5	Local \$18.0	
20	Road Widening	Benton Pike	APD-40 (Bypass)	Michigan Avenue Rd	Widen from 2 to 3 lanes	Cleveland	\$ 16.5	U-STBG \$1.0	STA \$10.0	
55	Road Widening	Georgetown Road	20th Street	Harrison Pike (SR 312)	Widen from 2 to 3 lanes	Cleveland	\$ 9.6	U-STBG \$9.6		
60	Road widening	Peerless Road	25th Street (SR 60)	Georgetown Road	Widen from 2 to 3 lanes with curbs and sidewalks	Cleveland	\$ 8.6	U-STBG \$8.6		
10	Intersection Improvements	Westside Drive	@ Harrison Pike (SR 312)		Widen approaches; consider signalization	Cleveland	\$ 0.4	U-STBG \$0.4		
9	Intersection Improvements	20th Street	@ Parker Street		20th St - Widen E and W approaches to 5 lanes; Parker St - Widen to 3 lanes for N and S approaches	Cleveland	\$ 0.9	U-STBG \$0.9		
8	Intersection Improvements	Peerless Road	@ Norman Chapel Road		Widen west approach from 2 to 3 lanes	Cleveland	\$ 0.3	U-STBG \$0.3		
100	New Roadway	Midtown Connector			Construct bridge over railroad in downtown Cleveland	Cleveland	\$ 2.2	U-STBG \$2.2		
98	Reconstruction	9th Street S.E.	Euclid Avenue S.E.	Church Street	Align offset intersection at Euclid Ave. S.E.	Cleveland	\$ 3.0	Local \$3.0		
17	Reconstruction	Mouse Creek Road	Hunters Run	Hoopers Gap	Reconstruct 2-lane road; turn lanes at Hoopers Gap; alignment improvements	Cleveland/Bradley Co	\$ 14.5	HSIP \$14.5		
114	Road Widening	Mouse Creek Road	Wedgewood Dr.	East Circle	Widen from 2 to 3 lanes	Cleveland	\$ 7.4	Local \$7.4		
115	Reconstruction	Mouse Creek Road	East Circle	Hunters Run	Reconstruct 2-lane road	Cleveland	\$ 6.8	Local \$6.8		
72	Road Widening	Spring Place Road (SR 74)	APD 40	Kile Lake Road	Widen from 2 to 3 lanes with shoulders	TDOT	\$ 35.2	S-STBG \$15.2	STA \$20.0	
83	Interchange Improvements	I-75	@ SR 308 (Laud Memorial Hwy.)		Interchange modifications for increased capacity	TDOT	\$ 19.3	NHPP \$19.3		
104	Road Widening	SR 163 (Etowah Rd)	Lee Highway (US 11/SR 2)	Lynncrest Ave in Calhoun	Widen from 2 to 3 lanes, including improvements to narrow RR underpass	TDOT	\$ 13.3	S-STBG \$8.3	STA \$5.0	
97	Intersection Improvements	Industrial Drive S.W.	@ Old Chattanooga Pike		Realign and improve rail crossing	Cleveland	\$ 0.3	Local \$0.3		
105	Road Widening	I-75	Hamilton County line	APD-40	Widen from 4 to 6 lanes	TDOT	\$ 192.2	NHPP \$192.2		
23	Reconstruction	Hoopers Gap Road	Frontage Road	Mouse Creek Road	Upgrade lane width, shoulders; add turn lanes at Mouse Creek Road	Bradley County	\$ 3.6	Local \$3.6		
5	Intersection Improvements	Spring Place Road (SR 74)	@ Wildwood Ave (SR 311)		Widen from 2/3 lanes to 4 lanes on all approaches; modify existing signal	TDOT	\$ 0.8	S-STBG \$0.8		
70	Road Widening	N. Lee Highway (US 11/SR 2)	Near Anatole Ln	SR 308 (Laud Mem Hwy)	Widen from 2 to 5 lanes	TDOT	\$ 50.5	NHPP \$50.5		
92	New Roadway	SR 308 Extension	SR 2/US 11 (N. Lee Hwy.)	Chatata Valley Dr	Extend as 3-lane roadway, including RR overpass. Eastern terminus aligns with Upper River Rd N.E.	TDOT	\$ 18.2	STA \$18.2		
101	Road Widening	I-75	APD-40 (SR 311)	Bradley/McMinn co line	Widen from 4 to 6 lanes	TDOT	\$ 242.9	NHPP \$242.9		
86	Road Widening	Georgetown Road (SR 60)	Eureka Road	Rabbit Valley Road	Widen from 2 to 5 lanes with shoulders	TDOT	\$ 60.5	NHPP \$60.5		
2026-2040 TOTAL							\$ 790.4			

APPENDIX E

Consultation with Resource Agencies

(Additional information to be included after the consultation period)