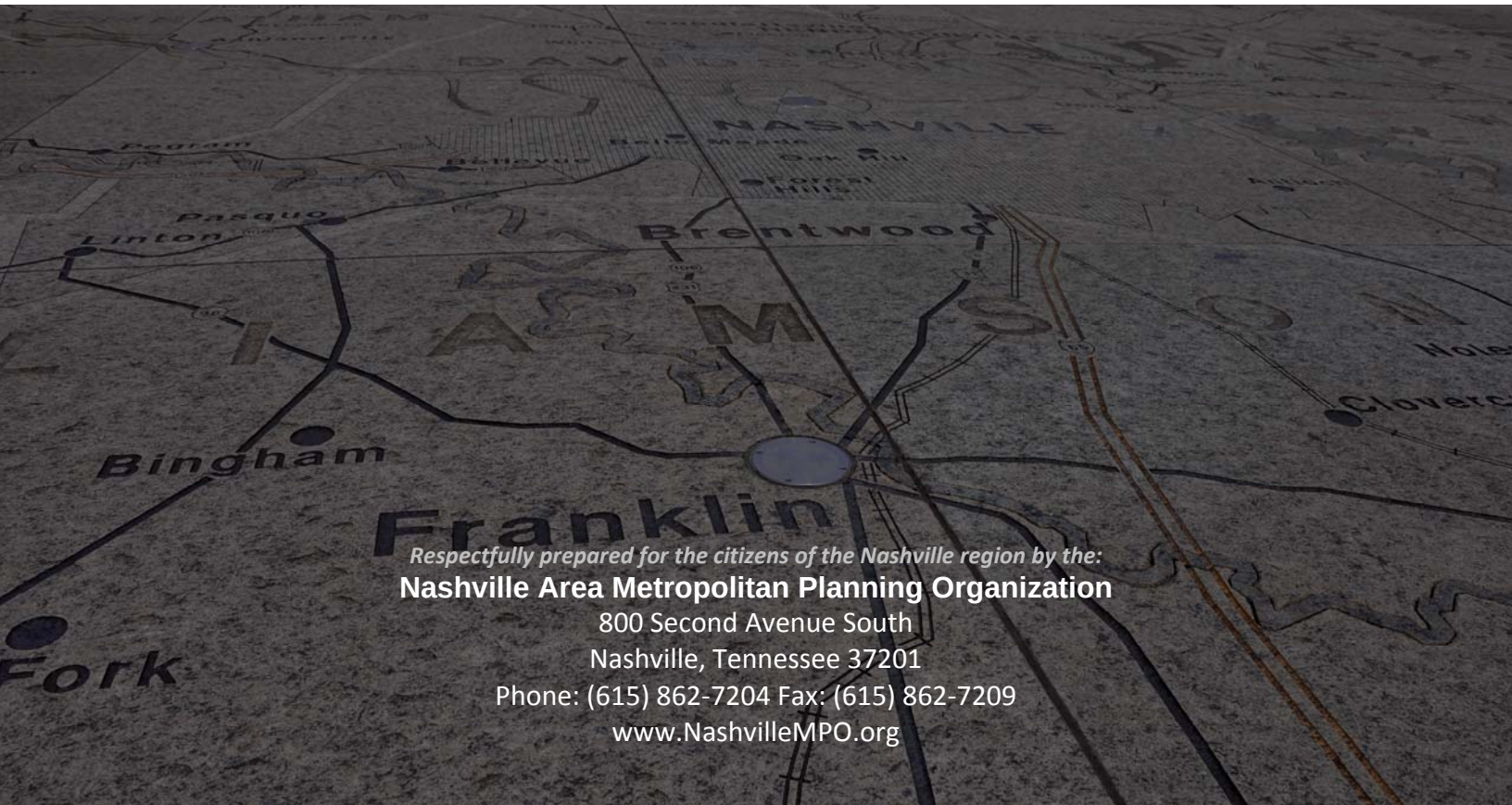
Nashville Area Metropolitan Planning Organization

2035 NASHVILLE AREA Regional Transportation Plan



Respectfully prepared for the citizens of the Nashville region by the:

Nashville Area Metropolitan Planning Organization

800 Second Avenue South

Nashville, Tennessee 37201

Phone: (615) 862-7204 Fax: (615) 862-7209

www.NashvilleMPO.org

Funding for this document was provided by the U.S. Department of Transportation Federal Highway Administration and Federal Transit Administration, the Tennessee Department of Transportation, and local government members of the Nashville Area Metropolitan Planning Organization.

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MPO RESOLUTION 2010-008

A RESOLUTION ADOPTING THE 2035 REGIONAL TRANSPORTATION PLAN

WHEREAS, the Nashville Area Metropolitan Planning Organization (MPO) is responsible for carrying out a comprehensive, cooperative, and continuing transportation planning process throughout Davidson, Rutherford, Sumner, Williamson, Wilson and portions of Maury and Robertson counties; and

WHEREAS, the Safe, Accountable, Flexible, Efficient, Transportation Equity Act – A Legacy for Users (SAFETEA-LU), passed by the United States Congress and signed into law by the President in 2005, requires that each MPO adopt a long range transportation plan to help guide federal investments in transportation infrastructure; and

WHEREAS, various federal, state, regional, and local agencies and organizations concerned with transportation planning for the MPO area have cooperatively developed the 2035 Regional Transportation Plan to satisfy federal planning requirements of SAFETEA-LU; and

WHEREAS, the MPO has followed the prescribed guidance for the development of the long range transportation plan, as found in the Final Rule for Metropolitan Planning in the Federal Register, February 14, 2007 under section 450.322, in the preparation of the 2035 Regional Transportation Plan; and

WHEREAS, the MPO has involved the public and interested stakeholders in an open and transparent process as detailed by the MPO's Public Participation Plan which includes a public review and comment period of no less than 30 days, at least one public workshop in each of the counties of the MPO, and two formal public hearings; and

WHEREAS, the 2035 Regional Transportation Plan is consistent with state and local transportation plans and programs and has been determined to be in conformity with the Clean Air Act Amendments of 1990;

NOW, THEREFORE, BE IT RESOLVED by the Executive Board of the Nashville Area MPO, that 2035 Regional Transportation Plan is adopted in order to ensure the continued livability, sustainability, prosperity, and diversity of Middle Tennessee by serving as the basis for future transportation planning and programming decisions for the region.

Adopted this 15th day of December, 2010 by the Executive Board of the Nashville Area Metropolitan Planning Organization.

The Honorable Mayor Karl F. Dean
Chairman, MPO Executive Board

Attest:

Michael Skipper, AICP
Secretary, MPO Executive Board

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Forward

From lush, rural, wide open spaces, to vibrant, vigorous metropolitan places; Middle Tennessee is on the move! Proud of our past and poised for the future, our region is a great American crossroads, rich in history, and shaped, in part, by visionary, transportation innovation.

Since the opening of Tennessee's first interstate highway, the population of our region has increased by nearly 1.2 million people. Over the next 25 years, we expect to welcome close to one million new citizens to our area. We stand at a new and exciting crossroads, driven by a desire to maintain the way of life that defines Middle Tennessee as we welcome the advantages of increased opportunities.

To that end, in partnership with numerous government, business, and community organizations, the Nashville Area MPO has prepared a "something-for-everybody" transportation plan. Already shaped by thousands of citizens, guided by commonly shared principles, this bold new vision for transportation will complement and facilitate planned growth through the year 2035. There are three main components to the plan:

- To greatly expand mass transit options including increased rapid transit service, a larger network of busses running more frequently, the expansion of the regional vanpool program, and continued support for the transportation disadvantaged;
- To improve and expand upon active transportation choices and walkable communities; creating safe, scenic pathways connecting people to places while fostering healthy activity; and
- To preserve and enhance strategic roadway corridors by resting on a "fix-It-first" mentality, ensuring the safety and long-term viability of our roads & bridges and using new technologies to upgrade to a smarter and more efficient roadway system.

This three-tiered approach will allow us to maximize our economic future, creating robust urban centers while preserving our cherished rural countryside. Following in the footsteps of our founders, we stand at the crossroads ready to embrace the challenge. This is our time, our turn to "pay it forward" - to adopt this transportation vision for Middle Tennessee – for us, our children and grandchildren.

We cannot afford to merely spend money on these projects; our mission is to wisely invest in vital infrastructure that will benefit us in the long run, knowing that the cost of doing nothing is far too great. Some funding is in place, more will be needed, but this plan, bolstered by your support, will help us compete for new federal funding available to regions that prepare for the aging of America, rising energy costs, and the increasingly competitive global economy.

This is your plan, and this is our promise: to embrace the future as we honor the past; to preserve and protect our wholesome heritage; and to keep the people of Middle Tennessee on the move!

1.0 Introduction

1.1 A Transportation Plan for the Next 25 Years

The primary purpose of the Regional Transportation Plan (RTP), also known as the long range transportation plan (LRTP), is to provide an overarching vision and set of actions for satisfying the existing and future demands on the transportation system serving the Nashville metropolitan area in a way that enhances the livability, sustainability, prosperity, and diversity of the region. Prepared by the Nashville Area Metropolitan Planning Organization (MPO), the plan spans the next quarter century through the year 2035.

Working as part of a regional coalition comprised of local governments, non-profit organizations, the business community, and public citizens, the MPO recently adopted four guiding principles to align its decision-making with the multi-faceted needs and desires of the region:

- **Guiding Principle #1: *Livability* -** Work to enhance the quality of life in the region by supporting initiatives that increase opportunities for affordable housing, education, jobs, recreation, and civic involvement without increasing the burden on citizens to enjoy their community.
- **Guiding Principle #2: *Sustainability* -** Strive to support growth and prosperity without sacrificing the health, environment, natural and socio-cultural resources, or financial stability of this or future generations.
- **Guiding Principle #3: *Prosperity*** - Contribute to the continued economic well-being of the greater Nashville area by investing in transportation solutions that increase access to education, jobs, and amenities, reduce the cost of living and doing business, and attract new investment to the region.
- **Guiding Principle #4: *Diversity*** - Recognize the multitude of needs and the variety of perspectives and backgrounds of the people that live and work in the greater Nashville area by promoting a range of transportation choices that are designed with sensitivity to the desired context.

In its first major effort to help the region in its pursuit of those four guiding principles, the MPO has developed the 2035 Regional Transportation Plan with a focus on three major transportation policy initiatives:

- **#1: Create a Bold, New Vision for Mass Transit** to help guide the expansion and modernization of the region's mass transit system in preparation for the increasing competitive global economy and to more proactively address the growing concerns about the health of our environment, worsening congestion, and the sprawling land development pattern that has began to encroach upon the area's cherished rural countryside.
- **#2: Support Active Transportation and the Development of Walkable Communities** to improve connectivity between people and places within the urbanizing area of the region, foster healthier activity for the region's citizens, and to serve as the backbone of investments in mass transit.
- **#3: Preserve and Enhance Strategic Roadway Corridors** with a focus on repairing an aging roadway and bridge network to ensure the safety and security of the traveling public and an emphasis on using technology to make roadway corridors more efficient and ready for the vehicle fleet of the 21st century.

A Fiscally-Constrained Plan with Illustrative Needs

The 2035 RTP provides a balanced, financially-feasible set of transportation improvements that can be constructed or implemented over the next 25 years with expected federal, state, and local revenues. Those proposed improvements are intended to help alleviate traffic congestion, provide more transportation choices, improve transportation system operations, and meet the region's air quality goals over the next quarter century.

The RTP presents projects over the span of three planning horizons including a short-term horizon (2011-2015), a mid-term horizon (2016-2025), and a long-term horizon (2026-2035). Projects included in the short-term horizon also comprise the MPO's regional Transportation Improvement Program (TIP), which is presented in more detail by a separate document.

As important as those proposed projects are to the region's future, it is important to realize that the cost of the full set of transportation needs identified within the metropolitan area far outpaces the expected revenue. As such, this document presents a discussion of illustrative projects where funding has not yet been identified, as well as other strategies that could be implemented to reduce the gap between what the region can afford and what it really needs.

This document reflects an emphasis on transportation planning and project programming that is consistent with the most recent federal transportation legislation, The Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU) passed by the United States Congress in 2005, and the *Clean Air Act Amendments* (CAAA) of 1977 and 1990. SAFETEA-LU continues the metropolitan transportation planning provisions of its predecessor, TEA-21, that reinforce and complement the Clean Air Act Amendments air quality conformity provisions.

1.2 About the Nashville Area MPO

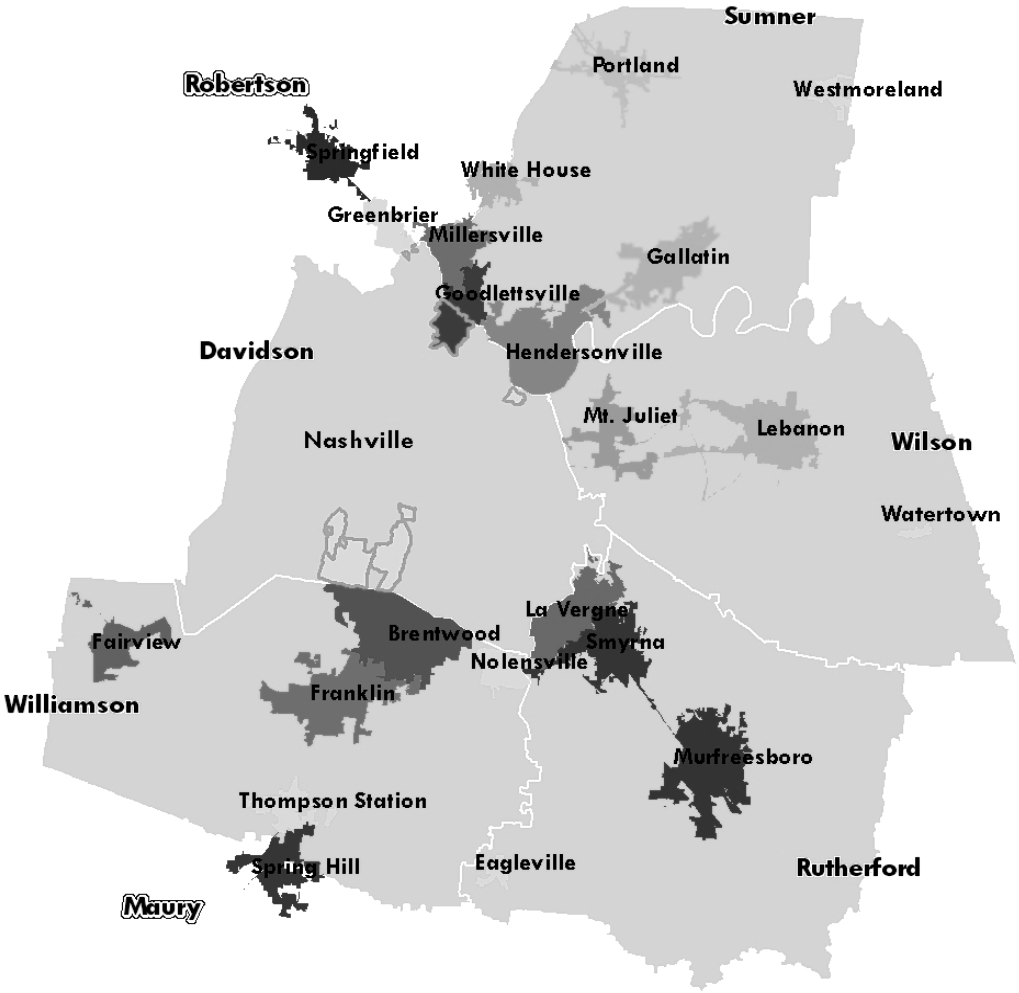
The Nashville Area MPO, serving as lead author of the 2035 RTP, has respectfully prepared the plan for and on behalf of a broad set of public and private stakeholders with an interest in creating a sustainable future for Middle Tennessee. The role of the MPO is to help the region create its desired future through transportation investments that are consistent with regional goals for growth.

The MPO is the federally-designated transportation planning agency for over 2800 square miles and more than 1.5 million people throughout Davidson, Rutherford, Sumner, Williamson, Wilson and parts of Maury and Robertson counties. The MPO is funded by grants from the U.S. Department of Transportation and the Tennessee Department of Transportation, and by local governments through regional dues.

Serving as a regional partnership among the U.S. DOT, Tennessee DOT, local elected leadership, local planning and public works directors, the business community, and citizens across the five-plus county planning area, the MPO leads in the development of the region’s long-range transportation plan and short-range Transportation Improvement Program and contributes to ongoing conversations about issues such as land use, economic development, climate change and the environment, safety and security, and health.

The MPO is committed to providing leadership to the region in the planning, funding, and development of a regional multi-modal transportation system; one that promotes personal and social economic prosperity while encouraging sustainable growth and development practices to protect and preserve valuable community and natural assets.

Figure 1. MPO Planning Area Map



1.3 Metropolitan Planning Requirements

Since the 1960's, the federal government has required that metropolitan areas (defined as urbanized areas with populations greater than 50,000) undertake a continuing, comprehensive, and cooperative planning process. Legislation also requires that all surface modes of transportation be considered during the planning process. In Tennessee, this process is administered through the Tennessee Department of Transportation (TDOT) and carried out by the MPO.

Specifically, the MPO is responsible for:

- Monitoring the conditions of the existing transportation network;
- Identifying existing capacity or safety problems through detailed planning studies to develop candidate transportation improvements;
- Forecasting future population and employment growth for the region;
- Evaluating the effects that future land use plans will have on transportation infrastructure within major growth corridors throughout the region;

- Developing alternative growth scenarios to evaluate the affects that land use and transportation choices made today will have on the region's future;
- Estimating the impact that an expanding transportation system will have on air quality; and
- Developing a financial plan that identifies the costs and revenues associated with the continued operation and maintenance, and future expansion of the region's transportation system.

In carrying out its requirements, SAFETEA-LU calls for the MPO to inherit the following eight factors to ensure consistency with national goals and objectives for transportation planning:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
2. Increase the safety of the transportation system for motorized and non-motorized users.
3. Increase the security of the transportation system for motorized and non-motorized users
4. Increase the accessibility and mobility options available to people and for freight.
5. Protect and enhance the environment, promote energy conservation, improve quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
7. Promote efficient system management and operation.
8. Emphasize the preservation of the existing transportation system.

In order to carry out its responsibilities, the MPO produces three major work products: a Regional Transportation Plan (also known as a long range transportation plan), a Transportation Improvement Program, and a Unified Planning Work Program. MPO plans and programs are available to the public and interested parties at the MPO's website (NashvilleMPO.org), by calling the MPO at (615) 862-7204, or by visiting the MPO offices at 800 Second Avenue South, Nashville, Tennessee, 37201.

Regional Transportation Plan

The Regional Transportation Plan (RTP) is a long-range, twenty-five year multimodal strategy and capital improvement program developed to guide the effective investment of public funds in transportation facilities to help manage congestion, increase regional mobility options, and conform to national air quality standards. The RTP is updated every four or five years and may be amended as a result of changes in anticipated federal, state, and local funding; major investment studies; congestion management systems plans; interstate interchange justification studies; and environmental impact studies.

Transportation Improvement Program (TIP)

The Transportation Improvement Program (TIP) is a four or five-year work program that lists all regionally significant and federally funded projects and transportation services in the MPO planning area including highway and street projects, public transit projects, and bicycle/pedestrian enhancement projects. Any project included in the TIP must be consistent with, or be selected from an approved regional transportation plan. Additionally, the TIP must be fiscally constrained by estimated future revenues. As such, the TIP can be amended to account for changes in funding or need.

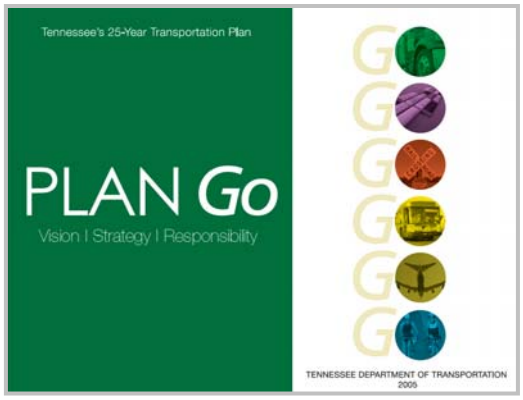
Unified Planning Work Program (UPWP)

The Unified Planning Work Program (UPWP) is a one or two-year plan developed to focus work efforts of staff and consultants using planning funds in the upcoming fiscal year. All federally funded planning activities must conform to federal planning requirements and be listed in the UPWP.

1.4 Statewide Transportation Planning & Programming

While the primary purpose of the Nashville Area MPO is to provide coordinated long and short-term transportation planning within the greater Nashville region, the Tennessee Department of Transportation (TDOT) performs both long and short-term planning across the entire state, taking a lead in rural areas, and working with MPOs in urban areas.

Tennessee Long-Range Transportation Plan



In order to support a growing population, Tennessee needs a strong economy. A dynamic and reliable transportation system helps to create jobs, and so economic success directly depends on transportation planning.

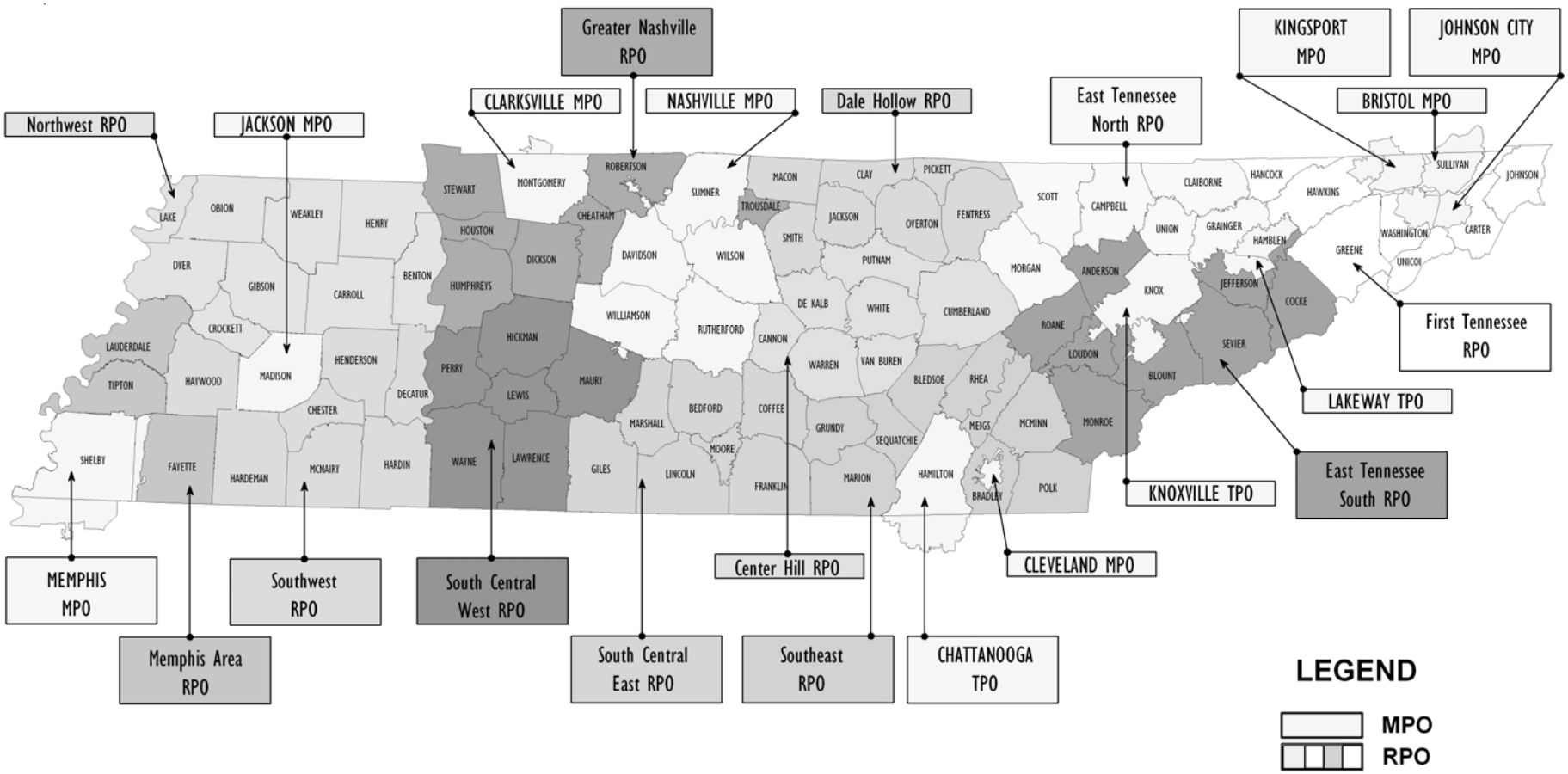
Beginning in January 2004, TDOT worked to identify the transportation challenges facing Tennessee, determine the state's modal needs, find the opportunities that exist to make improvements, and investigate potential funding scenarios. From this data, goals, objectives and performance measures were developed, as well as a set of draft policies. An update of the state's Aviation Plan was completed, and a statewide Bicycle and Pedestrian Plan was created. Finally, a financial plan, strategic investments program and project evaluation system were developed.

Tennessee's Long-Range Transportation Plan (LRTP), also known as PLAN*Go*, brings together the needs for all modes of transportation, including rail, transit, ports and waterways, aviation, pedestrians and bicycles in addition to highways. Although TDOT has developed transportation plans in the past, this is the first multimodal plan that strives to integrate all modes of transportation into a seamless system. PLAN*Go* is available on the web at *www.tdot.state.tn.us/ /plango/home.htm* or by contacting TDOT at (615) 741-2848.

State Transportation Improvement Program

As part of the federal requirements for transportation planning, TDOT develops a 4-year short-term improvement program called the Statewide Transportation Improvement Program (STIP). To develop the STIP, TDOT works directly with the Rural Planning Organizations (RPOs) and MPOs throughout the state to determine project needs. For urban areas, the state participates in the metropolitan planning process to ensure the inclusion of state projects in the appropriate MPO Transportation Improvement Program. Upon adoption, each project within the Nashville Area MPO's TIP, within the years 2011-2014, will become, without exception, a part of the larger STIP. Funding amounts for projects included in federal fiscal year 2015 of the TIP are shown for illustrative purposes only. The STIP is available on the web at *www.tdot.state.tn.us/programdev/* or by contacting TDOT at (615) 741-2848.

Figure 2. Statewide MPO and RPO Planning Areas

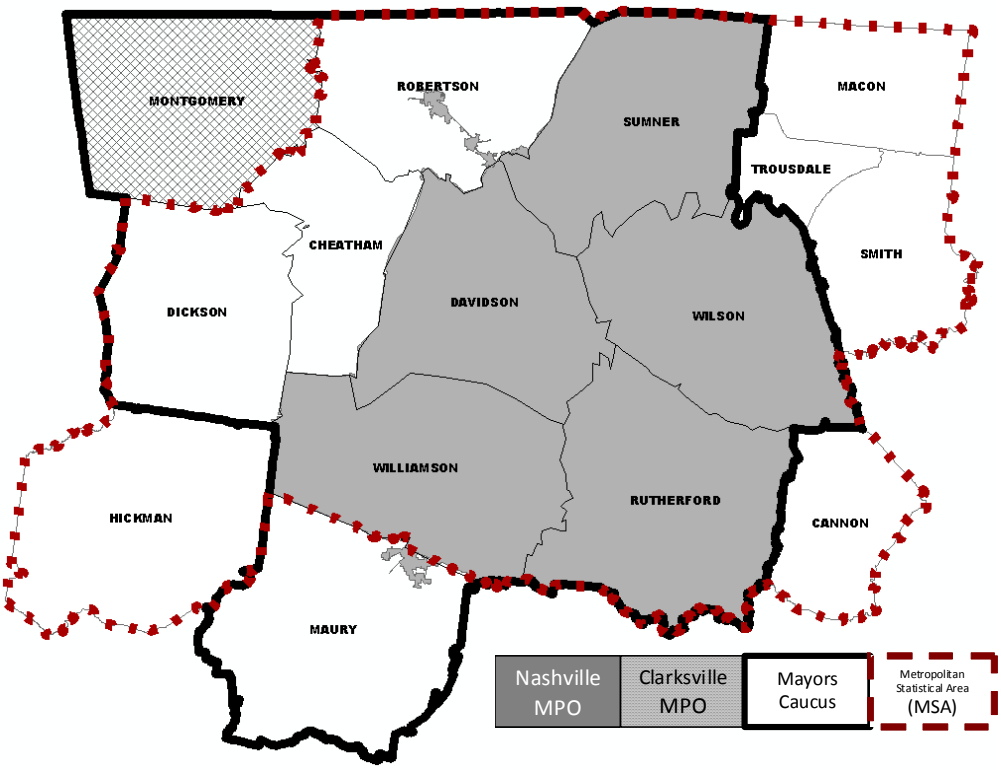


2.0 A Regional Context for Transportation Planning

2.1 Defining a Region

There are numerous ways to define a region. For the past decade or so, the Middle Tennessee region generally has been defined by 10 counties that share strong economic and political ties. While the Nashville Area MPO's planning area includes only a portion of that 10-county area, it is important for the agency to consider the larger context that lies beyond the edges of its jurisdiction in order to understand the true needs of the region for which it plans.

Figure 3. Regional Geographies



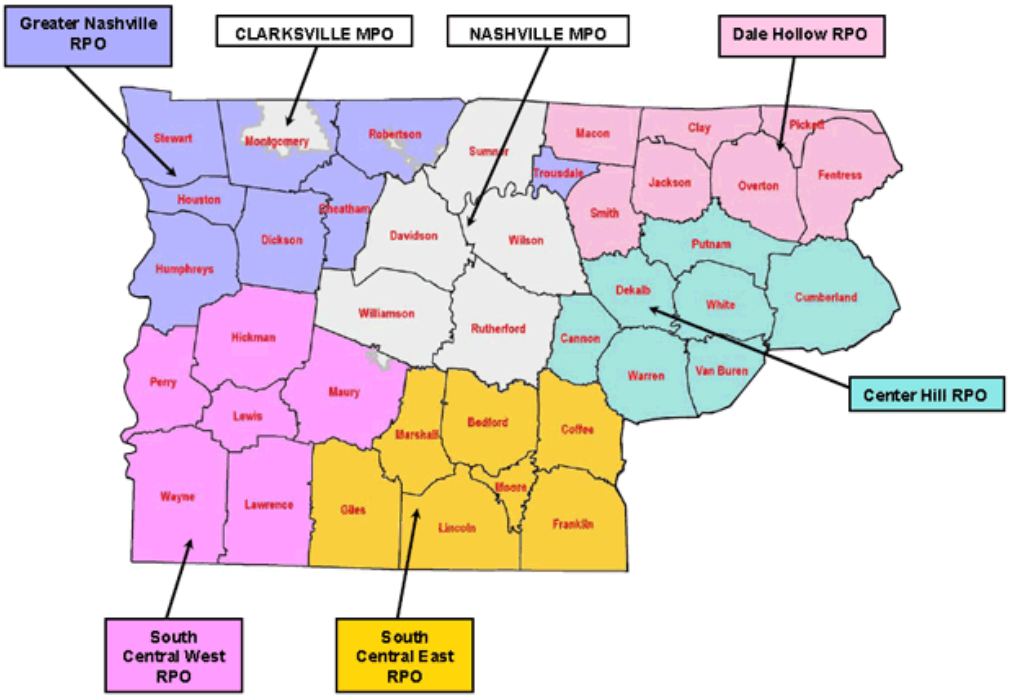
A 10-County Middle Tennessee Region

Initial actions to define the region's geography occurred during the last decade. In the late 1990's, local leaders first began conversations about the effects of the region's rapid economic growth following a 1999 study sponsored by the Vanderbilt Institute for Public Policy Studies and published in the *Tennessean.* The study yielded *The Peirce Report* which detailed the region's assets, liabilities, and challenges as it related to growth issues. The report also provided possible strategies to deal with those challenges. A one-day regional planning summit sponsored by Vanderbilt University and the Greater Nashville Regional Council was organized around issues raised by the report in 1999. This first major event served as the catalyst for the region's collaborative work that has been dedicated to planning for the future livability and economic vitality of the ten-county Middle Tennessee region since that time including the establishment of several regional organizations such as Leadership Middle Tennessee, Cumberland Region Tomorrow, the Nashville Civic Design Center, and most recently, the Middle Tennessee Mayors Caucus.

Transportation Planning Areas

Across the 10-county Middle Tennessee Region, transportation planning and programming responsibilities fall to two separate MPOs and the Tennessee Department of Transportation. In urban areas of the region, the Clarksville Urbanized Area MPO and the Nashville Area MPO take the lead role in regional planning and programming. In rural portions of the region, TDOT works through rural planning organizations to establish priorities for state and federal funding for transportation projects.

Figure 4. Transportation Planning Areas in Middle Tennessee



Metropolitan Statistical Area

The 13-County Nashville-Davidson-Murfreesboro-Franklin, TN Metropolitan Statistical Area is defined by the United States Office of Management and Budget (OMB) according to published standards that are applied to Census Bureau data. The general concept of a metropolitan or micropolitan statistical area is that of a core area containing a substantial population nucleus, together with adjacent communities having a high degree of economic and social integration with that core.

2.2 Challenges & Opportunities for Regional Thinking

Growth & Development Pressures

Middle Tennessee is made up of 3.4 million acres and more than 1.7 million residents. The area has emerged as one of the most land-extensive metropolitan regions in the country. Over the last decade, the region has experienced a significant expansion of a sprawling development pattern which has threatened the region's rural countryside and has placed increased pressure on the area's fiscal capacity to keep up with growing demands for new infrastructure and community services. Several growth indicators related to energy and transportation (e.g., vehicle miles traveled per capita) show that our land development patterns have created an unsustainable

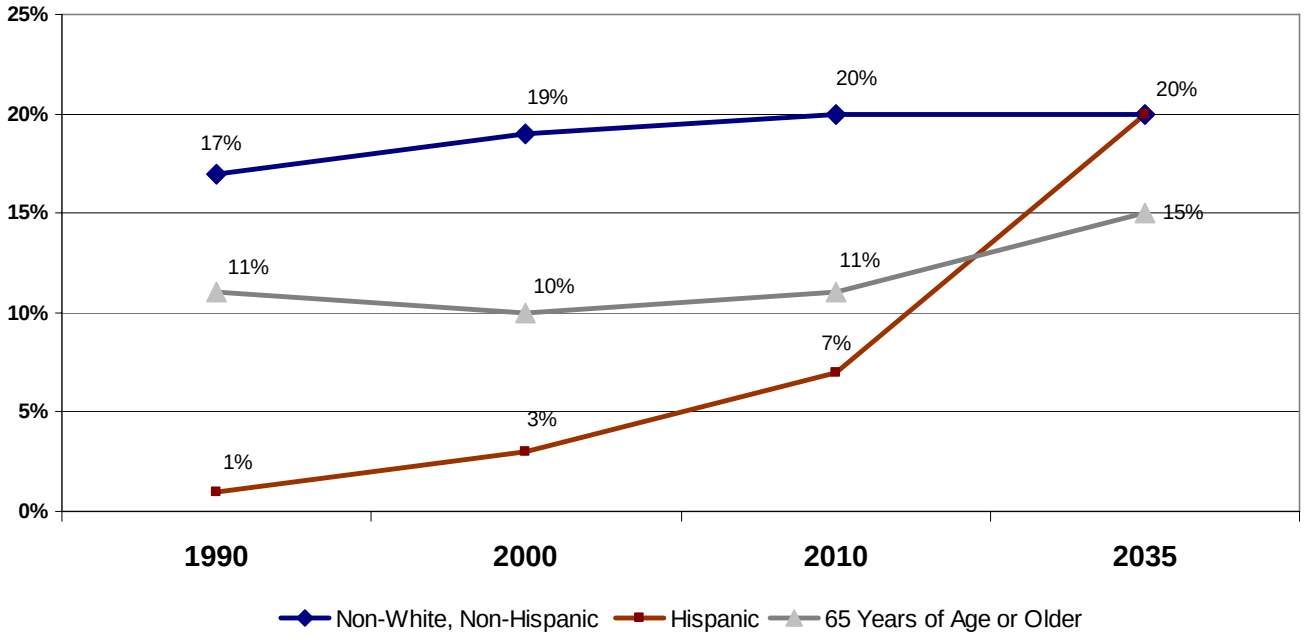
urbanized foot print that needs to be addressed in the short-term in order to ensure future, long-term prosperity.

Within the next 25 years, the population of the 10-county Middle Tennessee region is expected to increase by nearly one million people, making the area roughly the size of Denver, Colorado in terms of population. This growth will create further pressure on our existing transportation system, negatively impact our environment, and if not managed well, detract from the future economic competitiveness of our region and that of the state of Tennessee.

Aging of America and Increasing Ethnic Diversity

Not only is the region forecasted to grow by 45 percent between 2010 and 2035, but it is predicted to grow older and more diverse. By the year 2035, about 15 percent of Middle Tennesseans will be 65 years or older, compared with about 11 percent today. Nationally, by the year 2025, experts expect less than one-third of all households will have children living at home – compared with about half of households back in the 1950s. The region's population also will be more racially and ethnically diverse. According to MPO forecasts provided by Woods and Poole Economics, by the year 2035, the percentage of the population within the region of Hispanic ethnicity will grow to 19 percent from about 6 percent in 2010.

Figure 5. Changes in Race, Ethnicity, and Age 1990 to 2035



Declining Physical Activity and Personal Health

The United States is experiencing an epidemic health crisis of diseases related to obesity. The increasing rates of people, both children and adults, who are either overweight or obese is increasing rapidly. According to the Centers for Disease Control, in 2008 thirty-three percent of American children and sixty-seven percent of adults were overweight or obese (2008 National Health and Nutrition Examination Survey, NCHS). As of Summer 2010, of all 50 states, Tennessee ranked first in adult physical inactivity, second in highest rate of overweight adults (over 68 percent), third highest for number of obese adults (over 30 percent), fourth highest in extreme obesity and fifth highest for percentage of children ages 10-17 who are overweight or obese.

Research indicates that the rise in obesity is related to food intake and physical inactivity. Food consumption may be influenced by food availability, especially in 'food deserts'. Food deserts are areas in which the population is typically low income, the rate of personal vehicle ownership is low, there is a lack of a full-service grocery store that offers fresh fruits and vegetables, and there is no direct transit route to access the closest full-service store. Many factors influence the presence of a full-service grocery store including zoning and parking requirements, economic conditions and crime. A recent Canadian study shows that when a full-service grocery store is located within a neighborhood, there is a 50 percent increase in consumption of fresh fruits and vegetables and customers arrive on foot or bicycle up to 50 percent of the time.

In addition to consumption of food, physical activity plays a major role in overall health. The Surgeon General and American Heart Association recommend that children get 60 minutes of moderate to vigorous physical activity every day and that adults get at least 30 minutes of exercise a day. Some people get physical activity by visiting a gym or a community center. Not everyone has access to these facilities, and using them creates an extra trip or outing. However, getting physical activity as part of a transportation trip is an affordable and time-saving way to get physical activity. According to the National Household Transportation Survey, 40 percent of trips in urban and suburban areas are 2 miles or less, a distance that is easily bicycled or walked. Taking a portion of these trips out of a car and transferring them into transit, walking or bicycling trips not only helps to improve congestion and air quality, but helps people get their daily physical activity. In recent years, research shows that small bouts of physical activity as short as five or ten minutes throughout a day can be just as effective as getting the recommended daily physical activity at one time.

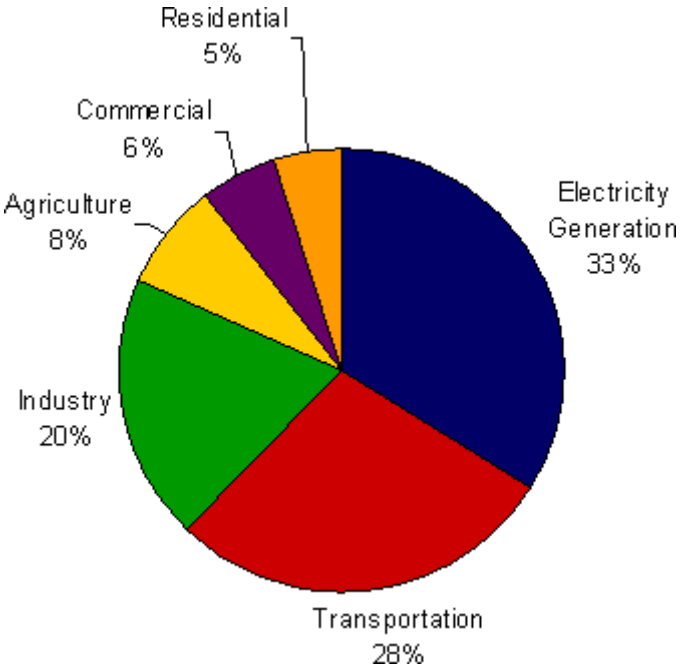
Continued Change in the Earth's Climate

The earth's climate is predicted to continue changing over the next several generations, in part because human activities are altering the chemical composition of the atmosphere through the buildup of greenhouse gases - primarily carbon dioxide, methane, and nitrous oxide. The heat-trapping property of these gases is undisputed. Although uncertainty exists about exactly how the earth's climate responds to these gases, global temperatures are rising due to three main factors:

- Natural factors, such as changes in the sun's intensity or slow changes in the earth's orbit around the sun;
- Natural processes within the climate system (e.g. changes in ocean circulation); and
- Human activities that change the atmosphere's composition (e.g. through burning fossil fuels) and the land surface (e.g. deforestation, reforestation, urbanization, desertification, etc.).

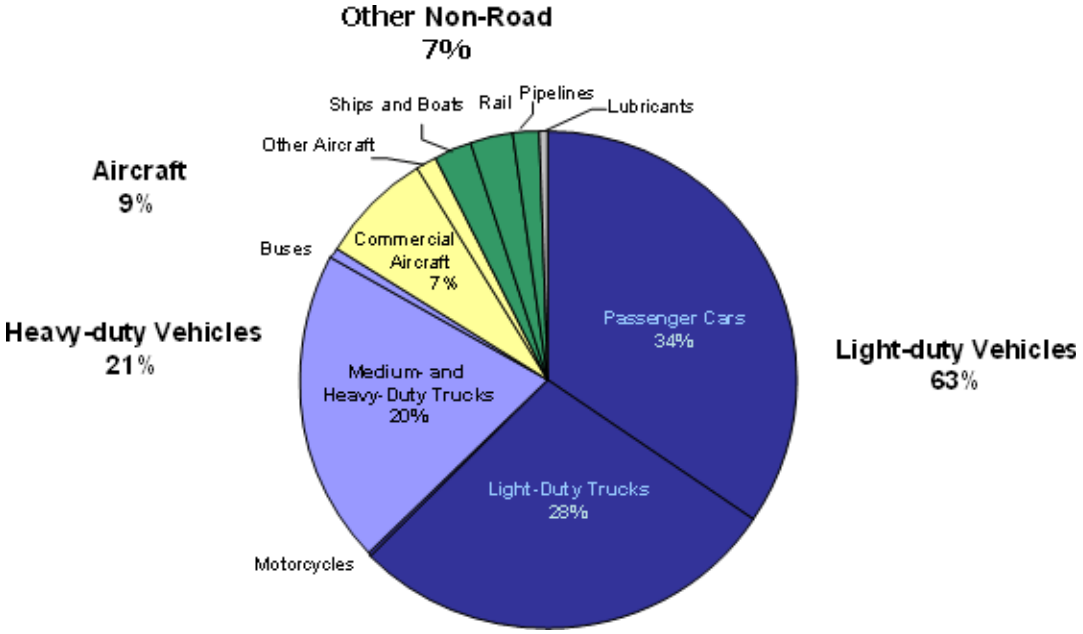
Virtually all human activities have an impact on our environment, and transportation is no exception. While transportation is crucial to our economy and our personal lives, as a sector it is also a significant source of greenhouse gas (GHG) emissions. Since 1990, transportation has been one of the fastest-growing sources of U.S. GHGs and accounts for roughly 28 percent of the total GHG emissions across the nation.

Figure 6. Source of U.S. Greenhouse Gas Emissions



The largest sources of transportation GHGs in 2006 were passenger cars (34%) and light duty trucks, which include sport utility vehicles, pickup trucks, and minivans (28%). Together with motorcycles, these light-duty vehicles made up about 63 percent of transportation GHG emissions. The next largest sources were freight trucks (20%) and commercial aircraft (7%), along with other non-road sources (which combined, totaled about 7%). These figures include direct emissions from fossil fuel combustion, as well as emissions from mobile air conditioners and refrigerated transport allocated to these vehicle types.

Figure 7. Source of U.S. Transportation-Related Greenhouse Gas Emissions



Impacts of the Greenhouse Effect

The greenhouse effect keeps the earth warm and habitable; without it, the earth's surface would be about 60 degrees Fahrenheit colder on average. Since the average temperature of the earth is about 45 degrees Fahrenheit, the natural greenhouse effect is clearly a good thing. But the enhanced greenhouse effect means even more of the sun's heat is trapped, causing global temperatures to rise.

Scientists refer to what has been happening in the earth's atmosphere over the past century as the "enhanced greenhouse effect." By pumping man-made greenhouse gases into the atmosphere, humans are altering the process by which naturally occurring greenhouse gases trap the sun's heat before it can be released back into space.

Since the beginning of the industrial revolution, atmospheric concentrations of carbon dioxide have increased nearly 30 percent, methane concentrations have more than doubled, and nitrous oxide concentrations have risen by about 15 percent. These increases have enhanced the heat-trapping capability of the earth's atmosphere which has led to a decrease in the polar ice caps and an increase in sea levels. Such trends are a particular threat to coastal communities in the U.S. and around the world which are vulnerable to flooding and increased tropical storm activity.

Figure 8. Greenhouse Gas Effect

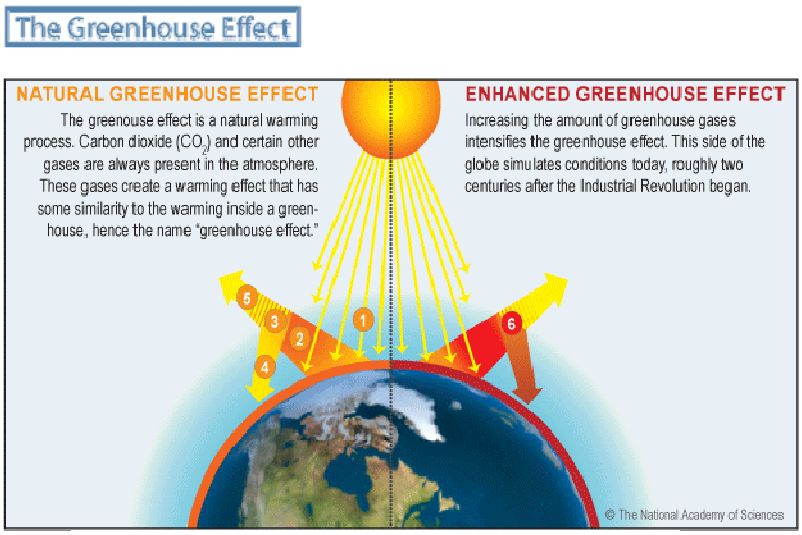


Illustration of the greenhouse effect (courtesy of the Marion Koshland Science Museum of the National Academy of Sciences). Visible sunlight passes through the atmosphere without being absorbed. Some of the sunlight striking the earth 1 is absorbed and converted to heat, which warms the surface. The surface 2 emits infrared radiation to the atmosphere, where some of it 3 is absorbed by greenhouse gases and 4 re-emitted toward the surface; some of the heat is not trapped by greenhouse gases and 5 escapes into space. Human activities that emit additional greenhouse gases to the atmosphere 6 increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and amplifying the warming of the earth.

Image Source: The National Academy of Sciences

Fluctuations in the Economy

The economic health of the region depends on remaining competitive by attracting and maintaining a well-trained labor force and maintaining the low cost of living and doing business. The 2035 Regional Transportation Plan recognizes that the transportation system plays a crucial role in sustaining the economic health of the area and the state of Tennessee. Many sectors of the regional economy depend heavily on the safe and efficient movement of people and goods and services by car, truck, rail, air and water. Additionally, the economic health of the Region depends on attracting high-quality jobs that are dependent on a region that maintains a desirable quality of life.

Using transportation investments as a way to support urban reinvestment and infill provides tremendous advantages to enhancing the economic health of our Region. The necessary transportation, water, sewer, and other infrastructure are already present, thus reducing the cost of development. Transportation investments geared toward creating more livable, walkable places provide choice in the marketplace, allowing for increased diversity to flourish and the Region as a whole to prosper. Furthermore, strong central places are engines that drive regional economic growth. The economic competitiveness of Middle Tennessee depends upon its community centers to serve as core areas for business, government, education, health care, culture and entertainment. Failure to attract and support development in the city centers and urban corridors will contribute to further loss of activity in these areas and additional decentralization. Transportation investments supportive of growth and redevelopment in town centers and along urban corridors promote the efficient use of land and existing infrastructure. They also have the potential to improve quality of life by enhancing our main streets and central business districts, making them safer and more attractive for business and public activities.

Rising Costs of Transportation

Geopolitical instability, uncertain energy supplies and other trends will continue to drive up transportation costs, affecting project costs and household expenditures. Rising costs are felt collectively and individually. Higher prices for all petroleum products—not just fuel—are here to stay. We may experience some fluctuation in the cost of fuel, but the reality is we have a finite supply, and we need to think about how to make our Region's transportation system more sustainable. For example, the price of asphalt more than doubled in Tennessee from January 2008- December 2008. This increase has contributed to a doubling of project costs in some cases. While the costs have very recently fluctuated and even dropped in some instances, in general, transportation construction costs have risen quickly in the last 10 years. Due to the overall and projected rising cost of gasoline, personal vehicle upkeep and insurance and greater driving distances between destinations, transportation costs per household in the Region are also increasing. Transportation is the second highest household expense after housing, with lower-income households spending a higher percentage of their income on transportation costs than on housing.

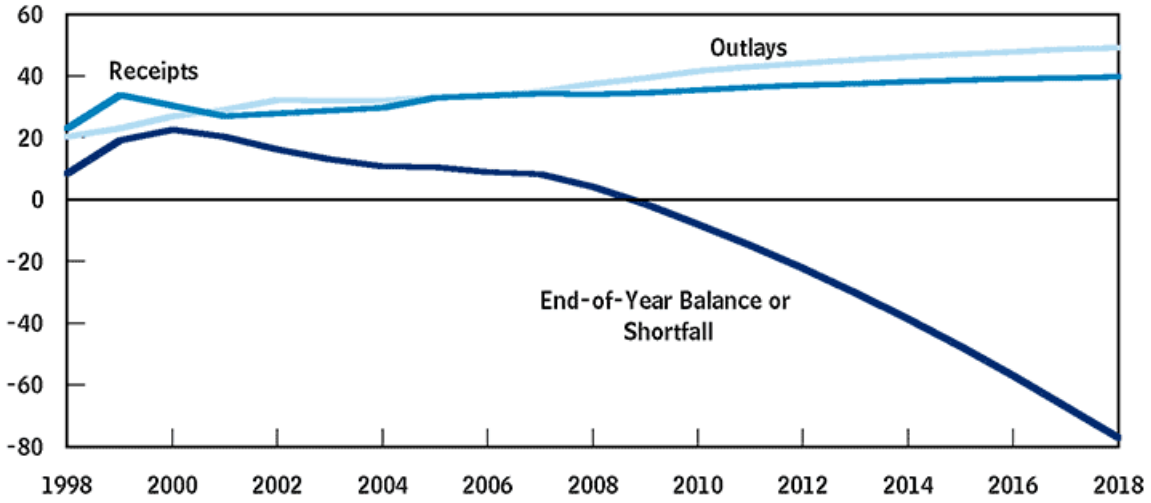
Increasing evidence suggests that communities with more options for active transportation thrive better economically and spend less money on congestion due to increased safety for all modes. These communities also have healthier residents overall and may spend less money treating chronic diseases such as heart disease and asthma. Although research of this type is still relatively new, the conclusions so far strongly point to the relationship between active transportation options, economic health and reduced costs due to congestion and disease.

Shortfalls in Transportation Funding

Revenue from Federal and state transportation sources are not keeping up with growing needs. As the following graphic shows, at current spending levels and without new sources of funding, the federal highway trust fund

will expend all available revenues projected to be collected during 2009. State and local government purchasing power is steadily declining because the federal gas tax has not been increased since 1997, and Tennessee's state gas tax has not been increased since 1989. Since that time inflation has reduced its value by more than 40 percent. Attempts to adjust the gas tax have failed, and persistently higher pump prices for gasoline will continue to thwart any attempts to adjust the state or federal fuel tax. This will increasingly force local governments to find other means to meet their funding needs.

National Highway Trust Fund Balances, 1998-2018



Reduced purchasing power of current revenues leads to increasing competition for transportation funds, and less capability to expand, improve and maintain the transportation infrastructure we currently have. Meanwhile, the Region's transportation infrastructure continues to age, requiring increasing maintenance. Over the next two decades, the gap will grow between the revenues we have and the investments we need to make just to keep interstates, streets and transit systems in their current condition.

The Emergence of Regional Collaboration and Problem Solving -- "Regionalism"

One of the defining strengths of Middle Tennessee lies within its demonstrated capacity to effectively organize key leaders to address issues of regional significance – the development of the 2035 Regional Transportation Plan being no exception as thousands of community leaders have spent significant time thinking about and discussing the regional goals and objectives and desired outcomes of the regional plan. The following organizations play a major role in shaping the region's response to a variety of challenges facing the area including those associated with the movement of people and goods to support a regional economy and way of life.

Middle Tennessee Mayors Caucus

The Middle Tennessee Mayors Caucus was formed on July 22, 2009 in order to provide leadership on important issues facing a rapidly changing regional landscape. Transportation, and particularly the pursuit of a modern mass transit system, served as the early catalyst, but in its brief history the Caucus has served as an effective forum to build personal relationship among the mayors, improve relationships among jurisdictions, and helped local governments support each other on issues ranging from flood recovery to proposed state regulation.

The Caucus includes approximately 40 city and county mayors from across the 10 Middle Tennessee counties of Cheatham, Davidson, Dickson, Maury, Montgomery, Robertson, Rutherford, Sumner, Williamson, and Wilson. City of Gallatin Mayor Jo Ann Graves serves as chair and is supported by Metro Nashville Mayor Karl Dean and

Montgomery County Mayor Carolyn Bowers as vice chairs, and a 10 member executive committee that manages meeting topics and joint regional issues.

Cumberland Region Tomorrow

Cumberland Region Tomorrow was formed in 2000 as a non-profit regional organization dedicated to working with the public sector to support and encourage quality growth planning. Through its work, CRT brings people together to address the challenges and opportunities that come with growth and development in Middle Tennessee. Its mission is to foster communication, collaboration, and action as the region plans for the long-term livability, economic vitality and sustainability.

Partnership 2020

The Nashville Area Chamber of Commerce, through its regional economic development initiative Partnership 2020, pursues opportunities to grow the Nashville region through corporate relocation, expansion of existing business and entrepreneurship. It offers diverse programming in workforce development, public policy and also addresses issues related to quality-of-life enhancement. The Chamber is Middle Tennessee's largest business federation, representing more than 2,300 businesses in 10 counties (Davidson, Dickson, Montgomery, Cheatham, Robertson, Wilson, Sumner, Williamson, Rutherford and Maury).

Leveraging its assets in government, the music industry, healthcare and other top industry sectors, the Nashville area features one of the most dynamic economies and lifestyles in the nation. Its economic and demographic strengths have landed the Nashville region on dozens of “top places” lists in previous years. Among the Nashville area’s 2009 rankings include: Market Watch’s "Best Cities for Business"; Forbes’ "Fastest-Recovering Cities"; Black Enterprise’s "10 Best Cities for African Americans"; Fourth Best City for Live Music (Society of American Travel Writers); America’s Friendliest City (Travel + Leisure magazine); and Forbes’ "Best Places to Begin a Career.

Greater Nashville Regional Council

The Greater Nashville Regional Council (GNRC) was established by the Tennessee General Assembly as the state development district for northern Middle Tennessee. Today, it is a regional organization comprised of 13 counties and 52 cities offering a variety of programming, products and services, both on the municipal and regional level, to member counties. GNRC serves the counties of Stewart, Montgomery, Robertson, Sumner, Houston, Cheatham, Davidson, Wilson, Trousdale, Humphreys, Rutherford and Williamson counties.

GNRC works daily with local elected officials, economic development councils, chamber of commerce officials, and other local leaders to help communities organize and prepare for economic and community development needs. These activities are critical to providing safe, sanitary, and affordable energy efficient housing, as well as essential public infrastructure and services required to accommodate regional growth and development including new job opportunities for our growing population.

Transit Alliance of Middle Tennessee

The Transit Alliance of Middle Tennessee is a non-profit organization with the mission of encouraging private sector as well as public sector support for new investments in mass transit in the 10-county region of Middle Tennessee. The Alliance is committed to communicating the value of regional mass transportation needs and options. The Alliance fosters education across the region about the economic value of mass transit investments. Through these communication and education efforts, the Alliance will actively participate in the steps necessary to secure dedicated revenues for mass transit in the months and years ahead.

Leadership Middle Tennessee

Leadership Middle Tennessee (LMT) is a regional leadership institute founded in 1999 as a result of the Regional Partnerships initiative of Partnership 2000. The initiative was founded in 1994 in direct response to the "lack of a regional agenda" as identified in the Partnership 2000 agenda. Its mission is to broaden the regional perspective of diverse and proven community leaders. Through networking, collaboration, and strategic thinking, LMT is committed to developing regional leaders who can contribute to long-term solutions that sustain and balance the quality of life and economic growth for the region's collective communities.

Leadership Middle Tennessee serves a 10-county area including Cheatham, Davidson, Dickson, Maury, Montgomery, Robertson, Rutherford, Sumner, Williamson, and Wilson counties.

Tennessee Obesity Taskforce

The Tennessee Obesity Taskforce is a partnership of over 100 organizations across Tennessee, including the State Department of Health, which is working to mitigate obesity by implementing the strategies of the recently released *Eat Well, Play More Tennessee* state obesity plan. The Plan was released in the fall of 2010 and will be implemented over the next three years in a variety of policies and programs. The Nashville Area MPO is serving as co-chair of the Tennessee Obesity Taskforce along with the YMCA of Middle Tennessee. Policy recommendations of the Plan around the built environment and transportation include school-siting, joint-use agreement, Safe Routes to School and Complete Streets.

Recent Accomplishments in Regionalism

Since 2000, a coalition of regional and state partner agencies including Cumberland Region Tomorrow, the Mayors Caucus, the businesses community, and the MPOs in Middle Tennessee have accomplished the following major milestone activities to address the challenges that face the area and to advance the region towards a more sustainable future.

- Developed and presented regional growth scenarios and growth trend data in the 2001 – 2003 Regional Visioning Project, along with regional policy and comprehensive planning strategies, that have created understanding and consensus for shared benefits of moving to a regional sustainable growth scenario;
- Created Quality Growth tools and resources that have moved a critical mass of communities in the ten county region toward successful development and implementation of local and regional comprehensive plans that align with Cumberland Region Quality Growth Principles and Sustainable Communities Livability Principles;
- Organized successful Convening the Region Summit events in 2009 and 2010 that are now our recognized annual "Power of Ten" Regional Summits that serve our communication, education and collaboration needs and strategically brings together key regional leaders to learn about and commit to focused collaborative efforts to address our key regional issues and opportunities;
- Created more than 233,955 net jobs, recruited 601 companies since the Nashville Area Chamber of Commerce initiated Partnership 2000. Since then, the partnership has continued to set goals for regional economic development, most recently as Partnership 2020;
- Collaborated to develop a new transportation plan that includes a bold, new vision for mass transit, support for active transportation and walkable communities, and the preservation and enhancement of strategic roadway corridors – a departure from the business-as-usual MPO planning strategies;

- Organized to draft and support the passage of state enabling legislation to establish a legal framework for cities and counties within a metropolitan area to pursue a regional mass transit system and a prescription for dedicating funding for that purpose;
- Established new regional organizations to help guide the implementation of planning recommendations including the Middle Tennessee Mayors Caucus and the Transit Alliance of Middle Tennessee;
- Connecting with the newly established state-wide Farmland Legacy Partnership and Sustainable Community Partnership Network that are providing support and project actions that will support our region's future implementation success;
- Emergence of the Tennessee Interagency Partnership for Sustainable Communities as an official joining of key state agencies to support successful implementation of the federal Sustainable Communities Partnership program goals and objectives and regional applications;
- Established new staff positions within local governments dedicated to promoting sustainable policies. In Nashville, The Mayor's Green Ribbon Committee on Environmental Sustainability was created to assure that Nashville continues to be a livable city with clean air, clean water, open spaces, transportation infrastructure and an energy use profile necessary to provide a prosperous community for current and future generations. The committee presented a summary report of 16 goals and 71 recommendations to Mayor Karl Dean on April 16, 2009 which included a recommendation to establish a director of sustainability within the Mayor's Office. The City of Franklin also has established a director of sustainability.

2.3 Public & Stakeholder Participation

Public involvement is a critical element of all planning that is done through the Nashville Area MPO. Such involvement ensures that the planning process conforms to the vision, goals, and objectives of the region. Over the last three years the MPO has engaged the community through a variety of forums with the strategic objective to engage a broad and diverse audience with specific efforts to target the following:

- General public;
- Traditionally-undeserved populations including the low-income and minority groups;
- Governmental partners including local, state, and federal agencies;
- Local and regional transit agencies and private transit operators;
- State and local political leadership;
- Business community including area chambers of commerce and economic developers;
- Non-profit community including quality growth advocacy groups; and
- Freight shippers and transportation providers.

In order to engage those audiences in the most effective way, the MPO used a variety of tools and techniques to augment the standard public workshops that are often used in public planning.

- **MPO Website**: In early 2010, the MPO launched a brand new website developed to make regional plans and programs more accessible to the general public. The website provides an overview of the MPO and its responsibilities and information about staff, executive board leadership, regional planning efforts, regional data and forecasts, meeting information, and items for public review and comment. The

website also contains a multi-media section which houses relevant videos, PowerPoint presentations, and photo slideshows, and a public involvement section containing access to social media outlets.

- **Print, Radio, and Television Media**: Throughout the past three years, the MPO has used the media to communicate its proposed plans and programs and to encourage public participation at regional events and local workshops. During the development of the 2030 plan, MPO staff and board leadership contributed to numerous newspaper articles and conducted several radio and television interviews.
- **Social Media**: In early 2010, the MPO launched a presence on various social media outlets, including Facebook and Twitter, to broaden its outreach to younger audiences looking to get involved in shaping the region's future.
- **Regional Symposiums/ Summits**: Since 2008, the MPO has hosted or co-hosted five large regional summits or symposiums to educate the public and stakeholders about important regional issues including context sensitive solutions, complete streets, school-siting, regional transit development, and regional growth and development.
- **Speaker's Bureau**: MPO staff have been very active over the last two to three years to visiting a variety of organizations throughout the region to provide presentations aimed at communicating proposed plans and programs as well as soliciting input through facilitated conversations.
- **Survey Research**: In recent years, the MPO has conducted various telephone and web-based surveys to measure attitudes and perceptions towards transportation policy. The largest of the efforts included statistically valid telephone survey of 1,100 residents from across the 10-county Middle Tennessee region.
- **Videos and other Visualizations**: The MPO has invested significantly in recent years to produce visualization tools in order to increase the public's understanding of proposed plans and programs. To kick-off the final stretch of public outreach for the 2035 plan, the MPO produced a 4-minute video to communicate the MPO's major policy initiatives and to illustrate the main concepts proposed by the plan.

Participation through Regional Studies

Even before the 2035 Regional Transportation Plan was conceived of as a comprehensive document, the MPO began to engage the public and interested stakeholders through a series of major studies focused on improving certain elements of the transportation system and/ or the relationship between transportation and land use, urban design, and economic development. The following provides an overview of the major studies conducted during the development of the plan. Each contained a robust public involvement process that included a range of activities, from public meetings and workshops to web-based and telephone surveys.

- **Southeast Corridor Transit Alternatives Analysis**: A formal Federal Transit Alternatives Analysis for the region's 30+ mile southeast corridor connecting Nashville with Murfreesboro. The study followed strict FTA guidelines for the analysis of transit alternatives including a series of interactions with the public to ultimately select a locally-preferred transit alternative for the corridor.
- **Northeast Corridor Mobility Study:** A comprehensive planning effort focused on developing transportation investment strategies that support the priorities of communities between downtown Nashville and Gallatin, TN. The study examined the economic growth potential of various land use and urban design scenarios for the fast growing corridor en route to evaluating potential transportation projects like passenger rail and bus rapid transit.

- **Tri-County Transportation & Land Use Study:** A first of its kind effort in the region to bring local governments, citizens, and businesses together to talk about significant growth issues across jurisdictional boundaries. The effort created a formal forum for local leaders in the counties of Robertson, Sumner, and Wilson to consider the growth plans of their neighboring communities in an effort to improve their own – all for the sake of regional coordination and decision-making. The MPO used the effort to generate ideas for the regional transportation plan while local governments used the effort to develop or improve upon their own local comprehensive plan.
- **Regional Freight & Goods Movement Study:** A major effort to bring together local leaders, freight industry representatives, and major freight shippers and receivers to discuss the influence that regional freight movements have on our quality of life. The effort helped the MPO to recognize the significant contributions that freight makes in the region while at the same time helped to identify improvements to the transportation system to minimize the undesirable side-effects of being located at the convergence of three major Interstates (I-65, I-40, and I-24).
- **Regional Bicycle and Pedestrian Study**: A multiple award winning study that provided the region with a comprehensive inventory of non-motorized modal facilities, a measure of the levels of service for walking and bicycling on regional roadways, a model for predicting potential demand for active transportation, a long-range vision for building a multi-modal network, a process to prioritize candidate projects, a funding toolbox, and a set of roadway design guideline/ considerations. As part of the study, the MPO established a standing Bicycle and Advisory Committee comprised of public and private-sector representatives to help guide future active transportation planning efforts of the MPO.
- **Nashville MTA Master Plan**: A strategic guide to help the MPO and the Nashville MTA set forth a set of guiding principles and policies for improving public transportation in Nashville/Davidson County, as well as describe actions and projects for the short, medium and long term. The plan is an action-oriented strategy that leads MTA closer to the long-term vision established through local collaboration and the long range transportation plan adopted by the MPO
- Others major efforts included an update to the Regional ITS Architecture, a Regional Roadway Safety Analysis, a regional Transit Needs Assessment, and the Southwest Area Transportation & Land Use Study.

Formal Interagency Consultation and Public Review

The MPO's SAFETEA-LU compliant Public Participation Plan (PPP) provides guidelines for how the public and interested stakeholders will be involved in the development of the regional transportation plan. While public involvement opportunities have been numerous over the past three years, the formal public review and comment period associated specifically with the 2035 Regional Transportation Plan occurred during a 30-day period leading up to the final public adoption hearing for the plan.

During the 30-day period, copies of the 2035 Regional Transportation Plan were made available on the MPO's website and at local branch libraries throughout the MPO region. Several workshops and meetings were held around the region to provide an opportunity for members of the public and stakeholder groups to evaluate the proposed policies, programs, and projects.

In addition, local, state, and federal agencies involved in natural resources, land use management, environmental protection, conservation, and historic preservation also were given an opportunity to review the draft plan to ensure adequate interagency consultation yielded a plan that was consistent with the goals and objectives of other public agencies that are affected by transportation plans, programs, and policies. Many of

them had indicated an interest in the regional plan through a survey conducted during the development of the MPO's Public Participation Plan.

Key Dates of the Public Review and Comment Period

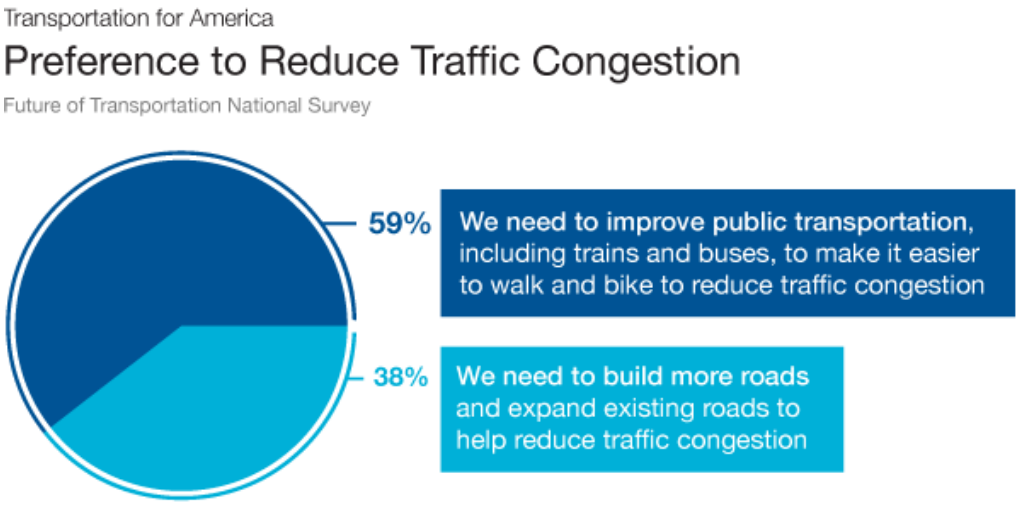
- **November 8, 2010:** Draft copies of the plan placed on website and in area libraries.
- **November 9 - December 12, 2010:** Formal public workshops in counties throughout the MPO region,
- **December 1, 2010:** First public hearing,
- **December 15, 2010:** Second public hearing/ Adoption.

Comments received through the public involvement period were provided to the MPO Executive Board prior to adoption and summarized in Appendix C.

2.4 Public Attitudes towards Transportation Policy and Programs

American Attitudes toward Transportation Policy

Americans today are overwhelmingly supportive of broader access to public transportation and safe walking & biking. A national poll released by Transportation for America in 2010 revealed that Americans have a strong and broadly shared desire to expand the transportation options available to them, and for the federal government to take a more active role in financing a wide range of mobility options – including public transportation, biking, and walking.



- Over 4-in-5 voters (82%) agree that "the U.S. would benefit from an expanded & improved transportation system, such as rail & buses." A solid majority (56%) "strongly agree" with that statement. 79 percent of rural voters also agreed with the statement, despite much lower use of public transportation compared to Americans in urban areas.
- When asked about reducing traffic congestion, three-in-five voters choose improving public transportation and making it easier to walk & bike over building more roads or expanding existing roads (59% to 38%).
- Americans who have not taken a bus, train or ferry in the last month for a trip to school, work, errands, or shopping, the primary reason cited is that transit simply is not available in their community (47%),

while another 35 percent say it's not convenient to work, home, school (35%). Only 8 percent said they preferred to drive.

- Americans would prefer to nearly double the federal budgetary allocation to public transportation, saying that 37 cents of every dollar should be the norm. Fifty-nine percent (59%) of the electorate cite some amount greater than what the federal government currently spends (18 cents or greater).

Also according to Transportation for America, "the desire to increase the amount of funding allocated to options beyond roads and highways" was shared across demographic, geographic and political lines, including:

- Sixty-seven (67%) percent of residents in the Northeast, 58 percent in the West, 57 percent in the Midwest, and 52 percent in the South regions of the U.S.,
- Sixty-two percent (62%) of urban areas, 59 percent of suburbanites, 60 percent in small towns and 50 percent in rural areas,
- Sixty-six (66%) percent of Democrats, 59 percent of Independents, and 49 percent of Republicans.

Even in the current economic times, a majority of voters are willing to increase their own taxes in order to expand/improve public transportation in their community. Nationally, 52 percent of respondents said that they would support increasing funding to expand and improve public transportation in your community, if it required a small increase in taxes or fees.

National Perceptions on Walking Facilities

A 2002 Surface Transportation Policy Project national random sample telephone survey (800 adults) found that Americans would like to walk more than they are currently, but are held back by poorly-designed communities that encourage speeding and dangerous intersections, and whose footprint is inconvenient to walk to shops and restaurants.

- More than half of the American public (55%) says it would like to walk more throughout the day either for exercise or to get to specific places. Four in ten (41%) Americans would choose driving over walking for wherever they need to go.
- Eight in ten Americans (80%) would like to walk more for exercise, with over half (54%) saying they would like to walk "a lot" more for exercise. Similarly, 78 percent would walk more for fun (46% "a lot" more). And, nearly two-thirds (63%) say they would like to walk more to stores or to run errands (36% "a lot" more).
- Majorities of the public associate walking with good exercise (65% say this describes walking "very well"), relaxation (56%), and fun (48%). Walking is considered "fun" more often by women than men. To a lesser degree, walking is viewed as a "good way to get around" (35%). The public, however, does not associate walking with being inconvenient (16%) or exhausting (13%).
- One of the reasons walking may not be so closely related to getting around is a lack of access to stores, restaurants and other areas within walking distance of people's homes. Over half of Americans (54%) say there are too few shops or restaurants within walking distance of their home.
- The main reasons Americans report not walking more are that "things are too far to get to" (61% - reason for not walking more), and that they "don't have enough time" (57%). Fear of crime, a dislike of walking, or laziness, however, are not reasons that Americans point to for why they do not walk more often.

- When thinking about deciding where to live, having sidewalks and places to take walks for exercise or fun is important to nearly eight in ten Americans (79%), and "very" important to four in ten (44%). Having areas to walk in the neighborhood rates third on a list of seven items asked in the survey, behind feeling safe from crime and the quality of the public schools.

National perceptions on Growth, Transportation, and Energy

The 2009 Growth and Transportation Survey, a national telephone survey of 1,005 adults commissioned by Transportation for America and the National Association of Realtors, describes what Americans think about how development affects their immediate community.

- Eighty percent (80%) of Americans expressed that they wanted transportation & infrastructure spending included in the economic stimulus bill to target projects that achieve multiple goals and create new jobs.
- An overwhelming 80 percent believe it is more important that a stimulus plan include efforts to repair existing highways and build public transit rather than build new highways.
- Forty-five percent (45%) said construction of new highways should "definitely" or "probably" not be included in the plan.
- The survey found that Americans wanted Congress and the incoming Obama administration to factor plans for reducing dependence on foreign oil, improving the environment, and increasing transportation choices into the stimulus, even if it were to temporarily delay job creation.
- Eighty-nine percent (89%) of those surveyed agreed that transportation investments should support goals for reducing energy use, with 58 percent agreeing strongly.
- Three in four of those polled wanted ARRA to support the reduction of carbon emissions that lead to global warming and climate change.

Middle Tennesseans' Attitudes towards Transportation

As part of its overall public involvement strategy for the 2035 Regional Transportation Plan, the Nashville Area MPO commissioned a statistically-valid research effort on public opinions about transportation among Middle Tennesseans. While national data on the public's attitudes and perceptions about today's mobility status in U.S. metro areas can be helpful in formulating public policies for a southeastern urbanized region, qualitative evidence of a mirroring of overall national attitudes and opinions was surfacing at local public meetings and other speaking engagements held across the ten-county Middle Tennessee region. Subsequently, formal quantitative research data via a 2010 telephone survey revealed the following about localized attitudes & opinions on various transportation-related issues:

Satisfaction with Current Transportation System

- Middle Tennessee residents are most satisfied with the maintenance of roadways in their area (63%) and overall levels of roadway congestion in their area (54%),
- Middle Tennessee residents are least satisfied with how walkable their community is (49%), how safe it is to ride a bicycle in their community (42%), and the availability of mass transit services in their area (29%). The lack of transit options is considered the greatest problem in Middle Tennessee, followed by the lack of walking and bicycling options.

Transportation Priorities for the Future

- Respondents were asked to prioritize the strategies for improving transportation. The first choice was to improve and expand mass transit options, the second choice was to build or widen existing roadways, and the third choice was to make communities more walkable and bicycle-friendly. In the more urban areas of Middle Tennessee the second and third choice were reversed.
- When asked about preferences for alternative sources of funding for transportation improvements, the largest amount of support was for applying a new impact fee on private land developers (55%) followed by a vehicle registration fee or wheel tax (47%), a vehicle emissions fee (46%), and a fee for single occupant cars to use in a carpool lane (46%).

Mass Transit

- Respondents generally agreed that mass transit provided numerous benefits to the region. Eighty-three percent (83%) agreed that mass transit is important for the economy, 83 percent agreed that the area needs regional mass transit to prepare for growth, and 74 percent agreed that more people will use transit due to increasing fuel prices.

2.5 Guiding Principles, Regional Goals, and Major Objectives

The development of the MPO's plan provides a significant opportunity to identify and document community values and to define goals and objectives for transportation planning and policy for the next 25 years. Working through a comprehensive, continuing and cooperative effort with the Federal Highway Administration, Federal Transit Administration, Tennessee Department of Transportation, local transit operators, the public, and other interested parties, the MPO strives to identify the most appropriate set of short-, mid-, and long-term projects that address the anticipated needs within the region as embodied by a set of guiding principles, regional goals, and major objectives developed through extensive public and stakeholder involvement.

Guiding Principles

Guiding principles direct how the Nashville Area MPO -- working as part of a larger regional coalition comprised of the interests of local governments, non-profit organizations, the business community, and public citizens -- will contribute to overall quality of life for the region.

Guiding Principle #1: *Livability*

MPO plans and programs will work to enhance the quality of life in the region by supporting initiatives that increase opportunities for affordable housing, education, jobs, recreation, and civic involvement without increasing the burden on citizens to enjoy their community.

Guiding Principle #2: *Sustainability*

MPO plans and programs will strive to support growth and prosperity without sacrificing the health, environment, natural and socio-cultural resources, or financial stability of this or future generations.

Guiding Principle #3: *Prosperity*

MPO plans and programs will contribute to the continued economic well-being of the greater Nashville area by investing in transportation solutions that increase access to education, jobs, and amenities, reduce the cost of living and doing business, and attract new investment to the region.

Guiding Principle #4: *Diversity*

MPO plans and programs will recognize the multitude of needs and the variety of perspectives and backgrounds of the people that live and work in the greater Nashville area by promoting a range of transportation choices that are designed with sensitivity to the desired context.

Regional Goals

The regional goals embody a general set of strategies by which the Nashville Area MPO will seek to help the region in its pursuit of quality growth as directed by the overarching guiding principles.

Goal # 1: Maintain and Preserve the Efficiency, Safety, and Security of the Region's Existing Transportation Infrastructure.

Goal # 2: Manage Congestion to Keep People and Goods Moving.

Goal # 3: Encourage Quality Growth and Sustainable Land Development Practices.

Goal # 4: Protect the Region's Health & Environment.

Goal # 5: Support the Economic Competitiveness of the Greater Nashville Area.

Goal # 6: Offer Meaningful Transportation Choices for a Diverse Population including the Aging

Goal # 7: Encourage Regional Coordination, Cooperation, & Decision-Making.

Goal # 8: Practice Thoughtful, Transparent Financial Stewardship by Ensuring that Transportation Improvements meet Regional Goals.

Major Objectives

The major objectives represent specific strategies and actions that the MPO seek to implement en route to achieving the regional goals of the 2035 Regional Transportation Plan.

Objective #1: Adopt a "fix-it-first" mentality in directing transportation funding. Initial focus should always be on the maintenance or improvement of existing facilities.

Objective #2: Strive for quality over quantity. Build out all elements of priority projects or phases rather than stringing funding out over several incomplete projects or incomplete phases.

Objective #3: Shift investment strategies towards providing a diversification of modes, rather than solely on strategies focused on roadway capacity.

Objective #4: Improve marketing and promotion of successful existing transportation services. It is acceptable to use federal transportation funds to do this.

Objective #5: Provide opportunities and define roles for all types of organizations and/or individuals (public or private) to assist in the implementation of programs and projects.

Objective #6: Improve the coordination of land use, urban design, transportation, rural and environmental feature preservation, and economic development policies and decisions through incentives and/or policies.

Objective #7: Encourage the development of context sensitive solutions to ensure that community values are not sacrificed for a mobility improvement.

Objective #8: Increase efforts to improve the form and function of transportation corridors in order to contribute to the "sense of place." Such investments can: improve attractiveness to visitors or prospective businesses or residents; compliment existing natural and cultural resources; improve the function of the road for a variety of users; and foster civic pride toward public investments in infrastructure.

Objective #9: Consider how transportation policies, programs, and investment strategies affect the overall health of people and the environment including air quality, physical activity, biodiversity, and the natural resources.

Objective #10: Invest in the development of walkable communities that offer citizens the ability to access residences, jobs, retail, recreation, and other community amenities without the need to rely on an automobile.

Objective #11: Invest in a modern regional mass transit system to maintain the region's economic competitiveness with other metropolitan regions, and to ensure continued economic prosperity in the face of growing energy costs, environmental concerns, and increasingly expensive automobile traffic.

Objective #12: Work to ensure that Middle Tennessee is given priority consideration in proposed national plans for high-speed rail. Identify opportunities to coordinate regional mass transit planning efforts with super-regional and national efforts to invest in rail infrastructure.

Objective #13: Provide proper guidance to the region for how to bridge the gap between the MPO's "cost-feasible" plan and the ultimate vision for how transportation will shape the future of the region.

Relating Regional Goals to Federal Planning Factors

The *Safe Accountable Flexible Efficient Transportation Equity Act – a Legacy for Users* (SAFETEA-LU), federal transportation legislation passed by U.S. Congress and signed by the President in 2005, defines specific planning factors to be considered when developing transportation plans and programs in a metropolitan area. Current legislation calls for MPOs to conduct planning that:

#1. Supports the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.

#2. Increases the safety of the transportation system for motorized and non-motorized users.

#3.Increases the security of the transportation system for motorized and non-motorized users

#4.Increases the accessibility and mobility options available to people and for freight.

#5.Protects and enhance the environment, promotes energy conservation, and improves quality of life, and promotes consistency between transportation improvements and state and local planned growth and economic development patterns

#6.Enhances the integration and connectivity of the transportation system, across and between modes, for people and freight.

#7.Promotes efficient system management and operation.

#8. Emphasizes the preservation of the existing transportation system.

The following table illustrates how the MPO's regional goals relate to each of those factors.

MPO Goals and SAFETEA-LU Planning Factors

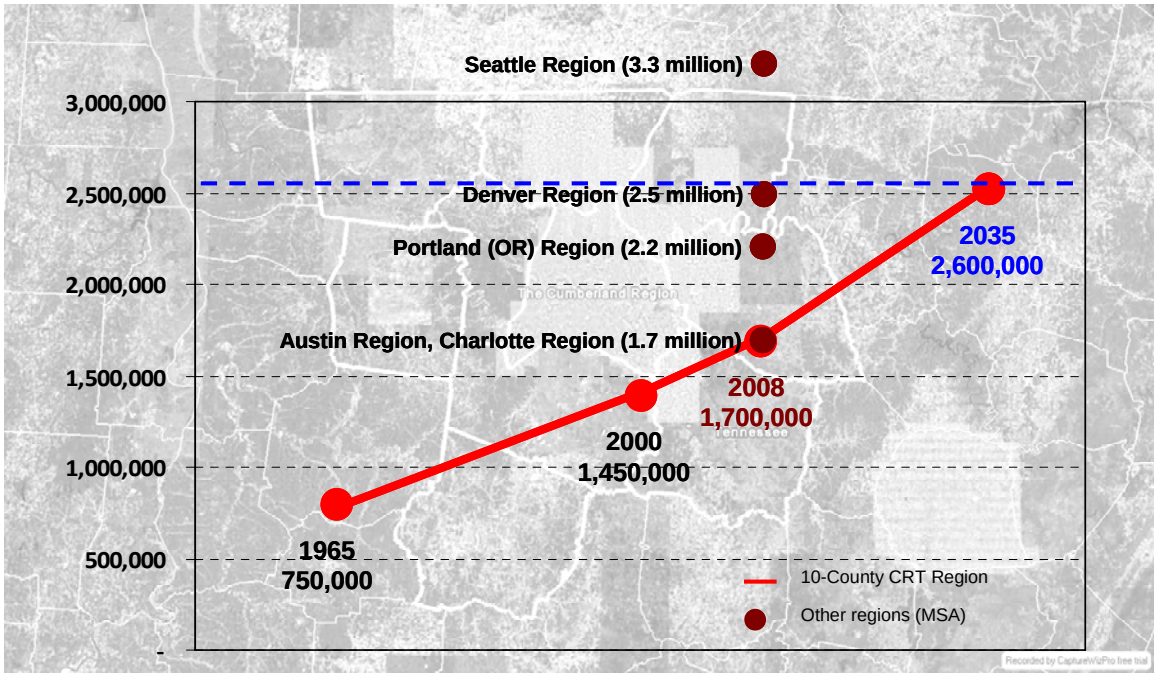
MPO Regional Goal	Applicable SAFETEA-LU Federal Planning Factors
Goal # 1: Maintain and Preserve the Efficiency, Safety, and Security of the Region's Existing Transportation Infrastructure.	1, 2, 3, 7, 8
Goal # 2: Manage Congestion to Keep People and Goods Moving.	1, 4, 7
Goal # 3: Encourage Quality Growth and Sustainable Land Development Practices.	1, 4, 5,
Goal # 4: Protect the Region's Health & Environment.	1, 5
Goal # 5: Support the Economic Competitiveness of the Greater Nashville Area.	1
Goal # 6: Offer Meaningful Transportation Choices for a Diverse Population including the Aging.	4, 6
Goal # 7: Encourage Regional Coordination, Cooperation, & Decision-Making.	1, 5
Goal # 8: Practice Thoughtful, Transparent Financial Stewardship by Ensuring that Transportation Improvements meet Regional Goals.	1, 2, 3, 4,5, 6, 7, 8

3.0 Regional Growth Forecasts

3.1 Population & Employment Trends

The greater Nashville area is poised to grow by leaps and bounds over the next 25 years. Across the 10-county Middle Tennessee region, the MPO forecasts nearly one million more people to live in the area by the year 2035. Where those people live, work, and play, along with their socio-economic characteristics, will significantly influence the need for investments into our region's transportation infrastructure. As we think about future investments in transportation, it is important to realize that by the 2035, our region will be as large as the Denver region is today.

Figure 9. Middle Tennessee Population Growth Trends and Forecast, 1965 to 2035



Source: U.S. Census Bureau, Woods & Poole Economics.

Much of the projected growth for Middle Tennessee is expected to occur within the seven counties that are included, at least in part, in the planning area of the Nashville Area MPO. As shown in the following tables, from 2006 -- a year following the adoption of the MPO's last regional transportation plan -- to the year 2035, the seven county area is expected to see a 56 percent increase in population and jobs.

Davidson County is expected to remain the most populous county of the region and the center of the region's job market, adding another 138,470 people and 196,429 jobs by the year 2035. Williamson County is expected to see the largest rate of growth, as well as the largest net increase in population (228,976 people), more than doubling its population from 2006 through 2035, from 159,094 people to 387,970– a 144 percent increase.

Table 2. Population & Jobs Forecast for MPO Counties

	YEAR	MPO	DAVIDSON	MAURY	ROBERTSON	RUTHERFORD	SUMNER	WILLIAMSON	WILSON
People	2006	**1,394,928**	**613,856**	**77,550**	**61,708**	**230,980**	**148,534**	**159,094**	**103,206**
	2015	**1,637,000**	654,879	89,371	73,949	288,734	172,232	229,052	128,783
	2025	**1,904,300**	702,871	101,595	87,563	349,083	197,500	308,328	157,360
	2035	**2,174,914**	**752,326**	**114,005**	**101,324**	**409,986**	**223,124**	**387,970**	**186,179**
Jobs	2006	**983,074**	**559,435**	**44,773**	**29,573**	**131,831**	**57,236**	**108,904**	**51,322**
	2015	**1,128,118**	618,891	50,722	34,251	155,284	64,282	143,628	61,060
	2025	**1,316,029**	687,059	58,019	40,223	187,195	73,129	196,539	73,865
	2035	**1,536,746**	**755,684**	**65,964**	**47,049**	**226,453**	**83,053**	**269,755**	**88,788**

Source: U.S. Census Bureau, Woods & Poole Economics

Over the next quarter century, the demographic makeup of the region is expected to change significantly from that of today, particularly with respect to race, ethnicity, and age. By the year 2035, 15 percent of residents in the area will be 65 years or older, compared with about 11 percent today. Nationally, by the year 2025, experts expect just over one-quarter of all households will have children living at home – compared with about half of households back in the 1950s. The region's population also will be more racially and ethnically diverse. According to MPO forecasts provided by Woods and Poole Economics, by the year 2035, the percentage of the population within the region of Hispanic ethnicity will grow to 19 percent from about 6 percent in 2010.

Table 3. Change in Key Demographic Indicators, 1990-2035

Demographic	1990	2000	2010	2035
Total Population	982,486	1,226,954	1,506,645	2,174,914
Median Age	33	35	36	35
Non-White, Non-Hispanic	17%	19%	20%	20%
Hispanic	1%	3%	7%	20%
65 Years of Age or Older	11%	10%	11%	15%

Source: U.S. Census Bureau, Woods & Poole Economics

Since the mid-1980s, the counties surrounding Davidson County have been experiencing rapid population and economic growth, resulting in a diversification of economies and the development of a regional economy. Mirroring trends at the national level, the Nashville region will see continued job losses (-14%) in the Manufacturing and Industrial sectors while Nashville's strength in the Medical and Services (+78%) sectors will drive future growth. Transportation, Communication and Public Utilities will also experience noteworthy growth.

Table 4. Regional Employment by Industry/ Sector, 2008-2035

Category	Detailed Category	2008 Jobs	2008 % of Jobs	2035 Jobs	2035 % of Jobs	Change 2008-2035
	Totals	1,013,430	100%	1,536,746	100%	52%
Industrial	Farm and Agricultural Services	13,386	1.32%	14,217	0.93%	6%
	Mining	928	0.09%	912	0.06%	-2%
	Construction Employment	65,045	6.42%	92,297	6.01%	42%
	Manufacturing Employment	83,309	8.22%	71,806	4.67%	-14%
	Trans, Comm, & Public Utilities	40,604	4.01%	68,429	4.45%	69%
	Wholesale Trade	43,167	4.26%	49,819	3.24%	15%
Retail	Retail Trade	185,871	18.34%	278,331	18.11%	50%
Office	Finance, Insurance, & Real Estate	88,668	8.75%	120,327	7.83%	36%
	Services	391,338	38.62%	697,292	45.37%	78%
	Government	101,114	9.98%	143,316	9.33%	42%

Source: U.S. Department of Labor, Woods and Poole Economic

Table 5. Percentage of Jobs by Employment Category and County, 2008-2035

Year	Category	Davidson	Maury	Robertson	Rutherford	Sumner	Williamson	Wilson
2008	Industrial	19%	33%	44%	36%	34%	17%	35%
	Retail	19%	16%	15%	16%	17%	20%	18%
	Office	62%	52%	41%	48%	49%	63%	47%
2035	Industrial	15%	26%	37%	31%	31%	11%	28%
	Retail	17%	15%	13%	20%	16%	21%	21%
	Office	68%	59%	50%	49%	53%	68%	51%

Source: U.S. Department of Labor, Woods and Poole Economic

3.2 Land Development Forecasts

As indicated by the MPO's projection for a 56 percent increase in population between now and 2035, the Nashville area is anticipated to grow as a region well into the future. Determining where those people will live, work, and play is instrumental in determining where and how transportation infrastructure should be improved or expanded to accommodate that growth. While predicting the future is no easy task, the MPO employs a state-of-the-art geographic information system (GIS) modeling tool to assist in the effort.

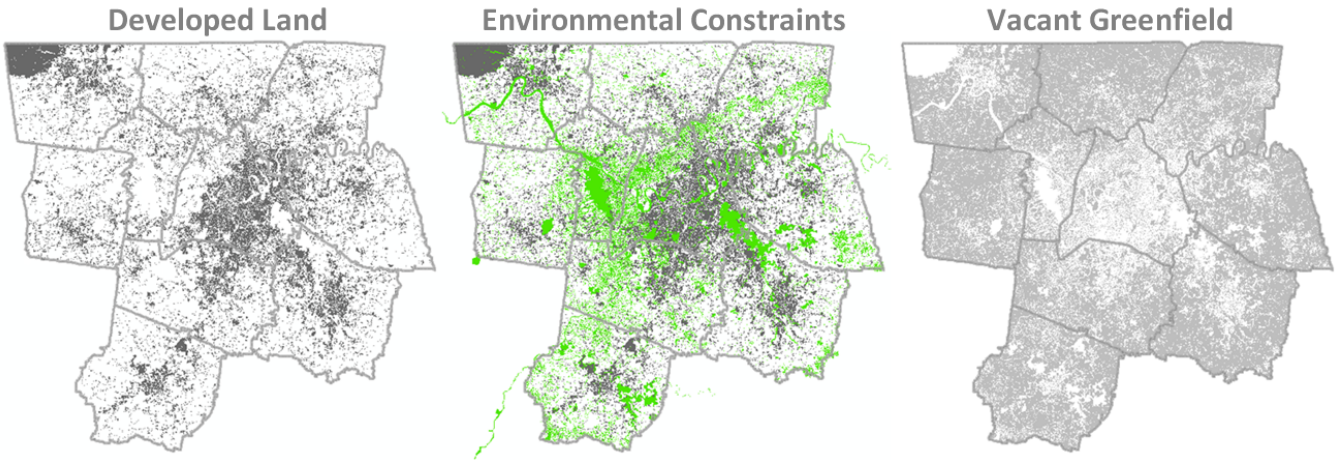
The MPO's regional land use model, built using *CommunityViz*, is the tool used to predict future demographic potential of each parcel of land throughout the region. This model allocates future households and employment throughout the region based on the land use policies and the each parcel of land's ability to attract new growth.

The basic premise of the land use model is the concept of supply and demand. The supply is simply the region's ability to accommodate new development. In other words, it's the regions "development capacity". Supply is usually determined by land use policies and/or subdivision regulations and provides specific guidelines that developers should follow when looking at a prospective piece of property. Demand is the region's predicted growth based on the region's economic outlook. This value can, (and does), change on a regular basis so it's important to monitor this and revise the demand when appropriate.

Step 1: Identify Land Available for Future Development

The first step in predicating a future land development pattern is to identify those areas that can physically accommodate future growth. This analysis includes the identification of parcels of land throughout the region that are either already developed, or have some characteristic or factor that prevents or precludes future growth from occurring. Natural barriers such as bodies of water or steep slopes, or land protected by public policy or regulation (e.g., parks, conservation areas, etc.) are taken off the table and not considered available for future development. The result of this analysis produces a map of vacant Greenfield parcels that have the capacity to support some amount of future growth.

Figure 10. Land Availability Analysis



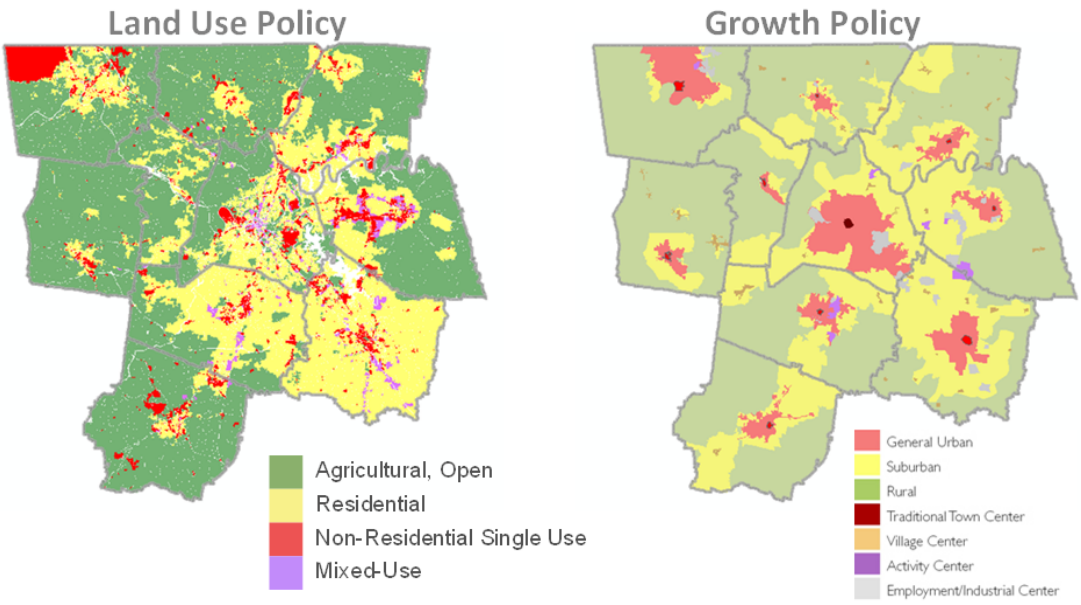
Step 2: Identify the Development Capacity of that Land

Exactly how much opportunity a parcel has to support future growth is determined by several factors. The second step in the land use modeling process measures each parcel's development capacity through an in-depth analysis of its land area, topographic features, and the implications of the overlying land development regulations and local land use policies.

Capacity is calculated for each parcel for a three-dimensional area called a building envelope. The building envelope exists on the portions of the parcel that can physically support development and is further defined by land development regulations (e.g., parking requirements, allowable density or floor-area-ratios, building heights, setbacks, etc.). The local land use policy dictates what type of capacity is being calculated (e.g., residential, commercial, mixed-use, etc).

Because of the regional scale of the MPO's land use model, it is not practical to analyze the specific land development regulations that apply to every single parcel throughout the area. Instead, the MPO assigns each parcel into one of eight character area types (e.g., general urban, suburban, rural, town center, etc.) which provide generalized assumptions about the land development regulations that would apply to a set of parcels that are part of a relatively homogeneous area. The following figure presents the generalized land use policies and land development regulations (or growth policy) that are used by the land use model.

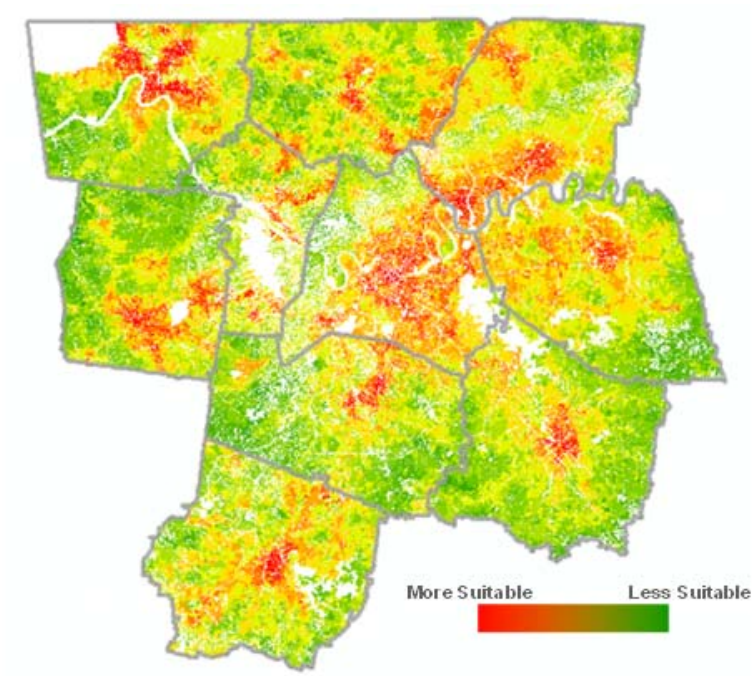
Figure 11. Land Use and Capacity Analysis



Step 3: Assess the Attractiveness of that Land to Future Development

Up to this point, no effort has been made to account for the real-world influences that determine to what extent the real estate market will invest or not in future development. The third step in the land use modeling process involves developing a measure of suitability, or level of attractiveness, for each parcel to develop at some point in the future. In taking this step, the MPO relied heavily on the input from real estate developers from across the region to identify the attributes that must exist in order to make a property a worthwhile investment. Using that local expertise, the MPO assign a suitability score to each parcel based on its proximity to a long list of assets or liabilities that make it more or less attractive for development.

Figure 12. Land Suitability Analysis

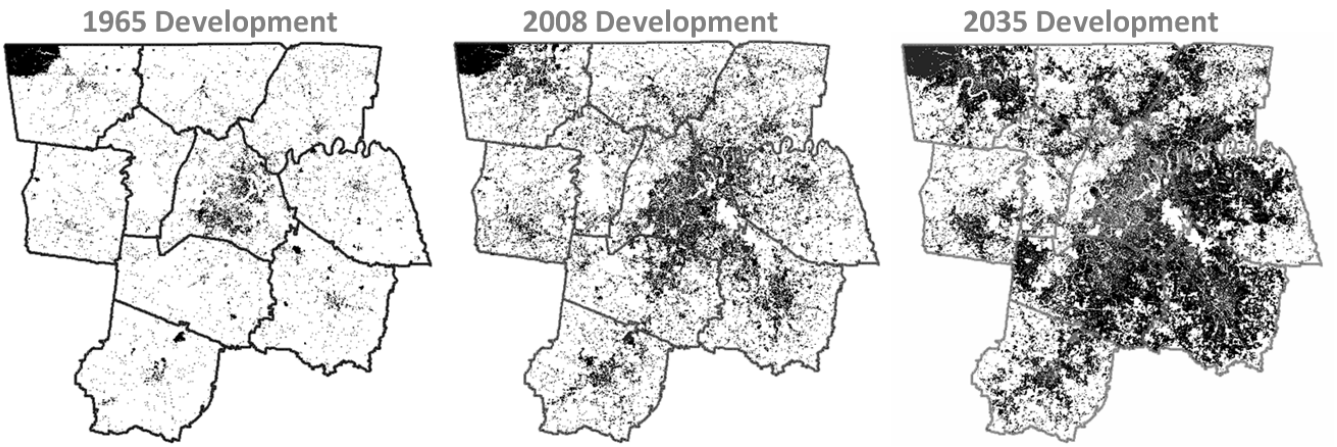


Step 4: Allocate New Growth to Suitable Land

The last step in the land use modeling process is the allocation of future growth to vacant parcels. In this final step, the model first looks to allocate future growth to the more suitable parcels, but not to exceed any one parcel's available capacity for growth. Once a parcel has reached its full potential – as defined by its own physical features as well as local policy and regulation – the model removes the parcel from further consideration.

The following figure presents the results of the 2035 land use model, compared with the observed land development pattern of 1965 and 2008.

Figure 13. Land Development Trends and Forecast, 1965 to 2035



Distribution of People and Jobs

With the land use modeling task complete, the MPO is able to complete its forecasts of future growth by identifying where people will live in work in the future. The results of such analysis become the basis for predicting future traffic congestion using the MPO's regional travel demand model.

The following figures present the resulting forecast for the distribution of people and jobs throughout the MPO area, with a comparison made to the observed pattern of 2008.

Figure 14. MPO Residential Growth by Block, 2008 to 2025

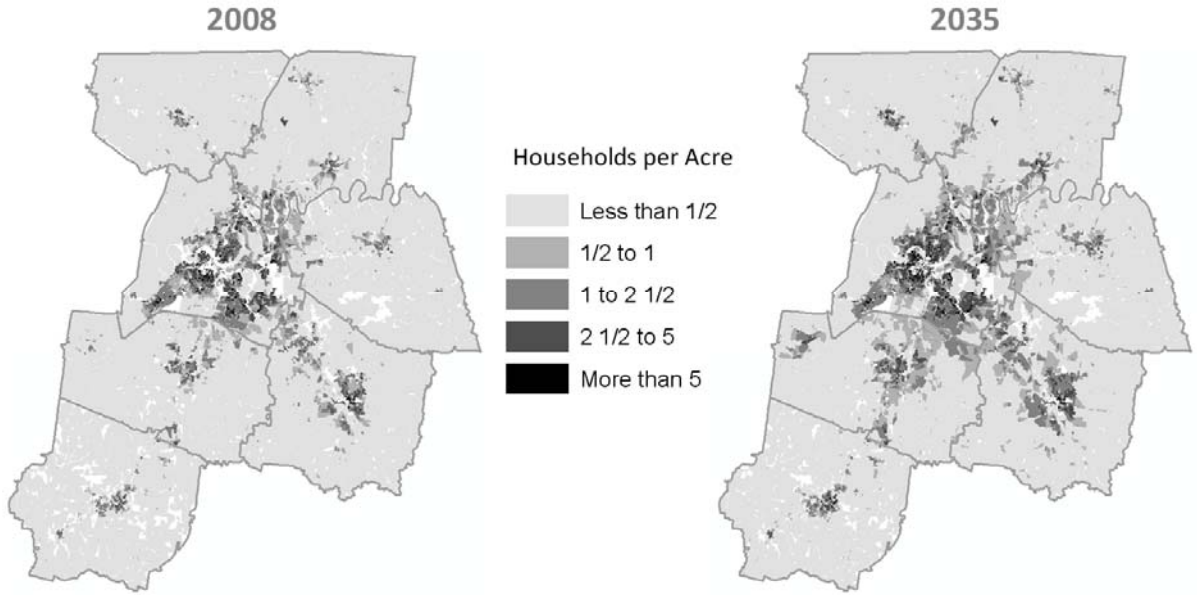
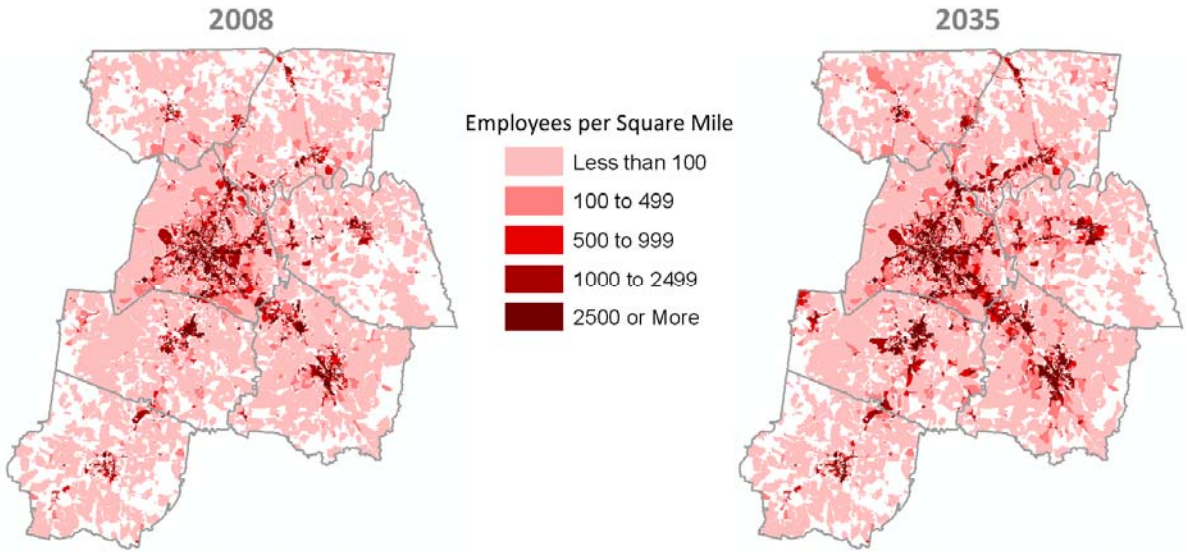


Figure 15. MPO Employment Growth by Block, 2008 to 2025



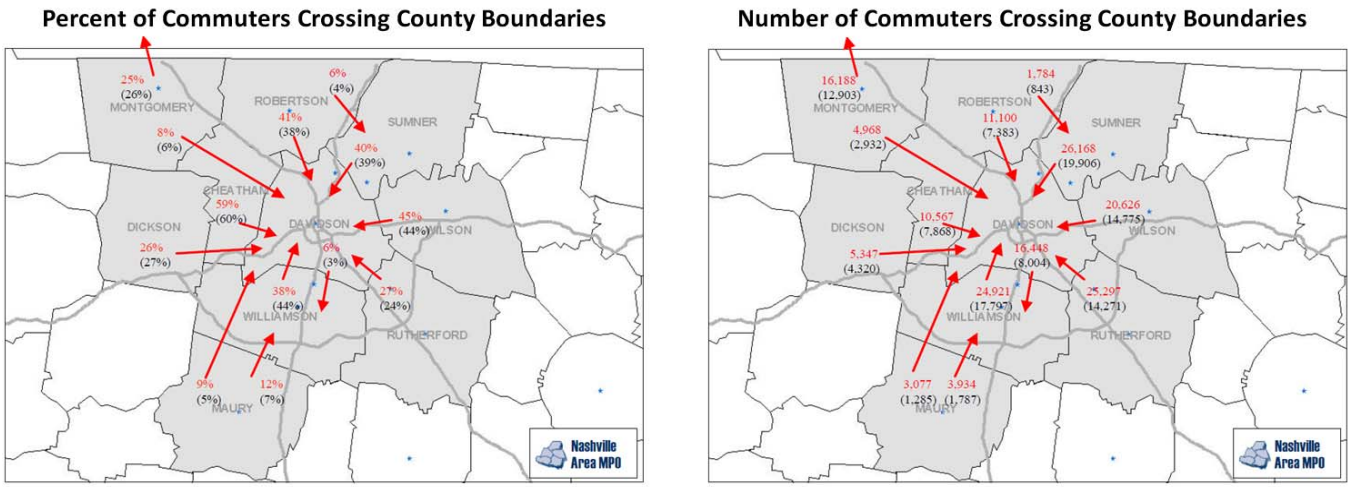
4.0 Evaluating the Existing Transportation System

4.1 Regional Travel Behaviors

Our transportation system, with its vast network of roads, bus routes, rail lines, sidewalks, and bicycle lanes, is the backbone of our region. Coordinated planning of that system is critical to the continued growth of our local and regional economies. Planning also is important to ensure that as the system grows to manage the traffic congestion that we know is coming as a result of our economic growth and development, and that it grows in a way that is sensitive to our region's valuable natural and community resources.

Understanding how, when, and where people need to move throughout our region plays an important role in determining future transportation needs. One of the most significant influences on travel behavior is the geographic relationship between where people live and work. The commuting workforce is by far the most pronounced part of area traffic congestion, particularly during peak travel periods which typically occur on weekday mornings, from 6 AM to 8 AM, and evenings, from 4 PM and 6 PM.

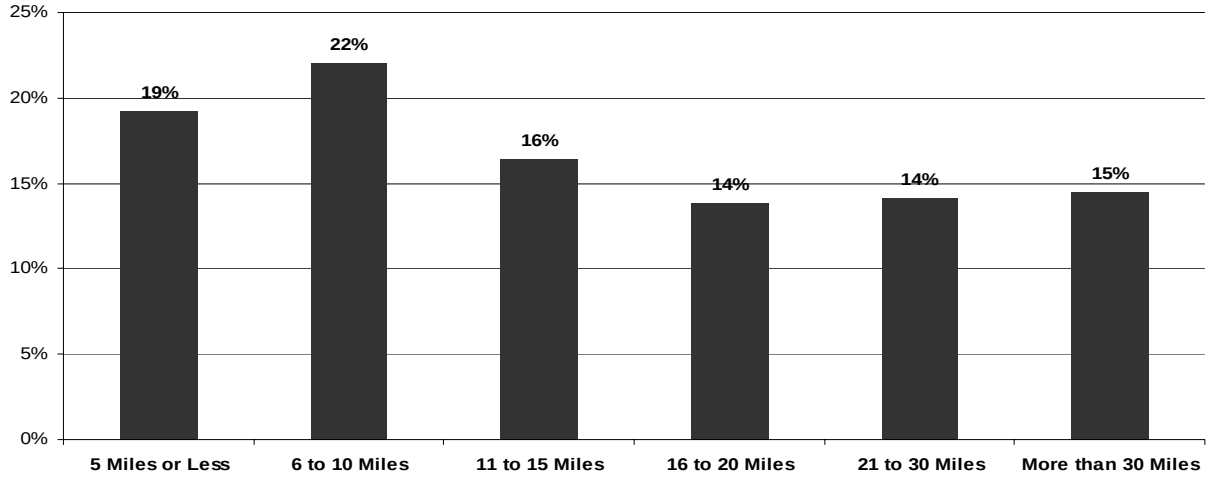
Figure 16. Inter-County Commuting Patterns, 1990 and 2000



Source: U.S. Census Bureau Journey to Work Data: 2000 (1990)

The U.S. Census is the most prominently used resource for understanding commuter characteristics. Unfortunately, the last decennial Census was published about 10 years ago. To augment its understanding of travel behaviors, the MPO conducted a random sample telephone survey in 2010. According to that survey, a little more than four out of ten (43 percent) commuters travel more than fifteen miles to get to work. One in five (19 percent) residents reported traveling five miles or less to get to work.

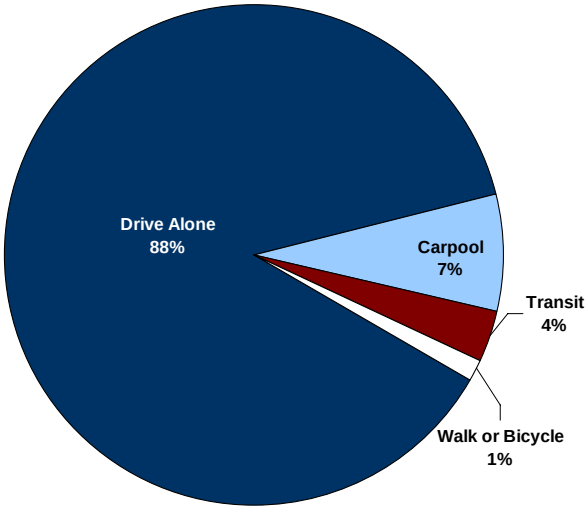
Figure 17. Average Commute Distance



Source: Nashville Area MPO, 2010 Transportation Survey.

When asked to indicate the travel mode most typically used to travel to and from destinations, including work, eighty-eight percent of respondents reported that they typically drive alone. Carpooling, or driving or riding in a car with someone else, was the second most reported typical way to travel, while transit (4 percent), and walking and bicycling (1 percent) was reported by about five percent of respondents.

Figure 18. Typical Mode of Travel

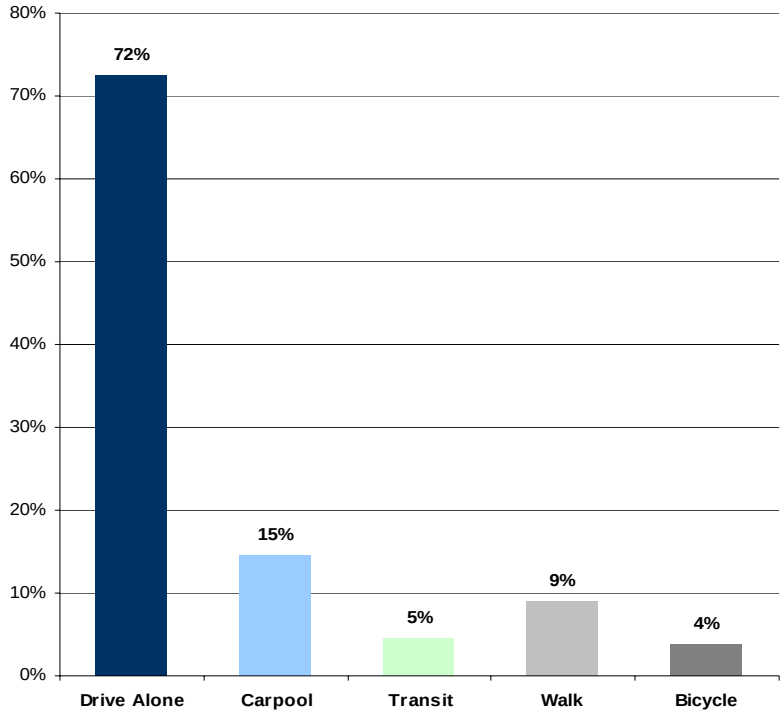


Source: Nashville Area MPO, 2010 Transportation Survey.

Since the Nashville Area MPO is concerned with developing a greater understanding of the full scope of how people choose to travel throughout the area, the survey also asked respondents to report how they have traveled within the last 90 days. Such a question allows the MPO to have a more complete understanding of the types of modes used in daily travel than what asking only for the "typical" travel mode would provide. As anticipated, the responses to that question provided a greater variation in the types of travel modes used by residents across the region. Walking, bicycling and transit made up almost 20% of the modes used within the last ninety days at the time the responses were provided. Moreover, when asked specifically if *any* member of the household had used transit within the past 90 days, fourteen percent reported, "yes." When asked if *any* member in the household had walked or bicycled somewhere for purposes other than for recreation or exercise,

twenty percent reported "yes." Such responses indicate that the percentage of households that have members with experience using transit or non-motorized modes of transportation is far greater than the percentage of respondents answering the survey.

Figure 19. Travel Modes Used within Last 90 Days

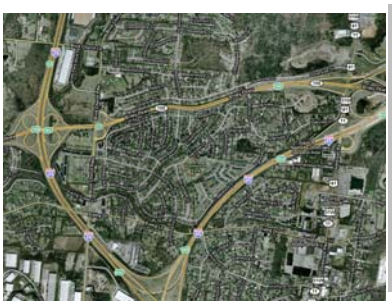


Source: Nashville Area MPO, 2010 Transportation Survey.

4.2 Roadways & Bridges

Roadways are the most visible and productive component of our national, state, and regional transportation infrastructure. The greater Nashville region benefits from easy access to three major U.S. Interstates. However, those facilities demand constant monitoring, maintenance, and management to ensure an acceptable level of service for a growing region.

In general, there are four general classifications of roadways in the Nashville area:



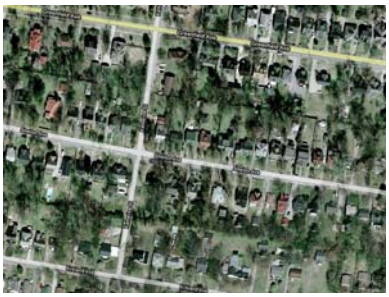
Freeways - A divided highway having two or more lanes for the exclusive use of traffic in each direction and full control of access. The freeway is the only type of highway intended to provide complete "uninterrupted" flow.

Examples: Interstates 24, 40, and 65, State Route155-Briley Parkway, State Route 6-Ellington Parkway, State Route 386- Vietnam Veterans Parkway, 440 Parkway, State Route 840, etc.

Arterials: A major thoroughfare that is vital for moving people and goods: feeds into the interstate and freeway systems.

Examples: Gallatin Pike, West End Avenue, Dickerson Pike, Hillsboro Pike, Nolensville Pike, Lebanon Road, State Route 109, State Route 96, etc.

Collectors Streets: Intended to balance access and mobility considerations by serving through movement as well as access to land. Collectors connect traffic on highways and arterials to local streets and adjacent land.



Local Streets: All other streets are generally considered to be local. Local streets typically support direct access to homes and are generally designed for slow speeds to safely allow for other neighborhood activities like walking and biking.

There are more than 8,000 lane miles of major roadways throughout the MPO planning area, of which more than 6,700 lane miles are eligible for federal funding made available through the MPO. Generally speaking, major roadways classified as collectors, arterials, and freeways in urban areas are eligible for federal-aid. In rural areas, major collectors, arterials, and freeways are eligible for federal aid. Some exceptions are made to allow federal funds to be used for improvements to bridges on local roads, or projects that improve the safety of local roadways for the non-motorized modes of transportation (e.g., sidewalks, bicycle lanes, etc).

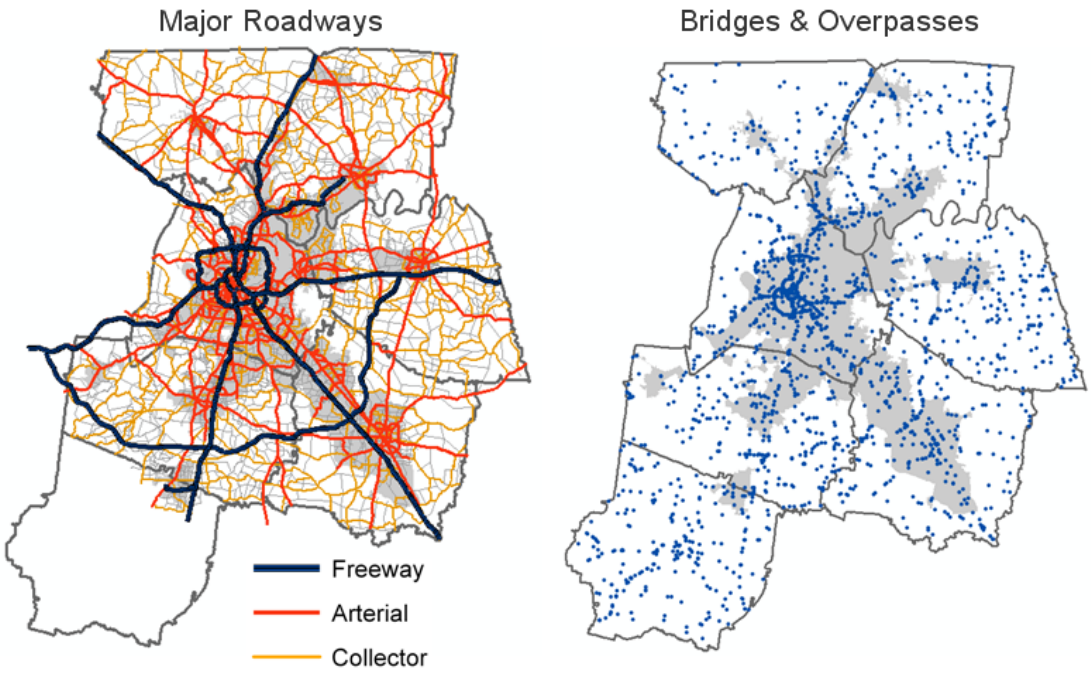
Table 6. Roadway Lane Miles by Functional Class and County

Functional Classification	Davidson	Maury	Robertson	Rutherford	Sumner	Williamson	Wilson	Total	Percent
Rural Interstate	47	20	91	30	-	47	32	**267**	3%
Rural Principal Arterial	2	-	-	129	74	64	60	**329**	4%
Rural Freeway	-	-	-	-	-	-	-	**-**	0%
Rural Minor Arterial	120	-	199	65	72	102	90	**648**	8%
Rural Major Collector	25	7	124	128	104	109	132	**629**	8%
Rural Minor Collector	117	14	218	222	271	294	404	**1,540**	19%
National Park Service Road	2	-	-	-	-	43	-	**45**	1%
Urban Interstate	537	-	16	170	24	88	92	**927**	11%
Urban Other Freeway / Expressway	159	19	-	19	52	1	2	**252**	3%
Urban Other Principal Arterial	576	19	73	199	158	108	125	**1,258**	15%
Urban Minor Arterial	745	-	66	254	83	126	103	**1,377**	17%
Urban Collector	322	21	50	231	190	144	92	**1,050**	13%
Total All Road Miles	2,652	100	837	1,447	1,028	1,126	1,132	**8,322**	100%
Percent	31.9%	1.2%	10.1%	17.4%	12.4%	13.5%	13.6%	**100%**	
Total Federal Aid Lane Miles	**2,535**	**86**	**619**	**1,225**	**757**	**832**	**728**	**6,782**	
Percent	37.4%	1.3%	9.1%	18.1%	11.2%	12.3%	10.7%	**100%**	

Source: Tennessee Department of Transportation

The maps in the following figure provide a graphical representation of the existing major roadways and the more than 2,000 bridges and overpasses located throughout the MPO planning area and includes existing roadways, as well as those with funding already committed to construction within the next couple of years. A list of current roadway projects contributing to the existing plus committed network is provided in Appendix A.

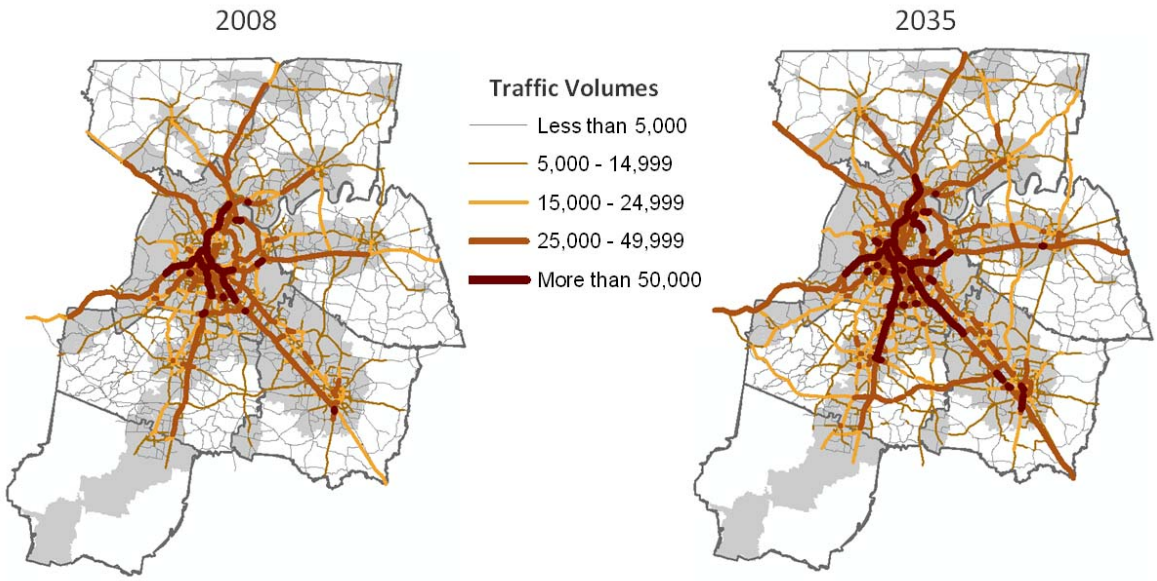
Figure 20. MPO Major Roadways & Bridges (Existing plus Committed)



Future Roadway Travel Demand

Working in partnership with the Tennessee Department of Transportation and local governments, the MPO must be able to track the traffic volumes of existing roads and predict how those volumes will grow in the future in order to appropriately plan for future investment in roadway infrastructure. Between now and 2035, the traffic volume, as expressed in terms of vehicle miles traveled, is expected to increase by 45 percent. The following figure provides a comparison between existing and future vehicle volumes for major roadways throughout the region.

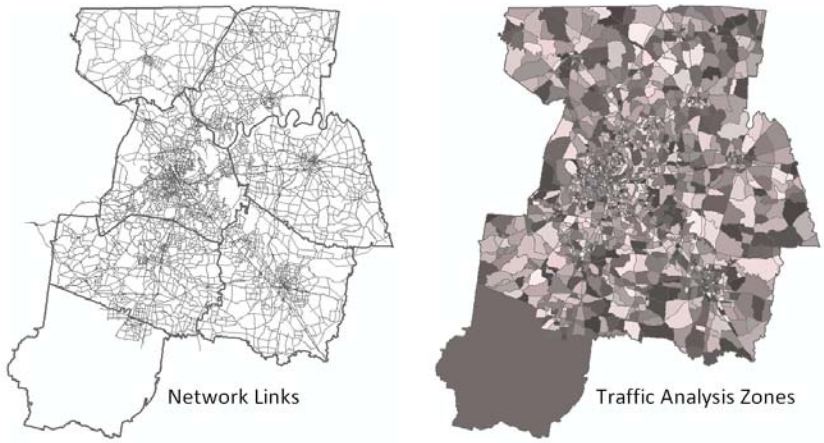
Figure 21. Relative Vehicle Flows on Major Roadways, 2008 vs. 2035



Predicting Future Traffic Volumes

In urban areas of the state, MPOs take a lead role in predicting future traffic volumes for major roadways within their respective planning areas. In most cases, the primary tool used in developing traffic forecasts is a regional travel demand model. The travel demand model consists of two types of geographies -- a network of *links* representing regionally-significant roads) and *nodes* (representing the Traffic Analysis Zones (TAZs) - there are over 2,100 TAZs in the Plan area).

Figure 22. Travel Demand Model – Network Links and Traffic Analysis Zones



Each TAZ is coded with the employment and demographic data (discussed in the Population & Employment Projections section) for the required years of the Plan (2008 base year, 2015, 2025 and 2035). At the same time, the links are coded with roadway characteristics that are used to determine the peak hour and daily 'capacity' of each road network segment. Network characteristics used to estimate capacity include facility type (e.g. arterial, freeway, collector or local), area type (e.g. rural, suburban, exurban), number of lanes, and speed under free-flow conditions.

Before future model years are run, tests are made with a base year network that represents the most current year for which 'on the ground' traffic counts are available. This is done to ensure, as closely as possible, that the model can reasonably represent traffic volumes for the forecast years. If the result of this initial run is far off, the model is *calibrated* until the modeled traffic volumes are within the threshold of error compared to observed traffic counts, or validated.

A common practice in assessing future demand is to assume no additional improvements to the existing transportation system will occur beyond what is currently being funded or currently under construction. This system is often referred to as an *existing plus committed network (E+C),* or a "no-build" network. This is essentially a test of how a roadway network, consisting of existing and currently funded future roads, could withstand the demand of projected population and employment growth.

- **Trip Generation** - This is the first step of the four-step travel demand modeling process. The model is rooted in synthetic equations derived from local travel survey data - in this case the 1998 Nashville Area Travel Behavior Study - to create trip rates (i.e. trips per household). The trips rates are organized by trip purpose (i.e. home-based work) and then converted to total trips. The sum of these trips becomes the region's trip productions.

- **Trip Distribution** - Next, the model needs to determine where these trips are going. This is where the employment data comes in. These will attract the trips, so they can be distributed from zone to zone (example zone 163 to zone 420). Note that at this stage the model has not yet determined which actual paths - or roads – will be used. Trips are established between zones based upon the shortest travel time or lowest cost between all zones in the network. The model uses an accessibility-based algorithm to estimate the optimal distribution of trips within the region. Once completed, this portion of the model is calibrated against 'real–world' data obtained from the household survey.

- **Modal Split** - Modal Split is the process of splitting person trips, (i.e. the total trips a person will take each day), into all available modes of transportation, (e.g. auto, transit, bike, etc.). The process of determining how many trips to transfer can vary depending on the level of sophistication of the region's travel demand model. It can range from taking a set percentage of trips, to a mathematical mode-choice model. This type of model requires a substantial data collection and work effort, as a detailed origin-destination transit survey needs to be done, in addition to coding a full transit network in the model. If combined with various future forecast runs that emulate different land-use scenarios (i.e. transit-oriented development versus sprawl), the model can serve as a powerful tool to evaluate transportation and land-use policy options and how they affect the transportation system.

  As part of the current Northeast Corridor Mobility Study, the Nashville Area MPO is piloting a regional mode-choice model capable of assigning a percentage of trips to transit alternatives as part. As an interim step toward the adoption of a regional mode-choice model, mode split for the region is based on the average vehicle occupancy of each trip purpose. Validation of the travel demand model supports this assumption – and for reference, the criteria used to validate the travel demand model are presented in the technical documentation for the regional model.

- **Trip Assignment** - Finally, the model assigns trips to the links in the network. The final output of the model shows the estimated volumes and average speed for each link in the network.
- **Model Calibration/ Validation** - Before the model can be used as a planning tool, the base year (2008) network is adjusted, or calibrated until the modeled results are within the established allowable error, (i.e. validated), when compared to actual base year traffic data.

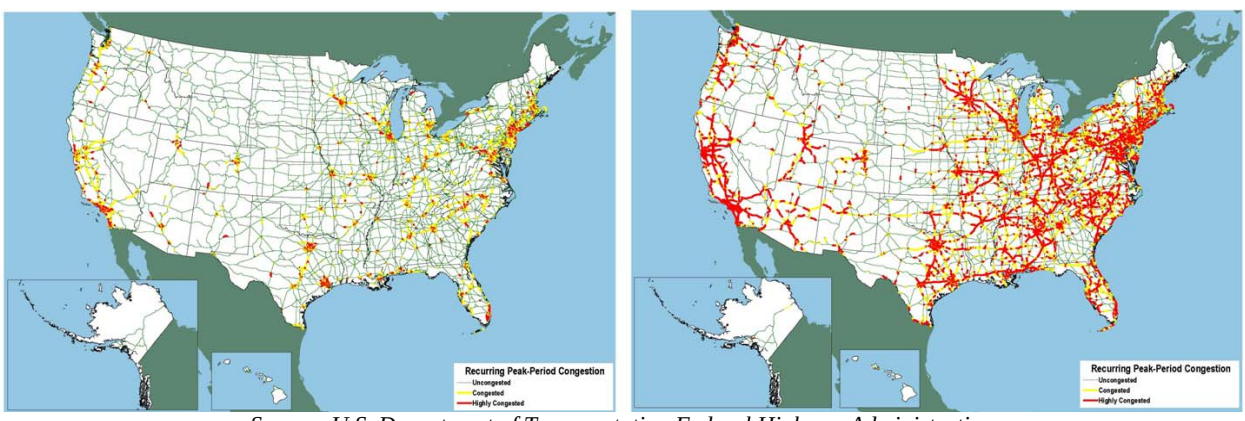
Projected average route speed on major arterials and interstates indicate how well a segment or route is expected to accommodate future travel demand. Even though some segments and routes may be operating efficiently at current levels, they may not be able to handle anticipated future traffic volumes. Conversely, the segments and routes which are currently experiencing poor operating conditions may be improved to acceptable average route speeds as a result of certain travel demand and supply strategies and/or infrastructure improvements.

More information about the MPO's Regional Travel Demand Model is included in Appendix E.

4.3 Roadway Congestion

Demand for highway travel by Americans continues to grow as population increases, particularly in metropolitan areas. Construction of new highway capacity to accommodate this growth in travel has not kept pace. Despite the recent blip in traffic volumes due to the economic recession, traffic volumes are projected to continue growing. The volume of freight movement alone is forecast to nearly double by 2020. Congestion is largely thought of as a big city problem, but delays are becoming increasingly common in small cities and some rural areas as well.

Figure 23. U.S. Daily Recurring Peak Period Congestion, 2002 and 2035



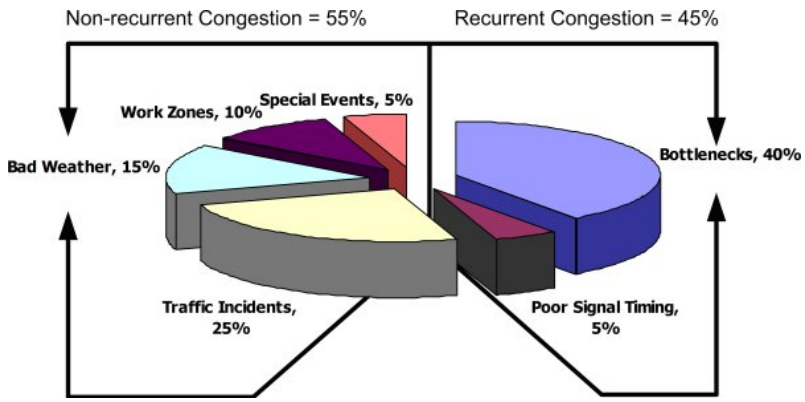
Source: U.S. Department of Transportation Federal Highway Administration

Causes of Congestion

Transportation planners and engineers monitor two types of congestion, recurring and non-recurring. Recurring congestion results when traffic demand approaches or exceeds the available capacity of a facility as determined by the physical limitations of a roadway and/ or the operation of the facility (e.g., signalization or other traffic control devices). Recurring congestion is somewhat reliably predictable based on analysis of growth in demand and the supply of roadway capacity. Non-recurring congestion, on the other hand, is much more difficult to predict -- as it depends largely on factors beyond a transportation planner's control including weather, driver behavior and/or impairment, accidents, and special events.

Across the U.S., less than half (45 percent) of all congestion is considered recurring and caused by bottlenecks or poor signal timing. That portion of congestion can be treated or managed through transportation improvements that add capacity to the network in the form of additional roadway lanes, transit service, sidewalks, and bicycle lanes or through more efficient traffic control measures (e.g., improved traffic signal timing). The remaining congestion, about 55 percent, is considered non-recurrent – or beyond the direct control of transportation planners or engineers. Still, DOTs and MPOs are seeking ways to minimize delays caused by bad weather, special events, work zones, or traffic accidents by employing more effective traffic incident techniques and targeting funding at improving the safety of high crash locations.

Figure 24. Causes of Congestion in the U.S.



Source: Federal Highway Administration (2007)

Current and Future Levels of Congestion

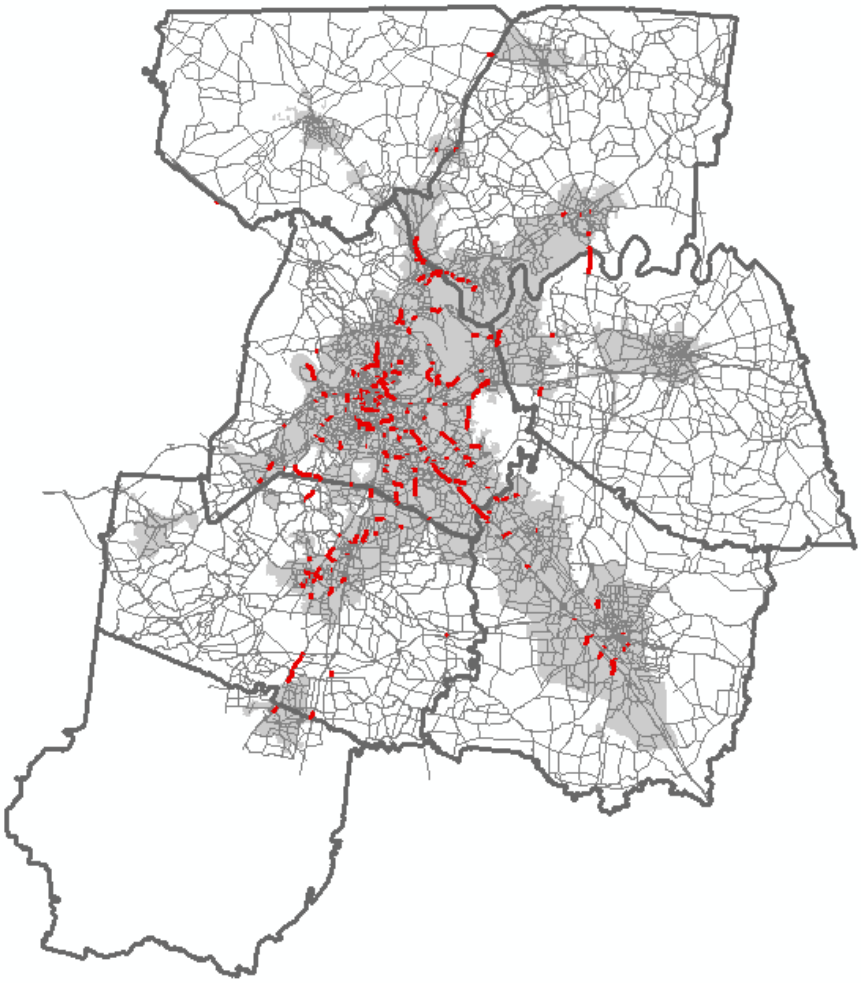
The Nashville region is well served by a complex system of roads ranging from the interstates and other freeways to city streets and rural local roads. Travel on these roads has been steadily increasing as the region has grown, causing congestion levels to rise. Congestion occurs regularly on certain roads and freeways as traffic approaches and exceeds the roadway's operating capacity. Historically, congestion has been associated with radial commuting patterns leading in and out of downtown central business districts. Over the past thirty to forty years, large suburban retailers located along these arterial routes to take advantage of regular commuter traffic. The resulting commercial clusters (also called Regional Activity Centers) are now the location of frequent congestion.

Many communities are experiencing conflicts between the desire to use arterial roads as commercial destinations, versus the routes' original role of carrying thru-traffic at relatively high speeds. As a result of arterial roads being congested with shoppers, the region's interstates have been carrying an increasing proportion of local traffic. This in turn leads to congestion on the interstates, as commuting traffic mingles with heavy trucks and other vehicles who simply want to travel through the area.

In more recent years, the establishment of strong employment centers in suburban locations (such as Cool Springs in Williamson County and Indian Lake Village in Sumner County) has led to increased travel on circumferential routes around cities throughout the region. With the growth of suburban development in the region, congestion now occurs with regularity on circumferential as well as radial routes.

The following figure represents the MPO's analysis of recurring congestion on major roadways throughout the region based on the land development patterns and population and job characteristics of 2008, which serves as the base year for the 2035 RTP. In determining congestion, the MPO defines any segment of roadway with a modeled travel speed of seventy percent or less of the expected free flow speed as being congested.

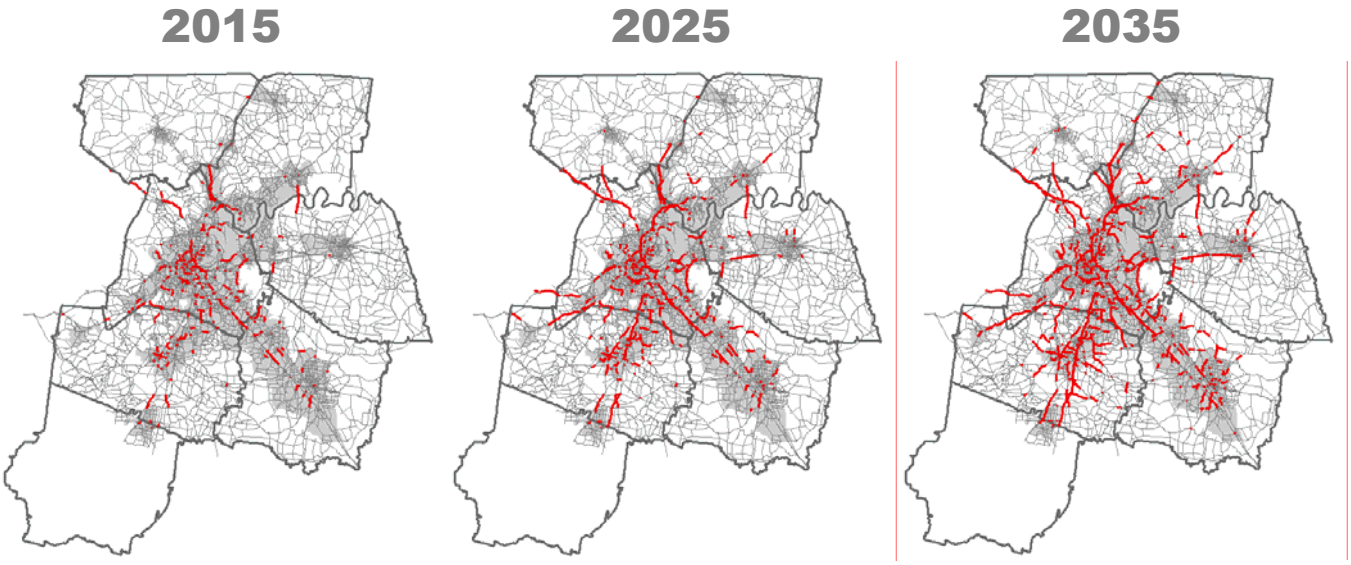
Figure 25. MPO Daily Recurring Congestion, 2008



Source: Nashville Area MPO, Regional Travel Demand Model

In predicting future congestion for the purposes of identifying the deficiencies of the existing roadway network, the MPO first uses a land use model (described in Section 3.2) to predict where people will live and work in the future. Once the land use model has determined the distribution of households and jobs, the travel demand model predicts how and where people will travel using the existing roadway network – assuming no improvements are made beyond those already underway. Using the same definition of congestion used for the base year (speeds at 70 percent or less of expected free flow), the MPO identifies congested routes for each of the plan's horizon years. The following figure presents the results of the MPO's congestion forecast for the short-term (2015), mid-term (2025), and long-term (2035) horizon years.

Figure 26. MPO Congestion Forecasts by Horizon Year



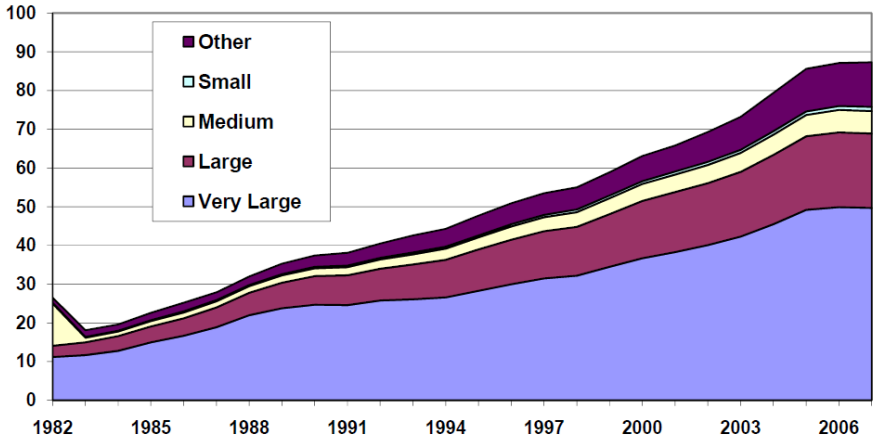
Source: Nashville Area MPO, Regional Travel Demand Model

Cost of Congestion

While it is difficult to know for sure the true cost of congestion, the Texas Transportation Institute (TTI) at Texas A&M University has gained a solid reputation as being the leading authority for publishing congestion-related date for urban areas across the nation. Every two years, TTI releases their highly anticipated and highly publicized, "Urban Mobility Report," which provides an overview of congestion in more than 439 urban areas across the nation including estimates of the cost of that congestion. According to TTI, congestion has several costs for travelers, businesses, agencies and cities. Two significant elements are the value of the time spent in traffic and the fuel wasted in that congestion. The following are highlights from the *2009 Urban Mobility Report* which includes data through the year 2007.

- In 2007, congestion (based on wasted time and fuel) cost about $87.2 billion in the 439 urban areas, compared to $87.1 billion (in constant dollars) in 2006.
- 2.8 billion gallons of fuel were wasted in the 439 urban areas. This amount of fuel would fill 56 super-tankers or 370,000 gasoline tank trucks.
- The urban areas with populations greater than 3 million accounted for 1.6 billion gallons (almost two-thirds of the national estimate) of wasted fuel.

Figure 27. Annual Cost of Congestion for U.S. Urban Areas, 1982-2007



Source: TTI Urban Mobility Report (2009)

For the Nashville-Davidson Urbanized Area (UZA), which includes only a portion of the Nashville Area MPO planning area, TTI estimates the average annual cost of congestion to be about $426 million. Assuming that figure to remain constant over the life of the 2035 Regional Transportation Plan, the Nashville-Davidson UZA portion of the MPO's region would incur roughly $10.6 billion (2007 dollars) in lost time and wasted fuel as a result of congestion. By comparison, the total federal revenues for transportation projects between 2010 and 2035 is estimated at about $5 billion (in year of expenditure dollars). As the 44th most populous urban area of the 439 included in the report, the Nashville-Davidson UZA ranks 34th most costly in terms of congestion.

Additional costs of congestion include impacts to personal and environmental health. A study conducted in Atlanta during the 1996 Olympics found a significant decrease in hospital admissions related to asthma during the two-week period when the ADT on the regional roadways was down significantly. Studies such as this one provide insight into health concerns that may be related to air quality. New research indicates that severity of damage due to heart disease worsens as air quality deteriorates. The environmental impact of congestion is another area that is just starting to be understood. The MPO is aware that these hidden costs of congestion exist, and that congestion has significant impacts on health in addition to fuel consumption and time lost.

4.4 Roadway Safety

Incorporating safety in transportation planning helps identify, analyze and develop solutions to transportation hazards – and is an effective congestion management tool considering that 25 percent of traffic congestion is caused by accidents/ incidents. For safety conscious planning to appropriately address the movement of passengers and goods across all modes of transportation, it is necessary for many agencies (MPO, TDOT, local governments, public safety personnel, emergency services personnel and trucking companies) and the public to communicate consistently with one another. While the primary focus of transportation safety planning efforts is on reducing injuries and loss of life, improving safety can also decrease economic losses and significant transportation system disruptions that result from crashes.

National, State and regional statistics are given below to provide a realistic view of the challenges regarding safety problems for varying modes of transportation. Although there have been improvements and the rates of fatalities and injuries have declined on the national level over the years, there are still obviously needed improvements.

The following table presents a summary of crash data for a four-year period from 2005-2008 for the United States, Tennessee, and the Nashville region. In all cases, the frequency of total crashes and crashes involving a fatality or injury has declined over the past four years.

Table 7. National, State, and Regional Crash Statistics, 2005-2008

Year	All Crashes	Fatal Crashes	Injury Crashes
2005			
Nashville Area MPO Region	42,689	196	13,338
Tennessee	177,638	1,161	51,626
United States	6,159,000	39,252	1,816,000
2006			
Nashville Area MPO Region	44,507	187	13,676
Tennessee	179,168	1,161	51,487
United States	5,973,000	38,648	1,746,000
2007			
Nashville Area MPO Region	43,511	186	13,156
Tennessee	172,127	1,111	49,353
United States	6,024,000	37,435	1,711,000
2008			
Nashville Area MPO Region	39,321	181	11,922
Tennessee	158,731	950	45,474
United States	5,811,000	34,017	1,630,000

Source: Tennessee Department of Safety, NHTSA Fatality Analysis Reporting System, Nashville Area MPO

Because raw crash figures can be difficult to understand when comparing different locations, the Tennessee DOT and the MPO both rely on the use of crash rates in order to interpret useful information from the data. A crash rate represents the number of crashes per 1,000 licensed drivers for any given area (county, region, state, etc.). The following table presents the ranking of each MPO county (out of 95 Tennessee counties) for crash rates of various types of crashes. Overall the MPO region ranks fairly well when compared with other counties, statewide. Only two MPO counties are ranked in the bottom 10 for any one category. Davidson County has the highest overall crash rate, highest injury crash rate, and highest young-driver related crash rate in the state, and ranks 3rd worst for speed-related crashes, 4th worst for senior adult-related crashes, and 10th worst for motorcycle-related crashes. Rutherford County ranks 6th worst overall and 6th worst for injury crashes, young-driver related crashes, and senior-adult related crashes.

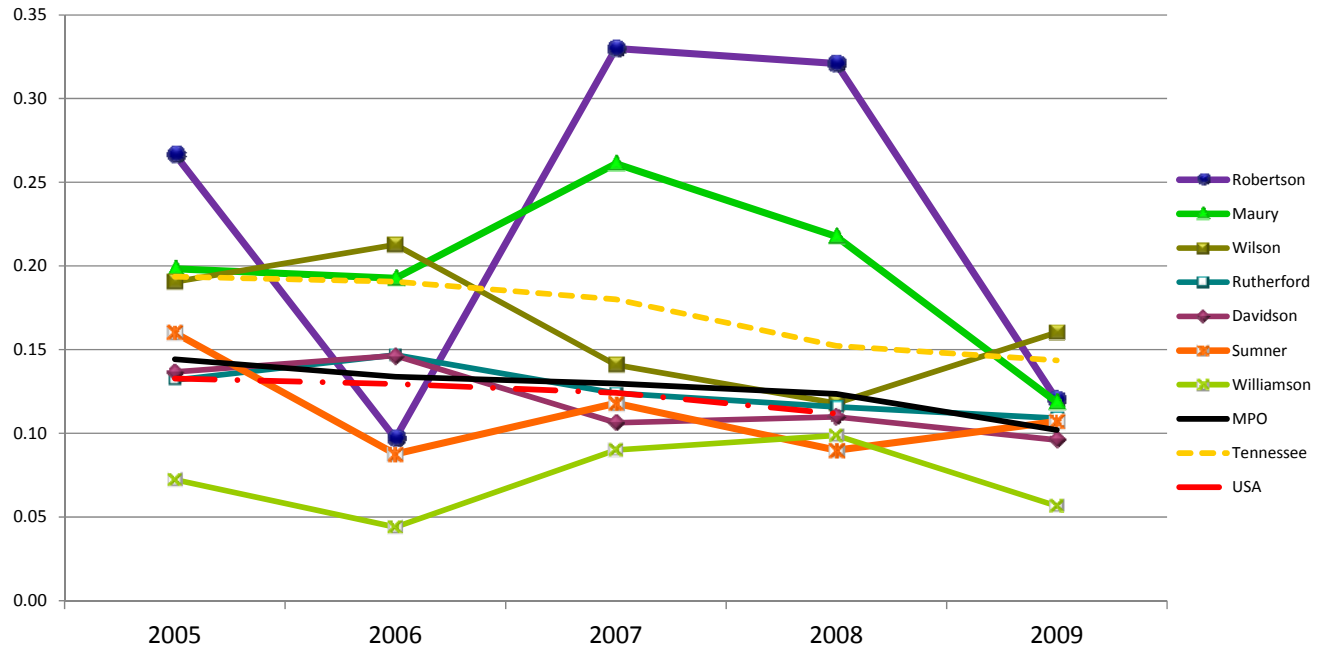
Table 8. Statewide Crash Rate Rankings for MPO Counties, 2005-2009

County	Licensed Drivers	All Crashes	Fatal Crashes	Injury Crashes	Motorcycle Crashes	Alcohol Related	Speed Related	Young Driver	Senior Driver
Davidson	2	1	90	1	10	20	3	1	4
Maury	16	23	67	17	67	26	39	29	27
Robertson	20	44	53	60	86	32	66	50	36
Rutherford	5	6	89	6	26	24	38	6	6
Sumner	8	49	94	72	68	62	30	39	35
Williamson	6	67	95	81	82	90	70	69	50
Wilson	12	52	79	52	57	53	31	44	37

Source: Tennessee Department of Safety, Nashville Area MPO

Within the MPO region, fatality crash rates tend to be the highest in the less populated, or more rural counties. Robertson and Maury consistently see the highest number of fatal crashes per 1,000 licensed drivers. The MPO performs worse than the national average, but significantly better than the state. The following figure presents the fatal crash rates by MPO county for the last five years, 2005 to 2009.

Figure 28. Fatal Crash Rates by County, 2005 to 2009



Source: Tennessee Department of Safety, NHTSA Fatality Analysis Reporting System, Nashville Area MPO

Crash Locations

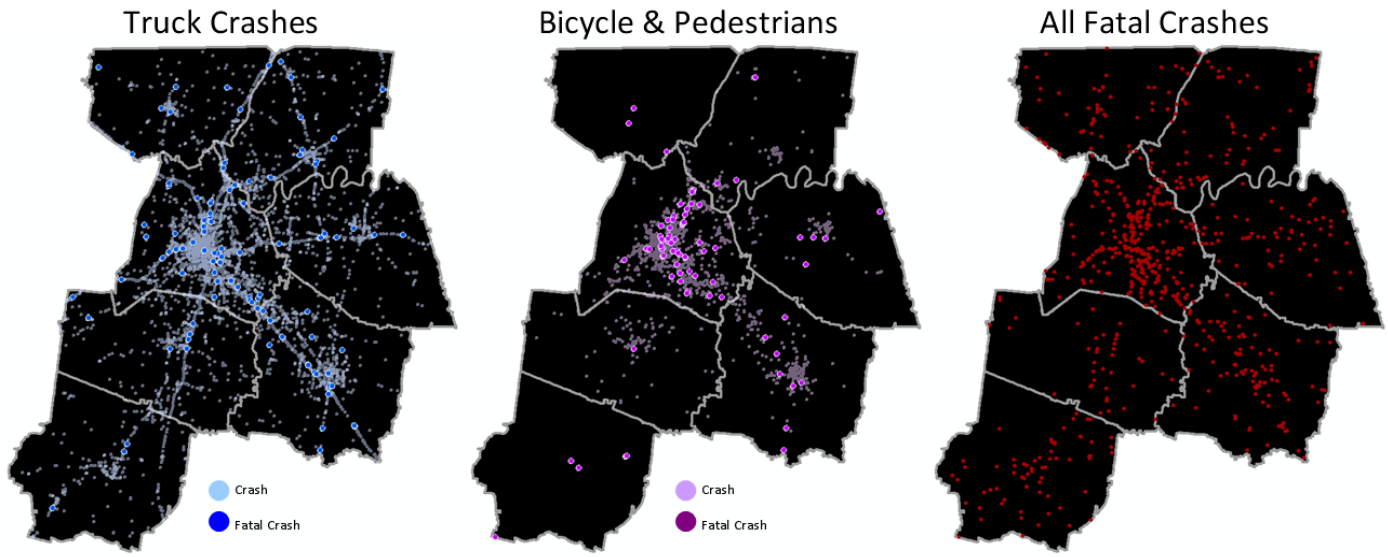
The MPO compiled information from a variety of sources to identify high crash locations on major roadways in the region. Although data were not analyzed by MPO staff in order to determine the specific causes of crashes at particular locations, the following observations were made:

- Most of the high crash locations listed were located at isolated spots or intersections rather than on longer segments of roadways; and
- More high crash locations occurred on uncontrolled access roadways than on controlled access roadways such as interstates.

Since the MPO is involved in a regional-level planning analysis, it is not practical to address all of the individual spot crash locations. That task is left to the state and local jurisdictions as specific improvements are proposed and implemented. The more appropriate means for the MPO to address high crash locations is to reward candidate projects proposing to make safety improvements at known high crash locations with additional consideration for funding, and to advocate safety conscious design principles into roadway improvement projects that are planned in order to promote safe transportation facilities for all modes of travel.

The following figure presents the locations of crashes across the region for the last five years, from 2005 to 2009.

Figure 29. Regional Crash Locations, 2005-2009



Source: Tennessee Department of Safety, NHTSA Fatality Analysis Reporting System, Nashville Area MPO

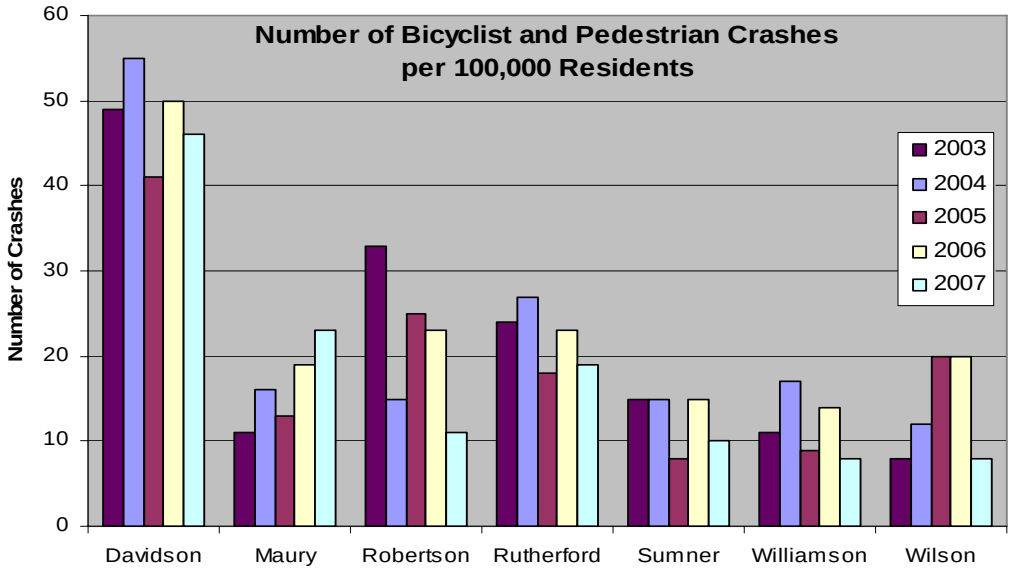
Bicycle & Pedestrian Safety

Increasing bicycle and pedestrian safety is one of the goals of this plan along with evaluating the existing levels of service and facility needs. In order to increase safety for bicyclists and pedestrians, the locations and characteristics of crashes need to be determined and analyzed so that specific facility improvements where necessary can be identified. Pedestrian and bicycle crashes are generally a function of exposure. Pedestrian and bicycle crashes occur more frequently in urban areas where traffic volumes and pedestrian facility use is higher than in rural areas. However, according to the Federal Highway Administration (FHWA), 65 percent of pedestrian crashes occur at non-intersections. Nationally, about half of bicyclist crashes with motor vehicles occur at or near intersections.

A bicycle and pedestrian crash analysis was undertaken as part of the MPO's recently completed Regional Bicycle and Pedestrian Study (2009). The study evaluated crashes involving bicyclist and pedestrians in the MPO area on state routes based on data provided by TDOT. The data were evaluated to determine areas and corridors in the MPO that need improvements to increase safety for bicyclist and pedestrians. This information can be utilized to help prioritize facility improvements. The data spanned the five-year time period between 2003 and 2007. According to the data, 2,076 reported crashes involving a pedestrian or bicyclist occurred within the MPO during this time period, 107 of which resulted in a fatality.

In the figure below, the number of bicycle and pedestrian crashes per 100,000 people for each year between 2003 and 2007 by each of the MPO counties are shown. The figure shows that Davidson County consistently has the highest number of crashes per 100,000 people, which is expected based on exposure and greater use within Davidson County compared to the outlying counties. The figure also identifies a reduction in bicyclist and pedestrian crashes in six of the seven counties since 2003. Any number of factors could contribute to such a trend, but the most likely factor is increased education and awareness for both motorists and non-motorists coupled with improved bicycle and pedestrian facilities.

Figure 30. Bicyclist & Pedestrian Crashes per 100,000 Residents by County, 2003-2007



Furthermore, the crash data were evaluated geographically on a corridor level for a three-year period (2003-2005). This analysis is limited to state routes and interstates within the MPO. Crashes that occurred on local routes have been excluded. The following roadway segments in the MPO were identified as high-crash roadway segments, with ten or more pedestrian crashes and five or more bicyclist crashes. As shown, seven segments in Davidson County had ten or more pedestrian crashes within the three-year analysis period, and one segment in Rutherford County had five or more bicycle crashes.

Table 9. High-Crash Bicycle and Pedestrian Roadway Segments, 2003-2005

Route	Street Name	Segment (between)	# Ped Crashes	# Ped Fatalities	# Bike Crashes	# Bike Fatalities
Davidson County						
SR 1	West End Ave	15th Ave & Cherokee Rd	13	0	4	0
SR 1	Lafayette St	Broadway & Fairfield Ave	11	0	0	0
SR 1	Murfreesboro Pk	Fairfield Ave & McGavock Pk	13	1	1	0
SR 11	Nolensville Pk	I-440 & Old Hickory Blvd	27	1	3	0
SR 11	Dickerson Pk	Jefferson St & I-65	21	3	3	0
SR 24	Charlotte Pk	I-40/65 & White Bridge Pk	14	2	2	0
SR 106	Hillsboro Pk, 21st Ave, Broadway	16th Ave & Abbott Martin Rd	11	0	3	0
Rutherford County						
SR 10	Memorial Blvd	W Thompson Ln & New Nashville Hwy	6	1	6	0

Source: Tennessee Department of Transportation. These data were for planning purposes only and are protected by USC 409.

In order to determine some overarching causes of pedestrian and bicycle crashes and deficiencies in non-motorized facilities, an analysis of crash characteristics was conducted. This analysis, which included all the crashes in the MPO between 2003 and 2005, determined that approximately 86 percent of all crashes involving bicyclists or pedestrians occurred with no adverse weather conditions. Approximately 48 percent of the crashes occurred in the evening after 5pm and 35 percent occurred when it was dark outside. Approximately half of the crashes occurred at intersections and half occurred at non-intersections or on roadway segments.

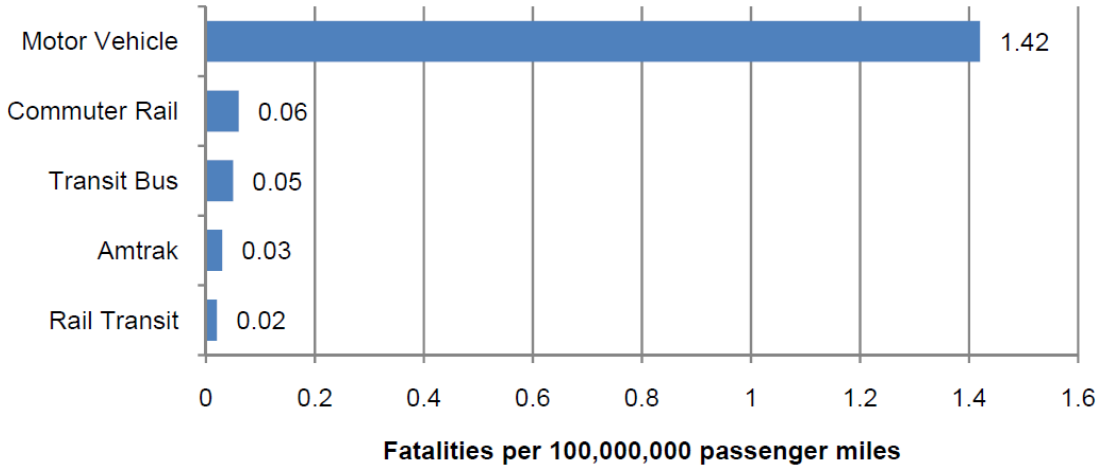
The MPO is working with the Tennessee Departments of Transportation and Safety to analyze bicycle and pedestrian crashes on local and regional roadways to find trends in crash causes such as behavior, time of day and weather conditions. Analyzing crashes by attributes will help MPO staff determine how to mitigate safety issues for bicycle and pedestrian modes. The MPO is also reviewing new reports that demonstrate pedestrian

safety increases with the presence of bicycle lanes (New York, NY) and safety for all modes increases with the presence of transit (Charlotte, NC). Understanding the causes of bicycle and pedestrian crashes and how safety for modes interrelate will help the MPO to make safety recommendations that will increase safety for all modes.

Safety on Public Transportation

Local transit agencies have always placed an emphasis on providing a safe, secure, and reliable service for its passengers and employees. These efforts are continuing and are an integral part of providing transit service and mirror the national observations for the overall safety of public transportation, especially as compared with the fatality rates of the automobile.

Figure 31. National Fatality Rates by Travel Mode, 2003-2008



Source: Federal Transit Administration (2009)

4.5 Freight Movement

The Nashville region occupies a strategic location within North America. It is within 650 miles of half the U.S. population and sits at the nexus of major highways and rail routes. This location has made the region a transportation hub for many industries, which have produced enormous benefits to the many communities throughout the area. However, this position as a crossroads also brings the region a set of challenges associated with various aspects of transportation, particularly highway congestion and air quality, as the major sources of those problems originate outside the area. The need to influence the overhead flow of through traffic becomes a clear priority for a metropolitan area wishing to control its own development destiny.

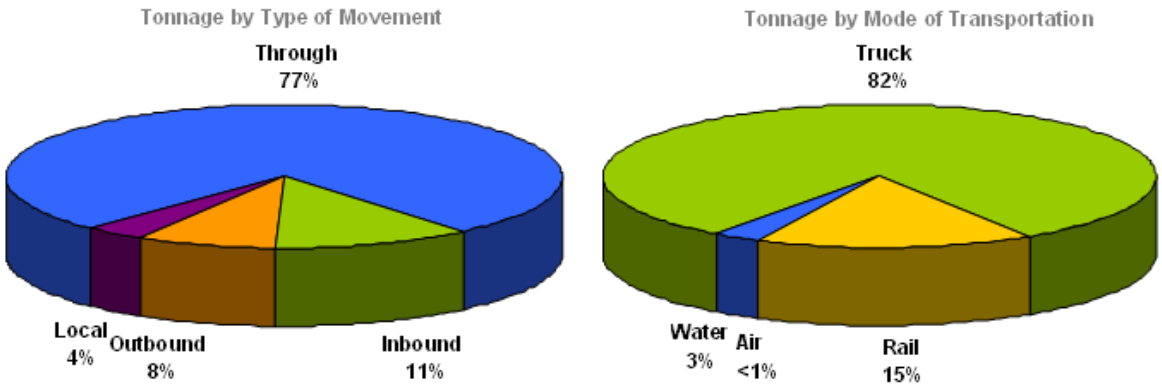
Through its freight planning efforts, the Nashville Area MPO is committed to developing a regional investment strategy that optimizes transportation infrastructure for the freight industry, while conforming to the Nashville region's overall goals for mobility, air quality, and economic development.

Existing Freight Flows

Nashville has an excellent distribution network at hand with highway, rail, air, and barge facilities all readily available. Three major U.S. interstate highways intersect in Nashville: I-40, I-65, and I-24. The area is served by numerous freight carriers with terminal locations throughout the metropolitan area and beyond. The Cumberland River provides full river barge access to the Gulf of Mexico. CSX Transportation serves Nashville with a major classification yard as well as container, automotive, and bulk terminals. Companies who arrange freight transportation on behalf of local businesses are also active in the Region.

Nashville's freight infrastructure carries significant tonnage of traffic through the year. The total volume is just short of 300 million tons. While all four modes of transport – truck, rail, water, and air - are represented, trucking far surpasses others in volume. Of the total tonnage moving in the Nashville Region, 87 percent is moving by truck. Rail service moves a substantially smaller volume at 11 percent of the total, and water and air have lesser volumes. Individual Profiles show the breakdown of tonnage by mode.

Figure 32. Travel Behavior of Freight (2007)



A substantial portion of the total freight traffic traversing the Nashville Region is "through traffic" with no origin or destination in the area. Nearly 80 percent of truck and rail tonnage combined is through traffic. Looking just at tonnage based in the area (excluding through traffic), Nashville is a medium sized freight market with a typically heavy reliance on the truck mode: 81 percent of area-based tonnage moves by truck, which is slightly above the 79 percent national average. The rail share of this volume is half the U.S. average, but that is common in markets where the water mode also is active.

Truck Freight Overview

The Nashville Area supports over 47,000 trucks per day. The majority of trucks by unit count are classified as through traffic – just over 34,000. The smaller inbound and outbound volumes are fairly well matched - in the neighborhood of 11 percent. Truck movement is an integral segment of any freight transportation system as highly evidenced in the Nashville region. While all four modes of transport – truck, rail, water, and air – are represented, trucking accounts for the majority of freight volumes carried inbound, outbound, locally, and through the area. Of the 298,171,394 tons of freight handled in 2007, 82% was transported by truck.

Davidson County accounts for the majority of inbound and outbound traffic in the Nashville region. This is to be expected given the fact that Davidson County is the "hub" of the region in terms of population, employment, and the cross-roads point of the Interstate system. This does not necessarily translate to greater efficiency of trips because the variety of commodities, in conjunction with the diverse type and number of motor carriers in the region, generates empty trips by trucks.

Like inbound and outbound freight, local movements, where trips originate and terminate within the region, mostly occur within Davidson County. Local movements mostly occur on collector and local roads and typically employ a greater number of drivers with knowledge of area roadways. Travel along local and collector roadways may be an attempt to reduce mileage or travel time between stops, increase productivity, or result as an alternative to a delay occurring on the arterial or interstate systems.

Traditional highway assets supporting truck movement are under increasing pressures to identify alternative infrastructural systems that will specifically expand truck capacity. Coalitions across the country are actively

reviewing structural implementations such as dedicated truck lanes (DTL), increased length and weight regulations, and private sector equipment design programs. These capacity enhancements have the potential to reduce trip miles and load counts.

On Road Freight Facilities

The Nashville Region has about 1,200 lane miles of Interstate and about 8,300 total lane miles. This provides access either for long-haul or "final mile" of an intermodal shipment.

The recently completed *Freight & Goods Movement Study: Phase II* determined a network of preferred routes currently utilized to fulfill the needs of freight generators. This system of preferred routes is categorized based on the intended use or functional classification of the roadways in conjunction with the volume of truck traffic. The Primary Freight Highway System (PFHS) consists of interstates and US highways that are observed with an aggregated volume illustration compiled from all four directions. The PFHS may include arterials that exhibit truck volumes consistent with interstate and US highways. The Secondary Freight Highway System (SFHS) consists of arterials and collectors where larger truck volumes are present, as in the Primary System. This system should further reflect roadways that contribute to the overall mobility of the two systems. A third category, Connector Freight Highway System (CFHS), are those roadways similar to the Secondary Freight Highway System, but appear to supply access to a specific geographical area and thus do not contribute to overall mobility of the region's freight transportation system.

Air Freight Overview

Increasing fuel and security costs have driven overall operating costs up substantially for the air industry. However, domestic cargo competition for goods that might be moved by air has grown due to carrier consolidation and trucking market-share gains. E-commerce, globalization, and increased competition are driving demand for just-in-time shipments, along with new technological advances and increased efficiencies.

The Airport and Airway Trust Fund (AATF), created by the Airport and Airway Revenue Act of 1970, provides funding for the federal commitment to the nation's aviation system through several aviation-related excise taxes. Funding currently comes from collections related to passenger tickets, passenger flight segments, international arrivals/departures, cargo waybills, aviation fuels, and frequent flyer mile awards from non-airline sources like credit cards. The Tennessee Department of Transportation Aeronautics Division administers Federal and State funding to assist in the location, design, construction and maintenance of Tennessee's diverse public aviation system.

Of the nearly 20,000 airports in the U.S., there were about 106 qualifying cargo airports in 2009, according to Airports Council International. Nashville International Airport (BNA) is the only airport in the Nashville region to make this list. Total air cargo tonnage equaled 69,499 tons in 2007 with the majority of air freight moving outbound (66 percent). Overall, the airport has experienced a 14 percent average annual growth rate in the last 12 years. In 2007, approximately 55% of the cargo tonnage at the Airport was domestic air freight and about 45% was international air cargo. The major commodities transported by carriers at the airport are comprised mostly of small mixed shipments. Other key commodities are machinery, fabricated metal parts, printed material, and transportation equipment specifically motor vehicle parts and accessories.

Air cargo tonnage at the airport has increased steadily since 1997 after experiencing a dip in activity in the years following 9/11. Air cargo traffic fell precipitously in the United States in 2008 and 2009 as a result of the global recession, a decline that was nearly twice as much as that experienced in 2001 from the 9/11 attacks. The severity of the air freight slump is partially driven by manufacturers seeking to correct large inventory "overhangs" that emerged in late 2008. The lingering decline in air freight is also the result of international

shippers switching to maritime containerized shipping. While this mode is a much slower transport alternative, the cost savings are considerable. More importantly, it is unclear if this shift to container shipping will reverse as the economy rebounds.

For the past decade, rising fuel costs and more cost conscious shippers have created a shift in focus from overnight express to time-definite service. Coupled with financial and cost-saving measures, air cargo shippers are increasing the use of trucks on longer routes that were traditionally served by aircraft. This modal shift is particularly pronounced within the integrated express carrier community. In addition, less-than-truckload (LTL) companies have become major competitors to air freight. These trucking companies enjoy a significant cost advantage over air cargo carriers because of lower capital costs for equipment and lower wage scales. These trends do impact interstate highways such as I-40 as integrated express companies rely more on trucking to airports from distant markets. Integrated express truck operations face the same traffic congestion issues other trucking firms face. Most congestion issues for integrated express carriers occur in metropolitan areas, near major bridges and, to a degree, in the vicinity of airports. This is critical since integrated express companies' measure on-time performance in one-minute increments as opposed to 15- or even 60-minute increments utilized by some trucking companies.

Air transport can impact the local highway network when dealing with delivery of those goods between the airports and their origin or destination within the region. However, in comparison to the freight truck flows on the roadways, air freight contributes very little congestion to the region. However, an over-dependence on highway transportation leads to traffic congestion and lost time, which will, in turn, negatively impact economic growth. This combination of factors has driven efforts to promote intermodal transportation development that incorporates aviation.

Air Freight Facilities

Within Nashville Area MPO area there are three airports that have facilities capable of shipping and receiving goods by air:

International Airport (BNA): The largest and most active airport is the Nashville International Airport (BNA), with almost 70 thousand tons of freight annually in 2007. According to Airports Council International, BNA ranked 61 in total air cargo tonnage handled in North America in 2008. The Nashville International Airport is second busiest passenger airport in the state following Memphis International. The Nashville Airport covers more than 4,460 acres and is served by 16 scheduled air carriers.

The Nashville Air Cargo Link all-cargo complex is located across the airfield from the passenger facility. The Air Cargo Link complex helps meet the high speed goods movement needs of area industries. Automotive manufacturers and health care facilities in particular rely on air cargo to keep their assembly lines moving and health care facilities supplied. FedEx operates a regional sort center at the airport. UPS used to operate aircraft at this facility but, within the last two years, switched to trucking air cargo to their global hub at Louisville Sanford International Airport (SDF). Until 2009, the airport received freighter flights on China Airlines 747 aircraft six days per week. This China Airlines flight supported Dell Computer's nearby assembly and distribution facility. This flight now arrives in Birmingham and Dell products are trucked to their Nashville facility. Air cargo, at BNA, dropped considerably in 2009 as a result of the China Airlines flight relocating to Atlanta or Birmingham. The US Postal Service maintains an air transfer station at the airport to expedite the shipment of mail via belly cargo on passenger airlines. Additionally, there is an array of transfer agents, freight forwarders, ground trucking companies, and contracted cargo carriers that rely on the airport to conduct business. The east side of the airport accommodates the freight services of the airlines – belly freight. The west side is the Air Cargo Link,

where Dell has two facilities. Trucks servicing the Air Cargo Link, on the west side, use Briley Parkway for access. Trucks servicing the freight needs (belly freight) for commercial airlines, on the east side, use I-40 for access.

John C. Tune Airport (JWN): John C. Tune Airport (JWN) is located on the west side of Nashville off Briley Parkway, and is owned and managed by the Metropolitan Nashville Airport Authority. It serves an important niche in Nashville's metropolitan economy by catering to corporate and personal aircraft users. The airport is capable of accommodating freight shipments, but it does not offer scheduled air cargo services.

Smyrna/Rutherford County Airport (MQY): Located twelve nautical miles south of Nashville, Smyrna/Rutherford County Airport (MQY) is the "reliever" airport for Nashville. With more than 1,700 acres, MQY is the third largest airport in Tennessee and the busiest general aviation airport in Tennessee and has an 8,000 foot runway which can handle up to 747's. The airport is within ten miles access to rail and three interstate systems which bisect Middle Tennessee. MQY handles corporate aviation, cargo, and aviation maintenance. Cargo is currently limited, but is use they contemplate expanding upon.

Waterborne Freight Overview

The U.S. Army Corps of Engineers (USACE) is responsible for 12,000 miles (19000 km) of the waterways. This figure includes the Intracoastal Waterways. Most of the commercially important inland waterways are maintained by the USACE, including 11,000 miles of fuel taxed waterways. Commercial operators on these designated waterways pay a fuel tax, deposited in the Inland Waterways Trust Fund, which funds half the cost of new construction and major rehabilitation of the inland waterways infrastructure. The U.S. Army Corps of Engineers maintains lock and dam structures at Hickory Lock and Dam upstream between Nashville and Gallatin and Cheatham Lock and Dam located downstream. Should the waterway become victim to neglect, the primary goods it supplies to the Nashville Area must continue to move. If they cannot go to the at-capacity rail network, they will add many slow and heavy trucks to the road system, affecting congestion, air quality, and highway maintenance budgets.

Water borne cargo is typically associated with bulk commodity movement on barges in either short or long haul environments. With limited interest and success, conversion of water barge service to a container on barge (COB) or trailer on barge (TOB) operation is occurring. One of the prominent efforts is occurring in Alabama and Mississippi with expansion of dockside service at the Port of Mobile, extending through to the Tennessee-Tombigbee waterway. The successful implementation of both COB and TOB service on this line may prompt introduction and diversion of this service in other parts of the country, where applicable. Though no readily identified efforts exist, adoption of this modal variant has the capacity to divert a percentage of highway and rail traffic in the Nashville market.

Substantial changes in traffic volumes are not anticipated, so current capabilities should remain sufficient, and allow the river to continue as a low-cost method of supplying basic and heavy bulk goods to the Nashville Area community and industry. Access to and from the water is still considered adequate with sufficient roadway access and multiple interstate highways paralleling, crossing, and radiating from the Cumberland River.

Waterborne Freight Facilities

Nashville lies on the banks of the Cumberland River, an important waterway in the Southeastern United States that provides full river barge access to the Gulf of Mexico via the Ohio River. The waterway flows through southern Kentucky, looping through northern Tennessee before returning north to join the Ohio River after a course of 687 miles. Most of the river below Lake Cumberland's Wolf Creek Dam is navigable because of several locks and dams. Dams at various locations of the Cumberland River have created large reservoirs for recreation such as Lake Barkley, Lake Cumberland, Cordell Hull, Old Hickory, and Cheatham Lake. Laurel Lake, the Dale

Hollow Reservoir, and Percy Priest Lake are each created by dams located just upstream from their respective confluences with the Cumberland River.

The majority of water transport is mostly inbound. Most of the freight is delivered by truck to nearby locations – usually terminating within twenty to thirty miles of the riverside. Steel for automotive plants, for example, is supplied in part by water and trucked south from Nashville. Aggregates like sand and gravel are the chief form of outbound traffic, and primarily originate at locations adjacent to the riverbank. Water carries approximately 3 percent of the total tons of freight in the Nashville region. 96 percent of the total tons of water freight are inbound to Nashville and Gallatin. Water freight transport is very limited by the available docking and inland waterways available for cargo shipments.

For water freight, the two largest commodities are coal and nonmetallic minerals, accounting for 85 percent of the total water freight in the Nashville region. It is very common for these two commodities (coal and nonmetallic minerals) to be the largest commodities carried by barge due to the fact that heavy, non-perishable goods are most compatible with water movement. Most of the coal is delivered to the Gallatin power plant. Almost all the nonmetallic minerals (typically gravel and sand) traveling by water are going to Nashville. Ingram Barge Company is the primary provider of water related goods movement.

Rail Freight Overview

Approximately 650 railroads operate about 150,000 route miles infrastructure in the United States. Class I railroads are the primary freight haulers for most of the country. There are seven National (Class I) railroads in the U.S. and Canada. They are fed by Regional(Class II) and Short-line (Class III) railroads. Most railroads are privately owned and operated. For this reason, improvements in capacity are generally part of a rail carrier's capital program with little input from the public sector.

Rail diversion has gained increased support in the past decade, though this has equal detractors citing rail infrastructural capacity constraints, in light of proposed increased presence of passenger rail and desired business models by the Class I and Short line operators. This mode is due to be significantly influenced by the development of numerous projects, to provide service from the east coast ports to the Midwest by Class I carriers. Continued development of capacities to provide continental transit, independent of Nashville oriented routes, may lessen the impact of through volumes.

In the past several years, the rail industry has embarked on a number of "public-private partnerships" designed to secure public funding for capital investments that increase rail capacity in designated high volume freight corridors such as The Heartland Corridor by Norfolk Southern and the National Gateway project by CSX Corporation. One of these initiatives, the $2 billion Crescent Corridor, has been developed by Norfolk Southern Railroad (NS) in conjunction with federal, state and local governments. The proposed route runs in a crescent shape along the railroad's southeast rail line paralleling Interstate 81, a key congested highway route connecting markets in the Northeast, Mid-Atlantic, and Southeast United States.

The corridor is 1,400 miles long and 28 new trains daily would be expected to go into service along with improvements to rail yards along the corridor. Construction on the first phase began in 2008. The Crescent Corridor's public benefits include improved roadway safety and air quality, stemming from the projected reduction of trucks on highways.

The Crescent Corridor would expand the entire NS network from the Northeast to the Southeast with implications for the Nashville Region’s traffic congestion, air quality, and access to the Memphis freight network. The Corridor has the potential to significantly improve rail access between Memphis, Knoxville, and major northeast metropolitan areas served by NS, including Washington, D.C., Philadelphia, and New York. A Memphis

regional terminal will be an anchor for the Crescent Corridor, and the new facility will help make possible truck-competitive freight transportation between the Nashville Region and major Northeast markets. The Crescent Corridor and the Memphis intermodal terminal will expand the role of freight rail in the Nashville Region with recently approved TIGER funds.

The Crescent Corridor is anticipated to absorb more than one million truckloads of freight from the highways to the rails annually, saving the U.S. more than 170 million gallons of fuel per year. This will not only relieve traffic congestion throughout the region but also help the environment by removing trucks from long-haul transport. While focusing primarily on domestic traffic, the Corridor will also improve transit time to the Port of Norfolk as well.

Rail Freight Facilities

Nashville is a crossroads for rail as it is for the highway. The Nashville area is served by the following Class I and two short line railroads:

CSX Transportation: Nashville Area's single Class I railroad, CSX Transportation (CSXT) operates 22,000 route miles in 22 eastern and Midwest states, the District of Columbia, and two Canadian provinces. Its network stretches from Chicago, East St. Louis, Memphis, and New Orleans to the eastern Great Lakes, Boston, New York, Philadelphia, and Baltimore on the east and down the Atlantic coast to Tampa and Miami.

CSXT's Tennessee Operating Division Headquarters are located in Nashville. They manage 1,377 track miles, two major rail yards, and nine terminals. The Nashville Area facilities include a major classification yard (Radnor), intermodal terminal (Nashville), TRANSFLO terminal (Nashville), and three TDSI automotive distribution terminals (Nashville, Smyrna, Spring Hill). Radnor Yard is a key hub in the CSX system. Sixty trains per day are routed through the Nashville Area toward five key cities: Atlanta, Birmingham, Chicago, Louisville, and Memphis. Forty of these trains simply pass through; the rest are "hubbed" in a classification yard, with the majority of railcars sent out again on a different train set.

The orientation of CSX lines in Tennessee is chiefly north-south, with a spur west from Nashville to Memphis, but none eastward. A second Class I railroad, the Norfolk Southern (NS), has a network orientation running northeast-southwest. The NS has a curving east-west line between Memphis and Knoxville via Huntsville and Chattanooga, skirting Nashville and lying over 100 miles to the south.

Nashville & Eastern Railroad (NERR): Nashville & Eastern Railroad runs 110 miles from Nashville east to Monterey, TN. NERR is a short-line railroad that has worked collaboratively with the Tennessee Department of Transportation (TDOT) and the Nashville and Eastern Railroad Authority (NERA). NERR does not offer intermodal services and are somewhat limited in their abilities to expand, however they carry important goods from Nashville to east Tennessee. They serve about 40 industries and are responsible for moving about 9,000 carloads a year.

Nashville & Western Railroad (NWR): As a sister railroad to NERR, NWR runs 18 miles from Nashville west to Ashland City, TN. NWR is a short-line railroad that has worked collaboratively with the Tennessee Department of Transportation (TDOT) and the Cheatham County Railroad Authority. NWR does not offer intermodal services and are somewhat limited in their abilities to expand, however they carry important goods from Nashville to Cheatham County. They serve about 7 industries and are responsible for moving about 600 carloads a year.

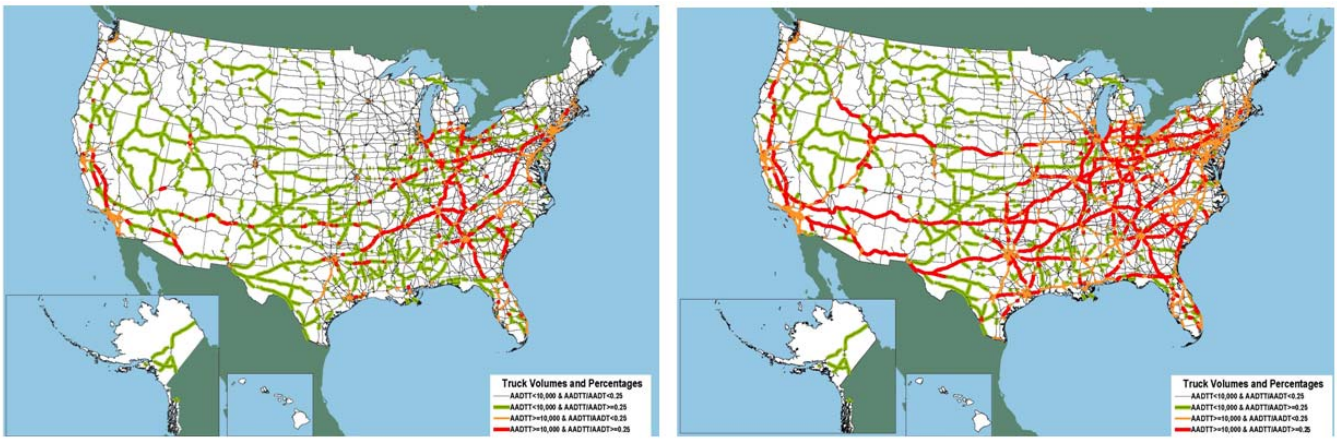
Freight Flow Forecasts

Nashville's freight infrastructure is projected to carry around 400 million tons of freight in 2035 compared to 2007 volumes of around 300 million tons. The Nashville region is currently serviced by all modes of goods

movement including highway, rail, air, and barge facilities. Nashville is situated at the convergence of three major U.S. interstate highways: I-40, I-65, and I-24. With a central location in the East-Central United States, it can be expected that freight traffic volumes in the Nashville region will continue to grow. According to the Transearch dataset, freight tonnages impacting the Nashville region are anticipated to increase 35 percent between 2007 and 2035. This compares to a 124 percent expected growth for the combined Richmond and Tri-Cities MPO's in Virginia(from 2004 to 2035) and a 78 percent projected growth for the Atlanta Regional Commission (ARC) MPO (from 2004 to 2030). In today's global economy, improving freight mobility in metropolitan transport networks can result in substantial cost savings to regional business and ultimately increase the Nashville region's economic competitiveness.

Future growth is closely related to economic development and quality of life issues that deal with the externalities associated with increasing goods movement demands. The Nashville region's status as a crossroads in the transportation networks of the Eastern U.S. makes freight transportation a key component of current and future economic health. Transportation and material moving occupations employ almost 9 percent, ranking third, of those employed across all occupations within the Nashville MSA. Though geography heavily influences the dominance of this industry and employment sector, increasing levels of delay and reliability concerns pose a threat to corridor usage through the region. Alternative routings, where currently not selected due to circuitous miles, become viable as transit times deteriorate.

Figure 33. Major Truck Flows on the National Highway System, 2002 and 2035

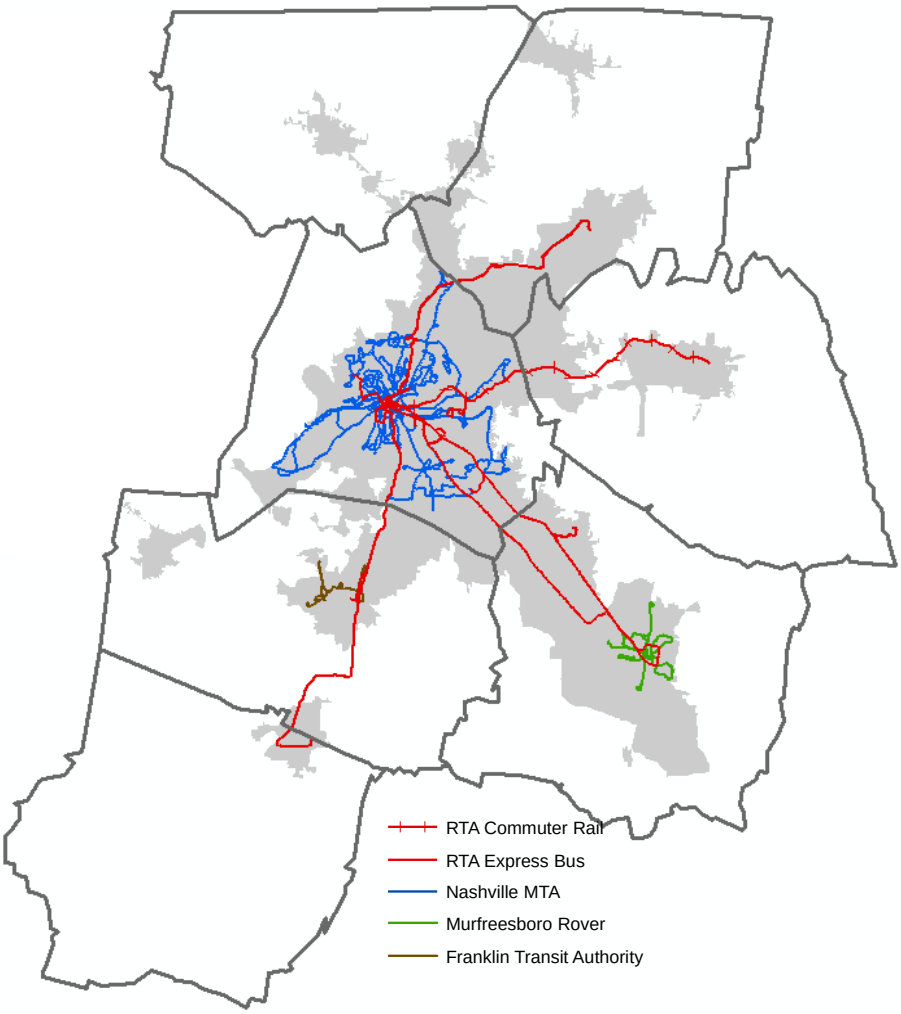


Source: US DOT Federal Highway Administration (2007)

4.6 Public Transportation

The Nashville area is served by multiple transit agencies that provide a variety of services to Middle Tennesseans ranging from rural demand response service to vanpool services to commuter rail services. The following figure presents an overview of the existing urban fixed route services offered by the Regional Transportation Authority, the Nashville MTA, the Franklin Transit Authority, and the Murfreesboro Rover. A description of each of the Nashville area's transit agencies, and the services they offer follows.

Figure 34. Existing Urban Fixed-Route Transit Service



Regional Transportation Authority

The Regional Transportation Authority (RTA) is a nine county authority created by state statute in 1988 to encourage transportation alternatives and develop a regional mass transit system. RTA oversees the operation of a variety of regional transit services that including the area's first commuter rail line. RTA also offers the following services:

- Commuter rail service in the East Corridor to Mt. Juliet and Lebanon,
- Express commuter bus services in the South Corridor to Franklin,
- Express commuter bus services in the Southeast Corridor to Murfreesboro,
- Express commuter bus services in the Northeast Corridor to Hendersonville and Gallatin,
- Guaranteed Ride Home Program, which provides regular customers a taxi ride home in case of an emergency,
- RIDE, a commuter rideshare matching program,
- Employer-based promotions to encourage carpools, vanpools, and transit ridership,
- Development of park-and-ride lots.

Nashville Metropolitan Transit Authority

The Metropolitan Transit Authority (MTA) was formed in 1973 for the purpose of stabilizing existing public transportation services and meeting other transportation needs of the citizens within Davidson County and visitors who visit the city and local areas.

The Nashville MTA provides public transportation services, local and express routes, to citizens and visitors within the Metropolitan Nashville area and is a component unit of the Metropolitan Government of Nashville & Davidson County. MTA operates 36 bus routes throughout Metro-Davidson County and now provides more trips than at any other time in recent decades. Nashville MTA reached a milestone in ridership by providing our community with 9.4 million rides in fiscal year 2008. This is nearly an 11 percent increase over the previous fiscal period and almost 1 million additional trips when compared to the previous year. Average rides per weekday are 30,000. Nashville also has contracts with the Regional Transportation Authority (RTA) to provide management services for the RTA and to run bus service to Murfreesboro and the Music City Star bus shuttles. In addition, the Nashville MTA provides special door-to-door paratransit services (AccessRide) for seniors and people with disabilities that are unable to ride the larger buses on the fixed routes.

MTA has formed several unique EasyRide transit partnerships with organizations which pay for their employees transit commute to and from work and school. Metro Government has recently joined others such as Vanderbilt University and Medical Center, Belmont University, the State of Tennessee, Bass, Berry & Sims, LP Building Products, the U.S. Corps of Engineers, U.S. Bankruptcy Court, U. S. Probation Dept., and area hotels such as Holiday Inn Select Vanderbilt, Renaissance Hotel, Hilton Hotel and Hampton Inn in participating in the Easy Ride program.

In October 2008, MTA opened Music City Central (MCC) Station which is a multi-level indoor transfer facility in the heart of downtown Nashville. This indoor facility has customer waiting rooms, a ticketing and information booth, and a coffee shop. A new state-of–the-art 800 MHz radio and data transmission system for all buses is also being implemented in phases over the next year. Once completed, this system will give customers access to "real time" bus arrival and departure information via digital signage around town, at the MCC, and in the future, via the internet.

Nashville MTA currently has 137 fixed route buses, 63 AccessRide buses and 475 employees. A five-member Board of Directors, appointed by the Mayor and approved by the City Council, governs the Nashville MTA. A management team, headed by a Chief Executive Officer (CEO), oversees the day-to day operations. Nashville MTA receives funding from federal, state, and local governments to supplement its operating revenue.

Franklin Transit Authority

On May 14th, 2003, the City of Franklin held its new trolley service dedication with a ribbon cutting where over 200 area residents and city/state officials attended the event. Preview rides on the vintage trolleys were provided and Daily trolley service started officially on May 15, with four daily routes. The FTA, which is operated under contract by The TMA Group, offers a unique Flexible service. Anyone who needs to be picked up or dropped off within three-quarters of a mile of the standard trolley route can call and make a reservation for pickup. The trolleys are all wheelchair accessible. FTA also provides *Transit On DemandD* (TODD), a pre-arranged curb-to-curb pick-up and drop-off service as well as all-day, same-day access to the Franklin Trolleys. Use of TODD requires reservations and the fares are based on a zone-based.

In March 2010 FTA implemented service changes that included the following:

- Expanded service hours on fixed route from 6:00 am to 6:00 pm (was 9:00 am to 6:00 pm);

- The Gold route was eliminated and replaced with the new 30 minute TODD Service;
- The Red and Green routes were be combined;
- Provided better service to Embassy Suites, Corporate Centre Buildings, Nissan Corporation, Marriott, Meridian complex and Gillespie Drive – Alara Farms;
- Increased transit accessibility to work force of Cool Springs during lunch hours;
- The 2-bus system takes in the majority of the area that riders are traveling.

Murfreesboro Rover

The City of Murfreesboro Public Transportation Department is responsible for the administration and operation of public transportation service (Rover) within the City of Murfreesboro. Service is provided from 6 AM to 6 PM along eight fixed-routes. Each bus in the Rover fleet is lift-equipped, which means that all buses are accessible to passengers who use wheelchairs. If a disability prevents a customer from using the regular Rover service, paratransit services also are available through Mid-Cumberland Regional Transit System (MCRTS).

Rover began service to the public in April of 2007, providing comfortable and convenient bus transportation for the citizens of Murfreesboro along eight routes throughout the city. To find a name for the new service, the City of Murfreesboro held a city-wide contest to find a name for its public transportation system, offering a prizes including a free year's pass to ride the system's buses and the honor of being the first person to ride the new transportation system. The purpose of the contest was to involve the community and create some excitement and energy around public transportation in Murfreesboro.

A panel of citizen judges reviewed hundreds of entries based on the criteria of creativity, uniqueness, applicability to Murfreesboro, ability to create visual interest and overall viability as a name. They chose the name "Rover," submitted by 4-year old Savannah Leigh Bowen, because they liked the double entendre aspect as applying to movement as well as to the visual aspects of being able to use canine attributes like a friendly puppy or paw prints as icons.

Mid-Cumberland Human Resource Agency Rural Paratransit Service

Enhancing access to Tennessee's non-urbanized areas and connecting thousands of people to jobs, schools and other destinations, the Mid-Cumberland Human Resource Agency (MCHRA) Public Transit serves as a vital function in meeting the mobility needs of thousands of people. As a mass public transportation service, it provides a basic level of rural mobility to those who depend on some form of public transportation.

MCHRA Public Transit provides rural mass public transportation service to 12 counties including Cheatham, Dickson, Houston, Humphreys, Montgomery, Robertson, Rutherford, Stewart, Sumner, Trousdale, Williamson, and Wilson counties using a fleet of vehicles that are accessible for the physically disabled.

Originally, MCHRA Public Transit was the Senior Citizens Transit System, serving people age 60 or older. Today, it is a full-fledged mass public transit system with a strong commitment to senior citizens and people with disabilities. MCHRA is proud to have a 72 percent accessible fleet.

Tennessee Department of Transportation Intercity Bus Service

Until the late 1970s, Greyhound bus and other urban transit services provided connections to rural Tennessee that knitted communities together, spurred economic development and enhanced community life. As automobile ownership became economically feasible for more families, citizens bought cars and much of the transit network, along with the social connections it created, quickly disappeared.

The Amish community was one of the hardest hit by the discontinuation of bus service. Unable to drive cars, the Amish must find alternative means for traveling 80 miles or more to Nashville to access medical care, shopping, and other goods and services. Moreover, the lack of bus service diminished tourism revenue, stunting the growth of an important industry.

In response to growing public demand, the State of Tennessee implemented the Tennessee Intercity Bus Demonstration Program in 2008. Designed and managed at the state level, the program responds to local needs and provides residents and visitors the opportunity to choose public transportation to meet their mobility needs. Since the onset of the project, the State of Tennessee Division of Multimodal Transportation Resources has distributed $3.6 million in Intercity Bus funds to seven transportation providers. This year, newly available ARRA funds will allow for an additional investment of $3.2 million. Combined with Tennessee's share, this reinvestment will allow the program to cover up to 98 percent of the State by the end of the program.

The Federal Transit Administration (FTA) and TDOT provided funds to Anchor Trailways Tours for the purchase of four new buses which offer service seven days a week to Nashville MTA and RTA train stations, and the Nashville Greyhound station. In addition to transporting Amish residents, the new buses and routes foster economic growth by expanding tourism and enabling visitors to "take a step back in time".

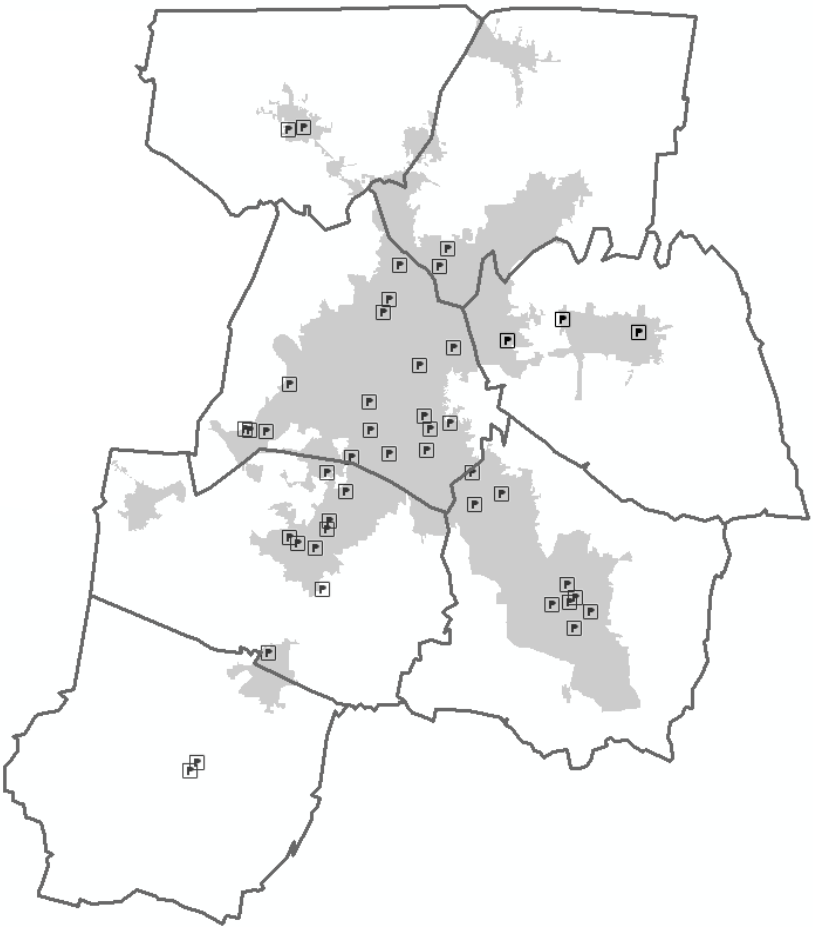
The Tennessee effort exemplifies rural livability. Coordination had to be achieved between many stakeholders including the Nashville Area MPO and local city and county officials throughout fifteen counties. The end result provides the Amish community, and others, an affordable, efficient way to access urban areas and enjoy greater independence.

Figure 35. Tennessee Intercity Bus Service

Regional Park & Ride Lots

The greater Nashville region has many Park & Ride lots. Of the official lots, some have been built exclusively as Park & Ride, but most have been developed with agreements with churches or shopping areas. In addition to the official lots, there are many unofficial lots that are used by commuters who are carpooling or vanpooling. The following figure shows Park & Ride lots in the MPO planning area.

Figure 36. Existing Park & Ride Lots



The following table presents a listing of area-wide Park & Ride lots. As shown, most of those are shared lots with churches or shopping areas. This has the advantage of being low cost for the transit agencies providing bus service and also bringing potential customers to malls in days when the lots are likely to have plenty of parking. On the other hand, these lots are not as visible as lots located along a highway might be—and that additional visibility can help to draw potential customers for express bus service or ridesharing.

Table 10. Regional Park & Ride Lot Locations

County	Location/Description	Spaces Occupied
Davidson	Long Hollow Pike - K-Mart Goodlettsville (serves MTA Route 35X Rivergate Express)	60
Davidson	Rivergate Mall (serves MTA Route 35X Rivergate Express)	128
Davidson	Madison Square Shopping Center (serves MTA Route 26 Gallatin)	38
Davidson	K-Mart – Madison (serves MTA Routes 26 Gallatin, 56 BRT and 34X Opry Mills Express)	70
Davidson	Temple Church - Kings Lane (serves MTA Route 22 Bordeaux)	16
Davidson	M.T.A. Bellevue Park & Ride (serves MTA Routes 3 West End and 24X Bellevue Express)	88
Davidson	Staples - Bellevue - Park & Ride (serves MTA Routes 3 West End and 24X Bellevue Express)	69
Davidson	Bellevue Plaza (serves MTA Routes 3 West End and 24X Bellevue Express)	20
Davidson	Dollar General - Hickory Plaza (serves MTA Routes 12 Nolensville Road, 37X Tusculum/McMurray Express)	38
Davidson	Hickory Hollow Mall (serves MTA Route 15 Murfreesboro Road and 33X Hickory Hollow Mall/Old Hickory Express)	237
Davidson	Smith Springs Church of Christ (serves MTA Route 38X Antioch Express)	155

County	Location/Description	Spaces Occupied
Davidson	Una Church of Christ (serves MTA Route 15 Murfreesboro Road)	51
Davidson	Southminster Presbyterian Church (serves MTA Route 12 Nolensville Road)	49
Davidson	Crieve Hall Church of Christ (serves MTA Route 12 Nolensville Road)	20
Davidson	Music City Star - Donelson Station, 2705 Lebanon Pike, north of the intersection of Donelson Pike and Bluefield Ave. (also serves MTA Route 6 Lebanon Road and 34 Opry Mills Local via Donelson)	230
Davidson	Music City Star - Hermitage Station at 4121 Andrew Jackson Pkwy. (also MTA Route 6 Lebanon Rd)	280
Wilson	22 East Division St, Mt. Juliet with direct access from Division Street (parking for Music City Star)	220
Wilson	65 Martha Circle (State Rte 109 and Powell Grove Road) in Lebanon (parking for Music City Star)	75
Wilson	334 West Baddour Parkway, Lebanon (parking for Music City Star)	140
Sumner	Gallatin Wal Mart (Serves RTA Route 92X Gallatin, Hendersonville Express)	36
Sumner	Hendersonville Kohl's (Serves RTA Route 92X Gallatin, Hendersonville Express)	23
Sumner	Oak Street and Park Street, Westmoreland	N/A
Rutherford	Mercury Plaza (Serves RTA Route 96X Nashville/Murfreesboro Relax and Ride)	12
Rutherford	Tennessee-Rehabilitation Center (Serves RTA Route 96X Nashville/Murfreesboro Relax and Ride)	0
Rutherford	Smyrna – K-Mart (Serves RTA Route 96X Nashville/Murfreesboro Relax and Ride)	28
Rutherford	I24 and Waldron Road, LaVergne	N/A
Rutherford	I24 and Sam Ridley Parkway	N/A
Rutherford	SR 840 & US 41-US 70S (Murfreesboro Road)	N/A
Rutherford	Edge-O-Lake Park & Ride (serves RTA Route 96X Nashville/Murfreesboro Relax and Ride)	N/A
Rutherford	Agricultural Center SR 99 (off SR 96 near I-24)	N/A
Rutherford	LaVergne – Kroger (Serves RTA Route 96X Nashville/Murfreesboro Relax and Ride)	24
Rutherford	Bell Road & Murfreesboro Road (Serves RTA Route 96X Nashville/Murfreesboro Relax and Ride)	4
Davidson	Donelson Plaza and Cliffdale Road (south of Old Lebanon Pike)	N/A
Wilson	I40 and Mt. Juliet Road off Belinda Parkway	N/A
Wilson	I40 and SR109 off Safari Campground Road	N/A
Wilson	Valley Center on Mt. Juliet Road	N/A
Williamson	I40 and Highway 96	N/A
Williamson	Brentwood Civilian Ballpark (parking for RTA Route 91X Franklin/Brentwood Express)	N/A
Williamson	Cool Springs Lowes (parking for RTA Route 91X Franklin/Brentwood Express)	N/A
Williamson	Williamson Square Shopping Center (parking for RTA Route 91X Franklin/Brentwood Express)	N/A
Williamson	Thomson's Station Baptist Church (parking for RTA Route 95X Spring Hill Express)	N/A
Williamson	Spring Hill Kroger on Port Royal 9 (parking for RTA Route 95X Spring Hill Express)	N/A

Source: MPO Counts (Summer 2008)

Regional Transit Ridership Trends

Nationally, public transportation ridership grew 36 percent from 1995 through 2008, almost three times the growth rate of the U.S. population (14 percent) and substantially more than the growth for vehicle miles of travel (VMT) on our nation's streets and highways (21 percent) over the same period. In 2008, Americans took more than 10.7 billion trips on public transportation, or 35 million trips each weekday.

Regionally, after a long period of declines during the 1980's and 1990's, ridership in the first decade of the 21st century is expanding in the greater Nashville area. The largest component of this expansion is the Nashville MTA which makes up the largest portion of transit service and transit ridership in the region. But other transit organizations are also increasing transit offerings outside of Davidson County. Several new agencies have been created in the past ten to fifteen years to provide service in the region, including the Franklin Transit Authority, Murfreesboro Public Transportation (Rover), and the RTA. As can be seen in the following table, nearly all of the

agencies have increased ridership since 2001 or since they were first created. Most of the transit providers in the Nashville Area MPO region provide bicycle racks on transit vehicles. The racks help to facilitate the use of bicycling to and from transit.

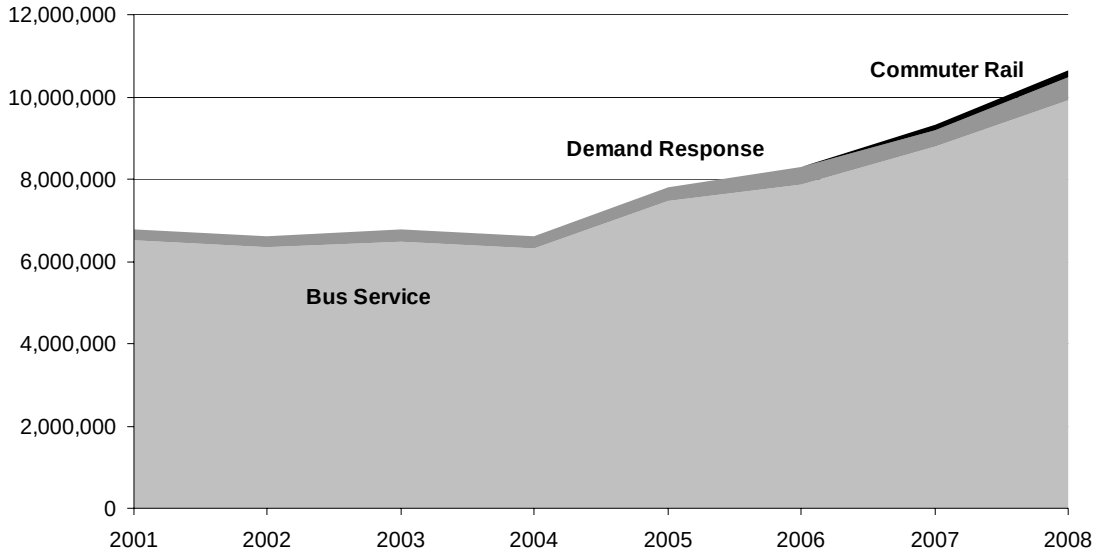
Table 11. MPO Area Transit Ridership by Agency and Type of Service, 2001 to 2008

	Regional Transportation Authority			Nashville MTA		Franklin Transit Authority		Murfreesboro Rover	Mid-Cumberland HRA
Fiscal Year	Bus	Vanpool/ Rideshare	Rail	Bus	Access Ride	Flex Trolley	Demand Responsive	Bus	Demand Responsive
2001	0	0	0	6,527,926	118,121	0	0	0	129,735
2002	3,807	0	0	6,347,743	112,631	0	0	0	149,422
2003	3,825	51,000	0	6,473,724	120,771	3,307	0	0	167,363
2004	3,825	76,500	0	6,268,926	141,907	28,200	0	0	165,602
2005	41,110	*incl in bus*	0	7,372,388	170,214	45,895	0	0	165,663
2006	52,960	*incl in bus*	0	7,752,809	261,652	51,330	0	0	172,078
2007	68,208	23,400	104,785	8,644,456	211,268	51,177	2,167	15,331	212,848
2008	81,402	127,008	166,750	9,701,697	315,188	43,484	13,036	106,793	217,660

Source: Local Agencies, FTA National Transit Database

During the growth in ridership seen in the early part of the decade, the Nashville MTA began to expand service to reach more customers throughout Davidson County. Though the expansion required additional funding from the various sources that support operations, the service has been effective at increasing the number of passengers served per hour of service. In addition to the MTA, other transit organizations in the region were in a pattern of increasing transit offerings. Though new types of services have been introduced in recent years, traditional bus service remains the most prominent. The recent downturn in the economy and increases in fuel expenses required MTA and other operators to consider a reduction in service and an increase fares in FY 2008.

Figure 37. MPO Ridership Trends by Transit Mode, 2001 to 2008



4.7 Walking & Bicycling Facilities

Historically, bicycle and pedestrian facilities have not been given significant consideration in urban development throughout the region. Over the past several years, however, MPO communities have realized the importance of non-motorized modes of transportation such as walking and bicycling, as well as the need for crosswalks and traffic control features. These facilities are crucial for safe, convenient, and attractive access to transit, as well

as activities along major streets. They also provide connections between neighborhoods, schools, regional activity centers, community centers, parks, and greenways. The MPO has been placing an increasing amount of emphasis on projects that support or provide alternatives to the automobile. Moreover, federal funding opportunities offered under SAFETEA-LU– along with a growing interest in health, the environment, and energy conservation – have helped to promote a greater interest in non-motorized modes of transportation.

Types of Facilities

A critical component of understanding walking and bicycling conditions in the region is to first understand the existing environment and provision of accommodations for non-motorized users. As part of the Regional Bicycle and Pedestrian Study, the MPO conducted a comprehensive inventory of existing and currently proposed on and off-road bicycle and pedestrian facilities within the region.

Figure 38. Types of Facilities for Walking or Bicycling

Bicycle Lanes

A bike lane is a portion of the roadway that has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes can located on either side of the road, but both sides is typically preferred so that bicyclists move in the same direction as adjacent motor vehicle traffic.

Paved **Shoulder**

A paved shoulder refers to the part of the highway that is adjacent to the regularly traveled portion of the roadway and is on the same grade as the roadway.

Signed Bicycle Route

Signed shared roadways are a commonly used bike facility using signs to designate a travel lane as being shared by vehicles and bicycles – no separate bicycle lane exists.

Sidewalk

Sidewalks and walkways are "pedestrian facilities" that provide people with space to travel within the public right-of-way that is separated from roadway vehicles. Pedestrian signals, ramps, and marked crosswalks are components of a pedestrian facility.

Shared Used Path/ Greenway/ Multi-Use Trail

Shared-use paths or greenways are non-motorized facilities most often built on exclusive rights-of-way with limited motor vehicle crossings. A shared-use path is a facility that is physically separated from motor vehicle traffic by an open space or barrier, and may be within the roadway right-of-way or within an open space. Paths are normally two-way facilities and are used by a variety of users (cyclists, runners, walkers, skaters, etc.) and skill levels.

Existing & Planned Accommodations

The greater Nashville area has seen significant progress in the last ten years in terms of the growth in the number of bike lanes, bike routes, and greenway trails throughout the region as well as the presence of sidewalk accommodations. A regional inventory taken in 2009 revealed that there are currently over 354 miles of bike lanes, bike routes, and greenways in the greater Nashville area and for arterial and collector roadways within the region, approximately 460 miles of sidewalk accommodations.

While on and off-road bicycle and pedestrian facilities exist in every MPO county, Davidson County has the highest concentration of bike lanes, bike routes, and greenway facilities. While the provision of bike lanes and bike routes throughout the region adhere to AASHTO standards the exact definition for a greenway has had many variations since the facilities were first introduced. While the typical definition for greenways across the region seems to follow the AASHTO standard for a 'shared use path', widths and materials vary greatly per each community. The designated greenways or multi-use paths in this region are typically paved and range from 12-foot wide asphalt or concrete paths to only 5-foot concrete paths in some communities. It should be noted that a 10-foot wide path is the minimum standard per AASHTO standards.

The number of on and off-road facilities that have been put in place in the region in the last ten years is considerable given that many communities over that time period had no bicycle facilities at all. Since 2000 a number of municipalities in the MPO area have developed bicycle and pedestrian master plans and greenway master plans as well as enacted policies encouraging pedestrian and bicycle accommodations.

Figure 39. Miles of Sidewalks by County

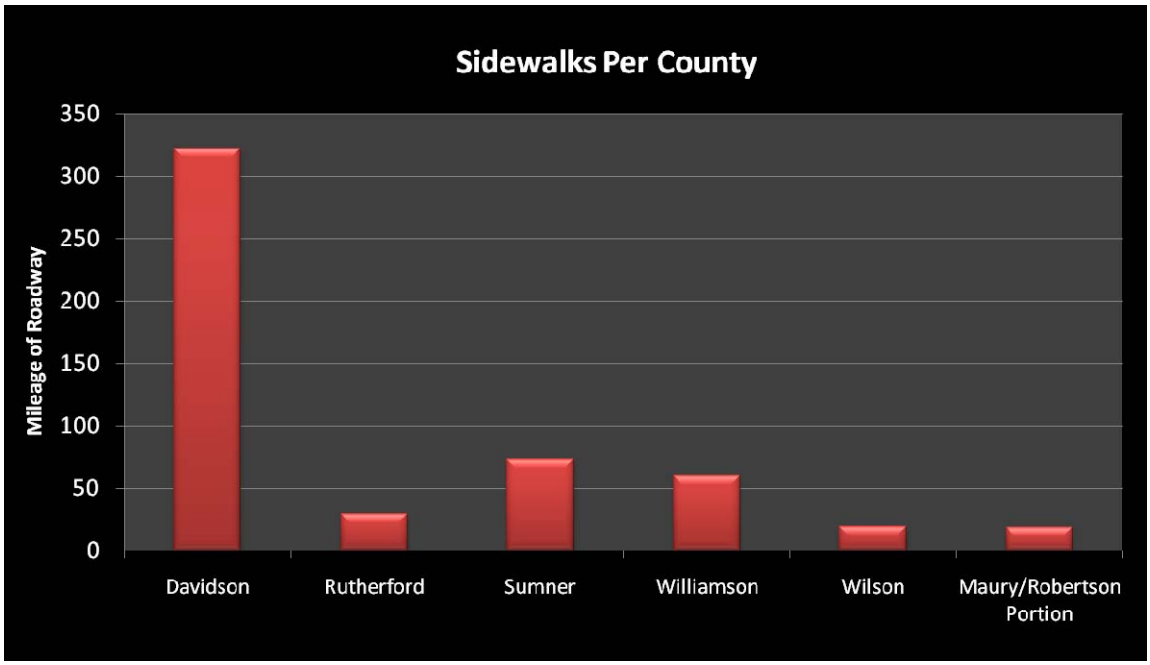
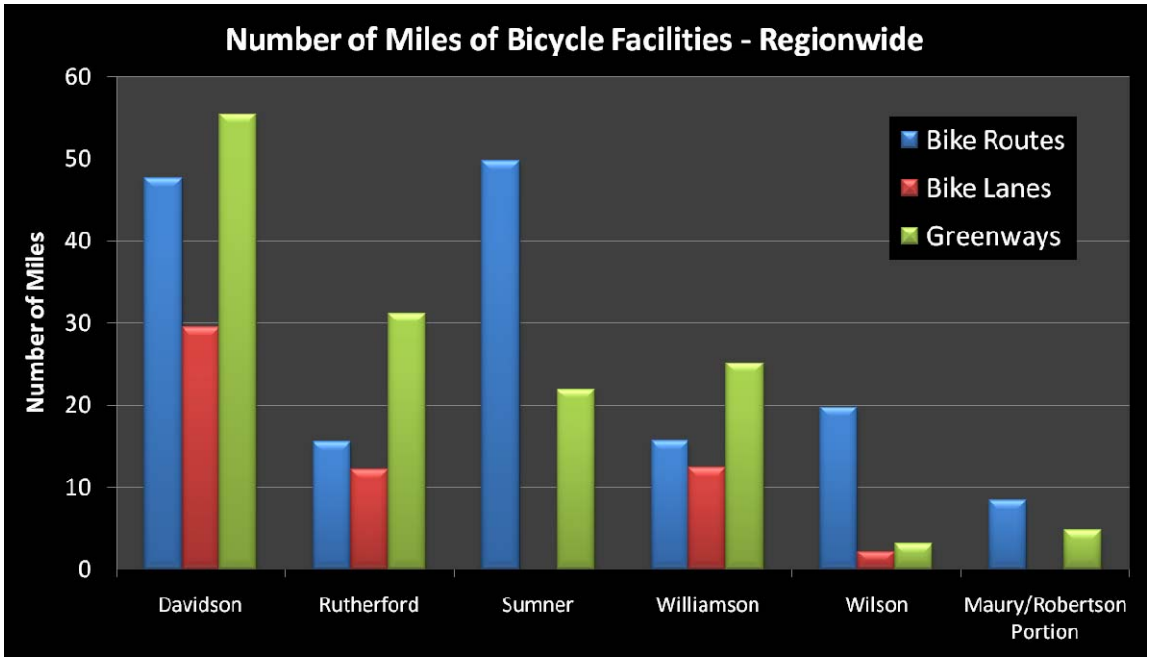


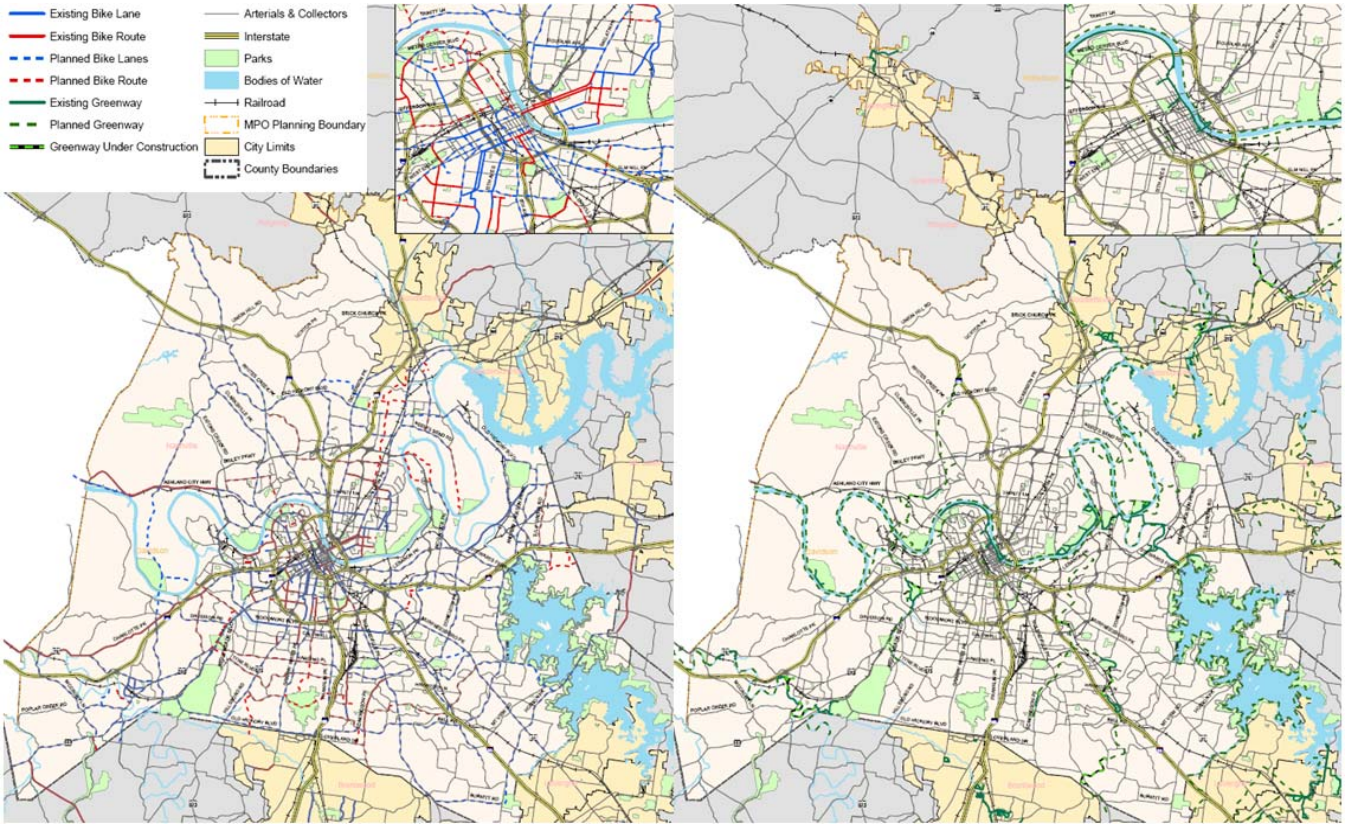
Figure 40. Miles of Bicycle Facilities by County



The following provides a county by county summary of existing on and off-road bicycle and pedestrian facilities in the greater Nashville region. These summaries also include information on future planned bicycle and pedestrian accommodations based on locally approved plans.

Davidson County

Approximately 30 miles of bike lanes in Davidson County were identified as part of the regional inventory taken by the 2009 Regional Bicycle and Pedestrian Study. The inventory also showed approximately 48 miles of signed bike routes where extra pavement like a paved shoulder or wide outside lane is sometimes provided. The bike lanes inventoried in the Nashville-Davidson County area provide at least four feet of pavement with pavement markings and signs.



Nashville-Davidson County has the most extensive existing greenway facilities in the region with approximately 55 miles on the ground. The standard trail section for Davidson County is a 12-foot wide asphalt path, although many of the paths in the floodplain also utilize extensive boardwalk and sections of concrete trail which vary in width. A unique feature of Nashville's greenway system is the development of a number of significant bridges, which have provided important system-wide connections. The Cumberland River Bridge spanning the Cumberland River connects the Stones River greenway and Shelby Bottoms greenway. The rehabilitation of the Shelby Pedestrian Bridge across the Cumberland River and also the Old White Bridge Road Bridge across the railroad tracks provide unique and historic connections. Without these connections the river and railroad tracks can be obstacles for pedestrians and bicyclists.

The inventory found approximately 322 miles of collector and arterial roadways within Nashville-Davidson County that have a sidewalk on one or both sides of the road. The majority of the sidewalks did not have a buffer area between the curb and the sidewalk and therefore did not provide any appurtenances such as trees.

Existing Bicycle & Pedestrian and Greenway Master Plans

Since the adoption of the Nashville-Davidson County Strategic Plan for Sidewalks & Bikeways in 2003 (updated in 2008), the Metro Nashville area has consistently made bicycle and pedestrian facilities part of redevelopment and resurfacing projects as well as including the facilities in the construction of new developments. The adoption of the plan was the first step towards improving the bicycle and pedestrian accommodations in the Nashville-Davidson County area.

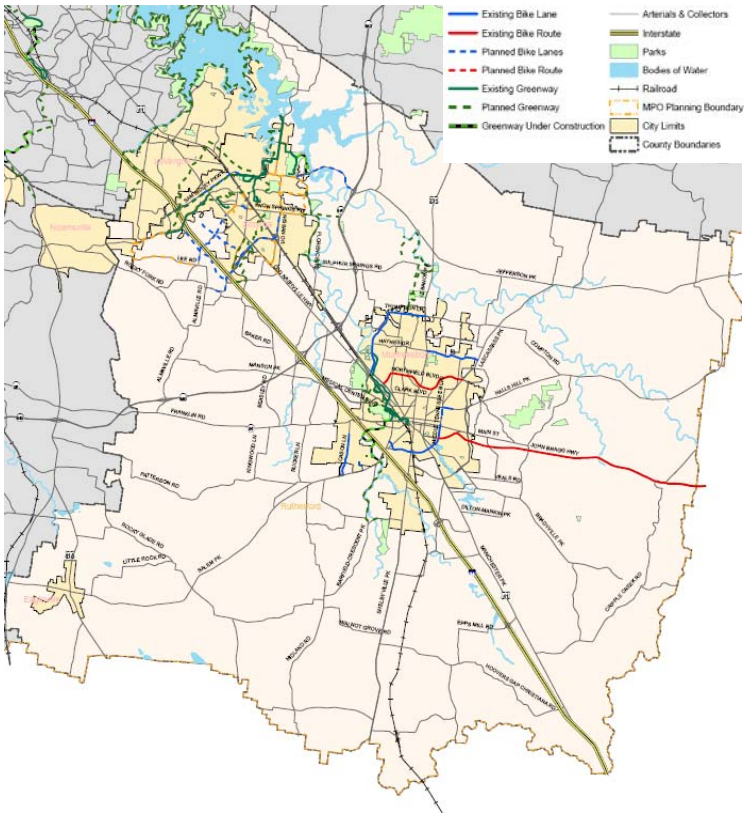
The vision for the Strategic Plan is to provide bike lanes and bike routes on most collector and arterial roadways. Phase One of the plan shows bike lanes and bike routes on the major downtown routes such as Charlotte Pike, Broadway, 8th Avenue/Franklin Pike, Lafayette Street/Murfreesboro Pike, and Gallatin Pike.

The Nashville-Davidson County Strategic Plan also includes policies to improve sidewalk accommodations. The plan targets pedestrian facility conditions and connections between land uses. It focuses on providing ADA compliant crossings, ramps, and sidewalk clearances.

Metro Nashville developed the Metropolitan Parks & Greenways Master Plan in November 2002. A major component of the vision and master plan for Metro Nashville is to locate greenways along waterways with the Cumberland River acting as the spine. It is envisioned that a multi-use path will eventually be located on both sides of the Cumberland River the entire way through the county. The system will eventually include several hundred miles of greenway throughout Nashville/Davidson County. A main priority is to acquire greenway easements for environmental, recreation, and transportation purposes.

Rutherford County

According to the regional inventory conducted in 2009, Rutherford County has approximately 16 miles of signed bike routes and 12 miles of bike lanes. Of the 12 miles of bike lanes within the county, all of them are located within the City of Murfreesboro and are four feet wide with pavement markings and signs. In addition, the City of Murfreesboro provides bike lanes on some local roads that were not included as part of this inventory. Bike routes are signed on John Bragg Highway located in the eastern portion of the county and along Northfield Boulevard in the City of Murfreesboro.



There are approximately 30 miles of existing trails on the ground in Rutherford County. The vast majority of these facilities are located in the cities of Murfreesboro and Smyrna. Murfreesboro is the largest city in Rutherford County and has 12.5 miles of existing greenway facilities including the Stones River and Lytle Creek Greenways. Smyrna has an extensive

network of greenway trails, second only to Nashville in the region. They have just over 17 miles of existing facilities. These facilities include eight-foot to twelve-foot asphalt trails and eight-foot concrete sidewalks. Many of the projects have been able to utilize Corps of Engineers land adjacent to Percy Priest Lake.

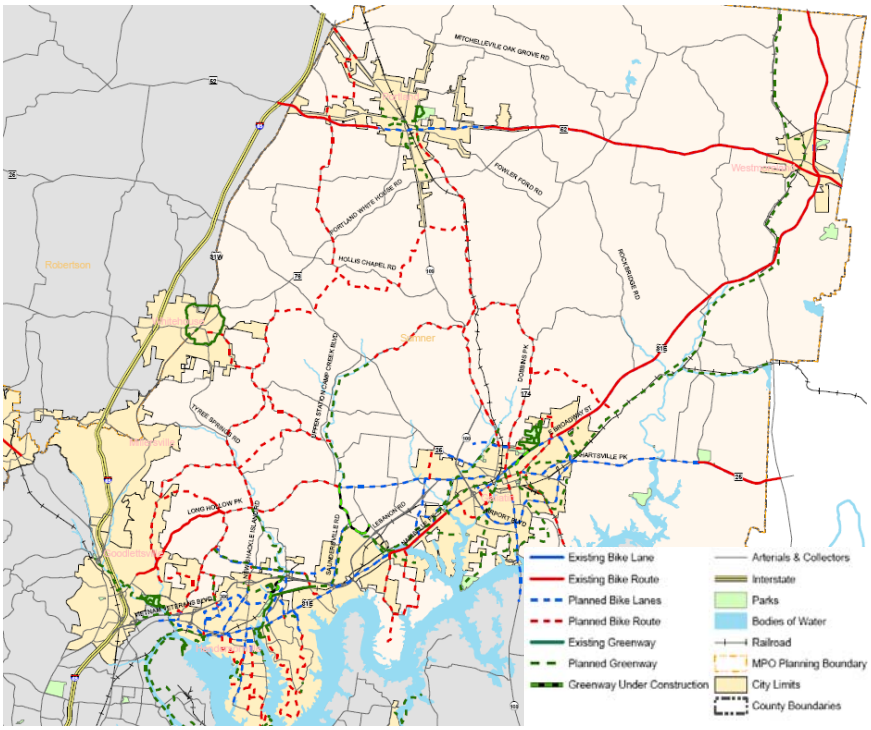
The sidewalks inventoried were all located within the Smyrna, LaVergne, and Murfreesboro city limits. Sidewalks were found on approximately 29 miles of collector and arterial roadways, on one or both sides of the road.

Existing Bicycle & Pedestrian and Greenway Master Plans

Within Rutherford County, the cities of LaVergne, Smyrna, and Murfreesboro have prepared bicycle and greenway plans. Also, the Town of Smyrna has prepared a comprehensive plan that sets a goal to provide bicycle and pedestrian travel between destinations and activity centers. Rutherford is one of the counties in the region that does not have a completed master plan for greenways; however the cities of Smyrna, LaVergne and Murfreesboro do have completed master plans.

LaVergne's master plan for their greenway network was completed in conjunction with Smyrna. The plans provide a good connection between cities so that multi-modal travel will be possible between the two cities. While the desire for greenways is high, LaVergne has not been able to implement any trails to date.

Sumner County and Springfield, Greenbrier, Ridgetop in Robertson County



The 2009 regional inventory documented approximately 50 miles of bike routes and no bike lanes in Sumner County and the MPO area of Robertson County. The facilities that were found to be signed during the inventory are on Highway 52, Highway 31E, and Long Hollow Pike and Highway 41 in Robertson County.

Within Sumner County and its municipalities, there are approximately 23 miles of trails on the ground. Many of the existing facilities parallel existing roadways. Hendersonville has approximately five miles of trail facilities, which vary from asphalt paths to five-foot concrete sidewalks. Many of the existing five-foot wide facilities are undersized per AASHTO design standards. Many of the trails are provided in relationship to Drakes Creek Park and to nearby schools.

Other areas in Sumner County with significant trail systems either in place or under design include the City of Gallatin, the City of Goodlettsville, White House, and Portland. White House's greenway system includes a loop around the city, which provides connections to Robertson County. Springfield also has a greenway system that links to the City's downtown district.

Additionally, there are approximately 84 miles of sidewalks along arterial and collector roadways in Sumner County and the MPO area of Robertson County. The majority of these sidewalks are provided in the cities of Gallatin, Hendersonville, and Goodlettsville.

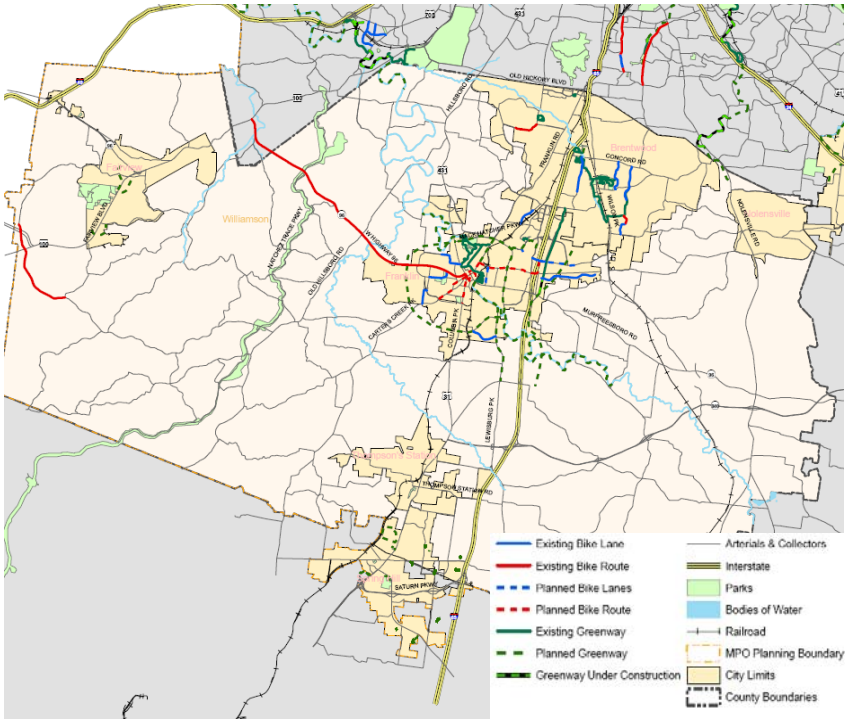
Existing Bicycle & Pedestrian and Greenway Master Plans

In 2000, Sumner County and the Cities of Gallatin and Hendersonville jointly developed individual bicycle and pedestrian master plans for their respective communities. Development of the three plans concurrently resulted in a high level of coordination and understanding of connectivity of facilities between each of these communities. The plans have been utilized by Sumner County and the Cities to determine the feasibility and location of bicycle and pedestrian facilities. Also included in the plans are recommended cross-sections and design standards.

Sumner has a countywide master plan for their greenway system. Gallatin has recently completed a 2020 master plan that includes over 25 miles of potential greenway corridors. The City of Goodlettsville just this year adopted a greenway and open space master plan and they are in the process of developing a bicycle and pedestrian plan for the City as well.

Williamson County and Spring Hill in Maury County

According to the 2009 inventory, there are over 12 miles of bike lanes and approximately 16 miles of bike routes in Williamson County and the portion of Maury County included in the MPO planning area. The majority of the bike lanes are in the cities of Brentwood and Franklin. The longest bike route is on Highway 96 West and runs from the county boundary to the downtown Franklin area.



There are approximately 25 miles of greenways in Williamson County, which are largely located in the cities of Brentwood and Franklin. The City of Brentwood has 12.6 miles of existing trails, which are primary asphalt pathways, including an extensive trail from Concord Road to Crockett Park. There are currently 12.4 miles of existing greenways in the City of Franklin. Recently completed projects within Franklin include trails along Carothers Parkway and a trail utilizing an old roadway near the new Nissan Headquarters.

The inventory showed that there are 60 miles of sidewalks along arterial and collector roadways in the Williamson County area and the MPO area of Maury County. The sidewalks are provided within the city boundaries and connect commercial, office, and residential areas.

Existing Bicycle & Pedestrian and Greenway Master Plans

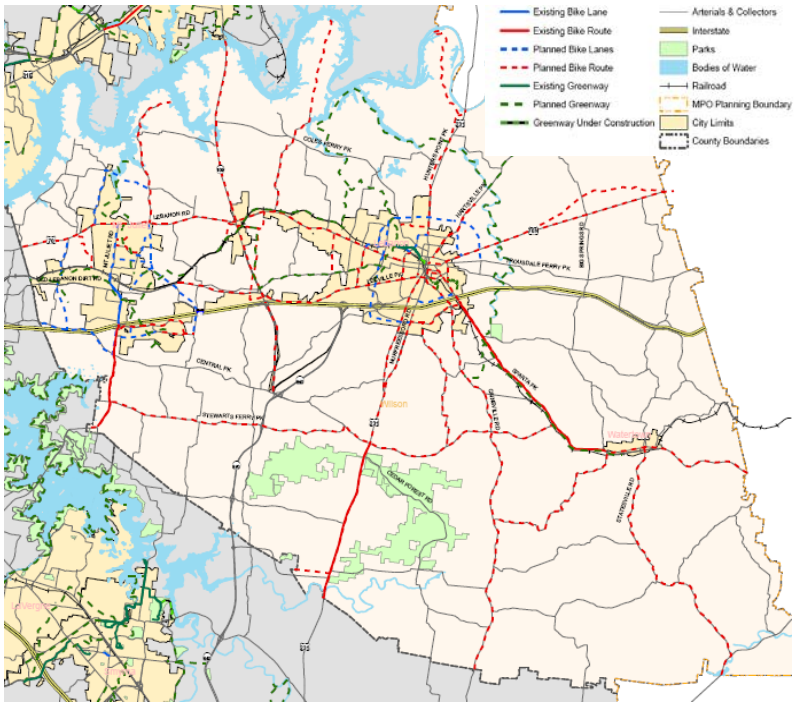
Both the cities of Brentwood and Franklin have bicycle and pedestrian plans and the City of Franklin has recently completed a greenway and open space master planning project. The Cities of Fairview and Spring Hill both have a bikeway plan map but no formal bicycle and pedestrian plan. Williamson County does not have a bicycle and pedestrian or a greenway master plan.

The City of Brentwood updated their 2020 plan in 2006, which includes a bicycle and pedestrian facilities inventory and review. In addition, the City of Franklin prepared a Bicycle and Pedestrian Plan in 2003, which is currently being updated. Both of the plans emphasize the importance of including bicycle and pedestrian accommodations in future development as well as in redevelopment projects. Both cities have an extensive greenway system that is complemented with on-road bicycle facilities.

The City of Fairview has a bicycle facilities map as part of its open space plan, and the Town of Nolensville has been working to establish a bicycle and pedestrian and greenways master plan.

Wilson County

According to the 2009 inventory, there are approximately 20 miles of bike routes in the Wilson County area and about 2 miles of bike lanes. The bike lanes are located in the City of Mount Juliet on State Route 171. The bike routes are located on Highway 231, South Mount Juliet Road and Sparta Pike between Lebanon and Watertown.



Currently, there are approximately 3.1 miles of existing trails in Wilson County. These trails are located in the City of Lebanon. The City of Mount Juliet does not currently have any greenway trails on the ground; however, there is an eight-foot wide sidewalk as part of the recent Providence development in Mount Juliet. This facility was not included in the total for the greenways.

The inventory also showed approximately 19 miles of sidewalk along arterial and collector roadways in Wilson County. The majority of these sidewalks are provided in the City of Lebanon and Mount Juliet.

Existing Bicycle & Pedestrian and Greenway Master Plans

The Bicycle and Pedestrian Master Plan for Mount Juliet, Lebanon, and Wilson County, was prepared to guide the county in developing a bicycle and pedestrian system that will be usable for the two major cities in the county as well as for Wilson County. Since this plan was developed the cities and county have implemented several policies that support the construction of pedestrian and bicycle accommodations. In 2003, the City of Mount Juliet updated its bicycle and pedestrian plan and added additional recommendations for greenway improvements.

Existing Levels of Service for Non-Motorized Modes

Many factors influence one's decision to walk or bike when making a transportation choice. Many of these factors have to do with the physical environment, which includes the presence of adequate walking and biking accommodations. Various tools have been developed in recent years to assist engineers and planners in evaluating the ability of roads to serve pedestrians and bicyclists. Similar to the vehicular Level of Service, there are models that have been developed to evaluate the suitability of the roadway for walking and bicycling. The Level of Service for walking and bicycling is based on the comfort level of the pedestrian and bicyclist on the roadway. Both the Pedestrian Level of Service (PLOS) and the Bicycle Level of Service (BLOS) models were developed using input from actual pedestrians and bicyclists on various roadway segments. There are various factors used to evaluate the comfort level of the users which involve the roadway geometry, motor vehicles using the road, and the presence and condition of pedestrian and bicycle facilities. In addition, the 2010 Highway Capacity Manual includes a multimodal level of service (MMLOS) , comprised of four tools – two of which are the BLOS and PLOS, which evaluates roadway level of service for all modes.

Pedestrian Level of Service

A Pedestrian Level of Service (PLOS) analysis was conducted for roadway segments inventoried in the Nashville MPO based on the National Cooperative Highway Research Program (NCHRP) Report 616 on Multimodal Level of Service Analysis for Urban Streets. The evaluation of pedestrian levels of service involves the walking conditions within the shared roadway environment (e.g. sidewalk or path to the side of the roadway) since pedestrians typically do not utilize the roadway unless there is no other option.

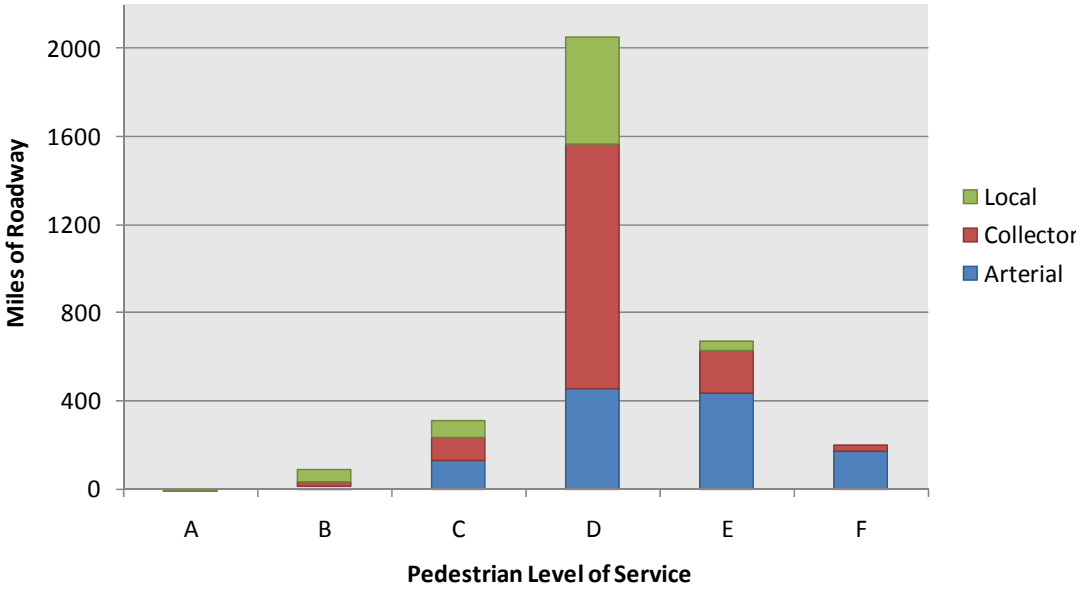
As discussed in NCHRP Report 616, part of the development of the pedestrian level of service model involved pedestrians walking on a variety of roadway segments and rating their comfort level on each segment on a scale from A to F, with A being the best conditions and F the worst conditions. The pedestrians used in the research study consisted of all age groups and various levels of walking experience. Based on the response of the participants, the researchers developed an equation to determine the PLOS for the roadway segment. The PLOS equation uses some of the same measurable traffic and roadway factors that transportation planners and engineers use for other travel modes. The model reflects the effect on walking suitability or "compatibility" due to factors such as roadway width, presence of sidewalks and intervening buffers, barriers within those buffers, traffic volume, motor vehicles speed, and on-street parking.

The chart below contains examples of the different PLOS. Each of the examples provides a brief, general description of the characteristics associated with each PLOS rating A thru F.

Figure 41. Pedestrian Level of Service Rating Definitions

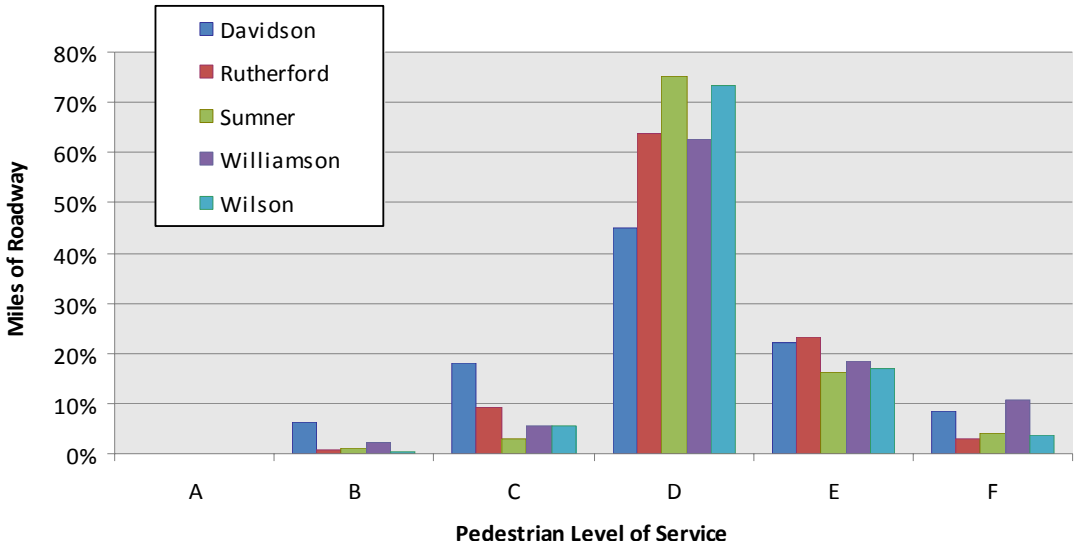
Results of the Nashville area PLOS analysis are divided according to the roadway classification as well as the Level of Service. The following figure shows the results for the whole MPO area broken down for arterial, collector, and some local roads. As shown in the chart, a majority of the arterial, collector, and local roads that were inventoried are operating at a LOS D (2,048 miles). The mileage in this chart includes several roads that were inventoried outside the MPO boundary.

Figure 42. Pedestrian Level of Service by Roadway Class



The following figure presents the results of the PLOS by county. As shown, at least 50 percent of roadways in each of the MPO counties are operating a PLOS of D or worse. Davidson County roadways provide the highest level of service when compared with other counties, with Williamson and Wilson having the highest percentage of roadways operating at an E or F PLOS.

Figure 43. Pedestrian Level of Service by County



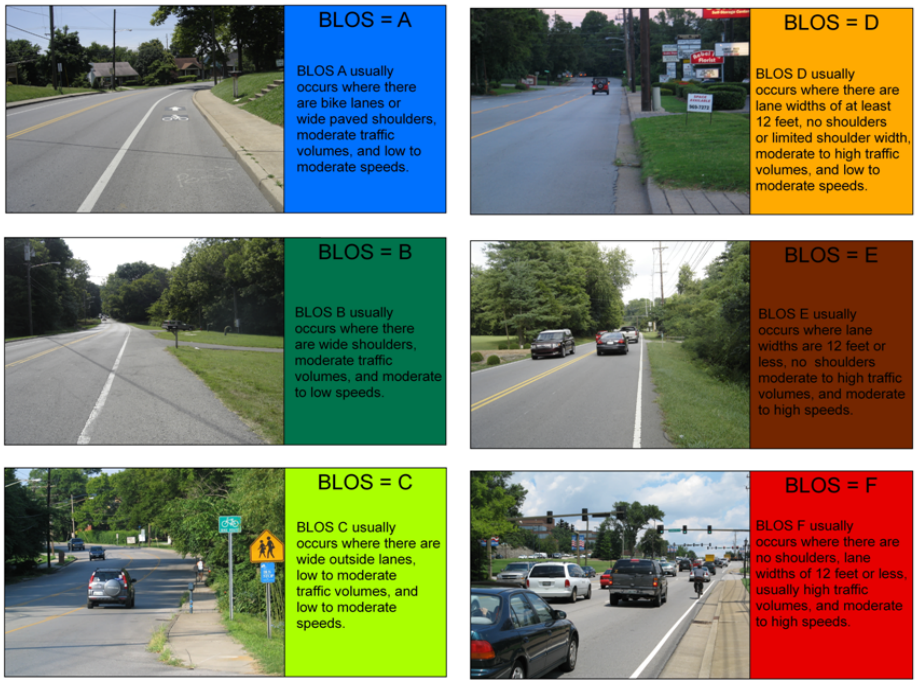
Bicycle Level of Service

Similar to the PLOS analysis, a Bicycle Level of Service (BLOS) model for the Nashville region was developed based on NCHRP Report 616 for the analyses of the roadway segments inventoried in the Nashville MPO area.

As discussed in the NCHRP Report 616, bicyclists were asked to ride on a variety of roadway segments and then rate their comfort level on each segment on a scale from A to F with A being the best conditions and F the worst conditions. Like the pedestrians, the bicyclists used in the research study consisted of all age groups and riding capabilities. Based on the response of the participants, the researchers developed an equation to determine the BLOS for the roadway segment. The BLOS equation uses some of the same measurable traffic and roadway factors that transportation planners and engineers use for other travel modes. The factors used in the calculation include the Average Daily Traffic (ADT) volume, number of through lanes on the roadway segment, speeds, percentage of trucks, the width of the outside travel lane, shoulder, and bike lane, the condition of the pavement, and the occupancy rate of on-street parking.

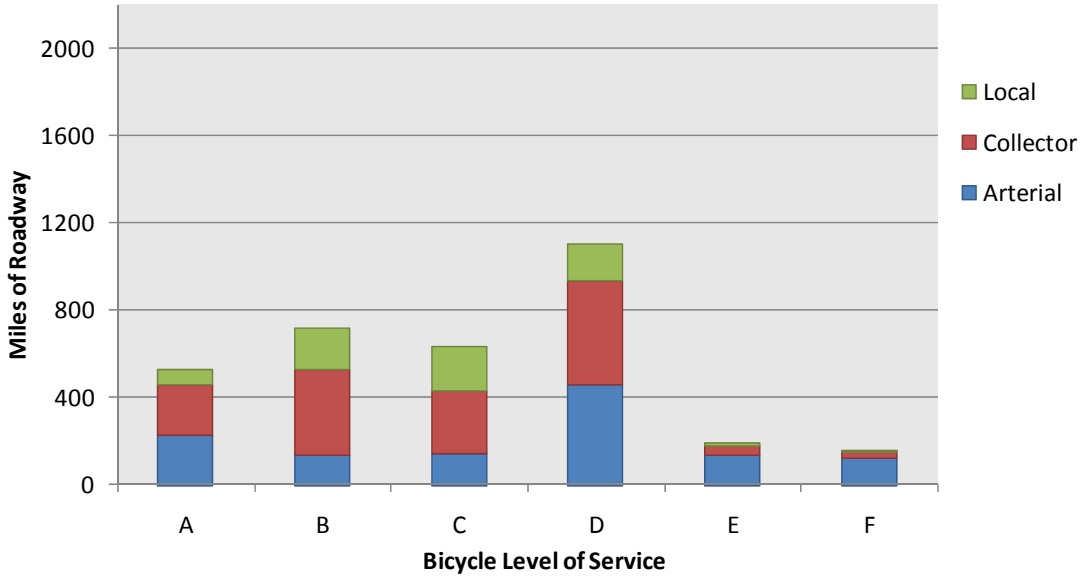
The chart below contains examples of the different BLOS. Each of the examples provides a brief, general description of the characteristics associated with each BLOS rating A thru F.

Figure 44. Bicycle Level of Service Rating Definitions



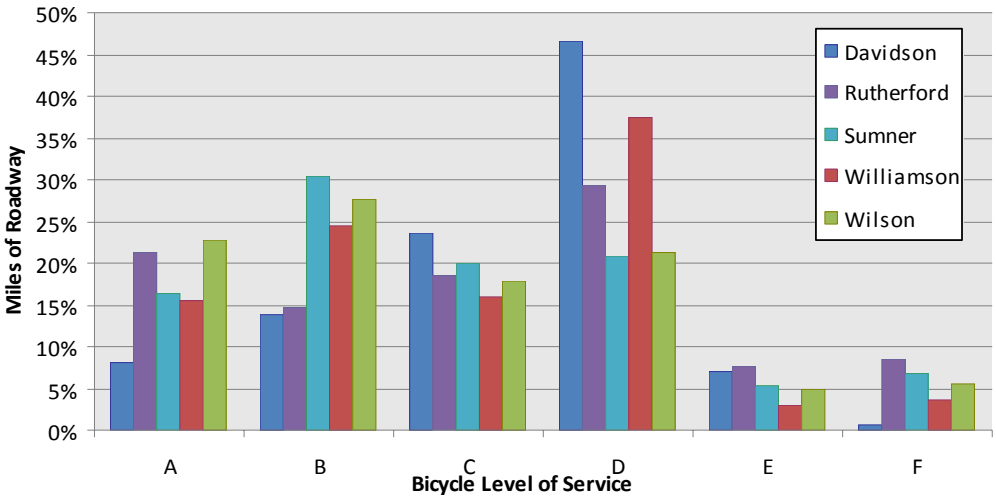
Results of the Nashville area BLOS analysis are broken into the roadway classification as well as the Level of Service. The following figure shows the results for the whole MPO area broken down for arterial, collector, and local roads. As shown in the chart the highest number of arterial and collector roadways were determined to operate at a LOS D.

Figure 45. Bicycle Level of Service by Roadway Class



The next figure presents the results of the BLOS by county. As shown, levels of service provided by roadways in each of the counties for bicycle movements is significantly better than the level of service provided for pedestrian movements. All counties have at least 80 percent of roadways operating at a BLOS of D or better.

Figure 46. Bicycle Level of Service by County



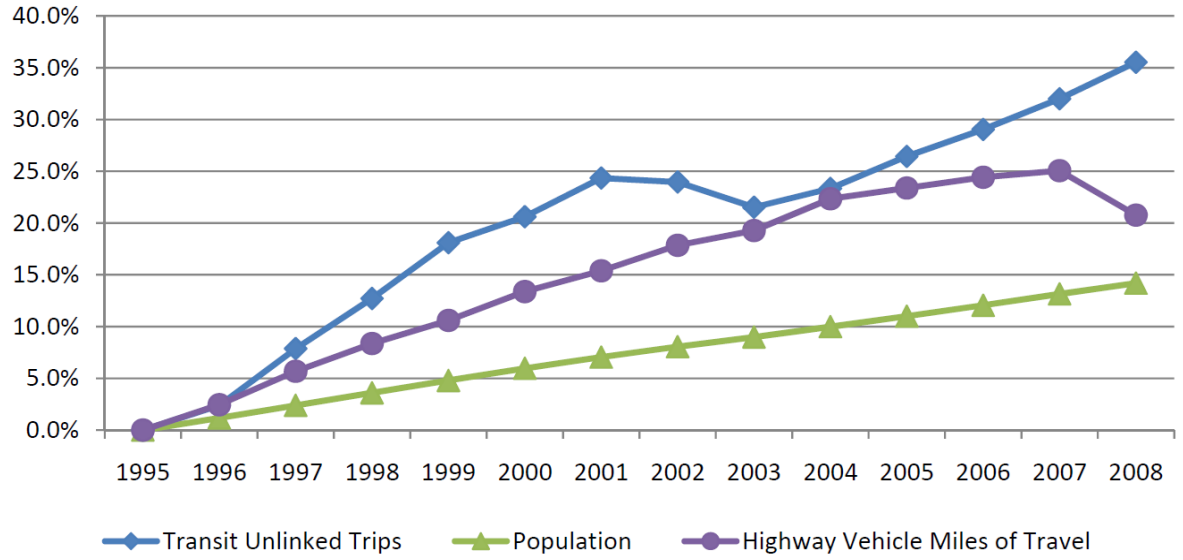
5.0 A Bold, New Vision for Mass Transit

5.1 Transit for Mobility, Economy, and Livability

Public transportation in the United States is a crucial part of the solution to the nation's economic, energy, and environmental challenges – helping to bring a better quality of life for both those who ride transit and those who do not. Every segment of American society – individuals, families, communities, and businesses – benefits from the integration of public transportation choices into the transportation system.

In the last decade and a half, public transportation ridership has grown by 36 percent, almost three times the growth rate of the U.S. population (14 percent) and substantially more than the growth for vehicle miles of travel (VMT) on our nation's streets and highways (21 percent) over the same period.

Figure 47. Growth in National Transit Ridership, Population, Highway VMT, 1995 to 2008



It is no surprise that ridership is on the rise. Regions across the nation are becoming more aware of the benefits of public transportation. The Middle Tennessee region's top economic competitors (e.g., Charlotte, Austin, Denver, etc.) have recently invested billions of dollars in modernizing their public transportation system to position their areas for attracting and retaining the labor force that will be required to compete in an ever-changing global economy. That, combined with transit's unique ability to help provide alternatives to traffic congestion, prepare for higher energy prices, and establish a more sustainable path for future growth and development, is a major reason why the MPO has established as one of its three major policy initiatives of the 2035 Regional Transportation Plan, a call to create and adopt a bold, new vision for mass transit. The following provides a quick overview of the more obvious reasons to invest.

Mobility & Convenience - Mobility, the freedom and ability to travel, has always been an important part of the American lifestyle. However, as more and more vehicles crowd the nation's roadways, traffic congestion is having an increasingly debilitating effect on our quality of life.

- Congestion caused 4.2 billion hours of travel delay and 2.9 billion gallons of wasted fuel in 2005, according to the 2007 Texas Transportation Institute (TTI) Urban Mobility Report.

- The average person in the Nashville-Davidson area loses about 40 hours and wastes 25 gallons of fuel per year sitting in traffic congestion.
- Public transportation services in America's most congested cities saves more than 1.1 billion hours of additional delay.
- Public Transit enhances economic growth by increasing the local customer base for a range of services.
- National research shows that four out of five seniors believe public transit is a better option than driving alone. By 2025, an estimated 20 percent of Americans will be over the age of 65 and more reliant on alternative forms of transportation.
- The greater Nashville region is expected to grow from 1.3 million people in 2008 to more than 2.1 million by 2030, adding significant demands to the regional transportation network.
- Public transportation is an important part of most disaster relief or emergency evacuation plans.
- Transit offers mobility options for rural residents that might have no other way to medical appointments, work, or school.
- Public transportation provides a safe alternative to driving with 0.03 fatalities per 100 million miles, about 1/25th the rate for automobiles.

Personal & Regional Economic Prosperity - Transportation is the backbone of a strong and prosperous economy, and investments in public transportation generate significant economic benefits.

- The average household spends 18 cents of every dollar on transportation, and 94 percent of this goes to buying, maintaining, and operating cars, the largest expenditure after housing.
- Public transportation provides an affordable, and for many, necessary, alternative to driving.
- Households that are likely to use public transportation on a given day save over $8,400 every year.
- According to the American Public Transportation Association, for every 10 dollars invested in transit capital, 30 dollars is returned to the economy through increased business sales. Even more is returned for every 10 dollars invested in transit operations.
- Public transportation provides economic stimulus by creating jobs. Every $1 billion in federal investment in transportation infrastructure supports and creates 47,500 jobs in manufacturing, construction, finance, insurance, real estate, retail, and other services.
- Mass transit enhances personal economic opportunity by saving employees money on daily commutes. The average household spends 18 cents out of every dollar earned on transportation costs – 94 percent of that on maintaining and operating personal autos. Transit riders save an average of $1,400 per year on gas and up to $6,251 in savings by eliminating the need for one car.
- A multi-modal transportation systems saves everyone money. For every $10 million invested in transit, more than $15 million is saved by highway and transit users. Americans living in areas with transit save an estimated $18 billion in annual congestion costs.
- Transit provides access to jobs and education.
- Residential, commercial, or office properties that are served by public transportation are valued more highly than properties not accessible by transit.

Environmental Sustainability - As we become more conscious of how our travel behaviors affect our environment, public transportation will play an important role in meeting local, sate, and federal environmental sustainability goals.

- Each year, public transportation saves the U.S. 1.4 billion gallons of gasoline per day, the equivalent of one supertanker leaving the Middle East every 11 days.
- The health effects of mobile source pollution are a growing hazard for people across America. According to the U.S. EPA, asthma accounts for more than 2 million emergency room visits, 5,000 deaths, and costs the nation more than $14 billion per year.
- Public transportation produces 95 percent less carbon monoxide, 90 percent less volatile organic compounds, and 50 percent less carbon dioxide and nitrogen oxide per passenger mile than private vehicles.
- The Nashville region is expected to be designated by the EPA as non-attainment for ozone levels by 2011 – indicating a growing health hazard for residents.
- Public transportation supports quality growth management policies aimed at reducing sprawling land development patterns by providing residents more choices for travel.
- Communities that invest in public transit reduce the nation's carbon emissions by 37 million metric tons annually – equivalent to New York City; Washington, DC; Atlanta; Denver; and Los Angeles combined stopping using electricity.
- One person switching to public transit can reduce daily carbon emissions by 20 pounds or more than 4,800 pounds in a year.
- A single commuter switching his or her commute to public transportation can reduce a household's carbon emissions by 10 percent, and up to 30 percent if he or she eliminates a second car. When compared to other household actions that limit CO2, taking public transportation can be 10 times greater in reducing this harmful greenhouse gas.

5.2 Transit Service Strategies and Technologies

There is a wide range of mass transit services offered throughout the United States and in order to develop a regional vision for transit that makes sense for Middle Tennesseans, it is extremely important that policy-makers understand the menu of options available to the region so that that the appropriate solutions are deployed to address the unique service needs of different communities.

In forming a more complete understanding of that menu, planners typically categorize or describe available transit options by the types of markets they serve (i.e., service strategy) or by the mode or technologies employed to provide the service (e.g., light rail, commuter rail, etc.).

Transit Service Strategies

In discussing the characteristics of mass transit service and appropriate areas for implementing them, it is helpful to start by grouping services based on the types of markets served and/ or function.

- ***Commuter Transit:*** This service is principally operated during the periods of day when commuting is at its heaviest levels (e.g., AM or PM rush hours) and serves to connect regional employment centers with suburban residential areas. A range of choices are available to connect people with job sites including commuter rail, express bus, and vanpool service. The most appropriate mode for a particular area or

corridor will be determined by the level of expected ridership, available right-of-way, average trip length, and travel patterns.

- ***Rapid Transit:*** This service is intended to move large numbers of people along well-defined corridors to a variety of employment, retail, and recreational destinations throughout day, not just the peak commuting periods. Rapid transit operates in fixed-guideway or exclusive lanes with limited stops at designated stations. Examples of technologies used to provide rapid transit include heavy rail, light rail, and bus rapid transit.
- ***Urban Fixed-Route Transit:*** This is the most predominant type of service provided throughout the country, particularly in urbanized areas. Large- and medium-sized buses use the existing road network to carry up to 30-50 passengers on shorter trips on scheduled routes, usually with unlimited stops, although sometimes offering express service. In some higher-density communities, urban fixed-route service may be provided by streetcars which may or may not operate in exclusive lanes.
- ***Suburban or Community Circulators:*** Circulator services primarily focus on connecting neighborhoods or job centers to other primary destinations including connections to other transit service. They are operated using a variety of methods including busses, shuttles, vans and in some cases can be offered as door-to-door services or flexibly routed services within individual communities, as well as in low-density, rural areas. They also include community or employer shuttle service between fixed-route transit lines and scattered employment, shopping, or residential areas within individual communities.
- ***Demand-Response/ Paratransit:*** Shared ride/door to door/flexibly routed services are van or small bus based services that generally operate in lower density areas (with fewer residences per square mile). Unlike door to door services which are required by the Americans with Disabilities Act, these services are designed to serve everyone, and are not limited to individuals with disabilities. They are often used either to provide transportation from rural or other low density areas to minor urban centers or as a feeder service to other types of transit. Trips generally need to be pre-scheduled, sometimes 24 hours or more in advance. Service may be provided seven days per week, on weekdays only (especially for employment focused services), or on only a few days every week (especially rural transportation services).

Transit Modes and Technologies

The following sections look more specifically at each type of transit service of interest and the conditions where it is appropriate. The final section summarizes the discussion of transit mode technologies and provides tables which further describe the operating and financial characteristics of each specific type of service

Commuter Rail Transit

Commuter rail is intended to carry large volumes of passengers with stations typically spaced in the 3 to 5 mile range. It is oriented to the peak period and typically serves suburban residents commuting to downtown employment centers. Usually, trains consist of one locomotive and several passengers cars which accommodate approximately 140 riders per car. Commuter rail is typically diesel powered and can operate on tracks shared with freight traffic. Another alternative is the diesel multiple unit (DMU) which is a train of several cars, each of which is powered by its own diesel engine (although trains can use a mixture of DMUs and regular coaches). DMU trains scale well as they allow extra motive power to be added at the same time as extra passenger

capacity. If the DMUs comply with the requirements of the Federal Railway Administration (FRA) safety requirements, they can be used at the same time as freight rail service.

Financial Characteristics

The actual cost of constructing a commuter rail line depends on the type of upgrades to the track and signaling system, the number of stations, and the negotiations with the owner of the track. For example, the Northstar Commuter Rail Line serving Minneapolis was constructed by improving a major freight rail line that was already double-tracked. Improving 40 miles of track and constructing 6 stations cost approximately $170 million, or just over $4 million per mile (2009 dollars), excluding vehicles. Similarly, the current cost estimate for the 33 mile Kenosha-Racine-Milwaukee Commuter Rail Line is approximately $4.7 million per mile (2009 dollars), excluding vehicles.

Another issue is how payments to the owner of the track will be accounted for, with the Northstar line requiring a payment to the private owner of the line of $100 million and the Kenosha-Racine-Milwaukee line considering lease payments for the line as an operating expense.

While the total range of costs experienced for commuter rail systems have ranged from about $1.5 million to $10 million per mile, given the assumptions that service in the greater Nashville region will take place in existing right of ways, and that that limited double tracking will be required, it is likely that the costs for the commuter rail alternatives being considered in the Nashville region would be around $4.5 million per mile, and probably between $3.2 million and $5.6 million, excluding vehicles and payments for use of the existing rail line. FRA compliant DMUs cost approximately $2.7 million - $3 million each. Payments for use of the existing rail line vary with each line owner, the existing traffic on the line, and the improvements to the line being funded by the commuter rail project.

Light Rail Transit

Light rail transit (LRT) is an electrically powered rail passenger system used for urban transportation, typically used on shorter routes than those covered by commuter rail. LRT typically operates at grade, primarily within a dedicated right-of-way. It can also operate in mixed traffic on street. LRT is capable of high speed (55 mph) when in an exclusive right-of-way. Stations are generally spaced at minimum of half mile intervals to allow the vehicles to reach higher speeds. Stops within a city's downtown, especially when the LRT is operating in the street, are often spaced much closer together, similar to bus stops. LRT typically operates with at least two cars in a train; each car can accommodate approximately 150 - 220 riders. LRT systems operate with overhead catenary wires and poles required for electrification.

Financial Characteristics

The cost of LRT depends on the characteristics of the line, with elevated segments and underground segments adding substantially to the cost of a project. Denver's T-Rex Line, which was constructed along several freeways at the same time as other work on the freeways, had a cost of approximately $46 million per mile (2009 dollars), excluding vehicles. A similar light rail system in Portland, OR had costs of about $69 million per mile (2009 dollars).

A good estimate for the costs of LRT around the Nashville region would be between the costs of these two projects, or about $58 million per mile (2009 dollars). A reasonable range of costs would probably be between

$46 million and $69 million per mile. LRT cars cost between $3 and $5 million depending on capacity, power source, and other design characteristics and generally are operated in 2 car trains.

Bus Rapid Transit

A bus rapid transit (BRT) is in theory a rubber-tire version of light rail transit, with the added advantage of being able to phase-in improvements over time with greater ease than a rail-mode provides. Many communities introduce BRT short of its ultimate goal of emulating LRT by improving regular bus service with increased amenities or travel time savings. Some of those improvements over regular bus may include operations on reserved or restricted lanes, priority at traffic signals, express operations with limited stops, special low floor buses, enhanced passengers facilities, branding, and other means for buses to emulate the reliability and convenience of rail transit. Bus lanes can be designed for conventionally steered buses or for Curb Guided Bus operation. This latter option allows buses to operate at high speed in a right-of-way barely wider than the bus itself.

BRT services are flexible, and in some places like Nashville, vehicles operate on the street within mixed traffic as a standard bus. The key to BRT however, is that it has sufficient priority in traffic so that it is operating speed is closer to the private automobile than a regular route bus service.

BRT buses usually have a more modern look than standard buses. Ridership is lower than some of the rail options as buses accommodate 40 to 60 riders. Typical station spacing is 1-2 miles apart. Stops within a city's downtown, especially when the BRT is operating in the street, are often spaced much closer together, similar to regular bus stops. Buses operate on shorter headways (or frequencies); 5 to 10 minutes apart ideally.

Financial Characteristics

The capital cost of BRT systems depends upon the cost of the running way, the stations, the fare collection system, and the cost of the technologies implemented (e.g., Automatic Vehicle Location, Automatic Passenger Counters, Transit Signal Priority, and Driver Assist).

For the running way, designating existing lanes for BRT use through painting and signage (with no physical barriers) is on the order of $50,000 - $200,000 per mile. Reconstructing arterial lanes costs about $2.6 to $3.1 million per mile (2009 dollars). If new lanes need to be constructed, such as in a median, the capital costs of the lanes typically rise to between $5 and $10 million per mile, plus any right-of-way acquisition costs. Cleveland's Health Line is a one of the kind system, with costs of $24.7 million per mile for a 6.8 mile system. The Health Line involved a complete reconstruction of Euclid Avenue from building face to building face. The reconstructed roadway included exclusive bus lanes, one lane of auto travel in each direction, and streetscape enhancements like new sidewalks, crosswalks, lighting, trees and other landscaping.

For Transit Signal Priority, which can play a very valuable role at highly congested intersections, the capital cost is roughly between $3,000 and $20,000 per intersection depending on the type of equipment currently used to control the intersections. The costs for stations along arterial streets (not including buildings) average in the range between $50,000 and $150,000 each, although much simpler (and cheaper) as well as more complex (and expensive) stations have been implemented by many transit agencies. For example, Cleveland's cost for a standard shelter with a bench, posted bus information and a ticket machine is about $40,000, while an upgraded shelter with a bench, real-time bus information, and a ticket machine is about $175,000. The cost of stations is

significantly increased if they include substantial parking lots, which can cost around $4,000 - $5,000 per parking spot.

The buses themselves also vary widely in cost, with stylized standard 45' buses costing between $400,000 and $600,000, while specialized BRT articulated buses can cost anywhere from $600,000 to $1,600,000. Automatic Vehicle Location systems are required for real-time bus information, and add about $5,000 to the cost of each bus. For the Nashville region, assuming that 1/3 of the length of the entire route is on existing arterial streets, which lanes are not reconstructed but only designated through painting and signage, and 2/3 is new median lanes in freeways, with stations averaging every ½ mile, the probable cost would be between $4 million per mile and $8 million, plus the cost of vehicles.

Streetcar

Streetcars are electrically or diesel powered vehicles designed to travel in urban cores and serve a wide variety of trip types over shorter distances. The cars are "light weight" and maneuverable. They have relatively fast acceleration and can travel quickly between shorter spaced stations, typically within mixed traffic in the street. They accommodate a lower ridership because each train typically has one car. The vehicles can be modern (which accommodate up to 180 riders) or historic replicas (which accommodate approximately 50 riders) as shown below.

Financial Characteristics

Streetcar systems are generally cheaper than LRT systems as the vehicles are smaller and lighter. LRT often requires reconstruction of urban roadway lanes as the roads are not designed to support the weight of the LRT vehicles. This is usually not required for streetcars. Furthermore, the size (and cost) of stations and other system elements are also usually less. Streetcar systems therefore tend to cost about 70 percent to 80 percent of the cost of LRT systems. Streetcar vehicles, however, tend to cost around the same amount as LRT vehicles, or between $3 and $5 million.

Regular Fixed-Route Bus

Regular route bus is the most common type of bus service where buses operate over fixed routes according to the preset schedule. Service is generally provided from early morning through the evening, although the frequency of service may vary between peak and off-peak periods. Stop spacing is generally based on the density of the area, with stops as close as 1/8th of a mile in high density areas, such as the urban center, and up to 3/4th of a mile in low density areas.

Express bus or coach service is a bus operating strategy that is designed to operate faster than regular bus service. This is generally accomplished by dividing the route into three sections:

- A section which operates as regular bus service,
- A line-haul section with that operates at higher speeds with few or no stops, possibly along a limited-access highway,
- A distribution section which operates as regular bus service within a downtown core or other high density area.

Express bus is typically oriented to the peak period and serves suburban residents (or residents or outer urban areas) commuting to downtown or other major employment centers. Peak period headways can be anywhere from every 10 minutes to hourly, and frequently service is reduced or eliminated during off-peak periods.

Another version of express bus operates between smaller urban centers on a less frequent service, anywhere from hourly to only 2 or 3 trips per day. This service may be focused on a major employer, a major shopping center, or a major medical center that serves the entire region and is intended to provide a minimal level of access to that location from the entire region.

Express bus services frequently make the collection of riders more efficient by serving one or more park & ride lots in addition to, or instead of, operating regular service in a suburban area. The park & ride lot has the effect of collecting relatively large numbers of riders at a limited number of locations, significantly increasing the effectiveness and efficiency of the express bus.

Express bus service can be operated either with regular transit buses or with coaches similar to those used for intercity bus services. Such coaches may have reclining seats, luggage storage, Wi-Fi, and/or other amenities. These coaches also often have less standing room and may have fewer or smaller entrances and exits. The additional amenities are most common on long routes where additional time spent boarding and disembarking from the bus is of less importance than the additional comfort during the line-haul section of the route.

Financial Characteristics

Buses vary significantly in costs. Standard buses cost between $40,000 and $500,000, while articulated buses generally are generally in the range between $500,000 and $700,000.

A 100 parking space park & ride lots generally ranges in cost between $450,000 and $550,000, excluding land acquisition costs. However, many agencies have arrangements with churches and malls to use a portion of their existing parking lots as park & ride lots, since these lots generally have low usage during the periods when there is high demand for the park & ride lot. Such lots can have capital costs as low as a few thousand dollars, primarily for signage.

Shared-Ride/ Vanpool Service

Shared ride/door to door/flexibly routed services are van or small bus based services that generally operate in lower density areas (with fewer residences per square mile). Unlike door to door services which are required by the Americans with Disabilities Act, these services are designed to serve everyone, and are not limited to individuals with disabilities. They are often used either to provide transportation from rural or other low density areas to minor urban centers or as a feeder service to other types of transit. Trips generally need to be pre-scheduled, sometimes 24 hours or more in advance. Service may be provided seven days per week, on weekdays only (especially for employment focused services), or on only a few days every week (especially rural transportation services).

Community Paratransit

Table 12. Summary of Service Concepts for Transit Options

Transit Option	Service Concept	Characteristics of Service Area	Width of Corridor	Average Passenger Trip Length
Commuter Rail	Operates 4 – 6 car trains on exclusive ROW (may be shared with freight trains)	Low population and employment density terminating in a major population/employment center with either another major center at the other terminus or clusters of employment/population along the route	5 miles around park & ride; farther at terminal stations	37 miles
Light Rail	Operates 2-4 car trains primarily on exclusive ROW	4750 households per square mile and/or 35 MSF of commercial/office space	Primarily ¼ mile, lesser importance out to ½ mile	7 miles
Streetcar	Operates 1-2 car trains primarily in mixed traffic	4750 households per square mile and/or 35 MSF of commercial/office space	Primarily ¼ mile, lesser importance out to ½ mile	5 miles
Bus Rapid Transit	Operates generally in exclusive ROW with limited stops, possibly no stops along part of the corridor	4750 households per square mile and/or 12 MSF of commercial/office space	Primarily ¼ mile, lesser importance out to ½ mile	4 miles
Express Bus	Operates with limited stops, possibly no stops along part of the corridor	Service to an area with over 10,000 employees and over 32,000 employees per square mile AND corridor meets the qualifications for moderate regular route bus service (see below)	Primarily ¼ mile, lesser importance out to ½ mile. 5 miles around park & ride.	5 miles
Regular Route Bus	Frequent stops along route	Moderate service (2 buses per hour) – 3325 households per square mile and/or 8 MSF of commercial/office space. Minimum service (1 bus per hour) – 1900 households per square mile and/or 5 million square feet (MSF) of commercial/office space. Lower densities are appropriate to serve where walking conditions encourage transit use.	Primarily ¼ mile, lesser importance out to ½ mile	3 miles
Door to Door/ Flexibly Routed Service	May pick up customers at the curb or at special pick-up points by arrangement	May serve small neighborhoods or entire counties.	Any	13 miles (reflecting distances in rural systems)

The following table provides more detail on the operating characteristics of the different modes, including average speed, carrying capacity of the service per hour and per vehicle, type of right-of-way and typical station or stop spacing. Light rail has the highest carrying capacity on a per hour basis, whereas the door to door or flexibly routed services have the lowest carrying capacity.

Table 13. Summary of Transit Operating Characteristics by Mode

Transit Option	Avg. Speed w/ Stops	Route Capacity	Passengers / Vehicle	Right-of-Way (ROW)	Station Spacing
Commuter Rail	20 – 50 mph	2,000 – 10,000 passengers per hour	100 - 200	Exclusive ROW (may share with freight traffic)	2 - 5 miles
Light Rail	20 – 30 mph	3,000 – 15,000 passengers per hour	150 – 220	Exclusive ROW, generally running at-grade	0.5 – 1.5 miles
Streetcar	15 – 30 mph	1,000 – 6,000 passengers per hour	50 - 180	Mixed traffic, may have some exclusive lanes or ROW	¼ – 1 mile
Bus Rapid Transit	15 – 30 mph	2,000 – 10,000 passengers per hour	75 -100	Exclusive ROW or mixed traffic with priority measures	1/2 – 1.5 miles, may have larger gap in middle of route
Express Bus	10 – 20 mph	500 – 3,000 passengers per hour	40 – 110	Mixed traffic, may include freeways	¼ – 1.5 miles, may have larger gap in middle of route
Fixed-Route Bus	5 – 15 mph	200 – 1,200 passengers / hour	40 – 60	Mixed traffic on regular roads	¼ mile
Door to Door/ Flexibly Routed Services		< 20 passengers per hour / vehicle	4 – 8 in urban areas, less in rural areas	Mixed traffic	NA

Table 14. Summary of Typical Costs by Transit Option

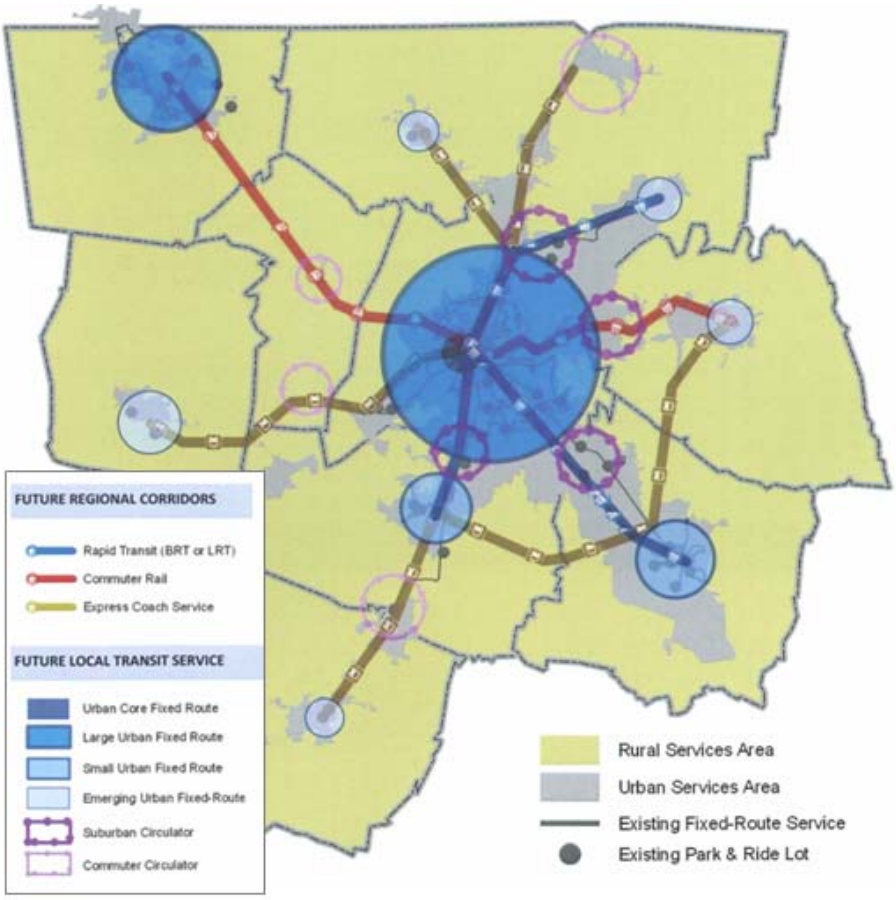
Transit Option	Capital Cost per Mile (millions)	Capital Cost per Vehicle (millions)	Operating Cost Per Hour (hundreds)
Commuter Rail	$3.2 - $5.6	$2.7 - $3.0	$300 - $400
Light Rail	$46 - $69	$3.5 -$5	$200 - $250
Streetcar	$31 - $56	$3.5 -$5	$140 - $170
Bus Rapid Transit	$4 - 8	$0.6 – $1.6	$120 - $160
Express Bus	n/a	$0.4 -$0.7	$100 - $110
Regular Route Bus	n/a	$0.4 -$0.5	$95 - 100
Door to Door/Flexibly Routed	n/a	$0.05 - $0.07	$70 -$75

Costs in 2009 Dollars. Capital costs exclude cost of Right-of-Way.

5.3 Long-Range Vision for Transit

A significant element of the 2035 Regional Transportation Plan involves the formal act of adopting a bold, new vision for mass transit that calls for the expansion and modernization of the region's mass transit system. Such a move is a necessary part of the region's preparation for the increasing competitive global economy, and proactively addresses the growing concerns about the health of our environment, worsening congestion, and the sprawling land development pattern that has begun to encroach upon the area's cherished rural countryside. The vision includes a variety of new and expanded services for regional corridors, urban centers, suburban communities, and even the rural countryside.

Figure 48. Long-Range Vision for Regional Transit



The long-range vision for mass transit calls for a strategic mix of transit options for future generations of Middle Tennesseans, ranging from high-frequency rapid transit service to the continued provision of rural transit services for those who do not live nearby to fixed-route options. The following describes the various types of services proposed for Middle Tennessee.

- ***Rapid Transit:*** Three corridors are identified for future regional rapid transit service including the region's northeast, southeast, and south corridors. These areas are the most densely populated and fastest growing within the region and have a well-established pattern of cross-county travel. The long-range vision for rapid transit in these corridors includes the development of either light rail transit or dedicated-lane bus rapid transit that would operate at high levels of service throughout the day. The specific mode or technology used will be determined by future study and depend heavily on development patterns, anticipated ridership, cost of construction, and public support for funding.

- ***Commuter Rail:*** The long-range vision calls for continued support for the Music City Star's east corridor commuter rail service and the development of a new commuter rail line in the region's northwest corridor to connect Clarksville and Nashville, two of Tennessee's five most populous cities.
- ***Express Coach Service:*** In corridors with strong commuting patterns but without the land development patterns or traffic congestion to warrant dedicated-lane transit service, the vision calls for the implementation of premium express coach service. Such service will offer a comfortable and stress-free ride to and from work for commuters, providing enhanced amenities along the way including high-back seats, wireless internet access, on-board televisions, and restrooms.
- ***Urban Fixed-Route Service:*** By far the most critical piece of the long-range vision, the region must continue to expand the existing urban fixed-route services in Nashville-Davidson County, Clarksville, Franklin, and Murfreesboro. Urban services are the backbone of any regional transit system and must be optimized in order to ensure the success of investments in regional rapid transit or commuter rail. The vision calls for continued investment in existing local bus systems, the eventual introduction of fixed-route service in Springfield, Gallatin, Lebanon, Columbia, and Dickson, and the return of the urban streetcar in downtown Nashville which serves as the central hub for the region.
- ***Suburban and Commuter Circulators:*** As the region begins to implement rapid transit, commuter rail, or express coach services in each of the regional corridors, the vision calls for the development of local circulators markets where a full-fledged urban fixed-route system would not make sense. Such local circulation will be important to customers to access regional services from primary destinations within their community. Suburban circulators, which would operate throughout the day, are envisioned for places like Goodlettsville, Hendersonville, Smyrna, La Vergne, and Brentwood, while commuter circulators, which would operate during peak commuting times, are envisioned for places like Portland, Spring Hill, Kingston Springs, and Ashland City.
- ***Other Regional Services:*** In addition to the geographically defined train, bus, and circulator services described above, the vision also calls for the expansion of the regional vanpool program and rural paratransit services. The regional vanpool program has been proven to be a popular and cost-effective way to provide ride-sharing opportunities to commuters who live too far away from fixed-route lines, and as the region's population continues to grow older, rural paratransit services will be needed to ensure older Middle Tennesseans have transportation to and from life-sustaining services.

While the adoption of a bold, new long-range vision for mass transit is a momentous step by Middle Tennesseans towards the expansion and modernization of its public transportation system, the vision itself will not guarantee the successful implementation of transit improvements. The transit vision seeks to communicate the region's intent for developing mass transit, but more difficult work is needed in order to make the vision a reality. The following sections of this plan provide specific guidance for how to achieve significant portions of the vision over the next 25 years.

5.4 Regional Corridor Recommendations

The Middle Tennessee area is served by seven major regional corridors, each a significant part of the overall vision for mass transit to provide increased connectivity between downtown Nashville and other traditional town centers and emerging activity centers across the area. Additionally, the MPO has begun to plan for emerging development along the SR 840 corridor, particularly between Lebanon, Murfreesboro, and Franklin, where the long-range vision calls for future express bus/ coach service as commuting patterns begin to yield sufficient demand for transit.

- North Corridor – Nashville to Springfield and Portland.
- Northeast Corridor – Nashville to Goodlettsville, Hendersonville, and Gallatin,
- East Corridor – Nashville to Mt. Juliet and Lebanon,
- Southeast Corridor – Nashville to La Vergne, Smyrna, and Murfreesboro,
- South Corridor – Nashville to Brentwood, Franklin, Spring Hill, and Columbia,
- West Corridor – Nashville to Kingston Springs and Dickson,
- Northwest Corridor – Nashville to Ashland City and Clarksville,

The region's vision for mass transit calls for the implementation of rapid transit services in three of the seven major regional corridors, commuter rail in two, and premium express coach service in three. The following presents a set of recommendations for the short and long-term to encourage progress towards the vision.

Rapid Transit Corridors

Northeast Corridor (Davidson and Sumner Counties)

The region's 30-mile Northeast Corridor extends between downtown Nashville and the City of Gallatin and is generally defined along US 31 (Gallatin Road, Nashville Pike), Interstate 65, SR-386 (Vietnam Veterans Blvd) and encompasses the areas of East Nashville, Madison, Goodlettsville, Hendersonville, and Gallatin.

The corridor ranges from relatively mature development in the southwest to new development in the northeast. East Nashville is undergoing revitalization of its commercial areas and residential neighborhoods while maintaining a traditional, compact urban development pattern. Gallatin Pike is an important transportation corridor in the East Nashville and Madison communities and future land use plans call for concentrating development in nodal community centers with a pedestrian-oriented character. The cities of Hendersonville and Gallatin are experiencing faster population growth and development with new upscale residential and commercial development occurring in less concentrated suburban development patterns.

The area is served by a variety of transportation services, highlighted by major north-south roadway facilities. Traffic volumes on those and other major facilities have increased significantly over the past decade, resulting in higher levels of congestion. A variety of transit services also are available within the corridor including fixed route bus service, express service and park and ride lots.

- Four north-south roadway facilities run in parallel in the northeast Nashville area, each with different transportation characteristics: Interstate 65, Vietnam Veteran's Blvd (SR 386), Gallatin Road/ Nashville Pike (US 31E), Dickerson Pike (SR 11), and Ellington Parkway.
- Average traffic volumes have increased by 6 percent on the roadways in the study area between 2000 and 2006.
- An HOV lane is currently in use on I-65 between Briley Parkway and the I-65/Vietnam Veteran's Blvd. interchange.
- CSX owns and operates a mainline railroad which travels through downtown Nashville, Madison, Hendersonville, and Gallatin.
- In 2005, there were about 96 trains per day using two existing tracks between downtown Nashville and Madison. Between Madison and Gallatin there were about 32 trains per day using one existing track.

- The Nashville MTA currently provides bus service (Route 26) between downtown Nashville and Rivergate Mall. In 2004 it carried 10 percent of all fixed route customers in the MTA's network and was the route with the overall highest ridership. 2007 data indicates substantially increased ridership.
- MTA introduced light Bus Rapid Transit (Route 56) in late September 2009. The service covers 12 miles along Gallatin Pike and runs between Music City Central in downtown Nashville to the edge of Sumner County, just north of Rivergate Mall.
- Bus service also is provided via Route 35X which extends from downtown Nashville to Hendersonville with service provided in the morning and evening rush hours.
- According to a 2006 survey, 54 percent of the MTA transit riders had no working vehicle and 74 percent had incomes less than $15,000 per year indicating a heavily transit dependent customer base.
- RTA introduced Express Coach Service between downtown Nashville and Hendersonville and Gallatin in Sumner County via Route 92X on September 29, 2008. Since its inception, the service has been very popular. It currently operates two morning inbound trips and two afternoon outbound trips and averages around 2,200 passenger per month.
- Several park and ride lots are provided in the study area for bus transfers and car and van pools. These lots are located at the Madison Kmart, Madison Square, Hendersonville Kohl's (RTA), New Shackle Island (Hendersonville), Rivergate Mall and Gallatin Walmart. In total, over 250 parking spaces are available.

The urban design characteristics of the corridor represent a continuum of development patterns representative of time periods as the region has expanded over the last 50 years. Each community has small commercial nodes that formed their original town centers. Connecting these nodes are various scales of strip commercial. The scale of these strip commercial areas is smaller within the segment between Nashville's central business district and Madison.

With the exception of large grocery store developments, the size of these developments is typically under an acre with less than 100ft of street frontage. Larger strip commercial developments are more characteristic of the segments around the Rivergate Mall. These developments commonly include 3 or more acres with street frontage exceeding 150ft. Indian Lake Village in Hendersonville, a large office, residential, and retail center currently under construction, has begun to introduce a large-scale multi-use development pattern to the north Hendersonville portion of the corridor.

Short-Term Recommendations for Express Coach Service

Options should be sought to further improve the express service to Gallatin. Recommendations are to add a third trip during each peak, either by combining the service with one trip on the 35X which could be extended, or adding a trip independently to Route 92X. Efforts should also be made to develop a formal Park & Ride lot east of the merge of the Vietnam Veterans Parkway merge with I65 north. Such a lot could add capacity to the Rivergate Mall Park & Ride (which is reasonably well utilized), it could make it easy and quick for the 92X to serve the Rivergate area. It could also be a very visible lot from the highway which would increase use.

An additional morning trip departing Gallatin at 7:00AM is recommended. An additional early evening trip would depart 21st and West End at 5:20PM. The one-way travel time would be approximately 70 minutes. One vehicle would be needed to operate these additional trips at a total capital cost of $450,000. The annual operating cost would be around $110,000. The additional trip is expected to increase in annual ridership by 13,000 passengers or about 50 per day.

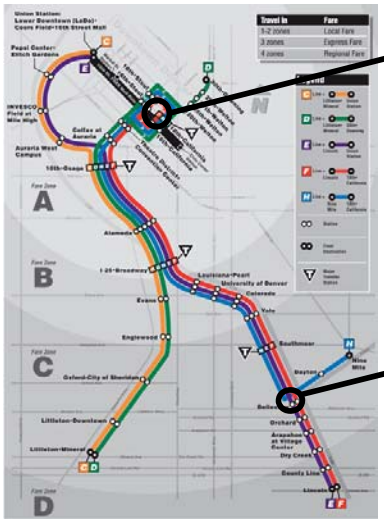
Funding should be allocated for a Park & Ride lot in the vicinity of Conference Drive and Vietnam Veterans Boulevard. The cost for a 200 space lot at $9,000/space can be estimated as $1,800,000.

Mid-Term Recommendations for Evolutionary Bus Rapid Transit

Understanding that implementing the region's Light Rail Transit vision for the Northeast Corridor will not happen overnight, a series of interim projects based on a Bus Rapid Transit alternative are being recommended to lay out the path to accomplish that ultimate vision. Some of those recommendations for the Davidson County portion of the corridor include the intensification of the light BRT service currently operated by MTA on Gallatin Pike to add dedicated lanes at selected locations north of Briley Pkwy, enhancing bus stations to include real time information and ticket vending machines as recommended on phase 2 of MTA's BRT implementation plan, and incorporation of queue jumps at selected intersections to allow buses to improve travel time. In the Sumner County portion of the corridor, dedicated/managed lanes are recommended for bus travel including the possibility of slip ramps to provide access to TOD sites along the corridor like in the case on Indian Lake Village in Hendersonville. Additionally, new circulator routes providing access to the main line in certain strategic areas in both counties is also recommended.

Long-Term Vision for Rail Transit

Following a similar approach to that one taken by the Denver region for its southeast corridor (T-Rex), an urban/suburban LRT alignment along a freeway corridor represents the locally desired alternative for Nashville's Northeast Corridor. In order to get there, an alternative growth scenario that provides a different approach to the trend that has been taking place during the last several years needs to be designed and followed. This alternative approach is imperative to position the corridor in a place where an LRT investment makes sense and can respond to the different realities permeating these types of investments. Answers to several question ranging from future ridership and capital and operating costs to economic and land use impacts and public policy and funding need to be considered and analyzed thoroughly in order to move forward. At a minimum, the following steps needs to be taken to advance the long term vision



- Translate revised growth scenario into the future land use plans of local governments;
- Educate the public and policy-makers on the benefits of targeted density with good urban design;
- Analyze gaps in policies to identify regulatory barriers to a more compact land development pattern;
- Identify and promote market incentives that encourage increased development around targeted TOD locations;
- Align public sector investment strategies with stated vision to help created a more suitable environment for major transit investment, or at least to not contradict it.

Southeast Corridor (Davidson and Rutherford Counties)

The Southeast Corridor area is approximately 30 miles in length from downtown Nashville to just south of the City of Murfreesboro and encompasses an area of approximately 350 square miles. The corridor has experienced tremendous population growth in recent years and is expected to continue growing at a rapid pace. The population in the study area, which includes portions of both Davidson and Rutherford Counties, was 331,000 in 2000 and is forecast to grow to more than 438,000 by the year 2025.

There are two major thoroughfares in the corridor, Interstate 24 (I-24) and Murfreesboro Road (US-41/70S), which connect Nashville with La Vergne, Smyrna and Murfreesboro. Both thoroughfares provide access to high concentrations of employment sites, including large state and federal offices in downtown Nashville, commercial/retail development in suburban areas, and single-family and multi-family housing throughout. With rapid growth in the area, congestion along these major roadways is forecast to increase. This increased congestion will make existing bus service less attractive due to longer travel times and buses that are stuck in traffic.

There are limited opportunities for roadway expansion due to topographic constraints and development adjacent to the right of way. For example, I-24 in and around downtown Nashville was constructed in the late 1950s and roadway improvements over the last several decades have expanded to the maximum amount of available right-of-way within the corridor. As a result, there is no available median right-of-way. The outside travel lanes are 20 to 30 feet below the surrounding topography and abut rock walls. The physical challenges and potential costs of expanding the right-of-way under these conditions, along with the impacts of taking the highly developed urban and industrial land which surrounds the right-of-way, limits the potential to expand the roadway. Additionally, in other parts of the I-24 corridor, major widening has occurred within the available median right-of-way to avoid affecting development alongside the edge of the roadway. Similar limitations exist along Murfreesboro Road which includes numerous commercial and retail establishments with driveways or parking facilities that directly access the roadway.

Currently, few options in the corridor provide alternatives to driving in heavily congested conditions. Options for longer-distance commuters are limited to: carpools and vanpools using park-and-ride lots; the Regional Transportation Authority (RTA) “Relax-and-Ride” commuter bus service which operates only during rush hour periods; local and express Metropolitan Transit Authority (MTA) routes that operate over shorter segments of the corridor; and use of the HOV lane on I-24. The HOV lane on I-24 runs between Murfreesboro and Nashville but terminates at Harding Road, several miles short of downtown Nashville. Drivers using the HOV lane must enter mixed traffic at that point creating significant congestion and limiting the utility of the HOV lane for carpools and transit. In addition, the HOV lane is not enforced, further limiting its benefit. For existing bus service there are no options that enable buses to bypass congestion. Considering this, ridership on the existing commuter services is relatively high which indicates a potential unmet demand for transit options in the corridor.

Potential commuters that do not have access to private transportation are denied access to jobs and educational opportunities throughout the corridor as a result of the lack of transit options. This lack of access reduces opportunities for all people throughout the region, hinders social and economic advancement, and reduces regional economic development. As the Southeast Corridor High-Performance Transit study illustrates, the lack of mobility and transportation options combined with the current and projected growth of population, employment—and traffic congestion—requires that transportation alternatives be developed now to address these needs.

Short-Term Recommendations for Express Coach Service

It is recommended that the Murfreesboro trips be modified to provide easier connections between Rover, Murfreesboro's bus system, and the express route. The Murfreesboro express trips could begin at the Rover transfer location at Walnut and Burton. The bus would then run on Medical Center Parkway and serve a new Park & Ride located near the interchange with I-24. A Park & Ride could either be established at the Avenue Shopping Center or a new one could be constructed since land is available near the interchange. This location is preferred over the existing Park & Ride at Old Fort Park. It is unlikely that there is space for a transit coach to serve this lot and it is located two miles east of the I-24 interchange.

From the I-24 and Medical Center Parkway interchange, the route would run express to Downtown Nashville, using the HOV lane from Highway 96 to the Davidson County line. The estimated travel time to Nashville is about 50 minutes.

Possible morning inbound departure times for the Murfreesboro route could be 6:00 AM, 6:30 AM, 7:00 AM, and 7:30 AM. Possible afternoon outbound departure times could be 3:50 PM, 4:10 PM, 4:50 PM, and 5:20 PM. Two additional vehicles would be needed to operate this service, with a total capital cost of $900,000. The annual operating cost would be $157,000 with an expected increase in annual ridership of 23,000 passengers or about 90 per day.

Funding should be allocated for a Park & Ride lot in the vicinity of Medical Center Parkway and I-24. The cost for a 100 space lot at $9,000/space can be estimated as $900,000.

The Smyrna and La Verge express service would begin at the Smyrna K-Mart and run north on US 41 through La Vergne, serving the Park & Ride at the Kroger. It would then turn left on Parthenon Boulevard to reach I-24 and run express to downtown. The travel time from La Vergne to downtown should improve to around 30 minutes.

Possible morning inbound departure times for the Smyrna and La Vergne route could be 6:00 AM, 6:30 AM, 7:00 AM, and 7:30 AM. Possible afternoon outbound departure times could be 3:50 PM, 4:10 PM, 4:50 PM, and 5:20 PM. Two additional vehicles would be needed to operate this service, with a total capital cost of $900,000. The annual operating cost would be $142,000 with an expected increase in annual ridership of 23,000 passengers or about 90 per day.

The local service connecting Nashville to Murfreesboro would operate similar to the current service. There would be three northbound trips and three southbound trips. The trip times should be reviewed with MTSU to make sure the service is meeting the travel needs of its students, staff, and faculty.

Mid-Term Recommendations for Enhanced Bus Service/ Bus Rapid Transit

In 2007, the MPO completed a Transit Alternatives Analysis which determined that the most practical investment in the short- and mid-term was to significantly enhance the regional express bus service by integrating features to increase its attractiveness to choice users that have access to a personal automobile. The study also recommended the implementation of new local circulator service in communities along the corridor including LaVergne and Smyrna. The MPO has budgeted planning funds to assist those communities in identifying possible startup services.

Long-Term Vision for Rapid Transit Service

Given the continued rapid growth between Nashville and Murfreesboro, and the ongoing interest in rapid transit in the region's urban corridors, the MPO recommends that as bus service is incrementally improved along I-24 and US 41 and local governments find opportunities to densify existing communities, the Southeast corridor be re-evaluated for possible fixed-guideway investments within the next five to ten years.

South Corridor (Davidson, Williamson, and Maury Counties)

The south corridor stretches 15 plus miles between Nashville and Franklin, TN and another 20 miles to Columbia. Currently served by express bus service during peak commuting periods, the corridor is a top candidate for more significant transit investment over the next decade. Williamson County is expected to more than double its population by the year 2035 and high-capacity rapid transit may be one of the most effective ways to keep this part of the region moving efficiently.

The long-range vision for the south corridor calls for high-capacity rapid transit in the form of light rail or bus rapid transit to connect residents to major employment and shopping destinations between Nashville and Franklin. The service should be integrated with local transit services in Franklin and Nashville and provide a catalyst for new local circulation in the Brentwood area.

Within the next two years, the MPO should work with the RTA and local governments in Davidson and Williamson Counties to conduct a major corridor study to evaluate the feasibility of light rail and bus rapid transit investments. Such a study will cost up to $1.2 million and could be paid for with MPO planning grants with local governments providing the required 20 percent local matching funds.

Short-Term Recommendations for Express Coach Service

Williamson County

Almost 30,000 Williamson County residents commute to Davidson County. To serve this commuter market, the RTA started a new express service in December 2009 from Franklin and Brentwood to Downtown Nashville. Route 91X Franklin/Brentwood Express serves two Park & Ride lots in Franklin, one at the Williamson Square Kroger near Route 96 and I-65 and another at Lowe's Home Improvement near Cool Springs Boulevard and I-65. The route also serves a Park & Ride at the Brentwood Civitan Ball Park.

There are two trips to Nashville in the morning departing at 6:30 AM and 7:00 AM and two trips from Nashville in the afternoon departing at 4:20 PM and 4:45 PM. Running only two trips in each direction limits customers' choices of when to travel. The last afternoon departure is before 5:00 PM, the traditional end of the workday for many professions.

It is recommended that a third trip operate in both directions. The additional morning trip would depart Franklin at 7:30 AM and serve all three Park & Rides. The additional early evening trip would depart Music City Central at 5:30 PM and serve all three Park & Rides. The one-way travel time would be approximately 50 minutes.

One vehicle would be needed to operate these additional trips at a total capital cost of $450,000. The annual operating cost would be $79,000 with an expected increase in annual ridership of 13,000 passengers or about 50 per day.

The RTA also started an express bus service to Spring Hill, which sits partly in Williamson County and partly in Maury County. Population in Spring Hill has almost quadrupled in eight years from 7,725 to 26,320. Route 95X Spring Hill Express serves two Park & Rides in Spring Hill, one at Thompson's Station Baptist Church and another at Spring Hill Kroger. Route 95X only runs two trips. One trip departs Spring Hill at 6:20 AM and another departs Music City Central at 4:10 PM. The one-way running time is approximately 60 minutes.

The times these trips operate only allow employees to be at work 8.5 hours. Many professional positions require longer work days. Two additional morning and two additional early evening trips are recommended to provide an express bus option for these employees.

The two additional morning trips would depart Spring Hill at 6:50 AM and 7:20 AM and serve both Park & Rides. The additional early evening trips would depart Music City Central at 5:00 PM and 5:45 PM and serve both Park & Rides.

Two vehicles would be needed to operate these additional trips at a total capital cost of $900,000. The annual operating cost would be $189,000 with an expected increase in annual ridership of 23,000 passengers or about 90 per day.

Maury County

The number of commuters between Maury and Davidson counties has increased rapidly from 3,077 in 2000 to 7,073 in 2008. This 130 percent increase is the largest increase in the ten-county region. Some of this growing commuter market may be served by the new express Route 95X Spring Hill Express discussed above. RTA Express Bus Service to Columbia is not recommended in the short-term because of the length of trip required, which is more appropriately served by intercity service. However, a Park & Ride lot is recommended near Nashville Highway (US 31) and Bear Creek Pike (US 412). The lot could serve as a carpool and vanpool staging area. The cost of a 50 space lot can be estimated as $450,000.

The South Central Tennessee Development District has begun intercity service that serves Columbia (stopping at the McDonalds at 110 Bear Creek Pike near Route 31). One trip leaves Columbia at 8:00AM and arrives at the Nashville Greyhound station at 9:45AM on Tuesdays, Thursdays and Fridays. The return trip leaves Nashville at 12:00 noon. On Monday and Wednesday, the trip runs to the Greyhound station in Murfreesboro, arriving at 9:45AM, with a return at 12:00 noon. This service is not aimed at the commuter market..

Commuter Rail Corridors

East Corridor (Davidson and Wilson Counties)

The region's east corridor stretches 30 plus miles between Nashville and Lebanon, TN. Currently served by the area's first example of local fixed-guideway rail service since the InterUrban rail lines closed down several decades ago. While ridership levels continue to ebb and flow with the price of fuel, the corridor is well positioned for growth over the next two decades as development begins to occur near stations. The MPO should continue to provide support to the line and seek ways to encourage densification of development to spawn new ridership.

Currently, the train operates 3 trips inbound to Nashville and 3 trips outbound to Wilson County in the morning peak period and 3 trips outbound to Wilson County and inbound to Nashville in the afternoon. The Music City Star also provides a fourth trip in the early evening from Wilson County to Nashville on Fridays only with a return trip leaving Nashville at 9:30PM.

Northwest Corridor (Davidson, Cheatham, and Montgomery Counties)

Clarksville, the largest city in Montgomery County and the fifth largest city in Tennessee, is increasingly becoming a bedroom community to Davidson County. The number of commuters traveling from Montgomery County to Davidson County increased from 4,698 to 8,335 (68%) from 2000 to 2008.

Vanpools and informal carpools operate from six Park & Rides and Jarmon D and Q Transportation operates express bus service from northeast Clarksville to Nashville. With the increase in the number of commuters from Montgomery County to Davidson County, express bus service from Park & Rides along I-24 to Nashville is recommended en route to the longer-term vision for commuter rail.

Short-Term Recommendations for Express Coach Service

Montgomery County

Two new routes are recommended between Clarksville and Nashville. The first route would begin at the Park & Ride at the Walmart on Wilma Rudolph Boulevard near Exit 4 on I-24. The route would run on I-24, serve the Park & Ride at Exit 8, and then run express to Downtown Nashville. The travel time to downtown would be approximately 55 minutes. This route is similar to the Jarmon Transportation service, which could be used to demonstrate the feasibility of express bus service from Exit 4. This existing service would need to be marketed to commuters as it appears it is currently mostly marketed to Ft. Campbell personnel.

Possible morning inbound departures could be 6:45AM, 7:15AM, and 7:45AM. These departures would make timed connections to Clarksville Transit System (CTS) Route 7 at the Walmart.

A reverse trip could depart Nashville at 7:45 AM. This route would be designed to serve Hemlock Semiconductor (HSC) and other business in Commerce Park. Commerce Park is located approximately 1.5 miles east of I-24 on the northwest side of Highway 79. HSC is currently under construction and is expected to create at least 500 jobs for the region. Many of these jobs will require skilled professionals that are well paid and are likely to reside in Nashville.

Possible afternoon outbound departure times could be 4:00 PM, 5:00 PM, and 6:00 PM, with a reverse trip at 5:15 PM. Three vehicles would be needed to operate this service at a total capital cost of $1.35 million. The annual operating cost would be $345,000 with an expected annual ridership of 45,000 passengers or about 175 per day.

The second route would begin at the downtown transit center. The route would run would run east on Ashland City Road and Martin Luther King Parkway, serve the Park & Ride lot at Exit 11 and then operate express on I-24 to downtown. The travel time to downtown would be approximately 60 minutes.

Possible morning inbound departures could be 6:30 AM, 7:00 AM, and 7:30 AM. These departures would make timed connections to all Clarksville Transit System (CTS) routes at the transit center. A reverse trip could depart Nashville at 7:45 AM and operate express to downtown Clarksville. Possible afternoon outbound departure times could be 4:00 PM, 5:00 PM, and 6:00 PM, with a reverse trip at 5:15 PM. Three vehicles would be needed to operate this service at a total capital cost of $1.35 million. The annual operating cost would be $377,000 with an expected annual ridership of 45,000 passengers or about 175 per day.

Cheatham County

While anticipated growth between Nashville and Ashville City is not as robust as that projected between Nashville and Clarksville along I-24, the plan recommends the introduction of express bus service from Ashland City. While the number of commuters from Cheatham County to Davidson has remained unchanged from 2000 to 2008, the total of 10,500 commuters is above the minimum threshold of 5,000 commuters.

A Park & Ride could be established at the Walmart just east of Ashland City (Route 12 and Old Hydes Ferry Run). The route would then run express on Route 12 into Davidson County, follow 8th Avenue into Downtown Nashville, and end at Music City Central. Possible morning inbound departures could be 6:40 AM, 7:20 AM, and 8:00 AM. Possible afternoon outbound departures could be at 4:15 PM, 5:10 PM, and 6:00 PM. The one-way travel time would be approximately 40 minutes.

Two vehicles would be needed to operate these trips at a total capital cost of $900,000. The annual operating cost would be $189,000 with an expected increase in annual ridership of 34,500 passengers or about 135 per day.

Long-Term Vision for Commuter Rail

Over the next several years no major highway projects are expected to significantly improve intercity commute times in the Clarksville-Nashville corridor. Over the next 20 years, intercity commute time is expected to deteriorate further to 1 hour and 35 minutes from the 50 minute drive of today. Clarksville-Nashville commuters need a travel option which bypasses the deteriorating traffic conditions on I-24 and Clarksville Highway. That transportation option should be developed within the next 5-7 years.

The Nashville Area MPO recently participated in a study along with the Clarksville Urbanized Area MPO, TDOT, the Cheatham Rail Authority, and the Nashville Western Rail Authority to evaluate the feasibility of a high-capacity commuter service which would improve the current travel times and provide flexibility for low-cost expansions of capacity as travel demand increases. The study evaluated commuter rail service via three different alignments including I-24, existing CSX tracks through Springfield, and the old Tennessee Central Railroad through Cheatham County. The study concluded that the following scenario was the most feasible, but further study is needed prior to the selection of a preferred alignment.

- **Project Alignment:** The old Tennessee Central Railroad, which follows the Cumberland River and passes through Ashland City, was found to be the most practical alignment. Most of the old railroad bed is still in place and the Nashville and Western short line freight railroad now operates on the line from the Farmer's Market area of Nashville to the Ashland City Industrial Park just south of Ashland City. The CSX alignment proves impractical since the private rail company has limited capacity to share with passenger service. The initial estimates for the cost of constructing new track along the I-24 corridor did not appear to be competitive with the Tennessee Central Railroad alignment.
- **Service Concept:** Passenger stations would be located in Mid-Town Nashville, Downtown Ashland City, and the Old Hospital/Madison Street area of Clarksville. Two train sets each make the full Clarksville/Nashville trip; 2 times in the AM and 2 times in the PM. Speeds would be up to 79 miles per hour over long sections, with an overall 50 minute Clarksville to Nashville trip time.
- **Initial Capital Costs:** $114.8 million is the projected cost to rehab 16 miles of existing track, construct 27 miles of new track, upgrade 54 bridges or overpasses, construct 3 stations and the support and maintenance facilities, acquire new rights of way, purchase locomotives and train cars, and includes a budgeted contingency.

- **Annual Operating Costs:** $5.7 Million to operate the service during peak commuting times, two runs in the AM, and two runs in the PM.

To date, the conceptual feasibility study represents the latest evaluation of the potential commuter rail in the corridor. In order to advance to the next level, the Nashville Area MPO recommends a continued partnership with the Clarksville Urbanized MPO and TDOT to further refine projects for ridership and costs to allow decision-makers to better understand the benefits and costs of moving forward with commuter rail in the northwest corridor. The following are proposed as the immediate next steps:

- Conduct a 10-county regional household travel survey in FY 2011 ($800,000 to $1.2 million) in order to update information about current regional travel behaviors. Such data will be needed in order to conduct a more thorough transit alternatives analysis to compete for Federal Transit Administration (FTA) grants for implementation.
- Program funds ($800,000 to $1.2 million) for the detailed corridor study to include the required FTA Alternatives Analysis that is required to qualify for federal grant funding. Should funds be available, the study could begin as early as Fall 2012, but not sooner than the completion of the household travel survey.
- Integrate corridor study recommendations into the MPO's regional transportation plan. Given the required work elements to complete the study, it is likely that those findings and project recommendations will be presented as part of the region's 2040 Regional Transportation Plan, scheduled for adoption in late 2015.
- Begin efforts to preserve and protect potential right-of-way located along the corridor. Such action now can help significantly reduce the cost of implementation by preventing unnecessary land acquisitions or business relocations to make way for the construction of tracks or stations.
- Work with TDOT to secure Truman-Hobbs funding for a new Cumberland River bridge that could be used by the commuter rail service should the FTA Alternative Analysis recommend an alignment through Ashland City.
- Continue investment in interim transit solutions along the corridor including inter-city bus service and the vanpool program to serve existing commuters and to help build ridership for future rail service.

Regional Express Coach Services

Even within the "bold" vision for mass transit, much of the region does not have the concentrated development that is needed to support regularly scheduled transit service such as local fixed-bus service or light rail service. However, to build towards a future with a comprehensive public transportation system, some steps can be taken to improve and fill gaps in the public transportation services available today. In particular, Park & Ride with express coach services are an excellent way to accommodate transit commuters in less dense areas. Express coach service, combined with strategically located park and ride lots, allow customers of public transportation to access the service by car and thus this option increases the residential area that transit can serve by many times.

The potential for Park & Ride/express bus service is dependent upon the number of commuters traveling between a Park & Ride service area and the destinations served by the express bus service. Actual usage of Park & Ride lots will depend upon the quality and quantity of transit service, the degree of highway congestion, and the availability of parking at the destination. Following is an assessment of the potential for Park & Ride with express bus.

West Corridor (Dickson County)

The number of commuters from Dickson County to Davidson County in 2008 was 6,620. This is barely above the threshold of 5,000 and express bus service from Dickson County can be considered a lower priority compared to the other eight counties.

A Park & Ride could be established near the intersection of I-40 and State Route 46. The route would then run express on I-40 and stop at existing informal and formal Park & Rides located at the intersection Interstate 40 and State Route 96 near the border of Dickson and Williamson Counties. The bus would continue to run express along I-40 and end at Music City Central. Possible morning inbound departures could be 6:30 AM, 7:00 AM, and 7:30 AM. Possible afternoon outbound departures could be at 4:15 PM, 5:10 PM, and 6:00 PM. The one-way travel time would be approximately one hour.

Three vehicles would be needed to operate this service at a total capital cost of $1.35 million. The annual operating cost would be $283,000 with an expected annual ridership of 34,500 passengers or about 135 per day. The cost of a 50 space Park & Ride can be estimated as $450,000.

North Corridor (Robertson County)

While the number of commuters from Robertson County to Davidson has increased slightly from 2000 to 2008, the total of 12,357 commuters is above the minimum threshold of 5,000 commuters.

A Park & Ride could be established near the intersection of I-65 and State Route 52. The route would then run express on I-65 and stop at another newly established Park & Ride located at the intersection I-65 and State Route 25. The bus would continue to run express along I-65 and end at Music City Central. Possible morning inbound departures could be 6:30 AM, 7:00 AM, and 7:30 AM. Possible afternoon outbound departures could be at 4:15 PM, 5:10 PM, and 6:00 PM. The one-way travel time would be approximately 55 minutes.

Three vehicles would be needed to operate this service at a total capital cost of $1.35 million. The annual operating cost would be $259,000 with an expected annual ridership of 34,500 passengers or about 135 per day. Two 50 space Park & Ride lots at $9,000 per space can be estimated to cost $900,000.

Summary of Park & Ride Service Recommendations

The recommendations for new and additional Park & Ride service are summarized in the following table. Altogether improvements are recommended for ten existing routes, and five new routes are recommended. The total additional operating cost for these services is $2.5 million, some of which will be offset by fares collected. Assuming similar fares of $2.10 for express bus service in Davidson County (the current fare for express bus service) and $3.50 for express bus service outside Davidson (the current RTA fare), and that the average fare will be around 70 percent of full fare (to allow for fare discounts), the overall net operating cost of service would be $1.66 million. The additional capital cost for 33 vehicles is $14.8 million. The cost for six new Park & Ride lots is $4.5 million.

Table 15. Summary of Express Coach and Park & Ride Service Recommendations

County	Express Service	Total Operating Cost	Net Operating Cost	Capital Cost for Vehicles	Capital Cost for Park & Ride	Passengers
Davidson	Add 11 trips to existing express bus services	$358,000	$238,950	$4,950,000		81,000
Sumner	Additional trip to/from Gallatin	$110,000	$78,150	$450,000	$1,800,000	13,000
Rutherford	Modify and improve express service on 96X	$157,000	$100,650	$900,000	$900,000	23,000
Rutherford	Modify and improve Smyrna and La Vergne service on 96X	$142,000	$85,650	$900,000		23,000
Williamson	Improve service on 91X	$79,000	$47,150	$450,000		13,000
Williamson/Maury	Improve service on 95X	$189,000	$132,650	$900,000		23,000
Maury					$450,000	
Cheatham	Ashland City to Downtown Nashville	$189,000	$ 104,475	$900,000		34,500
Dickson	Intersection of I-40 and State Route 46	$283,000	$ 198,475	$1,350,000	$450,000	34,500
Robertson	I-65 to Downtown Nashville	$259,000	$ 174,475	$1,350,000	$900,000	34,500
Montgomery	Exit 4 I-24 to Downtown Nashville	$345,000	$ 234,750	$1,350,000		45,000
Montgomery	Clarksville Transit Center to Downtown Nashville	$377,000	$ 266,750	$1,350,000		45,000
Total		**$2,488,020**	**$1,662,125**	**$14,850,000**	**$4,500,000**	**369,500**

5.5 Local Fixed-Route Recommendations

Nashville MTA

During most of the first decade of the 21st century, the Nashville MTA has been improving its service incrementally along several dimensions. Ridership has grown in response to service improvements and partnerships with Nashville employers. Service effectiveness (rides provided per each vehicle hour) has been increasing. The downtown Music City Central Station now provides a modern facility to shelter bus passengers and provide convenient transfers. Support from Nashville Metropolitan Government will allow further service improvements, such as a BRT on Gallatin Road. Also, the state of Tennessee now has enabling legislation to permit a larger regional solution to providing public transportation.

Nashville MTA is poised to take another step forward by increasing the level of service provided so that MTA will rise to the upper levels of some of our peer regions. The following sections present further recommendations for Nashville MTA service expansion over the short-, mid-, and long-term horizons. Further detail is available in the MTA's recently published *Strategic Master Plan*, which provides the foundation for the following.

Short Term Recommendations (2010-2015)

Gallatin Road BRT

Implement a BRT service for Gallatin Road. MTA is planning to use hybrid 60 foot long articulated BRT vehicles, as used by the Los Angeles MTA on its Orange Line BRT, on a new BRT along Gallatin Road. The proposed BRT will have stops around every ¾ mile with enhanced stop amenities such as electronic signs giving the arrival time of the buses in real time, enhanced shelters and amenities. Weekday service will be every 15 minutes all day and 30 minutes off-peak. The system will include traffic signal priority for the buses to give them some additional green time as they proceed along the corridor.

The BRT service will improve service frequency in the Gallatin corridor, increase speed of many trips, improve signage, and improve the image of transit. In short, the BRT will make improvements in 4 out of the 5 priority categories. The increased operating cost for the recommenced service is $2.3M per year. The increase in capital cost will be $9.4 M.

Increase Frequency of Service

Provide frequency improvements on eleven routes to bring them up to minimums as described in the Service Delivery Policy. Note that many of these suggested service additions are in off-peak hours which do not require additional vehicles, and which can provide an excellent boost to ridership. The total operating cost per year for these improvements is estimated at $1,156,000 and the capital cost for new buses at $300,000 each is $5.1 M.

With the addition of improvements on Route 26 Gallatin Road, altogether 12 routes are recommended for frequency improvements. These frequency improvements will affect 44 percent of households which are located within ½ mile from each route that is improved. Frequency improvements on express routes will greatly increase the availability of higher speed transit to outer areas of the county. These are areas that are growing—and since ridership per trip on the existing express routes is quite good, providing additional trips should be an effective way to draw new riders.

Downtown Circulator

Institute a Downtown Circulator. A Downtown Circulator will provide better connections between transit facilities such as Music City Central and the Music City Star, as well as connect state office buildings, downtown businesses/residents, and tourist destinations. The Downtown Circulator will speed transit service as it will provide very frequent pickups for any passenger arriving in the downtown.

While the exact routing(s) have not yet been established the service can be estimated to require 4 buses to provide a very frequent level of service. Operating 17 hours a day weekdays and 8 hours a day on Saturdays and Sundays would cost around $1.8 M for operations and $1.3M for vehicles and specially signed bus stops. In March 209, 2010 MTA implemented the Music City Circuit, a circulator providing free of cost service around downtown Nashville. The Circuit started with two routes, the Blue Circuit (Bicentennial Mall) and the Green Circuit (Gulch). On September 27, 2010 a third route named the Purple Circuit (Richard H. Fulton Complex) was introduced.

Service to New or Unserved Areas

Reserve funding for service to a new or unserved area. While the densities in most unserved neighborhoods are not sufficient to recommend fixed route services, MTA will continue to refine the flexibly routed services concept, BusLink, that can link neighborhoods with important destinations and other fixed route services. In particular, neighborhoods with densities of greater than 2500 persons per square mile with a pedestrian

environment that would encourage walking to transit stops would be good candidates for a pilot project. A budget of $700,000 would allow for two buses operating 12 hours weekdays and 10 hours on Saturday.

Marketing

Provide an additional marketing budget to help non-users learn how to use the service. This effort will continue the work done by Transit Now on a video for helping non-users to learn how to use the service. A budget of $30,000 is recommended for this project. Note that BRT implementation also calls for a special marketing budget of $50,000.

The table below summarizes the short-term list of projects along with the five areas for improvement: As can be seen, all of the priority areas are affected by the improvements. The total of the recommended service improvements comes to around $6M in additional operating funding and $16M in capital funding.

Table 16. Recommended Short-Term MTA Improvements and Priority Areas

Service	Operating Cost ($1000)	Capital Cost ($1,000)	Increase Frequency	Faster Transit	Serve New Areas	Easier to Use	Improve Image
Gallatin Road BRT	$2,305	$9,400	X	X		X	X
Frequency improvements on 11 routes to bring to minimums	$1,156	$5,100	X			X	
Downtown Circulator	$1,800	$1,300	X	X		X	X
Service to new or unserved areas (undesignated)	$700	$250			X		
Program to show new users how to use the service	$30					X	X
Total	**$5,991**	**$16,050**	X	X	X	X	X

Opportunities for Transit Investment in the Mid Term (2016-2025)

In the mid-term this plan assumes that MTA, working with the Mayor's Office, Metro Council, Tennessee DOT, the Nashville MPO, Cumberland Region Tomorrow and other stakeholders will have been successful in finding a new source of funding for regional transit services. If this is the case, it is likely that the MTA will be able to offer additional regional service. Recommendations for Nashville/Davidson County include:

- Extend the Gallatin BRT service from the Music City Central (MCC) to Vanderbilt/ West End.
- Improve night service on certain routes to continue in the same pattern as during the day. Routes affected would be Routes 2 Belmont, 4 Shelby, 7 Hillsboro, 19 Herman, 20 Scott, 28 Meridian, 29 Jefferson, and 30 McFerrin.
- Establish mini-hubs at Clarksville Pike and Gallatin Road.
- Provide signal priority and BRT elements for other corridors including Route 15 Murfreesboro Road, Route 12 Nolensville Road, and Route 23 Dickerson Road.

- Add park and ride capacity for Routes 35X Rivergate Express and 41 Golden Valley.
- Extend and expand park and ride service to Rutherford, Sumner and Williamson Counties. In particular, offer half hour service during the peak hour to Murfreesboro and Hendersonville. Institute park and ride service to Franklin.
- Expand service to unserved areas including new fixed route or flexible service in areas meeting density standards such as:
- Two neighborhoods to the east of Gallatin Pike and just north of the new Madison Bus Link area. These might be served by expanding BusLink service northward to Anderson Lane.
- An area between Routes 3 West End and 7 Hillsboro, part of the Hillsboro-West End area. This area would be a candidate for a neighborhood route or flexible route connecting to the Mall at Green Hills.
- A area south of I-440 between MTA Route 12 Nolensville Road and I-24. Feeder routes could connect neighborhoods north of Route 72 Edmondson Pike Connector with the 100 Oaks Shopping Center.

Opportunities for Transit Investment in the Long Term (2026-2035)

Long-term (2026-2035) project recommendations include providing high capacity transit service beyond Davidson County (BRT or commuter rail) to Rutherford, Sumner and Williamson Counties, further improving transit capacity between Nashville and the West End with streetcar or dedicated bus lanes, extend current route services to reach developing residential and employment centers, and institute additional mini-hubs to improve connections.

- Extend Route 23, Dickerson Road to reach emerging employment areas north of the current service area.
- Extend Route 6 southward to reach new developing communities and employment areas, including Summit Medical Center.
- Further improve transit capacity between downtown Nashville and the West End with light-rail or if BRT, with dedicated bus lanes and/or queue jump lanes.
- Provide high capacity service (BRT, light rail or commuter rail) to Rutherford, Sumner and Williamson Counties. If BRT service, improve existing right-of-way for buses with exclusive lanes or queue jump lanes.
- Provide additional service to the developing neighborhoods currently served by Route 37X Tusculum/McMurray Express and Route 38X Antioch Express. These neighborhoods are expected to reach densities that would justify more than peak hour service. The express bus services could be expanded throughout the day and into the early evening or alternatively, the service could be used to connect with the regional high capacity service.
- Institute an additional mini-hub at 100 Oaks to improve connections.

Murfreesboro Rover

Rover is the City of Murfreesboro's public transportation system and it provides fixed-route transit service within the City of Murfreesboro. It also works with and/or assists other regional providers with mobility issues.

Rover began bus transportation service to the public in April of 2007 along six routes throughout the city and expanded to eight routes in December 2008. Rover buses run Monday through Friday from 6 a.m. until 6 p.m. and all buses are equipped with bike racks and are wheelchair-accessible.

In August 2010, Rover completed a Transit Service Assessment study. The study purpose was to evaluate the system and identify service improvement needs and opportunities. The following are the specific study goals:

- Understand the needs of current riders,
- Identify opportunities to attract more riders,
- Identify if the current service is meeting rider needs,
- Identify unmet rider needs,
- Measure current levels of customer service delivery, including service quality, cleanliness, timeliness, etc.

Study results show that Rover has been doing a good job in general to provide frequent and reliable transit services as well as providing good geographic area coverage in Murfreesboro. The study also identifies some key findings that provide insight on how Rover can improve and increase service in the future. Several of those findings are already being addressed by Rover as specific projects included in the MPO's FY2011-15 Transportation Improvement Program. Additionally, the study outlines short and long term recommendations that can be implemented as additional resources become available. Those findings and service recommendations are described below.

Key Findings

An on-board survey was conducted to learn more about Rover customers, how they ride Rover, and what would encourage them to ride more often. Survey analysis revealed:

- Rover passengers are very satisfied with the service and likely to continue riding.
- A majority of passengers use Rover to travel to and from work and ride frequently.
- Almost all of the customers do not have a car available for these trips.
- Passengers wish Rover went further west on Old Fort Parkway, served Cason Lane, and went further south on Church Street.
- Evening service until 9:00 p.m. and weekend service ranked the highest of the elements that may encourage customers to ride more frequently.
- Increasing the availability of shelters could contribute to an overall increase in satisfaction.

Stakeholder interviews were conducted to gain an understanding of the current and projected conditions in Murfreesboro. Overall, stakeholders had a positive view of Rover. The most common comments during interviews were:

- Extend service on weekdays,
- Start operating service on Saturdays,

- Add service on MTSU campus,
- Install shelters and benches.

A fixed route assessment was conducted. This assessment included an analysis of ridership data and on-board ridechecks to determine stop-level passenger activity. Rover is doing the following items well:

- Increasing ridership – Three routes (Mercury, Highland, Medical Center) continue to have ridership growth. Ridership on the remaining routes is stable.
- Frequency of service – Four of eight routes operate every 30 minutes. This level of frequency makes the service more attractive, especially to choice riders as it allows them the flexibility to travel when they want to travel.
- Better productivity than in-state peers – Rover's overall productivity (passengers per revenue hour) is 10.2. This slightly exceeds the average productivity of Rover's in-state peers[1] of 9.0 passengers per revenue hour.
- Service coverage – The eight routes provide good geographic coverage of Murfreesboro
- Disabled use – Several passengers with disabilities routinely use the fixed-routes. It is less expensive to transport these passengers on fixed route service than on paratransit service.

Recommended Service Changes

Two short-term service improvements were recommended for consideration:

- The extension of every other trip on S Church to Innsbrooke Boulevard near the frequently requested Barfield Crescent area. *This recommendation was implemented on September 1, 2010.*
- Creation of a taxi subsidy program to provide evening trips, Saturday trips, and serve areas of Murfreesboro not served by Rover. In a subsidized taxi program, eligible individuals can purchase discount coupons to use as taxi fare.

Three long-term service improvements were recommended for consideration for implementation after the taxi subsidy program has established demand for each service and funding is available:

- Westside route restructuring,
- Evening demand response service,
- Saturday fixed-route service.

Franklin Transit Authority

Franklin Transit's 5-Year Service Plan responds to the challenges of the next five years by refining the service standards by exploring new ways Franklin Transit can continue its innovative development with flexible services, use of smaller/efficient buses, connectivity with express services, and community shuttles, all supporting and complementing the network of regional transit services in our area. Three key components of Franklin Transit's 5-Year Service Plan include:

- Replacement of aging equipment;
- Adding new vehicles and staff, as existing transit services continue to expand especially TODD (Transit On DemanD) service;

- Planning and implementation of new sustainable transit services to continually meet the needs of the passengers and the community.

5.6 The Return of Urban Streetcar

Nashville once had an active streetcar system beginning in 1860 with mule drawn streetcars running on city streets operated by the McGavock & Mt. Vernon Horse Railroad Company and the South Nashville Street Railroad. In 1887 several "dummy" lines (streetcars pulled by little engines) were in operation and by 1889 the first electric streetcar ran in Nashville.

From the NashvillePost.com "The electrification of the street railways was a great occasion. Nashville was one of the first cities in the country to adopt the trolley. While the wires were being put up, everybody was speculating on how the trolley could run on the main wire without being obstructed by the supporting cross wires. .When the great day came and the first electric car, handsomely finished with plush upholstering, appeared, the streets were crammed and jammed with a curious crowd to see the lightning harnessed. Everybody was afraid of these half-tamed thunderbolts of Jove."

Highlights of Nashville's history with streetcar include:

- In the 1890's the Nashville Street Railway built a casino at Shelby Park that later became a community center.
- On June 22, 1901 the Nashville Street Railway was forced into receivership when it defaulted on the interest payment for $2,060,000 in bonds.
- In 1909 the Nashville-Franklin Interurban Railroad began running between Nashville and Franklin and it operated until 1943. The Nashville Gallatin Interurban operated from 1913 to 1932.
- Streetcars in the city of Nashville which once ran on many routes completed their last run in 1941

Economic Development Potential of Streetcars

Today, the nation is seeing a resurgence of the streetcar all across the country. Communities instituting this mode of transit are using streetcars for many of the same reasons that they were originally built at the turn of the century. Streetcars are uniquely suited to serve high density areas in downtown districts across the country. They are slow and integrate well into an urban environment. They are much cheaper than light rail, are hugely successful in promoting development and street life, and fit easily into built environments with little disruption to existing businesses, residents and traffic. People are attracted to streetcars because they are nostalgic and a reminder of a simpler time. They are a comfortable mode of transportation with fixed routes making them less confusing than buses for the public regarding their destinations. They are an attraction in their own right and because people like to ride the streetcars, developers are attracted to them. Streetcars today are a form of entertainment as well as a mode of transportation that provides a tangible economic impact, while connecting core downtown districts.

In many cities today, the construction of a streetcar line produces significant businesses and residential development and attracts many more riders than a bus service following a similar route. People are more apt to give up their automobiles and ride the streetcars than with any other mode of transportation. People are also drawn to live in areas served by a streetcar route.

Table 17. Economic Development Results for Streetcar Projects

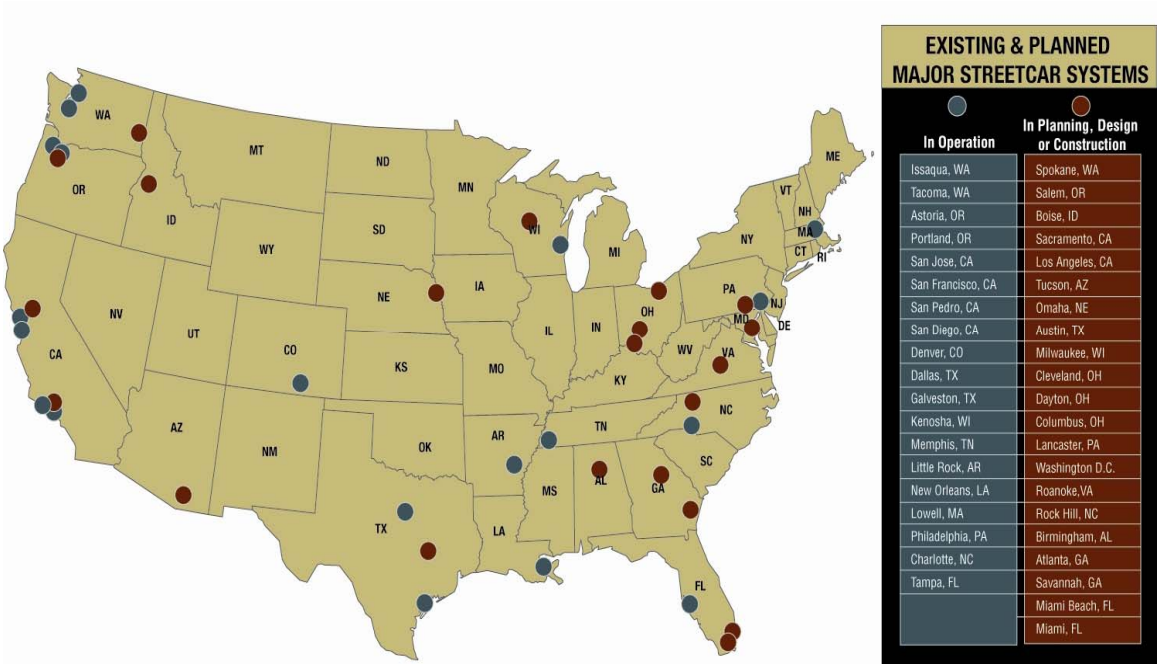
ECONOMIC DEVELOPMENT RESULTS FOR STREETCAR PROJECTS						
Recent Projects	Year Opened	Miles	Number of Cars	Cost in Millions	Economic Development	Return on Investment
Kenosha	2000	2	5	$5.2	$150,000,000	2885%
Tampa	2002	2.4	11	$53.0	$2,000,000,000	3774%
Little Rock (2 phases)	2004-2007	3.4	5	$28.5	$260,000,000	912%
Memphis (3 phases)	1993-2006	6.5	20	$24.0	$137,000,000	571%
Portland (2 phases)	2003	6	5	$73.0	$2,399,000,000	3286%

Source: Street Smart

Some of the cities benefiting from the construction of a streetcar route are Portland OR, Tampa FL, Little Rock AK, Kenosha WI and Dallas TX. Economic development in all of these cities has achieved financial success well beyond the original expectations and all of these cities have either expanded their original systems or plan to expand them in the near future.

Most of the streetcar systems constructed in the USA in the last 15 or 20 years have been constructed to encourage or spur economic development. All of the projects have been successful to various degrees.

Figure 49. Map of Existing and Planned Streetcar Systems in U.S.



The following table presents more information about the successes of streetcars in peer regions.

Table 18. Examples of Recent Streetcar Success

Streetcar Example	
	Portland, Oregon A modern streetcar system (cars by Skoda) was constructed in Portland. The operation of the system began in 2001, and it has been extended several times. Initially, the system operated over a 3 mile loop with an approximately 13 minute headway. Economic development in the area surrounding the streetcar route has been $2.3 Billion since the construction of the system.
	Charlotte, North Carolina This is a modern streetcar system that was just completed in the fall of 2007 in conjunction with a new light rail line. Development along the streetcar system has been rapid and more than $400 Million in development has occurred prior to the start up of the system.
	Tampa, Florida Tampa built a heritage streetcar system using replica streetcars constructed by Gomaco Corp. of Iowa. The 2.3 mile system began operation in October of 2002. This system resulted in $600 million in development that occurred prior to the opening of the system and over $2 Billion in development through 2004.

Kenosha, Wisconsin

Dealing with double digit unemployment, the loss of 5,300 jobs in three years and a dying downtown, the City of Kenosha undertook a massive redevelopment effort with a 2 mile streetcar loop as the centerpiece of development. Beginning construction in 1999, the system opened for business in 2000 using ex-Toronto PCC cars painted in the liveries of cities that had used the PCC car in their streetcar systems. Since the start up of the system, Kenosha has seen the construction of hundreds of condominiums, a museum and a park. Economic development is estimated at $120 Million with three more museum buildings in the planning stages.

Little Rock, Arkansas

The original project completed in 2003 consisted of 2.5 miles of track with three Gomaco replica streetcars. Since the original construction and second phase has been completed providing service to the William Jefferson Clinton Presidential Library, economic development has been calculated in the $2 Billion range.

Lower Broadway-West End Streetcar Concept

Generally streetcars are thought of as a circulator system and that lends itself to the establishment of circular routes. An added advantage of a circular route is the area of effect for the system is increased by using parallel streets for the return track. Several possible route locations were investigated including Demonbreun, Broadway, Central and Church Streets as possible route alternatives. After investigating these possible routes and walking or riding each of them, it was determined that the recommended route would be using Broadway as a two way spine from 1st Avenue to just beyond 31st Avenue, very close to the I-440 exit.

This route is recommended as a starter route because it has the best connectivity of any of the routes investigated. Connecting the high density residential units at the west end of the system, Centennial Park, Baptist Hospital, Vanderbilt University, a myriad of hotels, all to the most vibrant street in the downtown at the east end of the system, would be a great benefit to the community.

The route would also be close enough to the new convention center and be able to connect to the riverfront commuter rail station and the various activities that take place along the riverfront throughout the year.

The system would be three miles from end to end or six miles long for a round trip, and be able to operate with four cars, each making the complete circuit every 40 minutes providing a 10 minute headway. The street cars could be modern, newly constructed heritage (historic replication) cars or reconstructed older cars that would meet all current safety and ADA requirements. All cars would be powered electrically by a single overhead wire spanning between single poles that would be in the center of the spine on Broadway up to West End Avenue

and then be mounted behind the curb line on West End, 21st and the upper section of Broadway. Cars could be stored and displayed in a Car Barn in an area adjacent to the streetcar line.

Capital Cost Estimates

Estimated capital costs for the proposed 6 mile track system including track, power, maintenance, car barn (and property acquisition), cars and stops was estimated to be in the $110 million dollar range.

The capital costs for the system have been estimated using the following assumptions:

- Two way spine in dedicated right of way on lower Broadway and street running on upper Broadway and West End Avenues;
- The existing bridges can be used as is with minor paving adjustments for the track structure and approaches;
- The car barn will be constructed within 1,000 feet of the existing or proposed streetcar line;
- Four new cars will be purchased;
- Project will be constructed within two years;
- Minimal utility relocations in existing streets will be required;
- Track and Overhead Wire;
- Car Barn and Related Track.

Operating Cost Estimates

Operating costs will vary based upon the hours of operation, the number of cars in service and system operator. At this stage of development, it is impossible to provide accurate forecasting for actual operating costs, but a range of $2 to $2.5 million per year would be a reasonable estimate. Many decisions will have to be made before an accurate estimate of operating costs can be put together. The largest portion of operating costs is the labor and direct overhead costs. Mechanic costs might be a little higher than bus costs because there are fewer cars to spread the cost over. Fuel costs are much lower as electric power does not increase at the rate that fuel will increase and the power consumption of streetcars is relatively low.

Operating assumptions include:

- Seven days per week operation;
- Average of 17 hours operation per day;
- Operations 7 days per week;
- Ten minute headway (time between cars);
- Four Vehicles operating to maintain headways.

Funding Considerations

The following are established funding methods utilized in successful systems across the country:

- Instituting a Business Improvement District (BID).
- Seeking a subsidy from the benefiting private entities and from Economic Development budgets.

- Launching a Capital Campaign to raise dollars from philanthropic sources. Many of the streetcar projects have also had a 501-C3 non-profit organization set up to help raise funds.
- Creating sponsorship models utilizing naming opportunities.
- Establishing agreements with the transit operator to provide operating funds when a streetcar replaces a transit service.
- Selling advertising in the streetcars and along the right of way.
- Using parking revenues to fund operations.
- Charging riders to generate fare box income.

Streetcar Design Considerations

Cars (Heritage & Historic): There are several types of streetcars available. Portland used modern cars manufactured by Skoda, Little rock, Tampa and Charleston used newly constructed historic looking streetcars, Memphis and Savannah used reconstructed historic streetcars. The type of car used has little or no effect on the design of the track and the overhead contact system (OCS) and generally the type of cars that can be used are interchangeable.

There is a major difference in costs between the various types of cars. The new modern cars are currently selling between $3.7 million and $4.6 million per car. The new historic looking cars are currently selling for $1 million and rebuilt cars either modern, art deco or historic can be purchased for between $.75 and 1.25 million each depending upon the type of car and level of rebuild.

Stations/Stops: Car stops can vary greatly depending upon location and purpose. The amenities can be as simple as a concrete or bricked waiting area with a bench and an overhead shelter to a major stop with a waiting room, electronic signing showing the wait to the next streetcar and a ticket booth.

Electrification System: The overhead wire system proposed for this project would be a very simple system consisting of a single 4-0 copper wire suspended between a single pole using a pipe arm. The system is extremely safe with the powered wire suspended a minimum of 18' above the roadway and using the track for a grounded return.

Power is provided from the standard Nashville power grid using a transformer to change the voltage to 600 volts and a rectifier to change the current from AC (alternating current) to DC (direct current). It is expected that for the initial system, three substations with a footprint of approximately 80 square feet will be required within the project area. A smaller station would be placed inside the car barn for maintenance.

Car Barn: A 30,000 square foot car barn is proposed that will serve as a storage and maintenance facility for the streetcars as well as a public space for meetings and viewing areas. A small gift shop might be included that would sell streetcar memorabilia and books. The working shop would be separated from the viewing area with a glass or Plexiglas wall that would allow spectators to watch repairs and renovations without being exposed to any safety hazards. The building would also include public restrooms, office space, storage for parts inventory and parking.

Methods of Propulsion: Traditionally, streetcars have been powered by overhead 600 volt DC electric using single wire. Power is furnished through the standard electric grid to a transformer and rectifier that changes the standard AC power to DC for the streetcar and adjusts the voltage. This unit, called a sub-station, usually is supplied as an enclosed pre-packaged unit which has a footprint approximately eight feet square. Nashville will need to power their cars with the overhead electric because Nashville streetcars will travel a long distance, will

have extreme grades to traverse, will require heated and air conditioned cars and will operate in extreme temperatures.

Urban Design & Pedestrian Considerations

As urban designers and planners will tell you, elements of an urban environment that blend into and enhance the street experience are key to creating a pedestrian friendly place where people want to be, a place of choice.

That is why streetcars are so appealing. They do not require the massive infrastructure of big stations, structures, bus bays, turn around areas or exclusive rights of way. Consequently, these systems are a particularly effective tool to connect and shape neighborhoods because they become an enhancement to the neighborhood streetscape. Streetcars are considered as circulators, and thus tend to have frequent stops for passengers, usually no more than a couple of blocks apart. These stops are designed to fit attractively into the urban space they occupy, yet must be signed to allow easy visibility, as well as to permit arriving passengers to find their way easily to nearby destinations.

The amenities provided at the various stops will be largely determined by the urban context of the stop. Some locations will need little more than way-finding signage, others may require more significant landscaping and perhaps benches or a shelter. The cost figures presented herein assume an average level of amenity which would allow a range of different stop designs.

Recent streetcar systems are completely compliant with the requirements of the Americans with Disabilities Act. Modern cars are generally low floor design and heritage type cars have an incorporated lift mechanism. They can also be boarded using a high block boarding platform. One of the advantages of the streetcar is that it can share the street with auto traffic and act as a traffic calming mechanism in neighborhoods.

Streetcars move at the pace of traffic, and have performance characteristics which allow them to flow with urban traffic. Thus, there is usually little need for special signaling or traffic pre-empt devices. The exception occurs where the streetcar must turn across one or more lanes of traffic at an intersection, such as the fork in the road where Broadway meets West End Avenue. Similarly, because the street grades are not adversely impacted under normal conditions, street drainage can be handled by normal design methods. This results in opportunities for the street and sidewalk designs to be enhanced for pedestrians. Streetcars are also very pedestrian-friendly because they are non-threatening to pedestrians.

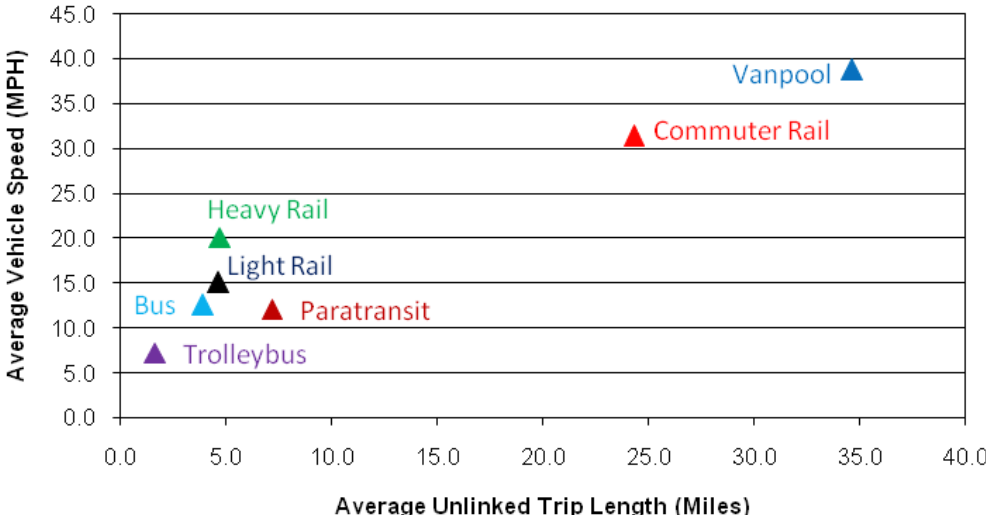
As the streetcar system for Nashville moves forward, attention should be paid to a number of urban design related areas, including:

- Stop locations,
- Streetlight locations,
- Sidewalk widths, pedestrian signage, and crossing areas,
- Street drainage,
- Intersection visibility & signage,
- Waiting area capacities,
- Waiting area shelter design (size, type, lighting),
- ADA compatibility,
- Service frequency & traffic flow impacts.

5.7 Regional Vanpool Program

Vanpools are a successful and efficient Transportation Demand Management strategy to move long-distance, intercity commuters. Currently, the vanpools managed and operated by The TMA Group on behalf of the Regional Transportation Authority and Williamson County eliminate 1,654 single vehicle trips daily. Existing vanpools reduce annual vehicle miles traveled by more than twelve million miles and reduce annual mobile emissions by over 38,000 pounds and save more than 600,000 gallons of fuel. Our air quality is improved by the removal of 21 thousand tons of ozone pollutants. Sharing a commute through a vanpool reduces parking and fuel costs, allows access to HOV lanes, consumes fewer resources and is often cheaper, more flexible, and faster than other mass transit choices.

Figure 5: Vehicle Speed vs. Trip Length by Mode



The average cost to start up a vanpool, including the cost of the vehicle is $36,000. Riders in the regional program pay according to miles traveled at the rate of $.431 per mile. Almost 60 percent of annual operating and vehicle replacement costs are covered by the vanpool riders' fares. Bus transit recovers almost 25% of operating costs and no vehicle replacement costs through fares and advertising.

- The region is currently working to develop a Comprehensive Marketing Plan for the regional vanpool program. Research results will be used to:
    - Develop a prototype of person(s) in Middle Tennessee mostly likely to choose vanpooling as their commute choice;
    - Identify where these persons are most likely to commute from in Middle Tennessee;
    - Identify marketplace forces affecting each audiences' actions, i.e., demographics, lifestyle, social and cultural; health, environmental trends, economic, competition; and
    - Identify the motivations behind why residents in the identified target markets choose to vanpool while others do not.

Based upon the findings, the Vanpool program partners (e.g., RTA, The TMA Group) will develop a customizable and audience-centered marketing campaign. The plan will include a brand, theme, and message(s).

Vanpool Program Recommendations:

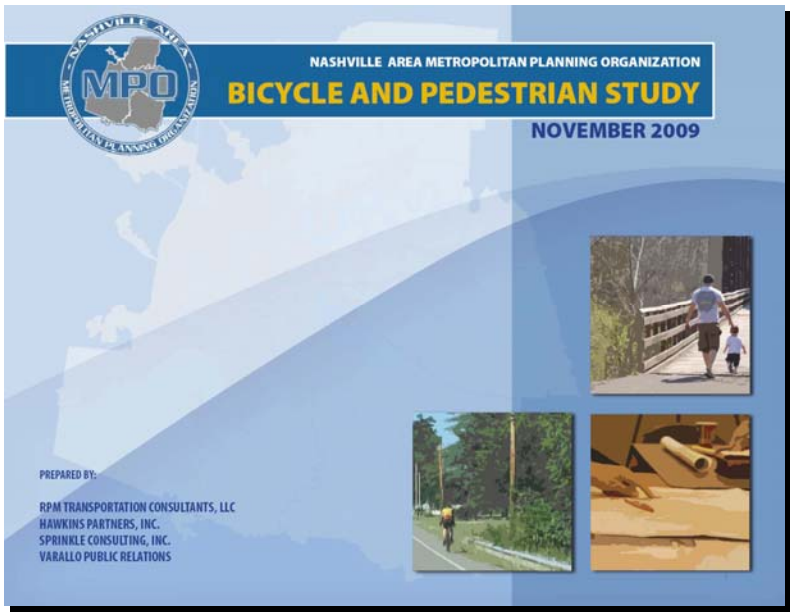
- Implement the Vanpool Marketing Plan, evaluate its effectiveness, and update as needed.

- Expand Vanpool Service throughout the region. The goal is to increase the regional vanpool network by forty percent per year for the next five years, but the goal may be adjusted based upon the size of the market identified through the market research.
- Provide Emergency Ride Home options (including car-sharing).
- Make vanpool seat subsidies available, as needed.
- Provide ridematching services for vanpools, carpools, and special events
- Streamline the reporting and payment procedures required of program administrators and vanpool drivers through the procurement of a vanpool management system that will improve efficiency of vanpool services by automating manually-intensive National Transit Database (NTD) reporting tasks. The system will also provide a social network approach to vanpool formation and real-time information regarding upcoming stops and riders.
- Add a school-pool option to the vanpool program for middle schools in Middle Tennessee. A school-pool is a group of parents who take turns carpooling their children to school.

6.0 Active Transportation Choices & Walkable Communities

6.1 A Strategic Vision for Walking and Biking

Walking and bicycling are important modes of travel in our region. Everyone is a pedestrian, and people make pedestrian trips on a daily basis, whether that means walking from the transit stop to work, walking from the parking lot to the store, or walking with children to school. Walking and bicycling provide great forms of exercise. Bicycling, once seen primarily as a form of recreation, is now viewed as an inexpensive, quick and eco-friendly form of travel. Our region is supporting the growth of walking and bicycling and the Nashville Area MPO is working with local, state, and Federal government to ensure that walking and bicycling are viable transportation options in the greater Nashville area.



In 2008, the Nashville Area MPO initiated the development of the region's first comprehensive bicycle and pedestrian study. The Study was conducted to establish a strategic vision for walking and bicycling in the region. This strategic vision feeds into the MPO's overall 2035 Regional Transportation Plan and provides the basis by which future funding priorities of the MPO are established for bicycle and pedestrian accommodations.

Working with local governments, businesses, non-profit organizations, and the general public the Nashville Area MPO designed the study to serve as a mechanism to foster a better understanding of bicycle and pedestrian needs within the region. In general, the Regional Bicycle and Pedestrian Study:

- Provides a comprehensive inventory of existing and currently proposed on and off-road bicycle and pedestrian facilities in the greater Nashville region;
- Increases the region's understanding of how non-motorized modes add to system-wide capacity by improving connectivity between residential areas, employment centers, schools, retail centers, recreational centers, and other attractions;
- Serves as a framework for identifying and selecting bicycle/pedestrian projects for the region's Long Range Transportation Plan and Transportation Improvement Program; and
- Provides guidance for engineering, education, enforcement, encouragement, and evaluation activities to help improve the safety of non-motorized travel modes.

Improving walking and bicycling conditions across the Nashville area will provide numerous benefits to the region including increased recreational and leisure opportunities, increased roadway safety, and even increased access to and from existing and future mass transit services; but, perhaps the most significant reason for the recent emergence of active transportation initiatives relates more directly to personal health, and more

specifically, the increasing costs to our nation associated with an overall decline in public health, of which a share of the blame can be attributed current and former public policies for transportation infrastructure that have shaped the built environment. The issue is so important, the Nashville Area MPO has adopted as one of its three major policy initiatives an emphasis on supporting active transportation and the development of walkable communities.

6.2 Regional Objectives & Strategies

Throughout the development of the 2035 Regional Transportation Plan, the public and interested stakeholders were provided a variety of opportunities to share ideas for improving walking and bicycling conditions in their area. During the course of that community outreach, several themes for obstacles, challenges, and solutions were consistently surfaced to the top. Combining that public and stakeholder input with peer reviews and best practice research, the MPO has established the following set of four regional objectives for advancing active transportation choices and supporting the development of walkable communities.

	Regional Issues								
Objectives	Congestion	Land Use Patterns	Safety	Environmental Conservation & Quality	Sustainability	Health	Quality of Life	Mobility & Accessibility	Maintenance/ Construction Costs
Provide Facilities - Provide a comprehensive, safe, and convenient bicycle and pedestrian system for a wide range of skill levels that is interconnected and accessible making it easier for individuals to choose to walk and bicycle	◕	●	●	●	◕	◕	●	●	●
Build Support - Build a collaborative and cooperative environment within the region among stakeholders and communities that supports more non-motorized transportation choices	◕	◕	◕	◕	◕	◕	◕	◕	◕
Create Policies & Programs - Integrate walking and biking within the region through policies and programs that foster accommodations for improved safety, mobility, and health	◕	◕	◕	◕	●	●	◕	●	●
Increase Awareness - Elevate the level of understanding and awareness of the benefits, uses, and needs of non-motorized transportation choices through comprehensive educational, enforcement, and outreach programs	◕	◕	●	◕	◕	●	◕	◕	◕

● – *Primary issue addressed by objective/strategy*
◕ – *Secondary issue that benefits from achievement of objective/strategy*

The following presents the recommended strategies, policies, and programs that will help the region pursue and carryout the main objectives. Emphasis is placed on policies and programs that support the top priorities as identified by the MPO's Bicycle and Pedestrian Advisory Committee (BPAC).

Objective#1: Provide Facilities

Strategy #1 - Designate and implement a regional bicycle network of bicycle commuter corridors and community connections.

- A regional bicycle network has been developed as part of the MPO's Regional Bicycle and Pedestrian Study which includes all the major commuting corridors into downtown Nashville as well as the US and State highways that connect the urbanized areas in the Nashville MPO region.
- Facilities should be constructed so that riders of all abilities can use the system.
- Facilities on the network that will provide connection of existing facilities should be given high priority.
- Policies should be adopted by local jurisdictions to provide ongoing maintenance of the bicycle network and to establish procedures for monitoring the implementation of the network. Examples of such maintenance activities include regular street-sweeping of the roadway and bicycle facility, debris removal, and sign and striping replacement.

Strategy #2 - Require sidewalk accommodations along all Arterial roadways on which pedestrians are allowed.

- A Sidewalk Accommodation Policy has been developed as part of the MPO's Regional Bicycle and Pedestrian Study. The policy calls for sidewalk accommodations on all federally classified Arterial roadways within an Urban Growth Boundary of the MPO on which pedestrians are not prohibited. The Urban Growth Boundary area (as defined by TN Public Chapter 1101) is used as this defines areas of the region that are expected to be urban in form over the next 20 years. For Davidson County, the Urban Transect categories (T3 through T6) define Metro Nashville's urban growth area.
- It is recommended that all local jurisdictions within the MPO region, at a minimum, adopt guidelines requiring sidewalk and/or pedestrian accommodations along all arterial roadways within an urban growth boundary. Policy adoption should occur as part of a local municipality's comprehensive plan, zoning code, and/or subdivision regulations.
- If not already an adopted standard in local documents, the minimum width of the sidewalk should be 5 feet regardless of the street classification. The sidewalks should be constructed with buffer zones along all roadways. A buffer zone width of 4 to 6 feet is recommended in the Nashville MPO region.
- Some jurisdictions in Tennessee and the MPO region allow "in-lieu-of" payments to the community's sidewalk fund. By collecting equal payments in lieu of actual on-site sidewalk construction, more strategic choices can be made regarding where and when sidewalks are built. Further use of this practice should be considered by local governments within the Nashville MPO region.

Strategy #3 - Create, fund, and implement spot improvement programs so that minor walking and bicycling improvement needs can be quickly addressed.

- Develop a maintenance and spot improvement program to be run by a Public Works or a Parks and Recreation Department. The responsibility could be split where on-road facilities are maintained by Pubic Works and greenways are maintained by a Parks and Recreation Department. Examples of such maintenance activities include regular sweeping, litter and debris removal, vegetation control, and signing and striping.
- Provide spot maintenance forms upon request at bicycle shops and on a website set-up for bicycle and pedestrian information.

- Roads that have bicycle facilities should be on the regular street sweeping schedule in jurisdictions where a schedule exists.
- Local sidewalk maintenance programs should be established to address sidewalk maintenance and repair needs.

Strategy #4 - Improve connectivity for pedestrians and bicyclists by providing a continuous system of sidewalks, bicycle facilities, and greenways that connect key origins and destinations such as neighborhoods, commercial areas, schools, parks, and transit service.

- In cooperation with local municipalities, the MPO should develop programs and initiatives which encourage local governments, as part of the development review process, to evaluate the potential for new developments to provide pedestrian connections to existing sidewalks and nearby destinations. These programs and initiatives should also encourage pedestrian and bicycle facilities which provide logical connections between schools, shopping centers, parks, civic buildings, transit stops, park-and-ride lots, residential developments, and other activity centers.
- The MPO should work with local municipalities to establish bicycle and pedestrian accommodation provisions within their local plans and governing documents (e.g. comprehensive plans, zoning ordinances, and subdivision regulations). Provisions should not only require sidewalk and bikeway facilities but also advocate for policies that support walking and bicycling through community design, mixed-use development, street connectivity, and transit oriented development.

Strategy #5 - Promote and encourage land use decisions that provide a meaningful and context-appropriate mixture of uses that are supportive of increased walking and bicycling.

- The Nashville region should consider developing a program to encourage local jurisdictions to more effectively plan and implement ways to link land use and transportation. A good example is the "Livable Centers Initiative" (LCI) which was created by Atlanta's regional planning agency. The program is offered to encourage local jurisdictions to plan and implement strategies that link transportation improvements with land use development strategies to create sustainable, livable communities consistent with regional development policies. Planning grants are awarded by the regional planning agency on a competitive basis to local governments and non-profit organizations to prepare plans for the enhancement of existing centers and corridors. This takes advantage of the investments committed in these communities to achieve more balanced regional development, reduce vehicle miles traveled, and improve air quality. The primary goals of the program are to:
    - Encourage a diversity of mixed-income residential neighborhoods, employment, shopping and recreation choices at the activity center, town center, and corridor level;
    - Provide access to a range of travel modes including transit, roadways, walking and biking; and
    - Develop an outreach process that promotes the involvement of all stakeholders.
    - A similar program in the Nashville region could be an effective means in accomplishing the above strategy.
- The MPO and its member jurisdictions should encourage local school boards to establish school siting policies that favor sites with good walking and biking access. As an example, the policy could include a recommendation that new elementary schools be located on neighborhood streets with low traffic volumes and speeds, and within walking distance of a large proportion of students' homes. In addition, the site design of schools should give opportunity for pedestrian and bicycle access.

Objective #2: Build Support

Strategy #1 - Hold annual walking and bicycling regional summits in order to enhance awareness and report on progress made on increasing non-motorized transportation throughout the region.

- In May 2009, the Nashville MPO held a summit in conjunction with Cumberland Region Tomorrow (CRT) and TDOT to discuss transit initiatives in Middle Tennessee. It was well attended by local mayors and other public officials as well as by private businesses. The Nashville MPO could hold an annual (or biennial) walking and cycling summit in as a stand-alone event or in conjunction with other related initiatives.

Strategy #2 - Partner with local planning and transit agencies on integrated transportation and land use corridor studies, small area plans, and transit-oriented developments.

- Providing continuous bicycle and pedestrian facilities across city and county boundaries and between transportation modes enables bicycling and walking throughout the region. The Tri-County Study which includes the counties of Wilson, Sumner, and Robertson and the Northeast Corridor Study which includes the counties of Davidson and Sumner are two good examples within the MPO region of inter-jurisdictional cooperation and modal interconnectivity. The MPO could develop a pilot program which establishes similar cooperation between jurisdictions when preparing local plans, corridor studies, small area plans, and transit-oriented developments so that continuous facilities crossing city and county boundaries are constructed.
- The Nashville MPO should work with local and regional transit providers (MTA, RTA, and Franklin and Murfreesboro transit systems) to develop strategies and opportunities to increase walking and biking to and from public transportation services and facilities. Potential strategies include linking transit stops to sidewalks and bikeways, providing comfortable, well designed transit stops, and providing bike storage at transit stops.

Strategy #3 - Establish an annual report on the state of walking and biking improvements and activities in the region whereby municipalities report annually on their local activities. Information can be used to prepare a package to present throughout the region to mayors and elected officials, community organizations (i.e. YMCA, health depts., churches, bicycle clubs, parks depts., etc.), and other stakeholders detailing the benefits, projects, and practices for the year related to walking and biking in the region.

- The Nashville Region should continue an annual bicycle and pedestrian count program as piloted in 2009 consistent with the National Bicycle & Pedestrian Documentation Project (NBPD).
- Household surveys can be conducted periodically regarding the number of biking and walking trips and the type of trip that occurred, i.e. home to school, home to work, home to shop, work to shop, etc. Surveys can be used as a tool to measure the effectiveness of various policies and programs.
- Area Specific Programs - The City of Portland has a program that targets an area of town each year to increase bicycling, walking, transit, carpool, and car sharing trips. The projects include programs that are targeted toward the demographics in that area of town. Each household in the target area receives an order form for informational materials. The households can order materials about bicycling which included a bike kit, maps, safe routes, ride calendar, and helmet brochure. In some areas there are incentives offered to residents who returned their order forms. The residents receive a newsletter every other month that provides information on traffic safety and programs in that area, a calendar of events, and other resources.

Objective #3: Create Policies & Programs

Strategy #1 - Create a dedicated funding source for bicycling and pedestrian facilities improvements.

- While there currently is no state enabling legislation that would allow for the Nashville Area MPO to enact dedicated revenues for sidewalk and bikeway improvements at this time, such opportunities may materialize in the future given recent legislation that was passed this year. In July of 2009, Tennessee State Law (TCA Title 64, Chapter 8) was amended to allow for the levying of dedicated revenues for transportation purposes. This legislation is largely for the provision of public transportation services by a regional transportation authority (RTA), for which the Nashville region has. Funding through this program could be used for sidewalk and bikeway improvements. Limiting use of this to sidewalk and bikeway accommodations that directly link to transit services would be one way to ensure a link between transit and these funds.

Strategy #2 - Integrate consideration of walking and bicycle travel into all transportation planning, design, construction and maintenance projects as well as in local community and transportation plans.

- Across the country Complete Streets policies are being adopted by communities. A Complete Streets policy ensures that the roadway is designed with all users and all skill levels in mind, i.e. it is designed to accommodate bicyclist, pedestrians, transit users, and motorists from children to older people. Establishing a Complete Streets policy will ensure roadway designs include safe and effective access to all users. The MPO, the Tennessee Department of Transportation (TDOT), and local communities in the MPO region should adopt a Complete Streets policy.
- As part of all roadway design and retrofit projects in Tennessee, bicyclists and pedestrians should be accommodated when appropriate as stated in the Bicycle and Pedestrian Element of the Tennessee Long Range Transportation Plan. The Statewide Plan also states that bicycle and pedestrian facilities should be enhanced when existing roadways are improved and upgraded.

Strategy #3 - Give guidance to local communities on methods for establishing developer incentives for inclusion of sidewalks, bike lanes, and transit accommodations as part of all projects, and for inclusion of bike racks, lockers, showers, and other facilities in commercial and public building projects.

- Develop recommended guidelines for bicycle parking provisions which can be used by local governments.
- As an incentive, local jurisdictions could offer to perform an expedited development review for commercial developments and public building projects that include facilities for alternative modes of travel. The expedited review would place the development on the top of a priority list that is set by the local municipality.
- A variable reduction in the traffic impact fee for developments that include facilities for alternative modes of travel may be granted based on the level of action. An example of this reduction would be if a walkway is being constructed to connect to the nearest arterial for non-abutting developments a traffic impact fee reduction of 3 percent could be given to the developer. The criteria for the reductions and the amount of the reduction would need to be determined and clearly defined by the local jurisdictions.

Objective #4: Increase Awareness

Strategy #1 - Emphasize a greater importance of pedestrian and bicyclist laws on the driver's licensing exam as a means of increasing safety for all users. The enforcement program should target pedestrian, bicyclist, and motorist behavior that can possibly result in a crash.

- The MPO should continue taking a leadership role in improvements to driver education. The Tennessee drivers' manual should incorporate clear, forceful information on the responsibilities of both motorists and pedestrians and the MPO can serve as a valuable resource in improving how that information is provided. Information and questions regarding the rights and safety of bicyclists and pedestrians should be added to the drivers' handbooks and driving tests. These components should be consistently used as part of driver education classes.
- The MPO should continue educational efforts regarding bicycle safety including efforts to increase understanding and awareness of the Tennessee 3-foot law for motorists passing bicyclists.
- The MPO should continue working with TDOT, the Tennessee Department of Safety, and the Governor's Highway Safety Office in the development, research, and outreach of efforts aimed at improving pedestrian and bicyclist safety.
- Grants from the National Highway Traffic Safety Administration (NHTSA) can be obtained by local police departments for enforcing pedestrian right-of-way laws and bicycle traffic violations. The grants can be used to conduct targeted enforcement campaigns, pedestrian enforcement at intersections and bicycle enforcement at other intersections.
- Pedestrian Enforcement campaigns can be conducted similar to those seen in Seattle. These campaigns have two components, one targets motorist and a second component targets pedestrians. The police write tickets to motorists who do not yield to pedestrians in the crosswalk or to pedestrians who jaywalk or do not follow the traffic signals.
- Those behaviors to be targeted should be determined at the outset of a law enforcement campaign. It is recommended that the following behaviors be targeted:

Motorist behaviors

- Failing to pass at a safe distance (not less than three feet),
- Right turners cutting off bicyclists,
- Failing to yield to bicyclists (comply with signals/signs) at intersections,
- Failing to yield to pedestrians at crosswalks, and
- Right turn on red violations.

Bicyclist behaviors

- Riding at night without lights,
- Violating traffic signals/stop signs,
- Sudden changes in direction without scanning or signaling,
- Riding against traffic on the roadway,
- Failing to yield to motorists at midblock locations, and

    - Violating traffic signals.

- The effort to enforce the traffic laws as they relate to bicycle and pedestrian safety should be addressed in a regional, coordinated, bicycle enforcement campaign. Sporadic enforcement is not likely to result in significant improvements to motorist, cyclist, or pedestrian behavior.
- Adult Bicycle and Pedestrian Safety Training - Getting adults to participate in bicycle and pedestrian training courses is challenging. Bicycling and walking are not typically viewed by adults as things they have to learn how to do. Consequently, they do not typically enroll in traffic safety courses. As part of a Bike to Work promotion it is recommended that safety training be included. These can vary from "lunch and learn" type presentations to evening/weekend commuter workshops to providing League of American Bicyclists *Traffic Skills 101* courses.

Strategy #2 - Establish an informational website showing routes and locations of bicycle facilities as well as printable PDF maps.

- A website should be established that contains information regarding biking and walking in the region. This website can be used to post bicycle maps showing the routes in the MPO region.
- The website should also provide spot maintenance forms for bicycle and pedestrian facilities.
- The website should provide information on a variety of educational resources including information such as elementary instructor training courses on bicycle and pedestrian safety for children through programs like Safe Routes to School.

Strategy #3 - Integrate bicycle and pedestrian skills training into appropriate school curricula and annually fund school-based education programs on bicycling and walking safety.

- The MPO should encourage greater use of the Safe Routes to School Program locally and work to provide a coordinated approach to such initiatives within the region.
- It is recommended that a bicycle and pedestrian traffic safety curriculum for elementary school students be developed. The program should establish guidelines to maintain, update, and distribute the materials, as well as train the educators on implementing the materials.
- The program should have access to the biking and walking website that contains links to resources and mini-grant programs. The instructor courses should be free for educators, law enforcement officers, and community volunteers. The program should also provide mini-grants to local agencies/school districts to buy new materials or replace existing materials.

Strategy #4 - Create, fund, and implement pedestrian and bicycle media campaigns and promotional materials to promote walking and bicycling as a safe, healthy, cost effective, environmentally beneficial transportation choice. Identify partners to provide bicycle and pedestrian education, enforcement, and encouragement programs.

- One of the primary resources for non-motorized transportation safety campaign materials is the Federal Highway Administration's (FHWA) Pedestrian Safety Campaign. As stated on FHWA's website, the materials developed in 2003 consist of ready-made information that State or local governments can tailor and use for campaigns in their communities. These materials include radio, television, and public service announcements; brochures; posters; press releases; and newspaper articles.
- In a separate effort, FHWA developed and tested media-based marketing materials directed specifically at Hispanic audiences. This information may be useful in reaching out to the Nashville region's growing

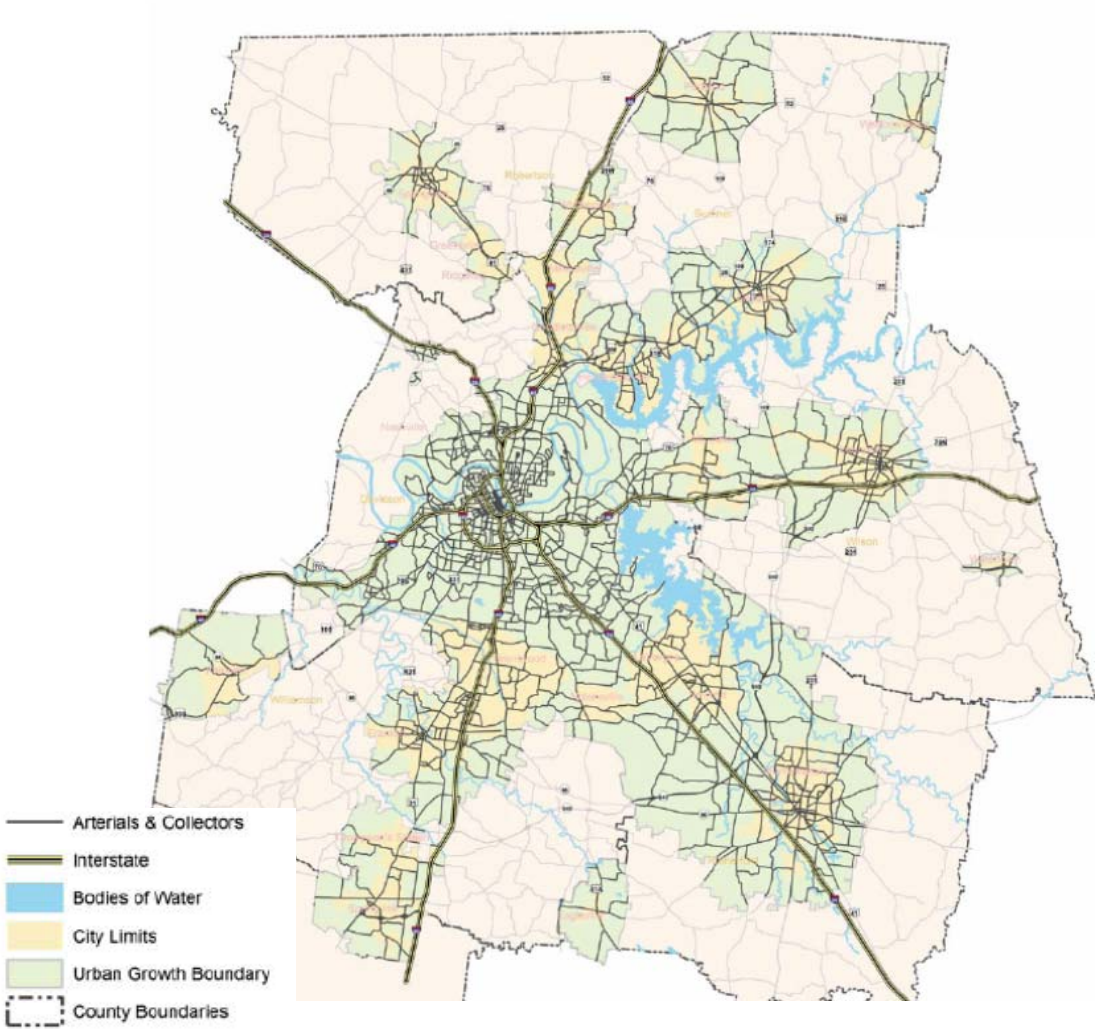
Hispanic community. Other training resources exist through NHTSA including training for law enforcement.

6.3 Future Accommodations on the Regional Network

Regional Sidewalk Recommendations

The MPO's strategic vision for walking and bicycling across the region includes support for the development of local sidewalk and bikeway improvements but places emphasis on regional accommodation recommendations as a regional priority system. As a regional priority, sidewalk accommodations should be included on all federally-classified Arterial roadways within an Urban Growth Boundary of the MPO, on which pedestrian are not prohibited. These roadways serve as major commuting corridors, commercial corridors and corridors of commerce, and connect communities, activity centers, transit, and major destinations throughout the region. As such, they serve as the backbone to other roadways and streets in the region which, combined with local sidewalks and streets, link neighborhoods, businesses, and other community facilities to one another. The Urban Growth Boundary (as defined by TN Public Chapter 1101) was selected as the policy boundary as these areas of the region are expected to be urban in form over the next 20 years.

Table 19. Regional Sidewalk Priority Areas



There are approximately 914 miles of federally functionally classified Arterial roadways in the Nashville region that are located in an Urban Growth boundary. Of these facilities, 252 miles currently have sidewalk accommodations. The following table depicts the total Arterial miles within the MPO region by county with and without existing sidewalk accommodations.

Table 20. Arterial Roadway Miles in the MPO Region within an Urban Growth Boundary

County	With Sidewalks (Miles)	Without Sidewalks (Miles)	Total Arterial (Miles)	% Miles Built
Davidson	167	223	**390**	**43%**
Rutherford	31	110	**141**	**22%**
Sumner/Robertson	16	162	**178**	**9%**
Williamson/Maury	30	88	**118**	**25%**
Wilson	8	79	**87**	**9%**
Regional Total	**252**	**662**	**914**	**28%**

Design Considerations

Everyone is a pedestrian at one time or another. Pedestrian facilities must be designed to meet a wide range of needs. One's decision to walk is not only based on convenience, but also on the perceived quality of the experience. The choice to walk is influenced by both "hard" factors, such as the continuity of the sidewalk system, and "soft" factors, such as the shade or the beauty offered by street trees. Therefore, pedestrian facilities should be designed with the following considerations:

- Pedestrian facilities should be easily accessible for all users.
- Pedestrian facilities should offer real and perceived safety. They should be free of hazards and obstructions and should be designed so as to minimize conflicts with vehicular traffic.
- Sidewalks and crosswalks should be wide enough to comfortably accommodate the anticipated volume of pedestrians. The widths should be based on the pedestrian volumes, adjacent land uses, and roadway classifications.
- Crosswalks should be frequent and as short as possible.
- Pedestrian facilities should provide direct connections between origins and destinations.
- Pedestrian facilities should be continuous.
- Landscaping and street furnishings should be provided to create an attractive and comfortable sidewalk corridor.

Sidewalk corridors should be compatible with the community and the context for which they are provided. Their design should complement the adjacent land uses, as well as enhance the design and transportation objectives of the neighborhoods through which they travel or downtown centers for which they serve.

The Americans with Disabilities Act

The *Americans with Disabilities Act* (ADA) is a federal law that was signed on July 26, 1990. The ADA prohibits discrimination on the basis of disability and mandates that all disabled persons be provided full access to all public facilities in the country. Designing and constructing public facilities that are not usable by people with disabilities is a violation of the ADA.

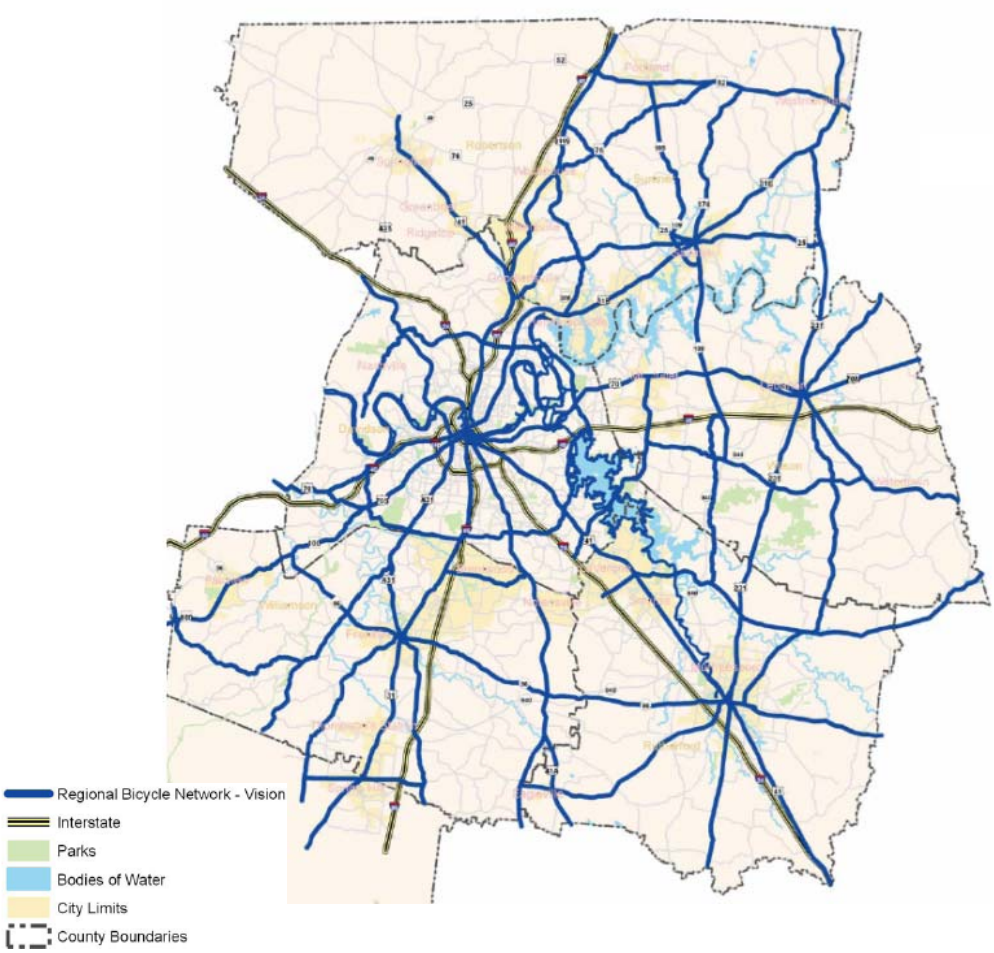
Current ADA standards, which are contained in the 2002 edition of the *Americans with Disabilities Act Accessibility Guidelines* (ADAAG), thoroughly outline requirements for building design. However, ADAAG provides little guidance regarding the design of facilities in public right-of-way. The U.S. Access Board is the federal agency that is responsible for the development of minimum accessibility guidelines to assist the Department of Transportation (DOT) and the Department of Justice (DOJ) in establishing design standards for the ADA. This board released a draft update of the ADA guidelines on June 17, 2002. The draft update was revised on November 23, 2005 and is entitled *Accessible Public Rights-of-Way Planning and Designing for Alterations.* This document provides more specific guidance for public right-of-way and includes provisions for sidewalks, sidewalk ramps, street crossings, and related pedestrian facilities. Although these guidelines have not yet been adopted, the Federal Highway Administration (FHWA) and the U.S. Access Board encourage their use since they offer the most authoritative guidance available regarding accessible design in public right-of-way.

The current and proposed ADA guidelines provide minimum design standards for ensuring accessibility. Alternate standards may be applied provided that the alternate standards meet or exceed the minimum ADA guidelines. The recommendations presented in the pedestrian facilities design guidelines section are consistent with, and in some cases exceed, the standards presented in *Accessible Public Rights-of-Way Planning and Designing for Alterations* (refer to the US Access Board's website – http://www.access-board.gov/prowac/ for the most up to date ADA accessibility guidelines).

Regional Bikeway Network Recommendations

The Nashville region has numerous roadways throughout the region which serve as direct links between communities and major destinations for employment and other activities. The inventory and needs assessment process of the Regional Bicycle and Pedestrian Study revealed a number of roadways within the region that currently provide some level of bicycle facility accommodations, such as a paved shoulder and/or signed bicycle designation. Also, the analysis process identified numerous connections via these roadways to areas which indicate a relatively high potential for non-motorized travel. The proposed Regional Bikeway Network serves to provide bicycle accommodations along major commuting corridors and corridors that connect communities, activity centers, transit, and major destinations throughout the region.

Table 21. Regional Bikeway Vision



The Regional Bikeway Network focuses on regional routes and connections. The MPO recognizes that the cities and counties within the region will need to develop or update community level bicycle plans so that localized bikeway networks and connections between the regional facilities are provided.

The Regional Bikeway Network consists largely of on-street facilities but also includes the Cumberland River Greenway in Davidson County and the Stones River Greenway of Davidson and Rutherford Counties given the linear and regional connections of these two planned greenway facilities. The Regional Bikeway Network consists of 1,127 miles traversing the complete region. The network includes 908 miles of on-street bicycle facilities and 219 miles of greenways. Currently, 130 miles of signed on-street bicycle facilities and 30 miles of greenways exist (a combined total of 160 miles). Of the Regional Bikeway Network which is unbuilt, approximately 284 miles of the on-street network currently have 4 foot or more of paved shoulders but is unsigned. Approximately 493 miles have less than 4 foot of paved shoulder and are unsigned as well. The unbuilt off-road component of the Regional Bikeway Network includes approximately 190 miles of unbuilt greenways.

A summary of the network mileage by county, including a breakdown of existing versus unbuilt mileage, is shown in the following table. Of the Regional Bikeway Network, approximately 625 miles (or 55 percent) are actually identified in local.

Table 22. Regional Bikeway Network Miles in the MPO Region

County	Existing Facilities		Proposed Facilities			Total Bikeway Network (Miles)
	On-Street (Signed)	Off-Street (Greenway)	On-Street > 4 Ft PS (Sign)	On-Street < 4 Ft PS (Pave & Sign)	Off-Street (Greenway)*	
Davidson*	15	25	62	136	174	**412**
Rutherford*	11	5	90	56	16	**178**
Sumner/Robertson	58	0	62	86	0	**206**
Williamson/Maury	24	0	31	122	0	**177**
Wilson	22	0	39	93	0	**154**
Regional Total	**130**	**30**	**284**	**493**	**190**	**1127**

** Totals include both the planned Cumberland River Greenway and Stones River Greenway, PS – Paved Shoulder*

Table 23. Regional Bikeway Network in Local Plans

County	Proposed Regional Bikeway Network (Miles)	Existing Facilities			Regional Bikeway Network in Local Plans		
		On-Street (Signed)	Off-Street (Greenway)	Percent Existing	On-Street Facility	Off-Street (Greenway)	Percent in Local Plans
Davidson	**412**	15	25	10%	168	174	83%
Rutherford	**178**	11	5	9%	13	16	16%
Sumner/Robertson	**206**	58	0	28%	111	0	54%
Williamson/Maury	**177**	24	0	14%	39	0	22%
Wilson	**154**	22	0	14%	104	0	68%
Regional Total	**1127**	**130**	**30**	**14%**	**435**	**190**	**55%**

6.4 System Costs, Prioritization, & Funding Opportunities

Project cost estimates at a systems level have been developed for both the recommended Regional Sidewalk Accommodation Policy improvements as well as for the proposed designated Regional Bikeway Network. This cost information provides a regional perspective of facility cost and funding needs for sidewalk and bicycle facility improvements as part of these regional priority systems. Cost estimates are in 2009 dollars and were prepared as stand-alone projects (e.g. not as part of a road widening project). The total estimated cost for implementing the regional sidewalk and bikeway recommendations is nearly $800 million with the regional sidewalk recommendations accounting for $149 million and the Regional Bikeway Network accounting for $644 million.

Regional Sidewalk and Bikeway System Costs

Planning level cost estimates were prepared for both the regional sidewalk recommendations as well as the recommended Regional Bikeway Network. Cost estimates are in 2009 dollars and were prepared as stand-alone projects (e.g. not as part of a road widening project). The total estimated cost for implementing the regional sidewalk and bikeway recommendations is nearly $800 million with the regional sidewalk recommendations accounting for $149 million and the Regional Bikeway Network accounting for $644 million.

Regional Sidewalk System Costs

The following table shows a summary of total costs for each county to construct sidewalks on both sides of all arterial roadways within an urban growth boundary of the MPO. It is assumed that the sidewalks will be constructed of concrete on both sides of the road and will be five (5) feet wide. The cost for drainage and additional right-of-way, if needed, and the cost for pedestrian facilities at the intersections, i.e. ramps, crosswalks, and pedestrian signals, are not included in the total cost, which is typical for a regional planning cost estimate.

Table 24. Costs of Proposed Regional Sidewalk Network

County	Existing Sidewalks (Miles)	Planned Sidewalks (Miles)	Planned Sidewalks Total Cost
Davidson	167	223	$ 50 Million
Rutherford	31	110	$ 25 Million
Sumner/Robertson	16	162	$ 36 Million
Williamson/Maury	30	88	$ 20 Million
Wilson	8	79	$ 18 Million
Regional Total	**252**	**662**	**$149 Million**

Cost estimates are in 2009 dollars

Regional Bikeway Network Costs

The following table shows a summary of total costs by county to implement the proposed Regional Bikeways Network. Cost estimates assume a four foot bike facility on the Regional Bikeway Network for on-road facilities and a 12-foot wide asphalt facility for the greenway connections.

Table 25. Costs of Proposed Regional Bikeway Network

	Proposed Facilities			
County	On-Street > 4 Ft PS (Sign)	On-Street < 4 Ft PS (Pave & Sign)	Off-Street (Greenway)*	Total Cost (Rounded)
Davidson*	$0.087 Million	$126 Million	$173 Million	$ 299 Million
Rutherford*	$0.126 Million	$ 52 Million	$ 16 Million	$ 68 Million
Sumner/Robertson	$0.087 Million	$ 79 Million	-	$ 79 Million
Williamson/Maury	$0.044 Million	$112 Million	-	$ 112 Million
Wilson	$0.055 Million	$ 86 Million	-	$ 86 Million
Regional Total	**$0.399 Million**	**$453 Million**	**$189 Million**	**$ 644 Million**

** Totals include both the planned Cumberland River Greenway and Stones River Greenway, Cost estimates are in 2009 dollars*

Historic Funding Levels

A review of the Nashville Area MPO's *Fiscal Years 2006 through 2008 TIP* and *Fiscal Years 2008 through 2011 TIP*, covering a combined six year horizon, was undertaken during the Regional Bicycle and Pedestrian Study, with projects funded exclusively for the purposes of adding sidewalks, bicycle facilities, and/or greenways identified. While a number of roadway widening projects and new roadway construction projects provided sidewalk and bikeway facilities in the TIP, funding levels for these projects were not included in the funding analysis. Additionally, locally constructed sidewalk, bikeway, and greenway facility improvements which may be funded locally were not included in this assessment.

The results of the analysis indicate that over the six year period (e.g. 2006 to 2011), approximately $87 million (representing an annual average of $14.5 million per year) in funds have been, or are to be, expended specifically for sidewalk, bikeway, and greenway facilities in the Nashville region. Of these funds, all are federal funds less local match requirements. The following table illustrates the funding type and funding level for each of the funds allocated for sidewalk and bikeway improvements.

Table 26. Historic Funding Levels for Sidewalk and Bikeway Improvements by Funding Type

Funding Program	Source	Amount	Percent
Surface Transportation Program (STP) Funds	Federal	$ 2,242,481	3%
Congestion Mitigation & Air Quality (CMAQ) Funds	Federal	$10,693,005	12%
Transportation Enhancement (TE) Funds*	Federal	$14,713,016	17%
High Priority Project (HPP) Funds*	Federal	$53,550,054	61%
Demonstration (DEMO) Funds*	Federal	$ 1,657,614	2%
Transportation, Community, & System Preservation (TCSP) Funds*	Federal	$ 250,000	0.3%
Safe Routes to School (SRTS) Funds*	Federal	$ 812,169	1%
American Recovery & Reinvestment Act (ARRA) Funds	Federal	$ 3,124,724	4%
Regional Total		**$87,043,063**	**100%**

*Source: Nashville Area MPO Fiscal Years 2006-2008 TIP and Fiscal Years 2008-2011 TIP, * Discretionary and/or grant funds*

As illustrated by the numbers, approximately $71 million (or 82 percent) of these funds are discretionary and/or grant awarded funds not dedicated to active transportation, meaning they are not reliable and/or stable funding sources for future non-motorized mode accommodations. In fact, of the $71 million, 78 percent of these funds are congressionally selected (e.g. earmark funded). Of the total amount of funds allocated toward sidewalk and bikeway improvements over the 6 year period, approximately $16 million (or 18 percent) are funding sources (e.g. Surface Transportation Program (STP) Funds and Congestion Mitigation & Air Quality (CMAQ) Funds) for which the MPO has had programming authority. Of these two funding sources, the MPO annually receives about $17 million ($14.7 million and $2.3 million respectfully). This equates to about 2.5 percent of the MPO's annual STP allocation toward sidewalk and bikeway improvements and approximately 77 percent of the MPO's historic levels of CMAQ allocation.

The table below summarizes how these funds are allocated by type of improvement. Of the $87 million nearly $73 million (or 83 percent) of the funding is allocated toward greenway facilities. The remaining lion's share is allocated toward sidewalk and streetscape projects which largely include sidewalk accommodations. A tenth of one percent is allocated toward exclusive bikeway improvements.

Table 27. Historic Funding Levels for Non-Motorized Modes Type of Improvement

Type of Improvement	Amount	Percent
Sidewalk	$10,429,354	12%
Bikeway	$ 48,000	0.1%
Greenway	$72,662,518	83%
Streetscape	$ 3,903,191	4%
Regional Total	**$87,043,063**	**100%**

Source: Nashville Area MPO Fiscal Years 2006 through 2008 TIP and Fiscal Years, 2008 through 2011 TIP

The next table summarizes how these funds have been allocated by county. The vast majority are shared between Davidson and Rutherford Counties.

Table 28. Historic Funding Levels for Non-Motorized Modes by County

County	Amount	Percent
Davidson	$28,152,950	32%
Robertson	$ 3,835,235	5%
Rutherford	$32,895,077	38%
Sumner	$15,204,289	18%
Williamson	$ 1,717,600	1%
Wilson	$ 5,237,912	6%
Regional Total	**$87,043,063**	**100%**

Source: Nashville Area MPO Fiscal Years 2006 through 2008 TIP and Fiscal Years, 2008 through 2011 TIP

Funding Gap

Full Implementation of the proposed regional sidewalk and bikeway network totals nearly $800 million. As previously discussed, current funding practices within the Nashville MPO indicates that approximately $14.5 million annually is specifically allocated toward sidewalk and bikeway improvements throughout the region. Not accounting for investments in sidewalk and bikeway improvements implemented as part of a new roadway or roadway widening project and/or as part of a project that may be constructed exclusively by local funds and/or through development activity, it would take nearly 55 years to implement the Regional Bicycle and Pedestrian Study recommendations, assuming the same annual funding levels for sidewalk and bikeway improvements.

Looking at implementing the proposed recommendations over a 25 year horizon, which is consistent with the planning horizon of the MPO's regional transportation planning requirements, there would be an annual funding gap of approximately $17.2 million annually (or 2.19 times the current funding level). The following table illustrates the funding gap based on current funding levels and the necessary funding level to implement the recommendations within a 25 year planning horizon.

Table 29. Projected Funding Gap for Regional Sidewalk and Bikeway Recommendations

Funding Level	Annually	25 Year Horizon	Study Recommendations	Funding Gap
Current	$14.50 Million	$363 Million	$793 Million	$430 Million
2.19 Times Current Level	$31.72 Million	$793 Million	$793 Million	-

Proposed Funding Level

To achieve implementation of the strategic vision's recommendations the region must allocate a larger amount of funding toward sidewalk and bikeway facilities. Based on the review of historic funding levels within the MPO region toward sidewalk and bikeway facilities and the stated sidewalk and bikeway recommendations of the Regional Bicycle and Pedestrian Study, it is recommended that funding levels for such programs be significantly increased. The results of the funding assessment indicate that the MPO region would need approximately 2.19 times more funds annually allocated toward sidewalk and bikeway improvements.

In order to bridge this funding gap, the Nashville Area MPO is adopting a new and progressive funding strategy as part of this Regional Transportation Plan. The funding strategy takes 15 percent of all Surface Transportation Program (STP) funds and allocates them to Active Transportation. This funding could be used for infrastructure improvements such as bicycle lanes, greenways or sidewalks, or could be used from programming such as Safe

Routes to School, education for Law Enforcement, educational classes on bicycle safety, or encouragement programs such as Bike to Work programs. Combined with the 10 percent of Urban STP that will be flexed to transit, the MPO is exclusively dedicating 25 percent of its primary infrastructure funding source to Active Transportation. The remainder of the STP funds is spent on projects that are weighed on criteria with a heavy emphasis (60%) on active transportation, health, the environment, safety and congestion. This aggressive funding strategy is the MPO's response to the desires of the public who want to see more funding being spent on walkable and bikeable communities and transit, and less money spent on wider roadways for motorized vehicles.

These STP funds will complement other funding sources (below) and those listed in section 8.2 Grant Programs and Revenue Sources, such as Transportation Enhancement (TE) funds.

Project Prioritization

To ensure that transportation projects are including infrastructure for bicyclists and pedestrians, the MPO has adopted a systematic process by which candidate projects are evaluated, scored, and ranked by how well they serve the needs of bicyclists and pedestrians. This prioritization process is used to assist the MPO as it considers funding bicycle and pedestrian investments throughout the region.

The first step in the prioritization process includes an assessment of facility needs for both bicycle and pedestrian accommodations. The analysis is based on facility bicycle and pedestrian level of service and non-motorized demand. The second step in the process takes into consideration the following factors:

- LOS and Non-Motorized Potential Trips;
- Connectivity;
- Safety;
- Congestion Mitigation;
- Community Goals;
- Health Impact.

The project evaluation methodology and process was developed based on citizen input and the objectives and strategies of the Regional Bicycle and Pedestrian Study. The prioritization methodology provides a consistent yet flexible means for selecting bicycle and pedestrian facility improvement projects for funding. The process provides the MPO with an objective and quantifiable way for assessing both walking and biking project needs that are consistent with the MPO's regional goals and objectives.

The versatility of the prioritization process has allowed the MPO to use the process in several capacities. The process was used to develop the Regional Sidewalk and Regional Bikeway Network facility recommendations. The process was also used during the development of the Regional Transportation Plan to analyze proposed projects for how well they provide accommodations for bicyclists and pedestrians. Finally, the process will be used by the MPO Bicycle and Pedestrian Advisory Committee to determine how to spend the 15 percent of Urban STP funds set aside for the specific purpose of supporting active transportation.

The STP set-aside for active transportation is intended to support the Objectives of the Regional Bicycle and Pedestrian Study – Provide Facilities, Build Support, Create Policies and Programs, and Increase Awareness. The Committee can decide how to divide the funds among these activities. Example expenditures could be to add sidewalks or bikeways to an infrastructure project that does not have a budget for these facilities; fund stand-alone, multi-use facilities such as greenways; support education programs such as Safe Routes to School;

provide classes on bicycle and/or pedestrian safety; and purchase gear to be provided to the public for bicycle and pedestrian safety classes such as helmets and reflective safety items.

Below is a list of stand-alone greenway projects submitted for the 2035 Regional Transportation Plan that may be considered for funding from the STP set-aside.

Table 30. Candidate Greenway Projects for Future Funding

Project Name	Location
Main Street Pedestrian Walkway	City of Goodlettsville
Springfield Greenway	City of Springfield
Cedar City Trail	City of Lebanon
Cedar City Trail - Bartons Creek South	City of Lebanon
Station Camp to Vol State Greenway	City of Gallatin
Town Creek Greenway - Phase 3	City of Gallatin
Town Creek Greenway	City of Gallatin
Lock 4 Road Greenway - Bicycle and Pedestrian	City of Gallatin
Stones River Greenway North	City of Murfreesboro
W. Division Street Greenway, Phase II and III	City of Mt. Juliet
Woodridge Road Sidewalk/Path - Phase I	City of Mt. Juliet
Woodridge Road Sidewalk/Path - Phase II	City of Mt. Juliet
Cedar Creek Multi-Use Trail	City of Mt. Juliet
Franklin Greenway - Bicentennial Park Connection	City of Franklin
Franklin Greenway - Downs Boulevard Connection	City of Franklin
Franklin Greenway - Harlinsdale Park Connection	City of Franklin
Franklin Greenway - Nichols Bend Connection	City of Franklin
Franklin Greenway - Spencer Creek Connection	City of Franklin
Franklin Greenway - West Main Street Connection	City of Franklin
BNA Greenway Pedestrian/Biking Trail	Nashville Area MPO
Greenway	Town of Smyrna
Greenway	Town of Smyrna
Greenway/Walking Trail	City of Spring Hill
Otter Creek Greenway Mult-Use Path	City of Forest Hills
Multi-Use Path Granny White Pike (Phase 3 John C. Lovell Bikeway)	City of Forest Hills
Rolling Mill Hill Greenway Extension	MDHA
Hendersonville Bike/Ped Phase 3 (Drakes Creek Greenway)	City of Hendersonville
Goodlettsville Greenway Phases I-VI	City of Goodlettsville
Hendersonville Bike/Ped Phase 4 (Saundersville Rd Greenway)	City of Hendersonville
Upper Station Camp Greenway	Sumner County
Lower Station Camp Greenway	Sumner County
Cumberland River Greenway Opry Mills Connector	Metro Board of Parks and Recreation
Cumberland River Greenway East Bank to Shelby Bottoms	Metro Board of Parks and Recreation
Harpeth River Greenway Old Harding to Harpeth Bend	Metro Board of Parks and Recreation
Whites Creek Greenway Clarksville Highway to University School	Metro Board of Parks and Recreation
Seven Mile Creek Greenway Extension	Metro Board of Parks and Recreation
Mill Creek Greenway Lenox Village to Mill Run	Metro Board of Parks and Recreation
Cumberland River Greenway Bells Bend to Brookemeade	Metro Board of Parks and Recreation
Stones River Greenway Connections	Metro Board of Parks and Recreation
Timberland Park Visitor Improvement Phase I	Williamson County

Project Name	Location
Cumberland River Greenway at TSU	Metro Board of Parks and Recreation
La Vergne Pedestrian Trail	City of La Vergne
Hurricane Creek Greenway	City of La Vergne
Jefferson Springs Greenway Extension	Town of Smyrna

Potential Revenue Sources

The MPO has produced a funding toolbox that provides a range of funding sources available for implementing sidewalk and bikeway improvements. The region has made good use of a large number of these funding programs and should continue to use these funding sources to implement the recommendations plan. Also, bikeway and sidewalk improvements have routinely been implemented as part of roadway improvement projects. In addition to these funds and reliance on roadway improvement projects for bikeway and sidewalk improvements, the MPO is likely going to need to establish a dedicated funding source or target level funding from its current funding programs to implement this Study's recommendations. Regardless of the option, the MPO will need to annually fund approximately $31.72 million to implement the recommendations of the Study within the MPO's 25 year long range planning horizon.

The following table presents a quick overview of the various funding opportunities which are described in more detail as of part of the regional study documentation.

Table 31. Potential Funding Sources for Active Transportation Improvements

Potential Funding Sources for Bicycle and Pedestrian Projects and Programs – Summary Table					
Funding Program	**Source**	**Agency**	**Primary Purpose**	**Eligibility**	**Match Requirements**
Interstate Maintenance (IM)	Federal	TDOT	Funding is targeted at maintaining and improving the Nation's Interstate highway system.	IM funds may be used for resurfacing, restoration, rehabilitation, and reconstruction (4R) projects. The inclusion of pedestrian safety and bicycle facilities that are incorporated in the design of new/reconstructed interchanges and/or overpasses are eligible.	90% Federal / 10% Non-Federal
National Highway System (NHS)	Federal	TDOT	Improvements to roads that are part of the NHS and NHS Intermodal connectors.	Construction of pedestrian and bicycle facilities on land adjacent to any highway on the NHS system.	80% Federal / 20% Non-Federal or 90%/10% for Interstates
Surface Transportation Program (STP)	Federal	MPO/TDOT	Construction, resurfacing, and operational improvements for highways and bridges, including transit and other modes.	Construction of pedestrian/bicycle transportation facilities; Non-construction projects for safe bicycle use; Upgrade public sidewalks to comply with the ADA.	80% Federal / 20% Non-Federal
Transportation Enhancement (TE) Activities	Federal	TDOT	Funds twelve specific activities that include pedestrian and bicycle facility development, and safety/education activities.	3 of the 12 categories are pedestrian and bicycle facilities, safety and education for pedestrians and bicyclists, and rail-trails.	80% Federal / 20% Non-Federal
Congestion Mitigation and Air Quality (CMAQ)	Federal	MPO/TDOT	Funds projects in nonattainment and maintenance areas that reduce transportation related emissions.	Construction of pedestrian/bicycle facilities; Non-construction projects for safe bicycle use. Projects do not have to be within the right-of-way of a Federal-aid highway, but must demonstrate an air quality benefit.	* 80% Federal / 20% Non-Federal
High Priority Projects (HPP) Program	Federal	Congress	Congressionally designated funding for specific project in federal highway transportation bill.	Only those projects specifically identified in SAFETEA-LU Act.	80% Federal / 20% Non-Federal
Highway Bridge Program (HBP)	Federal	TDOT	Funding for States to improve the condition of their highway bridges through replacement, rehabilitation, and systematic preventive maintenance.	Pedestrian/bicycle facilities on highway-bridges. If a highway bridge deck is replaced or rehabilitated, and bicycles are permitted at each end, then the bridge project must include safe bicycle accommodations.	80% Federal / 20% Non-Federal
Recreational Trails Program (RTP)	Federal	TDEC	Develop and maintain recreational trails and trail-related facilities for non-motorized/ motorized recreational trail uses.	Motorized and non-motorized trails. Eligible categories are trail maintenance and rehabilitation, trailside or trailhead facilities, construction and maintenance equipment, trail construction, trail assessments, and trail safety and environmental protection education.	80% Federal / 20% Non-Federal
Transportation, Community, and System Preservation (TCSP) Program	Federal	FHWA	To address the relationships among transportation, community, and system preservation plans and practices and identify private sector-based initiatives to improve those relationships.	Sidewalk and bikeway improvements are eligible for funding under this program as are other activities such as traffic calming measures.	80% Federal / 20% Non-Federal
National Scenic Byways Program	Federal	FHWA	The program recognizes roads having outstanding scenic, historic, cultural, natural, recreational, and archaeological qualities and provides for designation of these roads as National Scenic Byways, All-American Roads or America's Byways.	Development and provision of tourist implementation, construction of bicycle and pedestrian facilities, interpretive facilities, overlooks and other enhancements for byway travelers.	80% Federal / 20% Non-Federal
Federal Lands Highway Program (FLHP)	Federal	FHWA	Provides for transportation planning, research, engineering, and construction of roads and parkways and transit facilities that provide access to or within public lands, national parks, and Indian reservations.	Sidewalks, greenways, trails, and bicycle facilities that provide access to or within public lands, national parks, and Indian reservations.	80% Federal / 20% Non-Federal

Potential Funding Sources for Bicycle and Pedestrian Projects and Programs – Summary Table					
Funding Program	**Source**	**Agency**	**Primary Purpose**	**Eligibility**	**Match Requirements**
Safe Routes to School (SRTS)	Federal	TDOT	Enable and encourage children, including those with disabilities, to walk and bicycle to school; Make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age; Facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.	Sidewalk improvements; Traffic calming and speed reduction improvements; Pedestrian and bicycle crossing improvements; On-street bicycle facilities; Off-street bicycle and pedestrian facilities; Secure bicycle parking facilities; Traffic diversion improvements in the vicinity of schools; Public awareness campaigns and outreach; Traffic education and enforcement in the vicinity of schools; Student sessions on bicycle and pedestrian safety, health, and environment; Funding for training, volunteers, and managers of safe routes to school programs.	100% Federal
Highway Safety Improvement Program (HSIP)	Federal	TDOT	Reduction in traffic fatalities and serious injuries on public roads.	Improvements for pedestrian/bicyclist safety; Construction of yellow-green signs at pedestrian/bicycle crossings and in school zones. Correction of hazardous locations including roadside obstacles, railway-highway crossing needs, and poorly marked roads that constitute a danger to bicyclists/pedestrians. Highway safety improvement projects on bicycle/pedestrian pathways or trails.	* 90% Federal / 10% Non-Federal
State and Community Highway Safety Grants (Section 402)	Federal	GHSO	To assist states and communities in the development and implementation of highway safety programs designed to reduce traffic crashes, deaths, injuries and property damage.	Funds may be used for a wide variety of highway safety activities and programs including those that improve pedestrian and bicycle safety. A minimum of 40% of a state's 402 funds must be expended by local governments or be used for the benefit of local governments.	80% Federal / 20% Non-Federal
State Planning & Research (SPR) Funds	Federal	TDOT	Planning and research funds for state DOTs to address federal statewide planning requirements and to conduct research, development, and technology activities relating to highway, public transportation, and intermodal transportation systems.	Systems and sub-regional planning and research, development, and technology activities in accordance with the provisions of 23 U.S.C. 505(b). Funding is eligible under this program for bicycle and pedestrian planning and research.	80% Federal / 20% Non-Federal
Metropolitan Planning (PL) Funds	Federal	MPO	Funds are for MPOs to carry out federal transportation planning activities within a MPO area. Activities include administering the MPO process, development of a regional multimodal long range transportation plan, and maintaining a multiyear transportation improvement program.	Funding can be used for regional, sub-regional, and other modal planning activities including plans, studies, and programs for bicycle and pedestrian accommodations.	80% Federal / 20% Non-Federal
Urbanized Area Formula Grants (Section 5307)	Federal	Transit Agency/ MPO/TDOT	Transit capital and planning assistance to urbanized areas of over 50,000 and operating assistance to areas with populations of 50,000 - 200,000.	Improve bicycle and pedestrian access to transit facilities and vehicles, including bike stations.	* 80% Federal / 20% Non-Federal
Job Access and Reverse Commute Grants	Federal	TDOT	Intended to transport welfare recipients and eligible low-income individuals to and from employment.	Can fund pedestrian and bicycle-related services.	50% Federal / 50% Non-Federal
Paul S. Sarbanes Transit in Parks Program	Federal	FTA/Interior	Funds alternative transportation that helps visitors access destinations in federally-owned or managed parks and public lands.	The program funds capital and planning expenses for alternative transportation systems such as shuttle buses and pedestrian and bicycle trails in national parks and public lands.	100% Federal*
Land and Water Conservation Fund (LWCF)	Federal	TDEC/NPS	Build a variety of park and recreation facilities, including trails and greenways.	Greenway and trail facilities.	50% Federal / 50% Non-LWCF
EPA Climate Showcase Communities Grant	Federal	EPA	Assist local governments in developing plans, conducting demonstration projects, and implement projects that reduce greenhouse gas (GHG).	Activities must achieve reductions in GHG emissions by addressing one of ten priority areas including land use, transportation, and community planning and include reductions in vehicle miles traveled.	50% Federal / 50% Non-Federal
Community Development Block Grant (CDBG)	Federal	City/HUD	Directly provides funds to cities and towns for projects with community-wide benefits. Activities must benefit low to moderate income persons.	Sidewalks, greenways, trails, and bicycle facilities that provide increased safety, access, and transportation options.	100% Federal

Potential Funding Sources for Bicycle and Pedestrian Projects and Programs – Summary Table					
Funding Program	**Source**	**Agency**	**Primary Purpose**	**Eligibility**	**Match Requirements**
Local Parks and Recreation Fund (LPRF)	State	TDEC	To provide grants to all eligible local governmental entities for the purchase of lands for parks, natural areas, greenways, and land for recreation facilities.	The funds may be used for trail development and capital projects in parks, natural areas, and greenways. At least 60% of the funds allocated go to municipal governments as authorized by the Act.	50% State / 50% Non-LPRF
Natural Resources Trust Fund (NRTF)	State	TDEC	To protect the endowment represented by the land and minerals owned by the State; and to ensure that development of state-owned non-renewable resources will proceed in a manner which is economically sound, and that revenues received from disposal of those resources is used for the public.	Grants from the NRTF may be awarded to all eligible local governmental entities and state agencies for outdoor recreation, historical or archaeological sites, the acquisition of lands, waters, or interests in lands and waters.	50% State / 50% Non-NRTF
Bikes Belong Coalition	Private	Bikes Belong Coalition	Bikes Belong will accept requests for funding of up to $10,000 for facility and advocacy projects.	Fundable projects include paved bike paths and rail-trails as well as mountain bike trails, bike parks, BMX facilities, and large-scale bicycle advocacy initiatives.	None, but encouraged
Kodak American Greenway Awards	Private	Foundation	In general, grants can be used for all appropriate expenses needed to complete, expand or improve a greenway project including planning, technical assistance, legal and other costs. Most grants range from $500 to $1,000. The maximum grant is $2,500.	Grants may be used for activities such as: mapping, ecological assessments, surveying, conferences, and design activities; developing brochures, interpretative displays, audio-visual productions or public opinion surveys; hiring consultants, incorporating land trusts, building a foot bridge, planning a bike path, or other creative projects.	None, but encouraged
Fish America Foundation	Private	Foundation	The Foundation grant system includes several changing grant categories, each with different application cycles and some of which can include greenways that enhance or conserve water resources.	Projects must result in on-the-ground habitat restoration, clearly demonstrate significant benefits to marine, estuarine or anadromous fisheries resources, particularly sportfish, and must involve community participation through an educational or volunteer component tied to the restoration activities.	One for One Match
National Trails Fund	Private	American Hiking Society	Gives resources necessary to build or repair new or existing trails, protect trail corridors, and support trail outreach and volunteer programs.	Grants range from $500 to $10,000 per project and are awarded to nonprofit organizations that help build and maintain hiking trails, preserve lands, and promote trail volunteerism throughout America.	None, but encouraged
Global ReLeaf Program	Private	American Forests	Funding for planting tree seedlings on public lands, including trailsides.	Emphasis is placed on diversifying species, regenerating the optimal ecosystem for the site and implementing the best forest management practices. This grant is for planting tree seedlings on public lands, including along trail rights-of-way.	None, but encouraged
Robert Wood Johnson Foundation (RWJF)	Private	RWJF	Active Living Research - supports research to identify promising policy and environmental strategies for increasing physical activity, decreasing sedentary behaviors and preventing obesity among children and adolescents.	Active Living Research supports research examining how environments and policies impact physical activity, especially among ethnic minorities and children living in low-income communities. Findings are expected to inform environmental and policy changes that will promote active living among children and families.	Varies

*Notes: * Funding match levels may vary; Agency refers to lead agency with regards to funding source (MPO – Metropolitan Planning Organization, FHWA – Federal Highway Administration, FTA – Federal Transit Administration, TDOT – Tennessee Department of Transportation, TDEC – Tennessee Department of Environment and Conservation, GHSO – Governor's Highway Safety Office, NPS – National Park Services, HUD - U.S. Department of Housing and Urban Development)*

7.0 Preservation & Enhancement of Strategic Roadway Corridors

7.1 The Cost of Aging & Congested Infrastructure

Each year, hundreds of people die on dangerous sections of roadways throughout Tennessee. In urban areas, drivers waste time waiting to get through congested intersections, pedestrians and cyclists are injured or killed by motorized vehicles, and public transportation is not a viable choice for the majority of commuters. To meet the multitude of challenges in balancing transportation needs with quality of life goals, the region must invest in a diverse strategy that not only seeks to build new infrastructure, but one that first seeks to fix what we have and make it better.

Because the vast majority of money for major transportation projects built to serve the metropolitan area, or "capital" projects, historically came from federal tax dollars, it is far too easy to perceive these projects as "free." The truth is that capital funding for mega-projects comes at the expense of other long-awaited improvements to the existing transportation system. Additionally, federal funding for transportation projects is in decline due to the ongoing depletion of the Highway Trust Fund which provides states and MPOs with federal money from taxes on transportation fuels such as gasoline.

Once transportation infrastructure is built, state and local governments must keep roads, bridges, sidewalks, and trails maintained and public transportation operated and maintained. Over time, as our region – like other areas around the nation – has continued to build new bridges and roadway infrastructure, the challenge to keep it safe and efficient has grown substantially.

The American Society of Civil Engineers (ASCE) estimates that $1.6 trillion is needed over the next five-years to bring the nation's infrastructure to a state of good condition. Establishing a long-term development and maintenance plan must become a national priority as poor road conditions cost U.S. motorists $67 billion a year in repairs and operating costs – $333 per motorist.

Moreover, Americans spend 4.2 billion hours a year stuck in traffic, at a cost of $78.2 billion a year to the economy. At the same time, transit ridership has grown at a faster pace than highway use. Total federal spending of approximately $60 billion annually is well below the $155.5 billion needed annually to improve surface transportation infrastructure conditions nationally. Between 2003 and 2007, the percentage of the nation's 599,893 bridges rated structurally deficient or functionally obsolete decreased slightly from 27 percent to 26 percent.

- Thirty-two percent (32%) of Tennessee's major urban roads are congested.
- Vehicle travel on Tennessee's highways increased 48% from 1990 to 2003. Tennessee's population grew 20% between 1990 and 2003.
- Driving on roads in need of repair costs Tennessee motorists $636 million a year in extra vehicle repairs and operating costs --- $152 per motorist.
- Congestion in the Nashville area costs commuters $730 per person per year in excess fuel and lost time

For those reasons and more, the Nashville Area MPO has adopted as one of its three major policy initiatives an emphasis on preserving and enhancing existing roadway corridors. The following sections describe some of the more significant strategies for turning an aging and increasingly congested urban roadway system into one that is modern, safer, more efficient, and built to address the needs of a variety of users and modes of travel.

7.2 Complete Streets for Purpose and Function

As most communities' largest collection of public space, streets need to reflect the values of the community and reinforce a unique 'sense of place' to be enjoyed by citizens – whether in urban, suburban, or rural contexts. This is especially true for a collector street system that serves as the backbone for local mobility, property access, and non-vehicular transportation modes. "Complete Streets" is a term used nationally to describe the transformation of vehicle-dominated thoroughfares in urban and suburban areas into community-oriented streets that safely and conveniently accommodate all modes of travel, not just motorists.

Recently, municipalities across the country have started implementing Complete Streets as one way to transform their transportation corridors from vehicle-dominated roadways into community-oriented streets that safely and efficiently accommodate all modes of travel – not just motor vehicles. The Complete Streets movement as described later in this chapter does not advocate for one size fits all — solutions for an urban area may look quite different from those in a more rural area. However, both facilities are designed to balance mobility, safety, and aesthetics for everyone using the travel corridor. Furthermore, design considerations supportive of Complete Streets include elements in both the traditional travel corridor (i.e., the public realm) as well as adjacent land uses (i.e., the private realm) for reinforcing the desired 'sense of place.'

Complete Streets policies and enabling legislation should be reflected in important policy documents including:

- City or County Comprehensive Plans;
- City or County Comprehensive Transportation Plans;
- Area Plans (for the applicable area served by the Complete Street);
- Park Master Plans (if adjacent to the corridor);
- Economic Revitalization/Development Strategies.

Implementing Complete Streets

Transforming major arterials into Complete Streets is complicated, requiring a diverse range of skill sets and broad support from the community. Fortunately, other metropolitan areas have demonstrated success stories that have been translated into guiding documents. The most detailed guidance comes from a joint effort of the Institute of Transportation Engineers and Congress for the New Urbanism. With funding from the U.S. Department of Transportation and the U.S. Environmental Protection Agency, best practices have been published as "Context-Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities."

Successful Complete Street transformations require community support and leadership, as well as coordination between various disciplines. In particular, support must include economic revitalization, business retention and expansion, property owner involvement, urban planning, urban design, landscape architecture, roadway design, utility coordination, traffic engineering, transportation planning, transit planners, architects, graphic artists, and developers.

Complete Streets Principles

The following principles embody the most important aspects of a successful Complete Streets program:

- Achieve community objectives.
- Blend street design with the character of the area served.

- Capitalize on a public investment by working diligently with property owners, developers, economic development experts, and others to spur private investment in the area. A minimum return-on-investment of $3 private for every $1 of public investment should be expected. Often in more densely populated areas, the ratio is 10:1 or more.
- Design in balance so that traffic demands do not overshadow the need to walk, bicycle, and ride transit safely, efficiently, and comfortably. The design should encourage people to walk.
- Empower citizens to create their own sense of ownership in the success of the street and its myriad characters.

Realms of Complete Street

As described below, Complete Streets can be viewed in terms of four basic zones or realms: the context realm, pedestrian realm, travelway realm, and intersection realm. Together these street designs ensure the needs of all users are accommodated.

Context Realm

The context realm of a Complete Street is defined by the buildings that frame the major roadway. Identifying distinct qualities of the context realm requires focusing on four areas: building form and massing, architectural elements, transit integration, and site design.

Building Form and Massing: To enhance an already high-quality street design and help create a complete street, buildings should be located close enough to the street that they are able to frame the public space enjoyed by pedestrians. In more urban areas, these buildings should be located directly behind the sidewalk. Buildings with stairs, stoops, or awnings may even encroach into the pedestrian realm to provide visual interest and access to the public space. Suburban environments that must incorporate setbacks for adjacent buildings should limit this distance to 20 feet or less and avoid off-street parking between buildings and the pedestrian realm.

Larger setbacks in these suburban areas will diminish the sense of enclosure afforded to the pedestrian and move access to the buildings farther away from the street. In both environments, building heights should measure at least 25 percent of the corridor width. For example, a 100-foot wide roadway right-of-way should be framed by buildings that are at least 25 feet high (a typical two-story building) on both sides with facades that are at most 20 feet from the edge of right-of-way.

Architectural Elements: Careful placement and design of buildings adjacent to the major roadway offer opportunities for meaningful interaction between those traveling along the corridor and those using the corridor for other purposes. These opportunities are greatly enhanced when restaurants, small shops and boutiques, residential units, and offices are located adjacent to the street. Building scale and design details incorporated into individual buildings foster a comfortable, engaging environment focused on the pedestrian. Common building design treatments generally favored in a pedestrian environment include awnings, porches, balconies, stairs, stoops, windows, appropriate lighting, promenades, and opaque windows.

Transit Integration: Areas that are targeted for high-quality transit service must be supported through land use and zoning policies that support transit-oriented development and reflect the benefits of increased access to alternative modes of travel. Policy examples include appropriate densities and intensities for supporting transit use, parking ratios that reflect reduced reliance on the automobile, and setback and design guidelines that result in pedestrian-supportive urban design. In addition, potential transit service identified for transportation corridors within the community should take into consideration the land use, density/intensity, and urban design

characteristics of the surrounding environment before selecting proposed technologies or finalizing service plans.

Site Design: The Complete Street truly is integrated into the surrounding environment when the interface between the site and the street is complementary to the pedestrian environment created along the entire corridor. Access to the site should be controlled through a comprehensive access management program to minimize excessive driveways that create undesirable conflicts for traveling pedestrians. Building orientation, further defined by landscape and architectural elements incorporated into the site should reinforce the public space protected between the buildings. Public paths through sites should be provided to shorten blocks longer than 600 feet.

Pedestrian Realm

The pedestrian realm of a Complete Street extends between the outside edge of sidewalk and the face-of-curb located along the street. Safety and mobility for pedestrians within this realm is predicated upon the presence of continuous sidewalks along both sides of the street built to a sufficient width for accommodating the street's needs as defined by the environment. For example, suburban settings will require different widths than downtown settings. The quality of the pedestrian realm also is greatly enhanced by the presence of high-quality buffers between pedestrians and moving traffic, safe and convenient opportunities to cross the street, and consideration for shade and lighting needs.

The pedestrian realm may consist of up to four distinct functional zones: frontage zone, throughway zone, furnishing zone, and edge zone. The frontage zone is located near the back of the sidewalk and varies in width to accommodate potential window shoppers, stairs, stoops, planters, marquees, outdoor displays, awnings, or café tables. The throughway zone provides clear space for pedestrians to move between destinations and varies between 5 and 16 feet wide, based on the anticipated demand for unimpeded walking area. The furnishing zone provides a key buffering between pedestrians and moving traffic. It generally measures at least 4 to 6 feet wide to accommodate street trees, planting strips, street furniture, utility poles, sign poles, signal and electrical cabinets, phone booths, fire hydrants, bicycle racks, or retail kiosks targeted for the pedestrian realm. The edge zone is incorporated into the pedestrian realm concurrent with the presence of on-street parking to allow sufficient room for opening car doors.

Incorporation of one or more of these function zones in the pedestrian realm of a street generally is based upon the context of the surrounding built environment. For example, a more urban, downtown environment will include all four zones in the pedestrian realm and could measure up to 24 feet wide. An equally important link to the pedestrian network that is located in a more suburban setting may omit one or more of the function zones listed above, resulting in an overall minimum width of 11 feet.

Recommended design elements for promoting a healthy pedestrian realm generally focus on one of four areas of concentration: pedestrian mobility, quality buffers, vertical elements, and public open space. Together, these best practices can be implemented in both urban and suburban environments, to varying degrees, for promoting healthy pedestrian environments.

Pedestrian Mobility: The presence of a comprehensive, continuous pedestrian network serves as the foundation for fostering a walkable community that supports active transportation and mode choice. Sidewalks generally provide clear zones of 6 to 8 feet wide to accommodate pedestrian travel. In more urban environments, amenities in the frontage zone and furniture zone will greatly increase the overall width of the corridor when compared with more suburban settings. Mid-block pedestrian crosswalks should be incorporated into the urban fabric as needed to make sure that convenient crossing opportunities are provided approximately every 300 feet

for maximizing efficiency and safety within the pedestrian system. As a general rule, mid-block crossings should be considered on two-lane streets when the block length is greater than 500 feet and the posted speed limit for the travel lanes does not exceed 40 miles per hour.

Quality Buffers: Providing separation between pedestrians and moving traffic greatly enhances the character of the pedestrian realm. The amount of separation incorporated into the pedestrian realm may vary between corridors based on the context of the surrounding built environment or on streets with different travel speed and/or traffic volume characteristics. In downtown areas, parallel or angled on-street parking provides sufficient distance (8 to 18 feet) for separating pedestrian and vehicle traffic. Likewise, landscape planting areas (typically 6 feet wide) incorporated into either urban or suburban environments provide adequate lateral separation for pedestrians. In urban areas, street trees may be placed in tree wells within an overall hardscaping surface instead of using suburban-style grass areas.

Vertical Elements: Vertical elements traditionally incorporated into the pedestrian realm include street trees, pedestrian-scale street lighting, and utilities. Street trees provide necessary shade to pedestrians and soften the character of the surrounding built environment. They should be spaced between 15 and 30 feet apart, be adapted to the local environment, and fit the scale and character of the surrounding area. Pedestrian-scale street lighting incorporated into the pedestrian realm should use metal halide fixtures mounted between 12 and 20 feet high. Utilities should not interfere with pedestrian circulation or block entrances to buildings, curb cuts, or interfere with sight distance triangles. In some cases, burying utilities underground avoids conflicts and clutter caused by utility poles and overhead wires. Relocation of overhead utilities to tall poles on just one side of the roadway, however, can be a cost-effective aesthetic alternative to burial of utilities in a duct bank under the road.

Public Open Space: The pedestrian realm serves a dual purpose within the built environment, acting as both a transportation corridor and a public open space accessible to the entire community. As a result, specific design elements incorporated into the pedestrian environment should reinforce this area as a public space. Properly planned, these design elements could provide opportunities for visitors to enjoy the unique character of the corridor in both formal and informal seating areas. Public art and/or specialized surfaces and materials introduced into the pedestrian realm are appreciated by slower moving pedestrians. In more urban areas, street furniture and/or outdoor cafes provide opportunities that foster community ownership in the pedestrian realm, such as “people watching.” Furthermore, building encroachments in downtown areas, such as stairs and stoops, provide for interesting points of access to the pedestrian realm. Lastly, awnings and canopy trees provide shade which is helpful in the temperate climate of the region.

Travelway Realm

The travelway realm of a street is defined by the edge of pavement or curb line (in more urban areas) that traditionally accommodates the travel or parking lanes needed to provide mobility for bicycles, transit, and automobiles sharing the transportation corridor. This area also separates the pedestrian and context realms and may provide carefully-designed crossing opportunities between intersections. Recommended design elements incorporated into the travelway realm serve to achieve greater balance between travel modes sharing the corridor and favor design solutions that promote human scale for the street and minimize pedestrian crossing distance. Recommendations for the travelway realm in a Complete Street focus on two areas of consideration: modes of travel and medians.

Multi-modal Corridors: Balance between travel modes within the same transportation corridor fosters an environment of choice for mobility that could lead to reduced congestion on major roadways and a healthier citizenry. On a Complete Street, safe and convenient access to the transportation network for bicycles, transit,

and automobiles is afforded within the travelway realm. Travel lanes for automobiles and transit vehicles should measure between 10 and 11 feet wide, depending on the target speed, to manage travel speeds and reinforce the intended character of the street. Parking lanes incorporated into the travelway realm should not exceed 8 feet in width (including the gutter pan) and may be protected by bulb-outs evenly spaced throughout the corridor.

Bus stops located along the corridor should be well-designed to include shelters, as well as benches that comfort patrons while waiting for transit service. On-street bicycle lanes (typically 4 to 6 feet wide) should be considered when vehicle speeds range from 30 to 40 miles per hour. Wide outside lanes may be preferred on streets with higher speeds. To avoid situations where citizens with only basic bicycle skills may be attracted to a corridor, designated bicycle routes on parallel corridors may be the best option when speeds on the major street exceed 40 mph. According to state law, bicyclists are considered vehicles and are permitted on all corridors except freeways and access-controlled highways.

Median Treatments: Medians often are incorporated into the travelway realm to provide dedicated left-turn lanes, landscaping, and pedestrian refuge at crossings. They generally vary between 7 and 18 feet wide, depending on their intended application and the limitations of the surrounding built environment. Medians also reinforce other access management solutions provided within the travelway to reduce the number of conflict points and maintain the human scale intended for the Complete Street.

In addition to center medians, other access management solutions incorporated into the travelway realm should limit the number of individual driveways along the corridor and avoid the use of right-turn deceleration lanes. Together, these improvements will reduce the overall pedestrian crossing distance for the travelway and maximize the safety for pedestrians traveling inside the pedestrian realm.

Intersection Realm

Evaluating potential changes for the intersection realm of a street requires careful consideration for the concerns of multiple travel modes that could meet at major intersections within the transportation system. Recommendations for improving the multi-modal environment in and around these major intersections focus on two areas of the facility: operations and geometric design.

Geometric Design: Geometric design of an intersection should reinforce the operational characteristics of a traffic signal or roundabout. With traffic signals, this includes the introduction of curb extensions, or bulb-outs, to shorten pedestrian crossing distance and protect on-street parking near the intersection. Curb return radii designed for signalized intersections should be 15 to 30 feet to control turning speed around corners. At roundabouts, special consideration should be given to entry and exit speeds, pedestrian refuge in the splitter islands, and assigning predictability to the intersection for pedestrians, bicycles, and vehicles. Both intersection treatments may consider special pavement markings to distinguish pedestrian areas or bicycle lanes, although these surfaces need to be stable, firm, and slip resistant. Additional consideration should be given to maintaining adequate sight triangles in the intersection, addressing the treatment of bicycle lanes through the intersection, and compliance with federal requirements per the American with Disabilities Act for crosswalk and curb ramp design.

Operations: In terms of operations, traffic signals or roundabouts are the two most appropriate applications for traffic control devices that also could maintain the pedestrian scale of the street reinforced in the context, pedestrian, and travelway realms. The merits of a traffic signal rather than a roundabout for intersection control should be determined on a case-by-case basis after taking into consideration key issues such as desired traffic

speed, availability of right-of-way, anticipated traffic patterns, and the context of the built environment surrounding the intersection.

7.3 Congestion Management Strategies

Managing congestion requires an understanding of congestion and a definition of what constitutes congestion. Long-term solutions to congestion involve more that just the development of new roadway capacity, particularly in urban areas where major arterials cannot be widened without severely impacting the businesses that have grown up around those corridors.

While the traditional response to congestion has been to add capacity - either by building new roads or widening existing roads, there are other ways to improve mobility including the expansion of alternative transportation choices like transit, walking, or bicycling, or the use of technology to help better manage the follow of traffic on the transportation system. The following presents several strategies that will be deployed in the Nashville area to manage congestion.

Increased Multi-Modal Transportation Choices

Transit Service

One of the most significant alternatives to roadway construction is to improve transportation capacity in the deficient corridor(s) with better transit options. This might include more frequent service, the extension of existing routes, new routes, giving transit priority on conventional roadways, or providing a separate transit guideway. The foundation of any transit network is bus service, which is flexible and thorough, and requires relatively modest infrastructure investment. Bus Rapid Transit (BRT) is an expansion of standard bus service into a system that emulates rail. BRT systems have similar right-of-way characteristics, stations, and capabilities as rail transit systems yet tend to cost substantially less than fixed guideway systems such as Light-rail. Light-rail transit (LRT or streetcars) is suitable for transporting high volumes of passengers with frequent service, while commuter rail typically serves remote suburb-to-downtown commuters only during peak-hours.

Transit's ability to compete with the car depends on a large number of factors, the most important of which are speed, cost, and the frequency and reliability of service. As the region addresses the transportation challenges ahead of us, the implementation of a high-capacity transit system must be considered.

Bicycling and Pedestrian Facilities

When people first think about transportation, most people think about cars, buses, trains, and trucks. Bicycling and walking are often considered forms of recreation, and in fact, many people will put their bikes on their cars and drive to a good location for cycling. As we consider our transportation future through the 2035 Regional Transportation Plan, it is important that we develop a balanced system that provides choices for mobility. By providing bicycle facilities such as bike lanes, bike routes, or greenways, travelers are allowed to choose the most appropriate type of transportation for their trip. Data from the National Personal Transportation Survey indicate that about 40 percent of all trips are shorter than two miles. This is a very reasonable distance for bicycling when appropriate bicycle facilities exist.

The primary facilities available to cyclists are greenways, bike lanes, bike routes, and of course roadways. Greenways, also known as multi-use paths, are designed to be accessed by all types of users. They are separated from motor vehicle traffic by an open space or barrier and can be located within the roadway right-of-way (ROW) or they may have an independent ROW. While greenways can serve a transportation function, they are typically not designed to provide the most direct route and do not tend to have the high-level of connectivity

that a roadway-based network can provide. They are often located around parks and are used by walkers, runner, skaters, and cyclists.

Bike lanes can be built on new or existing roadways and are located at the edges of the pavement. These facilities are special lanes that have been striped to provide a travel way reserved for cyclists. The minimum width of a bicycle lane is 4 feet. Bike lanes must be well marked so that automobile drivers do not encroach into the cycling space and are aware of their use by cyclists. Bike lanes have a positive impact on both drivers and cyclists by making drivers more alert to the presence of cyclists due to the special lanes and roadway markings provided. This results in better safety for both the cars and cyclists. Bike lanes have several advantages that include: using a single ROW to provide multi-modal transportation opportunities; provide the most direct route and optimal connectivity for cyclists; they encourage cyclists to obey traffic laws as they are recognized as an on-road vehicle; and they make drivers aware of the legal use of roadways by cyclists.

Bicycle Routes are simply "shared roadways" that have been designated as bike routes by signage. Cyclists and pedestrians are legal users of all roadways unless they are specifically prohibited. Providing Bicycle Route signage on certain roadways can provide continuity by connecting other bicycle facilities, such as bike lanes or greenways, or by helping to identify preferred cycling routes through high-demand travel corridors. Like Bike Lanes, Bike Route signage helps to alert drivers to keep a look out for cyclists.

Roadway Construction

Building new roads or widening existing roads can help alleviate some of the anticipated congestion by providing increased capacity for all types of motorized vehicles. The reduction in congestion may not be proportional to the additional capacity. This is because the shorter travel times on the improved roadways can attract additional trips from vehicles that may have otherwise used other roads, traveled during off-peak times, or not made the trip at all. When roadways must be widened or built to alleviate congestion, the effort should focus on addressing bottlenecks and/or include multi-modal accommodations to increase the overall capacity of the facility – not just vehicular capacity.

Technology & Intelligent Transportation Systems

The term Intelligent Transportation Systems (ITS) refers to the use of technology to manage the transportation system more effectively, improve its efficiency, and make it easier to use. A wide variety of ITS techniques are under development or are being used in various parts of the country. In the Nashville area, the Tennessee Department of Transportation has recently installed dozens of dynamic message signs along interstates to provide important traffic-related messages to motorists. Similarly, radar detectors and video cameras have been installed on the interstates to alert transportation officials to a slow-down that could indicate that an incident has occurred. Faster response and clearance of these incidents reduces traffic congestion and helps prevent "secondary" incidents from occurring when motorists slow down to look or swerve to avoid a stopped vehicle.

Local jurisdictions are using ITS technology to achieve better signal coordination along important arterial routes, and to establish traffic management centers where data is collected and analyzed. Over the long term, the local and state efforts are coordinated through a plan known as the ITS Regional Architecture. This plan spells out what types of data are being collected by each agency, what will be shared, and the compatibility needs for equipment. The regional architecture is continuously updated.

The Nashville Area has undertaken several deployments of ITS programs throughout the Region. These programs have come from multiple agencies and cover multiple transportation modes as well. Some multi-

agency participation has been present on some of these ITS initiatives. The following are some of the larger ITS initiatives underway or existing within the Nashville Area:

- **TDOT SmartWay Program** – TDOT's SmartWay Program includes freeway closed circuit television (CCTV) cameras, dynamic message signs (DMS), vehicle detectors, and a traffic management center (TMC) that operates 7 days per week. A majority of the urban freeway systems is currently covered or will be covered in the future by the SmartWay system. The SmartWay Program is active in providing incident management and traveler information throughout the Region and coordinates with other TDOT SmartWay TMCs in Memphis, Chattanooga, and Knoxville to share traffic information that may have an impact on operations outside of the Region.
- **Municipal Traffic Management Centers and ITS Deployments** – Several cities within the Region have deployed ITS, to assist with arterial traffic management. These include Metro Nashville and the Cities of Franklin, Brentwood and Murfreesboro, which all have active traffic operations centers (TOCs) used for monitoring their traffic signal systems. Franklin, Brentwood and Murfreesboro also have CCTV cameras deployed within their cities that can be monitored from the TOC.
- **511 Traveler Information Number** – TDOT currently operates a statewide traveler information number that provides real-time traveler information throughout the state. Information is put into 511 through the TDOT SmartWay Information System (TSIS), which is updated by the TDOT SmartWay TMC operators and the Tennessee Highway Patrol (THP) dispatchers. 511 information can also be accessed through a 511 website and several social media sites such as Twitter and Facebook.

Coordination with Land Use and Urban Design

The primary purpose of a transportation system is to move people and goods from one place to another, but transportation systems also affect community character, the natural and human environment, and economic development patterns. A transportation system can improve the economy, shape development patterns, and influence quality of life and the natural environment.

Land use and transportation are symbiotic: development density and location influence regional travel patterns, and, in turn, the degree of access provided by the transportation system can influence land use and development trends. Urban or community design can facilitate alternative travel modes. For example, a connected system of streets with higher residential densities and a mix of land uses can facilitate travel by foot, bicycle, and public transportation, in addition to automobile. Conversely, dispersed land development patterns may facilitate vehicular travel and reduce the viability of other travel modes.

Studies have repeatedly shown that the most important factors in the feasibility of various transportation modes is land use mix, development intensity, and design. Focusing land development in corridors and nodes will do more to enhance transit in this region than any capital investment.

Walking plays a key role in any effort to reduce traffic. This is partly true because walking can substitute for short car trips, but more importantly, because almost any use of transit will involve walking to the transit line and then from the transit line to one's final destination. Willingness to walk is related to the safety of the route, the aesthetic appeal of the route, and the efficiency in which developments are connected. As such, the best way to maximize the convenience of transit - without adding new route miles, is to increase neighborhood connectivity for pedestrians.

Well designed developments also address how parking is arranged. Activities and buildings placed in the middle of large parking lots undermine walking and transit options. Instead, good design places parking at the side or

rear of a building, and emphasizes on-street parking. Parking garages also promote many objectives of pedestrian-friendly design, since they reduce the amount of surface land consumed by parking, allowing buildings to be closer together.

In Metro Nashville, benefits of such land-use patterns have begun to be realized. Hillsboro Village is an area which these components already are largely in place, whereas Green Hills has the density and mix of uses but is still in the planning stages for critical design improvements. Other jurisdictions have taken this concept to various levels, especially county seats such as Franklin and Murfreesboro that have historic downtown cores. These traditional models indicate the elements of good design that can be used to create new pedestrian-oriented developments in other parts of the region centered on transit stations and other public uses.

Employer-Based Transportation Demand Management Strategies

Transportation Demand Management or TDM refers most commonly to a collection of efforts that seek to reduce or manage the number of personal trips made by the private automobile using low-cost strategies aimed at travel behavior modification. The most common TDM objective is to encourage commuters to share rides so that more people can move through a segment with the same amount of vehicles; this is the aim of rideshare matching or carpool incentive programs. Both the Metropolitan Transit Authority (MTA) and the Regional Transportation Authority (RTA) have rideshare programs that target major employers and growth areas. The TMA Group in Franklin is a private non-profit organization which has forged a strong partnership with the business community to promote rideshare options.

Other TDM solutions more specifically target involvement by major employers and include strategies such as staggered work hours, flexible scheduling, transit subsidies, on-site bicycle parking, on-site showers, work site parking management, etc.

Incident Response & Management

Incident management is gaining national attention as a means to improve highway congestion problems as well as safety. An incident such as a traffic accident, an overturned truck, an abandoned vehicle on the shoulder, or debris on the highway can cause major problems on the highway system and eventually to the supporting network of local streets. Often these events lead to secondary crashes. Reportedly, approximately 20 percent of all freeway crashes are secondary.

The Nashville Regional Incident Management Taskforce was established in late 2006. The taskforce is comprised of the TDOT, Metro Police Department, EMS-911, Tennessee Highway Patrol, the Nashville Area MPO, and other incident management related agencies. This taskforce is intended to bring the stakeholders together to explore new initiatives and increase the efficiency in Incident Management. Incident Management encompasses all of the activities undertaken to assist involved motorists, protect public health and safety, conduct necessary investigations, minimize travel disruptions and delays, remove the damaged vehicles or cargo, and restore the roadway to normal conditions.

The TDOT HELP program provides motorist assistance throughout the Region on assigned routes throughout the Nashville Area. The HELP program trucks assist motorists with minor repairs such as flat tire changes, fuel, and push services to move disabled vehicles out of the through lanes. HELP operators also assist with traffic control and detours during major incidents and may be requested to assist with traffic management for special events.

Managed Lanes & Congestion Pricing

The distinction between managed lanes and other traditional forms of freeway lane management is the operating philosophy of "active management." Under this philosophy, the operating agency proactively

manages demand and available capacity on the facility by applying new strategies or modifying existing strategies. The agency defines the operating objectives for the managed lanes and the kinds of actions that will be taken once pre-defined performance thresholds are met.

High-Occupancy Vehicle (HOV): HOV facilities serve to increase the total number of people moved through a congested corridor by offering two kinds of travel incentives: a substantial savings in travel time, along with a reliable and predictable travel time. Because HOV lanes carry vehicles with a higher number of occupants, they move significantly more people during congested periods, even if the number of vehicles that use the HOV lane is lower than on the adjoining general purpose lanes. In general, carpoolers, vanpoolers, and bus patrons are the primary beneficiaries of HOV lanes by allowing them to move through congestion.

High-Occupancy Tolls (HOT): HOT lane facilities are limited-access, normally barrier-separated highway lanes that provide free or reduced cost access to qualifying HOVs, and also provide access to other paying vehicles not meeting passenger occupancy requirements. By using price and occupancy restrictions to manage the number of vehicles traveling on them, HOT lanes maintain volumes consistent with free flow levels of service even during peak travel periods.

Most HOT lanes are created within existing general-purpose highway facilities and offer potential users the choice of using general-purpose lanes or paying for premium conditions on the HOT lanes. HOT lanes utilize sophisticated electronic toll collection and traffic information systems that also make variable, real-time toll pricing of non-HOV vehicles possible. Information on price levels and travel conditions is normally communicated to motorists via variable message signs, providing potential users with the facts they need in order to decide whether or not to utilize the HOT lanes or the parallel general-purpose lanes that may be congested during peak periods.

HOT lanes may be created through new capacity construction or conversion of existing lanes. Conversion of existing HOV lanes to HOT operation is the most common approach.

Exclusive Transit Lanes: Exclusive, or dedicated, lanes for transit can be implemented in a variety of ways. In some cases, HOV lanes, or specific HOV access ramps, can be operated to allow buses preferential or exclusive use. In other cases, permanent exclusive transit lanes are built within the right-of-way of an existing roadway facility or in an entirely new alignment – which is more common with rail transit than bus service.

Truck-Only Lanes: Truck-only lanes are lanes designated for the use of trucks. The purpose of truck-only lanes is to separate trucks from other mixed-flow traffic to enhance safety and/or stabilize traffic flow. In some cases, tolls have been applied to truck-only lanes to help manage truck traffic during peak travel periods, or to help offset the cost to build and maintain the truck facility.

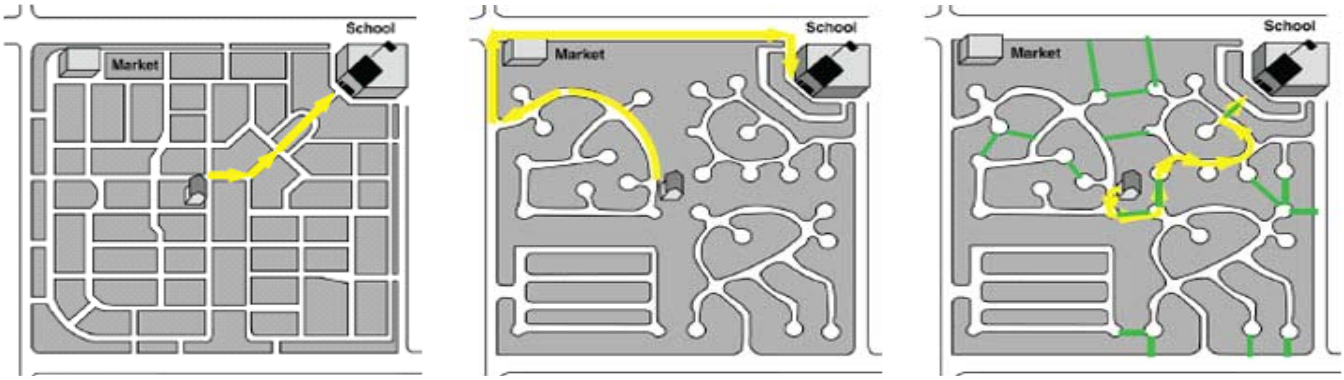
Collector Street Connectivity

Collector streets are an important component of the transportation system because they can reduce congestion on principle and arterial roadways. Many American cities and towns were originally developed utilizing a grid system of streets. This interconnectivity gives motorists several options to arrive at a destination; thereby, traffic is diverted through the interconnected street system.

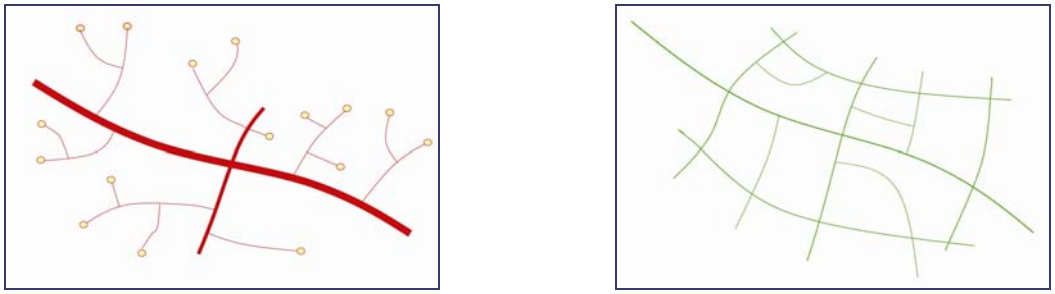
Since the modern suburb was built, streets began to be constructed in a curvilinear pattern with dead-ends. This type of street network development actually increases traffic congestion on principle and arterial streets by diverting traffic to only a few roadways. Many of the region's residential developments have been built along arterials, but they have not been connected to one another. Connecting the internal street system is one way of addressing congestion on the area's arterials. The following figure shows the grid system, curvilinear system,

and how to connect street networks. These connections can also be made with non-motorized infrastructure such as shared use trails or sidewalks.

Figure 50. Examples of Street Networks



The role of a collector street in a balanced transportation system is to collect traffic from neighborhood and local streets and distribute it to the network of arterials. As such, these streets provide relatively less mobility but higher overall accessibility compared to higher level streets. The lower design speeds and multi-modal amenities make these streets attractive for bicyclists and pedestrians. Proper design and spacing of collector streets is critical to ensuring a balanced transportation network.



Limited connectivity resulting in heavy reliance on arterial system (left) versus well-connected system of streets (right).

The design of a collector street network must respect present and future conditions, the public's vision for the future, and how the network can best balance the natural environment, connectivity, access, mobility, and safety. Local geography creates a network of lakes, creeks, and floodplains that impact land use and transportation decisions. These features affect how the community develops, where streets can be constructed and maintained, and where connections between streets can be made. Collector streets, as part of the development process, must respect the natural environment.

Local officials also must consider street spacing guidelines to promote the efficient development of an expanding transportation system. Ultimately, these street spacing guidelines could be used as "rules of thumb" during the development review process.

Different spacing standards are necessary for different development types and intensities. The figure below and the table on the following page show the desired collector street spacing for different intensities. In addition, individual driveway access to collector streets should be limited to local streets when possible.

Table 32. Land Use Intensity and Collector Street Spacing

Land Use/Type of Collector Street	Intensity (dwelling units per acre)	Access Function	Approximate Street Spacing
Very Low Intensity Residential	Less than 2	High	3,000 to 6,000 ft
Low Intensity Residential	2 to 4	High	1,500 to 3,000 ft
Medium and High Intensity Residential	More than 4	High	750 to 1,500 ft
Activity Center	Mixed-use	Medium	750 to 1,500 ft

Access Management

Access management allows local decision-makers to do more with less. As the region's most traveled corridors continue to attract commercial development, protecting the through capacity becomes essential for the efficiency of the transportation system and continued economic growth. Access management balances the needs of motorists using a roadway with the needs of adjacent property owners dependent upon access to the roadway. In an environment with limited funds for transportation projects and competing agendas, access management is not just good policy but crucial to the health of the entire transportation network.

The Federal Highway Administration (FHWA) defines access management as "the process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding system in terms of safety, capacity, and speed." According to the Access Management Manual, access management results from a cooperative effort between state and local agencies and private land owners to systematically control the "location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway." Access management requires cooperation between government agencies and private land owners.

Symptoms and Benefits of Access Management

Poor access management directly affects the livability and economic vitality of commercial corridors, ultimately discouraging potential customers from entering the area. A corridor with poor access management lengthens commute times, creates unsafe conditions, lowers fuel efficiency, and increases vehicle emissions. Signs of a corridor with poor access management include:

- Increased crashes between motorists, pedestrians, and cyclists,

- Worsening efficiency of the roadway,
- Congestion outpacing growth in traffic,
- Spillover cut-through traffic on adjacent residential streets,
- Limited sustainability of commercial development.

Without access management, the function and character of major roadway corridors can deteriorate rapidly and adjacent properties can suffer from declining property values and high turnover. Access management has wide-ranging benefits to a variety of users as shown in the table below.

Benefits of Corridor Access Management	
User	**Benefit**
Motorists	• Fewer delays and reduced travel times • Safer traveling conditions
Bicydists	• Safer traveling conditions
	• More predictable motorist movements
	• More options in a connected street network
Pedestrians	• Fewer access points and more median refuges increases safety • More pleasant walking environment
Transit Users	• Fewer delays and reduced travel times
	• Safer, more convenient trips to and from transit stops in a connected street and sidewalk network
Freight	• Fewer delays and reduced travel times lower cost of delivering goods and services
Business Owners	• More efficient roadway system serves local and regional customers
	• More pleasant roadway corridor attracts customers
	• Improved corridor aesthetics
	• Stable property values
Government Agencies	• Lower costs to achieve transportation goals and objectives • Protection of long-term investment in transportation infrastructure
Communities	• More attractive, efficient roadways without the need for constant road widening

Access Management Tools

Access management is not a "one size fits all" solution to corridor congestion. Successful strategies differ throughout a region and even along the same road. The Access Management Strategy Toolkit provides a general overview of the various strategies available to mitigate congestion and its effects. A comprehensive access management program includes evaluation methods and supports the efficient and safe use of the corridors for all transportation modes. The purpose of the toolkit is to provide local engineering and planning officials with access management strategies as well as an overview of their application, use, and, in some cases, unit cost.

Site Access Treatments: Improvements that reduce the total number of vehicle conflicts should be a key consideration during the approval of redeveloped sites along corridors identified for access management programs. Site Access Treatments include the following:

- Improved on-site traffic circulation,
- Number of driveways;
- Driveway placement/relocation; and
- Cross access.

Improved On-Site Traffic Circulation: One way to reduce traffic congestion is to promote on-site traffic circulation. Pushing back the throat of an entrance, as shown in the figures below, helps avoid spillback onto the arterial. This action improves both the safety and efficiency of the roadway. A minimum separation of 100 feet should be provided to prevent internal site operations from affecting an adjacent public street, ultimately causing spillback problems. Approximate construction cost varies and usually is the responsibility of private development.

Number of Driveways: Only the minimum number of connections necessary to provide reasonable access should be permitted. For those situations where outparcels are under separate ownership, easements for shared access can be used to reduce the number of necessary connections. Reducing the number of access points also decreases the number of conflict points, making the arterial safer and more efficient. Approximate construction cost varies and usually is the responsibility of private development.

Driveway Placement/ Relocation: Driveways located close to intersections create and contribute to operational and safety issues. These issues include intersection and driveway blockages, increased points of conflict, frequent/unexpected stops in the through travel lanes, and driver confusion as to where vehicles are turning. Driveways close to intersections should be relocated or closed, as appropriate. As a best planning practice, no driveway should be allowed within 100 feet of the nearest intersection.

Frontage Roads/ Cross Access: Cross access is a service drive or secondary roadway that provides vehicular access between two or more continuous properties. Such access prevents the driver from having to enter the public street system to travel between adjacent uses. Cross access can be a function of good internal traffic circulation at large developments with substantial frontage along a major roadway. Similarly, backdoor access occurs when a parcel has access to a parallel street behind buildings and away from the main line. When combined with a median treatment, cross access and backdoor access ensure that all parcels have access to a median opening or traffic signal for left-turn movements.

Median Treatments: Segments of a corridor with sufficient cross access, backdoor access, and on-site circulation may be candidates for median treatments. A median-divided roadway improves traffic flow, reduces congestion, and increases traffic safety — all important goals of access management. While medians restrict some left-turn movements, overall traffic delays are reduced by removing conflicting vehicles from the mainline. Landscaping and gateway features incorporated into median treatments improve the aesthetics of the corridor, in turn encouraging investment in the area. Median Treatments include the following:

- *Non-Traversable Median* - These features are raised or depressed barriers that physically separate opposing traffic flows. Inclusion in a new cross-section or retrofit of an existing cross-section should be considered for multi-lane roadways with high pedestrian volumes or collision rates as well as in locations where aesthetics are a priority. A non-traversable median requires sufficient cross and backdoor access. As these treatments are considered, sufficient spacing and locations for U- and left-turn bays must be identified.

- *Directional Cross (Left-Over Crossing)* - When a median exists on a corridor, special attention must be given to locations where left turns are necessary. A left-over is a type of directional crossover that prohibits drivers on the cross road (side street) from proceeding straight through the intersection with the main road, but allows vehicles on the mainline to turn left onto the cross road. Such designs are appropriate in areas with high traffic volumes on the major road and lower volumes of through traffic on the cross road, particularly where traffic needs to make left turns from the main line onto the minor street. A properly implemented left-over crossing reduces delay for through-traffic and diverts some

left-turn maneuvers from intersections. By reducing the number of conflict points for vehicles along the corridor, these treatments improve safety.

- *Left-Turn Storage Bays* - Where necessary, exclusive left-turn lanes/bays should be constructed to provide adequate storage space exclusive of through traffic for turning vehicles. The provision of these bays reduces vehicle delay related to waiting for vehicles to turn and also may decrease the frequency of collisions attributable to lane blockages. In some cases, turn lanes/bays can be constructed within an existing median. Where additional right-of-way is required, construction may be more costly.
- *Offset Left-Turn Treatment* - Exclusive left-turn lanes at intersections generally are configured to the right of one another, which causes opposing left-turning vehicles to block one another's forward visibility. An offset left-turn treatment shifts the left-turn lanes to the left, adjacent to the innermost lane of oncoming through traffic. In cases where permissive left-turn phasing is used, this treatment can improve efficiency by reducing crossing and exposure time and distance for left-turning vehicles. In addition, the positive offset improves sight distance and may improve gap recognition. In locations with sufficient median width, this treatment can be easily retrofitted. Where insufficient right-of-way width exists, the construction of this treatment can be difficult and costly. As a result, approximate construction costs vary.

Intersection and Minor Street Treatments: The operation of signalized intersections can be improved by reducing driver confusion, establishing proper curb radii, and ensuring adequate laneage of minor street approaches. Intersection and Minor Street Treatments include the following:

- *Skip Marks (Dotted Line Markings)* - These pavement markings can reduce driver confusion and increase safety by guiding drivers through complex intersections. Intersections that benefit from these lane markings include offset, skewed, or multi-legged intersections. Skip marks are also useful at intersections with multiple turn lanes. The dotted line markings extend the line markings of approaching roadways through the intersection. The markings should be designed to avoid confusing drivers in adjacent or opposing lanes.
- *Intersection and Driveway Curb Radii* - Locations with inadequate curb radii may cause turning vehicles to use opposing travel lanes to complete their turning movement. Inadequate curb radii may cause vehicles to "mount the curb" as they turn a corner and cause damage to the curb and gutter, sidewalk, and any fixed objects located on the corner. This maneuver also can endanger pedestrians standing on the corner. Curb radii should be adequately sized for area context and likely vehicular usage.
- *Minor Street Approach Improvements* - At signalized intersections, minor street vehicular volumes and associated delays may require that a disproportionate amount of green time be allocated to the minor street, contributing to higher-than-desired main street delay. With laneage improvements to the minor street approaches, such as an additional left-turn lane or right-turn lane, signal timing often can be re-allocated and optimized.

Signalization: The volume of traffic attracted to some side streets or site driveways is more than can be accommodated acceptably under an unsignalized condition. Delays for minor street movements as well as left-turn movements on the main street may create or contribute to undue delays on the major roadway and numerous safety issues. The installation of a traffic signal at appropriate locations can mitigate these types of issues without adversely affecting the operation of the major roadway provided they are spaced appropriately. Approximate construction cost is $50,000 to $60,000 per signal.

Progressive-Controlled Signal System: A progressive-controlled signal system coordinates the traffic signals along a corridor to allow vehicles to move through multiple signals without stopping. Traffic signals are spaced appropriately and synchronized so when a vehicle is released from one intersection the signal at the next intersection will be green by the time the vehicle reaches it.

Likewise, adaptive signal control involves continuously collecting automated intersection traffic volumes and using the volumes to alter signal timing and phasing to best accommodate actual—real-time—traffic volumes. Adaptive signal control can increase isolated intersection capacity as well as improve overall corridor mobility by up to 20 percent during off-peak periods and 10% during peak periods. Approximate construction cost is $250,000 per system and $10,000 per intersection in addition to 25% of capital costs in training, etc.

Emergency Vehicle Preemption: This strategy involves an oncoming emergency or other suitably equipped vehicle changing the indication of a traffic signal to green to favor the direction of desired travel. Preemption improves emergency vehicle response time, reduces vehicular lane and roadway blockages, and improves the safety of the responders by stopping conflicting movements. Approximate construction cost is $5,000-$7,000 per intersection plus $2,000 per equipped vehicle.

7.4 Keep Heavy Trucks Moving

The trucking industry hauls over 10 billion tons of goods annually, representing 70 percent of the value of all US commercial freight activity and serves as the final mode for many finished products. The nation relies on trucks to serve regional economies, yet truck congestion has caused many urban areas to consider alternate ways to manage and mitigate truck traffic. In urban areas, where infrastructure is often constrained and dense populations reside, the impact of truck traffic adds to overall congestion, poor air quality, and increased safety risks.

Many of the congestion mitigation strategies focus on identifying truck routes, utilizing technology for cleaner fuel and ITS, providing alternative routes for trucks, establishing truck restrictions and in some places fines, and adjustments to delivery and receiving patterns. While there is not a perfect strategy, a combination of strategies should be considered for truck congestion mitigation in the Nashville region. Following is a list of recommended strategies to further explore:

- Establish a network of recommended truck routes;
- Establish a truck route signage plan to help designate the recommended truck routes;
- Further develop the existing ITS program and infrastructure to include arterial signal timing adjustments, more dynamic message signs, and up to date information on arterials and designated truck routes through the existing 511 system. In general, expand the ITS program further into the region to provide for adequate alternative route identification for trucks;
- Consider the use of truck only lanes to alleviate truck congestion along I-40;
- Consider expanding the soon to be completed State Route 840 to the north thus completing a full bypass for all Interstates. The northern loop of SR 840 has been in the MPO Long Range Transportation Plan in the past but is not currently in the plan. As truck traffic continues to increase, the project should be reconsidered as part of the upcoming RTP;
- Conduct a complete inventory of railroad crossings on heavy truck routes to determine if improvements are needed.

Ongoing Freight Planning Efforts

The Nashville Area MPO has completed an effort to identify and plan for long-term freight needs in the Nashville region. The *Freight & Goods Movement Study: Phase II* provides the needed technical tools to help regional partners:

- Predict future freight traffic volumes through the year 2035;
- Identify areas likely to see future capacity constraints and infrastructure deficiencies;
- Identify possible traffic bottlenecks and safety concerns;
- Evaluate the costs and benefits of potential improvements;

The study also will be used to develop specific transportation projects, identify potential funding sources for those projects, and evaluate policy-based solutions to accommodate future levels of freight on our regional transportation system while protecting the mobility and safety of the traveling public. Key recommendations of the study will include:

- Identification of a freight routing system;
- Increased coordination of industrial development and land use planning;
- Development of urban design standards for freight infrastructure;
- Incorporation of heavy truck vehicles into transportation facility design.

TDOT Efforts

The Interstate 40/Interstate 81 (I-40/I-81) Corridor from Bristol to Memphis was identified through the statewide planning effort (Plan *Go*) as a strategic statewide corridor. The study identifies solutions to a variety of transportation challenges and provide a list of projects that can be considered by TDOT for the department's ten-year transportation improvement program. Projects will encompass capacity, roadway operations and maintenance, safety, freight movement, inter-modal connections, and economic access opportunities along I-40/I-81. The study area for the I-40/I-81 corridor extends from Bristol to Memphis, a distance of about 550 miles and traverses 27 of Tennessee's 95 counties, within 9 of the 12 Rural Planning Organization (RPO) boundaries and 8 of the 11 Metropolitan Planning Organization (MPO) / Transportation Planning Organization (TPO) areas.

The I-40/I-81 corridor travels east/west through the state of Tennessee and provides direct access to and from the Nashville region. The heavily traveled corridor carries a large amount of freight and deals with a variety of capacity and volume issues. The I-40/I-81 study looked at the corridor's deficiencies to develop corridor level multi-modal solutions that will improve freight and commuter transport throughout Nashville and surrounding regions. Existing data and forecasts of auto and truck delays from the study indicate the need for capacity improvements as well as ITS and other solutions to divert traffic from the facility.

Specifically the greater Nashville area faces many challenges in developing lane solutions along the corridor. Physical attributes of I-40 in the Nashville area reflect deficient interchange spacing, substandard acceleration, deceleration and weave areas, frequently spaced major interchanges, and limited right-of-way. An example of a short-term recommendation is to modify the current HOV lanes on I-40 east to HOT lanes, allowing use by single-occupant vehicles willing to pay a toll through the use of electronic transponders. In the longer term, two parallel managed lane strategies should be considered and studied further. Solutions such as these, along with new interchanges or interchange improvements identified to increase access to areas along the study corridor are recommended in the region.

National Efforts

In 2010, the American Association of State Highway and Transportation Officials (AASHTO) released a report on the nation's freight system. The *Unlocking Freight* report identifies key projects in 30 states, including Tennessee, Mississippi and Arkansas, which would improve freight delivery and dependability. According to the report, dramatic increases in freight demand finds the nation's highways, railroads, ports, waterways, and airports require investments well beyond the current levels to maintain – much less improve – their performance. Recommendations of this report include:

- Expand the capacity of the Interstate Highway System.
- Add 32,000 lane-miles to the current Interstate system.
- Upgrade 14,000 lane-miles of the current National Highway System to Interstate standards.
- Add 14,000 lane-miles to NAFTA corridors.
- Add 8,000 lane-miles of truck-only toll facilities.
- Add 400 lane-miles to provide access to key port and intermodal facilities
- Create and fund a national freight program that could include multi-state freight corridor organizations at the state, regional, and multi-state level.
- Develop a National Multimodal Strategic Freight Plan.
- Apportion approximately $3 billion annually of a proposed $375 billion highway program to the states for freight investment from the Highway Trust Fund, and add another $7 billion annually through freight fees outside the Highway Trust Fund.
- Invest in Intermodal Connector Improvements.
- Ensure funding eligibility for intermodal connectors—usually local roads in older industrial and residential neighborhoods used by truckers to travel between major highways and the nation's ports, rail terminals, and air cargo hubs.
- Support increased collaboration between states and railroads on public-private partnerships and federal investment tax credits to finance growing needs on the freight rail network.
- Use the existing surplus from the federal Harbor Maintenance Trust Fund for critical seaport dredging projects. Additionally, direct the Federal Inland Waterway Trust Fund to complete needed lock and dam construction and maintenance projects.

7.5 Planning for Safety & Security

The Nashville Area MPO promotes "safety conscious planning" in all of its planning and programming activities. "Safety conscious planning" is proactive planning for preventing crashes and unsafe conditions. Often safety improvements are reactive, spearheading strategies such as "hot spot" improvements and educational and behavioral programs. In essence, safety conscious planning involves a shift of focus from driver behavior initiatives to strategies that make it more difficult for the driver to have a crash. One way to look at integrating safety conscious planning into long range planning is considering that crashes are a function of exposure. In long range transportation planning, the MPO has the capability of minimizing exposure (via an efficient intermodal network), minimizing risk (via functional network), and minimizing consequences (via efficient emergency management system).

To be most effective, safety conscious planning must extend across all planning activities. The Institute of Transportation Engineers (ITE) identified several levels of planning processes and decisions which safety conscious planning must effectively address, namely:

- Regional- growth strategies, major network strategies, etc.;
- City/County- community plans, zoning and subdivision regulations, transportation plans, etc.;
- Small area plans- sector/neighborhood plans, area transportation strategies, corridor and access management strategies, pedestrian and bicycle facilities development, etc.; and
- Site- site plan review, site impact studies, etc.

Safety conscious planning is needed in land use planning decisions and processes to influence policies that shape the direction of land uses to the specifics of urban form, mix, and density of use. Safety conscious planning is also an integral part of transportation planning for all modes of travel in order to shape the amount of travel as well as the mix of transportation modes.

Challenges in Planning for Safety

Some of the challenges involved in planning for safety include creating an innovative region-wide and/or state-wide system for collecting, analyzing, and sharing important information like crash data and integrating safety conscious planning into long range planning and short-term programs.

Some other issues surrounding incorporating safety and security in the regional transportation plan are as follows:

- Recognizing regional safety needs and local isolated problems;
- Building stakeholder partnerships;
- Continuing multi-agency coordination and communication;
- Developing or obtaining modeling software tools for predicting potential hazards;
- Disseminating important real-time incident information to motorists;
- Implementing design factors in new infrastructure that enhances the safety and extends the life of structures, minimizing construction zone periods;
- Improving interconnectivity of the transportation system, across and between modes, for people and goods such as at modal transfer points, bikeways that share and cross the roadways, intersections with crosswalks, and railroad crossings;
- Improving the accessibility and safety of transit stops and transfer points;
- Continuing efforts to promote truck safety such as restricted lanes, speed limits, and proper loading to prevent turnovers;
- Implementing ITS technologies on transit and emergency vehicles; and
- Finding financial resources to fund safety and security improvements.

Tennessee Strategic Highway Safety Plan

The Tennessee Strategic Highway Safety Plan, revised in 2009, defines a system, organization, and process for managing the attributes of the road, the driver, and the vehicle to achieve the highest level of highway safety by

integrating the work of disciplines and agencies involved. These disciplines include the planning, design, construction, operation, and maintenance of the roadway infrastructure (engineering); injury prevention and control (law enforcement and emergency response services), health education; those disciplines involved in modifying road user behaviors (education, enforcement), and the design and maintenance of vehicles.

Developed through a partnership among the Federal Highway Administration, Tennessee Department of Transportation, Tennessee Department of Safety, the Governor's Highway Safety Office, the Federal Motor Carrier Safety Administration, MPOs, RPOs, the Federal Highway Administration, and others, the plan's mission is to reduce the number of crashes that result in fatalities, injuries, and related economic losses on Tennessee's roadways through coordination of education, enforcement, engineering, and emergency response initiatives.

The 2009 revision of the Tennessee Strategic Highway Safety Plan included the first language addressing the safety of bicycle and pedestrian travel. The inclusion of the language for bicyclists and pedestrians in the plan allows the state to spend safety dollars, such as 402 Safety Funds from the National Highway Traffic and Safety Administration and Highway Safety Improvement Program funds from the Federal Highway Administration, on bicycle and pedestrian safety improvement projects. Approximately 8 to 10 percent of the annual fatalities on Tennessee roadways are bicyclists and pedestrians. As urban areas expand and more people use these travel modes, the fatalities for these modes are likely to increase, especially as the percentages for other roadway fatalities decline in response to safety infrastructure and programming for motorized modes.

The plan sets a goal to ensure no more than 900 fatalities occur annually on Tennessee roadways by the end of calendar year 2012 by focusing efforts on eight individual emphasis areas:

- Improve Crash Data**,**
- Reduce Lane Departures,
- Improve Intersection Safety,
- Improve Work Zone Safety,
- Improve Motor Carrier Safety,
- Improve Driver Behavior,
- Strengthen Legislation, and
- Enhance Educational and Awareness Programs.

Improve Crash Data

A critical challenge facing Tennessee's state and local transportation safety professionals is optimizing the use of information technology. Knowing the specifics relating to traffic crashes is the foundation of a comprehensive traffic safety analysis system. Proactive decisions can be made and effective safety policies and projects implemented by improving the availability of crash, traffic, citation, medical, judiciary, criminal, and driver records. To facilitate this, a central point of contact for statistical data information has been established in the Department of Safety.

Appropriate use of integrated traffic records to plan and assess safety programs, and leverage critical resources, is needed to protect public safety. The systems utilized to collect, store, and analyze traffic safety information require continuous assessment. This promotes the open exchange of techniques and ideas to improve the availability of information used by the highway safety community.

A complete traffic records program is necessary for problem identification, planning, operational management or control, and evaluation of a state's highway safety activities. Each state, in cooperation with its political subdivisions, should establish and implement a traffic records program to collect and provide information for the entire state. This type of program is basic to the implementation of all highway safety countermeasures and is the key ingredient to their effective and efficient management. The Highway Safety Improvement Program (HSIP) is driven by data on fatal and serious injury crashes.

The state has developed the Tennessee Integrated Traffic Analysis Network (TITAN) to improve the accuracy and storage of crash records. TITAN is a multi-stage project consisting of a core system housing multiple functional components of highway safety and law enforcement data. TITAN will expand based on the availability of funding, resources and technical support. The first phases of TITAN address the availability of crash and citation data in Tennessee and are identified as TITAN E-Crash, TITAN Paper-Crash, and TITAN E-Citation. Additional TITAN applications will address criminal activity, arrests, and other traffic safety related reporting.

Strategies:

- Improve timeliness and accuracy of data collection, analysis processes, and traffic safety data systems including the linkage of crash, roadway, driver, medical, enforcement, conviction, criminal, and homeland security data.
- Improve and expand the storage and accessibility of safety data. Expansion will include additional data from local roads which is currently limited.
- Continually update data definitions defined by Model Minimum Uniform Crash Criteria and D-20.
- Maintain the Traffic Records Coordinating Committee (TRCC) and include stakeholders who require traffic safety information.
- Promote and expand the implementation of electronic data collection systems for traffic safety information.
- Improve safety and access to resources by expanding local partner agencies' participation in the collection and use of traffic information.
- Provide training to State and local partner agencies on data collection, submission, analysis, definitions, importance, and appropriate uses for traffic safety data.
- Improve access to highway improvement and traffic safety information by communicating to the media and general public via the Internet.
- Independently verify data validity.
- Develop standard methodologies for the state-wide analysis of Work Zone Crash Data consistent with the requirements of the Work Zone Safety and Mobility Rule.

The Nashville Area MPO has been assisting the Tennessee Departments of Transportation and Safety by helping to geocode crash data for crashes involving bicyclists, pedestrians and heavy trucks from 2003-2008. Having this geocoded data will enable the MPO to prioritize infrastructure and behavioral safety projects to increase safety of these modes, and will assist the state in having this data available.

Reduce Lane Departures

In 2008 lane departure related crashes accounted for 545 fatalities, approximately 52 percent of all the fatalities statewide. This is the first year since 2002 that this percentage has been below 65 percent. For example, a

head-on collision, one of the most serious crash types, occurs when a driver departs the travel lane and collides with an oncoming vehicle. Another type of lane departure crash is the run-off-road crash that occurs when the driver loses control and the vehicle either collides with a fixed object or overturns. The primary objective of this section is to identify cost effective strategies that reduce unintentional lane departure as well as alert the driver should a departure occur. The secondary objective is to assist the driver in returning to the travel lane safely and minimize the consequences of departure by creating clear zones along the roadside. A lane departure action plan was devised in 2006 and is being updated in the fall of 2010.

Strategies:

- Continue implementation of Lane Departure Action Plan.
- Identify locations with significant crash history or the potential for drivers to unintentionally leave their travel lane and develop and implement a comprehensive and coordinated initiative of Engineering, Education, Enforcement, and Emergency Response.
- Identify corridors and locations with a disproportionately large number of actual and/or potential for run-off-road and head-on crashes.
- Develop standard operating procedures for the implementation of roadway safety system-wide improvements.
- Apply the concepts of forgiving roadway design.
- Achieve increased safety through the implementation of the latest designs and technology.
- Investigate improved lighting at rural interchanges based on 2006 TDOT Customer Satisfaction Survey findings.
- Removal of hazardous obstacles in the clear zone on right-of-way.
- Encourage safer mailbox structures.
- Consider motorcycle travel when designing strategies for preventing lane departures.

When developing lane departure plans, it is important that a safety countermeasure that may improve the safety on one mode not decrease the safety of another mode. An example is the installation of a traditional rumble strip, which may increase the safety for a motor vehicle but may decrease the safety for a bicyclist.

Improve Intersection Safety

Intersection-related crashes accounted for 186 fatalities within Tennessee in 2008. Rural intersections accounted for 71 fatalities, of which 7 were at signalized intersections, and 64 were at unsignalized intersections. Urban intersections accounted for 115 fatalities, of which 51 were at signalized intersections, and 64 were at unsignalized intersections. Intersection related crashes accounted for 18 percent of Tennessee's fatalities compared to 22 percent nationally. Fatalities and serious injuries at highway/railroad intersections, while spectacular, account for a small percentage statistically of this particular emphasis area. According to NHTSA, two-thirds of all motor cycle vs. motor vehicle crashes occur at intersections. Tennessee will improve the focus for all modes of transportation at intersections.

Strategies:

- Identify intersections that qualify for the Highway Safety Improvement Program based on severity due to the number of fatal and serious injury crashes on the State and local systems.

- Implement cost effective intersection safety improvements that address project specific fatal and serious injury crash data.
- Achieve increased safety through the implementation of the latest designs and technology.
- Provide appropriate warnings at all highway-rail grade crossings.
- Increase enforcement at intersections and highway-rail grade crossings.
- Provide public information on the importance of compliance with traffic control devices.
- Inventory and bring up to MUTCD standards all signs on Tennessee roadways (state and county).

Improve Work Zone Safety

Most road construction projects or utility work along Tennessee's Highways involve lane closures or restricted lanes at times. Each year, there are hundreds of work zones which present dangers to workers and drivers alike. Typically, 85 percent of those killed in a work zone are drivers or occupants and rear-end crashes (running into the rear of a slowing or stopping vehicle) are the most common kind of work zone crash. Increased public awareness is a key factor in improving work zone safety. In order to comply with the Work Zone Safety and Mobility Rule, the Tennessee Department of Transportation developed the Tennessee Work Zone Safety and Mobility Manual to maintain safety and mobility within Tennessee's roadway work zones. Its purpose is to serve as a record of compliance with the Final Rule by promoting safety and mobility within work zones; define the process by which major aspects of applicable work zones shall be established; promote coordination between all organizations involved in work zone development; and provide guidance for the required completion of the work zone process by providing detailed instruction for completion of Traffic Management Plans.

Strategies:

- Provide work zone training and information for public agencies and industry personnel.
- Ensure appropriate work zone traffic control including pavement marking and signing.
- Implement the updated work zone temporary striping policy.
- Prepare and air Public Service Announcements on work zone safety.
- Continue "Between the Barrels" teenage driver work zone training program instituted in 2006.
- Provide practices and policies to improve the safe travel of motor carriers in work zones.
- Achieve increased safety through the implementation of innovative designs and technology.
- Provide incident management training for all responders to highway incidents.
- Publish work zone booklet.
- Provide funding to state and local law enforcement to help control speeding in major work zones.
- Use "Merge Left" lane drops wherever practical.
- Use the 511 system to relay important work zone information to the public.
- Expand use of coordinated incident management (including HELP Program) in work zones to minimize effects on traffic flow and decrease secondary incidents.
- Implement Quick Clearance on all highway incidents and in work zones as a means of minimizing effects of secondary incidents.

- Conduct comprehensive review of current procedures as required by TDOT's Work Zone Safety and Mobility Manual.
- Implement state-wide standardized inspection procedures for work zones.
- Provide Emergency Reference Markers on urban Interstates and other controlled access highways to improve emergency response and crash data.

Improve Motor Carrier Safety

According to the Federal Motor Carrier Administration, Tennessee's crash data shows over representation of crashes in metropolitan areas along the interstates, due to congestion and high amounts of through CMV traffic. Department of Safety data shows 2003 had 117 fatal crashes with 124 fatalities, 2004 had 148 fatal crashes with 165 fatalities, 2005 had 153 fatal crashes with 166 fatalities, 2006 had 151 fatal crashes with 157 fatalities and 2007 had 152 fatal crashes with 155 fatalities. For overall crashes, Motor Carrier Management Information System shows 3,452 in 2003 – 3,339 in 2004 – 4,698 in 2005 – 4,488 in 2006 - and 3,915 in 2007. During the year 2007 approximately 61 percent of all CMV fatalities reported occurred in rural locations, with approximately 79 percent of crashes identified as occurring on either undivided two way traffic ways, or divided traffic ways without a barrier. This information was taken from FMCSA Analysis and Information Online (A&I) and TDOS data.

Strategies:

- Combine Safety Education efforts;
- Improve the effectiveness and reporting of CMV violation citations;
- Restrict trucks to right two lanes in urban areas and outside city limits;
- Identify and manage problem drivers more effectively in high crash counties;
- Develop and implement targeted enforcement initiatives;
- Provide technological infrastructure and solutions;
- Continue to implement National and State Specific Program Elements:
- Driver/Vehicle Inspections
- Compliance Reviews and New Entrant Safety Audits,
- Traffic Enforcement,
- Public Education and Awareness,
- Data Collection,
- School Bus Program (State Specific),
- Drug and Alcohol Interdiction (State Specific),
- Hazardous Materials (State Specific),
- Motor Coach Program (State Specific),
- CMV Seat Belt Usage.

Improve Driver Behavior

Addressing driver behavior is a critical factor in reducing fatal and serious injury crashes. In 2008, of the 1,043 fatalities, 404 were alcohol related, 243 involved driving too fast or exceeding the speed limit, and 467 were not wearing safety restraint devices. The statistics also show that a large number of fatal crashes are due to the drivers' impaired condition or errors. A driver's lack of knowledge for the needs and rights of other road users leads to fatal crashes. Therefore, enforcement and education should be emphasized in the corresponding strategies.

Strengthen Legislation

Legislation that was passed in 2004 by the Tennessee General Assembly included a new Primary Seat Belt law that went into effect July 1, 2004. In addition to primary enforcement, this bill added the following definitions to the seat belt law: prohibits any passenger from riding anywhere in a motor vehicle other than in a passenger seat position; requires all passengers, and not just front seat passengers, to wear safety belts; directs $20.00 of the proceeds of the fines from violations, rather than full amount, to the division of vocational rehabilitation; mandates that violators receive points on driving record; and adds to the list of circumstances excluded from the act.

In 2007, the Jeff Roth and Brian Brown Act was passed by the Tennessee General Assembly requiring all motorists to provide at least three feet of distance between a motor vehicle and a bicyclist on a roadway, making roads safer for both motorized and non-motorized modes of transportation. Multiple testing of impaired drivers was passed in 2005. In fall of 2006 a task force appointed by the Governor reported on proposed changes and reorganization of DWI laws. These will be proposed in a future legislative session. Booster seat legislation was passed by the Tennessee General Assembly in 2003 that also went into effect July 1, 2004. A booster seat is now required for children aged 4 years through 8 years and less than 5 feet tall. In 2006, the *Move Over for Emergency Vehicles* law was strengthened. The maximum fine was raised from $50.00 to $500.00. A law prohibiting texting while driving was passed during the 2009 session. Also legislation allowing Department operated cameras in work zones for enforcing or monitoring traffic violations when workers are present was passed in 2009.

Enhance Educational and Awareness Programs

The Tennessee Law Enforcement Training Academy, as well as the four metropolitan area law enforcement academies, is overwhelmed with requests from law enforcement agencies for specialized traffic crash training courses. The need exceeds the resources. Due to overcrowded schedules as well as local agency funding resources, courses are unavailable on a regularly scheduled basis, the availability of specialized training within a geographic region is lacking in scope.

Also, due to emerging technologies and processes, additional safety training in intersection safety improvements, roadside safety design, safety data analysis and new approaches to highway safety design will be needed for State and local engineers, technicians, and highway personnel.

In 2006 a Safety Circuit Rider Program was instituted to train local officials on road safety audits and low cost safety improvements. Counties that were over represented in fatal crashes were first targeted. In 2009 this will be replaced by a Local Roads Safety Initiative to perform Road Safety Audits and let to bid safety improvement contracts on non-state routes. Priority will be given to items that do not require a local match of funds such as guardrail, signing, marking, lighting, etc.

Strategies:

- Conduct a needs assessment survey for municipal and county law enforcement agencies to determine specialized highway safety and traffic enforcement training courses.
- Offer more regional based highway safety and traffic courses to meet the demand for specialized traffic enforcement training.
- Conduct training for local and State engineering forces on integration of safety into the project development process (planning, design, construction, maintenance and operations) of the highway system.
- Implement a Local Roads Safety Initiative.
- Provide training to representatives of Metropolitan Planning Organizations and Rural Planning Organizations for Road Safety Audit Reviews.
- Continue to bring in Federal Highway Administration sponsored safety training.
- Continue "Between the Barrels" teenage driver work zone training.
- Provide law enforcement training for work zones and incident management.
- Continue training for law enforcement, prosecutors and judges for impaired driver enforcement. Collaborate with other agencies and organizations to establish standardization of traffic schools in Tennessee, i.e. licensing, curriculum, minimum hours, and qualification of instructors.
- Provide law enforcement agencies training about the laws that apply to bicyclists and sharing the road with bicyclists.
- Continue to promote and fund Safe Routes to School programs to enable communities to educate schools, law enforcement, parents, students and motorists about the benefits of walking and bicycling to school for reduction of traffic congestion and promotions of student health and environmental health.
- Continue utilization of driver awareness messages and programs aimed at reminding drivers to watch for motorcycles while on the road as a venue for reducing avoidable accidents from occurring.
- Partner with the Motorcycle Awareness Foundation to educate local and state law and emergency officials to train in the proper techniques for handling a motorcycle accident and motorcycle victims.

Safety on Public Transit

Local transit agencies have always placed an emphasis on providing a safe, secure, and reliable service for its passengers and employees. These efforts are continuing and are an integral part of providing transit service. While transit must be concerned about safety and security as it relates to the provision of service, transit itself can be a valuable resource to a community in providing rescue or evacuation services. Local transit providers participate as part of the larger community emergency preparedness efforts.

Transportation System Security

With increased emphasis placed on transportation system security as a result of recent national natural disasters and the ever present fear of an act of crime or terrorism against the public or public infrastructure, the metropolitan planning process has been improved to provide a more in-depth discussion of security. All projects

listed in this plan have been reviewed to determine their potential to improve the security of the transportation system.

Though the MPO is not involved in specific security or emergency planning activities, the Organization does communicate with the Tennessee Department of Transportation, Tennessee Department of Safety, Tennessee Emergency Management Agency, Tennessee Highway Patrol, local emergency management and law enforcement agencies, local engineering officials, and emergency personnel on major transportation plans and projects with the intention of developing a transportation system that is as secure as possible.

Intelligent Transportation Systems

Intelligent Transportation System (ITS) cameras allow officials at the Transportation Management Center (TMC) to monitor activity along Interstates within the region. Law enforcement and/or emergency personnel can be dispatched by the TMC if an emergency is spotted.

Dynamic Message Boards located along interstates and major highways throughout Davidson County and at some rural locations are capable of displaying emergency information such as weather or other natural incidents or warnings, hazardous spill information, Amber alerts, or evacuation orders.

The TDOT HELP trucks provide incident response services along area interstates and routine surveillance of bridges and overpasses, keeping a look out for suspicious activity or disabled vehicles. HELP truck operators are able to contact law enforcement or emergency personnel if needed.

Public Transportation

Since the terrorist attacks of September 11th, 2001, the efforts with regards to safety and security have reached a new level of importance. The Federal Transit Administration has undertaken a series of major steps to help local transit providers prepare against a variety of threats. It is critical to integrate security throughout every aspect of transit programs. This commitment must be demonstrated by the continual emphasis on security from the procurement or new systems and equipment, through the hiring and training of employees, to the management of the agency, and through the provision of service. The security function must be supported by an effective capability for emergency response, both to support resolution of those incidents that occur on transit property and those events that affect the surrounding community serviced by the agency.

Although local transit providers have made great strides to strengthen security and emergency preparedness, there remains much more to do. Local transit providers are a critical, high risk, and high consequence asset. Every day, transit provides mobility to thousands of our region's citizens. An appealing aspect of transit is its open and easy access. This aspect also makes it vulnerable.

At the basic level, local transit agencies are assessing their vulnerability, developing security and emergency response plans, training drivers and supervisors, coordinating with local emergency management services, and, if possible, accelerating technology development. Security is being considered proactively in all plans or projects being developed rather than added as an afterthought.

Basic goals of transit agencies in regards to safety and security include:

- Being prepared for and well-protected against attacks;
- Being able to respond rapidly and effectively to natural and human-caused threats and disasters;
- Being able to appropriately support the needs of emergency management and public safety agencies; and

- Being able to quickly and efficiently be restored to full capability.

While local transit agencies have embraced the need to update safety and security throughout their systems, there are relatively few funds to help pay for these programs. Capital expenses can slowly be absorbed through the regular improvement plans. As older vehicles are replaced, the fleet can be upgraded to include new security features, however, it would take years to turn over the entire fleet with some additional financial assistance.

Freight Movement

Trucking: The Transportation Security Administration (TSA) administers the Hazmat Threat Assessment Program which obtains background and security checks on drivers of commercial vehicles transporting hazardous materials. In addition, the Federal Motor Carrier Safety Administration (FMCSA) has initiated several programs aimed at protecting against terrorists using commercial trucks as weapons or targets. Their top priority is dealing with trucks that carry hazardous materials.

Rail: The TSA has developed a series of voluntary freight rail security action items that should be considered when security plans are developed. The action items address system security, access control, and en-route security.

CSX routinely monitors railroads for both safety and security purposes. CSX spends $1 billion annually on track maintenance and upgrades.

Air: The TSA has new air cargo regulations in place that includes canine teams, site and on-board inspections, and physical screening of cargo as well as security and background checks of pilots, employees, and air cargo carriers. The TSA is also responsible for air passenger security.

Barge: The U.S. Army Corps of Engineers in responsible for monitoring all the locks along the Cumberland River and ensuring that they are operating safely and efficiently.

Security Planning Progress

The Strategic Plan for Highway Incident Management in Tennessee was adopted in August 2003 and "establishes the framework for a systematic, statewide, multi-agency effort to improve the management of highway incidents- crashes, disabled and abandoned vehicles, debris in the roadway, work zones, adverse weather, and other events and emergencies that impact the transportation system."

The Department of Homeland Security administers the Targeted Infrastructure Protection Program which in 2005 allocated $365 million to rail, port, and inter-city bus security, and highway watch and buffer zone protection programs.

In April 2003, the State of Tennessee formally formed the Tennessee Department of Homeland Security with the intention of coordinating emergency services and investigative agencies.

The DHS has also provided $250 million to state and local governments and owners of transit security systems and $141 million to owners and operators of rail systems.

MPO-Interagency Consultation & Project Prioritization

The primary objective of the goals related to safety and security is to work with state and local agencies and transportation providers to identify needs and facilitate improvements. Building partnerships with stakeholders is important in the following areas:

- Developing and implementing short term strategies that enhance the safety and security for all users of the transportation system;
- Creating policies and design practices that are consistent with an efficient and safe Intermodal Transportation Network;
- Developing an information system for compiling, accessing, and analyzing crash data; and
- Establishing a long term vision that enhances the safety and security of all citizens.

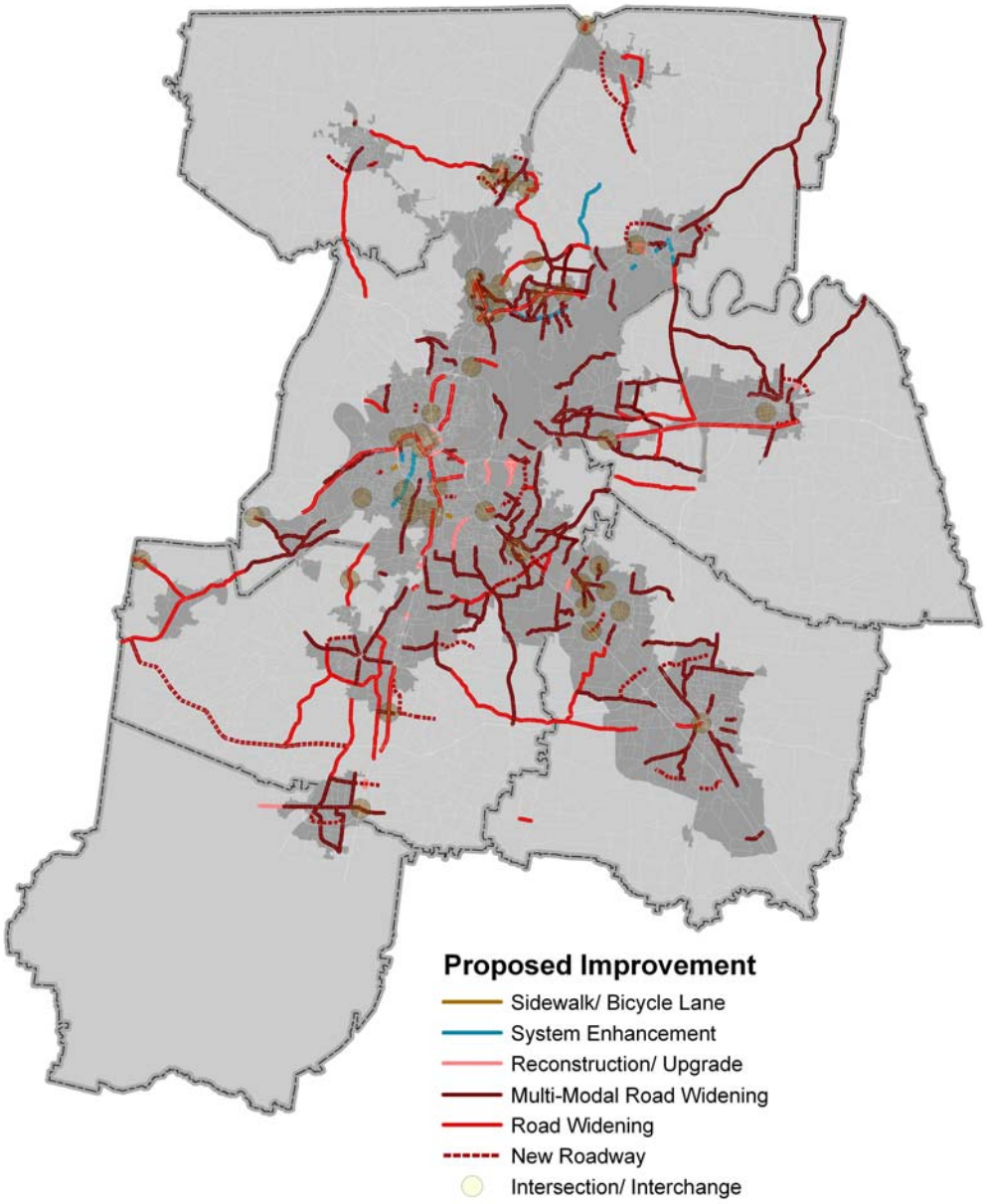
The MPO coordinates with the Nashville Regional Incident Management Committee which includes members of TDOT, TEMA, THP, local governmental officials, law enforcement, emergency personnel, and wrecker services to discuss challenges and solutions related to safety and security.

Projects benefiting the safety and security of the region are given heightened consideration for inclusion in the Plan. The MPO requires that all parties pursuing projects funded with federal funds show how the project meets the goals and objectives of this plan, including safety and security.

7.6 Roadway & Intersection Needs through 2035

The following map represents more than $6 billion dollars (today's dollars) in needed improvements to the region's major roadway network over the next 25-years, as identified by MPO member jurisdictions or the Tennessee Department of Transportation. With the MPO's increased emphasis of system preservation and enhancement, the bulk of the identified roadway needs contain provisions for the implementation of many of the strategies included in this chapter including complete streets, access management, safety improvements, and multi-modal improvements. With funding levels expected to fall well below the revenue needed to pay for these improvements, the MPO is tasked with developing a strategic approach to prioritizing projects so that limited financial resources are used in a way that most efficiently and effectively advances the region's goals and objectives. The following chapter presents and overview of that process.

Figure 51. Strategic Roadway & Intersection Needs

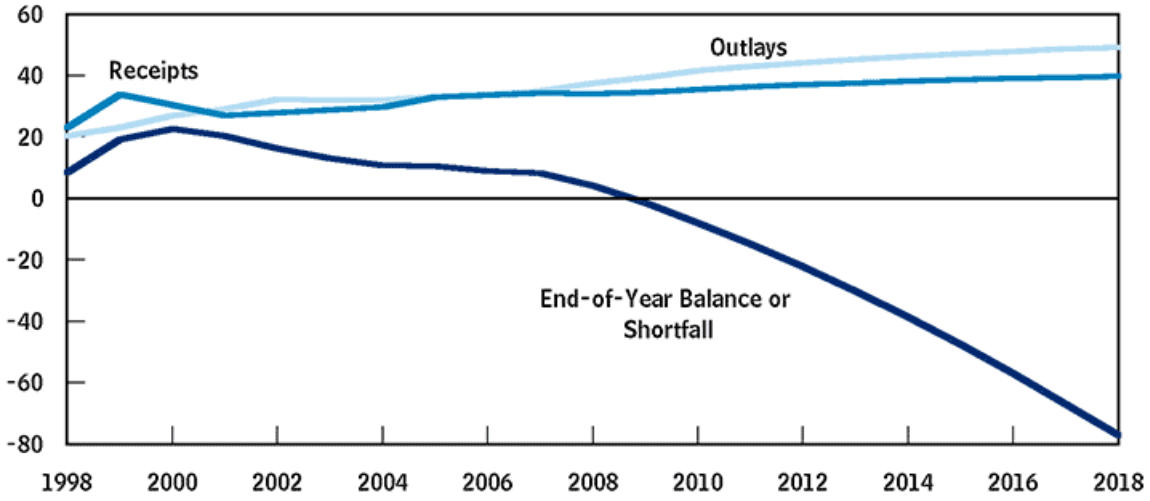


8.0 Investing in Transportation for Our Future

8.1 Fiscal Outlook

Revenue from Federal and state transportation sources are not keeping up with growing needs. As the following graphic shows, at current spending levels and without new sources of funding, the federal highway trust fund will expend all available revenues projected to be collected during 2009. State and local government purchasing power is steadily declining because the federal gas tax has not been increased since 1997, and Tennessee's state gas tax has not been increased since 1989. Since that time inflation has reduced its value by more than 40 percent. Attempts to adjust the gas tax have failed, and persistently higher pump prices for gasoline will continue to thwart any attempts to adjust the state or federal fuel tax. This will increasingly force local governments to find other means to meet their funding needs.

Figure 52. National Highway Trust Fund Balances, 1998-2018



Reduced purchasing power of current revenues leads to increasing competition for transportation funds, and less capability to expand, improve and maintain the transportation infrastructure we currently have. Meanwhile, the Region's transportation infrastructure continues to age, requiring increased maintenance. Over the next two decades, the gap will grow between the revenues we have and the investments we need to make just to keep interstates, streets and transit system in their current condition.

8.2 Grant Programs & Revenue Sources

The following sections provide an overview of the various sources of funding that are available today at the federal, state, and local levels for transportation improvements.

Federal Grant Programs

The largest source of funding for improvements to the region's major roadway network is from the federal government. The Federal-Aid Highway Act and the Highway Revenue Act in 1956 established the Highway Trust Fund in order to create a financing mechanism for the Interstate Highway System. SAFETEA-LU continues many grant programs established by U.S. Congress through previous transportation funding bills (e.g., ISTEA and TEA-21) but further expanded the flexibility afforded to states and MPOs for the use of federal transportation funds. Once used primarily for highway improvements on state and federal roadways, these funds can now be used for

a multitude of transportation related activities. Certain funds can now be used for projects such as roadway aesthetics, pedestrian and bicycle facilities, environmental impact mitigation, preservation of historic transportation facilities, transit facilities, and right-of-way corridor preservation.

Generally speaking, program funds come from a motor fuels tax and are administered by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). The following programs are included in the Highway Trust Fund, some as part of the Trust Fund's embedded Mass Transit Account.

National Highway System (NHS)

Roadways eligible for this funding include rural and urban roads serving major population centers, other rural and urban principal arterials, the Interstate system, international border crossings, intermodal transportation facilities, and major travel destinations. Other areas of eligible funding are publicly owned bus terminals, infrastructure-based intelligent transportation system capital improvements, and natural habitat mitigation. These funds are distributed based on a formula that includes each state's lane miles of principal arterials (excluding interstates), vehicle miles traveled on those arterials, diesel fuel used on state highways, and per capita principal arterial lane miles. Annually, the State of Tennessee receives approximately $127 million under this program.

Interstate System/ Interstate Maintenance (IM)

Reconstruction, maintenance, and improvement projects to the National System of Interstate and Defense Highways are eligible for this funding program. These funds are distributed based on each state's lane miles of interstate routes open to traffic, vehicle miles traveled on those interstates and contributions to the Highway Account of the Highway Trust Fund attributed to commercial vehicles. Annually, the State of Tennessee receives about $124 million.

Surface Transportation System (STP)

Projects eligible for funding under this program include construction, reconstruction, and rehabilitation (major resurfacing) of any Federal Aid Highway, including the NHS, rural minor collectors, bridge projects on any public road, transit capital projects, enhancement projects, and public bus terminals and facilities. Additionally the program funds advanced truck stop electrification systems, project relating to intersections which are on a Federal-aid highway that have high accident rates and high congestion, and environmental restoration and pollution abatement. Funds are distributed based on each state's lane miles of Federal Aid Highways, total vehicle-miles traveled on those highways, and estimated contributions to the Highway Account of the Highway Trust Fund. The State of Tennessee will receive approximately $141 million per year. The MPO receives approximately $21 million in combined STP suballocations annually.

Bridge Replacement and Rehabilitation (BRR)

Tennessee receives approximately $50 million annually for this program, which provides funding for rehabilitation and replacement of bridges on public roads. The State prioritizes projects for bridge repair based on the bridge's need for repair and maintenance.

Congestion Mitigation and Air Quality (CMAQ)

The CMAQ program was designed to assist non-attainment and maintenance areas in attaining the National Ambient Air Quality Standards for ozone, carbon monoxide (CO), and particulate matter by funding transportation projects and programs that will improve air quality by reducing transportation related emissions.

Historically, the MPO has received between $1.5 and $3.5 million per year from TDOT to spend on its own priorities – in addition to those TDOT-selected projects located within the area.

High Priority Projects (HPP)

SAFETEA-LU continued with the tradition of past highway bills by providing designated funding for specific projects identified by Congress. The State of Tennessee expects to receive approximately $68 million to fund the designated projects. Projects funded within the non-attainment area total approximately $112 million.

The Transportation and Community and System Preservation Pilot Program (TCSP)

TCSP's purpose is to increase the efficiency of the transportation system while decreasing its impact on the environment, lessening the need for costly future investments, and provide efficient access to jobs. This money can be used to design, plan, or implement projects that link transportation and land use decisions and to strengthen existing community assets. Examples include transit oriented development plans, traffic calming measures, and other community-based projects that involve transportation with a strong bias toward projects that include non-traditional partners. The Secretary of Transportation will make grants based on applications from States, tribal, regional, and local governments. The average annual amount of funding for this grant in Tennessee is $61.25 million.

Transportation Enhancements

The Transportation Enhancement (TE) program a 10 percent set-aside of the STP program funds and serves to provide a major source of funding for bicycle and pedestrian projects, the preservation of historic transportation resources, and projects that increase the usability or aesthetics of the existing transportation system. There are 12 categories of programs and projects eligible for TE funds:

- Provision of pedestrian and bicycle facilities,
- Provision of pedestrian and bicycle safety and education activities,
- Acquisition of scenic or historic easements and sites,
- Scenic or historic highway programs including tourist and welcome centers,
- Landscaping and scenic beautification,
- Historic Preservation,
- Rehabilitation and operation of historic transportation buildings, structures, or facilities,
- Conversion of abandoned railway corridors to trails,
- Control and removal of outdoor advertising,
- Archaeological planning and research,
- Environmental mitigation of highway runoff pollution, reduce vehicle-caused wildlife mortality, maintain habitat connectivity,
- Establishment of transportation museums.

Each State administers its own program and develops its own procedures to solicit and select projects for funding.

Safe Routes to School Program (SRTS)

This program was established by SAFETEA-LU in order to encourage and enable walking and bicycling to schools. Eligible activities include planning, design, and construction of projects that improve the connectivity and availability of students to walk and bike to school. Projects may include sidewalk improvements and construction, traffic calming and speed reduction improvements, pedestrian and bicycle crossing improvements, on-street bicycle facilities, off-street bicycle and pedestrian facilities, secure bike parking and traffic diversion improvements in the vicinity of schools (within two miles). States must set aside from this program 10 to 30 percent of the funds for non infrastructure-related activities to encourage walking and bicycling. These activities may include public awareness campaigns and outreach to press and community leaders, traffic education and enforcement in the vicinity of schools, student sessions on bicycle and pedestrian safety, health and environment, and training volunteers and managers of safe routes to school program. The average yearly authorization for this program is $122.3 million, of which the State of Tennessee will receive about $1 million each year.

Federal Transit Administration Large Urban Area Transit (FTA Section 5307)

This program provides funding to urban areas with at least 50,000 in population for planning, engineering, design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement of buses, overhaul of buses, rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software. All preventive maintenance and some Americans with Disabilities Act complementary paratransit service costs are considered capital costs.

Federal Transit Administration Bus & Bus Facility (FTA Section 5309)

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

Federal Transit Administration Rural and Small Urban Area Transit (FTA Section 5311)

This program provides funding to rural areas and small urban areas with less than 50,000 in population for planning, engineering, design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement of buses, overhaul of buses, rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software. All preventive maintenance and some Americans with Disabilities Act complementary paratransit service costs are considered capital costs.

Federal Transit Administration Transportation for the Elderly and Disabled (FTA Section 5310)

This program was provides funding to assist private nonprofit groups in meeting the transportation needs of the elderly and persons with disabilities when the transportation service provided is unavailable, insufficient, or

inappropriate to meeting these needs. Funds are apportioned based on each State's share of population for these groups of people.

Federal Transit Administration Job Access and Reverse Commute (FTA Section 5316)

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

Federal Transit Administration New Freedom (FTA Section 5317)

The New Freedom formula grant program aims to provide additional tools to overcome existing barriers facing Americans with disabilities seeking integration into the work force and full participation in society. Lack of adequate transportation is a primary barrier to work for individuals with disabilities. The 2000 Census showed that only 60 percent of people between the ages of 16 and 64 with disabilities are employed. The New Freedom formula grant program seeks to reduce barriers to transportation services and expand the transportation mobility options available to people with disabilities beyond the requirements of the Americans with Disabilities Act (ADA) of 1990.

State Funding Programs

The State of Tennessee levies a motor fuels tax on top of the federal fuel tax to generate state revenues for the administration and construction of transportation projects. State transportation funds are used for matching funds for federal grant programs, ongoing maintenance and operations of the statewide transportation system, and for state-aid grant programs. Currently, the state's gasoline tax rate is 21.4 cents per gallon which yields approximately $642.3 million per year. Of that amount, approximately $237 million is distributed to cities and counties and $380 million is retained by TDOT, with the remaining $25 million being deposited into the State General Fund.

State-Aid Grant Programs

Tennessee Roadscapes Program: A relatively new initiative from The Tennessee Department of Transportation (TDOT) that provides opportunities for a variety of environmental and beautification programs in Tennessee. Through Tennessee Roadscapes, TDOT partners with city, county and community organizations for environmentally friendly landscaping projects along interstates and highways throughout the state. Well-planned landscaping programs create inviting spaces that boost our economy and improve our quality of life.

- These programs help attract tourists, new residents and new businesses.
- They create welcoming places where people live and work.
- They build a sense of pride in local communities.
- Naturalized landscapes keep maintenance costs down.

Local Interstate Connector Program: TDOT provides funding for the construction, reconstruction or widening of existing roadways that connect to the interstate system using LIC funds. The local agency is responsible for 50

percent of the facility cost. Once the project is complete, the local agency is responsible for the maintenance of the facility.

Sate Industrial Access Program: Local agencies can enter into agreements with the State to assist in providing access to new or expanding industrial facilities. Examples of the type of assistance are: design, right-of-way acquisition, and utility relocation. To be eligible for this type of funding, a public roadway must be designated as an "industrial highway". Once the project is complete, the local agency is responsible for the maintenance of the facility.

Toll Roads

There are approximately 240 toll facilities in the United States today, accounting for more than 5,000 miles of highways. Most of these miles have not been financed with federal support, rather, financing has come from borrowing in the tax-exempt markets. Tolls offer good revenue potential for facilities with sufficient traffic, however, they are sensitive to inflation due to the difficulty of adjusting tolls to match the change in costs. The construction and design costs are usually financed through debt with the money repaid over 20 to 30 years. Tolls are seen as an equitable source of revenue since like vehicles are charged the same amount to use a particular facility. Costs are also allocated to the user and are a direct benefit to the participants choosing to use the facility. The Tennessee Legislature has authorized two roadway/bridge projects as part of a new tolling pilot program.

Local Revenue Sources

Local towns, cities, and counties use their respective General Fund as the primary source of funding for operations and maintenance. Some counties have instituted a local wheel tax in addition to the State motor vehicle registration fee to build the general fund. Local jurisdictions also provide funding in full or to match federal or state funds for local transportation projects. Money for capital investments in streets and highways may also come from the sale of bonds.

Locally, the jurisdictions in the MPO area have alternative sources of funding authorized by the state enabling legislation to finance transportation projects. These sources of funding can include toll facilities, rail authorities, local gasoline tax, local motor vehicle taxes and road improvement districts. These sources help to generate a steady flow of funding for transportation improvements. The following describes these options as well as other local funding available to the MPO member jurisdictions.

Special Assessment Districts

Special Assessment Districts are designated areas within which commercial and residential property is assessed a charge sufficient to defray the costs of capital improvements that benefit the property within the district. Transportation Development Districts (TDDs) are one example of these districts used to finance transportation improvements. The TDD has the power to issue bonds to pay for construction that can benefit the area instead of waiting for the local jurisdiction to fund the project. These districts work best in small, fast growing suburban areas where the tax base is low and the tax rate is high.

Impact and Utility Fees

This one-time fee is imposed by local governments on new developments to help pay for the capital facilities, mainly extending utilities and putting in traffic enhancements and transit facilities that serve it. A fee is typically assessed on a square footage of the planned development and in some cases the granting of a building permit is made contingent on payment of the fee. To implement this impact fee, it must be demonstrated that 1.) improvements are necessary and are caused by the new development, 2.) each developer is being charged a fair

share of the cost of the improvements, and 3.) funds to be collected are being used in close proximity to the new development and for the intended purposes only. These fees are enacted by the local ordinance and are usually favorable because the new development is creating these development needs. The upper limit on impact fees is around 3 percent of project value, however, enforcing and administrating this fee is burdensome to the local government.

Bond Financing

Bond financing helps local government pay for projects by establishing a type of payment plan that allows capital costs to be spread out over a number of years.

Property Tax

This is the chief source of local revenue. The funds are distributed to a General Fund and then appropriated for transportation purposes. These taxes are dependent on local economic conditions, although, they remain a steady and reliable source of revenue. A separate tax for transit operations and capital can be administered by voter approval.

State Street-Aid Fund

Section 54-4-Part 4 of the Tennessee Code established monthly distributions of a portion of the State's fuel tax revenues to incorporated cities and towns to help improve municipal streets. The distribution amount is based on the jurisdiction's area and population.

Local Option Gasoline Taxes

Counties, municipalities and metropolitan governments are authorized under Section 67-3-101 to 67-3-1013 of the Tennessee Code Annotated to impose a local gasoline tax to support local public transportation services. Imposition of the tax requires a majority vote in public referendum. The tax revenue depends on tax rate, driver sensitivity to price, administrative costs, population, and real travel patterns. The Tennessee Gasoline Tax is 21.4 cents per gallon. That yields approximately $642.3 million per year of which TDOT collects about $380.1 million (or 12.7 cents per gallon).

Local Option Sales Tax

This is one of the most commonly used and the second largest source of local revenue for local jurisdictions in the state. This tax is placed on the sale of consumer goods and services, and purchases by business firms of items for business use. The tax is a function of the tax rate, use of funds and of redistribution formulas. A sales tax is generally more acceptable to citizens than other taxes since the tax is collected in small amounts that are not highly visible to consumers. Sales tax within MPO counties range from a low of 1.00 percent to the state maximum of 2.75 percent.

Wheel Tax

Counties are authorized under Section 5-8-102 of the Tennessee Code Annotated to impose a local motor vehicle tax to provide revenue for county purposes. Imposition of the tax requires a majority vote in public referendum of a two-thirds vote from the county legislators at two consecutive meetings. Revenue potential of the local motor vehicle tax depends on the tax rate, driver sensitivity to price, administrative costs and the number of registered vehicles. The high tax rate may encourage some motorists to register their vehicle in a county that does not have local motor vehicle tax. Administrative costs are likely to be low because local motor vehicle departments are already organized to collect state taxes and fees. A disadvantage of this tax is that the tax revenues do not have to be earmarked for transportation.

Other Taxes

Other taxes that can be used to generate revenue include payroll tax, income tax, severance tax, driver's license fees, and a parking tax. The payroll, income, and parking tax are used in relatively few states but can offer a small additional revenue source. The severance tax can be imposed on resources extracting industries such as oil, gas, coal, or other natural products. This tax is used to help pay for the cost of providing roads to these industries. The driver's license fee has limited revenue potential but it does offer a stable source of money.

Alternative Revenue Sources

It is safe to say that the traditional "pay-as-you-go" method of funding transportation projects is in need of some assistance. With recent increases in construction costs outpacing inflation - coupled with the decrease in the Highway Trust Fund balance, the Middle Tennessee Region - as well as the rest of the nation - needs to explore new and creative ways of financing transportation projects. A brief overview of some of the more popular options follows.

Distance-Based Tax

Instead of using a tax on fuel consumption as a way of financing road infrastructure, a distance-based tax (i.e., vehicle miles traveled or VMT) would charge users based on their consumption by measuring their mileage. VMT could be implemented via the use of GPS units inside every vehicle that would record distance and charge motorists accordingly. VMT charges could also be expanded to charge motorists based on vehicle class, when they drive, where they drive, and the type road surface they drive on and could be linked to other methods, like congestion pricing, to help manage the real-time demand for roadways as a way fighting congestion.

Public-Private Partnerships

Public-private partnerships are cooperative agreements between the public and private sectors in which the private sector has the option to share in the design, delivery, operation, or maintenance of certain transportation projects. These partnerships allow the public sector to transfer some risk to the private sector and also allows the private sector to share in the proposed revenue or other incentive. There are many forms of public-private partnerships ranging from simple design-build contracts, where the public sector hires a single contractor to design and build a facility, to the most complex partnership, like a Design/Build/Finance/Operate, where the public sector privatizes nearly every aspect associated with a transportation facility to the highest bidding and/or most qualified private company.

Tolling & Congestion Pricing

Some states and local governments utilize toll roads as a way to help generate revenue. Depending on how the laws are written for each state, these revenue streams can either be used to help pay for the operation and maintenance costs of these tolled roadways, or could be used as a general fund revenue stream.

Tolling can also help manage traffic demand. One example of using tolls to manage congestion is the concept of road pricing. This is essentially a form of toll, but instead of the toll being a fixed price, the cost of using the roadway or lane will vary based on the demand. The more demand for the use of that roadway, the higher the price.

Depending on the laws established in each particular state, toll roads can be managed by private, independent agencies, or by the state. In the State of Tennessee, current legislation allows tolls to be established for a total of two new facilities (roadway and/or bridge), with the State acting as the tolling authority.

State Infrastructure Banks

State infrastructure banks (SIB) are essentially revolving accounts that function similar to a traditional bank. These banks - which are set up by each state - may be funded using federal dollars, state dollars or a combination of both. As with traditional banks, SIBs provide a variety of funding mechanisms such as loans and credit assistance for highway and transit projects.

Transportation Infrastructure Finance and Innovation Act

This provision of SAFETEA-LU helps local jurisdictions focus on finding other means of financing larger-scale projects. More specifically, the idea is to shift the jurisdiction's mindset away from always using direct funding by the federal government toward realizing the potential money available from private capital leveraged by federal loan guarantees. These programs and options allow governments to finance projects and are able to start projects at a quicker pace instead of waiting years to get to the front of the line for federal funding and matches.

The Transportation Infrastructure Finance and Innovation Act (TIFIA) promotes using public-private financing options to fund transportation projects. These financing options include direct loans, loan guarantees, lines of credit, recognition of donated funds, property, in-kind contributions, and joint public-private financing of transit-oriented community economic development surrounding public transit properties. Projects such as transit, highways, and inter-city rail can be financed during planning, design work, environmental mitigation, construction, buying real property, reconstruction, and rehabilitation. All projects funded under TIFIA must be included in the Transportation Improvement Program and be approved by the local planning process.

Local or Regional Dedicated Funding for Mass Transit

First and foremost, dedicated funding means providing a reliable source of annual revenues that provides support to transit operations and capital costs. It does not necessarily mean “new” or “increased” funding, but the expansion of existing transit service will necessitate new revenue.

Revenues, which can be implemented in a variety of ways, are established on the front-end, by a legislative body or by the voters, to be dedicated for transit without being subject to the same kind of discretion associated with general fund revenues. This approach reduces the annual burden placed on local governments to find funding for public transportation and minimizes the uncertainty for public transit customers, operators, and the business community looking to invest along fixed transit routes.

8.3 Financial Forecasts

The 2035 Regional Transportation Plan is required to include a financial plan that demonstrates how the program of projects can be implemented within reasonable assumptions for future revenue. The MPO is tasked with developing a rational methodology for predicting future revenues. The following sections provide an overview of that methodology, and the resulting projections for the short-, mid-, and long-range planning horizons.

Short-Term Revenue Projections, 2011-2015

Predicting federal funding levels for the near-term is relatively accurate so long as Congress has recently authorized transportation spending for the corresponding time period. In cases where transportation legislation expires or is extended without significant revision, the MPO typically chooses to assume that revenue levels will stay relatively static until a new transportation funding bill is passed by Congress. Today, SAFETEA-LU continues

to be the driving force behind revenue assumptions for the region, but the Act, passed in 2005, is currently being extended beyond its original lifespan. A new transportation bill will be required in the coming year or two.

Short-term revenue projections for TDOT-managed federal funds (e.g., IM, NHS, STP, etc.) were provided by TDOT and generally equal the programmed expenditures for the same period of time. MPO-managed federal funding sources (e.g., urban STP, FTA Section 5307, etc.) are generally assumed to grow at 3 percent per year above the observed 2010 appropriations and are added to carry-over balances of unobligated funding from prior years. Specific assumptions for each MPO-managed federal grant source follows:

- **Urban FHWA STP**– 3 percent annual growth starting in FY 2012 for allocations to the Nashville-Davidson Urbanize Area and the Murfreesboro Urbanized Area.
- **Local Urban FHWA STP** – TDOT has published a four-year award cycle for local STP funds for use by urban areas of 5,000 to 50,000 in population. No additional growth beyond TDOT's estimates for FYs 2010 through 2013 has been assumed. Local STP revenues for FYs 2014 and 2015 are assumed to be the annual average of the allocation for FYs 2010 through 2013.
- **Large Urban Transit FTA Section 5307** – 3 percent annual growth starting in FY 2011, with an increase in the base funding amount in FY 2013 to $16 million due to the area's eligibility for the bonus awarded to areas with commuter rail service and a population of 750,000 or more.
- **Bus and Rail Facilities/ Transit Earmarks FTA Section 5309** –Earmarks are contingent upon requests of the Tennessee Congressional delegation. The short-range forecasts include only those earmarks already identified.
- **Job Access Reverse Commute FTA Section 5316** – 3 percent annual growth starting in FY 2011.
- **New Freedom FTA Section 5317** – 3 percent annual growth starting in FY 2011.

Table 33. FY 2011-2015 Revenue Projections (Year of Expenditure)

Grant Program	Total Revenue
TDOT-MANAGED	**$ 363,933,289**
Bridge Repair & Replacement	$ 14,592,000
National Highway System	$ 7,784,000
Interstate Maintenance	$ 144,715,500
High Priority Projects	$ 31,622,103
CMAQ	$ 20,388,168
STP TDOT	$ 37,809,270
Other Federal Funding	$ 34,235,590
State Matching Funds	$ 72,786,658
MPO Managed Funds	**$ 330,509,520**
STP Urban	$ 165,122,574
STP Local	$ 6,639,706
5307 Large Urban	$ 87,823,493
5309 Bus & Rail Facilities	$ 69,413
5316 Job Access Reverse Commute	$ 2,889,550
5317 New Freedom	$ 1,862,880
State (matching amounts for federal funds)	$ 11,580,667
Local (matching amounts for federal funds)	$ 54,521,237.00

Mid- and Long-Term Projections, 2016-2035

While the process for predicting the funding levels for the mid- and long-term horizons is similar to that used for the short-term, the results come with significantly reduced certainty as laws may change or revenue sources are added or deleted. The following describes the set of assumptions used to project future federal grant sources:

- **TDOT Bridge Repair & Replacement (BRR) –** Revenues are expected to grow by 4 percent per year beginning with a 2010 base year assumption of $5,000,000, which accounts for historical allocations through both the BRR-L and BRR-S programs.
- **National Highway System (NHS)** - For the mid-term, revenues are expected to equal the cost estimates associated with the projects TDOT will sponsor during the 2025 horizon. For the long-term, revenues are equal to a 4 percent per year growth in revenue beginning with a 2010 base year assumption of $25,000,000 per year in funding for projects in the greater Nashville region.
- **Interstate Maintenance (IM)** – For the mid-term, revenues are expected to equal the cost estimates associated with the projects TDOT will sponsor during the 2025 horizon. For the long-term, revenues are equal to a 4 percent per year growth in revenue beginning with a 2010 base year assumption of $27,000,000 per year in funding for projects in the greater Nashville region.
- **High Priority Projects (HPP)** – HPP funding is made available through congressional earmarking and is contingent upon requests of the Tennessee Congressional delegation. For long-range planning purposes, the MPO anticipates a 4 percent per year growth in revenues beginning with a 2010 base year assumption of $23,000,000.
- **Congestion Mitigation Air Quality (CMAQ)** – Revenues are expected to grow by 4 percent per year beginning with a 2010 base year assumption of $3,800,000.
- **TDOT Surface Transportation Program** - For the mid-term, revenues are expected to equal the cost estimates associated with the projects TDOT will sponsor during the 2025 horizon. For the long-term, revenues are equal to a 4 percent per year growth in revenue beginning with a 2010 base year assumption of $27,000,000 per year in funding for projects in the greater Nashville region.
- **Other TDOT Federal Funding** – Other federal grant programs administered by TDOT that are not individually identified in the revenue projections (e.g., Transportation Enhancements, Safe Routes to School, Highway Safety Improvement Program, etc.) are assumed to be part of this category. Revenues are expected to grow by 4 percent per year beginning with a 2010 base year assumption of $10,000,000.
- **MPO Surface Transportation Program -** Revenues are expected to grow by 4 percent per year beginning with a 2010 base year assumption of $21,687,884 which reflects a combination of the individual MPO STP funding pots (e.g., Nashville-Davidson UZA STP, Murfreesboro UZA STP, local STP, etc.) which are expected to merge due to urban area expansion prior to the year 2025.
- **FTA Section 5307 Large Urban Area Transit** – Revenues are expected to grow by 4 percent per year beginning with a 2013 base year assumption of $19,000,000 which reflects a combination of the individual 5307 funding pots (e.g., Nashville-Davidson UZA, Murfreesboro UZA, etc.) which are expected to merge due to urban area expansion prior to the year 2025. 2013 is used as the base year since the region is expected to become eligible for a fixed-guideway bonus starting after the results of the 2010 Census are finalized.
- **FTA Section 5309 Bus and Rail Facilities/ Transit Earmarks** – Revenues are expected to grow by 4 percent per year beginning with a 2010 base year assumption of $5,000,000 and an additional

$2,000,000 starting in 2016 for rail modernization. Earmarks are contingent upon requests of the Tennessee Congressional delegation.

- **FTA Section 5316 Job Access & Reverse Commute** – Revenues are expected to grow by 4 percent per year beginning with a 2010 base year assumption of $450,000.
- **FTA Section 5317 New Freedom** – Revenues are expected to grow by 4 percent per year beginning with a 2010 base year assumption of $275,000.

Table 34. FY 2016-2035 Revenue Projections (Year of Expenditure)

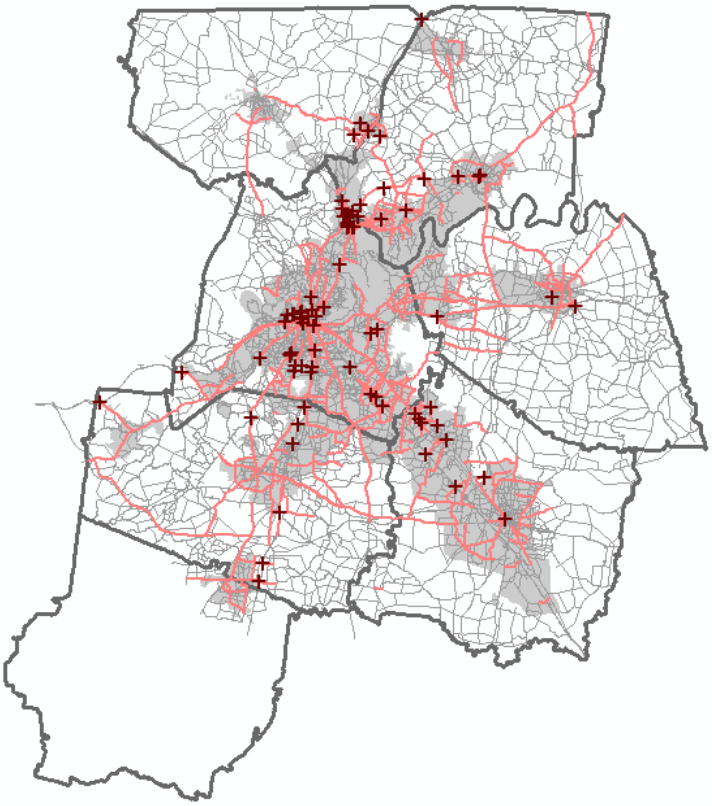
Grant Program	2016-2025 (FV)	2026-2035 (FV)
TDOT Managed Funds	**$ 2,507,438,319**	**$ 2,959,171,394**
Bridge Repair & Replacement	$ 70,267,493	$ 104,013,054
National Highway System	$ 629,268,752	$ 520,065,271
Interstate Maintenance	$ 412,625,779	$ 416,052,217
High Priority Projects	$ 323,230,466	$ 478,460,050
CMAQ TDOT	$ 53,403,294	$ 79,049,921
STP TDOT	$ 376,619,886	$ 561,670,493
Other Federal Funding	$ 140,534,985	$ 208,026,109
State (includes matching amounts for federal funds)	$ 501,487,664	$ 591,834,279
MPO Managed Funds	**$ 829,239,190**	**$ 1,227,476,571**
STP MPO	$ 304,790,646	$ 451,164,611
FTA 5307 Large Urban Area Transit	$ 254,132,213	$ 376,177,756
FTA 5309 Bus & Rail Facilities/ Earmarks	$ 94,279,707	$ 139,556,997
FTA 5316 Job Access Reverse Commute	$ 6,324,074	$ 9,361,175
FTA 5317 New Freedom	$ 3,864,712	$ 5,720,718
State Matching Funds	$ 44,825,088	$ 66,352,081
Local Matching Funds	$ 121,022,750	$ 179,143,233

8.4 Transportation Needs and Priorities

In response to the call-for-projects issued by the MPO in February 2010, MPO member jurisdictions submitted applications for more than $6 billion in funding requests for roadway improvements and more than $100,000 million in off-road greenway costs. Those figures are in 2010 dollars and are in addition to the more than $4 billion that could be spent implementing the region's transit vision (section 5), or the $800,000 million to fully implement the region's strategic vision for active walking and bicycling (section 6) – again, those figures are estimated in today's dollars.

Needless to say, the MPO faces a difficult challenge in setting priorities for future spending. The following sections present an overview of the MPO's process to evaluate and prioritize projects for federal funding.

Figure 53. Regional Roadway & Intersection Needs, 2011-2035



Project Evaluation & Prioritization

The MPO has developed a priority scoring system to help determine which projects will best facilitate the region's long term vision. The scoring system is based on both federally-defined planning factors and locally developed project evaluation factors.

Federal Planning Factors

Project prioritization and selection is based, in part, on the eight planning factors identified in the current federal transportation legislation (SAFETEA-LU), which requires this and other MPOs to focus efforts on the development and implementation of regional strategies that:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- Increase the safety of the transportation system for motorized and non-motorized users;
- Increase the security of the transportation system for motorized and non-motorized users;
- Increase the accessibility and mobility options available to people and for freight;
- Protect and enhance the environment, promote energy conservation, improve quality of life, and promote consistency between transportation improvements and State and local planned 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 operation; and
- Emphasize the preservation of the existing transportation system.

Moreover, since the Nashville urban area has a population greater than 200,000, it is federally designated as a Transportation Management Area (TMA). In a TMA, the planning and programming process also is expected to consider land use implications, strategies to improve transit service, transportation system management, intermodal connectivity, and urban congestion management. Projects to relieve congestion are given particular priority. As such, project prioritization is consistent with the MPO's Congestion Management Process (CMP) created as an integral part of the 2035 Regional Transportation Plan. In brief, the CMP provides a strategy and mechanism for identifying the appropriate transportation solution for congested roadways.

MPO Project Prioritization & Selection

Although the MPO's project evaluation criteria meet the requirements of the federal planning factors, the MPO developed a comprehensive set of factors that were determined to provide the best approach, given the available data, to evaluate projects for their consistency with the MPO's guiding principles, regional goals, and major objectives described in Section 2 of this plan. The following factors were considered in evaluating projects for funding:

- Congestion management,
- Multi-modal accommodations,
- Freight and goods movement,
- Safety and security,
- System preservation,
- Quality growth and sustainable development,
- Economic prosperity,
- Health and environment, and
- State and local support.

The MPO selection process focused largely on the identification of high-scoring projects eligible for MPO-managed funds including FHWA Surface Transportation Program (STP), FHWA Congestion Mitigation and Air Quality (CMAQ), and FTA Section 5307 Urban Transit grant funds. Projects more appropriately suited for state-managed funds were evaluated and scored primarily for the purpose of communicating priorities to the Tennessee Department of Transportation. Those projects with local or state funding commitments or prior federal funding commitments were given priority for funding in the new work program.

Appendix B (MPO Project Evaluation and Scoring) to the plan includes a comprehensive list of MPO evaluation criteria, project scoring weights, and an example of a project information sheet which was compiled to show relevant data and information for each project being considered for funding.

MPO Urban Surface Transportation Program Investment Strategy

Shaped by extensive input from regional leadership, the MPO has established a new direction for future investments made with MPO-managed grant funds received through the Federal Highway Administration Surface Transportation Program. The new strategy aligns the region's transportation investments with stated

goals and objectives, particularly those related to diversifying the set of transportation options available to those living, working, and doing business in the Nashville area.

The MPO's new strategy calls for a minimum level of investment of future revenues appropriated to the MPO through the Surface Transportation Program (STP) on projects in each of the following target areas, assuming such projects exist for consideration. Should there be no candidates in one of the three categories, funding may be awarded to roadway improvement projects that best meet overall regional goals and objectives.

- Fifteen percent (15%) to encourage the development of active transportation choices and walkable communities.
- Ten percent (10%) to support other regional investments in public transportation and mass transit.
- Five percent (5%) to improve the efficiency of the transportation system through innovative management and operations upgrades.

Of the remaining amount (roughly 70%), roadway improvement projects that best meet overall goals and objectives for a safe, efficient, multi-modal transportation system will compete for the remainder of funding. Historically, more than 90 cents of every dollar awarded to MPO projects with STP revenues has been used to pay for roadway capacity projects. This new direction provides an opportunity to build "complete streets" throughout the region.

Currently, the MPO receives Urban or Local STP on behalf of the Nashville-Davidson Urbanized Area, Murfreesboro Urbanized Area, and the Urban Areas of Lebanon, Fairview, Portland, Spring Hill, and White House. While specific revenues and expenditures for each of the region's STP accounts has been identified for the period of this TIP, those accounts for the 2025 and 2035 planning horizons of the 2035 Regional Transportation Plan have been combined into one, single pot of urban STP revenue as the MPO assumes these individual funding allocations will be collapsed in the future as the geographies of the census-defined areas are merged due to urban growth. The following presents the anticipated levels of funding for each category of investment available over the three planning horizons of the 2035 regional plan, beginning with the FY 2011-2015 Transportation Improvement Program. Please note that the new investment strategy applies only to funding available after the MPO's fulfills its commitment to existing TIP projects.

Table 35. U-STP Investment Strategy – Revenue Distribution by Horizon Year

Category	Target	2011-2015*	2016-2025	2026-2035
Multi-Modal Roadway Capacity & Safety	70%	$11,448000	$213,353,452	$315,815,227
Active Transportation & Walkable Communities	15%	$2,500,000	$45,718,597	$67,674,692
Public Transportation/ Mass Transit	10%	$1,650,000	$30,479,065	$45,116,461
System Management & Operations	5%	$825,000	$15,239,532	$22,558,231
TOTAL URBAN STP	**100%**	**$16,423,000***	**$304,790,646**	**$451,164,611**

**FY 11-15 revenues available after prior commitments are funded.*

The following provides an overview of the primary objective of and method of administration for each of the investment categories.

Active Transportation and Walkable Communities

Objective: The MPO will program at least 15 percent of its future allocation of Urbanized Area Surface Transportation Program funding to projects that proactively address goals for walkable communities and increased active transportation choices to respond to mounting challenges related to energy costs, health and environmental concerns, and the efficient use of land resources. Investments in the non-motorized modes will help increase accessibility to transit, provide safe and reliable transportation choices for trips of short distances, promote physical activity, and encourage infill and redevelopment of existing centers and corridors that may already have reached or be nearing the expected capacity on the supporting roadway infrastructure.

Eligibility: Any project that meets the federal requirements of the Surface Transportation Program that improves or expands infrastructure to accommodate non-motorized modes of transportation shall be eligible including sidewalks, bicycle lanes, shared lanes, transit stop amenities, bicyclist and pedestrian amenities, pedestrian crossings, intersection upgrades, greenways, etc. Funding may be used to implement a stand-alone project or supplement an existing project to ensure the inclusion of non-motorized modes (e.g., adding sidewalks to a road widening project). Highest priority will be given to the projects that address needs identified by the MPO's recently completed regional bicycle and pedestrian study. Further details about application process and project scoring will be developed in coordination with the MPO's Bicycle and Pedestrian Advisory Committee and TCC.

Process: Urban Surface Transportation Program funds will be programmed initially in a regional bucket to be used explicitly for the purposes of improving walking and bicycling opportunities and safety throughout the area. Within 6-months of the adoption of the multi-year Transportation Improvement Program containing the associated bucket funds, the MPO will announce a call for projects to solicit project ideas. Candidate projects will be scored, ranked, and prioritized by MPO staff working alongside the MPO's BPAC. Grant awards will be made to the selected projects after endorsement by the TCC and adoption by the Executive Board. Projects that are selected for funding will be amended into the TIP with funding distributed from the bucket. All TIP policies related to local matching requirements, construction funding availability, and project tracking will apply.

Public Transportation and Mass Transit

Objective: To enhance the revenue already made available by grant programs through the Federal Transit Administration for transit projects, The MPO will program at least 10 percent of its future allocation of Federal Highway Administration Urbanized Area Surface Transportation Program funding to projects that proactively address goals for increased public transportation service and the expansion of a safe and convenient regional mass transit system. Investments in transit infrastructure will 1) assist the region in expanding the capacity of the transportation system, particularly in areas with constrained corridors; 2) ensure that citizens and visitors without access to a personal automobile, either by choice or circumstance, have reliable transportation to access the local economy, educational and employment opportunities, and medical services; 3) address mounting challenges related to energy costs, health and environmental concerns, and the efficient use of land resources; and 4) stimulate economic development opportunities that keep the region competitive with a changing national and global economy.

Eligibility: Any project that meets the federal requirements of the Surface Transportation Program that improves or expands infrastructure to accommodate existing or future transit service or promotes or implements various other transportation demand management strategies such as ridesharing, telecommuting,

etc. shall be eligible. Funding may be used to conduct transit alternatives analyses for regionally significant transit projects, implement a stand-alone transit project, or supplement an existing project to ensure the inclusion of the appropriate transit accommodations. Highest priority will be given to the projects that help implement the regional vision for mass transit as identified by the MPO's 2035 Regional Transportation Plan. Further details about application process and project scoring will be developed in coordination with the MPO's transit working group and the TCC.

Process: Urban Surface Transportation Program funds will be programmed initially in a regional bucket to be used explicitly for the purposes of improving transit and transportation demand management opportunities throughout the area. Within 6-months of the adoption of the multi-year Transportation Improvement Program containing the associated bucket funds, the MPO will announce a call for projects to solicit project ideas. Candidate projects will be scored, ranked, and prioritized by MPO staff working alongside the MPO's transit working group. Grant awards will be made to the selected projects after endorsement by the TCC and adoption by the Executive Board. Projects that are selected for funding will be amended into the TIP with funding distributed from the bucket. All TIP policies related to local matching requirements, construction funding availability, and project tracking will apply.

System Management and Operations

Objective: The MPO will program at least 5 percent of its future allocation of Urbanized Area Surface Transportation Program funding to projects that improve the management or operations of the existing transportation system including roadways, transit, and non-motorized modes of transportation.

Eligibility: Any project that meets the federal requirements of the Surface Transportation Program that improves or the region's ability to effectively manage and operate a multi-modal transportation system through the use of technology, signage, lighting, or incident management strategies shall be eligible. Funding may be used to implement a stand-alone project or supplement an existing project. Highest priority will be given to the projects that address needs identified by the MPO's ITS master plan and any other MPO plan or study that addresses system management and operations needs. Further details about application process and project scoring will be developed in coordination with the TCC.

Process: Urban Surface Transportation Program funds will be programmed initially in a regional bucket to be used explicitly for the purposes of improving system efficiency through projects that use technology or intelligent transportation systems, signage, lighting, or incident management strategies. Within 6-months of the adoption of the multi-year Transportation Improvement Program containing the associated bucket funds, the MPO will announce a call for projects to solicit project ideas. Candidate projects will be scored, ranked, and prioritized by MPO staff working alongside the MPO's TCC and ITS working group. Grant awards will be made to the selected projects after endorsement by the TCC and adoption by the Executive Board. Projects that are selected for funding will be amended into the TIP with funding distributed from the bucket. All TIP policies related to local matching requirements, construction funding availability, and project tracking will apply.

Multi-Modal Roadway Capacity and Safety

Objective: The MPO will program approximately 70 percent of its future allocation of Urbanized Area Surface Transportation Program funding to projects that expand the multi-modal capacity of the regional roadway system in order to manage congestion, accommodate a growing population, and to address goals for increased safety and security.

Eligibility: Any project that meets the federal requirements of the Surface Transportation Program that improves or expands a specific roadway, intersection, or interchange to increase multi-modal capacity or

roadway safety shall be eligible including roadway widening, new roadways, roadway reconstruction and realignment, ITS upgrades, multi-modal upgrades, intersection and interchange improvements, bridge repair and replacement, etc. Highest priority will be given to the projects that address the MPO's primary project evaluation criteria including 1) system preservation and enhancement, 2) quality growth, sustainable development, and economic prosperity, 3) multi-modal options, 4) congestion management, 5) safety and security, 6) freight and goods movement, 7) health and environment, 8) project history and prior commitment.

Process: Urban Surface Transportation Program funds will be programmed on general roadway projects with the adoption of the multi-year Transportation Improvement Program. Prior to the adoption of a new TIP, the MPO will announce a call for projects to solicit project ideas. Candidate projects will be scored, ranked, and prioritized by MPO staff working alongside the MPO's TCC. Grant awards will be made to the selected projects after endorsement by the TCC and adoption by the Executive Board. All TIP policies related to local matching requirements, construction funding availability, and project tracking will apply.

8.5 Cost-Feasible Projects

Using the MPO's project evaluation and prioritization process as a framework, the region selects projects for funding using the revenues projected for the next 25 years. In all, more than $5.8 billion in projects have been identified as part of the cost-feasible plan. The financial tables included in this section compare the estimated revenues and identified project expenditures for each of the plan's horizon years. Though the financial tables may indicate a surplus of funding for some grant programs, the reality is that region's needs for transportation dollars far outpace the available revenues – by a margin of 2 to 1. Any appearance of a surplus exists as a result of the nature of grant programs that seek to identify projects as the funding is appropriated. Such projects must be consistent with the goals and objectives of the regional plan and are typically exempt from air quality conformity analysis.

Accounting for Inflation

Unless otherwise noted, all project costs reported in the plan are estimated for the expected year of expenditure, meaning that cost estimates include an adjustment to account the annual inflation of prices. For the short-term (2011-2015) planning horizon, project cost estimates were submitted to the MPO by sponsoring agencies in year of expenditure, as near-term inflationary pressures vary drastically by project type and schedule. For the mid-term (2016-2025), and long-term (2026-2035) planning horizons, project cost estimates for projects expected to be completed or implemented during the 2025 horizon are inflated by 4 percent per year up to the mid-point of that horizon, or to the year 2020 and 2030, respectively for the mid- and long-term horizons.

Figure 54. Financially-Feasible Roadway & Intersection Projects

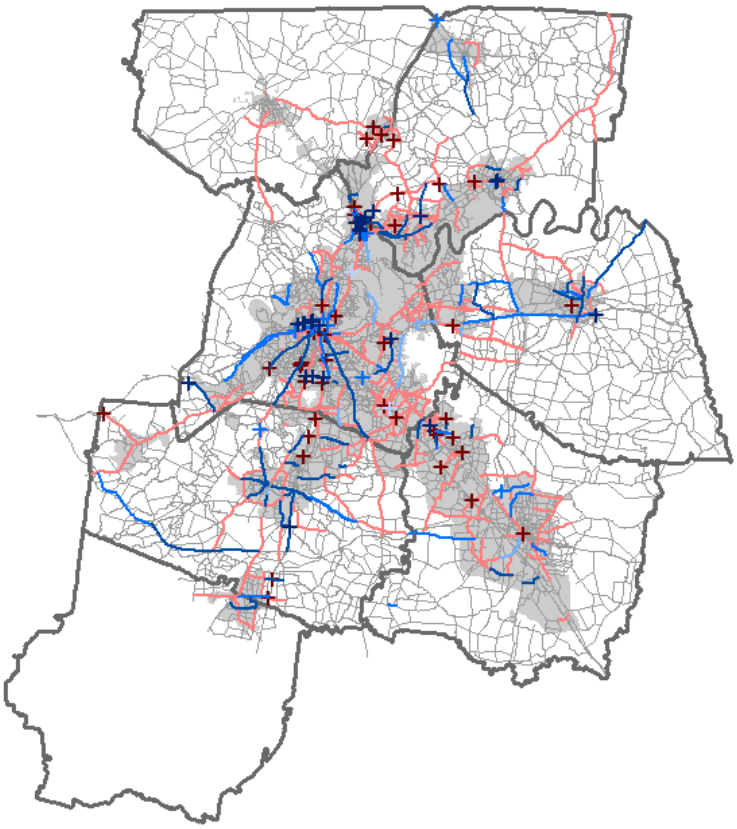


Figure 55. Unfunded/ Illustrative Roadway & Intersection Needs

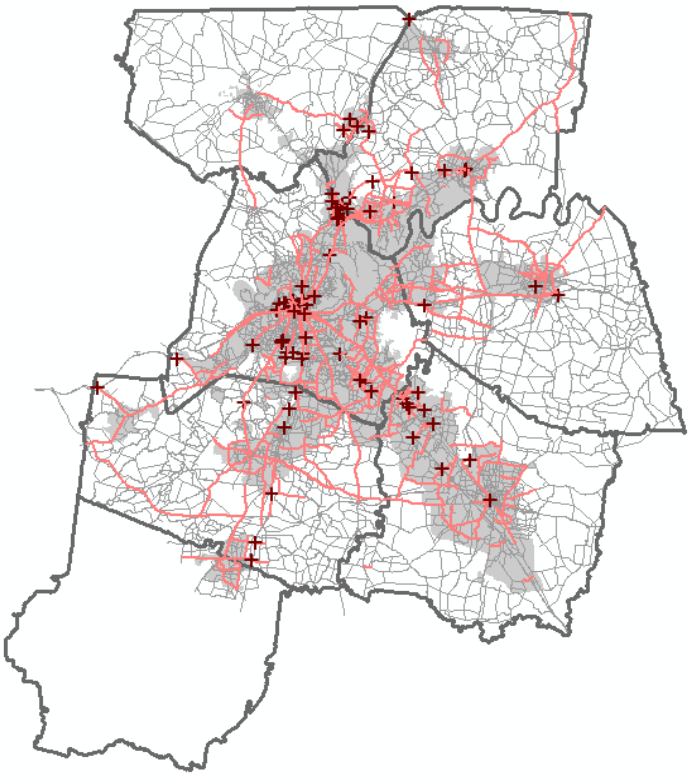


Table 36. Cost-Feasible Plan: Federal Revenues vs. Expenditures (2015 Horizon Year)

Grant Program	Short-Term: FYs 2011-2015		
	Revenues	Expenditures	Balance
TDOT-MANAGED	**$ 363,933,289**	**$ 363,933,289**	**$ -**
Bridge Repair & Replacement	$ 14,592,000	$ 14,592,000	$ -
National Highway System	$ 7,784,000	$ 7,784,000	$ -
Interstate Maintenance	$ 144,715,500	$ 144,715,500	$ -
High Priority Projects	$ 31,622,103	$ 31,622,103	$ -
CMAQ	$ 20,388,168	$ 20,388,168	$ -
STP TDOT	$ 37,809,270	$ 37,809,270	$ -
Other Federal Funding	$ 34,235,590	$ 34,235,590	$ -
State Matching Funds	$ 72,786,658	$ 72,786,658	$ -
MPO-MANAGED	**$ 330,509,520**	**$ 325,059,868**	**$ 5,449,653**
STP MPO	$ 171,762,280	$ 167,402,558	$ 4,359,722
FTA 5307 Large Urban Area Transit	$ 87,823,493	$ 87,823,493	$ -
FTA 5309 Bus & Rail Facilities/ Earmarks	$ 69,413	$ 69,413	$ -
FTA 5316 Job Access Reverse Commute	$ 2,889,550	$ 2,889,550	$ -
FTA 5317 New Freedom	$ 1,862,880	$ 1,862,880	$ -
State Matching Funds	$ 11,580,667	$ 11,580,667	$ -
Local Matching Funds	$ 54,521,237.00	$ 53,431,306.50	$ 1,089,931
TOTAL	**$ 694,442,809**	**$ 688,993,156**	**$ 5,449,653**

Table 37. Cost-Feasible Plan: Federal Revenues vs. Expenditures (2025 Horizon Year)

Grant Program	Mid-Term: FYs 2016-2025		
	Revenues	Expenditures	Balance
TDOT-MANAGED	**$ 2,507,438,319**	**$ 1,860,977,388**	**$ 646,460,932**
Bridge Repair & Replacement	$ 70,267,493	$ 70,267,493	$ -
National Highway System	$ 629,268,752	$ 629,268,752	$ -
Interstate Maintenance	$ 412,625,779	$ 412,625,779	$ -
High Priority Projects	$ 323,230,466	$ -	$ 323,230,466
CMAQ	$ 53,403,294	$ -	$ 53,403,294
STP TDOT	$ 376,619,886	$ 376,619,886	$ -
Other Federal Funding	$ 140,534,985	$ -	$ 140,534,985
State Matching Funds	$ 501,487,664	$ 372,195,478	$ 129,292,186
MPO-MANAGED	**$ 829,239,190**	**$ 829,211,979**	**$ 27,211**
STP MPO	$ 304,790,646	$ 304,768,877	$ 21,769
FTA 5307 Large Urban Area Transit	$ 254,132,213	$ 254,132,213	$ -
FTA 5309 Bus & Rail Facilities/ Earmarks	$ 94,279,707	$ 94,279,707	$ -
FTA 5316 Job Access Reverse Commute	$ 6,324,074	$ 6,324,074	$ -
FTA 5317 New Freedom	$ 3,864,712	$ 3,864,712	$ -
State Matching Funds	$ 44,825,088	$ 44,825,088	$ -
Local Matching Funds	$ 121,022,750	$ 121,017,308	$ 5,442
TOTAL	**$ 3,336,677,509**	**$ 2,690,189,366**	**$ 646,488,142**

Table 38. Cost-Feasible Plan: Federal Revenues vs. Expenditures (2035 Horizon Year)

Grant Program	Long-Term: FYs 2026-2035		
	Revenues	Expenditures	Balance
TDOT-MANAGED	**$ 2,959,171,394**	**$ 1,746,609,245**	**$ 1,212,562,149**
Bridge Repair & Replacement	$ 104,013,054	$ 104,013,054	$ -
National Highway System	$ 520,065,271	$ 375,457,514	$ 144,607,757
Interstate Maintenance	$ 416,052,217	$ 369,401,958	$ 46,650,259
High Priority Projects	$ 478,460,050	$ -	$ 478,460,050
CMAQ	$ 79,049,921		$ 79,049,921
STP TDOT	$ 561,670,493	$ 548,414,869	$ 13,255,624
Other Federal Funding	$ 208,026,109		$ 208,026,109
State Matching Funds	$ 591,834,279	$ 349,321,849	$ 242,512,430
MPO-MANAGED	**$ 1,227,476,571**	**$ 1,227,423,881**	**$ 52,690**
STP MPO	$ 451,164,611	$ 451,122,459	$ 42,152
FTA 5307 Large Urban Area Transit	$ 376,177,756	$ 376,177,756	$ -
FTA 5309 Bus & Rail Facilities/ Earmarks	$ 139,556,997	$ 139,556,997	$ -
FTA 5316 Job Access Reverse Commute	$ 9,361,175	$ 9,361,175	$ -
FTA 5317 New Freedom	$ 5,720,718	$ 5,720,718	$ -
State Matching Funds	$ 66,352,081	$ 66,352,081	$ -
Local Matching Funds	$ 179,143,233	$ 179,132,695	$ 10,538
TOTAL	**$ 4,186,647,965**	**$ 2,974,033,126**	**$ 1,212,614,839**

Table 39. Cost-Feasible Plan: Federal Revenues vs. Expenditures, 2011-2035

Grant Program	25-Year Plan - FYs 2011-2035		
	Revenues	Expenditures	Balance
TDOT-MANAGED	**$ 5,830,543,002**	**$ 3,971,519,921**	**$ 1,859,023,081**
Bridge Repair & Replacement	$ 188,872,547	$ 188,872,547	$ -
National Highway System	$ 1,157,118,023	$ 1,012,510,266	$ 144,607,757
Interstate Maintenance	$ 973,393,496	$ 926,743,237	$ 46,650,259
High Priority Projects	$ 833,312,619	$ 31,622,103	$ 801,690,516
CMAQ	$ 152,841,384	$ 20,388,168	$ 132,453,216
STP TDOT	$ 976,099,649	$ 962,844,025	$ 13,255,624
Other Federal Funding	$ 382,796,684	$ 34,235,590	$ 348,561,094
State Matching Funds	$ 1,166,108,600	$ 794,303,984	$ 371,804,616
MPO-MANAGED	**$ 2,387,225,281**	**$ 2,381,695,728**	**$ 5,529,553**
STP MPO	$ 927,717,537	$ 923,293,894	$ 4,423,643
FTA 5307 Large Urban Area Transit	$ 718,133,462	$ 718,133,462	$ -
FTA 5309 Bus & Rail Facilities/ Earmarks	$ 233,906,117	$ 233,906,117	$ -
FTA 5316 Job Access Reverse Commute	$ 18,574,799	$ 18,574,799	$ -
FTA 5317 New Freedom	$ 11,448,310	$ 11,448,310	$ -
State Matching Funds	$ 122,757,836	$ 122,757,836	$ -
Local Matching Funds	$ 354,687,220	$ 353,581,310	$ 1,105,911
TOTAL	**$ 8,217,768,283**	**$ 6,353,215,649**	**$ 1,864,552,634**

Ongoing Maintenance & Operations Costs

In addition to the growth and improvements of the transportation network, the MPO and its members must also ensure the maintenance and efficient operation of the existing roadway and public transit infrastructure. Maintenance activities are those that occur primarily in reaction to situations that have an immediate or imminent adverse impact on the safety or availability of transportation facilities such as pavement resurfacing and markings, bridge repair, guardrail and sign replacement and traffic signal maintenance. Operations may include more routine items such as painting and right of way maintenance.

The varied and complex systems used to maintain the regional transportation network are difficult to quantify and present. Each jurisdiction and agency has unique methods of accounting for these activities. They may also have varying goals and priorities they are seeking to achieve. In order to provide a clearer picture of the efforts undertaken, the MPO will act as a reporting agency for these activities through the region's long range plan and transportation improvement program. The following table presents the estimated costs incurred by each MPO jurisdictions involved in the operations and maintenance of transportation infrastructure over the life of the plan.

Table 40. Maintenance and Operations Funding by Horizon Year

Jurisdiction/ Agency	Annual Costs Basis*	2011 to 2015	2016 to 2025	2025 to 2035
ROADWAY EXPENSES	$ 96,677,001	$ 513,173,216	$ 1,192,139,983	$ 1,453,211,987
Anticipated Revenues	$ 96,677,001	$ 513,173,216	$ 1,192,139,983	$ 1,453,211,987
Nashville-Davidson County	$ 48,344,375			
Rutherford County	$ 9,788,880			
LaVergne	$ 892,588			
Smyrna	$ 1,137,412			
Murfreesboro	$ 4,115,018			
Sumner County	$ 3,203,956			
Hendersonville	$ 790,578			
Gallatin	$ 610,020			
Goodlettsville	$ 553,914			
Millersville	$ 294,809			
White House	$ 982,356			
Williamson County	$ 10,868,720			
Brentwood	$ 1,780,993			
Fairview	$ 277,365			
Franklin	$ 1,493,936			
Wilson County	$ 6,601,735			
Mt. Juliet	$ 387,638			
Lebanon	$ 1,198,618			
Springfield	$ 2,056,522			
Spring Hill	$ 249,925			
Portland	$ 1,047,643			
TRANSIT EXPENSES	$ 49,916,553	$ 264,963,101	$ 615,529,216	$ 750,326,680
Anticipated Revenues	$ 49,916,553	$ 264,963,101	$ 615,529,216	$ 750,326,680
Regional Transportation Authority	$ 7,000,946			
Nashville MTA	$ 40,804,000			
Franklin Transit Authority	$ 1,106,809			
Murfreesboro Rover	$ 1,004,799			

**Estimates based on recent local annual budgets.*

9.0 Monitoring Performance and Impacts

9.1 Title VI, Environmental Justice, & Social Equity

Title VI of the Civil Rights Act of 1964 and the 1994 President's Executive Order on Environmental Justice (#12898) state that no person or group shall be excluded from participation in, or denied the benefits of, any program or activity utilizing federal funds. Each federal agency is required to identify any disproportionately high and adverse health or environmental effects of its programs on minority and low-income populations. In turn, Metropolitan Planning Organizations (MPOs), are charged with evaluating their plans and programs for environmental justice (EJ) sensitivity, including expanding their outreach efforts to low-income, minority, and other disadvantaged populations, as part of the United States Department of Transportation's certification requirements.

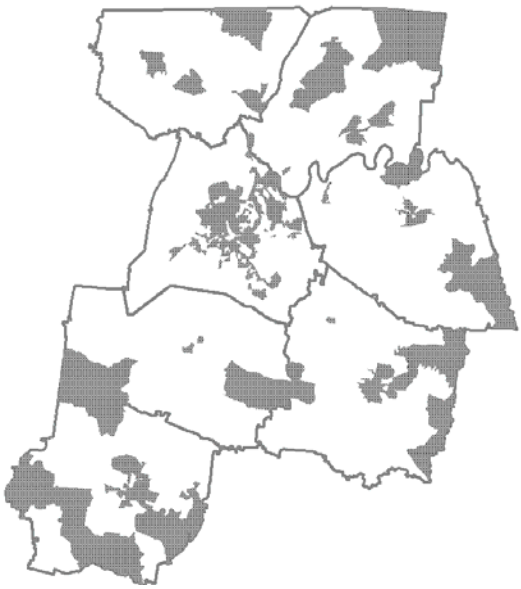
Identifying Disadvantaged Populations

This section summarizes the technical method that the MPO has developed to analyze the cost-feasible projects contained in the 2035 Regional Transportation Plan. EJ analysis is concerned with the impacts of disparate funding and disparate services on defined minority and low-income groups. The MPO currently assesses the following population groups: non-Hispanic minorities, carless households, households in poverty, persons with physical disabilities, female head of household with child, elderly, Hispanic persons, and limited English proficiency. Each population group has specific planning-related challenges. Using U.S. Census data for the year 2000, these groups are identified and located at the census tract level.

Data is gathered at the regional level, combining populations from each of the seven counties that overlap with the MPO planning area, for either individuals or households, depending on the indicator. From there, the total number of persons in each demographic group is divided by the appropriate universe (either population or households) for the seven county region, providing a regional average for that population group. Any census tract that meets or exceeds the regional average level, or threshold, is considered an EJ-sensitive tract for that group.

The following series of maps depict Census tracts with a higher rate of occurrence for each of the EJ factors.

Figure 56. Environmental Justice: Areas of Concern

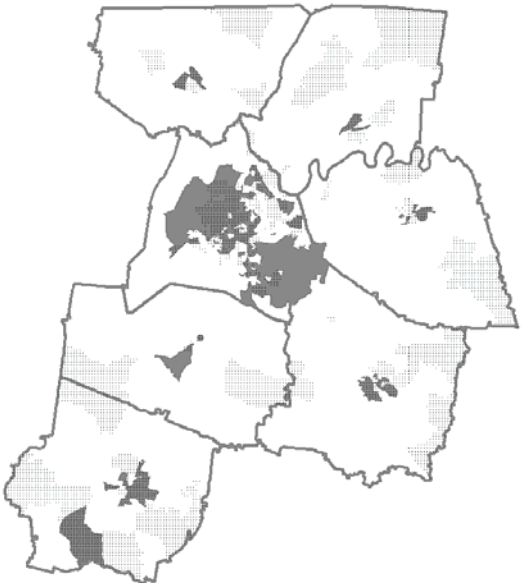


Households in Poverty

Regional Total: 48,492 Households | Regional Threshold: 10.2 percent

Poverty, or low income, is defined as personal or household income at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines, established as a relationship between income and the size of the family unit. These poverty guidelines are updated annually and are used as eligibility criteria for federal programs, such as Community Service Block Grants.

Areas with a higher than average rate of poverty are shown in the map to the left in dark gray, and then again in each of the following maps as Light gray dotted pattern.



Non-Hispanic Minority Population

Regional Total: 238,525 People | Regional Threshold: 19.5 percent

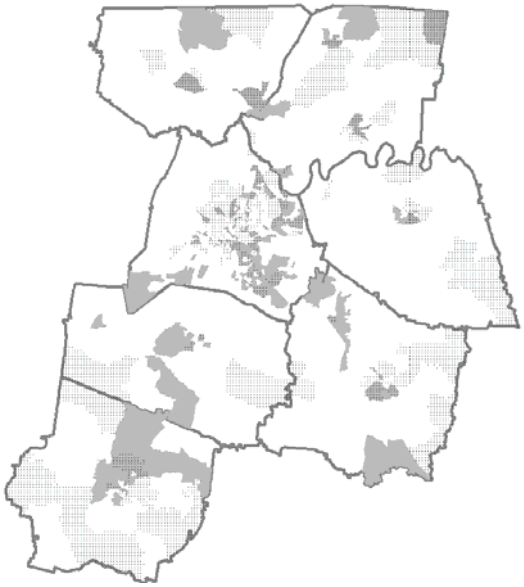
The U.S. Department of Transportation (DOT) Order (5610.2) on EJ defines "Minority" as:

- Black: a person having origins in any of the black racial groups of Africa
- Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands
- American Indian and Alaskan Native: a person having origins in any of the original people of North America who maintain cultural identification through tribal affiliation or community recognition

In addition to the groups mentioned above, the U.S. Census also recognizes two more racial categories: Some Other Race Alone and Two or More Races. All five racial categories have been included in this analysis. The U.S. Census also recognizes a difference between race and ethnicity, creating separate minority categories for Hispanic or Latino and race. The population group recognized in this category is non-Hispanic minorities. Hispanic ethnicity, regardless of race, is recognized as a separate category.

The 2000 U.S. Census question on race differed from the 1990 U.S. Census question by offering respondents the option of selecting

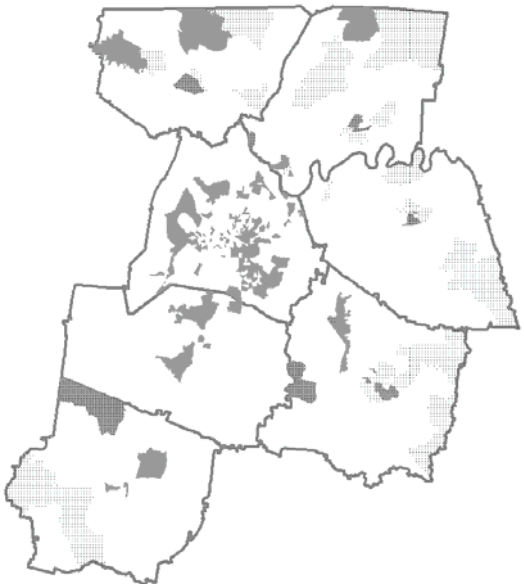
one or more racial categories. There are now 57 possible racial categories. Because of this change, 2000 Census data on race is not directly comparable with data from the 1990 Census. Thus, caution should be used in interpreting changes in racial composition over time. However, the overwhelming majority, 98 percent of the U.S. population, reported only one race.



Hispanic Population

Regional Total: 40,585 people | Regional Threshold: 3.3 percent

Though often included in many minority definitions, Hispanic or Latino is an ethnicity, not a racial category. Hispanics are defined by the U.S. Census as "persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race." Persons in the 2000 U.S. Census were asked, "Is this person Spanish, Hispanic, Latino?" Thus, persons of Hispanic origin can be of any race. Hispanics should have indicated their origin in the Hispanic origin question, not in the race question, because in federal statistical systems ethnic origin is considered to be a separate concept from race. This interpretation is based on changes made by the Office of Management and Budget in October 1997, requiring all federal agencies that collect and report data on race and ethnicity to follow these new standards.



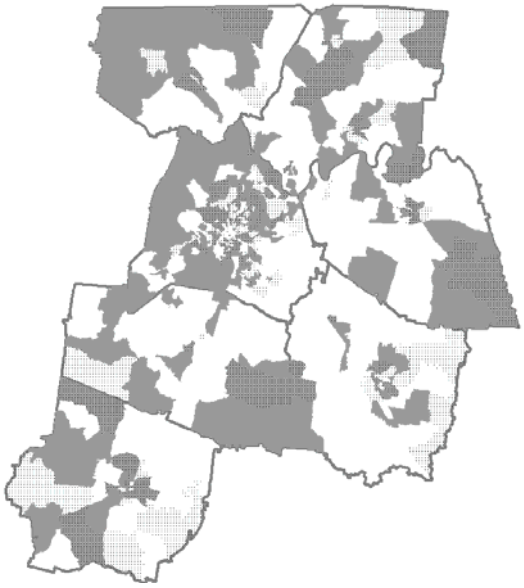
Limited English Language Proficiency Population

Regional Total: 20,858 people | Regional Threshold: 1.8 percent

Executive Order 13166 of 2000 on limited English proficiency (LEP) charges all federally funded agencies to make services more accessible to eligible persons who are not proficient in the English language. LEP is defined in the U.S. Census as "primary language spoken at home other than English and speak English not very well." This captures the populations with a primary language other than English spoken at home, including Spanish, Asian and Pacific Island languages, Indo-European languages, and other languages. The Census universe for this category includes only the population aged five years and older.

It is assumed that an inability to speak English well can be a barrier to accessing goods and services, including transportation. In addition, identifying these populations and their locations is important to MPO's outreach efforts, particularly in assessing the

need to make the agency's publications and written materials available in additional languages.

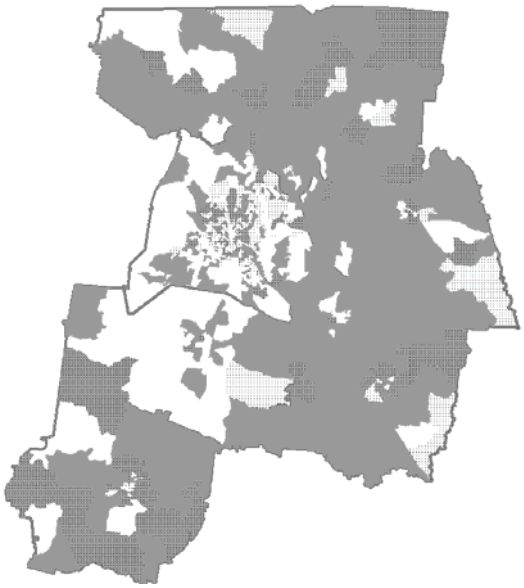


Senior Population

Regional Total: 123,749 People | Regional Threshold: 10.1 percent

Mobility barriers and age are linked together. Not every elderly individual has mobility challenges, but the likelihood of a challenge increases as an individual ages. Seniors aged 75 years qualify for most, if not all, mobility programs that have an age requirement.

In 1900, seniors aged 65 years and older accounted for less than five percent of the total population of the United States. Now numbering over 35 million, seniors currently account for over 12 percent of the nation's population. By 2030, the senior population will double to more than 70 million, or 20 percent of the U.S. population.

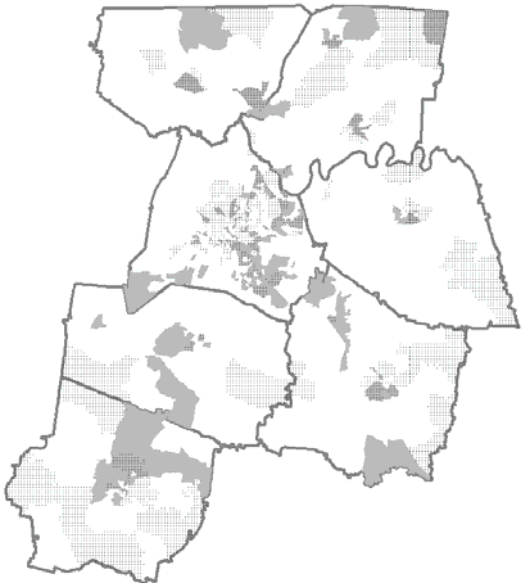


Physically Disabled Population

Regional Total: 91,802 People | Regional Threshold: 8.2 percent

Definitions for "people with disabilities" vary from agency to agency. The U.S. Census identifies six disability categories: sensory, physical, mental, going outside of the home, self-care, and employment. The Americans with Disabilities Act (ADA) provides comprehensive civil rights protection for "qualified individuals with disabilities." An individual with a disability, according to the ADA, is a person who has: (A) a physical or mental impairment that substantially limits one or more of the major life activities of such individual; (B) a record of such impairment; or (C) being regarded as having such impairment.

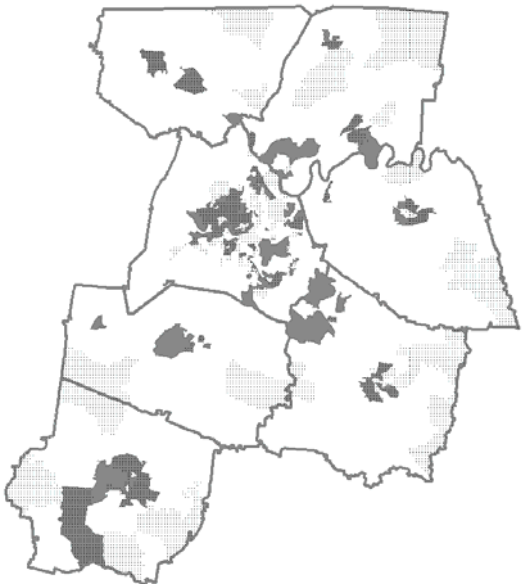
The MPO has decided to identify persons with a physical disability for the disability indicator, but recognizes that each disability type has specific challenges. This analysis of the distribution of persons with physical disabilities relies on data from the U.S. Census, which defines a physical disability as "a condition that substantially limits one or more basic physical activities, such as walking, climbing stairs, reaching, lifting, or carrying." The Census universe for this category includes only the population five years and older.



Carless Households

Regional Total: 31,341 Households | Regional Threshold: 6.6 percent

Carless households are defined in the U.S. Census as having zero vehicle availability. This population is often referred to as "transit dependent," i.e., those who must rely on public transit for their daily travel needs and who have limited mobility. It is recognized that not owning a personal automobile may be a lifestyle choice for some, but for others automobile ownership is unattainable due to various constraints, including income or disability. Additionally, many carless individuals may take transit to one destination, and then continue their trip as a pedestrian.



Single Mother Households

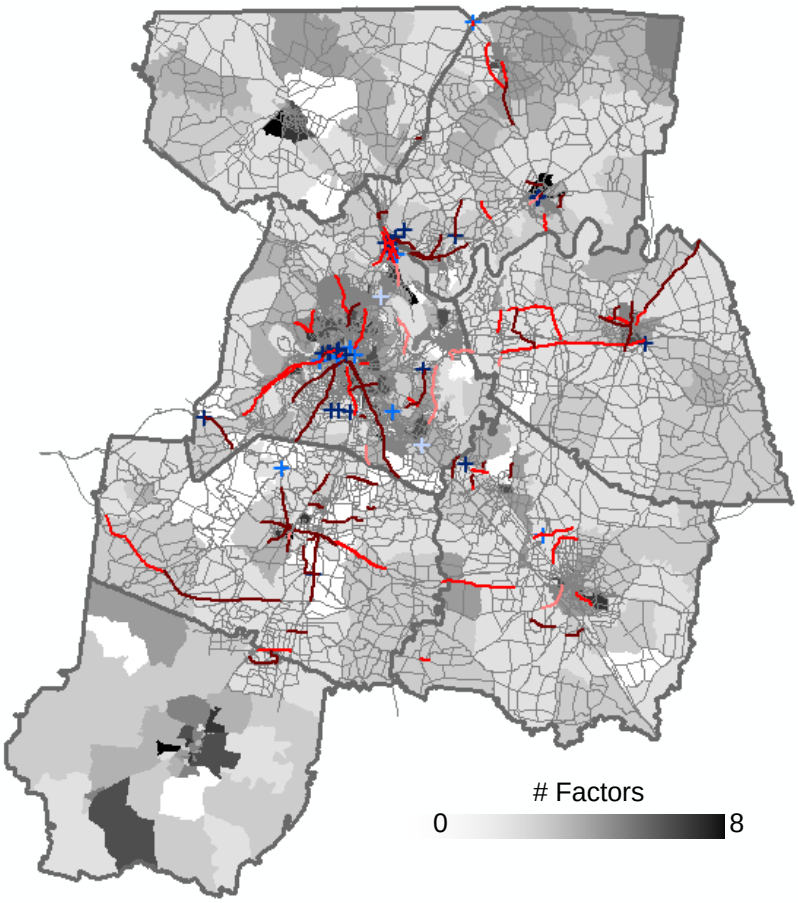
Regional Total: 35,175 Households | Regional Threshold: 7.4 percent

"Female head of household with child" is defined in the 2000 U.S. Census as a "female maintaining a household with no husband present, and with at least one child under 18 years old who is a son or daughter by birth, marriage (a stepchild), or adoption, residing in the home." This factor was chosen to add gender and children into the analysis, as well as to acknowledge the strong correlation between female heads of household with child and poverty status. In addition, this group exhibits different travel patterns and needs.

Degrees of Disadvantaged

Each census tract can contain a concentration greater than the regional average for each individual population group previously discussed, and any census tract can contain zero to eight categories that have been recognized as regionally sensitive. The number of sensitive groups in each census tract is referred to as its degree of disadvantage (DOD). The following map provides a comparison between the proposed roadway improvements contained in the MPO's 2035 Regional Transportation Plan and the DOD by census tracts. A list of projects that overlap with areas with at least three degrees of disadvantage is provided in Appendix D.

Figure 57. Planned Projects in Title VI/ EJ Areas



9.2 Impacts on Environment & Health

Environmental Mitigation

The SAFETEA-LU legislation requires that the Nashville Area MPO consult with Federal, State, and Tribal land management, wildlife, and regulatory agencies to develop a general discussion on possible environmental mitigation activities that should be incorporated into transportation projects identified in this plan.

As part of this requirement, TDOT established a consultation process with state and federal agencies responsible for environmental protection, land use management and natural resource and historic preservation. Through this process, the MPO was able to seek comment and compare available plans and maps with planned transportation improvements.

Since the transportation planning activities of the MPO are regional in scope, this environmental mitigation discussion does not focus on each individual project within the Regional Transportation Plan but rather offers a summary of the environmentally sensitive areas to be aware of regionwide, the projects that most likely will have an impact on these environmentally sensitive areas, and mitigation strategies that should be considered to reduce the impact of projects.

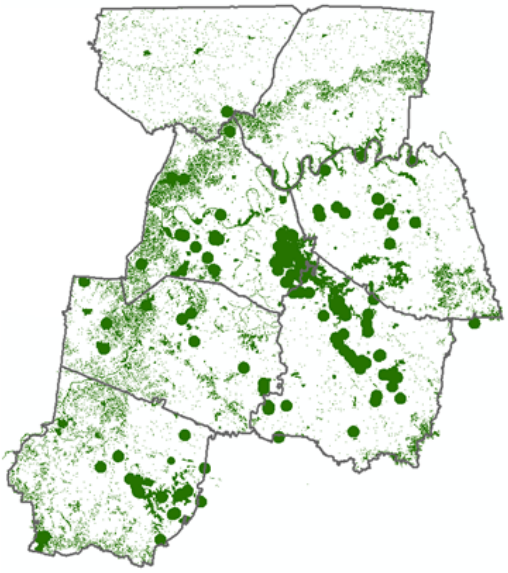
This environmental mitigation discussion was developed through a three step process. First, the MPO developed a list of environmentally sensitive areas that should be identified. Geographic Information Systems (GIS) was then used to map these areas. Second, the highway projects from the regional plan were overlaid. A query was performed to determine which projects would have an impact on an environmentally sensitive area. Finally, a discussion of general mitigation efforts that should be utilized is included to minimize the potential impacts any project in this plan has on an environmentally sensitive area.

Defining Environmentally Sensitive Areas

There are numerous environmentally sensitive areas found throughout the Nashville area. Many areas are too small or too numerous to map at a regional level and can only be clearly identified through a project level analysis. Some areas are yet to be identified and will only become known once a project level analysis is completed, such as caves, sinkholes, and wetlands. When a project is ready to move from the regional plan into construction phases, a complete analysis should be completed to determine the type and location of environmentally sensitive areas within the project study area. Typically, such analysis is part of the federally-required NEPA process.

In defining environmentally sensitive areas for the regional plan, the MPO identified two types of areas throughout the region where proposed improvements would either 1) pose a potential threat to the environment (areas of environmental conflict) or 2) potentially cost more to implement as a result of environmental features (areas of environmental challenge). The following environmentally sensitive areas are included in that analysis.

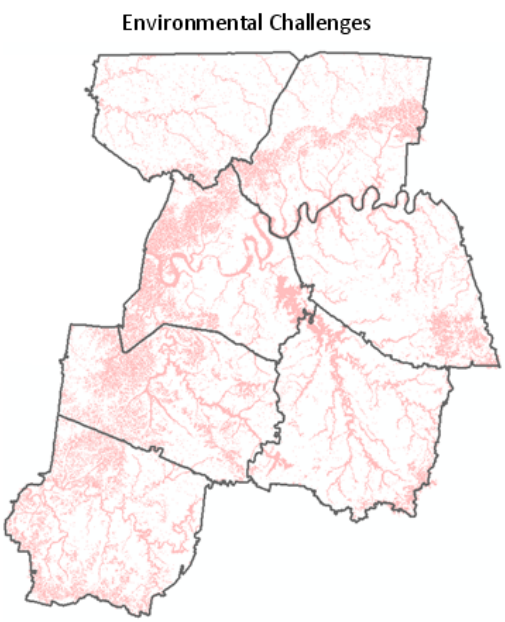
Environmental Conflicts



Areas of Environmental Conflict

Includes things that could be harmed or threatened by the proposed improvement including:

- Wetlands,
- Floodways,
- Hillsides with greater than a 25 percent slope,
- Water bodies,
- Protected lands, and
- Habitat of rare or endangered species.



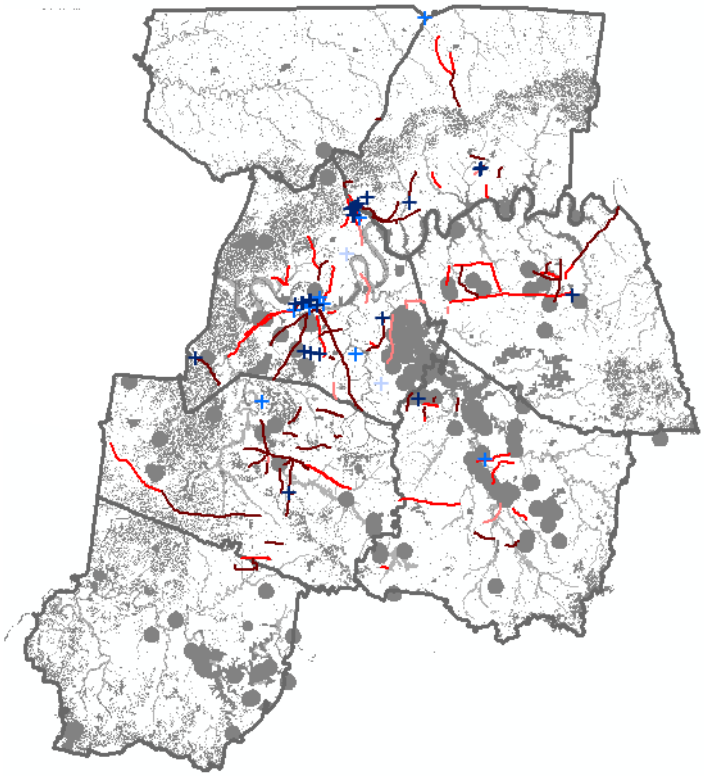
Areas of Environmental Challenge

Includes things that could be harmed or threatened by the proposed improvement including:

- Wetlands,
- Floodways,
- Hillsides with greater than a 15 percent slope,
- Water bodies,
- Floodplains, and
- Environmentally Sensitive Areas.

The following map provides a comparison between the proposed roadway improvements contained in the MPO's 2035 Regional Transportation Plan and the combined areas of the environmental conflicts and challenges. A list of projects that overlap with areas of environmental concern is provided in Appendix D.

Figure 58. Planned Projects in Areas of Environmental Concern



Environmental Mitigation Strategies

While some sort of mitigation effort should be included in every project that has an impact on an environmentally sensitive area, it is recognized that not every project will have the same level of impact and thus different levels and types of mitigation should be utilized. Some projects involve major construction with considerable earth disturbance, such as new roadways and roadway widening projects. Other projects involve minor construction and minimal, if any earth disturbance, such as traffic signal, street lighting, and resurfacing projects. The mitigation efforts used for a project should be dependent upon how severe the impact on environmentally sensitive areas is expected to be. In determining which mitigation strategies to utilize, each project identified as having an impact on an environmentally sensitive area should follow the three step mitigation planning process prior to construction:

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

All projects shall minimize off site disturbance in sensitive areas and develop strategies to preserve air and water quality, limit tree removal, minimize grading and other earth disturbance, provide erosion and sediment control, and limit noise and vibration. Where feasible, alternative designs or alignments should be developed that would lessen the project's impact on environmentally sensitive areas. The three step mitigation planning process should solicit public input and offer alternative designs or alignments and mitigation strategies for comment by the MPO and local government.

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

National Environmental Policy Act of 1969 (NEPA)

The National Environmental Policy Act of 1969 (NEPA) established a national policy to promote the protection of the environment in the actions and programs of federal agencies. The FHWA and FTA act as lead Federal agencies, and are responsible for implementing the NEPA process and working with state and local project sponsors during transportation project development. The FHWA and FTA NEPA process is designed to assist transportation officials in making project decisions that balance engineering and transportation needs with the consideration of social, economic and environmental factors. This process allows for involvement and input from the public, interest groups, resource agencies and local governments. The FHWA and FTA NEPA process is used as an "umbrella" for compliance with over 40 environmental laws, regulations, and executive orders and provides an integrated approach to addressing impacts to the human and natural environment from transportation projects.

NEPA Documentation

A good decision based on an understanding of environmental impacts is the objective of the NEPA process and a thorough analysis of these impacts as presented in the NEPA document is essential in meeting that objective. NEPA documentation serves several purposes: to disclose the analysis of benefits and impacts to the human and

natural environment; to get input from the public and other stakeholders on the proposed project and the environmental consequences; and to inform the final decision.

Different types of transportation projects will have varying degrees of complexity and potential to affect the environment. Under NEPA, the required environmental document depends on the degree of impact. FHWA and FTA, in coordination with the project sponsor, prepare one or more of the following documents for a proposed project:

- **Notice of Intent (NOI)** - a notice that an environmental impact statement (EIS) will be prepared and considered.
- **Categorical Exclusions (CE)** - apply to projects that do not have a significant impact on the human and natural environment.
- **Environmental Assessments (EA)** - prepared for projects where it is not clearly known if there will be significant environmental impacts. If the analysis in the EA indicates the proposed project will have significant environmental impacts, an EIS is prepared.
- **Finding of No Significant Impact (FONSI)** - If there is not a significant impact, this conclusion is documented in a separate decision document, the FONSI.
- **Environmental Impact Statements (EIS)** - prepared for projects that have a significant impact on the human and natural environment. Draft EIS (DEIS) and Final EIS (FEIS) documents, with input from the public, provide a full description of the proposed project, the existing environment, and the analysis of the beneficial and adverse impacts of all reasonable alternatives.
- **Record of Decision (ROD)** - presents the selected transportation decision analyzed in an EIS, the basis for that decision, and the environmental commitments, if any, to mitigate for project impacts to the human and natural environment.

Regardless of the type of NEPA document prepared, final selection or approval of a proposed project alternative by FHWA and FTA allows the project to be eligible for federal funding of subsequent project activities such as final design, right-of-way acquisition, and construction.

Vehicle Emissions & Air Quality

The Environmental Protection Agency (EPA) sets national standards for pollutants such as volatile organic compounds (VOCs) and nitrogen oxides (NOx), which are precursors of ozone formation. EPA designates areas that exceed the set pollutant levels as "non-attainment." In the Middle Tennessee region, a large portion of ozone causing pollutants comes from automobiles and trucks.

Transportation conformity is a mechanism to ensure that federal funding is given to transportation activities that are consistent with the air quality goals of the State Implementation Plans (SIP) for Tennessee. According to the Clean Air Act Amendments of 1977 and 1990, transportation plans and programs must be coordinated with, and conform to, local air quality budgets in the local SIP in geographic areas designated by the EPA as non-attainment or maintenance for any of the criteria pollutants.

The MPO counties of Davidson, Rutherford, Sumner, Williamson and Wilson were designated non-attainment in 1978 and declared maintenance areas in 1996 for the ozone precursor pollutants of NOx and VOC. In April, 2004, EPA developed new regulations for air quality conformity and established an 8-hour standard overwriting

the existing 1-hour standard in most areas including Nashville. This 8-hour standard established a longer period of sustained clean air than the previous standard.

On December 29, 2004, the region entered into an Early Action Compact (EAC) in order to defer a non-attainment designation for the 8-hour ozone standard long enough to "fast-track" towards air quality attainment. As of April 15, 2009, the counties of the Nashville Area MPO are considered by the EPA to be in compliance with National Ambient Air Quality Standards and, as such, the MPO is no longer required to demonstrate conformity with established motor vehicle emissions budgets. The region does remain part of Tennessee's State Implementation Plan, and as such, continues to be eligible to receive Congestion Mitigation Air Quality funding from the Federal Highway Administration, at the discretion of the Tennessee Department of Transportation.

Transportation's Impact on Health

The United States is experiencing an epidemic health crisis of diseases related to obesity. The increasing rates of people, both children and adults, who are either overweight or obese is increasing rapidly. According to the Centers for Disease Control, in 2008 33 percent of American children and 67 percent of adults were overweight or obese (2008 National Health and Nutrition Examination Survey, NCHS). As of summer 2010, of all 50 states Tennessee ranked 1st in adult inactivity, 2nd in highest rate of overweight adults (over 68%), third highest for number of obese adults (over 30%), 4th highest in extreme obesity and 5th highest for percentage of children ages 10 to 17 who are overweight or obese at 37 percent, with 17 percent obese.

Research demonstrates that the rise in obesity is related to food intake and physical inactivity. Food consumption may be influenced by food availability, especially in 'food deserts'. Food deserts are areas in which the population is typically low income, the rate of personal vehicle ownership is low, there is a lack of a full-service grocery store that offers fresh fruits and vegetables, and there is no direct transit route to access the closest full-service store. Many factors influence the presence of a full-service grocery store including zoning and parking requirements, economic conditions and crime. A recent Canadian study show that when a full-service grocery store is located within a neighborhood, there is a 50 percent increase in consumption of fresh fruits and vegetables and customers arrive on foot or bicycle up to 50 percent of the time.

In addition to consumption of food, physical activity plays a major role in overall health. The Surgeon General and American Heart Association recommend that children get 60 minutes of moderate to vigorous physical activity every day, but in Tennessee elementary school students receive only 90 minutes per week of physical education time. Health professionals recommend that adults get at least 30 minutes of exercise a day. Some people get physical activity by visiting a gym or a community center. Not everyone has access to these facilities, and using them creates an extra trip or outing.

Built Environment and Health

The opportunity to get physical activity as part of travel is available through facilities such as sidewalks, bike lanes, greenways and transit. These facilities have no membership fees or hours of operation, and combine the purposes of traveling and getting physical activity.

With the rise of the automobile and the construction of the Interstate system in the 1950's, Americans have increasingly relied on the car. Interestingly, the increase in obesity follows a similar trend line to the increase in personal vehicle miles. The more roadways that were constructed without accommodations for bicycles or

pedestrians, the more car trips were made, and obesity rates rose accordingly. Several studies have also shown that areas with more suburban land uses patterns (residential separated from commercial, for example) also have higher rates of obesity than more traditionally urban areas with mixtures of land uses. In fact, one study shows that compact development will reduce the need to drive between 20 and 40 percent, resulting in a reduction in Vehicle Miles Traveled (VMT) by 30 percent.

Health Care Costs

According to an article in the October 14, 2009 American Bicyclist Update, the U.S. government spends approximately $60 billion per year on transportation infrastructure. This outlay is dwarfed by the costs to our country resulting from the negative health impacts of transportation. Americans spend $168 billion a year on obesity, $76 billion a year on health care costs related to physical inactivity, partly because many individuals cannot safely walk, bicycle, or access public transit; $164 billion a year on health care costs associated with traffic injuries and deaths; and between $40 and $64 billion a year on health care costs associated with asthma and other health conditions related to high rates of air pollution.

The cost of obesity in 2008 in Tennessee was $1.84 billion and 50 percent was covered by tax payers ($433 million by Medicare, and $488 by Medicaid). According to America's Health Rankings, produced by Emory University, the 2008 financial burden of obesity on Tennessee for Medicare and TennCare was $1.57 billion is predicted to increase to $2.81 billion in 2013 and $7.08 billion by 2018. According to America's Health Rankings from the United Health Foundation, if the rates of obesity in Tennessee could be leveled out by the year 2013, health care expenditures could be reduced by $719 million a year (almost half of what the state spends on treating obesity).

The problem is not unique to Tennessee. According to an article in USA Today, "if Americans continue to pack on pounds, obesity will cost the USA about $344 billion in medical-related expenses by 2018, eating up about 21 percent of health-care spending. These calculations are based on the projection that in 10 years 43 percent of Americans adults may be obese, which is roughly 30 or more pounds over a healthy weight, if obesity continues to rise at the current rate. Extra weight increases the risk of diabetes, heart disease and many types of cancer." "Obesity is going to be a leading driver in rising health-care costs," says Kenneth Thorpe, chairman of the department of health policy and management at Emory University in Atlanta. Thorpe did this special analysis on obesity for America's Health Rankings, the 20th annual assessment of the nation's health on a state-by-state basis.

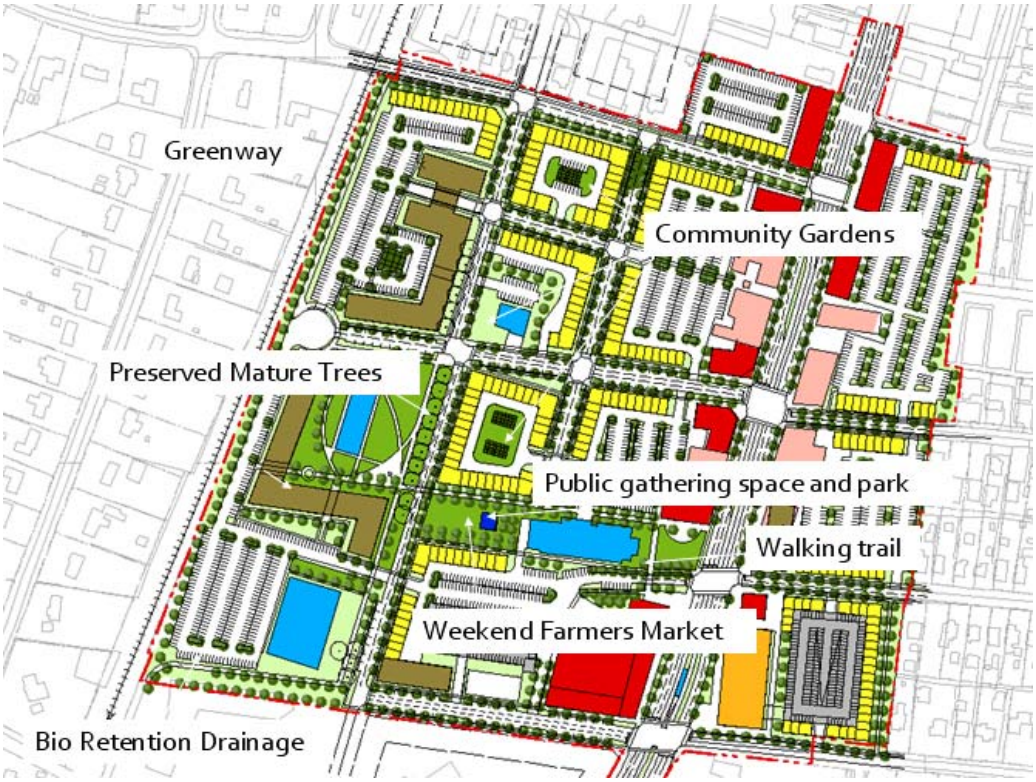
Looking at the numbers, for every $1 the United States spends on transportation infrastructure, we spend $5 treating diseases like obesity related to physical inactivity. Perhaps our goal should be to reverse those numbers and create more walkable, bikeable and transit-oriented communities so that for every $5 spent on transportation infrastructure, only $1 was needed to treated diseases related to physical inactivity. According to many studies, 'prescriptions' for physical activity yield better results in overweight study participants than diet medications or weight-loss programs. The benefit of the built environment for weight loss is that it is free to the participant, will be around for a long time, and can be used by the whole family and community.

Diseases such as asthma and heart disease, often related to obesity are also exacerbated by worsening air quality, yet another product of many cars on the roadway. There are an estimated 20,000-50,000 deaths per year due to air quality in the U.S. New studies also show that some pollutants not only cause respiratory

illnesses such as asthma in children and adults, but pollutants also increase deterioration of the heart muscle in heart-related diseases.

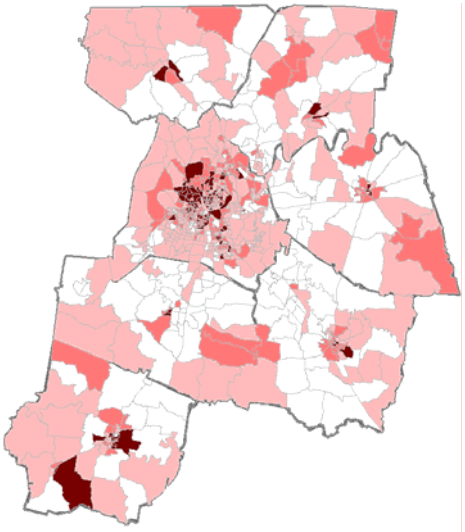
In response to the need to integrate considerations of health into transportation planning and other projects of the built environment, Health Impact Assessments (HIAs) were created about a decade ago and until recently, were used primarily in European countries. An HIA is "a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population" (1999 Gothenburg consensus statement). As of 2009, approximately 60 HIAs had been conducted in the United States, with approximately 4 involving a major transportation component such as a transit center. A Health Impact Assessment (HIA) pilot project was conducted in coordination with the Nashville area MPO to intercept and alter health outcomes such as obesity, physical inactivity, asthma, injuries, and social equity in conjunction with the Northeast Corridor Study proposed Transit Oriented Development (TOD) sites. The Centers for Disease Control has formalized six "steps" to conduct a Health Impact Assessment. These six steps are categorized in the following way: screening, scoping, assessing risks and benefits, developing recommendations, reporting, and evaluating. The first phase of the HIA was completed in the Spring of 2010 and resulted in design considerations that were included in the landscape and architectural renderings for one TOT site and included elements such as senior housing, community gardens, walking paths, a community gathering space and public art. The second phase of the HIA is currently being conducted, and involves focus groups and surveys centered around the public's perception of the relationship between the built environment and health. For more information about the MPO Health Impact Assessment, please contact MPO staff.

Figure 59. Example of Health Impact Assessment on Potential TOD



Recommendations from the Madison Transit Oriented Development (TOD) Health Impact Assessment, Phase 1

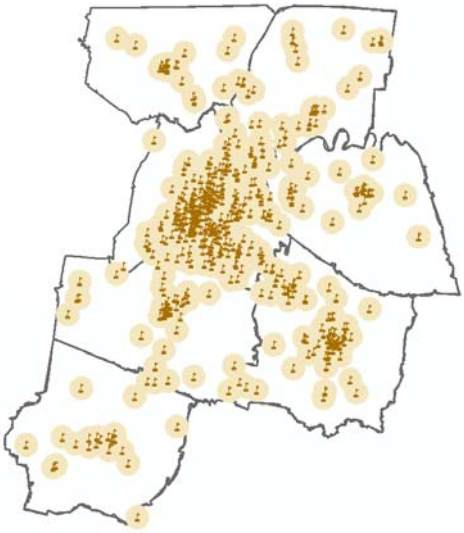
In addition to conducting a Health Impact Assessment, the MPO conducted other data analysis to consider the incorporation of health outcomes into transportation planning. A few examples include the High Health Impact Areas from the Regional Bicycle and Pedestrian Study which looked at areas with higher rates of impoverished, elderly and minority populations; analyzing projects in relationship to proximity to schools; as well as analyzing projects in relationship to grocery stores, farmers markets and emergency food sources. By considering transportation corridors as links to community amenities such as schools, food, religious centers, parks and community centers, the MPO was able to highlight the importance of transportation corridors for the economic, personal and environmental health of the community, and went beyond looking at transportation corridors as opportunities to move motor vehicles as quickly as possible from Point A to Point B. Transportation corridors must serve a variety of users, modes and destinations efficiently and safety.



Health Impact Areas

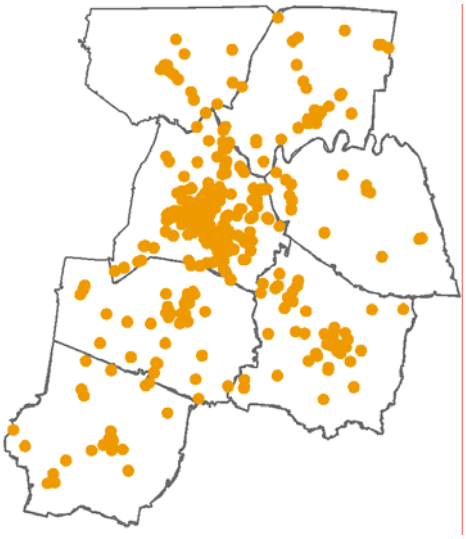
In evaluating projects, the MPO took into consideration the location of those projects in proximity to health impact areas (HIA). HIAs are defined by Census Tracts that have a higher than average rate of poverty, minority populations, and zero-car households.

Those areas of the map with the deepest reds include multiple HIA populations.



Areas within 2-Miles of Schools

The location of schools was an important consideration in the evaluation of projects – particularly in evaluating how well that project addressed connectivity between schools and adjacent residential areas. This type of analysis is particularly useful in prioritizing walking and bicycling projects, as well as in establishing priorities for specialized pots of funding such as Safe Routes to School program funds.

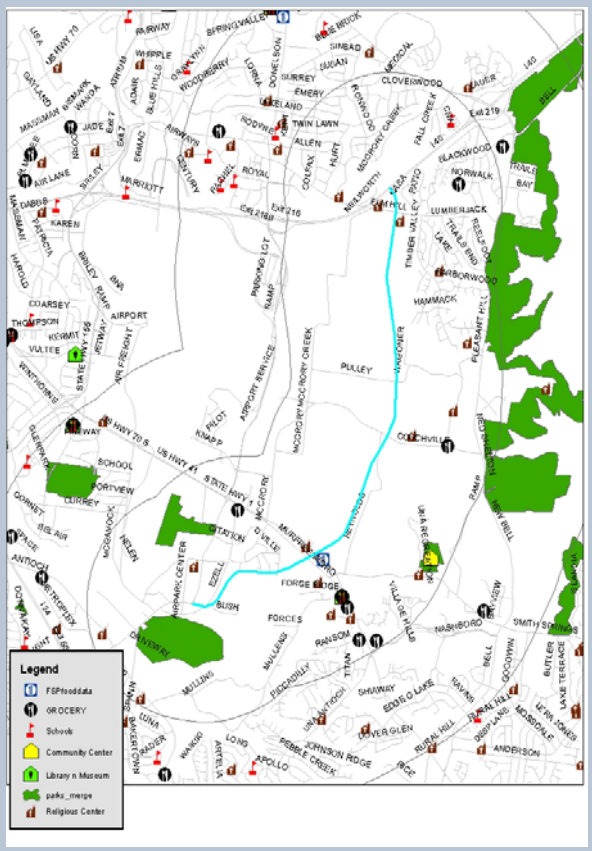


Areas within 1-Mile of Grocery Stores

Another important factor considered in project evaluation is the proximity of grocery stores to proposed roadway improvements. Similar to the goal of increasing multi-modal access to schools, the MPO is interested providing increased multi-modal access to fresh foods, particularly in areas of poverty.

Analytical Example: Access to Fresh Food

The MPO is able to use land-use data to look at how well a transportation corridor serves a community, not just how efficiently it moves traffic. The above map shows a potential transportation project that was submitted for the plan. Based on the community land data, there are ten grocery stores and one emergency food source located within one mile of the proposed project. In addition, there are twelve schools located within two miles of the project, as well as a community center and several religious centers. Looking at the surrounding uses in addition to the High Health Impact data provides information to help staff determine the potential and need for active transportation trips in this region to destinations like schools and grocery stores. Staff's recommendation is that this corridor provides transportation options such as transit, sidewalks and bike lanes so that users have choices in how they travel.



9.3 Ongoing Congestion Management

The ability to reach one's destination in the Nashville area in a timely manner, whether it is for work, shopping, school, social purposes or a delivery of goods, is a critical component in the quality of life for local residents and visitors. The problem of traffic congestion can threaten this aspect of quality of life, especially if it is not managed and is allowed to increase over time. The Nashville Regional Congestion Management System (CMS) plan adopted on in 1995, originally set in place a mechanism for identifying congestion in the MPO planning area, and for choosing appropriate solutions to deal with traffic congestion. MPO staff subsequently completed an update to the CMS plan in 2007, which is now known as a Congestion Management Process, or CMP, in order to comply with new requirements of SAFETEA-LU. Since then, the MPO has worked to fully integrate the CMP into the regional transportation planning process, including 2035 Regional Transportation Plan, so that a separate document is no longer needed to communicate the region's congestion management process. This section of the plan is intended to provide an overview of how the Congestion Management Process is conducted and implemented in the MPO planning area.

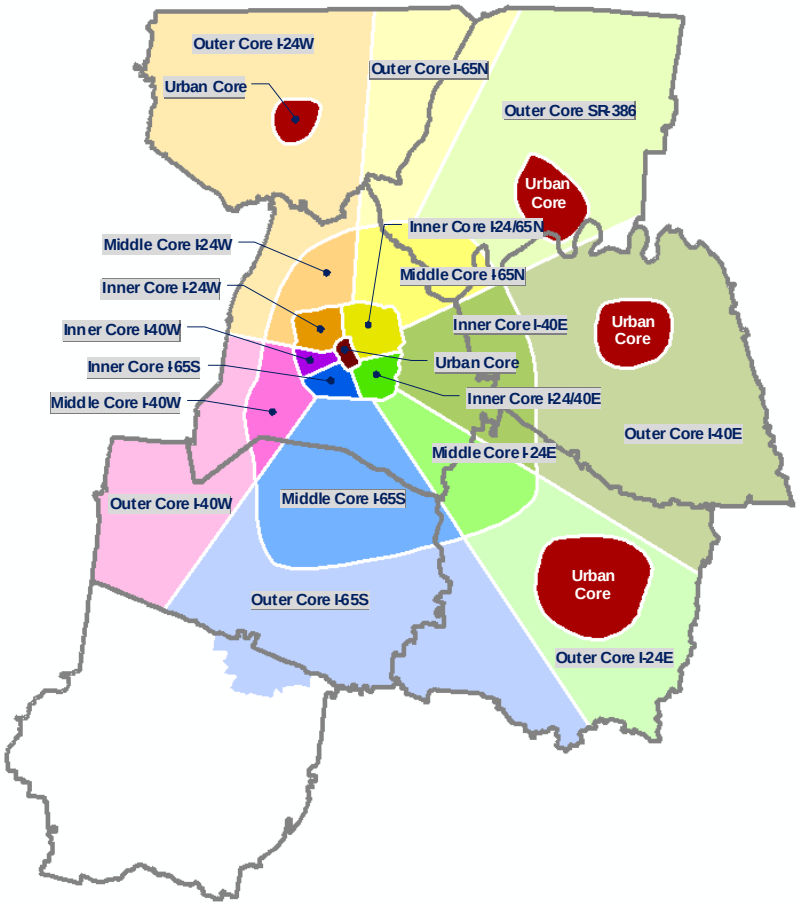
Required Elements of a CMP

The requirement for a CMP originated with the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) legislation in 1991, and was carried forward unchanged in its successor, the Transportation Equity Act for the 21st Century (TEA-21). With the passage of SAFETEA-LU in 2005, the Congestion Management System requirement was changed to a Congestion Management Process. Much of the language in the federal regulations remains the same between a CMS and a CMP, however, as the name suggests, there is more emphasis on making congestion management an ongoing process. The new regulations strengthen the tie between a CMP and the transportation plan, stating that the regulations reflect the goal that the CMP be an integral part of developing a long range transportation plan and TIP for MPOs. Furthermore, the CMP should not be developed as a stand-alone product of the planning process, but rather fully integrated into the operations, management and other planning processes of the metropolitan transportation system such that there are a common set of goals and objectives that provide a seamless selection process for projects to be included in the TIP. One of the key methods to insure the complete integration of the CMP with all other planning processes is to provide for stakeholder involvement with others in the Region including public transportation operators and State and local operations staff. The following paragraphs provide an overview of the individual elements of the required CMP.

Identify methods to monitor and evaluate the performance of the multimodal transportation system

The MPO has determined that the CMP should monitor, on some level, all facilities that are included in the MPO's travel demand forecasting model. While congestion is monitored on individual routes, analysis of congestion as it relates to regional mobility is typically performed at an aggregate level, looking at the system-level performance of parallel facilities within each of the major regional corridors. Each regional corridor is further divided into one of four distinct character areas (e.g., town center, urban, suburban, exurban/ rural) to allow for more appropriate definitions of congestion and to identify the most suitable solutions to manage that congestion. The following map depicts the areas of analysis used in the MPO's CMP.

Figure 60. Congestion Management Corridor Areas



Identify Mechanism for Selection of Appropriate Performance Measures.

This element involves the definition of parameters used to measure the extent of congestion based on locally determined thresholds for system performance. The primary performance measure for determining congestion in the Nashville region is the travel speed comparison between observed or modeled flows and the expected free flow, or ideal, speed for the facility. Free flow speed is based on the facility type and posted speed limit. Generally speaking, a roadway is considered congested if the observed or modeled travel speed is 70 percent or less of the expected free flow speed. In addition, third-party analysis provided by academia (e.g., Texas A &M's Texas Transportation Institute) and the private-sector (e.g., INRIX) are often monitored and cross-checked with local analysis. MPO forecasts for congestion are provided in section 4.3 of this plan.

Establishment of Program for Data Collection and System Monitoring

This component includes the development of a data collection program that provides for adequate system monitoring in order to identify the causes of congestion. The MPO periodically collects travel time data on the system's roadways and has found that vehicle-based GPS units provide the most efficient and accurate means of travel time data collection. Other transportation data such as hourly traffic volume counts feed into the CMP and are provided by various agencies in the area. Using the data that is collected and performing technical analyses based on the performance measures that were identified above, the roadway corridors and segments that qualify as being congested can be identified.

In addition to first-hand observation of traffic flows, the MPO also conducts periodic surveys of users (e.g., commuters, transit users, truck drivers, etc.) to measure vehicle occupancy levels, mode split, self-reported travel times and distances, and individual perceptions of levels of congestion.

Identification of Appropriate Congestion Mitigation Strategies

There are several strategies that are available in the transportation planner's "toolbox" that can be used to reduce congestion. This component of the CMP attempts to identify the most appropriate mitigation strategy on a case-by-case basis. The intent of the CMP regulations is to first investigate mitigation strategies that focus on improving transportation operations and managing the existing system more efficiently, as well as reducing travel demand as a means to reduce congestion before resorting to new roadway construction or widening projects that serve only single occupant vehicles (SOV). The Nashville CMP identifies a menu of congestion mitigation strategies (described in Section 7.3 of this plan) that provide for methods of dealing with congestion other than the construction of additional roadway lanes. In fact, the three major policy initiatives that have shaped the 2035 Regional Transportation Plan – a bold new vision for mass transit, support for active transportation and walkable communities, and preservation and enhancement of strategic roadway corridors – each place a strong emphasis on providing multi-modal options and the use of operations and management techniques to make our roadway system more efficient.

Identification of an Implementation Schedule

One mechanism for implementing the mitigation strategies that are identified by the CMP is through the project selection process of the MPO's Regional Transportation Plan and Transportation Improvement Program. Projects that are identified in the planning process are given points based on how well they address the goals and objectives of the region, of which congestion is a major factor. Coordination with operations and management partners throughout the region is another mechanism being pursued by the MPO in order to identify congestion issues and solutions that can be implemented more quickly than a major construction project. A description of the evaluation criteria used to identify projects for implementation is presented in Section 8.4 and Appendix B of the plan.

Implementation of a process for periodic assessment of the effectiveness of implemented strategies

A process for periodic assessment of the efficiency and effectiveness of implemented strategies is a key component of a fully operational CMP, although it can prove very challenging. Since certain congestion mitigation strategies take long periods of time to fully implement and others may be taking place simultaneously, it can be difficult to measure the effectiveness of the specific measure that was taken. An example of this may be where a major interstate widening is occurring during the same time that an ITS project is being implemented through the same corridor. The MPO plans to continually update the CMP through regular data collection that should provide information about the change in conditions over time and whether the mitigation strategies that are being employed are keeping pace with the congestion.

The MPO will publish an annual "regional indicators report" that provides the public and interested stakeholders with information about the state of congestion in the region, along with other key metrics related to regional growth and development trends.

CMP Interaction with the Overall Planning Process

The CMP is not intended to supersede the other elements of the transportation planning process, nor is it intended to prioritize all transportation projects. The primary purpose of the CMP is to provide for a more informed decision-making process that can be used to make the most effective use of limited resources to address congestion problems.

The project selection criteria for the Regional Transportation Plan and the Transportation Improvement Program have been modified to address results from the CMP. The scoring system used provides a direct mechanism for the CMP to be considered in the project selection process, which ultimately determines the projects that are to be implemented.

Appendix D of this document provides the list of projects that propose improvements to congested corridors.

Appendix A. 2035 RTP Project List

This appendix provides a list projects included in the fiscally constrained 2035 Regional Transportation Plan including:

- List of Committed Projects
- List of Cost-Feasible Projects (2011-2035)
- List of Transit Projects (also included in the Cost-Feasible Projects)

Committed Projects Underway from Previous Plan and Transportation Improvement Program

COUNTY	LEAD AGENCY	FY 08-11 TIP ID	TYPE OF WORK	PROJECT/ ROADWAY NAME	TERMINI/ INTERSECTING ROAD	DESCRIPTION
Davidson	TDOT	2003-004	Road Widening	I-40/I-24	Fesslers Lane to Green Street	Construct Auxiliary lane
Davidson	TDOT	2006-412	Interchange	I-40	Briley Parkway/Robertson Avenue (Phase 2 CNST)	Construct directional ramps from EB I-40 to NB Briley Pkwy and from SB Briley Pkwy to WB I-40 including noise walls & replace Robertson Ave. bridge over I-40
Sumner	TDOT	2002-018	Road Widening	SR-109	South of SR-76 to SR-52	Widen from 2-LN to 5LN
Sumner	TDOT	2009-52-010	Road Widening	SR-109	South of Hollis Chapel Road to South of SR-76	Widen SR-109 from 2 lanes to 4 lanes
Williamson	Brentwood	2004-058b	Road Widening	SR-253	Edmonson Pike to to Sunset Road	Widen from 2 lane to 3 lane on 5 lane Right-of-Way
Williamson	Franklin	2006-103	New Roadway	McEwen Drive	Cool Springs Boulevard easterly to Wilson Pike (SR-252)	Construct 4 lane divided median roadway.
Williamson	Franklin	2006-104	New Roadway	McEwen Drive Extension (Phase 1)	McEwen Drive from Cool Springs Blvd at the present locations of McEwen Dr easterly to Mallory Ln	Construct new roadway, including 5' bike lanes, sidewalks, and street lighting.
Williamson	Franklin	2006-111	New Roadway	Carothers Parkway Extension (Phase 1)	Existing Carothers Pkwy Terminus to existing McEwen Drive	Construct new 4 lane median divided roadway with bike lanes, curb and gutter, and sidewalks
Williamson	TDOT	407	New Roadway	SR-840 South	West of Bending Chestnut Road to east of Thompson Station Road	Stage Construction of new 4 lane roadway
Williamson	TDOT	407c	New Roadway	SR-840 South	East of Pinewood Road (SR-46) to west of Leipers Creek Road	Stage Construction of new 4 lane roadway
Williamson	TDOT	426	New Roadway	SR-840 South	Southeast of SR-100 to west of Bending Chestnut Rd	Stage Construction of new 4 lane roadway
Williamson	Franklin	2006-108 (06-08 TIP)	New Roadway	South Carothers Parkway Extension (Pha	Harpeth River to Long Lane	Construct New 4 Lane Roadway
Williamson	Franklin	2006-109 (06-08 TIP)	New Roadway	South Carothers Parkway Extension (Pha	Long Lane to Goose Creek Bypass Extension	Construct New 4 Lane Roadway
Williamson	Franklin	2006-111 (06-08 TIP)	New Roadway	Carothers Parkway Extension (Phase 1)	Existing Carothers Pkwy Terminus to existing McEwen Drive	Construct New 4 Lane Roadway
Wilson	TDOT	2002-023	Road Widening	SR-109	Division Street (north of I-40) to south of SR-24 (US-70)	Widen from 2 to 5 lanes
Wilson	TDOT	2004-068a	Road Widening	SR-171 / Mt. Juliet Road	Division Street to SR-24 (Lebanon Road)	Widen from 2/3 to 5 lanes; includes 2 travel lanes in each direction and a continuous center turn lane
Wilson	TDOT	2006-121	Road Widening	SR-141	0.2 miles south of Spring Creek to north of Lovers Lane	Widen from 2 to 5 lanes
Wilson	TDOT	2008-78-064	Bridge	Linwood Road (Route 1067)	I-40	Replace 2 LN bridge with 3 LN bridge

Nashville Area Metropolitan Planning Organization

2011-2035 Cost-Feasible Projects

Adopted December 15, 2010

2035ID	Old ID	FY 11-15 TIP ID	COUNTY	LEAD AGENCY	TYPE OF WORK	PROJECT/ ROADWAY NAME	FROM	TO	DESCRIPTION	TOTAL COST	FEDERAL	GRANT
FY 2011 to FY 2015 PROJECTS										**$ 1,466,576,333**	**$ 551,194,525**	
1011-182	1029	2006-124	Davidson	Metro Nashville	New Road	Gateway Blvd (Korean Veterans Blvd)	4th Ave South	8th Ave South/Lafayette St	Construct 6 lane urban boulevard	$ 39,757,725	$ 31,806,180	U-STP
1011-230	1085	2008-11-027	Davidson	Metro Nashville	New Road	Harding Place Extension	Ezell Pike	Couchville Pike	Construct new roadway as 4/6 lanes Location and ES, PE, ROW underway	$ 11,370,000	$ 9,096,000	U-STP
1012-108	8004	2008-14-083	Davidson	Goodlettsville	Road Widening	Rivergate Parkway	Moss Trail	Old Two Mile Pk	Improve access to and from Rivergate Pkwy Construct WB left turn lane at Moss Trail; install traffic signal at Old Two Mile Pike; median modification at Old Two Mile Pike and at Gate West/Two Mile Professional Plaza	$ 370,000	$ 266,400	STP-S
1012-157	1122	2008-12-095	Davidson	Metro Nashville	Road Widening	McCrory Lane	SR-100	I-40	Widen from 2 to 5 lanes	$ 3,000,000		Non-Federal
1012-229	1039	2004-066	Davidson	TDOT	Road Widening	I-65 N	Trinity Lane	Briley Parkway (SR-155)	Widen from 6 to 10 lanes with 2 being HOV Project in 3-year work program Design build turn in date 1/2/12 PE underway	$ 33,000,000	$ 29,700,000	IM
1012-239		2011-12-109	Davidson	TDOT	Road Widening	I-440 Eastbound Lane	I-65	I-24	Add eastbound lane only Development underway Survey and design almost complete Scheduled to let 12/10	$ 9,400,000	$ 8,460,000	IM
1014-238		2009-84-033	Davidson	TDOT	Interchange	I-40 @ I-440 Ramp Modification	I-440 South Ramp		Extend I-40 EB to I-440 system ramp decelaration lane 2100 feet Project in 3-year work program, PE scheduled for 2010	$ 1,228,603	$ 153,000	IM
1014-259	1030	2011-14-042	Davidson	Metro Nashville, Oak Hill	Intersection	Harding Place/Battery Lane	Franklin Pk, Lealand Ln, Granny White Pk		Turn lane construction at 3 intersections along Harding Place - Battery Lane: at Franklin Pike, Lealand Lane, and Granny White Pike	$ 1,810,000	$ 1,448,000	U-STP
1014-260	70	2004-005	Davidson	Metro Nashville	Intersection	Jefferson Street	Rosa L Parks Blvd, 10th Ave N, 12th Ave N, Dr D B Todd Jr Blvd, 21st Ave N, 28th Ave N/Ed Temple		Intersection improvements at 6 intersections along Jefferson Street: Rosa L Parks Blvd, 10th Ave N, 12th Ave N, Dr D B Todd Jr Blvd, 21st Ave N, and 28th/Ed Temple Project includes turn lanes, stamped crosswalks, signal upgrades, and streetscape impro	$ 1,401,010	$ 920,808	U-STP
1014-265	8006	2008-14-059	Davidson	Metro Nashville	Intersection	3rd Avenue	Union Street		Street improvements, streetscape features, signals and signage along 3rd Avenue and Union Street	$ 6,957,707	$ 5,566,166	HPP
1014-266	8004	2008-14-030	Davidson	Metro Nashville	Intersection	Various Intersections	Various		Safety and multi-modal improvements at high crash locations	$ 7,312,500	$ 5,850,000	U-STP
1015-306		2011-15-135	Davidson	MTA	Transit Capital	Farebox Purchase and Replacement	Davidson County		Onboard vehicle farebox purchase and replacement	$ 400,000	$ 320,000	5307
1015-307		2011-15-133	Davidson	MTA	Transit Capital	Bus Stop Improvements and Passenger Amenities	Davidson County		Various bus/transit stop improvements including fare vending machines, shelters, benches, signage, and other passenger amenities	$ 1,000,000	$ 800,000	5307
1015-308		2011-15-148	Davidson	MTA	Transit Capital	New Satellite Maintenance and Office Facility (Peterbilt)	Davidson County		Establish a new satellite maintenance and office facility within Davidson County	$ 1,250,000	$ 1,000,000	5307
1015-309		2011-15-137	Davidson	MTA	Transit Capital	Local Bus Service Preventative Mainatenance and Capitalization - MTA	Davidson County		Local Bus Service Preventative Mainatenance and Capitalization for the Nashville MTA service area	$ 30,343,750	$ 24,275,000	5307
1015-310		2008-15-046	Davidson	MTA	Transit	Project Administration for Grant Programs	130 Nestor Street - Administration Building		Cover costs associated with Project Administration such as administrative software and the cost for the management of grants and any grant-related project	$ 500,000	$ 400,000	5307
1015-311		2008-15-048	Davidson	MTA	Transit Capital	Service and Support Vehicles and Equipment	Davidson County		Purchase of service and support vehicles	$ 1,875,000	$ 1,500,000	5307
1015-312		2008-17-021	Davidson	MTA	Transit Capital	Computer Aided Dispatch (CAD), Automatic Vehicle Location (AVL) & Intelligent Transportation System (ITS)	Davidson County		Equipment will be installed at MTA HQ operations centers in downtown Nashville including Music City central as well as be installed on all of our buses which travel throughout Davidson County as well as into other counties through contracts with RTA	$ 2,400,000	$ 1,920,000	5307
1015-313		2008-15-049	Davidson	MTA	Transit Capital	MTA - Administration Building Rehabilitation (Nestor)			Rehab/renovate administration and maintenance facilities, replace roof, expand Customer Service, additional office space	$ 3,687,500	$ 1,750,000	5307
1015-314		2011-15-139	Davidson	MTA	Transit Capital	Transit Signal Prioritization	Several Corridors in Davidson County		Implementation of Signal Prioritization for transit vehicles along various corridors including Murfreesboro Pike and Nolensville Pike	$ 1,000,000	$ 800,000	CMAQ
1015-315		2011-15-117	Davidson	MTA	Transit Capital	Enhanced Transit Service along West End Corridor - Capital	Along West End Avenue and 21st Street		Introduce enhanced bus service on the West End Corridor to include frequent service, limited stops, BRT shelters and amenities, real-time bus arrival information and bike racks to build ridership in advance of upcoming Alternative Analysis study	$ 5,500,000	$ 4,400,000	CMAQ
1015-316		2008-15-052	Davidson	MTA	Transit Capital	ACCESSRIDE Buses	Davidson County		Replace and expand fleet for ACCESSRIDE paratransit buses	$ 6,800,000		Non-Federal
1015-317		2008-15-054	Davidson	MTA	Transit Capital	Bus Purchase and Replacement	Davidson County		Purchase transit buses	$ 43,200,000		Non-Federal
1015-318		2009-19-004	Davidson	TDOT	Bus Diesel Retrofit	Pilot School Bus Diesel Retrofit - Metro Nashville Public Schools	Countywide		Retrofit 19 MNPS buses with diesel particulate filters and crankcase filter systems to reduce mobile source diesel emissions	$ 250,000	$ 200,000	S-CMAQ
1016-187		2008-19-062	Davidson	Metro Nashville	Enhancements	21st Avenue Roadscaping in Hillsboro Village	Bernard Ave	Wedgewood/Blakemore Ave	Create an entry corridor along 21st Avenue South from Bernard Avenue to Blakemore/Wedgewood Avenue Improvements are focused on three main areas: St Bernard Park entrance, 21st/Fairfax/Magnolia intersection, and Hillsboro Village	$ 153,546	$ 122,837	ENH
1016-188	1002	2002-038	Davidson	Metro Nashville	Bike/Ped	21st Avenue Area Sidewalks	Wedgewood/Blakemore Ave	vicinity to the south	Construct sidewalks in the 21st Avenue area	$ 280,734	$ 208,734	ENH
1016-189		2011-16-104	Davidson	Metro Nashville	Enhancements	I-40 and Jefferson Street Transportation Enhancement	Jefferson St	28th Avenue North	Phase 1 of a plan to enhance the appearance of the "Gateway" into the Jefferson Street community from I-40 and 28th Avenue North Phase 1 consists of trees, plant beds, new seed and sod, an irrigation system, and gateway and directional signage	$ 792,000	$ 633,600	ENH
1016-190		2011-16-092	Davidson	Metro Nashville	Bike/Ped	Harding Place (SR-255)	Timberhill Dr.	Danby Dr	Sidewalk	$ 1,561,216	$ 880,449	ENH
1016-291		2009-16-029	Davidson	Metro Nashville	Bike/Ped	Cumberland River	Metro Center Levee at Clarksville Highway	Clifton Avenue	Pave trail extending 22-mile greenway system to connect to Tennessee State University and surrounding neighborhoods	$ 500,000	$ 400,000	U-STP
1016-349		2011-16-157	Davidson	City of Oak Hill	Bike/Ped	Oak Hill Greenway	Southern Davidson County	Southern Davidson County	Construct greenway in southern Davidson County	$ 291,044	$ 232,835	HPP
1017-191	1070	2011-17-064	Davidson	Metro Nashville	ITS	ATIS - Phase 1	Countywide	Countywide	Signalized Intersection Improvements	$ 1,640,000	$ 1,640,000	CMAQ
1017-192	8005	2004-001	Davidson	Metro Nashville	ITS	Arterial CCTV	Countywide	Countywide	Install fiber optic lines and CCTV along arterial roadways	$ 1,378,125	$ 1,102,500	U-STP
1017-193	1069	2004-004	Davidson	Metro Nashville	Wayfinding	Increased Guidance for Improved Mobility	Countywide	Countywide	Provide street name signs, guidance signs, pedestrian signalization to improve wayfinding for motorists and pedestrians	$ 551,250	$ 441,000	U-STP
1017-194	1067	2004-007	Davidson	Metro Nashville	ITS	Traffic Management Center	Countywide	Countywide	Data Sharing Enhancement - Increased communication capabilities necessary for information distribution- additional hardware, software, and facilities	$ 683,550	$ 546,840	U-STP
1017-195	1067	2004-008, 2011-17-062	Davidson	Metro Nashville	ITS	Traffic Signal Communication Provision and Upgrage	Countywide	Countywide	Provide fiber optic lines to areas without communications abilities, enhance existing communications with fiber optics	$ 2,172,063	$ 1,457,650	CMAQ

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1017-196	1069	2004-009	Davidson	Metro Nashville	ITS	Wayfinding Sign Program	Countywide	Countywide	ITS, sign, and guidance system; variable message signs at entry points and throughout downtown	$ 678,556	$ 542,845	U-STP
1017-197	1069	2008-17-020 (FY08-11), 2008-17-026	Davidson	Metro Nashville	ITS	Nashville ITS	Countywide	Countywide	Expanded system for ITS communications, DMS, and CCTV deployment on arterial corridors compliant with ITS Communication and Implementation Plans	$ 4,000,000	$ 3,200,000	U-STP
1017-198	8005	2008-17-031	Davidson	Metro Nashville	ITS	Countywide Wayfinding and Traffic Guidance Program	Countywide	Countywide	Arterial corridors compliant with ITS Communications and Implementation Plans	$ 1,500,000	$ 1,200,000	U-STP
1017-199	1070	2008-17-056	Davidson	Metro Nashville	ITS	ATIS - Phase 2	Countywide	Countywide	ATIS - Phase 2; Design and construct Metro Traffic Operations Center, design communications needed for surface street monitoring/control	$ 2,812,800	$ 2,250,440	HPP
1017-200	1070	2008-17-057	Davidson	Metro Nashville	ITS	ATIS Traveler Information System, ITS Communication & CCTV	Countywide	Countywide	ATIS Traveler Information System, ITS communication & CCTV design and construct Traffic Operations Center, ITS communications and CCTV	$ 2,363,842	$ 1,891,074	ITS
1017-267		2011-57-024	Davidson	Goodlettsville	ITS	SR-174 (Long Hollow Pk)	Main Street, Cartwright Street, North and South Bound I-65, Conference Drive, Loretta Drive,		Install a coordinated (fiber optic) traffic signal system for the Long Hollow Pike intersections with Main Street, Cartwright Street, the north and south bound Interstate 65 ramps, Conference Drive/East Cedar Street, Caldwell Drive and Loretta Drive as we	$ 300,000	$ 300,000	CMAQ
1019-282		2008-19-001	Davidson	TDOT	Barrier Walls	I-65	Near SR-45 (Old Hickory Blvd)	North of SR-386 (Vietnam Vets Blvd)	Construct Noise Barrier Walls	$ 1,530,000	$ 1,224,000	NHS
1021-172			Maury	Spring Hill	New Road	Reserves Boulevard	US-31/SR-6	Port Royal Road	Extend Reserves Boulevard as a new 3-lane road	$ 8,400,000		Non-Federal
1022-169	2001		Maury, Williamson	Spring Hill	Road Widening	Port Royal Road	Saturn Parkway (SR 396)	Duplex Road	Widen Port Royal Road from 2 to 3 lanes and correct horizontal and vertical alignment issues (Proposed length is 169 miles)	$ 12,100,000		Non-Federal
1032-109	3004	2010-32-004	Robertson	TDOT	Road Widening	US-431/SR-65 (Tom Austin Hwy)	W.A. Batson Pkwy (City Limits)	US-41/SR-11	Widening from 3 to 5 lanes; curb and gutter; sidewalks through a highly congested commercial developed area	$ 20,427,371	$ 1,720,000	STP
1036-274	8006	2004-022	Robertson	White House	Bike/Ped	SR-76	Raymond Hirsch Parkway	Hwy 31W/SR-41	Sidewalk Improvements	$ 765,811	$ 612,649	U-STP
1036-278		2004-010	Robertson	City of Springfield	Bike/Ped	Central Business District Sidewalks	Memorial Blvd/Locust	Willow/Springfield Middle School	Construct sidewalks in the Central Business District	$ 151,975	$ 121,580	U-STP
1041-125	4028		Rutherford	Murfreesboro	New Road	Joe B. Jackson Blvd.	US-231 (Church St.)	I-24	Build new 3/5 lane roadway	$ 8,700,000		Non-Federal
1041-129	4035	2011-41-144	Rutherford	Murfreesboro	New Road	Cherry Lane	US-41/70 (NW Broad)	Cavalier Dr.	Extend Cherry Ln from Cavalier Dr to Broad St with Interchange at SR-840	$ 35,673,887	$ 4,652,000	U-STP
1041-130	9005		Rutherford	Murfreesboro	New Road	Veterans Pkwy (formally SW Loop Rd)	St. Andrews / Armstrong Valley	Lone Oak / Barfield Crescent	Construct new 5-lane road and widen/ reconstruct existing substandard 2-lane road	$ 9,000,000		Non-Federal
1042-121		2011-42-031	Rutherford	La Vergne	Road Widening	Chaney Blvd.	Sam Ridley Pkwy (SR-266)	Old Nashville Hwy.	This project will widen Chaney Blvd to three lanes in order to accommodate existing and potential development	$ 6,661,099	$ 200,000	U-STP
1042-122		2011-42-032	Rutherford	La Vergne	Road Widening	Jefferson Pike	Old Nashville Highway	Murfreesboro Rd (US-41/SR-1)	This project will widen Jefferson Pike to three lanes In addition, the project should address grade issues and replace a substandard rail overpass	$ 7,401,221	$ 600,000	U-STP
1042-127	4030	2011-42-142	Rutherford	Murfreesboro	Road Widening	SR-266 (Thompson Lane)	Broad (US-41)	US-231/SR-10 (Memorial)	Widen from 2 to 5 lanes	$ 39,245,717	$ 6,560,000	U-STP
1042-131		2011-42-143	Rutherford	Murfreesboro	Road Widening	Bradyville Pk	US-41 (Broad St)	Rutherford Blvd	Widen from 2 to 3 lanes	$ 12,087,083	$ 1,467,520	U-STP
1042-167	4006	2011-42-061	Rutherford	Smyrna	Road Widening	Weakley Lane	Sam Ridley Parkway (SR 266)	Lakeside Drive	Widen Weakley Lane from 2 lanes to 5 lanes	$ 5,800,000	$ 2,800,000	U-STP
1042-271	4013	2006-401	Rutherford	City of La Vergne	Road Widening	Waldron Rd.\Parthenon Pkwy.	I-24	Murfreesboro Road	Widen Waldron Rd and Parthenon Pkwy from Industrial Blvd to Murfreesboro Rd (SR-1) to five lanes with shoulders to match cross sections on other portions of Waldron Rd Sidewalks will be constructed on both sides of the roadway	$ 10,303,600	$ 2,000,000	U-STP
1042-285		2011-410-149	Rutherford	City of Murfreesboro	Reconstruction	Manson, Gresham, Fortress	I-24	Puckett Creek Crossing	Realign Manson pike/Fortress Blvd and Gresham Lane; build as five lane roadways with bike lanes, curb & gutter and sidewalks	$ 7,052,000		Non-Federal
1042-286		2011-410-151	Rutherford	City of Murfreesboro	Reconstruction	Brinkley Road	Hwy-96	Manson Pike	Rebuild Brinkley Road from Hwy 96 to Manson pike from a 2-lane ditch section street to a 3-lane curb & gutter street complete with sidewalks	$ 7,847,500		Non-Federal
1042-287		2011-410-152	Rutherford	City of Murfreesboro	Reconstruction	Rucker Lane	SR-96	Veterans Pkwy	Rebuild Rucker Lane from SR-96 to the new SW Loop Rpoad to a 3-lane roadways with curb & gutter and sidewalk	$ 5,125,355		Non-Federal
1042-288		2011-410-153	Rutherford	City of Murfreesboro	Reconstruction	Pitts Lane	Northfield Blvd	Wenlon Drive	Rebuild two lane roadway inclusive of bike lanes amd sidewalks from Northfield Blvd to Wenlon Drive	$ 1,298,493		Non-Federal
1042-289		2011-42-150	Rutherford	City of Murfreesboro	Road Widening	Fortress Blvd	Blaze Drive	Puckett Creek Crossing	Widen Fortress Boulevard from Blaze Drive to approximatley Puckett Creek Crossing from 3-lanes to 5-lanes roadway with bike lanes, curb & gutter and sidewalks	$ 2,395,224		Non-Federal
1043-261	4003	2011-44-058	Rutherford	Smyrna, TDOT	Interchange	Interstate 24/Rocky Fork Road	Rocky Fork Road		Construct a new interchange at Interstate 24 and Rocky Fork Road	$ 18,624,547	$ 1,600,000	STP
1044-272	8004	99-New-14	Rutherford	City of La Vergne	Intersection	Old Nashville Highway / Stones River Road	n/a		Install traffic signal and turn lanes at intersection of Old Nashville Highway and Stones River Road	$ 405,000	$ 344,000	U-STP
1045-332		2005-006	Rutherford	Murfreesboro Public Transit	Transit Operating	5307 Urban Operating for Rover Public Transit - Relax & Ride Service	City of Murfreesboro		Operation of Relax & Ride service in the Murfreesboro Urban Area	$ 1,943,689	$ 971,846	5307
1045-333		2005-007	Rutherford	Murfreesboro Public Transit	Transit Operating	5307 Urban Operating for Rover Public Transit - MCHRA Contract	Murfreesboro Urban Area		Operation of para-transit and demand response service for the Murfreesboro urbanized area that exceeds the limits of the fixed route service operated by Rover (MCHRA)	$ 647,766	$ 323,883	5307
1045-334		2008-45-089	Rutherford	Murfreesboro Public Transit	Transit Operating	5307 Urban Operating for Rover Public Transit - Service Operations	City of Murfreesboro		Operation of transit services in the urbanized area of Murfreesboro	$ 6,416,414	$ 3,208,207	5307
1045-335		2008-45-090	Rutherford	Murfreesboro Public Transit	Transit Capital	5307 Urban Capital for Rover Public Transit - Equipment	City of Murfreesboro		FTA 5307 Urban capital Funding for Rover Public Transit to include passenger amenities, bus stop signs, benches, information kiosks, bike racks, maintenance equipment, miscellaneous bus equipment, office equipment, office furniture	$ 3,808,471	$ 3,046,777	5307
1045-336		2011-45-112	Rutherford	Murfreesboro Public Transit	Transit Capital	5307 Urban Capital for Rover Public Transit - Bus Replacement	City of Murfreesboro		Acquire equipment and services to enhance the fixed route Rover public transit system	$ 951,078	$ 760,863	5307
1045-337		2011-45-113	Rutherford	Murfreesboro Public Transit	Transit Capital	5309 Earmark for Rover Public Transit - Bus & Bus Facilities	City of Murfreesboro		Purchase miscellaneous support equipment for the fixed route transit system operated by the City of Murfreesboro	$ 86,766	$ 69,413	5309

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1045-338		2011-45-114	Rutherford	Murfreesboro Public Transit	Transit Capital	5307 Urban capital Funding for Rover Public - Station/Operations/Admin/Training Facility	City of Murfreesboro		Construct new or renovate and rehabilitate existing facility for Multipurpose Transit Facility	$ 1,697,095	$ 1,357,676	5307
1046-269	8006	2008-46-075	Rutherford	City of La Vergne	Bike/Ped	Chaney Blvd	Town of Smyrna-City of La Vergne line	Old Nashville Highway	Construct 5,600 linear feet of sidewalk Project will likely include drainage improvements	$ 154,000	$ 123,200	ENH
1046-270	4015	223	Rutherford	City of La Vergne	Bike/Ped	Fergus Road	Murfreesboro Road	Heritage Valley Circle	Project will extend sidewalks from Murfreesboro Road to Heritage Circle	$ 154,000	$ 123,200	ENH
1046-292		2011-46-056	Rutherford	Town of Smyrna	Bike/Ped	Threet Industrial Boulevard	Sam Ridley Parkway	Town limits (near airport)	Construct greenway along Threet Industrial Boulevard from Sam Ridley Parkway to the Town limits	$ 700,000	$ 560,000	HPP-TN100
1046-293		2011-46-057	Rutherford	Town of Smyrna	Bike/Ped	Smyrna Greenway (Stewart's Creek)	Old Nashville Hwy	S. Lowry St.	Construct greenway along Stewart's Creek from Old Nashville Highway to north of S Lowry St	$ 756,000	$ 604,800	ENH
1046-294		AM-006	Rutherford	City of La Vergne	Bike/Ped	Hurricane Creek Greenway	City Hall to Corps Property		Greenway/ bike trail connecting City Hall with residential areas	$ 147,000	$ 112,000	ENH
1046-295		2006-304	Rutherford	Town of Smyrna	Bike/Ped	Jefferson Springs Greenway	Sharp Springs Park/Percy Priest Lake	Jefferson Springs Recreation Area	Construct 12' pedestrian and bikeway from Sharp Springs Natural Area to Jefferson Springs Recreation Area to make connection toward Murfreesboro	$ 2,988,084	$ 2,390,467	ENH, HPP
1046-296		2006-202	Rutherford	City of Murfreesboro	Bike/Ped	Stones River Battlefield - Natl Park Service Interior	Stones River Battlefield		Plan and design a self-guided interpretive tour route and facility for Stones River Battlefield	$ 4,023,107	$ 4,023,107	PLHD
1046-297		2006-203	Rutherford	City of Murfreesboro	Bike/Ped	Downtown Eagleville	Downtown Eagleville	Downtown Eagleville	Plan and construct a bicycle and pedestrian trail, including enhancments	$ 200,000	$ 160,000	HPP
1046-298		226, 2006-201	Rutherford	City of Murfreesboro	Bike/Ped	Stones River Greenway	Barfield-Crescent Road	Leanna Swamp	Middle Tennessee alternative transportation system along Stones River Portions have been completed	$ 12,102,264	$ 9,681,811	HPP-TN146, ENH,
1047-279		2004-014	Rutherford	City of Murfreesboro	ITS	CCTV and Traffic Signal Connect	SR-96W, US-231N (SR-10), SR-99S		Install fiber optic interconnect cable and associated CCTV & traffic signal support, operations & communications equipment at the traffic operations center and various locations along SR1/2, SR10, SR96, Middle TN Blvd, Fortres Blvd and Medical Center Pkwy	$ 241,000	$ 192,800	M-STP
1047-290		203	Rutherford	City of Murfreesboro	Road Widening, ITS	Middle Tennessee Blvd	Greenland Drive	Main Street	Closed Loop Signal Coordination System and related road widening (widen from 4 to 5 lanes), including bike lanes and reconstruction of sidewalks	$ 7,872,001	$ 6,297,601	HPP, DEMO, M-ST
1051-222	5019, 5020	2011-51-108	Sumner	TDOT	New Road	SR-109 Bypass	New SR-109 South of Portland	Kirby Drive	Construction of new Portland bypass, from new alignment of SR-109 south of Portland to SR-109/ Kirby Drive north of Portland	$ 123,806,957	$ 2,400,000	NHS
1051-233	5043	AM-019	Sumner	TDOT	New Road	SR-109	Hollis Chapel Rd	SR-76	2 to 4 lanes Let 9/18/09 Estimated completion 11/15/11	$ 2,000,000	$ 1,600,000	STP
1051-268		2004-019	Sumner	Millersville	New Road	Cartwright Parkway	SR-41	US-31W	Extend Cartwright Parkway	$ 202,650	$ 162,120	U-STP
1052-120	5004	2008-51-032	Sumner	Gallatin, TDOT	Road Widening	Albert Gallatin Avenue / Hatten Track Road Extension	SR-109	N Water Avenue (SR-174)	Widen existing roadway to five lanes with curb and gutter between Blythe Avenue and North Water Avenue Construct new (2-lane, divided median with turn lanes or 3-lane cross section) roadway connection between Blythe Avenue and SR-109 Acquire right of w	$ 21,512,501	$ 17,210,001	U-STP
1052-174	18	99-New-28	Sumner	Hendersonville	Road Widening	Drakes Creek Road/Indian Lake Blvd.	SR-386 (Vietnam Veterans)	SR-174 (Long Hollow Pike)	Widen from 2-lane rural to 4-lane urban with median from SR 386 to SR-174 Construct new 4-lane street with median from Anderson Rd to SR 174	$ 1,400,000	$ 1,120,000	U-STP
1052-176	5009	2006-014	Sumner	Hendersonville	Road Widening	New Shackle Island Road	SR 6 (W. Main)	SR 386 (Vietnam Veterans)	Widen from 2/3 lanes to 5	$ 3,975,030	$ 3,180,024	U-STP
1052-177	31	2002-028	Sumner	Hendersonville	Road Widening	Rockland Rd	Center Point Rd	Imperial Blvd	Widen/construct 3- lanes Extend New Shackle Island Road across CSX to Rockland Road	$ 11,903,960	$ 9,511,668	U-STP
1052-180	36	2002-029	Sumner	Hendersonville	Road Widening	Walton Ferry Rd	Imperial Blvd/Gail	SR 6 (W. Main)	Widen from 2 to 5 lanes, including intersection re-alignment at SR 6	$ 6,404,785	$ 5,123,828	U-STP
1052-223	32	AM-018	Sumner	TDOT	Road Widening	SR-109	Cumberland River	SR-109 Bypass (S of Gallatin)	Widen from 2 to 5 including center turn lane PE completed 9/19/08 ROW underway	$ 10,646,317	$ 1,686,184	NHS
1052-273		2011-510-017	Sumner	Gallatin	Realignment	Airport Road	Steam Plant Road	Gregory Drive	Relocate of a portion of Airport Road and all associated costs to allow for runway and hangar expansion at the Sumner County Regional Airport to meet FAA safety regulations and to attract business and industry to Gallatin and Sumner County	$ 1,500,000	$ 1,500,000	HPP
1052-276	58	99-New-23	Sumner	Gallatin	Realignment	E Broadway Ave (SR-6)	N Water Ave	College Street	E Broadway Avenue (SR-6) - Realignment of N Water Avenue and signalization, roadway and streetscape improvements on SR-6 from W Eastland Avenue to College Street	$ 768,000	$ 742,800	U-STP
1053-240	5017	2006-416	Robertson, Sumner	TDOT	Interchange	I-65 @ SR-109 Interchange	SR-109		New interchange at I-65 and the relocated SR-109 PE scheduled 3rd qtr 2010 EA completed 1/6/10	$ 42,074,464	$ 60,800	NHS
1054-255	5032	2011-54-156	Sumner	White House	Intersection	Tyree Springs (SR-258)	South Palmers Chapel Rd		Center turn lane construction on Tyree Springs onto South Palmers Chapel Roadway and center left turn lane and right turn lane improvements and widending on South Palmers Chapel Road adjacent to Intersection	$ 350,000	$ 187,916	U-STP, Safety
1054-263	18	2008-52-034	Sumner	Hendersonville	Interchange	Indian Lake Blvd	SR 386		Widen Indian Lake Blvd bridge over SR 386 from 2 to 6 lanes; widen approaches; improve ramps; install signal	$ 5,775,000	$ 4,620,000	U-STP
1054-275	8004	2008-54-033	Sumner	Gallatin, TDOT	Intersection	SR-6 (Various Intersection Improvements)	SR-25	Locust St	Improve and upgrade existing signalization infrastructure at the intersection of SR-6/SR-25 and SR-6/Locust Street Add turn lane on SR-25	$ 341,000	$ 333,000	U-STP
1054-280		2004-020	Sumner	City of Portland	Intersection	SR-109	Kirby Drive		Install traffic signal and turn lanes from SR-109 onto Kirby and from Kirby onto SR-109	$ 665,845	$ 665,845	L-STP, U-STP
1056-299		2008-56-082	Sumner	Sumner County	Bike/Ped	Lower Station Camp Greenway	Parallel Lower Station Camp Creek Rd		Convert a portion of the roadway to non-motorized transportation use The project will be a combination of new alignment and existing roadway It begins at Big Station camp Blvd and extends to Lower Station Camp Creek Road	$ 554,810	$ 443,848	HPP-TN239, CMAQ
1056-300		2009-56-027	Sumner	City of Gallatin	Bike/Ped	Town Creek Greenway	Generally along US 31E/SR-6		Pedestrian and bike trail into downtown Gallatin along Town Creek from Triple Creek Park to Smith Street Project includes multiple segments with access to Municipal Park and residential neighborhoods as well as a connection to the Gallatin Civic Center	$ 33,750	$ 27,000	U-STP

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1057-178	5016	99-New-29	Sumner	Hendersonville	ITS	Hendersonville Signal System Upgrade	Various	Various	Synchronize/Upgrade Traffic Signals on Main Street, New Shackle Island Road and other streets	$ 966,614	$ 966,614	U-STP
1057-247		2011-57-026	Sumner	Goodlettsville	ITS	Madison Creek Rd	Long Hollow Pike		Add Traffic signalization to Madison Creek Rd/Long Hollow Pk intersection Intersection is approx 1400' from Madison Creek Elem School	$ 120,000	$ 120,000	CMAQ
1057-248		2011-17-019	Sumner	Goodlettsville	ITS	Caldwell Drive	Indian Hills Mound		Add Pedestrian signalization to intersection	$ 70,000	$ 70,000	CMAQ
1061-171			Williamson	Spring Hill	New Road	Buckner Road	Buckner Lane	Lewisburg Pike (US 431)	Extend Buckner Road as a 3-lane road from Buckner Lane to Lewisburg Pike (Proposed length is 201 miles)	$ 12,000,000		Non-Federal
1061-201		2011-61-012	Williamson	Franklin	New Road	McEwen Drive	SR-252 (Wilson Pike)	Clovercroft Rd	4 lane divided roadway ailigned with McEwen Drive	$ 12,500,000		Non-Federal
1061-225	39	407b	Williamson	TDOT	New Road	SR-840	Bending Chestnut	Thompson Station	Construct new 4-lane roadway ROW acqauired 11/13/09 Let 2/5/09 Estimated completion 10/31/12	$ 10,800,000		Non-Federal
1061-226	40	2008-61-094	Williamson	TDOT	New Road	SR-840	Thompson Station	SR-6	Construct new 4-lane roadway Let 2/16/04 Construction underway	$ 10,400,000		Non-Federal
1062-113	6018	2006-417, 2010-65-001, 2011-64-111, 2011-62-110	Williamson	TDOT, Franklin, Williamson Co.	Road Widening	I-65	SR-840	SR-96	Widen from 4 to 8 lanes with HOV & Goose Creek (SR-248)	$ 109,047,654	$ 97,830,623	IM, HPP
1062-135	6027	2011-62-004	Williamson	Franklin	Road Widening	Columbia Avenue	Mack Hatcher Memorial Pkwy (SR-397)	Downs Blvd	Project would provide congestion relief to one of Franklin's heaviest corridors Columbia Ave (SR 6/US 31) provides connectivity between Columbia, Spring Hill and Thompson's Station with Franklin and Nashville This is the Primary Freight Route for east/	$ 17,500,000	$ 10,000,000	U-STP
1062-136	6034	2011-62-005	Williamson	Franklin	Road Widening	Goose Creek Bypass	Lewisburg Pike (US 431)	Peytonsville Rd	4,500 lf of 4 lane median divided roadway with additional turn lanes as required This cross section will include curb and gutter, sidewalks, bike lanes and other appurtenances as indicated	$ 9,550,000		Non-Federal
1062-137	6030	2006-117, 2006-118	Williamson	Franklin	Road Widening	Hillsboro Rd.	New Hwy SR-96 W/Bridge St	Mack Hatcher Memorial Pkwy (SR 397)	5,000 LF of 3 lane with continuous center turn lane, bike lanes, sidewalks and street lighting from Del Rio to Mack Hatcher (SR 397) 2,500 LF of 4 lane with bike lanes, sidewalks and street lighting from New Hwy 96 W/Bridge St to Del Rio	$ 25,130,000		Non-Federal
1062-138	6032	2011-62-007, 2011-62-008, 2011-62-009	Williamson	Franklin	Road Widening	Lewisburg Pike	Goose Creek Bypass (SR-248)	Mack Hatcher Memorial Pkwy (SR-397)	4 lane median divided with multiuse path and curb and gutter	$ 11,810,000		Non-Federal
1062-141	9020	2011-62-010	Williamson	Franklin	Road Widening	McEwen Drive	Carothers Parkway	East Cool Springs Blvd	Widen and improve McEwen Drive to four lanes from Carothers Parkway to East Cool Springs Blvd	$ 15,000,000		Non-Federal
1062-142	9020	2011-62-011	Williamson	Franklin	Road Widening	McEwen Drive	East Cool Springs Blvd	Wilson Pike (SR 252)	Widen and improve McEwen Drive to four lanes from East Cool Springs to SR 252 (Wilson Pike)	$ 17,500,000		Non-Federal
1062-159	6009	2006-013	Williamson	Brentwood, TDOT	Road Widening	Concord Road (S.R. 253)	SR-252	Arrowhead Drive	Widen from 2 to 3 lanes, includes 2 travel lanes and a continuous center turn lane, elimination of hazardous curves, bikway/walkway separated by 4' green strip on south side of road with sidewalk under consideration on north side	$ 4,640,000	$ 3,400,000	U-STP
1062-160	6007	2006-408	Williamson	Brentwood, TDOT	Road Widening	Franklin Road	Moores Lane (SR-441)	Concord Road (SR-253)	Widening of Franklin Rd (SR-31) from two to five lanes including a continuous center turn lane, with a curb and gutter section Project would also include a 10 ft wide bikeway/walkway on west side placed a minimum of 4 ft behind the curb	$ 3,600,000	$ 1,000,000	U-STP
1062-162	9009		Williamson	Brentwood	Road Widening	Split Log Road	Ragsdale Road	Pleasant Hill Rd	Widening to provide 12 foot travel lanes and elimination of sight distance problems Includes center turn lanes for certain segments, especially for subdivision entrances with strategically placed medians to provide traffic calming features Also features	$ 4,800,000		Non-Federal
1062-170	6002	2004-051	Williamson	Spring Hill	Road Widening	Duplex Road (SR 247)	SR 6 (US 31)	I-65	Widen Duplex Road from 2 to 3 lanes with shoulders and sidewalks, and remove vertical curves with sight distance issues (Proposed length is 333 miles)	$ 24,986,586	$ 1,135,966	U-STP
1062-346	6005	2004-058	Williamson, Davidson	Brentwood, TDOT	Road Widening	Concord Road (S.R. 253)	Edmonson Pike	Nolensville Road (US-31A-41A)	Widen to 3 lanes with 10' multi-use path along the south side of the road	$ 24,572,055	$ 3,120,000	STP
1064-252		2008-64-037	Williamson	Williamson County	Intersection	SR-106 (Hillsboro Rd)	SR-46 (Old Hillsboro Rd)		Realign existing intersection	$ 1,850,305	$ 120,000	U-STP
1065-340		2011-65-016	Williamson	Franklin Transit Authority	Transit Capital	Local Bus Service Preventative Maintenance and Capitalization - Franklin	City of Franklin		Local Bus Service Preventative Mainatenance and Capitalization for the Franklin Transit Authority service area	$ 2,096,250	$ 1,677,000	5307
1065-341		2009-69-005	Williamson	TDOT	Bus Diesel Retrofit	Pilot School Bus Retrofit - Franklin Special School District	City of Franklin		Retrofit 21 FSSD buses with diesel particulate filters and crankcase filter systems to reduce mobile source diesel emissions	$ 212,002	$ 169,602	S-CMAQ
1065-342		2009-69-006	Williamson	TDOT	Bus Diesel Retrofit	Pilot School Bus Diesel Retrofit - Williamson County Schools	Countywide		Retrofit 34 WCS buses with diesel particulate filters and crankcase filter systems to reduce mobile source diesel emissions	$ 249,000	$ 199,200	S-CMAQ
1065-343		2009-65-007	Williamson	Franklin Transit Authority	Transit Operating	New Freedom Funds - Franklin Transit Authority	City of Franklin		Provide support to Transit on Demand service beyond the 3/4 mile radius of the route system to locations up to 25 miles around the route system within the City of Franklin	$ 167,764	$ 83,880	5317
1066-301		2011-69-145, 2011-69-146	Williamson	Williamson County	Bike/Ped	Natchez Trace Parkway	Located 1/2 mile SW of SR 96/NTP Bridge		800 linear feet, 5' wide, crushed gravel, compactedand meeting ADA standards Rustic Trail to blend with Park	$ 345,805	$ 276,644	NSBP
1066-302		2006-024	Williamson	City of Franklin	Bike/Ped	Harpeth River	Between Hillsboro Road/5th Ave N and N Margin		Construct a Multi-Use Path System along the Harpeth River, from Hillsboro Road/5th Ave N to North Margin Street	$ 1,147,500	$ 630,000	U-STP
1067-144		2002-032	Williamson	Franklin	ITS	Murfreesboro Rd. (SR 96 E); South Royal Oaks, West Main (SR 6/US 31); New Hwy 96 W	n/a		ITS Software and Infrastructure Upgrades and Installation	$ 330,000	$ 264,000	U-STP
1067-145		2009-67-026	Williamson	Franklin	ITS	Hillsboro Rd. (SR-106); Mallory Station Rd.	n/a		Installation of communications infrastructure, video monitoring systems and traffic signal coordination plans to mitigate congestion, reduce emissions, reduce travel time and delay and to improve the safety of the roadway network	$ 2,500,000	$ 2,000,000	U-STP
1067-161	6012	2008-67-035	Williamson	Brentwood, TDOT	ITS	Concord Road (S.R. 253)	Wilson Pike	Sunset Road	Expand ITS fiber network to incorporate 4 additional traffic signals into the City's ITS system	$ 265,000	$ 265,000	U-STP

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2035ID	Old ID	FY 11-15 TIP ID	COUNTY	LEAD AGENCY	TYPE OF WORK	PROJECT/ ROADWAY NAME	FROM	TO	DESCRIPTION	TOTAL COST	FEDERAL	GRANT
1072-111	7007	2011-72-033	Wilson	Lebanon	Road Widening	SR-26 (Baddour Pkwy)	SR-24 (Main Street)	Fairview Road	Widen existing roadway	$ 55,947,374	$ 656,000	U-STP
1072-112	7004	2008-72-042	Wilson	Lebanon	Road Widening	Hartmann Drive	SR-26 (Baddour Pkwy)	Coles Ferry Pike	Widen existing roadway, connecting previously widened sections	$ 6,000,000		Non-Federal
1072-132	7019	2008-71-038	Wilson	Mt. Juliet	Road Widening	Beckwith Rd / Golden Bear Gateway	I-40	US-70/SR-24	Link Beckwith interchange on I-40 to US70 via a new/widened 3 lane roadway	$ 18,330,000	$ 14,664,000	U-STP
1072-214	7027	2011-72-107	Wilson	TDOT	Road Widening	I-40 E	Mt Juliet Road (SR-171)	SR-840	Widen from 4 to 8 lanes with 2 being HOV	$ 143,248,995	$ 2,700,000	IM
1072-237	7023	2010-710-006, 2011-72-012	Wilson	TDOT	Road Widening	Hartsville Pike (SR-141)	Hartman Drive Extension	Trousdale County Line	Reconstruct SR-141 (2 lanes) and reserve ROW for future 5 lane roadway Development underway S of Spring Creek to Tomlinson Road Let 6/20/08 Est completion 10/31/10 ROW underway, Tomlinson Rd to county line scheduled to let 10/10	$ 21,600,000	$ 17,280,000	STP
1072-284		2010-79-005	Wilson	City of Lebanon	Resurfacing	3R Improvements Bucket	Various	Various	Resurfacing, restoration and rehabilitation improvements of various roads in the City of Lebanon	$ 814,170	$ 619,336	L-STP
1072-348	7028	2009-72-035	Wilson	Wilson County, TDOT	Road Widening	HWY 109	US-70 (SR-24)	Cumberland River	This is one of two segments between Portland and I-40 that will need to be widened to match or transition into incoming traffic flows and currently constructing cross sections approaching from the North and South	$ 116,643,250	$ 960,000	NHS
1074-277	75	503	Wilson	Lebanon	Intersection	SR-26 (Maddox-Simpson Pkwy)	US70/SR-26 (Sparta Pk)		Intersection realignment of Maddox-Simpson Pkwy at US-70/SR-26 (Sparta Pk) Install turn lane at SR-26 and install traffic signal at new intersection	$ 5,300,000	$ 4,770,000	U-STP
1074-347		2008-74-061	Wilson	City of Lebanon	Lighting Improvements	I-40/SR-109 Interchange Lighting	SR-109		Install Interchange lighting	$ 164,063	$ 131,250	L-STP
1076-303		2008-76-024	Wilson	City of Mt. Juliet	Bike/Ped	W. Division Street Greenway, Phase II and III	North Greenhill Road (West)	Music City Star station (East)	Construct a multi-use path that will provide for pedestrian/bike travel between Greenhill Road and the Music City Star terminal	$ 646,551	$ 517,241	CMAQ
1076-304		2009-76-001	Wilson	City of Lebanon	Bike/Ped	Greenwood, West Main Street	Jimmy Floyd Family Life Center	Music City Star station and Public Square	Construct bicycle and pedestrian multi-use paved trail in the City of Lebanon	$ 445,866	$ 356,693	ENH, L-STP
1076-305		2011-76-035	Wilson	City of Lebanon	Bike/Ped	Bartons Creek	Don Fox Park	Leeville Pike	Multi-use paved trail extension of existing trail system from Don Fox Park along Bartons Creek to the south connecting with existing & proposed schools as well as a proposed trail head at Leeville Pike	$ 830,898	$ 664,718	ENH, L-STP
1077-101	7010	2011-77-036, 2011-77-037	Wilson	Lebanon	ITS	Lebanon Closed Loop Signal System	n/a		Perform study of traffic signals on specific road segments and implement subsequent recommendations to improve traffic flow	$ 181,500	$ 181,500	CMAQ
1082-241		2008-32-018	Sumner, Robertson	TDOT	Road Widening	SR-41	SR-109	Kentucky State Line	TDOT is purchasing ROW (scheduled for 2011) for transition of existing 2-lane road to 5 lanes for 04 miles to KY state line KY will finance and let the project to construction Project is in 3-year work program ROW scheduled for 2011	$ 1,900,000	$ 1,520,000	STP, Non-Federal (
1085-319		2009-85-018	Regionwide	RTA	Transit Operating	SE Corridor Express Bus Service Expansion	Davidson County and Rutherford County		Operations and capitalize service contracts for operation of express bus service frequency in the area's Southeast Corridor for RTA's Express Route 96: Nashville/Murfreesboro Relax & Ride	$ 1,397,840	$ 710,920	5307
1085-320		2008-85-091	Regionwide	RTA	Transit Capital	Commuter Rail Capitalization and Preventative Maintenance	Downtown Nashville to Downtown Lebanon		Operation of and preventative maintenance for Music City Star Commuter Line East Corridor between downtown Nashville and the City of Lebanon	$ 18,000,000	$ 14,400,000	5307, U-STP
1085-321		2009-85-010	Regionwide	RTA	Transit Capital	Martha Station Construction	Music City Star Line @ Martha		Construction of Permanent Station at Martha station for the Music City Star Commuter Rail	$ 875,000	$ 700,000	U-STP
1085-322		2009-85-012	Regionwide	RTA	Transit Operating	Express Bus Service from Williamson County	Williamson County & Davidson County		Express bus service from Spring Hill, Franklin, and Brentwood to Nashville and return (two-year pilot program)	$ 900,000	$ 720,000	CMAQ
1085-323		2011-85-125	Regionwide	RTA	Transit Operating	Expansion of Regional Bus Services				$ 1,000,000	$ 800,000	CMAQ
1085-325		2006-113	Regionwide	RTA	Transit Operating	Bus Seat Guarantee	Regionwide	Regionwide	Bus Seat Guarantee for providing new regional express bus services and expanding regional bus services Service will be added to the SE corridor based on the study recommendations This increases funds to implement this service	$ 750,000	$ 600,000	CMAQ
1085-326		2011-85-154	Regionwide	MPO	Transit Capital	Regional Vanpool Start-Up Program (New Vehicles & Seat Guarantee)	Regionwide	Regionwide	Purchase new vehicles and provide funding for seat gurantees for vanpools	$ 1,999,500	$ 1,999,500	CMAQ
1085-327		2008-15-051	Regionwide	MPO	Transit Capital	ADA Service Capitalization	Regionwide	Regionwide	ADA service capitalization Complementary paratransit services within the Nashville-Davidson UZA using 10% of annual formula apportionment as allowed by FTA	$ 6,110,085	$ 4,888,068	5307
1085-328		2011-85-127	Regionwide	RTA	Transit Capital	Media Fare Purchase	Regionwide	Regionwide	Purchase of fare vending machines	$ 250,000	$ 200,000	5307
1085-329		2011-85-132	Regionwide	MPO	Transit Capital	Regional Park and Ride Lots	Regionwide	Regionwide	Improvments to the safety, security, comfort, and convenience of the regional Park and Rides system to be implemented by Local and Regional Transit partners like RTA, Nashville MTA and Franklin Transit Authority within the Nashville-Davidson UZA	$ 1,000,000	$ 800,000	5307
1085-330		2011-85-155	Regionwide	MPO	Transit Capital	Regional Vanpool Program - Vehicle Replacement	Regionwide	Regionwide	Vehicle replacement	$ 2,812,500	$ 2,250,000	5307
1085-331		2008-85-036	Regionwide	MPO	Transit	Regional Ridesharing & TDM Strategies - Program Administration	Regionwide	Regionwide	Administer, implement, and promote TDM-related programs including vanpools, employer/ commuter outreach, ridesharing, etc	$ 3,783,700	$ 3,783,700	CMAQ, U-STP
1085-501		2011-85-5555	Regionwide	MPO	Transit	MPO Mass Transit Program	Regionwide	Regionwide	Various transit projects as directed by the MPO's Urban STP Investment Strategy and including planning studies, bus stop improvements, service improvements, transit ITS, and other capital expenditures	$ 2,062,500	$ 1,650,000	U-STP
1085-502			Regionwide	MPO	Transit	Urban Transit	Regionwide	Regionwide	FTA 5307 funding For Urban Transit including Preventative Maintenance, Service Expansion, Facilities and Equipment for the urbanized areas	$ 29,704,066	$ 23,763,253	FTA
1085-504		2011-85-147, 2009-65-008	Regionwide	MPO	Transit	Job Access and Reverse Commute (JARC) Bucket	Regionwide	Regionwide	Expand the availability of public transportation and develop transportation services to sites such as employment and career centers throughout the region	$ 3,611,938	$ 2,889,550	5316
1085-505		2008-85-093	Regionwide	MTA	Transit	New Freedom (NF) Funds Bucket	Regionwide	Regionwide	Funds capital and operating expenses to reduce barriers to transportation services and expand the transportation mobility options available to people with disabilities beyond the requirements of the American with Disabilities Act (ADA)	$ 2,328,600	$ 1,862,880	5317

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2035ID	Old ID	FY 11-15 TIP ID	COUNTY	LEAD AGENCY	TYPE OF WORK	PROJECT/ ROADWAY NAME	FROM	TO	DESCRIPTION	TOTAL COST	FEDERAL	GRANT
1086-107		2011-16-119	Davidson, Sumner	Goodlettsville	Bike/Ped	City of Goodlettsville Bicycle & Pedestrian Plan	Various	Various	Construct/expand/widen various existing streets to accommodate bicycle/pedestrian improvements and connect to and expand various elements of the Goodlettsville Greenways Plan	$ 3,000,000	$ 3,000,000	CMAQ
1086-601		2011-86-6666	Regionwide	MPO	Bike/Ped	MPO Active Transportation Program	Regionwide	Regionwide	Various bicycle and pestrian related projects as directed by the MPO's Urban STP Investment Strategy to improve the walkability of local communities	$ 3,125,000	$ 2,500,000	U-STP
1086-602		2008-89-087	Regionwide	TDOT	Enhancements	Transportation Enhancement Projects Bucket	Regionwide	Regionwide	Surface Transportation, including roadscape awards	$ 10,000,000	$ 8,000,000	ENH
1086-603		2008-86-086	Regionwide	TDOT, MPO	Bike/Ped	Safe Routes to School Bucket	Regionwide	Regionwide	Funds the planning, development and implementation of infrastucture projects as well as education and outreach activities for projects that are focused on increasing levels of walking and bicycling to school among elementary and middle school students	$ 3,400,000	$ 3,400,000	SRTS
1087-281		206-411, 2006-411b, 2006-411c	Davidson/Sumner	Metro Nashville	ITS	ITS-Various	Countywide	Countywide	Operations & utilities/power/communication, maintenance, construction, etc	$ 7,500,000	$ 6,750,000	IM
1087-701		2011-89-9999	Regionwide	MPO	ITS	MPO ITS and M&O Program	Regionwide	Regionwide	Various ITS and related projects as directed by the MPO's Urban STP Investment Strategy to improve the operations of the regional roadway network	$ 1,031,250	$ 825,000	U-STP
1088-801		2008-89-004, 2008-89-003, 2008-88-011, 2008-88-002, 2009-88-032	Regionwide	TDOT, MPO	Bridge Replacement	Bridge Replacement Bucket	Regionwide	Regionwide	Bridge replacement, rehabilitation, systematic repair and preservation funds to cover cost overruns on project phases which were included previous STIPs (Local)	$ 48,540,000	$ 14,592,000	BRR
1089-345		2011-69-122, 2011-69-123, 2011-69-124	Regionwide	Clean Air Partnership/ Williamson	Education & Outreach	Clean Air Schools Anti-Idling Campaign and School Pooling Program	Regionwide	Regionwide	Campaign to address transportation-related issues negatively impacting the air quality in Middle Tennessee	$ 1,021,125	$ 1,021,125	CMAQ
1089-902		2008-84-012, 2008-89-091, 2008-84-013	Regionwide	TDOT	Safety	Safety Improvement Bucket	Regionwide	Regionwide	Safety (Highway hazard elimination: alignment, spot, intersection improvements, signalization, guardrail, lighting, marking & RR crossings such as install pads, bells, lights, pavement markings, etc)	$ 19,490,588	$ 16,392,470	STP
1089-903		2008-89-015	Regionwide	TDOT	State Route Improvements	State Route 3R Improvements	Regionwide	Regionwide	State Route 3R Improvements (Resurfacing, slide repair, guardrail, signing, marking and other preventive maintenance, etc)	$ 200,000	$ 160,000	STP
1089-904		2008-89-014	Regionwide	TDOT	Interstate Improvements	Interstate 3R improvements	Regionwide	Regionwide	Interstate 3R improvements such as resurfacing, slide repair, guardrail, signing, signalization, marking & other preventive maintenance, etc	$ 200,000	$ 180,000	IM
Consistent		2008-89-009, 2008-89-010	Regionwide	TDOT	Bucket	Various	Regionwide	Regionwide	Cost overrun bucket for Interstate Maintenance projects	$ 1,600,000	$ 1,440,000	IM
Consistent		2008-89-007, 2008-89-008	Regionwide	TDOT	Bucket	Various	Regionwide	Regionwide	Cost overrun bucket for NHS Projects	$ 4,000,000	$ 3,200,000	NHS
Consistent		2008-89-005, 2008-89-006	Regionwide	TDOT	Bucket	Various	Regionwide	Regionwide	Cost overrun bucket for STP projects	$ 4,000,000	$ 3,200,000	STP
FY 2016 to FY 2025 PROJECTS										**$ 2,704,991,811**	**$ 2,152,151,493**	
1012-102	1062		Davidson	Metro, Goodlettsville	Road Widening	Rivergate Parkway	Gallatin Pk	Dickerson Pk	Widen Rivergate Pkwy from 4 to 6 lanes	$ 23,634,942	$ 18,907,954	U-STP
1012-203			Davidson	Goodlettsville	Reconstruction	Main Street (US Hwy 41)/Long Hollow Pike (TN Hwy. 174)/Rivergate Parkway	Rivergate Parkway	New Brick Church Pk	Lane and intersection realignment, pedestrian access and safety features, congestion mitigation, economic development, and redevelopment	$ 14,920,862	$ 11,936,690	U-STP
1012-205	1099		Davidson	TDOT	Road Widening	I-65 South	Harding Pl (SR-255)	I-40	Widen from 6 lanes to 8, with 2 being HOV lanes	$ 60,279,717	$ 48,223,774	IM
1012-207	1093	2009-84-033, 2006-412	Davidson	TDOT	Road Widening	I-40	US 70 S (SR-1) Memphis-Bristol Highway	I-440	Widen from 6 lanes to 8, with 2 being HOV lanes Currently 8 lanes after White Bridge Road/ Briley Pkwy	$ 121,833,846	$ 97,467,077	IM
1012-208	1094		Davidson	TDOT	Road Widening	I-40 W	I-440	I-65	Widen from 6 lanes to 10 lanes, with 2 being HOV	$ 31,599,100	$ 25,279,280	IM
1012-217	1072		Davidson	TDOT	Road Widening	SR-12	SR-155 (Briley Parkway)	US-41A/SR-112 (Clarksville Pike)	Widen from 2 to 4 lanes with center turn lane	$ 51,045,164	$ 40,836,131	NHS
1012-218	1023		Davidson	TDOT	Road Widening	SR-6 (Ellington Parkway)	North 1st Street	Boardmoor Drive	Widen from 4 to 6 lanes PE and ROW completed in 2003	$ 64,043,725	$ 51,234,980	NHS
1012-219	1045		Davidson	TDOT	Road Widening	SR-1 Murfreesboro Road	Donelson Pike	Smith Springs Rd	Widen from 4 to 6 lanes including bike lanes	$ 21,314,319	$ 17,051,455	STP
1012-220	1043		Davidson	TDOT	Road Widening	Lebanon Pike (SR-24/ US 70)	Fairfield Avenue	Fesslers Lane	Upgrade from 2/5 lanes to 4/5 lanes including bike lanes	$ 19,398,914	$ 15,519,131	STP
1012-228	1015		Davidson	TDOT	Road Widening	Clarksville Highway (SR-112)	Hydes Ferry Pike (SR-12)	Briley Parkway (SR-155)	Widen from 2 to 5 lanes including center turn lane PE is underway	$ 54,573,631	$ 43,658,905	STP
1012-244	1079		Davidson	TDOT	Road Widening	Charlotte Pike (SR-24)	Old Hickory Blvd (SR-251)	Briley Pkwy (SR-155)	Widen from 2 to 5 lanes including center turn lane	$ 104,207,408	$ 83,365,926	STP
1012-245	1089		Davidson	TDOT/ Metro Nashville	Road Widening	I-24 W	I-65	Old Hickory Blvd (SR-45)	Widen 4 to 6 lanes	$ 61,297,699	$ 49,038,159	NHS
1013-243	1036		Davidson	TDOT	Interchange	I-24 E	Harding Place		Construct urban diamond interchange, phase I	$ 5,920,977	$ 4,736,782	NHS
1014-106			Davidson	Goodlettsville	Interchange	Conference Drive	NB Vietnam Veterans Off Ramp	Conference Drive	Add extension to NB off Ramp at Conference Drive	$ 532,888	$ 426,310	U-STP
1014-206	1100		Davidson	TDOT	Interchange	I-65 S	11th Avenue	12th Avenue	Add HOV ramps to and from CBD	$ 8,464,881	$ 6,771,904	IM
1014-209	1095		Davidson	TDOT	Interchange	I-40 W	12th Avenue	Charlotte Avenue	Construct HOV ramps to and from CBD	$ 8,881,466	$ 7,105,173	IM
1014-210	1096		Davidson	TDOT	Interchange	I-24	Shelby Avenue		Construct HOV ramps to and from CBD	$ 8,881,466	$ 7,105,173	IM
1014-211	1098		Davidson	TDOT	Interchange	I-65 N	N 1st Street		Construct HOV ramps to and from CBD	$ 8,881,466	$ 7,105,173	IM
1014-221	9021	2008-14-092	Davidson	TDOT/ Metro Nashville	Interchange	I-40	McCrory Lane		Reconfigure Interchange	$ 14,802,443	$ -	Non-Federal
1014-238			Davidson	TDOT	Interchange	I-40	I-440 South Ramp		Extend I-40 EB to I-440 system ramp decelaration lane 2100 feet Project in 3-year work program, PE scheduled for 2010	$ 1,228,603	$ 982,882	IM
1014-249			Davidson	Goodlettsville	Interchange	SR-386 (Vietnam Veterans Pkwy)	Conference Dr. (Exit #1)		Installation of High Mast Lighting System at Exit #1	$ 466,277	$ 373,022	U-STP
1016-103			Davidson	Goodlettsville	Enhancement	Conference Drive	Gallatin Rd	Long Hollow Pike	This is a project that would allow for the enhancement of Conference Dr through streetscape, hardscape and lighting improvements	$ 932,554	$ 746,043	U-STP
1032-109	3004		Robertson	TDOT	Road Widening	US-431/SR-65 (Tom Austin Hwy)	W.A. Batson Pkwy (City Limits)	US-41/SR-11	Widening from 3 to 5 lanes; curb and gutter; sidewalks through a highly congested commercial developed area	$ 20,427,371	$ 16,341,897	STP

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1041-129	4035		Rutherford	Murfreesboro	New Road	Cherry Lane	US-41/70 (NW Broad)	Cavalier Dr.	Extend Cherry Ln from Cavalier Dr to Broad St with Interchange at SR-840	$ 35,673,887	$ 28,539,110	U-STP
1042-121			Rutherford	La Vergne	Road Widening	Chaney Blvd.	Sam Ridley Pkwy (SR-266)	Old Nashville Hwy.	This project will widen Chaney Blvd to three lanes in order to accommodate existing and potential development	$ 6,661,099	$ 5,328,879	U-STP
1042-122			Rutherford	La Vergne	Road Widening	Jefferson Pike	Old Nashville Highway	Murfreesboro Road (US-41/SR-1)	This project will widen Jefferson Pike to three lanes In addition, the project should address grade issues and replace a substandard rail overpass	$ 7,401,221	$ 5,920,977	U-STP
1042-127	4030		Rutherford	Murfreesboro	Road Widening	SR-266 (Thompson Lane)	Broad (US-41)	US-231/SR-10 (Memorial)	Widen from 2 to 5 lanes	$ 39,245,717	$ 31,396,573	U-STP
1042-131			Rutherford	Murfreesboro	Road Widening	Bradyville Pk	US-41 (Broad St)	Rutherford Blvd	Widen from 2 to 3 lanes	$ 12,087,083	$ 9,669,666	U-STP
1042-231	4049		Rutherford	TDOT	Road Widening	SR-96	SR-840	Overall Creek	Reconstruct from 2 to 5 lanes with curb and gutter Development underway, PE completed 7/15/98	$ 165,837,975	$ 132,670,380	NHS
1042-232	4051		Rutherford	TDOT	Road Widening	SR-99	SR-16 in Eagleville	Swamp Road (W of Concord)	Construct new alignment from SR-16 to Swamp Rd as a 2 lane with continuous center turn lane; from Swamp Road, improve existing alignment to 2 lane Reconstruction from US41A (SR-16) to SR-269 Let 12/14/07 Estimated completion 8/31/10	$ 15,855,648	$ 12,684,519	STP
1051-222	5019, 5020		Sumner	TDOT	New Road	SR-109 Bypass	New SR-109 South of Portland	Kirby Drive	Construction of new Portland bypass, from new alignment of SR-109 south of Portland to SR-109/ Kirby Drive north of Portland	$ 123,806,957	$ 99,045,566	NHS
1052-115	59	2009-54-024	Sumner	Gallatin	Road Widening	Big Station Camp Boulevard	SR-386 (Vietnam Vets Blvd)	SR-174 (Long Hollow Pike)	Widen from SR-386 to SR-174 to a minimum of 3-lanes with additional turn lanes provided in certain locations, including pedestrian and bicycle facilities	$ 9,251,527	$ 7,401,221	U-STP
1052-212	5021		Sumner	TDOT	Road Widening	I-65 North	Two Mile Pkwy/ Rivergate Pkwy	US 31W (SR-41)	Widen from 4 to 8 lanes with 2 being HOV Currently 6 lanes from Rivergate Pkwy to SR-174 (Long Hollow Pike), 4 lanes from SR-174 to US 31W (SR-41)	$ 54,879,243	$ 43,903,394	IM
1052-223	32	AM-018	Sumner	TDOT	Road Widening	SR-109	Cumberland River	SR-109 Bypass (S of Gallatin)	Widen from 2 to 5 including center turn lane PE completed 9/19/08 ROW underway	$ 10,646,317	$ 8,517,053	NHS
1052-224	33	2002-018	Sumner	TDOT	Road Widening	SR-109	SR-76 (Fountain Head)	SR-52	Widen from 2 to 5 lanes including center turn lane Let to contract 6/20/08 Estimated completion 10/31/10	$ 25,756,251	$ 20,605,000	NHS
1053-240	5017		Robertson, Sumner	TDOT	Interchange	I-65	SR-109		New interchange at I-65 and the relocated SR-109 PE scheduled 3rd qtr 2010 EA completed 1/6/10	$ 42,074,464	$ 33,659,571	NHS
1056-104			Sumner	Goodlettsville	Lighting Improvements	Highway 41 / Highway 31-W	Old Springfield Hwy	Conference Dr	Installation of a street lighting system along Hwy 41 and 31-W of the Sumner County Portion of the City of Goodlettsville	$ 93,255	$ 74,604	U-STP
1062-143	6043		Williamson	Franklin	Road Widening	Murfreesboro Rd	S Margin St	North Royal Oaks Blvd.	3 lane cross section with shared lanes and continuous two way left turn lane, 5 foot parkway strips and 5 foot sidewalks from Third Ave (Harpeth River Bridge) to Mack Hatcher Memorial Parkway 7 lane cross section with bike lanes and continuous two way	$ 32,812,500	$ 26,250,000	U-STP
1062-170	6002	2004-051	Williamson	Spring Hill	Road Widening	Duplex Road (SR 247)	SR 6 (US 31)	I-65	Widen Duplex Road from 2 to 3 lanes with shoulders and sidewalks, and remove vertical curves with sight distance issues (Proposed length is 333 miles)	$ 24,986,586	$ 19,989,269	U-STP
1062-215	6051		Williamson	TDOT	Road Widening	SR-96	Mack Hatcher Pkwy (SR 397)	Hillsboro Road/ SR-106	Widen from 2 to 4 lanes with curb and gutter	$ 54,305,465	$ 43,444,372	STP
1062-234	6050		Williamson	Williamson Co., TDOT	Road Widening	SR-96	Arno Road	Wilson Pike (SR-252)	Widen from 2 to 4 lanes with curb and gutter ROW underway 10/28/02	$ 119,513,162	$ 95,610,530	NHS
1062-346	6005	2004-058a, 2004-058b	Williamson, Davidson	Brentwood, TDOT	Road Widening	Concord Road (S.R. 253)	Edmonson Pike	Nolensville Road (US-31A-41A)	Widen to 3 lanes with 10' multi-use path along the south side of the road	$ 24,572,055	$ 19,657,644	STP
1064-252			Williamson	Williamson County	Intersection	SR-106 (Hillsboro Rd)	SR-46 (Old Hillsboro Rd)		Realign existing intersection	$ 1,850,305	$ 1,480,244	U-STP
1072-111	7007		Wilson	Lebanon	Road Widening	SR-26 (Baddour Pkwy)	SR-24 (Main Street)	Fairview Road	Widen existing roadway	$ 55,947,374	$ 44,757,899	U-STP
1072-213	7012		Wilson	TDOT	Road Widening	I-40 E	SR-840	US 70	Widen from 4 to 6 lanes with 2 being HOV	$ 67,603,442	$ 54,082,753	IM
1072-214	7027		Wilson	TDOT	Road Widening	I-40 E	Mt Juliet Road (SR-171)	SR-840	Widen from 4 to 8 lanes with 2 being HOV	$ 143,248,995	$ 114,599,196	IM
1072-235	7009		Wilson	TDOT	Road Widening	Hartsville Pike (SR-141)	SR-26	Lealand Lane	Relocate SR-141 and add traffic signals	$ 22,215,872	$ 17,772,697	STP
1072-236	7017	2004-068a	Wilson	TDOT	Road Widening	SR-171	Division Street	SR-24/US-70	Widen SR-171 in Mt Juliet from 2 to 5 lanes (415 miles) Section 2 of APR SR-171 (Mt Juliet Rd) from Pleasant Grove Rd to SR-24	$ 25,164,153	$ 20,131,322	STP
1072-242			Wilson	TDOT	Reconstruction	Hartsville Pike (SR-141)	Lealand Ln	Hartman Drive Ext	Construct 4/5 lane PE underway Scheduled to be let 2011	$ 19,053,725	$ 15,242,980	STP
1072-246	7025		Wilson	Wilson County, TDOT	Road Widening	SR-25/ US-70	E of Cedar Creek	SR-109	Widen from 2 to 4 lanes including bike lanes (42 miles)	$ 89,686,297	$ 71,749,038	STP
1072-348	7028	2009-72-035	Wilson	Wilson County, TDOT	Road Widening	HWY 109	US-70 (SR-26)	Cumberland River	This is one of two segments between Portland and I-40 that will need to be widened to match or transition into incoming traffic flows and currently constructing cross sections approaching from the North and South	$ 116,643,250	$ 93,314,600	NHS
1085-501			Regionwide	MPO	Transit	MPO Mass Transit Program	Regionwide	Regionwide	Various transit projects as directed by the MPO's Urban STP Investment Strategy and including planning studies, bus stop improvements, service improvements, transit ITS, and other capital expenditures	$ 38,098,831	$ 30,479,065	U-STP
1085-502			Regionwide	MPO	Transit	Urban Transit	Regionwide	Regionwide	FTA 5307 funding For Urban Transit including Preventative Maintenance, Service Expansion, Facilities and Equipment for the urbanized areas	$ 317,665,266	$ 254,132,213	FTA
1085-503			Regionwide	MPO	Transit	Bus and Rail Facilities	Regionwide	Regionwide	FTA 5309 funding for bus and rail facilities including new and replacement vehicles	$ 117,849,634	$ 94,279,707	FTA
1085-504			Regionwide	MPO	Transit	Job Access Reverse Commute Program	Regionwide	Regionwide	FTA JARC funding for projects that provide increased access to jobs	$ 7,905,093	$ 6,324,074	FTA
1085-505			Regionwide	MPO	Transit	New Freedom Program	Regionwide	Regionwide	FTA New Freedom funding for projects that provide increased mobility for the elderly or disabled	$ 4,830,890	$ 3,864,712	FTA
1085-601			Regionwide	MPO	Bike/Ped	MPO Active Transportation Program	Regionwide	Regionwide	Various bicycle and pestrian related projects as directed by the MPO's Urban STP Investment Strategy to improve the walkability of local communities	$ 57,148,246	$ 45,718,597	U-STP
1085-602			Regionwide	MPO	ITS	MPO ITS and M&O Program	Regionwide	Regionwide	Various ITS and related projects as directed by the MPO's Urban STP Investment Strategy to improve the operations of the regional roadway network	$ 19,049,415	$ 15,239,532	U-STP

Nashville Area Metropolitan Planning Organization

2011-2035 Cost-Feasible Projects

Adopted December 15, 2010

2035ID	Old ID	FY 11-15 TIP ID	COUNTY	LEAD AGENCY	TYPE OF WORK	PROJECT/ ROADWAY NAME	FROM	TO	DESCRIPTION	TOTAL COST	FEDERAL	GRANT
1086-105			Davidson, Sumner	Goodlettsville	Lighting Improvements	SR-174 (Long Hollow Pike)	Main Street	City Limits	Installation of comprehensive street lighting system along SR-174 within the corporate city limits of Goodlettsville	$ 166,527	$ 133,222	U-STP
1088-801			Regionwide	TDOT/MPO	Bridge	Bridge Repair and Replacement Program	Regionwide	Regionwide	Bridge repair and replacement program funds	$ 87,834,366	$ 70,267,493	BRR
FY 2026 to FY 2035 PROJECTS										**$ 2,758,763,201**	**$ 2,379,226,501**	
1012-147	1006		Davidson	Metro Nashville	Road Widening	Bell Road	Murfreesboro Pk (US-41/SR-1)	Stewarts Ferry Pk	Widen existing 2-lane roadway to provide a center turn lane, bike lanes	$ 43,822,463	$ 35,057,970	U-STP
1012-148	1021		Davidson	Metro Nashville	Road Widening	Edmondson Pike	Davidson Co. Line (Holt Rd)	Old Hickory Blvd (SR-254)	Widen from 2 to 5 lanes	$ 71,242,605	$ 56,994,084	U-STP
1012-150	1135		Davidson	Metro, TDOT	Road Widening	Gallatin Pike	Rivergate Parkway	Conference Drive	Widen from 5 to 7 lanes	$ 16,516,938	$ 13,213,551	STP
1012-151	1031		Davidson	Metro, TDOT	Road Widening	Harding Place (SR-155)	I-24	CSX Railroad	Widen from 5 to 7 lanes	$ 15,760,935	$ 12,608,748	NHS
1012-152	1040		Davidson	Metro, TDOT	Road Widening	I-24/65	I-24 junction (S of Fern Avenue)	Trinity Lane	Replace underpass to accommodate 6 lanes in each direction	$ 150,000,000	$ 120,000,000	IM
1012-154	1091		Davidson	Metro, TDOT	Road Widening	I-40/65	I-65 junction (E of Demonbreun)	I-40 junction (W of Charlotte)	Widen to 8 lanes, 2 being HOV lanes	$ 42,633,589	$ 34,106,871	IM
1012-156	1018		Davidson	Metro Nashville, TDOT	Road Widening	Demonbreun Street	12th Avenue South	1st Avenue South	Widen from 2 to 3 lanes	$ 25,450,257	$ 20,360,205	NHS
1012-158	1033		Davidson	TDOT	Reconstruction	Donelson Pike	Hangar Lane	Interstate 40	Realignment of Donelson Pike to allow airport expansion and modification of Donelson Pike/I-40 Interchange to improve level-of-service and safety	$ 70,115,941	$ 56,092,752	IM
1012-181	1103		Davidson	Metro Nashville	Road Widening	McGavock Pike	Lebanon Pike (SR24)	Briley Pkwy (SR-155)	Widen from 2 to 3 lanes add bicycle lanes and sidewalks	$ 17,528,985	$ 14,023,188	U-STP
1012-183	1078	057, 057b	Davidson	Metro Nashville	Road Widening	Central Pike	I-40 connector	Chandler Rd	Widen from 2 to 5 lanes including sidewalks and bicycle lane	$ 69,312,500	$ 55,450,000	U-STP
1012-184	1051		Davidson	Metro Nashville	Road Widening	Old Hickory Boulevard	Bell Road	I-40	Widen from 2 to 3 lanes	$ 13,146,739	$ 10,517,391	U-STP
1012-185	1049		Davidson	Metro Nashville/ TDOT	Road Widening	Nolensville Pike (SR-11)	Burkitt Road	Old Hickory Blvd (SR-254)	Widen from 2 to 5 lanes	$ 98,200,000	$ 78,560,000	STP
1012-186	1136		Davidson	Metro Nashville	Road Widening	Myatt Drive	Old Hickory Blvd (SR-45)	Gallatin Pk (US-31E)	Widen from 4 to 5 lanes from SR-45 to Anderson Lane; improve existing substandard 5-lane section between railroad and Gallatin Pike; construct bike lanes over entire length	$ 32,866,847	$ 26,293,478	U-STP
1014-153	1041		Davidson	TDOT, Metro, Goodlettsville	Interchange	I-65 North	SR-386 (Vietnam Veterans Blvd)		Construct ramps from SB I-65 to EB Vietnam Veterans Boulevard and from WB Vietnam Veterals Boulevard to NB I-65	$ 10,955,616	$ 8,764,493	IM
1014-155	1120		Davidson	Metro, TDOT	Interchange	I-40/65	I-65 junction (W of 2nd/4th Av)	I-24 junction (E of 2nd/4th Av)	Realign and segregate traffic for safety purposes at interchange	$ 31,875,000	$ 25,500,000	IM
1014-216	1118		Davidson	TDOT	Interchange	I-24 E	Hickory Hollow Pkwy	SR-254 (Bell Rd) Exit	Modify interchange to allow access to/from Cane Ridge Road	$ 6,573,369	$ 5,258,696	IM
1014-258	1024		Davidson	Metro Nashville	Intersection	Gallatin Road	Due West Avenue		Turn lane construction at intersection in accordance with recommendations from 1995 Congested Intersection Study	$ 6,573,369	$ 5,258,696	U-STP
1018-202			Davidson	Goodlettsville, TDOT	Bridge	Dickerson Pike (US 41/31W)	CSX Railroad Overpass	CSX Railroad Overpass	Widen Dickerson Pike (US 41/31W) from 3 to 5 lanes and improve alignment under the railroad bridge	$ 9,860,054	$ 7,888,043	STP
1033-254			Robertson	White House	Interchange	I-65	Webster Road, Union Road		Contstruction of new I-65 interchange including overpass bridge between exits 104 and 108 and connections to existing and future roadway networks	$ 39,440,217	$ 31,552,173	IM
1042-124	4026	2004-056, 2008-42-017	Rutherford	Murfreesboro	Road Widening	SR-99 (New Salem Rd)	Cason Ln	Old Fort (SR-96)	Widen from 2 to 5 lanes	$ 41,250,000	$ 33,000,000	U-STP
1042-126	4029		Rutherford	Murfreesboro	Road Widening	Broad Street	Middle Tennessee Blvd	Maney	Widen from 4 to 5 lanes	$ 27,507,768	$ 22,006,214	NHS
1042-128	4034		Rutherford	Murfreesboro	Road Widening	SR-96 (Old Fort Parkway)	I-24	Broad (US-41)	Widen from 4 to 6 lanes	$ 46,453,137	$ 37,162,510	NHS
1042-168	4005	2006-415	Rutherford	Smyrna, TDOT	Road Widening	Jefferson Pike (SR 266)	Nissan Drive (SR 102)	SR 840	Widen Jefferson Pike from 2 to 5 lanes and improve geometry	$ 129,878,449	$ 103,902,759	STP
1042-204			Rutherford	Rutherford County, TDOT	Road Widening	Epps Mill Road	Auldridge Drive / Epps Mill Rd	US-41 (Manchester Highway)	Widen Epps Mill Road from a 2-Lane to a 3-Lane Cross Section and redesign/improve Exit 89 to better accommodate truck traffic	$ 25,290,447	$ 20,232,358	STP
1043-261	4003		Rutherford	Smyrna, TDOT	Interchange	Interstate 24/Rocky Fork Road	Rocky Fork Road		Construct a new interchange at Interstate 24 and Rocky Fork Road	$ 18,624,547	$ 14,899,637	STP
1052-116	5001, 5002, 5003		Sumner	Gallatin, TDOT	Road Widening	SR-174 (Long Hollow Pk)/SR-25 (Red River Rd)	SR-109	US-31E(SR-6)	Widen SR-174 to 3 lanes; construct new roadway over RR; improve SR-25; intersection improvements	$ 43,822,463	$ 35,057,970	STP
1052-119	5022		Sumner	Gallatin, TDOT	Road Widening	E Broadway Avenue - US-31E (SR-6)	N Water Avenue	Deshea Creek Rd / Brights Ln	Widen roadway from 2 to 4 lanes	$ 61,351,448	$ 49,081,158	NHS
1052-173	5022		Sumner	Sumner County, TDOT	Road Widening	Nashville Pike (US 31E/SR 6)	SR-52E	Pleasant Grove Rd	Widen from 2 to 4 lanes including intersection improvements at SR 52 and Austin Peay Hwy and include 2 marked bicycle lanes Construct sidewalks on both sides of road	$ 58,462,075	$ 46,769,660	NHS
1052-179			Sumner	Hendersonville	Road Widening	SR-386	I-65	Saundersville Road	Widen from 4 lanes to 6	$ 151,170,893	$ 120,936,714	NHS
1053-264	5006		Sumner	Hendersonville, TDOT	Interchange	SR-386	Forest Retreat Road		Construct Interchange	$ 10,955,616	$ 8,764,493	STP
1054-262	5040		Sumner	TDOT	Intersection	Long Hollow Pike (SR 174)	Center Point Rd, Happy Hollow Rd		Realign and improve intersection for safety reasons Include multi-modal needs identified along corridor such as a shared-use trail on the south side and sidewalks to connect to nearby schools campus	$ 4,382,246	$ 3,505,797	STP
1056-117			Sumner	Gallatin	Streetscape Improvements	US-31E (SR-6) - Nashville Pike/W. Main St/W. Broadway Ave	SR-109	N Water Avenue	Congestion management and streetscape improvements on US-31E (SR-6), install medians, sidewalks, intersection improvements Begin project in downtown Gallatin and continue improvements to SR-109	$ 10,955,616	$ 8,764,493	U-STP
1056-118			Sumner	Gallatin	Bike/Ped	US 31E (SR-6)	Greensboro Drive	Gap Blvd	Construct multi-modal ped and bicycle facilities at Volunteer State Community College to include the construction of sidewalks along US-31E/SR-6 and a tunnel under US-31E/SR-6 to the residential, commercial, mixed use neighborhood in Greensboro Village	$ 2,191,123	$ 1,752,899	NHS
1056-175	5034		Sumner	Hendersonville	Enhancement	Main Street	Center Point Rd.	Bonita Parkway	Construct medians, curb and gutter, islands, sidewalks, bike lanes, access control, streetscape improvements and intersection improvements	$ 43,822,463	$ 35,057,970	U-STP
1062-134	6029		Williamson	Franklin	Road Widening	Columbia Avenue	Downs Blvd	Fowlkes Street	Project would complete link between current Franklin Corridor and Connector Streets Economic Development Project phases north of the project terminus and the Columbia Ave South widening project between Mack Hatcher (SR 397) and Downs Blvd	$ 18,776,186	$ 15,020,948	U-STP
1062-139	38	AM-020b	Williamson	Franklin, TDOT	Road Widening	Mack Hatcher Memorial Parkway	Murfreesboro Rd. (SR 96E)	Franklin Rd. (SR 6/US 31)	Widen to 4 lane divided with multiuse pathway	$ 34,619,746	$ 27,695,797	STP
1062-140	6048		Williamson	Franklin, TDOT	Road Widening	Mack Hatcher Memorial Parkway	Columbia Pike (SR-6/US-31)	Murfreesboro Rd (SR-96E)	Widen to 4 lane divided with a multiuse pathway	$ 97,132,303	$ 77,705,842	STP

Nashville Area Metropolitan Planning Organization

2011-2035 Cost-Feasible Projects

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2035ID	Old ID	FY 11-15 TIP ID	COUNTY	LEAD AGENCY	TYPE OF WORK	PROJECT/ ROADWAY NAME	FROM	TO	DESCRIPTION	TOTAL COST	FEDERAL	GRANT
1062-163	6008		Williamson	Brentwood, TDOT	Road Widening	Wilson Pike (SR-252)	Concord Road (S.R. 253)	Church Street	Widen Wilson Pike (SR 252) to provide for improved safety and improved traffic flow Four alternate cross-sections have been proposed, all of which provide for two twelve (12) foot travel lanes and 2-6 foot shoulders Different alternates include either	$ 39,440,217	$ 31,552,173	STP
1063-166	6004		Williamson	Brentwood, TDOT	Interchange	I-65	n/a		New interchange on I-65 between Old Hickory Blvd and Concord Road (SR 253)	$ 43,822,463	$ 35,057,970	IM
1064-164	6013		Williamson	Brentwood, TDOT	Interchange	I-65 Interchange with Moores Lane (S.R. 441)	n/a		Modify southbound I-65 exit ramp to eastbound Moores Lane to eliminate dual lane conflict between traffic merging on to eastbound Moores Lane and traffic exiting eastbound Moores Lane to enter the I-65 north bound entrance ramp May include other modifica	$ 5,477,808	$ 4,382,246	IM
1064-165	6010		Williamson	Brentwood, TDOT	Interchange	I-65 Interchange with Concord Road (S.R. 253)	n/a		Modify southbound I-65 exit ramp and the exit ramp alarm signals	$ 2,629,348	$ 2,103,478	NHS
1064-253	6040		Dickson, Williamson	Fairview, Williamson County	Interchange	I-40	SR-96		Reconstruct Substandard cloverleaf design	$ 20,377,445	$ 16,301,956	IM
1072-110	7015		Wilson	Lebanon, TDOT	Road Widening	US-231 North	Forrest Ave	Old Hunters Point	Widen existing roadway	$ 78,344,909	$ 62,675,927	NHS
1072-123	7031		Wilson	Wilson County, TDOT	Road Widening	Central Pike SR 265	SR-171 (Mt. Juliet Rd)	SR-840/SR-109	Widening and re-alignment for safety and congestion mitigation	$ 155,700,000	$ 124,560,000	STP
1072-133	7018	2004-068b	Wilson	Mt. Juliet	Road Widening	SR-171 (S. Mt. Julliet Rd)	Central Pk (SR-265)	Providence Pkwy	General road widening from 2 to 5 lanes	$ 25,418,571	$ 20,334,857	U-STP
1073-256	7020	2004-059	Wilson	Mt. Juliet	Interchange	Central Pk	Central Pike		New interchange at I-40 and Central Pike	$ 39,001,992	$ 31,201,594	IM
1074-251	7013		Wilson	Lebanon, TDOT	Intersection	SR-24/US-70 (Main St.)	Castle Heights Ave			$ 1,095,562	$ 876,449	STP
1084-250			Davidson, Sumner	Goodlettsville	Interchange	I-65	RiverGate Pkwy (Exit #96), Long Hollow Pk (Exit #97), Highway 31W (Exit #98)		Installation of High Mast Lighting Systems at I-65 interchanges 96, 97, 98	$ 1,479,008	$ 1,183,206	IM
1085-501			Regionwide	MPO	Transit	MPO Mass Transit Program	Regionwide		Various transit projects as directed by the MPO's Urban STP Investment Strategy and including planning studies, bus stop improvements, service improvements, transit ITS, and other capital expenditures	$ 56,395,576	$ 45,116,461	U-STP
1085-502			Regionwide	MPO	Transit	Urban Transit	Regionwide		FTA 5307 funding For Urban Transit including Preventative Maintenance, Service Expansion, Facilities and Equipment for the urbanized areas	$ 317,665,266	$ 376,177,756	FTA
1085-503			Regionwide	MPO	Transit	Bus and Rail Facilities	Regionwide		FTA 5309 funding for bus and rail facilities including new and replacement vehicles	$ 117,849,634	$ 139,556,997	FTA
1085-504			Regionwide	MPO	Transit	Job Access Reverse Commute Program	Regionwide		FTA JARC funding for projects that provide increased access to jobs	$ 7,905,093	$ 9,361,175	FTA
1085-505			Regionwide	MPO	Transit	New Freedom Program	Regionwide		FTA New Freedom funding for projects that provide increased mobility for the elderly or disabled	$ 4,830,890	$ 5,720,718	FTA
1085-601			Regionwide	MPO	Bike/Ped	MPO Active Transportation Program	Regionwide	Regionwide	Various bicycle and pestrian related projects as directed by the MPO's Urban STP Investment Strategy to improve the walkability of local communities	$ 84,593,365	$ 67,674,692	U-STP
1085-602			Regionwide	MPO	ITS	MPO ITS and M&O Program	Regionwide	Regionwide	Various ITS and related projects as directed by the MPO's Urban STP Investment Strategy to improve the operations of the regional roadway network	$ 28,197,789	$ 22,558,231	U-STP
1088-801			Regionwide	TDOT/MPO	Bridge	Bridge Repair and Replacement Program	Regionwide		Bridge repair and replacement program funds	$ 130,016,318	$ 104,013,054	BRR

2011-2035 Transit Projects

COUNTY	LEAD AGENCY	TYPE OF WORK	PROJECT NAME	DESCRIPTION	TOTAL COST	FEDERAL	GRANT
Davidson	MTA	Transit Capital	Farebox Purchase and Replacement	Onboard vehicle farebox purchase and replacement	$ 400,000	$ 320,000	5307
Davidson	MTA	Transit Capital	Bus Stop Improvements and Passenger Amenities	Various bus/transit stop improvements including fare vending machines, shelters, benches, signage, and other passenger amenities	$ 1,000,000	$ 800,000	5307
Davidson	MTA	Transit Capital	New Satellite Maintenance and Office Facility (Peterbilt)	Establish a new satellite maintenance and office facility within Davidson County	$ 1,250,000	$ 1,000,000	5307
Davidson	MTA	Transit Capital	Local Bus Service Preventative Mainatenance and Capitalization - MTA	Local Bus Service Preventative Mainatenance and Capitalization for the Nashville MTA service area	$ 30,343,750	$ 24,275,000	5307
Davidson	MTA	Transit	Project Administration for Grant Programs	Cover costs associated with Project Administration such as administrative software and the cost for the management of grants and any grant-related project	$ 500,000	$ 400,000	5307
Davidson	MTA	Transit Capital	Service and Support Vehicles and Equipment		$ 1,875,000	$ 1,500,000	5307
Davidson	MTA	Transit Capital	Computer Aided Dispatch (CAD), Automatic Vehicle Location (AVL) & Intelligent Transportation System (ITS)	Equipment will be installed at MTA HQ operations centers in downtown Nashville including Music City central as well as be installed on all of our buses which travel throughout Davidson County as well as into other counties through contracts with RTA	$ 2,400,000	$ 1,920,000	5307
Davidson	MTA	Transit Capital	MTA - Administration Building Rehabilitation (Nestor)	Rehab/renovate administration and maintenance facilities, replace roof, expand Customer Service, additional office space	$ 3,687,500	$ 1,750,000	5307
Davidson	MTA	Transit Capital	Transit Signal Prioritization	Implementation of Signal Prioritization for transit vehicles along various corridors including Murfreesboro Pike and Nolensville Pike	$ 1,000,000	$ 800,000	CMAQ
Davidson	MTA	Transit Capital	Enhanced Transit Service along West End Corridor - Capital	Introduce enhanced bus service on the West End Corridor to include frequent service, limited stops, BRT shelters and amenities, real-time bus arrival information and bike racks to build ridership in advance of upcoming Alternative Analysis study	$ 5,500,000	$ 4,400,000	CMAQ
Davidson	MTA	Transit Capital	ACCESSRIDE Buses	Replace and expand fleet for ACCESSRIDE paratransit buses	$ 6,800,000		Non-Federal
Davidson	MTA	Transit Capital	Bus Purchase and Replacement	Purchase transit buses	$ 43,200,000		Non-Federal
Rutherford	Murfreesboro Public Transit	Transit Operating	5307 Urban Operating for Rover Public Transit - Relax & Ride Service	Operation of Relax & Ride service in the Murfreesboro Urban Area	$ 1,943,689	$ 971,846	5307
Rutherford	Murfreesboro Public Transit	Transit Operating	5307 Urban Operating for Rover Public Transit - MCHRA Contract	Operation of para-transit and demand response service for the Murfreesboro urbanized area that exceeds the limits of the fixed route service operated by Rover (MCHRA)	$ 647,766	$ 323,883	5307
Rutherford	Murfreesboro Public Transit	Transit Operating	5307 Urban Operating for Rover Public Transit - Service Operations	Operation of transit services in the urbanized area of Murfreesboro	$ 6,416,414	$ 3,208,207	5307
Rutherford	Murfreesboro Public Transit	Transit Capital	5307 Urban Capital for Rover Public Transit - Equipment	FTA 5307 Urban capital Funding for Rover Public Transit to include passenger amenities, bus stop signs, benches, information kiosks, bike racks, maintenance equipment, miscellaneous bus equipment, office equipment, office furniture	$ 3,808,471	$ 3,046,777	5307
Rutherford	Murfreesboro Public Transit	Transit Capital	5307 Urban Capital for Rover Public Transit - Bus Replacement	Acquire equipment and services to enhance the fixed route Rover public transit system	$ 951,078	$ 760,863	5307
Rutherford	Murfreesboro Public Transit	Transit Capital	5309 Earmark for Rover Public Transit - Bus & Bus Facilities	Purchase miscellaneous support equipment for the fixed route transit system operated by the City of Murfreesboro	$ 86,766	$ 69,413	5309
Rutherford	Murfreesboro Public Transit	Transit Capital	5307 Urban capital Funding for Rover Public - Station/Operations/Admin/Training Facility	Construct new or renovate and rehabilitate existing facility for Multipurpose Transit Facility	$ 1,697,095	$ 1,357,676	5307

2011-2035 Transit Projects

COUNTY	LEAD AGENCY	TYPE OF WORK	PROJECT NAME	DESCRIPTION	TOTAL COST	FEDERAL	GRANT
Williamson	Franklin Transit Authority	Transit Capital	Local Bus Service Preventative Maintenance and Capitalization - Franklin	Local Bus Service Preventative Mainatenance and Capitalization for the Franklin Transit Authority service area	$ 2,096,250	$ 1,677,000	5307
Williamson	Franklin Transit Authority	Transit Operating	New Freedom Funds - Franklin Transit Authority	Provide support to Transit on Demand service beyond the 3/4 mile radius of the route system to locations up to 25 miles around the route system within the City of Franklin	$ 167,764	$ 83,880	5317
Regionwide	RTA	Transit Operating	SE Corridor Express Bus Service Expansion	Operations and capitalize service contracts for operation of express bus service frequency in the area's Southeast Corridor for RTA's Express Route 96: Nashville/Murfreesboro Relax & Ride	$ 1,397,840	$ 710,920	5307
Regionwide	RTA	Transit Capital	Commuter Rail Capitalization and Preventative Maintenance	Operation of and preventative maintenance for Music City Star Commuter Line East Corridor between downtown Nashville and the City of Lebanon	$ 18,000,000	$ 14,400,000	5307, U-STP
Regionwide	RTA	Transit Capital	Martha Station Construction	Construction of Permanent Station at Martha station for the Music City Star Commuter Rail	$ 875,000	$ 700,000	U-STP
Regionwide	RTA	Transit Operating	Express Bus Service from Williamson County	Express bus service from Spring Hill, Franklin, and Brentwood to Nashville and return (two-year pilot program)	$ 900,000	$ 720,000	CMAQ
Regionwide	RTA	Transit Operating	Expansion of Regional Bus Services		$ 1,000,000	$ 800,000	CMAQ
Regionwide	RTA	Transit Operating	Bus Seat Guarantee	Bus Seat Guarantee for providing new regional express bus services and expanding regional bus services Service will be added to the SE corridor based on the study recommendations This increases funds to implement this service	$ 750,000	$ 600,000	CMAQ
Regionwide	MPO	Transit Capital	Regional Vanpool Start-Up Program (New Vehicles & Seat Guarantee)	Purchase new vehicles and provide funding for seat gurantees for vanpools	$ 1,999,500	$ 1,999,500	CMAQ
Regionwide	MPO	Transit Capital	ADA Service Capitalization	ADA service capitalization Complementary paratransit services within the Nashville-Davidson UZA using 10% of annual formula apportionment as allowed by FTA	$ 6,110,085	$ 4,888,068	5307
Regionwide	RTA	Transit Capital	Media Fare Purchase	Purchase of fare vending machines	$ 250,000	$ 200,000	5307
Regionwide	MPO	Transit Capital	Regional Park and Ride Lots	Improvments to the safety, security, comfort, and convenience of the regional Park and Rides system to be implemented by Local and Regional Transit partners like RTA, Nashville MTA and Franklin Transit Authority within the Nashville-Davidson UZA	$ 1,000,000	$ 800,000	5307
Regionwide	MPO	Transit Capital	Regional Vanpool Program - Vehicle Replacement	Vehicle replacement	$ 2,812,500	$ 2,250,000	5307
Regionwide	MPO	Transit	Regional Ridesharing & TDM Strategies - Program Administration	Administer, implement, and promote TDM-related programs including vanpools, employer/ commuter outreach, ridesharing, etc	$ 3,783,700	$ 3,783,700	CMAQ, U-STP
Regionwide	MPO	Transit	MPO Mass Transit Program	Various transit projects as directed by the MPO's Urban STP Investment Strategy and including planning studies, bus stop improvements, service improvements, transit ITS, and other capital expenditures	$ 2,062,500	$ 1,650,000	U-STP
Regionwide	MPO	Transit	Urban Transit	FTA 5307 funding For Urban Transit including Preventative Maintenance, Service Expansion, Facilities and Equipment for the urbanized areas	$ 29,704,066	$ 23,763,253	FTA
Regionwide	MPO	Transit	Job Access and Reverse Commute (JARC) Bucket	Expand the availability of public transportation and develop transportation services to sites such as employment and career centers throughout the region	$ 3,611,938	$ 2,889,550	5316
Regionwide	MTA	Transit	New Freedom (NF) Funds Bucket	Funds capital and operating expenses to reduce barriers to transportation services and expand the transportation mobility options available to people with disabilities beyond the requirements of the American with Disabilities Act (ADA)	$ 2,328,600	$ 1,862,880	5317

2011-2035 Transit Projects

COUNTY	LEAD AGENCY	TYPE OF WORK	PROJECT NAME	DESCRIPTION	TOTAL COST	FEDERAL	GRANT
Regionwide	MPO	Transit	MPO Mass Transit Program	Various transit projects as directed by the MPO's Urban STP Investment Strategy and including planning studies, bus stop improvements, service improvements, transit ITS, and other capital expenditures	$ 38,098,831	$ 30,479,065	U-STP
Regionwide	MPO	Transit	Urban Transit	FTA 5307 funding For Urban Transit including Preventative Maintenance, Service Expansion, Facilities and Equipment for the urbanized areas	$ 317,665,266	$ 254,132,213	FTA
Regionwide	MPO	Transit	Bus and Rail Facilities	FTA 5309 funding for bus and rail facilities including new and replacement vehicles	$ 117,849,634	$ 94,279,707	FTA
Regionwide	MPO	Transit	Job Access Reverse Commute Program	FTA JARC funding for projects that provide increased access to jobs	$ 7,905,093	$ 6,324,074	FTA
Regionwide	MPO	Transit	New Freedom Program	FTA New Freedom funding for projects that provide increased mobility for the elderly or disabled	$ 4,830,890	$ 3,864,712	FTA
Regionwide	MPO	Transit	MPO Mass Transit Program	Various transit projects as directed by the MPO's Urban STP Investment Strategy and including planning studies, bus stop improvements, service improvements, transit ITS, and other capital expenditures	$ 56,395,576	$ 45,116,461	U-STP
Regionwide	MPO	Transit	Urban Transit	FTA 5307 funding For Urban Transit including Preventative Maintenance, Service Expansion, Facilities and Equipment for the urbanized areas	$ 317,665,266	$ 376,177,756	FTA
Regionwide	MPO	Transit	Bus and Rail Facilities	FTA 5309 funding for bus and rail facilities including new and replacement vehicles	$ 117,849,634	$ 139,556,997	FTA
Regionwide	MPO	Transit	Job Access Reverse Commute Program	FTA JARC funding for projects that provide increased access to jobs	$ 7,905,093	$ 9,361,175	FTA
Regionwide	MPO	Transit	New Freedom Program	FTA New Freedom funding for projects that provide increased mobility for the elderly or disabled	$ 4,830,890	$ 5,720,718	FTA

Appendix B. MPO Project Evaluation & Scoring Documentation

This appendix provides a documentation of the MPO's project evaluation and scoring documentation including:

- Project Application Form
- Project Evaluation Factors
- Project Scoring Criteria

2035 NASHVILLE AREA Regional Transportation Plan

Received by: _____

Date: _____

CANDIDATE PROJECT APPLICATION FORM — ROADWAYS

PROJECT NAME		
LEAD AGENCY		
2030 LRTP ID# (If Available)		
COUNTIES		
ROADWAY NAME		
TERMINI	FROM:	TO:
GENERAL DESCRIPTION		

SCOPE OF WORK

Proposed Improvements:

- ☐ New Road/ Roadway extension
- ☐ Roadway Widening
- ☐ Realignment
- ☐ Wayfinding/ Signage
- ☐ ITS Improvements
- ☐ Curb & Drainage
- ☐ Streetscaping
- ☐ Other _____

Proposed Cross-Section:

- ☐ No Median or Center Turn Lane
- ☐ Continuous Center Turn Lane
- ☐ Center Median with Turn Lanes
- ☐ Limited/ Controlled Access
- ☐ Other _____

EXISTING # LANES: _____

PROPOSED # LANES: _____

Proposed Features:

- ☐ Sidewalks
- ☐ Marked Crosswalks
- ☐ Bicycle Lane
- ☐ Shared-Lane
- ☐ HOV Lane

Transit Accommodations:

- ☐ Mixed-Traffic Transit Route
- ☐ Transit-Only Lanes
- ☐ Signal Prioritization
- ☐ Transit Pullouts
- ☐ Transit Shelters

PURPOSE & NEED

Primary Objective (SELECT ONE):

- ☐ Mitigate Current Congestion
- ☐ Mitigate Future Congestion
- ☐ Support Economic Development
- ☐ Improve Safety
- ☐ Increase Access to Multi-Modal Options
- ☐ Increase Network Connectivity
- ☐ System Preservation (Maintenance)
- ☐ Improve System Efficiency (Operations)
- ☐ Other _____

Other Objectives (SELECT ALL THAT APPLY):

- ☐ Mitigate Current Congestion
- ☐ Mitigate Future Congestion
- ☐ Support Economic Development
- ☐ Improve Safety
- ☐ Increase Access to Multi-Modal Options
- ☐ Increase Network Connectivity
- ☐ System Preservation (Maintenance)
- ☐ Improve System Efficiency (Operations)
- ☐ Other _____

CANDIDATE PROJECT APPLICATION FORM FOR _____

Purpose & Need Statement:

PROJECT COSTS, FUNDING, & TIMING

PROJECT COST ESTIMATE IN 2010 DOLLARS: _____

Source of Cost Estimate:

- ☐ No Estimate Available
- ☐ Rough Planning Estimate
- ☐ Detailed Planning Report
- ☐ Preliminary Design & Engineering
- ☐ TDOT Estimate
- ☐ Other _____

Federal Funding Requested:

- ☐ YES, 100% of Cost
- ☐ YES, 80% of Cost
- ☐ YES, Some % of Cost
- ☐ NO
- ☐ NOT SURE

By when should this project be completed:

- ☐ 2015
- ☐ 2025
- ☐ 2035
- ☐ NOT SURE

Are Matching Funds Available:

- ☐ YES, Funds are locally programmed
- ☐ YES, Funds will be locally programmed
- ☐ NO
- ☐ NOT SURE

ABOUT YOU

Name _____ E-mail _____

Title _____ Phone _____

Department _____

Agency/ Organization _____

INSTRUCTIONS

Please submit this application along with any additional supporting documentation to the Nashville Area MPO.

ATTN: Matt Meservy, PE
By e-mail: meservy@nashvillempo.org
By mail: 800 Second Avenue South | PO Box 196300 | Nashville, TN 37219
By fax: 615.880.2450

This form can be completed online at: **http://www.surveymonkey.com/s/2035Projects**
More information available at: **http://www.nashvillempo.org/plans_programs/rtp/2035_call.aspx**

Deadline: February 19, 2010

Nashville Area MPO
2035 Regional Plan - Project Evaluation Factors
ENDORSED BY EXECUTIVE BOARD, MARCH 17, 2010

Factors in Evaluating Projects for the 2035 Regional Transportation Plan

1. **Congestion Management**
    a. What are the root causes of congestion in the vicinity of the project location (e.g., traffic volume, physical design, crashes, regulations, behavioral, freight, etc.)?
    b. Given the land uses, urban design and community goals for the project vicinity, what level of congestion is appropriate for the project and vicinity (i.e. some commercial centers/Downtowns need greater congestion for visibility/economic development)?
    c. How well does the project address those causes?
    d. How could the project be scoped to include congestion management solutions to optimize its benefit?
2. **Multi-Modal Choices**
    a. How well does the project introduce, support, or reinforce multiple transportation choices for people to access residences, jobs, schools, food, entertainment, etc?
    b. How can the project be scoped to incorporate facilities for and/or connections to non-motorized modes and transit?
3. **Freight & Goods Movement**
    a. How well does the project support or harm the movement of freight and goods through the region?
    b. How can the project be scoped to incorporate facilities that aid in the safe and efficient movement of freight?
    c. How can the project be scoped to balance the movement of freight and goods with other community goals?
4. **Safety & Security**
    a. How well does the project address safety concerns for all users?
    b. Is the project in a high-crash corridor?
    c. How can the project be scoped to increase safety of all users?
    d. How well does the project address security concerns?
    e. Does the project aid/ harm important evacuation routes?
    f. How can the project be scoped to features that help secure citizens and regional resources?
5. **System Preservation**
    a. How well does the project make use of limited financial resources to ensure the continued productivity of the existing transportation system?
    b. How can the project be scoped to include features the make the facility more efficient (e.g., ITS, design, materials, etc.)

6. **Quality Growth/ Sustainable Land Development**
    a. How well does the project encourage infill/ redevelopment?
    b. Do area plans call for mixed-used, higher density development? If so, how does the project complement these plans?
    c. Is the project encouraging growth in areas where growth is planned or desired?
    d. Conversely, is the project encouraging growth in areas where additional growth is not planned or desired?
    e. Does the project enhance or contribute to the form and function quality of the surrounding community?
7. **Economic Prosperity**
    a. How well does the project support or stimulate the local/ regional economy?
    b. How well does the project support freight movements?
    c. To what degree does the implementation of the project create jobs?
    d. How well does the facility connect people with opportunities to engage in economic activity?
    e. To what degree does the project aid in the region's economic competitiveness with other metro areas of the nation?
    f. Is the project supported by business leaders?
8. **Health & Environment**
    a. Does the project aid/ harm in the preservation of the region's natural or socio-cultural resources (e.g., open space, animal habitat, historic structures, places of worship, community centers, etc.)?
    b. How can the project be scoped to mitigate the negative impacts to valuable resources?
    c. How well does the project support efforts to reduce dependency on fossil fuels, particularly foreign oil?
    d. How well does the project support efforts to improve air and water quality?
    e. Does the project include facilities that provide opportunities for active transportation/ physical activity?
    f. Does the project aid/ harm the advancement of social justice and equal opportunity to destinations throughout the region?
    g. How can the project be scoped to mitigate any negative impacts to predominately low-income or minority communities or persons with a disability?
9. **Local Support/ Consistency with Plans**
    a. Is the project consistent with local, state, or other regional plans for growth and preservation (economic development, land use, natural features preservation, etc.)?
    b. Has the project been endorsed locally through the adoption of official instruments such as, but not limited to, a local major thoroughfare plan, transportation element of a comprehensive plan, or by resolution of the local governing body?
    c. If on a state-route, is the project endorsed or supported by TDOT?

Nashville Area Metropolitan Planning Organization

2035 Regional Transportation Plan | Project Scoring Key

Draft Implementation of Project Evaluation Criteria Endorsed by MPO Executive Board on March 17, 2010

EVALUATION CRITERIA	POINTS
TOTAL POSSIBLE POINTS	**100**
SYSTEM PRESERVATION & ENHANCEMENT	**15**
Project Improves Existing Route	Up to 15*
Project Improves an Intersection	3
2008 AADT Index to Average per Functional Class	Value
Project Upgrades Route to Context Sensitive/ Prescribed Design Standards	*# Strategies X 3 for Existing Route
Project Addresses Major Maintenance (e.g., bridge repair, general aging, etc.)	
Project Integrates ITS Technology, Signalization, Wayfinding	
Project Integrates Multi-Modal Upgrades	
QUALITY GROWTH, SUSTAINABLE DEVELOPMENT, & ECONOMIC PROSPERITY	**15**
Project Improves Accessibility and/or Connectivity to Existing Residential Population	Density/100
Project Improves Accessibility and/or Connectivity to Existing Jobs	Density/1000
Project Located ENTIRELY within Urban Growth Boundary	2
Project Located PARTIALLY within Urban Growth Boundary	1
Project Located ENTIRELY within Existing or Planned Mixed-Use or Employment Centers	2
Project Located PARTIALLY within Existing or Planned Mixed-Use or Employment Centers	1
Project Incorporates Streetscaping/ Enhancements	2
Project Corrects Poor Storm water Flow/ Drainage (Curb and Gutter)	2
Project Contributes to Grid Development/ Roadway Network Connectivity	1
Project Located In High Growth Areas	RES+EMP/10
MULTI-MODAL OPTIONS	**15**
Route Includes Existing Transit Service	3
Project Includes Transit Capacity (e.g., dedicated lanes, signal priority, HOV)	Up to 6
Project Includes Sidewalk Improvements (up to 7 depending on BPAC priority)	Up to 7
Project Includes Bicycle Facility Improvements (up to 7 depending on BPAC priority)	Up to 7
Project Includes Multi-Modal Treatments (e.g., x-walks, pullouts, shelters, etc)	Up to 4
CONGESTION MANAGEMENT	**10**
Project Addresses Corridor Congestion	
MPO Base Year Congestion (2008)	5
MPO Short-Term Congestion (2015)	4
MPO Mid-Term Congestion (2025)	3
MPO Long-Term Congestion (2035)	2
Congestion as Identified by Other Study or Observation	3
Project Incorporates Congestion Management Strategies (MULTIPLIER:)	2
Geometrical Improvement	ANY X2
Improvements to Access Management	
ITS/ Signalization Improvement	
Improvements to Turning Movements	
Improves Parallel Facility/ Contributes to Alternative Routing	
Provides Additional Non-Motorized Mode Capacity	
Transit Capacity	
Signage/ Wayfinding	
SAFETY & SECURITY	**10**
Project Addresses Location with High Level of Crashes	Crashes/10th Mile/20
Project has Fatal Crashes	2
Project Improves Modal Conflict (e.g., traffic signals, grade separation, dedicated lanes)	3
Local High Crash Corridor Designation	1
State High Crash Corridor Designation	1
Project Located on Known Evacuation Route	1
Project Located on the Strategic Highway Network (STRANET)	1
Project Located on the National Highway System (NHS)	1
Primary Purpose of Project to Improve Safety	7

EVALUATION CRITERIA	POINTS
Secondary Purpose of Project to Improve Safety	5
FREIGHT & GOODS MOVEMENT	**10**
Project Improves a Designated Truck Route	4
Project Improves High Volume Heavy Truck Route	Index
Project Improves High Volume Commercial Truck Route	Index
Project Design Accomodates Freight Flows	1
Route Serves Major Shipping/ Distribution Center	1
Route Serves Intermodal Center (e.g., rail yard, port, etc.)	1
Project Addresses Existing Freight/ Passenger Conflict	1
Project Provides Separation in Freight/ Passenger Movements (e.g., grade separation)	1
Project Impedes Efficient Delivery of Goods	-2
HEALTH & ENVIRONMENT	**10**
Project Located in Health Impact Area	2
Project Provides Alt Transportation Choices for Traditionally Underserved Groups	#Options X #Groups
Project Provide Multi-Modal Options Near Schools	#Options X #Schools
Project Overlaps Environmental Conflict Areas	-2
Project Overlaps Environmental Challenge Areas	-2
PROJECT HISTORY	**15**
Project Located within the Federal Aid Urban Boundary	1
Project Located on a Federal Aid Route	1
TDOT Support	2
TOP Local Priority	3
Programmed in Current LRTP	5
Programmed in Current TIP	10

Appendix C. Public & Stakeholder Participation Documentation

The following is documentation of the MPO's public and stakeholder participation process used during the development of the 2035 Regional Transportation Plan including:

- Plan Update/ Kickoff Press Releases
- Public Notice for Adoption Hearings
- List of Area Libraries where Plan was Made Available
- Public Workshop Announcements
- Stakeholder Coordination Letter
- Summary of Public Comments
- Plan Adoption Press Release

PLAN KICKOFF PRESS RELEASES

NASHVILLE AREA
Metropolitan Planning Organization

MEDIA RELEASE

Middle Tennessee Mayors, Nashville Area MPO Kick Off Major Update to Region's Long-Range Transportation Plan

FOR IMMEDIATE RELEASE
February 4, 2010

Media Contact: Mary Beth Ikard, APR
615.880.2452 | ikard@NashvilleMPO.org

NASHVILLE, **Tenn**.—At a joint meeting of the Middle Tennessee Mayors Caucus and the newly-formed Transit Alliance of Middle Tennessee today, Nashville Mayor Karl Dean announced details on a critical period in 2010 for public and municipal involvement in multi-billion dollar transportation investments for a growing Cumberland region.

Today marks the official public launch of the MPO's "Call for Projects" – meaning, ideas for regional transportation solutions that are likely to be selected by the MPO for inclusion in its 2035 update to the **Regional Transportation Plan**. As the MPO may require local grant recipients to abide by certain policies in order to receive federal transportation dollars, this year's plan update will mark a *significant* policy shift from previous years in how projects are evaluated, over the course of the next 25 years. Transportation investments will be scored based, in part, on new, forward-thinking criteria that factor in their potential to support livability, economic development, environmental conservation, and other socio-cultural considerations.

"Establishing a long-term vision for transportation in the region is the next critical step in making regional mass transit a reality for Middle Tennessee," said Nashville Mayor Karl Dean and chair of the MPO. "We need everyone's involvement. This shouldn't just be a business plan or a government plan. It should be a true regional collaboration that represents what everyone in our communities want for transportation. This is a plan that will impact our region for decades to come. I encourage citizens across Middle Tennessee to contact the Nashville Area MPO or your local mayor and get involved in this process."

To help facilitate involvement in the 2035 plan update –gathering comments and other data about people's perceptions, good or bad, of transportation options on the table for investment– the Nashville Area MPO is offering members of the public the opportunity to complete a **comprehensive survey** that focuses on quality-of-life, transit, and other growth issues, online at NashvilleMPO.org.

The Nashville Area MPO is currently in the midst of a major update to its multi-billion dollar regional transportation plan that would include a vast scope of federally-funded transportation projects in the metropolitan area. The MPO may set aside money for projects that support significant policy initiatives such as transit – including what would be new options for Middle Tennessee like passenger rail or Bus Rapid Transit– as well as communities that are friendlier to bicycle and pedestrian mobility. The plan can depict an innovative vision for transportation in the region, but ultimately must establish a path to realistic financial feasibility.

"Middle Tennessee is expected to grow by close to another million people within the next couple of decades. That growth will present significant challenges to communities across our region," said Michael Skipper, director of the Nashville Area MPO. "We must be thinking now about how those people will commute or use our transportation system to carry out their daily activities."

The Middle Tennessee region could soon be much better positioned to pay for transportation projects that support a higher quality-of-life, due to a dramatic change in federal policy announced in mid-January by U.S. Transportation Secretary Ray LaHood. The Obama administration just proposed new funding guidelines for major transit projects, with a focus on **livability** issues such as economic development and environmental benefits – in addition to cost/time savings, which were the primary criteria under the Bush administration.

For Middle Tennessee, this means that the Nashville Area MPO would have the ability to more boldly advance a progressive, strategic vision: to recommend projects for federal funding that emphasize environmental, community, and economic benefits – not just cost-effectiveness tests that are limited to how much transportation projects shorten commute times, thereby potentially escalating suburban sprawl and traffic congestion in urban areas of medium density, like that of greater Nashville. The MPO's study of the Northeast Corridor –a 30-mile segment between downtown Nashville and Gallatin– represents its chief first step toward a realistic evaluation of pioneering regional transportation opportunities – including passenger rail and bus rapid transit.

Locally, Mayor Karl Dean formed the Nashville Livability Project last fall after receiving a report on the impact that retiring Baby Boomers and other aging Nashvillians will have on the city over the next two decades. In Davidson County alone, 31,000 people over age 65 will live here by the year 2018, and more than 13,000 will be over 75 years old. Meaning, in the coming years, many people living in the greater-Nashville region will be either unable or unwilling to drive, so that mobility choices will need to include convenient, safe alternatives to the automobile.

In 2009, the Tennessee General Assembly passed critical legislation favoring regional transportation solutions to help local communities deal with mounting challenges created by congestion and urban sprawl, fueled onward by economic development. The legislation allows for the creation or expansion of regional transportation authorities in Tennessee's large urban areas, as well as the opportunity for those entities to select a **dedicated regional revenue source** from a menu of funding options, subject to voter approval or approval by local governing bodies, in order to expand transit services, and to support existing and future state and federal Investments.

"This recent shift in U.S. DOT policy enables us to get serious about facilitating the identification of an appropriate local source for dedicated funding," said Transit Alliance of Middle Tennessee Chairman Charles Bone of Sumner County. "There's an increasing sense that the political will exists to set us on a course for some pretty major changes to business-as-usual in the transportation scene. If we want to remain competitive for jobs to come here, as opposed to other U.S. cities that compete with us for business relocation and expansion, these investments need to be a top priority." Initially formed by the Mayors Caucus and comprised of public and private sector volunteers, the mission of the Transit Alliance is to develop a plan for funding public transit in Middle Tennessee.

About the Nashville Area MPO:
The Nashville Area MPO is the federally-designated transportation planning agency for over 2800 sq. mi. and more than 1.5 million people throughout Davidson, Rutherford, Sumner, Williamson, Wilson, and parts of Maury and Robertson counties. Serving as a regional partnership among the U.S. DOT, Tennessee DOT, local elected leadership, local planning and public works directors, the business community, and citizens across the five-plus county planning area, the MPO leads in the development of the region's long-range transportation plan and short-range Transportation Improvement Program, and contributes to ongoing conversations about issues such as land use, economic development, climate change and the environment, safety and security, and health. To learn more, visit NashvilleMPO.org.

About the Middle Tennessee Mayors Caucus
The Middle Tennessee Mayors Caucus was formed in July of 2009 in order to provide leadership on important issues facing a growing region. Gallatin Mayor Jo Ann Graves is the inaugural chair of the Caucus – an organization that serves as an opportunity for city and county mayors to build important working relationships with one another. Several Caucus mayors serve on the MPO Board, which has the authority to select projects for federal funding.

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NASHVILLE AREA
Metropolitan Planning Organization

MEDIA RELEASE

DRAFT 2035 Regional Transportation Plan Up for Public & Stakeholder Review

Short, mid, & long-range multi-modal investments to help foster livability, prosperity, sustainability & diversity

FOR IMMEDIATE RELEASE
May 26, 2010

Media Contact: Mary Beth Ikard, APR
615.880.2452 | ikard@NashvilleMPO.org

NASHVILLE, Tenn. – The Nashville Area MPO today unveiled the first major iteration of its 2035 Regional Transportation Plan, kicking off the next phase of a rigorous program for public involvement over the coming months. The MPO offered a direction for multi-modal transportation policy improvements –including a bold new vision for regional mass transit– to an audience of approximately 500 public and private sector leaders at the second annual *Power of 10: Convening the Region* summit, a collaborative forum to establish regional consensus on a sustainable future for Middle Tennessee.

"Today's unveiling of the MPO's draft plan initiatives represents another critical step in our regional efforts to plan long-term for transportation needs," said Nashville Mayor Karl Dean, who also serves as MPO chairman. "The development of the plan has been bolstered by new partnerships among public and private sector organizations including the Mayors Caucus, the Transit Alliance of Middle Tennessee, area chambers of commerce, Cumberland Region Tomorrow, the Greater Nashville Regional Council, Transit Now and others. The mayors that serve on the MPO board are now looking to the input of Middle Tennesseans as we prepare to adopt an updated regional transportation plan in October. There are important decisions to be made, and everyone has a voice and a role to play."

Through the year 2035, MPO plans and programs will draw on four broad **principles**, or strategies for future growth:

- **Livability –** Enhance quality-of-life by supporting increased opportunities for affordable housing, education, jobs, recreation, and civic involvement without increasing the burden on citizens to enjoy their community.
- **Prosperity –** Contribute to regional economic well-being through transportation solutions that reduce the cost of living and doing business, increase access to education, jobs and amenities, and attract new investment.
- **Sustainability –** Support growth and prosperity without sacrificing public health, natural and socio-cultural resources, or the financial stability of this or future generations.
- **Diversity –** Recognize the multitude of needs and variety of perspectives and backgrounds of Middle Tennessee's citizenry by promoting a range of transportation choices designed with sensitivity to the desired context.

The draft plan primarily rests on a "fix it first" mentality, with priority given to preservation and maintenance of existing infrastructure to protect prior investments and improve upon their safety, security, and reliability. Strategies for **system expansion**, or policy direction for **new investments**, are currently up for consideration and discussion: whether to continue the business-as-usual, traditional approach to adding system capacity – primarily through road widening and expansion. Or, to take a different course than that of previous decades, broadening support for multi-modal enhancements in and around residential and employment centers, giving Middle Tennesseans more mobility choices by improving walking, biking and transit facilities, while reducing the overall burden on roadway infrastructure.

The ten-county region is projected to grow by just under one million new residents by 2035. This growth has significant implications for congestion and commute times, as well as other quality-of-life factors such as access to parks and green space, preservation of agricultural and historic properties, air quality, affordable housing, and health.

"A modern, efficient transportation system that supports mobility in *all* modes –from highways to public transportation to bike lanes– is critical for fostering economic expansion and competitiveness, without forfeiting our natural beauty, cultural and historical heritage, and other revered qualities unique to Middle Tennessee," said Michael Skipper, executive director of the Nashville Area MPO. "The plan's guiding principles of livability, prosperity, sustainability, and diversity can provide a collective vision for the way our region will live, work, and play over the coming decades."

The federal government mandates that MPOs plan 20+ years into the future, and account for all regionally-significant road, transit, freight, ITS, walking and biking projects in that plan, regardless of how they're funded. The 2035 plan includes new, more holistic **scoring factors** (ADDENDUM), used by the MPO's multi-modal planners to evaluate all incoming transportation project ideas. These criteria proffer "big picture" consideration for –not only the overriding concern of congestion management– but *more* mobility options for citizens (including transit, walking and biking), freight and goods movement, safety and security, system preservation, sustainable land use practices, health and the environment, and support for and consistency with local plans.

This update to the long-range plan arrives at an ideal moment in Middle Tennessee's history, as the region is now much better positioned to pay for transportation projects that support a higher quality-of-life, due to dramatic changes in federal transportation policies under the Obama administration. To qualify for federal funds, major transit projects must include a focus on **livability** issues – in addition to just cost/time savings, which were the primary criteria under the Bush administration. The federal government seeks to stimulate **comprehensive regional and community planning** efforts that integrate transportation, housing, and other critical investments, helping communities nationwide to make better, coordinated, higher-performing infrastructure investments.

The Nashville Area MPO's draft 2035 plan emphasizes thoughtful, transparent **financial stewardship** by ensuring that transportation improvements meet these regional goals, while encouraging cooperation and coordinated decision-making among Middle Tennessee counties and municipalities. Working with mayors and other regional community, business and civic leaders, the MPO will soon post a schedule for **public and stakeholder meetings** on the plan's content, so that the vision and project list ultimately submitted to the federal government this fall will adequately and accurately reflect the desires of the people who live, work, and play in Middle Tennessee.

"This plan serves as a challenge to Middle Tennessee's leaders, decision-makers, and citizens to reach consensus on new, innovative and self-sufficient means to fund critical infrastructure investments," said Ed Cole, executive director of the Transit Alliance of Middle Tennessee. "The vision for mass transit expansion unveiled in the draft plan today offers us a blueprint for our transportation network that will not only improve our standard of living and protect the environment, but also allow us to viably compete with other urbanized regions for jobs and economic growth."

Developed with input and guidance from the public, the plan aims to connect people in cities, suburbs and rural areas of the ten-county region, coordinate planning efforts at the national, state, regional and local levels, and offer some means of cohesive consideration for land use, transportation, the economy, and the environment.

Regional goals for transportation investments over the next 25 years include: system preservation and maintenance; managing congestion to keep people and goods moving; encouraging quality growth and sustainable land development practices; protecting public health and the environment; offering meaningful transportation choices for a diverse population, including the aging; and ongoing support for regional economic competitiveness.

Documents, maps, schedules for public meetings, and other relevant information can be found online at a website dedicated exclusively to tracking the 2035 plan's progress: www.nashvillempo.org/plans_programs/rtp.

About the Nashville Area MPO:
The Nashville Area MPO is the federally-designated transportation planning agency for over 2800 sq. mi. and more than 1.5 million people throughout Davidson, Rutherford, Sumner, Williamson, Wilson, and parts of Maury and Robertson counties. Serving as a regional partnership among the U.S. DOT, Tennessee DOT, local elected leadership, local planning and public works directors, the business community, and citizens across the five-plus county planning area, the MPO leads in the development of the region's long-range transportation plan and short-range Transportation Improvement Program, and contributes to ongoing conversations about issues such as land use, economic development, climate change and the environment, safety and security, and health.

PUBLIC NOTICE – PLAN REVIEW AND ADOPTION HEARINGS

PUBLIC NOTICE

The Nashville Area Metropolitan Planning Organization (MPO) is seeking public comments on the proposed 2035 Regional Transportation Plan and the proposed FY 2011-2015 Transportation Improvement Program.

The MPO is the public agency responsible for long-range transportation planning and short-range transportation programming for Davidson, Rutherford, Sumner, Williamson, Wilson and parts of Maury and Robertson Counties. The **2035 Regional Transportation Plan (RTP)** is a federally-required document that contains proposed policies, programs, and transportation improvement projects for the next 25-years.

The **Transportation Improvement Program (TIP)** is a federally-required document that serves as the short-range component of the regional plan, and identifies specific grant funding for transportation projects proposed for fiscal years 2011 through 2015. The proposed TIP also serves as the Program of Projects (POP) for proposed federally funded projects for the Regional Transportation Authority (RTA), Nashville Metropolitan Transit Authority (MTA), the Franklin Transit Authority, and the Murfreesboro Rover as well as any proposed state and local funded projects. The development of the TIP satisfies the federal public participation requirements for the POP.

Both draft documents are available for public review and comment at all public libraries in the 5-county area, as well as Spring Hill and Springfield and on the MPO website www.nashvillempo.org. Comments received for either document by December 13, 2010 will be considered by the MPO Executive Board prior to final approval. The first public hearing will be on **Wednesday, December 1, 2010 at 10:30 a.m.** at 1417 Murfreesboro Rd. (Genesco Park), Nashville in the Green Hills Conference Room**.** The final hearing will be held **Wednesday, December 15, 2010 at 9:00 a.m.** at the Music City Central, 400 Charlotte Ave., Nashville in the Public Meeting Room

For more information, call 862-7204 or visit our website at **www.nashvillempo.org**

The Planning Department does not discriminate on the basis of race, color, national origin, gender, gender identity, sexual orientation, age, religion, creed or disability in admission to, access to, or operations of its programs, services, or activities, or in its hiring or employment practices. For ADA inquiries, contact Josie Bass, ADA Compliance Coordinator, at 862-7150 or e-mail her at **josie.bass@nashville.gov.** For Title VI inquiries, contact Shirley Sims-Saldana or Denise Hopgood of Human Relations at 880-3370. For all employment-related inquiries, contact Ron Deardoff at 862-6640.

NASHVILLE AREA LIBRARY LIST

NASHVILLE-DAVIDSON COUNTY

Bellevue
Ben West (Main)
Bordeaux
Donelson
East
Edgehill
Goodlettsville
Green Hills
Hadley Park
Inglewood
Looby
Madison
North
Old Hickory
Pruitt
Richland Park
Southeast
Thompson Lane
Watkins Park

ROBERTSON COUNTY

Springfield Public Library

RUTHERFORD COUNTY

Eagleville Bicentennial
LaVergne Public Library
Linebaugh (Murfreesboro)
Smyrna Public Library

SUMNER COUNTY

Edward Ward Carmack – Sumner County
The Martin Curtis – Hendersonville
Elmer Hinton Memorial – Portland
Westmoreland Public Library
White House Inn Library

WILLIAMSON COUNTY

Brentwood Library
Williamson County Public Library
Liepers Fork Public Library
Nolensville Public Library
Fairview Public Library
Bethesda Public Library (Thompson Station)
Spring Hill Public Library

WILSON COUNTY

Harvey Freeman (Mt. Juliet)
Lebanon-Wilson County
Watertown Library

PUBLIC WORKSHOPS ANNOUNCEMENTS

NASHVILLE AREA
Metropolitan Planning Organization

MEDIA ADVISORY

Wilson County Mayors to Host *Community Conversation* with Area Citizens on Landmark Regional Transportation Plan

FOR IMMEDIATE RELEASE
Nov. 1, 2010

Media Contact: Mary Beth Ikard, APR
615.880.2452 | ikard@NashvilleMPO.org

LEBANON, Tenn.—Wilson County's political leaders –Mayors Craighead, Elam, and Hutto– in partnership with the Nashville Area Metropolitan Planning Organization, invite their constituents to learn more about major regional transportation planning efforts and important changes to public policy therein, at a "Community Conversation" next week. Members of the public will have the opportunity to hear an in-depth presentation and submit questions and comments on proposed infrastructure investments to support the overall livability, sustainability, prosperity and diversity of the region, as well as that of Wilson County.

WHO: Lebanon Mayor Philip Craighead, Mt. Juliet Mayor Linda Elam, County Mayor Randall Hutto; city & county planners; transportation planning professionals with Nashville Area MPO; Wilson County citizens, business/community leaders; representatives from the Transit Alliance of Middle Tennessee.

WHAT: *Community Conversation* led by local political leaders and planning experts on short, mid, long-term transportation improvements for both Wilson County and the Middle Tennessee region as a whole.

WHEN: Tues., Nov. 9th, 2010; 5:30 – 7:45 p.m.

⇒ 5:30-6:15 p.m. – "Open House" with refreshments served; 2035 Plan visuals on display for public consumption and conversation with MPO planning staff.

⇒ 6:16-7:45 p.m. – Presentation of [draft] 2035 Regional Transportation Plan (major policy initiatives) to Wilson Co. residents, with commentary from Mayors Craighead, Elam and Hutto, then Q&A with audience.

WHERE: Lebanon **Town Meeting Hall**, 200 Castle Heights Ave. N, Lebanon, Tenn. 37087
Those who are unable to attend in-person are invited to join the conversation on the Internet. Various forms of media feeds will be available both during & after the event via the Transit Alliance of Middle Tennessee's media page: ***www.thetransitalliance.org/in-the-media***

WHY: Governed by mayors & county executives from five-plus Middle Tennessee counties, the Nashville Area MPO is currently **finalizing** a major update to its multi-billion dollar regional transportation plan that includes a vast scope of **federally-funded transportation projects**. The MPO sets aside money for projects that support **significant policy initiatives** such as mass transit –including modernized options for Middle Tennessee such as streetcar or Bus Rapid Transit– as well as walkable/bikeable communities, and roadway technologies to keep people & goods moving through the region.

The plan depicts an **innovative vision** for regional transportation, but must also establish a path to realistic financial feasibility. As fuel prices rise, and demand for energy independence scenarios continue, what happens in the transportation sector is critical to everything from regional quality-of-life, to business and job recruitment and retention. This region is also expected to grow by another one million people over the next two decades; the plan presented on Nov. 9th attempts to address how those people might commute or use our transportation system to carry out their daily activities.

NASHVILLE AREA
Metropolitan Planning Organization

MEDIA ADVISORY

Rutherford County Mayors to Host *Community Conversation* with Area Citizens on Landmark Regional Transportation Plan

FOR IMMEDIATE RELEASE
Nov. 8, 2010

Media Contact: Mary Beth Ikard, APR
615.880.2452 | ikard@NashvilleMPO.org

MURFREESBORO, Tenn.—Rutherford County's political leaders –Mayors Bragg, Burgess, Dover, Erwin, & Tune– in partnership with the Nashville Area Metropolitan Planning Organization, invite their constituents to learn more about major regional transportation planning efforts and important changes to public policy therein, at a "Community Conversation" next week. Members of the public will have the opportunity to hear an in-depth presentation and submit questions and comments on proposed infrastructure investments to support the overall livability, sustainability, prosperity and diversity of the region, as well as that of Rutherford County.

WHO: Murfreesboro Mayor Tommy Bragg, Rutherford County Mayor Ernest Burgess, Smyrna Mayor Tony Dover, LaVergne Mayor Ronnie Erwin, Eagleville Mayor Sam Tune; city & county planners; transportation planning professionals with the Nashville Area MPO; Rutherford County citizens, business & community leaders; representative from the Transit Alliance of Middle Tennessee.

WHAT: *Community Conversation* led by local political leaders and planning experts on short, mid, long-term transportation improvements for both Rutherford County & the Middle Tennessee region as a whole.

WHEN: Tues., Nov. 16th, 2010; 5:00 – 7:00 p.m.

- ⇒ 5:00-5:30 p.m. – "Open House" with refreshments served; 2035 Plan visuals on display for public consumption and conversation with MPO planning staff.
- ⇒ 5:30-7:00 p.m. – Presentation of 2035 Regional Transportation Plan (major policy initiatives) to Rutherford Co. residents, with commentary from Mayors Bragg, Burgess, Dover, Erwin and Tune, followed by Q&A.

WHERE: Smyrna City Hall, **Council Chambers**, 315 S. Lowry Street; Smyrna, Tenn. 37167

WHY: Governed by mayors & county executives from five-plus Middle Tennessee counties, the Nashville Area MPO is currently **finalizing** a major update to its multi-billion dollar regional transportation plan that includes a vast scope of **federally-funded transportation projects**. The MPO sets aside money for projects that support **significant policy initiatives** such as mass transit –including modernized options for Middle Tennessee such as streetcar or Bus Rapid Transit– as well as walkable/bikeable communities, and roadway technologies to keep people & goods moving through the region.

The plan depicts an **innovative vision** for regional transportation, but must also establish a path to realistic financial feasibility. As fuel prices rise, and demand for energy independence scenarios continue, what happens in the transportation sector is critical to everything from regional quality-of-life, to business and job recruitment and retention. This region is also expected to grow by another one million people over the next two decades; the plan presented on Nov. 9th attempts to address how those people might commute or use our transportation system to carry out their daily activities.

NASHVILLE AREA
Metropolitan Planning Organization

MEDIA ADVISORY

Nashville Mayor Karl Dean to Host *Community Conversation* with Area Citizens on Landmark Regional Transportation Plan

FOR IMMEDIATE RELEASE
Nov. 23, 2010

Media Contact: Mary Beth Ikard, APR
615.880.2452 | ikard@NashvilleMPO.org

NASHVILLE, Tenn. — Mayor Karl Dean, in partnership with the Nashville Area Metropolitan Planning Organization, invites Davidson County residents to learn more about major regional transportation planning efforts and important changes to public policy therein, at a "Community Conversation" on Nov. 29. Members of the public will have the opportunity to hear an in-depth presentation and submit questions and comments on proposed infrastructure investments to support the overall livability, sustainability, prosperity and diversity of the region, as well as that of Metro-Davidson County.

WHO: Metropolitan Government of Nashville Mayor Karl Dean; city and county planners; transportation planning professionals with Nashville Area MPO; Nashville-area citizens, business and community leaders; representatives from the Transit Alliance of Middle Tennessee.

WHAT: *Community Conversation* led by Nashville's mayor and planning experts on short, mid, long-term transportation improvements for both Davidson County and the Middle Tennessee region as a whole.

WHEN: Mon., Nov. 29th, 2010; 5:00 – 7:00 p.m.

- ⇒ 5:00-5:30 p.m. – "Open House" with refreshments served; 2035 Plan visuals on display for public consumption and conversation with MPO planning staff.
- ⇒ 5:30-7:00 p.m. – Presentation of 2035 Regional Transportation Plan (major policy initiatives) to Davidson County residents, with commentary from Mayor Karl Dean, followed by Q&A.

WHERE: **Adventure Science Center** – 800 Fort Negley Boulevard, Nashville 37203
Those who are unable to attend in-person are invited to join the conversation on the Internet. Various forms of media feeds will be available both during & after the event via the Transit Alliance of Middle Tennessee's media page: ***www.thetransitalliance.org/in-the-media***

WHY: Governed by mayors & county executives from five-plus Middle Tennessee counties, the Nashville Area MPO is currently **finalizing** a major update to its multi-billion dollar regional transportation plan that includes a vast scope of **federally-funded transportation projects**. The MPO sets aside money for projects that support **significant policy initiatives** such as mass transit –including modernized options for Middle Tennessee such as streetcar or Bus Rapid Transit– as well as walkable/bikeable communities, and roadway technologies to keep people & goods moving through the region.

The plan depicts an **innovative vision** for regional transportation, but must also establish a path to realistic financial feasibility. As fuel prices rise, and demand for energy independence scenarios continue, what happens in the transportation sector is critical to everything from regional quality-of-life, to business and job recruitment and retention. This region is also expected to grow by another one million people over the next two decades; the plan presented on Nov. 29th attempts to address how those people might commute or use our transportation system to carry out their daily activities.

NASHVILLE AREA
Metropolitan Planning Organization

MEDIA ADVISORY

Williamson County Mayors to Host *Community Conversation* with Area Citizens on Landmark Regional Transportation Plan

FOR IMMEDIATE RELEASE
Nov. 15, 2010

Media Contact: Mary Beth Ikard, APR
615.880.2452 | ikard@NashvilleMPO.org

FRANKLIN, Tenn.—Williamson County's political leaders – Mayors Anderson, Crossley, Dinwiddie, and Schroer– in partnership with the Nashville Area Metropolitan Planning Organization, invite their constituents to learn more about major regional transportation planning efforts and important changes to public policy therein, at a "Community Conversation" next week. Members of the public will have the opportunity to hear an in-depth presentation and submit questions and comments on proposed infrastructure investments to support the overall livability, sustainability, prosperity and diversity of the region, as well as that of Williamson County.

WHO: Williamson County Mayor Rogers Anderson, Brentwood Mayor Betsy Crossley, Spring Hill Mayor Michael Dinwiddie, and Franklin Mayor John Schroer; city & county planners; transportation planning professionals with Nashville Area MPO; Williamson County citizens, business & community leaders; representatives from the Transit Alliance of Middle Tennessee.

WHAT: *Community Conversation* led by local political leaders and planning experts on short, mid, long-term transportation improvements for both Williamson County & the Middle Tennessee region as a whole.

WHEN: Tues., Nov. 30th, 2010; 5:00 – 7:00 p.m.

- ⇒ 5:00-5:30 p.m. – "Open House" with refreshments served; 2035 Plan visuals on display for public consumption and conversation with MPO planning staff.
- ⇒ 5:30-7:00 p.m. – Presentation of 2035 Regional Transportation Plan (major policy initiatives) to Williamson Co. residents, with commentary from Mayors Anderson, Crossley, Dinwiddie, & Schroer, followed by Q&A.

WHERE: **Community Room** – Franklin Police Department, 900 Columbia Ave., Franklin 37064
Those who are unable to attend in-person are invited to join the conversation on the Internet. Various forms of media feeds will be available both during & after the event via the Transit Alliance of Middle Tennessee's media page: ***www.thetransitalliance.org/in-the-media***

WHY: Governed by mayors & county executives from five-plus Middle Tennessee counties, the Nashville Area MPO is currently **finalizing** a major update to its multi-billion dollar regional transportation plan that includes a vast scope of **federally-funded transportation projects**. The MPO sets aside money for projects that support **significant policy initiatives** such as mass transit –including modernized options for Middle Tennessee such as streetcar or Bus Rapid Transit– as well as walkable/bikeable communities, and roadway technologies to keep people & goods moving through the region.

The plan depicts an **innovative vision** for regional transportation, but must also establish a path to realistic financial feasibility. As fuel prices rise, and demand for energy independence scenarios continue, what happens in the transportation sector is critical to everything from regional quality-of-life, to business and job recruitment and retention. This region is also expected to grow by another one million people over the next two decades; the plan presented on Nov. 30th attempts to address how those people might commute or use our transportation system to carry out their daily activities.

NASHVILLE AREA
Metropolitan Planning Organization

MEDIA ADVISORY

Sumner County Mayors to Host *Community Conversation* with Area Citizens on Landmark Regional Transportation Plan

FOR IMMEDIATE RELEASE
Dec. 1, 2010

Media Contact: Mary Beth Ikard, APR
615.880.2452 | ikard@NashvilleMPO.org

GALLATIN, Tenn.— Sumner County's political leaders –Mayors Foster, Graves, Manning, Wilber, and County Executive Holt– in partnership with the Nashville Area Metropolitan Planning Organization, invite their constituents to learn more about major regional transportation planning efforts and important changes to public policy therein, at a "Community Conversation" next week. Members of the public will have the opportunity to hear an in-depth presentation and submit questions and comments on proposed infrastructure investments to support the overall livability, sustainability, prosperity and diversity of the region, as well as that of Sumner County.

WHO: Hendersonville Mayor Scott Foster, Gallatin Mayor (and Middle Tennessee Mayors Caucus chair) Jo Ann Graves, Sumner County Executive Anthony Holt, Goodlettsville Mayor Gary Manning, Portland Mayor Kenneth Wilber; city & county planners; transportation planning professionals with Nashville Area MPO; Sumner County citizens, business & community leaders; Ed Cole with the Transit Alliance of Middle Tennessee. Other Sumner County municipalities represented by: Westmoreland Mayor Cynthia Templeton, Millersville Mayor Dan Toole, and White House Mayor John Decker.

WHAT: *Community Conversation* led by local political leaders and planning experts on short, mid, long-term transportation improvements for both Sumner County & the Middle Tennessee region as a whole.

WHEN: Wed., Dec. 8th, 2010; 5:00 – 7:00 p.m.

- ⇒ 5:00-5:30 p.m. – "Open House" with refreshments served; 2035 Plan visuals on display for public consumption and conversation with MPO planning staff.
- ⇒ 5:30-7:00 p.m. – Presentation of 2035 Regional Transportation Plan (major policy initiatives) to Sumner Co. residents, with commentary from Mayors Foster, Graves, Holt, Manning Wilber & others, followed by Q&A.

WHERE: **Commission Chambers**–County Administration Building, 355 N. Belvedere Dr, Gallatin 37066
Those who are unable to attend in-person are invited to join the conversation on the Internet. Various forms of media feeds will be available both during & after the event via the Transit Alliance of Middle Tennessee's media page: ***www.thetransitalliance.org/in-the-media***

WHY: Governed by mayors & county executives from five-plus Middle Tennessee counties, the Nashville Area MPO is currently **finalizing** a major update to its multi-billion dollar regional transportation plan that includes a vast scope of **federally-funded transportation projects**. The MPO sets aside money for projects that support **significant policy initiatives** such as mass transit –including modernized options for Middle Tennessee such as streetcar or Bus Rapid Transit– as well as walkable/bikeable communities, and roadway technologies to keep people & goods moving through the region.

The plan depicts an **innovative vision** for regional transportation, but must also establish a path to realistic financial feasibility. As fuel prices rise, and demand for energy independence scenarios continue, what happens in the transportation sector is critical to everything from regional quality-of-life, to business and job recruitment and retention. This region is also expected to grow by another one million people over the next two decades; the plan presented on Dec. 8th attempts to address how those people might commute or use our transportation system to carry out their daily activities.

STAKEHOLDER COORDINATION LETTER

NASHVILLE AREA
Metropolitan Planning Organization

November 8, 2010

Re: Draft Nashville Area 2035 Regional Transportation Plan – Request for Review and Comment from Partner Agencies and Regional Stakeholder Organizations.

Dear Agency and/or Stakeholder:

The Nashville Area Metropolitan Planning Organization (MPO), the regional transportation planning agency for greater Nashville region including the counties of Davidson, Rutherford, Sumner, Williamson, and Wilson and portions of Maury and Robertson, has recently prepared the draft **2035 Regional Transportation Plan**. The plan provides a long-term vision for transportation infrastructure and identifies federal funding for a mix of improvements to the region's network of roadways, transit services, and walking and bicycling facilities.

As part of the planning process a special webpage has been established on the MPO's website to allow for your organization's review and comment of these draft documents:

http://www.NasvhilleMPO.org\2035

The MPO is seeking input from various federal, state, and local agencies and organizations having an interest in growth, development, transportation, safety, mobility, economic development, conservation, and/or other aspects related to the MPO's transportation planning process.

The MPO is requesting your organization's comments on the draft documents by close of business on December 12, 2010. Comments received for either document by December 13, 2010 will be considered by the MPO Executive Board prior to final approval. The first public hearing will be on **Wednesday, December 1, 2010 at 10:30 a.m.** at 1417 Murfreesboro Rd., Nashville**.** The final hearing will be held **Wednesday, December 15, 2010 at 9:00 a.m.** at the Music City Central, 400 Charlotte Ave., Nashville, in the Public Meeting Room.

We thank you for your continued support of a more livable and sustainable Middle Tennessee. We look forward to working with you in the future as we continue to develop plans for tomorrow.

Best,

Michael Skipper, AICP
Executive Director

SUMMARY OF PUBLIC COMMENTS

Summary of Public Comments

Draft 2035 Regional Transportation Plan and
FYs 2011-2015 Transportation Improvement Program

The full text of each comment is available by request at contact@nashvillempo.org or (615) 862-7204.

Comment #1: Jamie Melton (Franklin, TN)

Nature of comments: Requested that Old Hillsboro Road, Pinewood Road, Southall Road, and Boyd Mille Pike be designated as bike routes in Williamson County.

Comment #2: Bell Newton (Nashville, TN)

Nature of comments: Expressed opposition to the proposed Bosley Springs Connector road in the Harding Town Center area of Davidson County

Comment #3: Bill C. Duncan (Gallatin, TN)

Nature of comments: Expressed three concerns. The first is with an unfunded project which would connect Hatten Track Road (planned) to Green Lea Blvd. He feels this road is unnecessary. The second is ID# 1052-116, which he feels should be widened to 5 lanes instead of 3). The third is with respect to the amount of funding being spent on transportation over the next 25 years given the economic recession. He expressed a concern that too much taxes for transportation improvements could add to the long-term deficit.

Comment #4: Susan Wilkins and Evelyn Mitchell on behalf of other unnamed users of the Music City Star East Corridor Commuter Rail Service.

Nature of comments: Expressed desire for new shuttle service to connect to St. Thomas, Baptist, Centennial to Riverfront Station and new bus service to connect residents to the Lebanon, Martha, and Mt. Juliet stations. Expressed desire to see increased train service throughout the day, dedicated bus lanes to for downtown service from Riverfront, and increased information to passengers via text alerts/ electronic signs.

Comment #5: Richard Daigle (Gallatin, TN)

Nature of comments: Would like to see increased service along the 92X (Gallatin Express). Expressed interest in having more funding for transit made available.

Comment #6: Gilbert Smith (Nashville, TN)

Nature of comments: Expressed a desire to see solutions that help keep local traffic off the interstates. Pointed out that people drive to Nashville for reasons other than “to work” (e.g., entertainment).

Comment #7: Dave Bordenkircher (Nashville, TN)

Nature of comments: Expressed opposition to the widening of any interstates in the Nashville Area MPO area.

Comment #8: Kenya Stevens (Nashville, TN)

Nature of comments: Expressed a desire to continued improvements to the efficiency and appearance/ cleanliness of the Nashville MTA. Expressed an appreciation for regional planning efforts.

Comment #9: Ben Freeland (Nashville, TN)

Nature of comments: Expressed an interest in seeing Hickory Hollow included in the S.E. Corridor plan.

Comment #10: Christine Coldiron (Nashville, TN)

Nature of comments: Expressed a desire to see a walking and bicycling facility over/ under or through the 37th Avenue South bridge.

Comment #11: Joseph Reed, Jr. (Hermitage, TN)

Nature of comments: Expressed an opinion that a regional transportation system is "badly" needed in middle Tennessee area and that a monorail system would be a convenient way to get around while keeping protecting the environment.

Comment #12: Kathy Webber (Franklin, TN)

Nature of comments: Expressed a concern that bridges be properly improved and maintained due to the potential of a major disaster (e.g., earthquake along the New Madrid fault). Old bridges could collapse and hinder rescue and recovery efforts.

Comment #13: Ed Cole (Nashville, TN) on behalf of the Transit Alliance of Middle Tennessee

Nature of comments: Expressed support for the advancement of mass transit in Middle Tennessee as part of an overall comprehensive transportation plan.

Comment #13: Jay Everett (Wilson County, TN)

Nature of comments: Expressed support for the MPO's recent planning efforts and commended the Board for the inclusion of a bold new vision for mass transit.

PLAN ADOPTION PRESS RELEASE

NASHVILLE AREA
Metropolitan Planning Organization

MEDIA RELEASE

MAYORS ADOPT NEW TRANSPORTATION PLAN FOR MIDDLE TENNESSEE

2035 Plan Emphasizes Community Revitalization, Economic Development, Quality-of-Life, Responsible Land Use, and Modernization of the Region's Transportation System

FOR IMMEDIATE RELEASE
December 15, 2010

Media Contact: Mary Beth Ikard, APR
615.880.2452 | ikard@NashvilleMPO.org

NASHVILLE— Local elected officials made history today when the Executive Board for the Nashville Area Metropolitan Planning Organization adopted a new Regional Transportation Plan—a significant document that will guide the allocation of nearly $6 billion in federal, state, and local funds throughout a seven-county area over the next 25 years.

In preparing this Plan over the past three years, the MPO –which is comprised of political leadership and planning experts from its city and county member jurisdictions across the region– has listened to thousands of citizens and business leaders, looked at what other metropolitan areas throughout the nation are doing to improve their transportation systems, and conducted a detailed trends analysis of where Middle Tennessee is headed in terms of population growth, traffic congestion, and land development patterns.

Through the year 2035, MPO plans and programs will draw on four broad **principles**, or strategies for future growth:

- **Livability**– Enhance quality-of-life by supporting increased opportunities for affordable housing, education, jobs, recreation, and civic involvement without increasing the burden on citizens to enjoy their community;
- **Prosperity**– Contribute to regional economic well-being through transportation solutions that reduce the cost of living and doing business, increase access to education, jobs and amenities, and attract new investment;
- **Sustainability**– Support growth and prosperity without sacrificing public health, natural and socio-cultural resources, or the financial stability of this or future generations;
- **Diversity**– Recognize the multitude of needs and variety of perspectives and backgrounds of Middle Tennessee's citizenry by promoting a range of transportation choices designed with sensitivity to the desired context.

"The MPO mayors, working in partnership with their constituents, the business community, state and local agencies, transit authorities, and planning experts from across the region, have accomplished something remarkable in today's adoption of this Plan," said MPO Director Michael Skipper. "We're now better prepared to absorb the population growth that accompanies continued efforts to grow our local economies –bringing us new jobs and additional prosperity– without sacrificing Middle Tennessee as we know it today. Diversifying our transportation investment strategies –to more *seriously* support alternative modes, such as transit, walking and biking– will help us to conserve open space and fuel, manage congestion, and connect *people* with the *places* they want to go: work, school, shopping, or entertainment."

Resting on these guiding principles, transportation projects selected for inclusion in the 2035 Regional Transportation fall under three major policy initiatives:

1. **A BOLD NEW VISION FOR MASS TRANSIT.** *Under this policy initiative, the Plan provides:*
   - A first-of-its-kind vision for transit services [MAP] across Middle Tennessee's ten counties to communicate the region's intentions for the long-term;
   - Funding for upcoming corridor & circulator studies to layout more specific strategies to implement the vision;
   - A call to re-organize the existing RTA to take advantage of new legislation;

- A call to establish dedicated funding for transit to improve operational capacity of existing agencies, and to help build out the vision;
- $950 million in federal transit funds for the continued maintenance and modest expansion of urban transit, ridesharing, and vanpool services;
- $30 million for continued support for the JARC and New Freedom programs;
- **Ten percent** of future funding for urban roadway projects flexed to support transit projects.

2. **INCREASED SUPPORT FOR ACTIVE TRANSPORTATION[1] AND WALKABLE COMMUNITIES.**
   Under this policy initiative, the Plan provides:
   - A regional, comprehensive vision for future walking and bicycling facilities–
     - ✓ Infrastructure recommendations include expansion of greenways, regional network of 1100+ miles of on-road bicycle accommodations, and the creation of sidewalks on all major thoroughfares;
   - Guidance for roadway design standards to accommodate non-motorized modes of transportation;
   - Support for ongoing education of local law enforcement & the public to increase safety of walking & cycling;
   - A new emphasis on accommodations for non-motorized modes, with:
     - ✓ 75 percent of proposed roadway projects submitted by MPO member jurisdictions having included a sidewalk, bicycle lane, or shared-use lane (due to new MPO project scoring criteria)
     - ✓ **15 percent** of future funding for urban roadway projects flexed to support active transportation facilities
     - ✓ Guidance for utilizing other available grants such as Safe Routes to School and Transportation Enhancements.

3. **PRESERVATION & ENHANCEMENT OF STRATEGIC ROADWAY CORRIDORS**.
   Under this policy initiative, the Plan provides:
   - A regional, comprehensive approach to long-term transportation programming;
   - Guidance for local implementation of "complete streets" policies;
   - More than $3.2 Billion in Roadway Projects:
     - ✓ $2.7 billion for roadway widening
     - ✓ $291 million for interchanges/ intersections
     - ✓ $100 million for new roadways
     - ✓ $85 million for roadway reconstructions
     - ✓ $24 million for Intelligent Transportation Systems (**ITS**) & other enhancements, with **five percent** of all future urban roadway funds flexed to improve the efficiency of the transportation system through innovative management and operations upgrades (technology etc).
   - **Seventy percent** of the MPO's future allocation of urban roadway funding will be awarded to projects that **expand the <u>multi-modal</u> capacity** of the regional roadway system, in order to manage congestion, accommodate a growing population, and address goals for increased safety and security.

The federal government mandates that the nation's MPOs plan 20+ years into the future, and account for all regionally-significant road, transit, freight, ITS, walking and biking projects in that plan, **regardless of how they're funded**. The 2035 Plan provides a balanced, financially-feasible set of transportation improvements that can be constructed or implemented over the next 25 years with nearly $6 billion in expected federal, state, and local revenues. Proposed improvements are intended to help alleviate traffic congestion, provide more transportation choices, improve system operations, and meet the region's air quality goals over the next quarter century.

The cost of the full set of Middle Tennessee's transportation needs, as well as full funding of the Regional Transit Vision laid out in the Plan, is likely double or triple anticipated revenues. As such, the Plan presents a discussion of illustrative projects, where funding has not yet been identified, as well as other strategies that could be implemented to **reduce the gap** between what the region can *afford*, and what it actually needs.

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[1] '**Active transportation**' refers to any self-propelled form of travel (ex., walking, bicycling, in-line skating, using a wheelchair, riding a skateboard).

The establishment of a vision, however, is a critical step toward the region being awarded competitive federal funds. To qualify for competitive **transit** infrastructure funds, the region must next begin exploration of how to address the present lack of dedicated local or regional funding for mass transit – funding that would ensure stability in the operations of *existing* (and proposed) levels of transit service, and enable the region to compete against other U.S. metro areas for grant dollars to build modern transit infrastructure in the future, when Middle Tennessee is expected to see *significant* population growth and demographic shifts (increased diversity, aging Baby Boomers, more young professionals).

Remaining stagnant in our transportation planning efforts will prove to be enormously costly: the Texas Transportation Institute estimates the cost of congestion to the metro-Nashville area, in lost fuel and productive time, could be as much as $10.6 billion between now and 2035.

The Plan document in its entirety, maps, project lists, and other relevant information can be found online at NashvilleMPO.org/2035.

PHOTO CAPTION: Nashville Mayor Karl Dean and MPO Director Michael Skipper (seated right to left, in front) with the board of directors for the Regional Transit Authority at today's adoption hearing for the 2035 Regional Transportation Plan, Music City Central, downtown Nashville.

About the Nashville Area MPO:

The Nashville Area MPO is the federally-designated transportation planning agency for over 2800 sq. mi. and more than 1.5 million people throughout Davidson, Rutherford, Sumner, Williamson, Wilson, and parts of Maury and Robertson counties. Serving as a regional partnership among the U.S. DOT, Tennessee DOT, local elected leadership, local planning and public works directors, the business community, and citizens across the five-plus county planning area, the MPO leads in the development of the region's long-range transportation plan and short-range Transportation Improvement Program, and contributes to ongoing conversations about issues such as land use, economic development, climate change and the environment, safety and security, and health. For more information, visit our website at NashvilleMPO.org; find us at facebook.com/NashvilleMPO or on Twitter @NashvilleMPO.

Appendix D. Projects with Potential Impacts

This appendix provides a list of projects that are proposed in one of the three realms of concern that warrant further evaluation and/or monitoring during plan implementation:

- Congested Corridors
- Title VI or Environmental Justice Areas
- Areas of Environmental Concern

Cost-Feasible Roadway Projects on Congested Corridors

						PROPOSED IMPROVEMENTS		
2035ID	COUNTY	LEAD AGENCY	PROJECT NAME	PLANNING HORIZON	CONGESTED HORIZON	Sidewalks	Bicycle Lanes	ITS
1011-182	Davidson	Metro Public Works	Gateway Blvd Extension	2015	2008	Y	Y	
1012-229	Davidson	TDOT	I-65 N Widening with HOV Lanes	2015	2008			
1012-239	Davidson	TDOT	I-440 Eastbound Widening	2015	2008			
1014-259	Davidson	Metro Public Works, Oak Hill	Harding Place, Battery Lane intersection improvements	2015	2008	Y		
1014-260	Davidson	Metro Public Works	Jefferson Street Intersections	2015	2015	Y		Y
1014-265	Davidson	Metro Public Works	3rd Avenue and Union Street	2015	2008	Y		
1016-189	Davidson	Metro Public Works	I-40 and Jefferson Street Transportation Enhancement	2015	2015			Y
1016-190	Davidson	Metro Public Works	Harding Place Sidewalk Enhancements	2015	2015			
1017-267	Davidson	Goodlettsville	Long Hollow Pike Coordinated Signal Synchronization System	2015	2008			Y
1022-169	Maury, Williamson	Spring Hill	Port Royal Road	2015	2015	Y	Y	
1041-125	Rutherford	Murfreesboro	Joe B. Jackson Pkwy Ext.	2015	2035	Y		
1042-167	Rutherford	Smyrna	Weakley Lane Widening	2015	2015	Y		
1042-271	Rutherford	City of La Vergne	Waldron Rd.\Parthenon Pkwy. Widening	2015	2008	Y		
1044-272	Rutherford	City of La Vergne	Old Nashville Highway-Stones River Road Intersection Improvement	2015	2015	Y		
1046-270	Rutherford	City of La Vergne	Fergus Road Sidewalks	2015	2015	Y		
1052-177	Sumner	Hendersonville	Rockland Rd Widening and Construction	2015	2025	Y	Y	
1054-263	Sumner	Hendersonville	Indian Lake Blvd @ SR 386 Bridge	2015	2035	Y		
1054-275	Sumner	Gallatin, TDOT	Various Intersection Improvements	2015	2008	Y		
1057-247	Sumner	Goodlettsville	Madison Creek / Long Hollow Pike Traffic Signalization	2015	2015			Y
1062-113	Williamson	Franklin, Williamson County, TDOT	I-65 Widening	2015	2035			
1062-135	Williamson	Franklin	Columbia Ave South (SR 6/US 31)	2015	2008	Y	Y	Y
1062-136	Williamson	Franklin	Goose Creek Bypass (SR 248)	2015	2015	Y		Y
1062-137	Williamson	Franklin	Hillsboro Rd (SR-106/US-431)	2015	2008	Y	Y	Y
1062-138	Williamson	Franklin	Lewisburg Pike (US-431)	2015	2015			Y
1062-141	Williamson	Franklin	McEwen Drive Phase 3	2015	2025	Y	Y	Y
1062-159	Williamson	Brentwood, TDOT	Concord Road (SR-253) Widening	2015	2008	Y		
1062-160	Williamson	Brentwood, TDOT	Franklin Road Widening	2015	2008	Y		
1062-162	Williamson	Brentwood	Split Log Reconstruction (Phase 1)	2015	2035	Y		
1067-161	Williamson	Brentwood, TDOT	Concord Road (SR-253) ITS	2015	2008			Y
1072-112	Wilson	Lebanon	Hartmann Drive (Sec. 2)	2015	2025	Y	Y	
1072-237	Wilson	TDOT	SR-141 Widening	2015	2035		Y	
1074-277	Wilson	Lebanon	Maddox-Simpson Parkway Intersection Improvement	2015	2025			
1082-241	Sumner, Robertson	TDOT	SR-41 Widening	2015	2035			
1012-102	Davidson	Metro, Goodlettsville	Rivergate Parkway	2025	2035	Y		
1012-203	Davidson	Goodlettsville	Main Street/Long Hollow Pike/Rivergate Parkway Streetscape Plan Implementation	2025	2008	Y	Y	Y
1012-205	Davidson	TDOT	I-65 Widening	2025	2025			
1012-207	Davidson	TDOT	I-40 West HOV Lanes	2025	2015			
1012-208	Davidson	TDOT	I-40 W Widening	2025	2015			
1012-217	Davidson	TDOT	SR-12 Road Widening	2025	2035			
1012-218	Davidson	TDOT	SR-6 (Ellington Parkway) Widening	2025	2008			
1012-219	Davidson	TDOT	SR-1 (Murfreesboro Road) Widening	2025	2008		Y	
1012-220	Davidson	TDOT	Lebanon Pike (SR-24/ US 70) Widening	2025	2025	Y	Y	
1012-228	Davidson	TDOT	Clarksville Highway (SR-112) Widening	2025	2015	Y	Y	
1012-244	Davidson	TDOT	Charlotte Pike (SR-24) Widening	2025	2008	Y	Y	
1012-245	Davidson	Metro Nashville-Davidson Co., TDOT	I-24 W Widening	2025	2025			
1013-243	Davidson	TDOT	I-24 E @ Harding Place (Phase I)	2025	2008			
1014-221	Davidson	TDOT, Metro Public Works	I-40/McCrory Lane Interchange	2025	2008			
1014-249	Davidson	Goodlettsville	Vietnam Veterans Pkwy Interchange High Mast Lighting	2025	2025			
1016-103	Davidson	Goodlettsville	Conference Drive Enhancements	2025	2025			
1042-127	Rutherford	Murfreesboro	Thompson Lane Widening	2025	2008	Y	Y	
1042-231	Rutherford	TDOT	SR-96 Widening	2025	2035			
1052-212	Sumner	TDOT	I-65 Widening	2025	2008			
1052-223	Sumner	TDOT	SR-109 Widening	2025	2008			
1053-240	Robertson, Sumner	TDOT	I-65 @ SR-109 Interchange	2025	2035			
1056-104	Sumner	Goodlettsville	Highway 41/ Highway 31-W Lighting Improvements	2025	2008			

Cost-Feasible Roadway Projects on Congested Corridors

						PROPOSED IMPROVEMENTS		
2035ID	COUNTY	LEAD AGENCY	PROJECT NAME	PLANNING HORIZON	CONGESTED HORIZON	Sidewalks	Bicycle Lanes	ITS
1062-143	Williamson	Franklin	Murfreesboro Rd (SR-96 E)	2025	2008	Y	Y	Y
1062-170	Williamson	Spring Hill	Duplex Road	2025	2015	Y		
1062-215	Williamson	TDOT	SR-96 Widening	2025	2008	Y	Y	
1062-234	Williamson	Williamson Co., TDOT	SR-96 Widening	2025	2025			
1062-346	Williamson, Davidson	Brentwood, TDOT	Concord Road (SR-253) Widening	2025	2008			
1064-252	Williamson	Williamson County	SR-106/SR-46 Realignment	2025	2015			
1072-111	Wilson	Lebanon	SR-26 (Baddour Pkwy)	2025	2035	Y	Y	
1072-213	Wilson	TDOT	I-40 E HOV Lanes	2025	2015			
1072-214	Wilson	TDOT	I-40 E HOV Lanes	2025	2025			
1072-236	Wilson	TDOT	SR-171 Widening	2025	2025		Y	
1072-246	Wilson	Wilson County, TDOT	Lebanon Road (SR-24/ US 70) Widening	2025	2008	Y	Y	
1072-348	Wilson	Wilson County, TDOT	HWY 109 North	2025	2008		Y	
1086-105	Davidson, Sumner	Goodlettsville	Long Hollow Pike Lighting Improvements	2025	2008			
1012-147	Davidson	Metro Public Works	Bell Road Widening	2035	2008	Y	Y	
1012-148	Davidson	Metro Public Works	Edmondson Pike widening	2035	2008	Y	Y	
1012-150	Davidson	Metro, TDOT	Gallatin Pike widening in Rivergate area	2035	2008	Y	Y	
1012-151	Davidson	Metro, TDOT	Harding Place (SR-155) widening	2035	2008			
1012-152	Davidson	Metro, TDOT	I-24/65 under Fern Avenue widening	2035	2008			
1012-154	Davidson	Metro, TDOT	I-65 (downtown loop) HOV lanes	2035	2015			
1012-181	Davidson	Metro Public Works	McGavock Pike	2035	2008	Y	Y	
1012-183	Davidson	Metro Public Works	Central Pike Phase 2	2035	2008	Y	Y	
1012-184	Davidson	Metro Public Works	Old Hickory Boulevard (SR-45) widening	2035	2008	Y	Y	
1012-185	Davidson	Metro Public Works, TDOT	Nolensville Pike (SR-11) Widening	2035	2008	Y		
1012-186	Davidson	Metro Public Works	Myatt Drive widening	2035	2008	Y	Y	
1014-155	Davidson	Metro, TDOT	I-40 at 2nd/4th Avenue interchange upgrade	2035	2025			
1014-258	Davidson	Metro Public Works	Gallatin and Due West Intersection Improvement	2035	2015	Y		Y
1018-202	Davidson	Goodlettsville, TDOT	Dickerson Pike/CSX Widening	2035	2015	Y		
1042-124	Rutherford	Murfreesboro	New Salem Widening	2035	2008	Y		
1042-126	Rutherford	Murfreesboro	Broad Street Widening	2035	2025	Y		
1042-128	Rutherford	Murfreesboro	Old Fort Pkwy Widening	2035	2008			
1042-168	Rutherford	Smyrna, TDOT	Jefferson Pike (SR-266) Widening	2035	2025	Y		
1042-204	Rutherford	Rutherford County, TDOT	Epps Mill Road/Exit 89 Improvements	2035	2035	Y	Y	
1052-116	Sumner	Gallatin, TDOT	SR-174/SR-25 Corridor Improvements	2035	2025	Y	Y	
1052-119	Sumner	Gallatin, TDOT	Widen E. Broadway Avenue - US-31E (SR-6)	2035	2025	Y	Y	
1052-179	Sumner	Hendersonville	SR-386 (Vietnam Veterans) Widening	2035	2008			
1053-264	Sumner	Hendersonville, TDOT	SR 386 (Vietnam Veterans)/Forest Retreat Interchange	2035	2025	Y	Y	
1054-262	Sumner	TDOT	Long Hollow Pike (SR 174) & Center Point Rd/Happy Hollow Rd Intersection Improvements	2035	2035	Y		
1056-118	Sumner	Gallatin	Volunteer State Community College Pedestrian and Bicycle Project	2035	2035	Y	Y	
1056-175	Sumner	Hendersonville	SR-6 (Main Street)	2035	2008	Y	Y	
1062-134	Williamson	Franklin	Columbia Ave North (SR 6/US 31)	2035	2008	Y	Y	Y
1062-139	Williamson	Franklin, TDOT	Mack Hatcher NE Quad (SR 397)	2035	2008			Y
1062-140	Williamson	Franklin, TDOT	Mack Hatcher SE Quad (SR 397)	2035	2008			Y
1062-163	Williamson	Brentwood, TDOT	Wilson Pike (S.R. 252) Widening	2035	2008	Y	Y	
1064-164	Williamson	Brentwood, TDOT	Moores Lane (S.R. 441)/I-65 Interchange Improvements	2035	2008			
1064-165	Williamson	Brentwood, TDOT	Concord Road (S.R. 253)/I-65 Interchange Improvements	2035	2025			
1072-110	Wilson	Lebanon, TDOT	US-231 North	2035	2025	Y	Y	
1072-123	Wilson	Wilson County, TDOT	Central Pike (SR-265)	2035	2035		Y	
1072-133	Wilson	Mt. Juliet	South Mt. Juliet Road Widening	2035	2008	Y	Y	
1084-250	Davidson, Sumner	Goodlettsville	I-65 High Mast Lighting	2035	2025			

Cost-Feasible Roadway Projects in Environmental Justice Areas

2035ID	COUNTY	LEAD AGENCY	PROJECT NAME	PLANNING HORIZON	NUMBER OF EJ FACTORS
1011-182	Davidson	Metro Public Works	Gateway Blvd Extension	2015	8
1012-108	Davidson	Goodlettsville	Rivergate Pkwy Safety Improvements	2015	4
1012-229	Davidson	TDOT	I-65 N Widening with HOV Lanes	2015	6
1012-239	Davidson	TDOT	I-440 Eastbound Widening	2015	7
1014-260	Davidson	Metro Public Works	Jefferson Street Intersections	2015	7
1014-265	Davidson	Metro Public Works	3rd Avenue and Union Street	2015	5
1016-187	Davidson	Metro Public Works	21st Avenue Roadscaping in Hillsboro Village	2015	4
1016-189	Davidson	Metro Public Works	I-40 and Jefferson Street Transportation Enhancement	2015	7
1042-167	Rutherford	Smyrna	Weakley Lane Widening	2015	4
1051-233	Sumner	TDOT	SR-109 Widening	2015	4
1051-268	Sumner	Millersville	Cartwright Parkway Extension	2015	4
1052-120	Sumner	Gallatin, TDOT	Albert Gallatin Avenue / Hatten Track Road Extension - Phase 1	2015	8
1052-176	Sumner	Hendersonville	New Shackle Island Road Widening Phases 1 and 2	2015	4
1052-177	Sumner	Hendersonville	Rockland Rd Widening and Construction	2015	4
1052-180	Sumner	Hendersonville	Walton Ferry Rd Widening and Re-Alignment	2015	5
1052-273	Sumner	Gallatin	Airport Road Relocation	2015	8
1052-276	Sumner	Gallatin	E. Broadway (SR-6) Realignment, Signalization and Streetscape	2015	8
1054-275	Sumner	Gallatin, TDOT	Various Intersection Improvements	2015	8
1062-135	Williamson	Franklin	Columbia Ave South (SR 6/US 31)	2015	8
1062-137	Williamson	Franklin	Hillsboro Rd (SR-106/US-431)	2015	8
1072-112	Wilson	Lebanon	Hartmann Drive (Sec. 2)	2015	5
1074-277	Wilson	Lebanon	Maddox-Simpson Parkway Intersection Improvement	2015	6
1012-102	Davidson	Metro, Goodlettsville	Rivergate Parkway	2025	7
1012-203	Davidson	Goodlettsville	Main Street/Long Hollow Pike/Rivergate Parkway Streetscape Plan Implementation	2025	4
1012-205	Davidson	TDOT	I-65 Widening	2025	8
1012-207	Davidson	TDOT	I-40 West HOV Lanes	2025	7
1012-208	Davidson	TDOT	I-40 W Widening	2025	7
1012-217	Davidson	TDOT	SR-12 Road Widening	2025	7
1012-218	Davidson	TDOT	SR-6 (Ellington Parkway) Widening	2025	8
1012-219	Davidson	TDOT	SR-1 (Murfreesboro Road) Widening	2025	4
1012-220	Davidson	TDOT	Lebanon Pike (SR-24/ US 70) Widening	2025	7
1012-228	Davidson	TDOT	Clarksville Highway (SR-112) Widening	2025	7
1012-244	Davidson	TDOT	Charlotte Pike (SR-24) Widening	2025	7
1012-245	Davidson	Metro Nashville-Davidson Co., TDOT	I-24 W Widening	2025	6
1013-243	Davidson	TDOT	I-24 E @ Harding Place (Phase I)	2025	6
1014-106	Davidson	Goodlettsville	Vietnam Veterans Pkwy Merge Lane onto Conference Drive	2025	4
1014-206	Davidson	TDOT	I-65 South HOV CBD Connection	2025	6
1014-209	Davidson	TDOT	I-40 W HOV CBD Connection	2025	6
1014-210	Davidson	TDOT	I-24 HOV CBD Connection	2025	7
1014-211	Davidson	TDOT	I-65 N HOV CBD Connection	2025	7
1014-238	Davidson	TDOT	I-40 @ I-440 Ramp Modification	2025	7
1016-103	Davidson	Goodlettsville	Conference Drive Enhancements	2025	4
1032-109	Robertson	TDOT	US-431/SR-65 Widening	2025	8
1041-129	Rutherford	Murfreesboro	Cherry Lane Extension	2025	4
1042-131	Rutherford	Murfreesboro	Bradyville Pike Widening	2025	8
1042-231	Rutherford	TDOT	SR-96 Widening	2025	4
1051-222	Sumner	TDOT	Portland Bypass	2025	6
1052-212	Sumner	TDOT	I-65 Widening	2025	7
1052-224	Sumner	TDOT	SR-109 Widening	2025	6
1056-104	Sumner	Goodlettsville	Highway 41/ Highway 31-W Lighting Improvements	2025	4

Cost-Feasible Roadway Projects in Environmental Justice Areas

2035ID	COUNTY	LEAD AGENCY	PROJECT NAME	PLANNING HORIZON	NUMBER OF EJ FACTORS
1062-143	Williamson	Franklin	Murfreesboro Rd (SR-96 E)	2025	8
1062-215	Williamson	TDOT	SR-96 Widening	2025	8
1072-111	Wilson	Lebanon	SR-26 (Baddour Pkwy)	2025	7
1072-213	Wilson	TDOT	I-40 E HOV Lanes	2025	6
1072-235	Wilson	TDOT	Hartsville Pike (SR-141) Realignment	2025	7
1072-236	Wilson	TDOT	SR-171 Widening	2025	4
1072-242	Wilson	TDOT	Hartsville Pike (SR-141) Gap	2025	6
1072-246	Wilson	Wilson County, TDOT	Lebanon Road (SR-24/ US 70) Widening	2025	4
1012-147	Davidson	Metro Public Works	Bell Road Widening	2035	6
1012-150	Davidson	Metro, TDOT	Gallatin Pike widening in Rivergate area	2035	7
1012-151	Davidson	Metro, TDOT	Harding Place (SR-155) widening	2035	6
1012-152	Davidson	Metro, TDOT	I-24/65 under Fern Avenue widening	2035	6
1012-154	Davidson	Metro, TDOT	I-65 (downtown loop) HOV lanes	2035	8
1012-156	Davidson	Metro Public Works, TDOT	Demonbreun Street	2035	8
1012-158	Davidson	TDOT	Donelson Pike Realignment & Interchange Modification	2035	4
1012-183	Davidson	Metro Public Works	Central Pike Phase 2	2035	5
1012-184	Davidson	Metro Public Works	Old Hickory Boulevard (SR-45) widening	2035	5
1012-185	Davidson	Metro Public Works, TDOT	Nolensville Pike (SR-11) Widening	2035	8
1012-186	Davidson	Metro Public Works	Myatt Drive widening	2035	7
1014-153	Davidson	Metro-Nashville, Goodlettsville, TDOT	I-65 North / SR-386 Connecting Ramps	2035	4
1014-155	Davidson	Metro, TDOT	I-40 at 2nd/4th Avenue interchange upgrade	2035	8
1014-258	Davidson	Metro Public Works	Gallatin and Due West Intersection Improvement	2035	5
1018-202	Davidson	Goodlettsville, TDOT	Dickerson Pike/CSX Widening	2035	4
1042-124	Rutherford	Murfreesboro	New Salem Widening	2035	6
1042-126	Rutherford	Murfreesboro	Broad Street Widening	2035	8
1042-128	Rutherford	Murfreesboro	Old Fort Pkwy Widening	2035	6
1042-168	Rutherford	Smyrna, TDOT	Jefferson Pike (SR-266) Widening	2035	4
1052-116	Sumner	Gallatin, TDOT	SR-174/SR-25 Corridor Improvements	2035	8
1052-119	Sumner	Gallatin, TDOT	Widen E. Broadway Avenue - US-31E (SR-6)	2035	8
1052-173	Sumner	Sumner County, TDOT	US 31E/SR 6 Widening	2035	5
1052-179	Sumner	Hendersonville	SR-386 (Vietnam Veterans) Widening	2035	7
1056-117	Sumner	Gallatin	Congestion Management/Streetscape Improvements on US-31E(SR-6)	2035	8
1056-175	Sumner	Hendersonville	SR-6 (Main Street)	2035	5
1062-134	Williamson	Franklin	Columbia Ave North (SR 6/US 31)	2035	8
1062-139	Williamson	Franklin, TDOT	Mack Hatcher NE Quad (SR 397)	2035	7
1072-110	Wilson	Lebanon, TDOT	US-231 North	2035	6
1074-251	Wilson	Lebanon, TDOT	SR-24/US-70 (Main St)/Castle Heights Intersection	2035	6
1084-250	Davidson, Sumner	Goodlettsville	I-65 High Mast Lighting	2035	4

Cost-Feasible Roadway Projects in Areas of Environmental Concern

2035ID	COUNTY	LEAD AGENCY	PROJECT NAME	PLANNING HORIZON	ENVIRONMENTAL CONFLICT	PROJECT OVERLAP	ENVIRONMENTAL CHALLENGE	PROJECT OVERLAP
1012-157	Davidson	Metro Public Works	McCrory Lane	2015	YES	47%	YES	26%
1012-229	Davidson	TDOT	I-65 N Widening with HOV Lanes	2015			YES	6%
1012-239	Davidson	TDOT	I-440 Eastbound Widening	2015	YES	4%	YES	4%
1014-259	Davidson	Metro Public Works, Oak Hill	Harding Place, Battery Lane intersection improvements	2015	YES	100%		
1016-187	Davidson	Metro Public Works	21st Avenue Roadscaping in Hillsboro Village	2015	YES	100%		
1017-267	Davidson	Goodlettsville	Long Hollow Pike Coordinated Signal Synchronization System	2015			YES	100%
1021-172	Maury	Spring Hill	Reserves Boulevard Extension	2015	YES	7%	YES	12%
1022-169	Maury, Williamson	Spring Hill	Port Royal Road	2015	YES	50%	YES	54%
1041-125	Rutherford	Murfreesboro	Joe B. Jackson Pkwy Ext.	2015	YES	2%	YES	23%
1041-130	Rutherford	Murfreesboro	Veterans Pkwy	2015	YES	1%	YES	9%
1042-167	Rutherford	Smyrna	Weakley Lane Widening	2015			YES	19%
1042-271	Rutherford	City of La Vergne	Waldron Rd.\Parthenon Pkwy. Widening	2015	YES	63%	YES	10%
1044-272	Rutherford	City of La Vergne	Old Nashville Highway-Stones River Road Intersection Improvement	2015	YES	100%		
1046-270	Rutherford	City of La Vergne	Fergus Road Sidewalks	2015	YES	100%	YES	30%
1051-233	Sumner	TDOT	SR-109 Widening	2015	YES	1%	YES	1%
1051-268	Sumner	Millersville	Cartwright Parkway Extension	2015			YES	21%
1052-120	Sumner	Gallatin, TDOT	Albert Gallatin Avenue / Hatten Track Road Extension - Phase 1	2015			YES	3%
1052-174	Sumner	Hendersonville	Drakes Creek Road Widening	2015	YES	2%	YES	12%
1052-176	Sumner	Hendersonville	New Shackle Island Road Widening Phases 1 and 2	2015			YES	9%
1052-177	Sumner	Hendersonville	Rockland Rd Widening and Construction	2015	YES	1%	YES	12%
1052-273	Sumner	Gallatin	Airport Road Relocation	2015			YES	4%
1052-276	Sumner	Gallatin	E. Broadway (SR-6) Realignment, Signalization and Streetscape	2015			YES	100%
1054-275	Sumner	Gallatin, TDOT	Various Intersection Improvements	2015			YES	100%
1057-247	Sumner	Goodlettsville	Madison Creek / Long Hollow Pike Traffic Signalization	2015			YES	100%
1061-171	Williamson	Spring Hill	Buckner Road Extension	2015	YES	1%	YES	1%
1061-225	Williamson	TDOT	SR-840	2015	YES	19%	YES	33%
1061-226	Williamson	TDOT	SR-840	2015	YES	8%	YES	12%
1062-113	Williamson	Franklin, Williamson County, TDOT	I-65 Widening	2015	YES	0%	YES	8%
1062-136	Williamson	Franklin	Goose Creek Bypass (SR 248)	2015			YES	1%
1062-137	Williamson	Franklin	Hillsboro Rd (SR-106/US-431)	2015	YES	3%	YES	49%
1062-138	Williamson	Franklin	Lewisburg Pike (US-431)	2015	YES	14%	YES	6%
1062-141	Williamson	Franklin	McEwen Drive Phase 3	2015			YES	11%
1062-142	Williamson	Franklin	McEwen Drive Phase 4	2015	YES	6%	YES	8%
1062-160	Williamson	Brentwood, TDOT	Franklin Road Widening	2015			YES	3%
1062-162	Williamson	Brentwood	Split Log Reconstruction (Phase 1)	2015	YES	32%		
1067-161	Williamson	Brentwood, TDOT	Concord Road (SR-253) ITS	2015	YES	5%		
1072-112	Wilson	Lebanon	Hartmann Drive (Sec. 2)	2015			YES	30%
1072-132	Wilson	Mt. Juliet	Beckwith Road Eastern Connector	2015			YES	11%
1072-237	Wilson	TDOT	SR-141 Widening	2015	YES	0%	YES	6%
1012-205	Davidson	TDOT	I-65 Widening	2025	YES	24%	YES	0%
1012-207	Davidson	TDOT	I-40 West HOV Lanes	2025	YES	24%	YES	5%
1012-217	Davidson	TDOT	SR-12 Road Widening	2025			YES	7%
1012-219	Davidson	TDOT	SR-1 (Murfreesboro Road) Widening	2025			YES	4%
1012-220	Davidson	TDOT	Lebanon Pike (SR-24/ US 70) Widening	2025			YES	3%
1012-228	Davidson	TDOT	Clarksville Highway (SR-112) Widening	2025			YES	2%
1012-244	Davidson	TDOT	Charlotte Pike (SR-24) Widening	2025	YES	49%	YES	0%
1012-245	Davidson	Metro Nashville-Davidson Co., TDOT	I-24 W Widening	2025	YES	14%	YES	23%
1013-243	Davidson	TDOT	I-24 E @ Harding Place (Phase I)	2025			YES	1%
1014-211	Davidson	TDOT	I-65 N HOV CBD Connection	2025	YES	36%	YES	13%
1014-221	Davidson	TDOT, Metro Public Works	I-40/McCrory Lane Interchange	2025	YES	5%	YES	2%
1016-103	Davidson	Goodlettsville	Conference Drive Enhancements	2025	YES	1%	YES	1%
1032-109	Robertson	TDOT	US-431/SR-65 Widening	2025			YES	3%
1041-129	Rutherford	Murfreesboro	Cherry Lane Extension	2025	YES	46%	YES	23%
1042-121	Rutherford	La Vergne	Chaney Blvd. Widening	2025	YES	4%		
1042-122	Rutherford	La Vergne	Jefferson Pike Widening	2025	YES	32%	YES	5%
1042-127	Rutherford	Murfreesboro	Thompson Lane Widening	2025	YES	26%	YES	25%
1042-131	Rutherford	Murfreesboro	Bradyville Pike Widening	2025			YES	8%
1042-231	Rutherford	TDOT	SR-96 Widening	2025	YES	1%	YES	2%
1042-232	Rutherford	TDOT	SR-99	2025			YES	19%
1051-222	Sumner	TDOT	Portland Bypass	2025	YES	1%	YES	2%
1052-115	Sumner	Gallatin	Big Station Camp Boulevard Improvements	2025	YES	1%	YES	1%

Cost-Feasible Roadway Projects in Areas of Environmental Concern

2035ID	COUNTY	LEAD AGENCY	PROJECT NAME	PLANNING HORIZON	ENVIRONMENTAL CONFLICT	PROJECT OVERLAP	ENVIRONMENTAL CHALLENGE	PROJECT OVERLAP
1052-212	Sumner	TDOT	I-65 Widening	2025			YES	6%
1052-223	Sumner	TDOT	SR-109 Widening	2025	YES	3%	YES	12%
1056-104	Sumner	Goodlettsville	Highway 41/ Highway 31-W Lighting Improvements	2025			YES	0%
1062-143	Williamson	Franklin	Murfreesboro Rd (SR-96 E)	2025	YES	55%	YES	30%
1062-170	Williamson	Spring Hill	Duplex Road	2025	YES	1%	YES	10%
1062-215	Williamson	TDOT	SR-96 Widening	2025			YES	15%
1062-234	Williamson	Williamson Co., TDOT	SR-96 Widening	2025			YES	1%
1062-346	Williamson, Davidson	Brentwood, TDOT	Concord Road (SR-253) Widening	2025	YES	4%	YES	11%
1064-252	Williamson	Williamson County	SR-106/SR-46 Realignment	2025			YES	100%
1072-111	Wilson	Lebanon	SR-26 (Baddour Pkwy)	2025	YES	4%	YES	36%
1072-213	Wilson	TDOT	I-40 E HOV Lanes	2025	YES	39%	YES	4%
1072-214	Wilson	TDOT	I-40 E HOV Lanes	2025	YES	10%	YES	1%
1072-236	Wilson	TDOT	SR-171 Widening	2025	YES	46%	YES	3%
1072-246	Wilson	Wilson County, TDOT	Lebanon Road (SR-24/ US 70) Widening	2025			YES	1%
1072-348	Wilson	Wilson County, TDOT	HWY 109 North	2025	YES	1%	YES	18%
1086-105	Davidson, Sumner	Goodlettsville	Long Hollow Pike Lighting Improvements	2025			YES	14%
1012-147	Davidson	Metro Public Works	Bell Road Widening	2035	YES	92%	YES	10%
1012-151	Davidson	Metro, TDOT	Harding Place (SR-155) widening	2035			YES	1%
1012-152	Davidson	Metro, TDOT	I-24/65 under Fern Avenue widening	2035	YES	100%		
1012-154	Davidson	Metro, TDOT	I-65 (downtown loop) HOV lanes	2035	YES	8%		
1012-158	Davidson	TDOT	Donelson Pike Realignment & Interchange Modification	2035			YES	1%
1012-185	Davidson	Metro Public Works, TDOT	Nolensville Pike (SR-11) Widening	2035	YES	4%	YES	9%
1012-186	Davidson	Metro Public Works	Myatt Drive widening	2035			YES	1%
1014-153	Davidson	Metro-Nashville, Goodlettsville, TDOT	I-65 North / SR-386 Connecting Ramps	2035	YES	29%		
1014-216	Davidson	TDOT	Hickory Hollow Parkway Interchange	2035			YES	4%
1042-124	Rutherford	Murfreesboro	New Salem Widening	2035	YES	17%	YES	22%
1042-128	Rutherford	Murfreesboro	Old Fort Pkwy Widening	2035	YES	47%	YES	15%
1042-168	Rutherford	Smyrna, TDOT	Jefferson Pike (SR-266) Widening	2035	YES	91%	YES	15%
1042-204	Rutherford	Rutherford County, TDOT	Epps Mill Road/Exit 89 Improvements	2035	YES	3%	YES	27%
1052-116	Sumner	Gallatin, TDOT	SR-174/SR-25 Corridor Improvements	2035			YES	2%
1052-119	Sumner	Gallatin, TDOT	Widen E. Broadway Avenue - US-31E (SR-6)	2035			YES	5%
1052-179	Sumner	Hendersonville	SR-386 (Vietnam Veterans) Widening	2035	YES	1%	YES	7%
1056-117	Sumner	Gallatin	Congestion Management/Streetscape Improvements on US-31E(SR-6)	2035			YES	36%
1056-175	Sumner	Hendersonville	SR-6 (Main Street)	2035	YES	1%	YES	3%
1062-139	Williamson	Franklin, TDOT	Mack Hatcher NE Quad (SR 397)	2035	YES	8%	YES	6%
1062-140	Williamson	Franklin, TDOT	Mack Hatcher SE Quad (SR 397)	2035	YES	65%	YES	18%
1062-163	Williamson	Brentwood, TDOT	Wilson Pike (S.R. 252) Widening	2035			YES	15%
1063-166	Williamson	Brentwood, TDOT	I-65 Interchange between Old Hickory and Concord Rd	2035			YES	2%
1072-110	Wilson	Lebanon, TDOT	US-231 North	2035			YES	3%
1072-133	Wilson	Mt. Juliet	South Mt. Juliet Road Widening	2035			YES	3%
1074-251	Wilson	Lebanon, TDOT	SR-24/US-70 (Main St)/Castle Heights Intersection	2035	YES	100%		
1084-250	Davidson, Sumner	Goodlettsville	I-65 High Mast Lighting	2035			YES	100%

Appendix E. Travel Demand Model Technical Documentation

This appendix provides further documentation on the MPO's regional travel demand model.

NASHVILLE AREA MPO
2035 REGIONAL TRANSPORTATION PLAN

TRAVEL DEMAND MODEL DEVELOPMENT NOTES

NASHVILLE AREA
Metropolitan Planning Organization

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1.0 Introduction

This travel demand model update was developed for Nashville Area Metropolitan Planning Organization's 2035 Regional Transportation Plan. In the update, a base year, 2008, and three Horizon years were selected: 2015, 2025, and 2035. This document describes the development and calibration/validation of the passenger component for the base year only.

The model was developed using TransCad 5.0, and the following main data sources:

- Census 2000
- 1997 Nashville MPO's Household Travel Survey
- INFO-USA database for the base year business locations and number employees,
- Woods and Poole database for base year and future year population/ employment control total.
- TDOT Transportation Roadway Inventory Management System (TRIMS) Database
- TDOT ADAM Database
- Aerial Photos and Parcel Files
- Nashville Area Travel Speed Survey

A few major changes were made in this model:

<u>Freight Model</u>

A Freight and Truck Component was added to the model update. The model estimates three classes of trucks: Commercial vehicle, Single-Unit Truck, and Multi-Unit Truck trips. The model also outputs the region's commodity flow. For more details, refer to the Freight Component tech memo.

<u>Study Area and Traffic Analysis Zone (TAZ) structure</u>

In order to perform a more detailed analysis, the TAZ structure and study area boundary were changed significantly. Now all of Robertson County is included in the model. Second, the number of TAZs was increased from 1440 to 2102 because of expanded study area and completed roadway projects. Some TAZs were also split in order to reflect the growth in the area.

<u>External Trips</u>

New External stations were selected based on the new study area boundary. New External to External trips, Internal to External, and External to Internal trip percentages were estimated using The Tennessee State Wide Model (TDOT, 2002) using select link analysis in TransCAD 5.0.

<u>Network</u>

Network updates include alignment updates, attributes updates, etc. More detailed information can be found in Section 2.

<u>Integrated Horizon Year Scenarios</u>

Different attributes for different horizon years in the network include: Direction, FHWA Functional Class, Number of Lanes, Center Turn Lanes Flag, and Pavement width are now coded in the same network file instead of individual files for each horizon years. For more detail network fields, please refer to the appendix.

2.0 Highway Network Update

The network update includes

- Expanded study area
- Vehicle Classification Count data
- Continuous left turn lane and divided roadway designation
- New projects(As of 2030 Travel Demand Model)
- Functional Classification Updates
- 2008 ADT and vehicle class count
- Posted speed
- State route number
- U.S. route number
- External stations
- Truck model related fields (eg: SU, MU, CV)

2.1 Expanded Study Area

Robertson County: The study area was expanded to cover all of Robertson County. It means the network had to be expanded as well. First, all collectors and up roadways were added to the network. Secondly, local roads were added to create more accurate volume distribution during the assignment phase of the model.

Maury County: In order to compile information from the Census data correctly, some TAZ boundaries in Maury County were changed. The network was then updated to reflect the changes made in TAZ boundary.

2.2 Vehicle Classification Count Data

425 Classification count station data were incorporated to the network. It includes vehicle class composition and directional flow information. The count data is also used to develop TOD factor for trucks and EE trips.

2.3 Continuous Left Turn Lane (CLTL) and Divided Roadway

Continuous left-turn lanes are the common access management treatment. Typically, they are used in the center of a four-lane or two-lane roadway. It is being used to provide extra lane for left turning vehicles. The Continuous left turn lane field was reviewed in the update. New construction/widening projects that involved adding CLTL were updated in the network. The divided roadways were also updated.

2.4 New Projects

Projects completed from January 2002 to December 2008 were added to the base year network. The data sources include local inputs and Nashville Area MPO TIP documents.

2.5 Functional Classification

In the previous update, roadways were classified using part of TDOT's classification study conducted in 1989 and some field study results. In this update, the network functional class was updated using the TDOT TRIMS database only.

2.5.1 Facility Type

An automatic process was developed to read the highway link attribute and the associated TRIMS data in order to determine a facility type for each link to be used an input into the highway assignment process. The primary TRIMS data fields used in the facility type process are as follows:

- **Func_CLASS** – This is the normal Highway Planning Network (NHPN) functional classification of the roadway in the network. There are generally classified into rural facilities and urban facilities. They are further classified by Interstates, arterials, collectors, and local access roads. Table below shows the NHPN function classification codes.
- **Lanes** - The number of lanes (bi-directional) coded in the NHPN
- **Pavement_W** – The total width of the roadway for all travel lanes. The lane width can give important information about the operational characteristics or a facility as it can affect capacity and travel speeds. A lane width of 11 feet or greater is considered to be standard width and anything less than that as sub-standard.
- **DIR** – Directional code of the highway link. A code or "0" indicates a two-way road, and non-zero (1 or -1) indicates a one-way link.

Table 2.5.1.1: NHPN Functional Classifications

Code	Classification	Code	Classification
01	Rural Interstate	14	Urban other principal Arterial
02	Rural Principal Arterial	16	Urban Minor Arterial
03	Rural Freeway	17	Urban Collector
06	Rural Minor Arterial	19	Urban local Access
07	Rural Major Collector	20	System-System Ramp
08	Rural Minor Collector	21	On Ramp
09	Rural local Access	22	Off Ramp
10	National Park Service Road	23	Collector-Distributor Road
11	Urban Interstate	99	Centroid Connector
12	Urban Other Freeways/Expressways		

Based on these network fields, a facility type is calculated for use as input into the travel demand model assignment procedure. The facility type classifications are shown in Table. Table describes the relationships used in the model stream to relate the NHPN variables to facility type designations.

As can be seen in Table, the key characteristic in determining the facility type designation for each link in the network is the NHPN Functional Classification Code for the link. The detailed facility type designations for the arterial links are based upon the geometric characteristics of the roadway, i.e., number of travel lanes, two-way or one-way, and lane width. For example, if the two lane roadway (local lanes in both direction) has a NHPN Functional Classification Code of 02 (rural principal arterial) which lane widths of less than 11 feet, it would have facility type code of 12 (major arterial). This same roadway would have a facility type code of 11 (Principal arterial) if it was a one-way facility. These facility type codes along with the area type codes are the parameters used in assigning the capacities and free flow speeds for each link in the network.

Table 2.5.1.2: Federal Highway Functional Class

Code	Facility Type	Code	Facility Type
01	interstate	11	Principal Arterial
02	Freeway	12	Major Arterial
03	Expressway	13	Minor Arterial
04	Collector-Distributor	21	Collector
06	System-System Ramp	31	Local
07	On-Ramp	50	Transit-Only
08	Off-Ramp	99	Centroid Connector

2.6 Capacity and Speed

Normalized Capacity based on area type and facility type was not changed. See table below.

Table2.6.1: Normalized Capacity Based on Area Type and Facility Type

Facility Type		**Area Type[9]**						
Code	**Description**	1	2	3	4	5	6	7
1	**Interstate**	**1790[8]**	1830	1870	1910	**1930[8]**	1870	**1810[8]**
2	**Freeway[2]**	1590	1620	1650	1680	1700	1690	1680
3	**Expressway[1]**	1380	1400	1420	1440	1470	1510	1550
4	**Collector-Distributor[5]**	1590	1620	1650	1680	1700	1690	1680
6	**System-System Ramp[4]**	1790	1830	1870	1910	1930	1870	1810
7	**On-Ramp[6]**	1600	1650	1700	1750	1800	1850	1900
8	**Off-Ramp[3]**	960	970	980	990	1010[8]	1145	1280
11	**Principal Arterial**	**960[8]**	970	980	990	**1010[8]**	1145	**1280[8]**
12	**Minor Arterial**	**780[8]**	790	800	810	**820[8]**	980	**1140[8]**
13	**Minor Arterial**	**710[8]**	730	750	770	**770[8]**	780	**790[8]**
21	**Collector-Distributor**	**440[8]**	470	500	530	**560[8]**	630	**690[8]**
31	**Local[7]**	350	380	410	440	450	500	550

Note:

1. Expressway is interpolated between Interstate and Principal Arterial
2. Freeway is interpolated between Interstate and Expressway
3. Off-Ramp is equal to Principal Arterial
4. System-System ramp is equal to Interstate
5. Collector-Distributor is equal to Freeway
6. On-Ramp - Values based on lowest and highest ramp capacities (HCM, Exhibit 25-3)
7. Local capacities are assumed to be 20% lower than collectors
8. Bold values are determined from HCM procedures and assumptions
9. Value between Area Types are interpolated. Detailed definition can be found in 3.3(Page 20)

Data Source: 2004 Nashville MPO Model Update Document

2.7 Posted Speed and AADT Update

Posted speed was updated using travel time study from year 2005 to 2007, Local government inputs, TDOT TRIMS database, and MPO staff field study. Year 2008 AADT data was updated using TDOT's latest volume count station data.

2.8 External Stations.

New External stations were selected based on the new study area boundary. New external to external trips (E-E), internal to external (I-E), and external to internal (E-I) trips were estimated using Select Link Analysis in the Tennessee State Wide Model (TDOT, 2002).

Table2.8.1: Passenger Car External to External Trip Percentage Table from TN Statewide Model

NAMPO NODE ID	SWM Link ID	NAME	PASS AB_FLOW	PASS BA_FLOW	TOTAL_FLOW	EE_AB	EE_BA	PASS_EE_%
198002	51632	U.S. 31	13629	13629	27259	106	106	0.01
198005	52447	I-65	13915	13919	27834	1775	1777	0.13
198006	53123	U.S. 431	1464	1473	2937	0	0	-
198010	52532	U.S. 431	2753	2753	5506	30	30	0.01
198011	52332	SR 10	4877	4876	9753	184	184	0.04
198017	53222	U.S. 70N	1581	1582	3163	0	0	-
198018	53199		1168	1168	2335	550	550	-
198026	51680	SR 12	8072	8073	16145	71	71	0.01
198032	52310	U.S. 70 S	6500	6497	12996	293	290	0.04
198033	53215	I-40	16083	16079	32162	6141	6133	0.38
198039	53067	U.S. 231	6043	6044	12087	133	133	0.02
198044	51625	I-24	16844	16868	33713	5086	5079	0.3
198046	51944	U.S. 31 A	1427	1412	2839	29	29	0.02
198053	52802	U.S. 41	283	283	565	1	1	0
198054	53074	U.S. 41 A	1927	1927	3854	10	10	0
198055	53613	U.S. 70	7986	7982	15968	214	214	0.03
198056	53214	U.S. 70	3241	3243	6484	706	705	0.22
198058	52254	SR 52	3880	3880	7760	1122	1122	0.29
198059	57657	U.S. 41	851	850	1701	0	0	-
198060	57749	I-24	15792	15801	31593	5612	5618	0.36
198066	49370	U.S. 31W	4569	4569	9138	558	558	0.12
198069	52219	I-65	15756	15748	31504	3306	3297	0.21
198070	52685	SR 100	4194	4193	8388	377	377	0.09
198074	52717	SR 96	3733	3733	7466	313	313	0.08
198075	52524	U.S. 31 E	2717	2718	5436	929	929	0.34
198076	53248	SR 96	1691	1692	3383	626	627	0.37
198078	52442	I-40	11070	11080	22150	7410	7422	0.67

Note: In SWM, passenger trips also include Single Unit and Commercial vehicles. It was assumed that passenger vehicles, commercial vehicles, and single Unit trucks all share the same external to external percentage at all the external stations.

2.9 Miscellaneous Update

- **Alignments:** Some roadway alignments were fixed based on Parcel and Aerial Maps
- **Names:** Name updates include adding SR, US route name, and updating the street names if necessary.
- **External Stations Number:** Traffic count station number field was added for external station traffic count.
- **Turn Penalty:** Turn Penalties were added to network for some interchanges and intersections.
- **Number of Lanes:** This is updated based on TRIMS, aerial photos, local inputs and TIP documents.

3.0 Socio-Economic (SE) Data and Traffic Analysis Zone (TAZ) Updates

The TAZ database update was a significant component of this model. The update includes changing the TAZ alignment, size and allocating the socio-economic (SE) data for each TAZ.

3.1 TAZ

The number of TAZs was increased from 1440 to 2102 for several reasons:

- Census: The TAZ boundaries were revised to fit census block group boundaries.
- Expanded Study Area: The study area now includes all of Robertson County
- Rapid Area Growth: Rutherford County and Williamson County are two of the fastest growing counties in the region. TAZ size was reviewed, and adjusted to reflect the growth.
- New Projects: Some TAZs were divided when new or future regionally significant projects cut through them.
- TAZ size is smaller around Transit routes and stations in order to simulate reasonable walking distance, as well as helping incorporate transit models in the near future.

3.1.1 Alignments

TAZ alignments were also adjusted for:

- Roadway Alignment changes
- Future Major Projects, (e.g. SR-840 South)

3.1.2 Attributes

All SE data is now stored in the TAZ file and the attributes from the previous model's SE data file have been moved to the TAZ file.

The TAZ file also stores information from Census Block Group, Tract, and Parcel data. The SE dictionary table is attached in the Appendix E.

TAZ database structure changes:

- County IDs now are 3-digit numbers, for example, 037 instead of 37
- TAZ numbers are now 3 digits instead of 6.
- TAZ numbers are created based on the CountyID. For example, in County ID 037, there are 100 TAZs. Those TAZs in the county will be numbered from 037001, 037002, 037003… 037100. This procedure is the same for all counties.
- The TAZ ID number is now based on the distance from the Central Business District (CBD) for each county. The smaller the TAZ ID number, the closer it is to the CBD. (E.g.; 037001 is the Nashville CBD TAZ)
- All the external stations' countyID are now 999 instead of a 6 digit number. (E.g.; 999001 is the first external station)

3.2 Socio-Economic Data

Base year population allocation was based on Census 2000 data and the parcel map for each county. Household and Population totals are tied to a control total. This total is based on 2008 ACS (American

Community Survey), and 2009 Woods and Poole data. For Employment, the allocation was based on InfoUSA for business locations and business types, and Woods and Poole Database for the employment control total.

3.2.1 Household and Population Allocation

- Household Size Rates
  The household size rates are based on the 2000 Census and 2008 ACS. The rates were applied to all the TAZs to get the estimated population in each zone.

- Dwelling Units
  The number of Households for each TAZ was estimated from improvement type and dwelling unit counts in the parcel maps. In Davidson County the availability of detailed building permit information allowed us to track new residential construction and include the resulting dwelling units in the model.

  There are four different parcel systems in the 7-county study area. They are CASS 3 (Computer Aid System), CASS 4, Davidson County Parcel System, Rutherford County Parcel System. The following tables were used to determine if the parcel is used for residential purpose.

Table 3.2.1.1**:** CASS 3 and 4 Household Improvement Type

CAAS System	Building Type
IMP Code	Description
01	SINGLE FAMILY
03	SPECIAL RES
05	SINGLE FAMILY
09	EXCEPTIONAL
02	MULTI FAMILY
04	TOWNHOUSE
06	APARTMENT
07	RENTAL UNIT
08	RES CONDO
10	APARTMENT
12	Commercial Condo
CAAS 4 Extra Fields	Dwelling unit Type
51-56	Mobile Home

Table 3.2.1.2: Davidson Household Type

Davidson County	
Land_USE	Description
11	SINGLE FAMILY DWELLING
16	RESIDENTIAL ZERO LOT LINE U
18	MOBILE HOME(S)
62	MOBILE HOME PARK
81	SFD(S) - RURAL
88	MOBILE HOMES(S) - RURAL
92	PARSONAGE
13	TRIPLEX
12	DUPLEX
14	QUADRAPLEX
15	RESIDENTIAL CONDOMINIUM
19	RESIDENTIAL COMBO. OR MISC.
37	APARTMENT WALK UP
38	APARTMENT LOW-RISE
39	APARTMENT HIGH-RISE
82	DUPLEX(S) - RURAL
83	TRIPLEX(S) - RURAL
89	RURAL COMBINATION

Table 3.2.1.3**:** Rutherford County Household Type

Household Type		
Account Type	**Property Type**	**Property Description**
Residential	Residential	Condo <= 3 Stories
Residential	Residential	Condo > 3 Stories
Agricultural	Residential	Condo <= 3 Stories
City	Multiple Unit	Apartment <= 3 Stories
City	Residential	Apartment <= 3 Stories
Commercial	Condo	Condo <= 3 Stories
Commercial	Duplex	Duplex One Story
Commercial	Duplex	Duplex Two Story
Commercial	Multiple Unit	Apartment <= 3 Stories
Commercial	Multiple Unit	Apartment > 3 Stories
Commercial	Multiple Unit	Condo <= 3 Stories
Commercial	Residential	Apartment <= 3 Stories
Commercial	Residential	Apartment > 3 Stories
Commercial	Residential	Condo <= 3 Stories
Farm	Mobile Home	Permit Value
Mobile Home	Out Building	Permit Value
Multiple Unit	Multiple Unit	Apartment <= 3 Stories
Multiple Unit	Multiple Unit	Apartment > 3 Stories
Multiple Unit	Residential	Apartment
Residential	Commercial	Apartment
Residential	Condo	Condo <= 3 Stories

Household Type		
Residential	Condo	Condo > 3 Stories
Residential	Duplex	Duplex One Story
Residential	Duplex	Duplex Two Story
Residential	Mobile Home	Permit Value
Residential	Multiple Unit	Apartment <= 3 Stories
Residential	Residential	Townhouse One Story
Residential	Residential	Townhouse Two Story
Residential	Townhouse	Townhouse 1 1/2 Story
Residential	Townhouse	Townhouse One Story
Residential	Townhouse	Townhouse Two Story
State	Residential	Apartment <= 3 Stories
Agricultural	Residential	1½ Story Fin
Agricultural	Residential	2 Story
Agricultural	Residential	3 Story
Agricultural	Residential	Ranch One Story
Farm	Residential	1½ Story Fin
Farm	Residential	1½ Story Unfin
Farm	Residential	2 Story
Farm	Residential	Ranch One Story
Multiple Unit	Residential	Ranch One Story
Residential	Residential	1½ Story Fin
Residential	Residential	1½ Story Unfin
Residential	Residential	2½ Story
Residential	Residential	3 Story
Residential	Residential	Bi Level 1 Story
Residential	Residential	Bi Level 2 Story
Residential	Residential	Ranch One Story
Residential	Residential	Split Level

- Control Total

  Refer to the following table for the control total used in the base year and future year TAZ files.

Table3.2.1.4 County Control Total

	Year	Davidson	Maury	Robertson	Rutherford	Sumner	Williamson	Wilson
Total Population	2008	623,816	81,118	64,644	247,315	155,116	173,982	109,136
	2015	654,879	89,371	73,949	288,734	172,232	229,052	128,783
	2025	702,871	101,595	87,563	349,083	197,500	308,328	157,360
	2035	752,326	114,005	101,324	409,986	223,124	387,970	186,179
Number of Employment	2008	572,374	46,042	30,561	136,650	58,728	115,731	53,344
	2015	618,891	50,722	34,251	155,284	64,282	143,628	61,060
	2025	687,059	58,019	40,223	187,195	73,129	196,539	73,865
	2035	755,684	65,964	47,049	226,453	83,053	269,755	88,788
Number of Household	2008	268,697	31,975	24,531	93,847	60,799	63,853	42,073
	2015	289,632	36,218	28,874	112,778	70,052	86,646	51,467
	2025	316,455	41,962	34,884	139,114	82,970	119,252	64,829
	2035	338,140	47,182	40,511	163,719	95,226	150,917	77,747
Household Size	2008	2.23	2.5	2.61	2.57	2.53	2.71	2.56
	2015	2.17	2.43	2.54	2.5	2.44	2.63	2.48
	2025	2.13	2.39	2.49	2.46	2.36	2.57	2.4
	2035	2.12	2.38	2.48	2.46	2.32	2.56	2.37
Household Population	2008	599,194	79,938	64,026	241,187	153,821	173,042	107,707
	2015	628,501	88,010	73,340	281,945	170,927	227,879	127,638
	2025	674,049	100,289	86,861	342,220	195,809	306,478	155,590
	2035	716,857	112,293	100,467	402,749	220,924	386,348	184,260

Source: 2008 ACS and 2009 Woods and Poole Database.

3.2.2 Employment Allocation

The main data sources for employment allocation include:

- Info USA database: The database provides business locations and number of on-site employees.
- Woods and Pool database. This database provides estimated control total for base year as well as predicted control total for future years up to year 2040.

All the businesses were categorized into 1 retail and 2 non-retail categories based on their North American Industry Classification System (NAICS) code. (See table below for detailed information.) The number of employees in different categories was summed in each TAZ, and then factored to arrive at the control total of employees.

Table 3.2.2.1 NAICS Code and Woods & Poole Conversion

Categories	Employment Categories	2008 W&P Categories	NAICS Code
Industrial	Farm and Agricultural Services, other	Farm Employment	11,99
		Forestry, Fishing, Related Actives and other Employment.	
	Mining	Mining Employment	21
	Construction Employment	Construction Employment	23
	Manufacturing Employment	Manufacturing Employment	31,32,33
	Trans, Comm, & Public Utilities	Utilities Employment	22,48,49
		Transportation and Warehousing Employment	
	Wholesale Trade	Wholesale Trade Employment	42
Retail	Retail Trade	Retail Trade Employment	44,45,72
		Accommodation and Food Services Employment	
Office	Finance, Insurance, & Real Estate	Finance and Insurance Employment	52,53
		Real Estate, Rental and Lease Employment	
	Services	Information Employment	51,54,55,56,61,62,71,81
		Professional and Technical Service Employment	
		Management of Companies and Enterprises Employment	
		Administrative and Waste Services Employment	
		Education Service Employment	
		Health Care and Social Assistance Employment	
		Arts, Entertainment and Recreation Employment	
		Other Services, Except Public Administration Employment	
	Government	Government	92

Table 3.2.2.2: 2007 INFO USA Study area Number of employment (No part time or self-employed)

INFO USA Numbers (Study Area)	Davidson	Maury	Robertson	Rutherford	Sumner	Williamson	Wilson	Total
Farm and Agricultural Services, other	769	63	81	294	43	161	58	1,469
Mining	767	54	65	107	35	75	56	1,159
Construction Employment	27,228	1,845	1,532	6,369	3,563	5,733	2,056	48,326
Manufacturing Employment	35,577	8,278	8,373	13,200	6,514	5,335	7,255	84,532
Trans, Comm, & Public Utilities	14,728	762	457	4,984	1,173	984	1,407	24,495
Wholesale Trade	20,004	660	1,784	4,410	2,420	2,249	2,408	33,935
Retail Trade	94,647	8,556	4,436	25,881	8,050	23,121	8,316	173,007
Finance, Insurance, & Real Estate	33,965	2,059	823	8,453	2,157	10,360	1,296	59,113
Services	188,162	11,204	5,478	39,401	13,286	29,732	9,004	296,267
Government	35,114	1,904	1,097	6,239	2,657	2,837	1,185	51,033
Total	450,961	35,385	24,126	109,338	39,898	80,587	33,041	773,336

Note: There's a second source for the employment control total for Nashville MPO's study from US Department of Labor. However, this number doesn't include jobs not covered by unemployment insurance (Part time, agricultural employees, self-employed workers... etc). Those jobs were estimated in Woods and Poole database, they attract trips to the employment locations just like normal jobs.

Table 3.2.2.3: Aggregated Employment Control Total

	Category	DAVIDSON	MAURY	ROBERTSON	RUTHERFORD	SUMNER	WILLIAMSON	WILSON
2008	Industrial	109,867	15,048	13,564	49,329	20,178	19,650	18,803
	Retail	109,283	7,282	4,602	22,152	9,794	23,185	9,573
	Office	353,224	23,712	12,395	65,169	28,756	72,896	24,968
2015	Industrial	111,011	15,587	14,481	53,710	21,345	21,981	20,115
	Retail	115,466	7,966	5,061	26,573	10,765	29,460	11,500
	Office	392,414	27,169	14,709	75,001	32,172	92,187	29,445
2025	Industrial	111,981	16,446	15,853	60,927	23,358	25,870	22,306
	Retail	122,994	8,918	5,707	34,836	12,131	40,884	14,718
	Office	452,084	32,655	18,663	91,432	37,640	129,785	36,841
2035	Industrial	112,009	17,427	17,291	69,556	25,803	30,500	24,894
	Retail	128,471	9,797	6,313	46,155	13,407	55,713	18,475
	Office	515,204	38,740	23,445	110,742	43,843	183,542	45,419

3.3 Future year Socio-Economic data

Households and Employment were allocated by the Nashville MPO's land use model, Refer to Nashville MPO's Tri-County Study for more detailed information.

3.3.1 Household Size and Vehicle Ownership Sub-model

Household size and vehicle ownership composition were estimated by the sub-model developed by using Census 2000 data.

Table 3.3.1.1 Household Size Sub-Model Lookup Table

Average Household Size	1P	2P	3P	4P
1	100.0%	0.0%	0.0%	0.0%
1.1	90.7%	9.3%	0.0%	0.0%
1.2	82.7%	14.1%	1.7%	1.5%
1.3	76.4%	18.4%	3.5%	1.7%
1.4	70.5%	22.0%	5.3%	2.2%
1.5	64.9%	25.3%	6.9%	2.9%
1.6	59.6%	28.1%	8.4%	3.9%
1.7	54.5%	30.5%	9.9%	5.1%
1.8	49.8%	32.4%	11.3%	6.5%
1.9	45.4%	34.0%	12.5%	8.1%
2.0	41.2%	35.2%	13.7%	9.9%
2.1	37.3%	36.0%	14.8%	11.9%
2.2	33.6%	36.5%	15.8%	14.1%
2.3	30.2%	36.5%	16.8%	16.5%
2.4	27.1%	36.4%	17.6%	18.9%
2.5	24.1%	35.9%	18.4%	21.6%
2.6	21.4%	35.2%	19.1%	24.3%
2.7	18.9%	34.3%	19.7%	27.1%
2.8	16.7%	33.0%	20.2%	30.1%
2.9	14.6%	31.6%	20.7%	33.1%
3.0	12.7%	30.0%	21.1%	36.2%
3.1	10.9%	28.3%	21.4%	39.4%
3.2	9.4%	26.4%	21.6%	42.6%
3.3	8.0%	24.3%	21.8%	45.9%
3.4	6.8%	22.1%	21.9%	49.2%
3.5	5.7%	19.9%	21.9%	52.5%
3.6	4.8%	17.6%	21.8%	55.8%
3.7	3.9%	15.3%	21.7%	59.1%
3.8	3.2%	12.9%	21.6%	62.3%
3.9	2.7%	10.4%	21.3%	65.6%
4.0	2.2%	8.0%	21.0%	68.8%
4.1	1.8%	5.6%	20.7%	71.9%
4.2	1.3%	4.8%	19.0%	74.9%
4.3	0.8%	2.3%	19.0%	77.9%
4.4	0.5%	0.6%	18.1%	80.8%
4.5	0.4%	0.6%	17.0%	82.0%

Figure 3.3.1.1: Household Size Sub-model

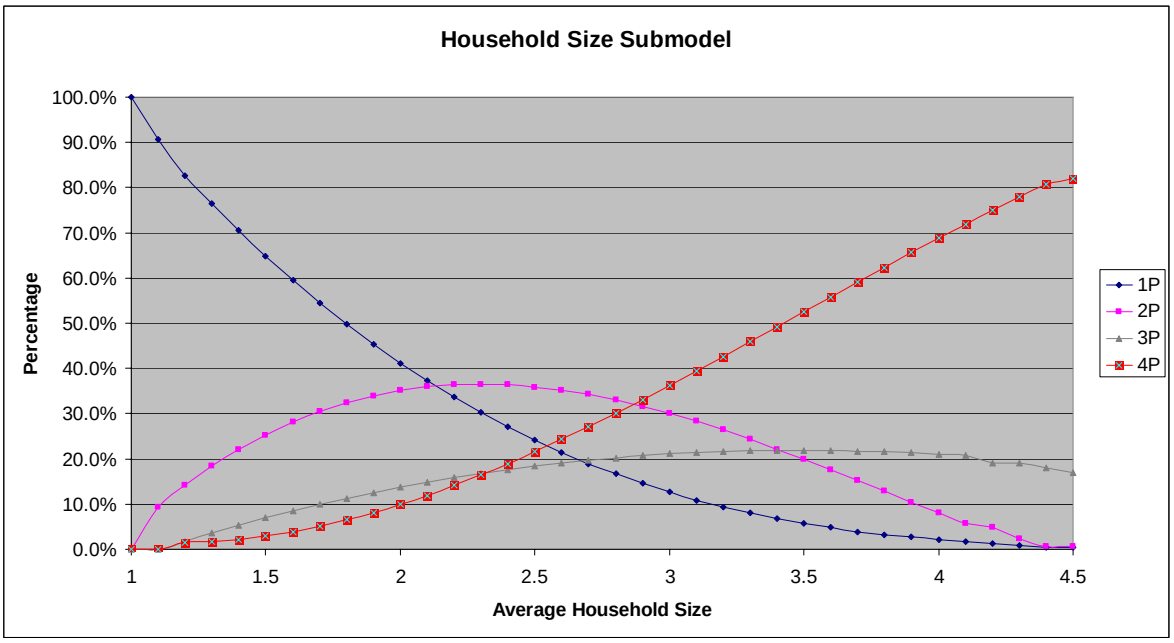


Table 3.3.1.2: Vehicle Ownership Lookup Table

Average Vehicle Ownership	0A	1A	2A	3A	4A
0.5	62.4%	31.2%	6.4%	0.0%	0.0%
0.6	56.4%	38.5%	4.6%	0.5%	0.0%
0.7	50.8%	45.0%	3.7%	0.5%	0.0%
0.8	45.5%	50.6%	3.4%	0.5%	0.0%
0.9	40.6%	55.4%	3.4%	0.5%	0.1%
1	36.1%	59.5%	3.9%	0.5%	0.1%
1.1	31.9%	62.8%	4.7%	0.5%	0.1%
1.2	28.0%	65.5%	5.8%	0.5%	0.1%
1.3	24.4%	67.6%	7.0%	0.6%	0.3%
1.4	21.2%	69.1%	8.3%	0.8%	0.5%
1.5	18.3%	70.2%	9.6%	1.3%	0.7%
1.6	15.6%	70.7%	10.9%	1.9%	0.9%
1.7	13.2%	70.8%	12.4%	2.5%	1.1%
1.8	11.1%	70.6%	14.0%	3.0%	1.3%
1.9	9.2%	70.0%	15.6%	3.6%	1.6%
2	7.6%	69.2%	17.4%	4.1%	1.8%
2.1	6.2%	68.1%	19.3%	4.5%	2.0%
2.2	5.0%	66.8%	21.2%	4.8%	2.1%
2.3	4.0%	65.5%	23.3%	5.1%	2.2%
2.4	3.2%	64.0%	25.4%	5.1%	2.3%
2.5	2.6%	62.5%	26.5%	6.1%	2.3%
2.6	2.2%	61.0%	27.5%	7.1%	2.3%
2.7	1.9%	59.5%	27.2%	8.1%	3.3%
2.8	1.7%	58.2%	26.8%	9.1%	4.3%
2.9	1.5%	57.0%	26.2%	10.1%	5.3%
3	1.3%	56.0%	25.4%	11.1%	6.3%
3.1	1.1%	55.2%	24.3%	12.1%	7.3%
3.2	0.9%	54.8%	22.9%	13.1%	8.3%
3.3	0.7%	54.7%	21.2%	14.1%	9.3%
3.4	0.5%	55.0%	19.2%	15.1%	10.3%
3.5	0.3%	55.7%	16.6%	16.1%	11.3%

Figure 3.3.1.2: One-Person Household Vehicle Ownership Sub-model

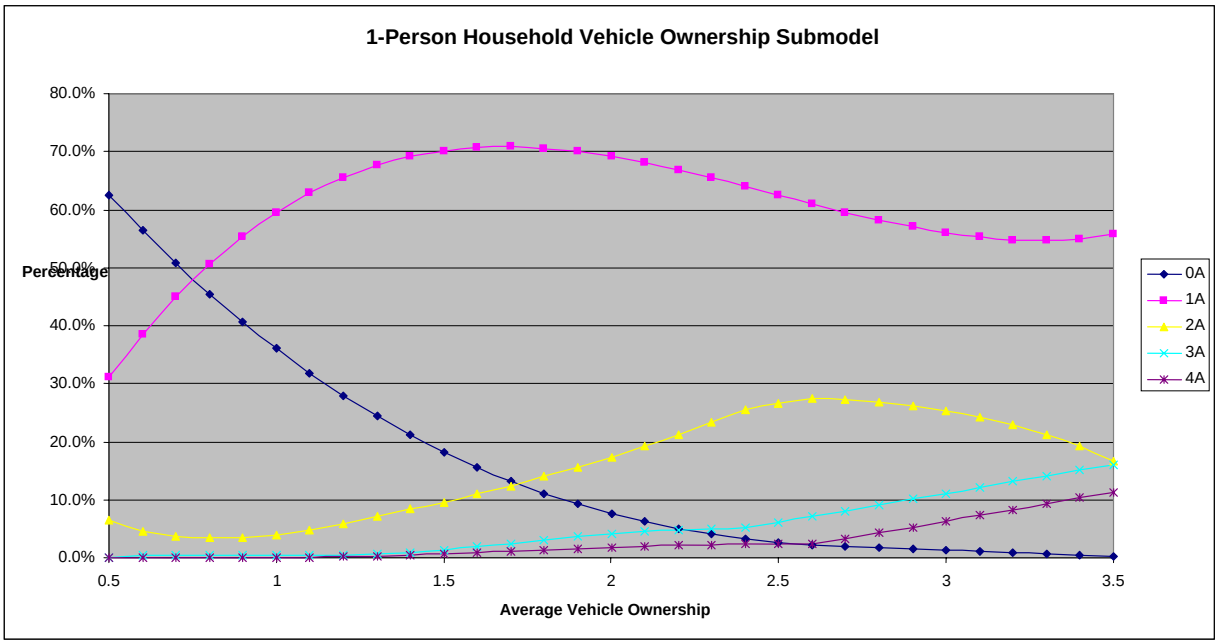


Figure 3.3.1.3: Two-Person Household Vehicle Ownership Sub-model

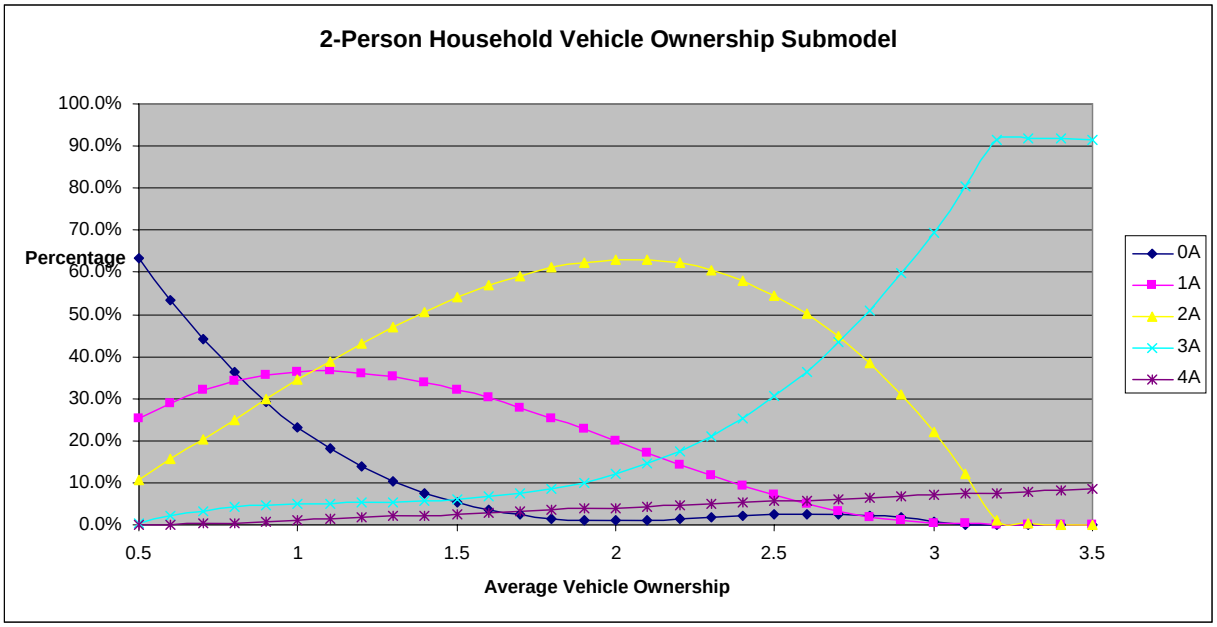


Figure 3.3.1.4: Three-Person Household Vehicle Ownership Sub-model

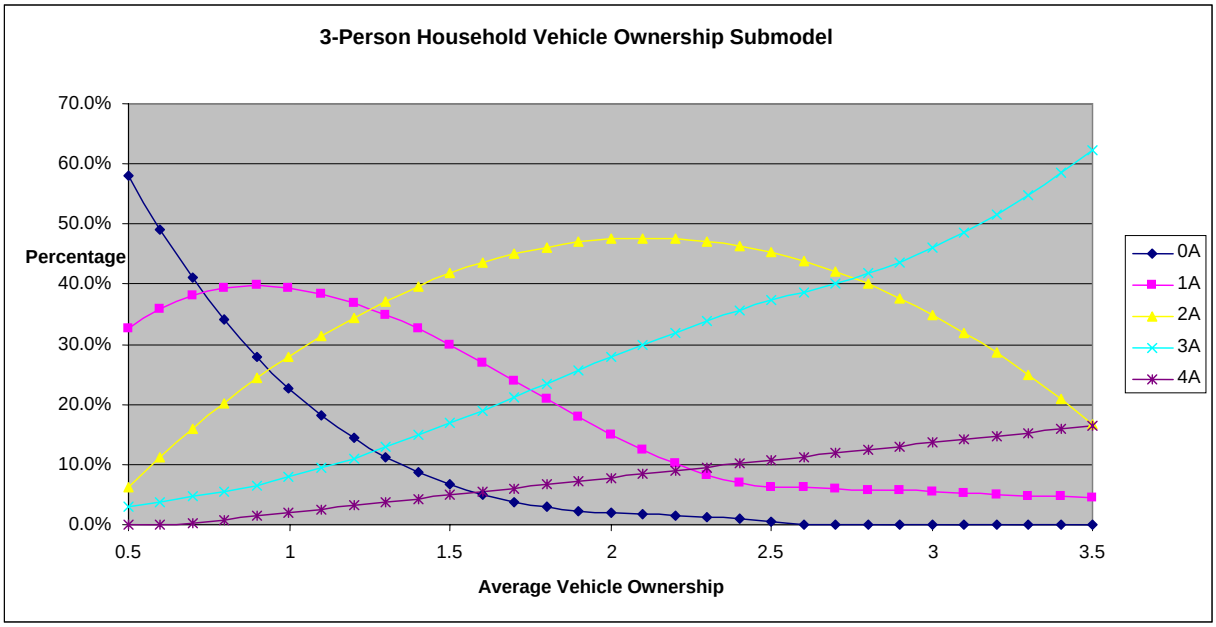
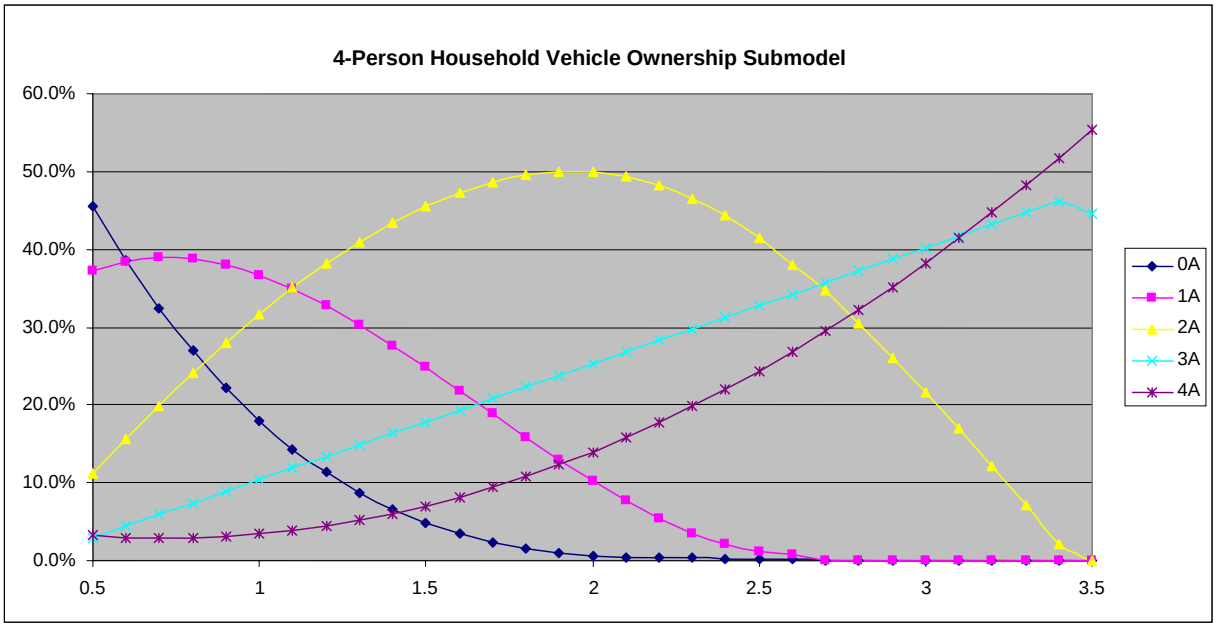


Figure 3.3.1.5: Four-Person Household Vehicle Ownership Sub-model



3.4 Area Type

Area types are used to represent how various development characteristics affect the transportation network, including highway network speed and capacity. Highway links are assigned an area type based on the TAZ where the link is located. This process facilitates the modification of link speed and capacities in future networks as development conditions change over time.

Population and employment densities are calculated using a "floating zone" process. Each TAZ's "floating zone" density are estimated by adding the population and total employment for all zones whose Centroid are located within a one-half mile buffer or the TAZ boundary, and then dividing by the cumulative area for all the zones. Demographic data for 2006 served as the source for developing area type definitions.

Seven area types are used, with the area types approximating the following development patterns:

1. High Density Urban(Central Business District- CBD)
2. Dense Urban
3. Urban
4. Suburban Business
5. Suburban Residential
6. Exurban
7. Rural

Table 3.4.1: Nashville Area Type Definition

Population density (Per Acre)		**Employment Density (Per Acre)**							
Low	High	Low	0.00	0.01	0.31	2.00	6.76	9.43	25.17
		High	0.01	0.31	2.00	6.76	9.43	25.17	-
0.00	0.05		7	7	6	4	3	3	1
0.05	0.22		7	6	6	4	3	3	1
0.22	0.59		6	6	5	4	3	2	1
0.59	0.83		6	6	5	4	3	2	1
0.83	3.73		5	5	5	4	3	2	1
3.73	5.57		5	5	4	3	3	2	1
5.57			5	5	4	3	2	2	1

4.0 Trip Generation and Trip Distribution

4.1 Trip Generation

Few minor changes were made to the trip generation rates in this model. They are

- Adding trip generation for dormitory
- Minor adjustments for trip generation rates.

There are 3 different trip purposes: Home-Based Work (HBW), Home-Based Other (HBO), and Non-Home Based (NHB). The trip rates are listed in the following tables, some minor adjustments were made during the calibration process.

Trip attraction for I-E and Truck trips were removed, because trucks are modeled separately and there is no satellite station or special generator in the network anymore.

Table 4.1.1: Trip Rates by Household Size and Vehicles Available - Production

HBW Trip Production Rate				
Vehicle Available	Household Size			
	1	2	3	4+
0	0.29	0.75	0.75	1.00
1	1.00	1.18	1.50	1.75
2	1.40	1.93	2.05	2.20
3+	1.40	1.93	3.00	3.00
HBO Trip Production Rate				
Vehicle Available	Household Size			
	1	2	3	4+
0	1.00	1.50	4.50	5.90
1	1.95	2.50	4.65	7.00
2	2.10	2.85	4.75	8.30
3+	2.10	3.00	5.00	8.50
NHB Trip Production Rate				
Vehicle Available	Household Size			
	1	2	3	4+
0	0.40	0.60	0.90	1.50
1	1.50	2.20	3.00	3.40
2	1.60	2.35	3.40	5.00
3+	1.60	2.50	3.40	5.10

Table 4.1.2: Trip Attraction Rate

Trip Purpose	HH	Retail Emp.	Non-Retail Emp.	Total Emp.
HBW		1.616	0.738	
HBO	3.368			0.677
NHB	1.101			0.800

4.2.1 Dormitory trip generation

There was no dormitory trip generation in the previous update, it was assumed that the trips generated from the dormitory was somewhat captured in HBO and NHB trip purpose. In this update, the production and attraction rates were borrowed from Knoxville Transportation Planning Organization (TPO).

Dormitory HBO Production = 1.29 * Dormitory Population
Dormitory HBO Attraction = 0.68 * Dormitory Population
Dormitory NHB Production = 0.93 * Dormitory Population
Dormitory NHB Attraction = 0.18 * Dormitory Population

4.2 Trip distribution

Trip Distribution was re-calibrated using 1998 Nashville Household Travel Survey (HHTS). The following data were used during the process:

- Geo-Coded location map for all the origins and destinations in the HHTS
- Number of trips and trip purposes from the HHTS

The gravity model was calibrated using:

- AM peak skim matrix for the HBW Trips
- Off-peak skim matrix for the HBO and the NHB trips.

For all trip purposes, the modeled average travel time, percentage intra-zonal trips, trip length curve were compared to the household travel survey during the calibration process.

4.2.1 Travel Impedance

A Travel Impedance matrix was created with:

- Terminal time, it is the time added to each trips to simulate the time spent walking to and from a traveler's vehicle within a TAZ.
- Inter-zonal travel time, the time that simulates the time people travel within the same TAZ. It is estimated using the sixty percent of the average travel time from the TAZ to four closest zones.
- Congested travel time was calculated using AM peak period assignment results.

Table 4.2.1.1: Terminal Time in Minutes

Area Type	Urban Very High Density	Urban High Density/ Commercial	Urban High Density/ Residential	Suburban Commercial	Suburban Residential	Exurban	Rural
Production End	2	2	2	1	1	1	1
Attraction End	2	2	2	1	1	1	1

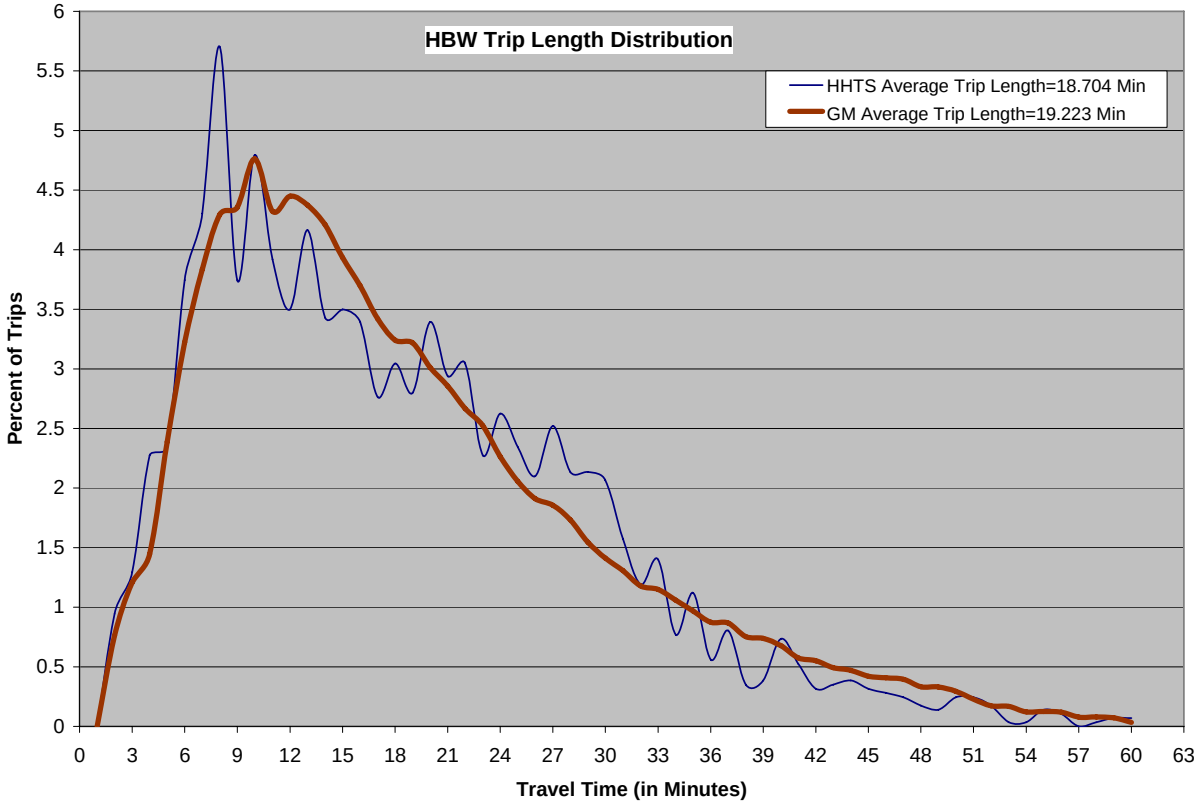
4.2.2 HBW Gravity Model

Data Source: AM period impedance matrix.

Calibration Criteria:

- Average travel time of observations and estimations should be within 3% .

Figure 4.2.2.1: HBW Trip Length Frequency Plot, +2.7% error



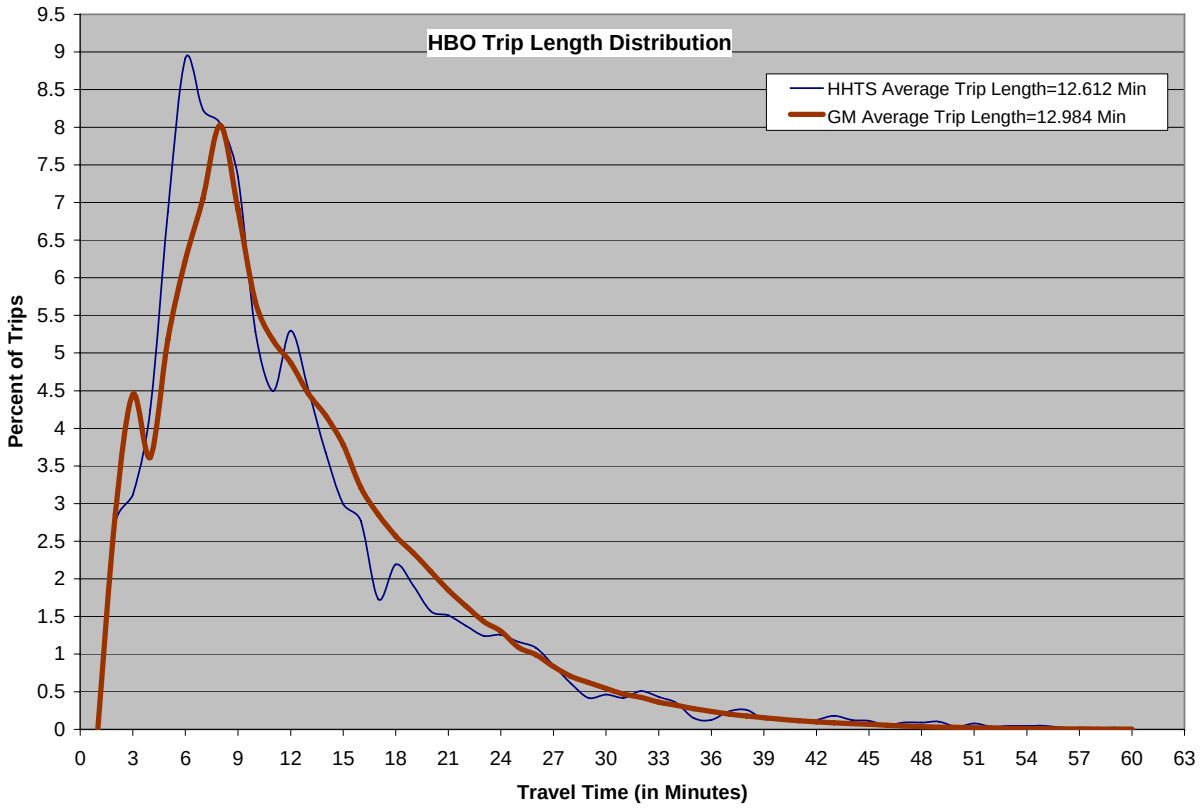
4.2.3 HBO Gravity Model

Data Source: Off-peak period impedance matrix.

Calibration Criteria:

- Average travel time of observations and estimations should be within 3% .

Figure 4.2.3.1: HBO Trip Length Frequency Plot, +2.9%



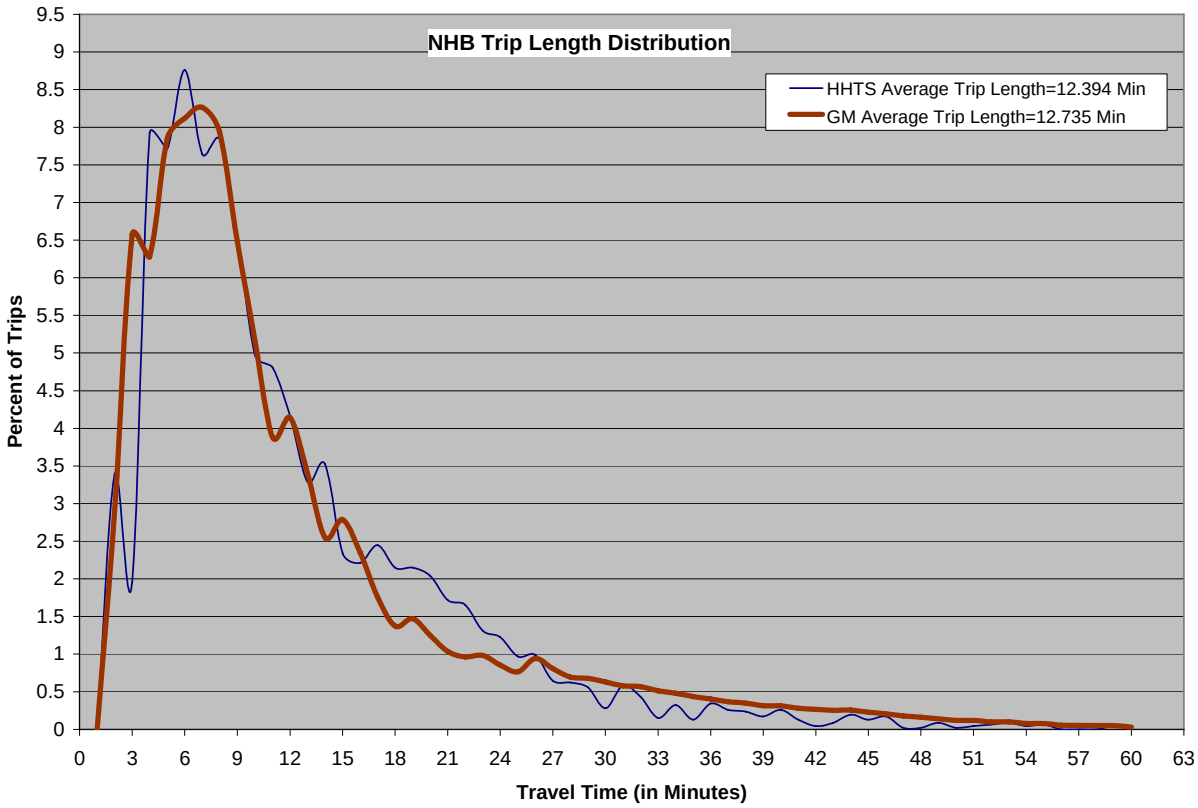
4.2.4 NHB Gravity Model

Data Source: Off-peak period impedance matrix.

Calibration Criteria:

- Average travel time of observations and estimations should be within 3% .

Figure 4.2.4.1: NHB Trip Length Frequency Plot, +2.7%



5.0 Mode Split and Time-of-Day Factors

5.1 Mode Split

Mode Choice methodology was not changed. Assumptions from the previously updated model will still be used. However, integrating a mode choice model is planned for the next model update (LRTP 2040).

Auto Occupancy Rates are

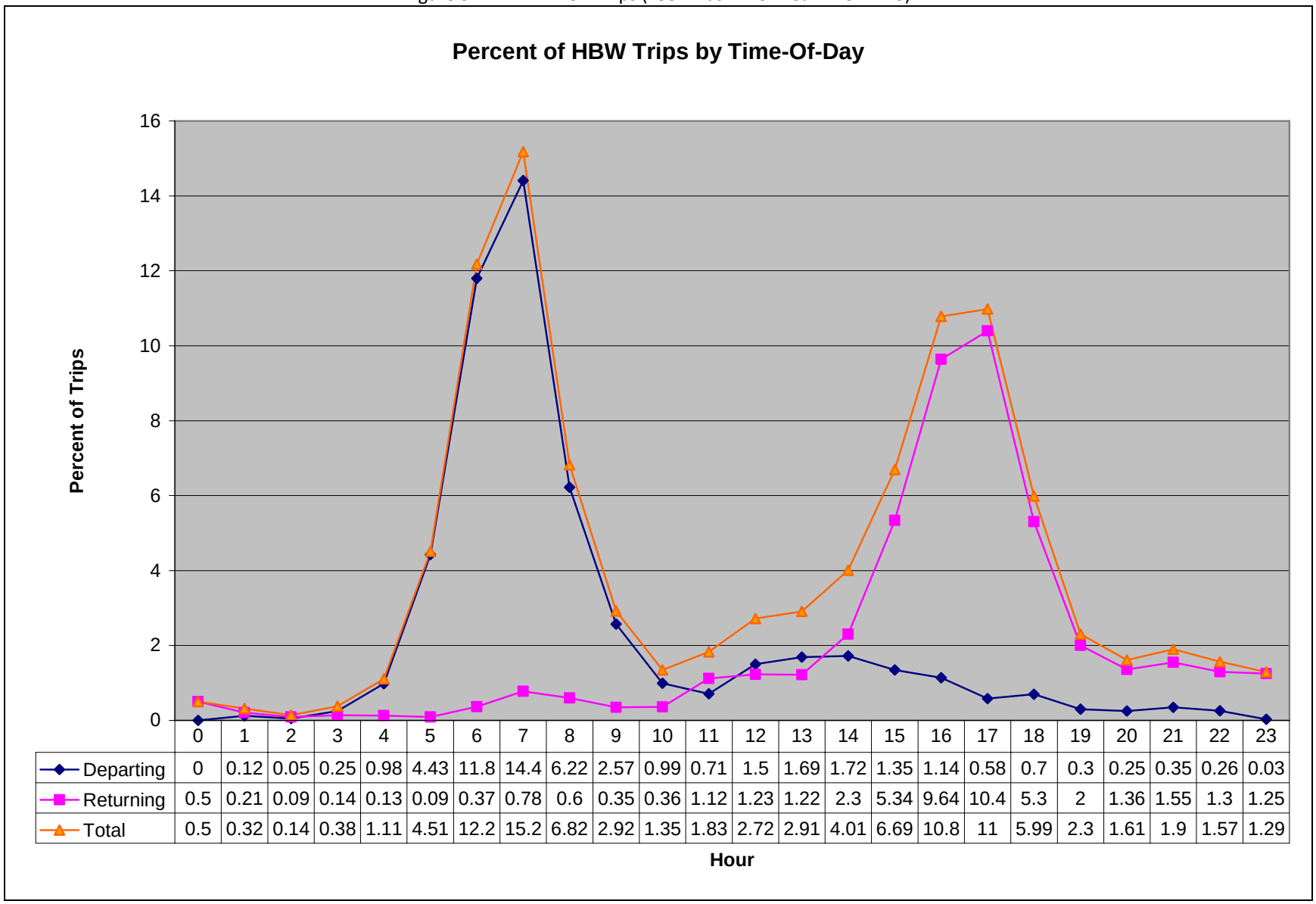
- HBW – 1.16
- HBO – 1.62
- NHB – 1.41

5.2 Time of day

Daily Vehicle trip tables from the trip distribution process were split into three time periods, before trips were assigned to the transportation network. The three time periods are:

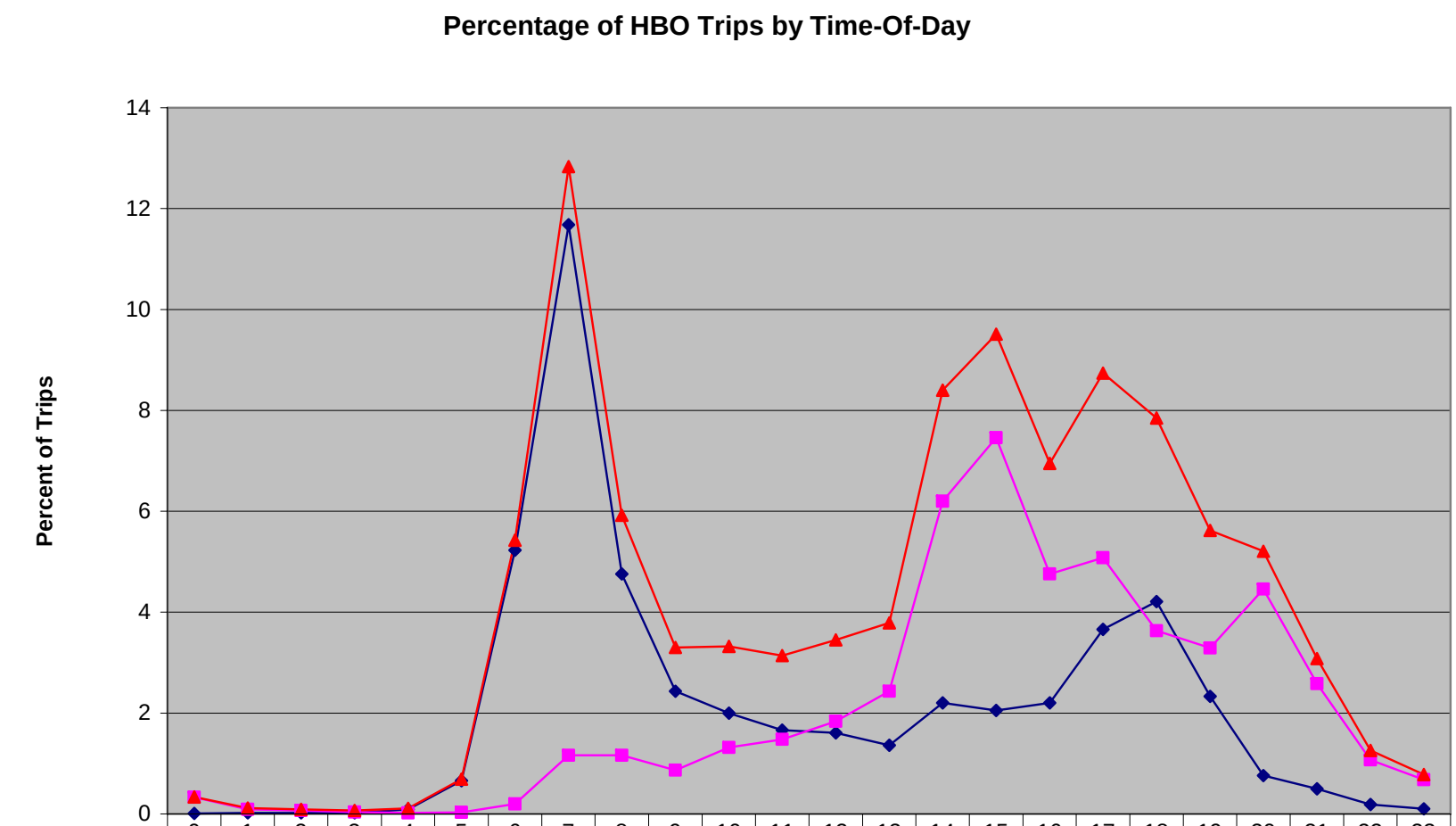
1. AM Peak Period [5AM – 9AM]
2. PM Peak Period [3PM – 7PM]
3. Off-Peak Period(s) [All other Hours]

Figure 5.2.1: HBW TOD Trips (1997 Nashville Area MPO HHTS)



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Departing	0	0.12	0.05	0.25	0.98	4.43	11.8	14.4	6.22	2.57	0.99	0.71	1.5	1.69	1.72	1.35	1.14	0.58	0.7	0.3	0.25	0.35	0.26	0.03
Returning	0.5	0.21	0.09	0.14	0.13	0.09	0.37	0.78	0.6	0.35	0.36	1.12	1.23	1.22	2.3	5.34	9.64	10.4	5.3	2	1.36	1.55	1.3	1.25
Total	0.5	0.32	0.14	0.38	1.11	4.51	12.2	15.2	6.82	2.92	1.35	1.83	2.72	2.91	4.01	6.69	10.8	11	5.99	2.3	1.61	1.9	1.57	1.29

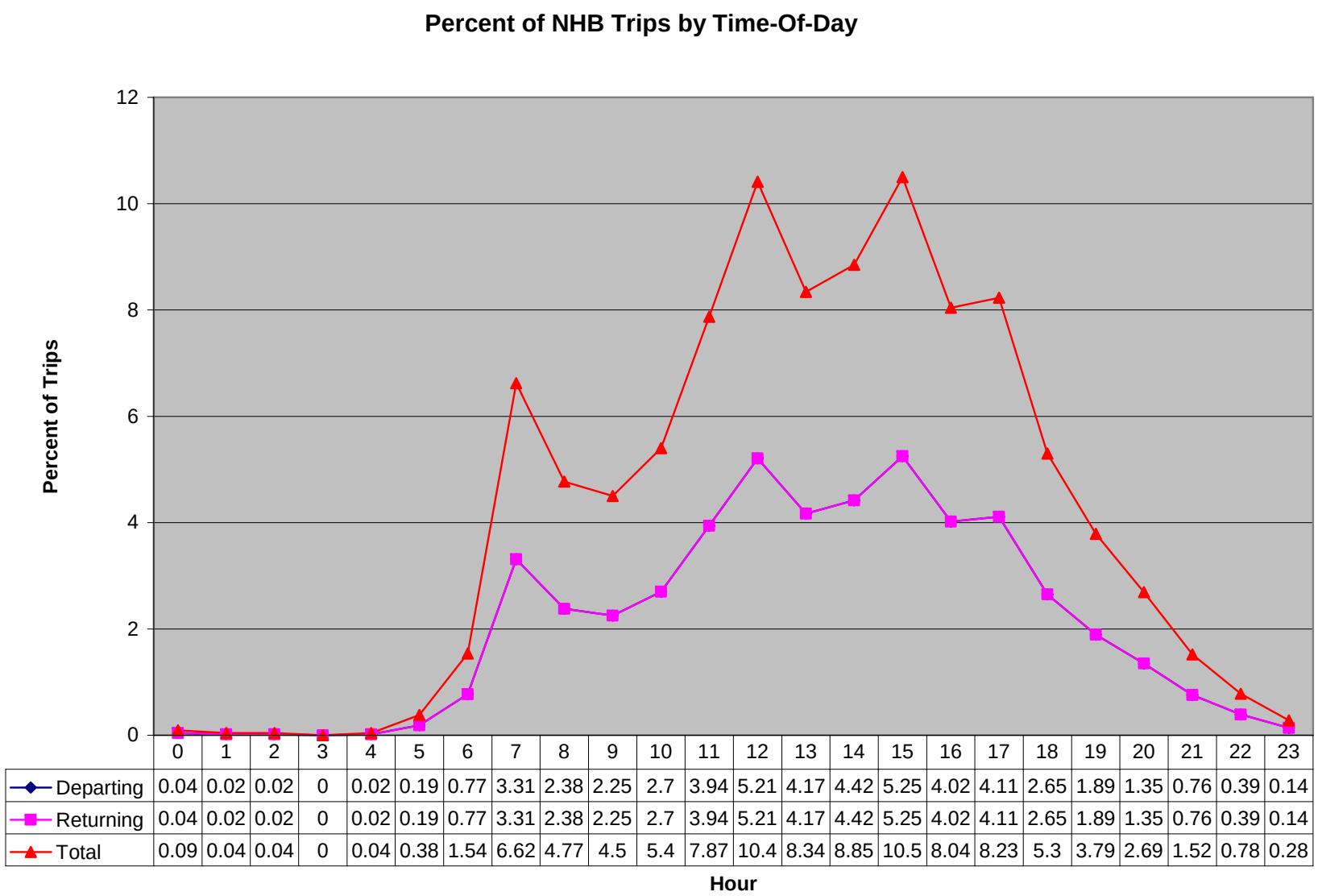
Figure 5.2.2: HBO TOD Trips (1997 Nashville Area MPO HHTS)



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Departing	0.01	0.02	0.02	0.02	0.09	0.66	5.23	11.7	4.76	2.43	2	1.66	1.61	1.36	2.2	2.05	2.2	3.66	4.21	2.33	0.76	0.5	0.19	0.1
Returning	0.33	0.09	0.07	0.04	0.02	0.03	0.2	1.16	1.16	0.87	1.32	1.48	1.84	2.43	6.2	7.46	4.76	5.08	3.63	3.29	4.46	2.58	1.07	0.68
Total	0.34	0.12	0.09	0.07	0.11	0.69	5.43	12.8	5.92	3.3	3.32	3.14	3.45	3.79	8.4	9.51	6.95	8.74	7.85	5.62	5.21	3.08	1.26	0.78

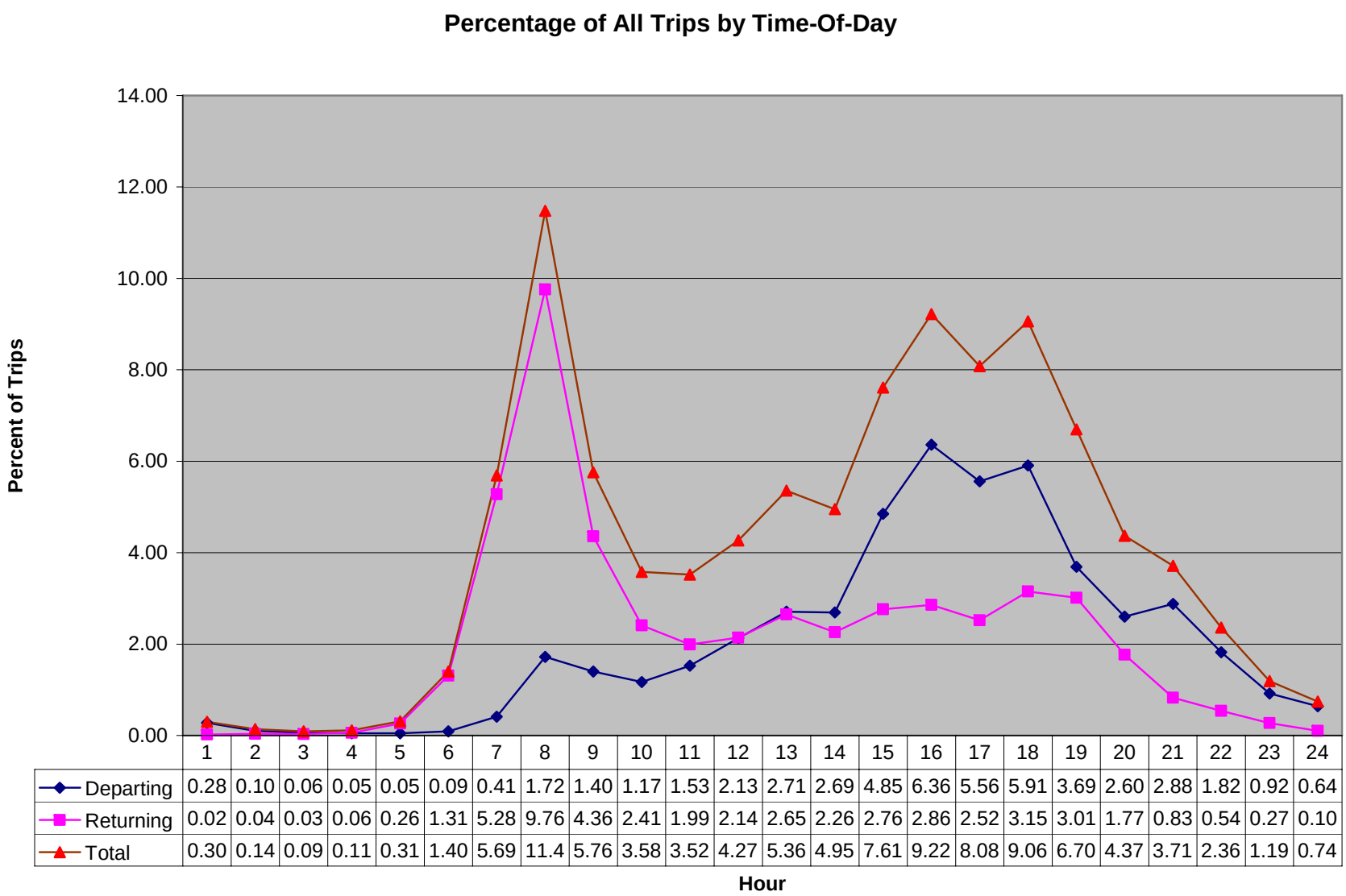
Hour

Figure 5.2.3: NHB TOD Trips (1997 Nashville Area MPO HHTS)



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Departing	0.04	0.02	0.02	0	0.02	0.19	0.77	3.31	2.38	2.25	2.7	3.94	5.21	4.17	4.42	5.25	4.02	4.11	2.65	1.89	1.35	0.76	0.39	0.14
Returning	0.04	0.02	0.02	0	0.02	0.19	0.77	3.31	2.38	2.25	2.7	3.94	5.21	4.17	4.42	5.25	4.02	4.11	2.65	1.89	1.35	0.76	0.39	0.14
Total	0.09	0.04	0.04	0	0.04	0.38	1.54	6.62	4.77	4.5	5.4	7.87	10.4	8.34	8.85	10.5	8.04	8.23	5.3	3.79	2.69	1.52	0.78	0.28

Figure 5.2.4: All Trip Purposes TOD Table (1997 Nashville Area MPO HHTS)



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Departing	0.28	0.10	0.06	0.05	0.05	0.09	0.41	1.72	1.40	1.17	1.53	2.13	2.71	2.69	4.85	6.36	5.56	5.91	3.69	2.60	2.88	1.82	0.92	0.64
Returning	0.02	0.04	0.03	0.06	0.26	1.31	5.28	9.76	4.36	2.41	1.99	2.14	2.65	2.26	2.76	2.86	2.52	3.15	3.01	1.77	0.83	0.54	0.27	0.10
Total	0.30	0.14	0.09	0.11	0.31	1.40	5.69	11.4	5.76	3.58	3.52	4.27	5.36	4.95	7.61	9.22	8.08	9.06	6.70	4.37	3.71	2.36	1.19	0.74

6.0 Traffic Assignment

6.1 Assumptions

- HOV lanes were treated as normal travel lanes due to insufficient data and high violation rate in the region.
- External to External Passenger Trips were pre-assigned and pre-loaded to the network.
- Free flow speed was updated. The result was compared to the posted speed and travel time study in order to ensure its accuracy. Refer to the table below for detail.

Table 6.1.1: Free Flow Speed for Different Area Types and Facility Types.

Facility Type		Area Type						
		1	2	3	4	5	6	7
Code	**Description**	Urban Very High Density	Urban High Density/ Commercial	Urban High Density/ Residential	Suburban Commercial	Suburban Residential	Exurban	Rural
1	**Interstate**	50	55	55	60	57	65	70
2	**Freeway**	50	50	50	58	55	55	55
3	**Expressway**	50	50	50	50	55	60	60
4	**Collector-Distributor**	50	50	55	55	57	60	60
6	**System-System Ramp**	55	55	55	55	55	55	55
7	**On-Ramp**	45	50	50	50	50	55	55
8	**Off-Ramp**	22	23	30	31	34	40	48
11	**Principal Arterial**	29	38	42	43	47	54	59
12	**Major Arterial**	28	35	40	42	44	45	40
13	**Minor Arterial**	27	33	38	41	42	44	39
21	**Collector-Distributor**	26	32	37	36	39	32	32
31	**Local**	14	14	17	18	22	28	28
99	**Centroid Connectors**	14	14	17	18	22	28	27

- Volume delay function parameters were based on the previous model. Refer to the table below for detail.

Table 6.1.2: Volume-Delay Function Parameters

Name	Area Type	Facility Type	Alpha	Beta
High Density Unsignalized	1-8	1-4	0.84	4.0
High Density Signalized	11-31	1-4	0.84	5.5
Low Density Unsignalized	1-8	5-7	0.84	4.0
Low Density Signalized	11-31	5-7	0.84	5.5

6.2 Validation

The Validation guidelines are from

- Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee (F. Wegmann and J. Everett, University of Tennessee, 2003)
- Model Validation and Reasonableness Checking Manual (US Department of Transportation, 2001),
- NCHRP 365 Travel Estimation Techniques for Urban Planning (Transportation Research Board National Research Council, 1998).

The following tests were performed to ensure the model's performance is acceptable.

- **Volume**
  - Percent Volume Difference by Functional Classification

Table 6.2.1 Percent Volume Difference by Functional Classification

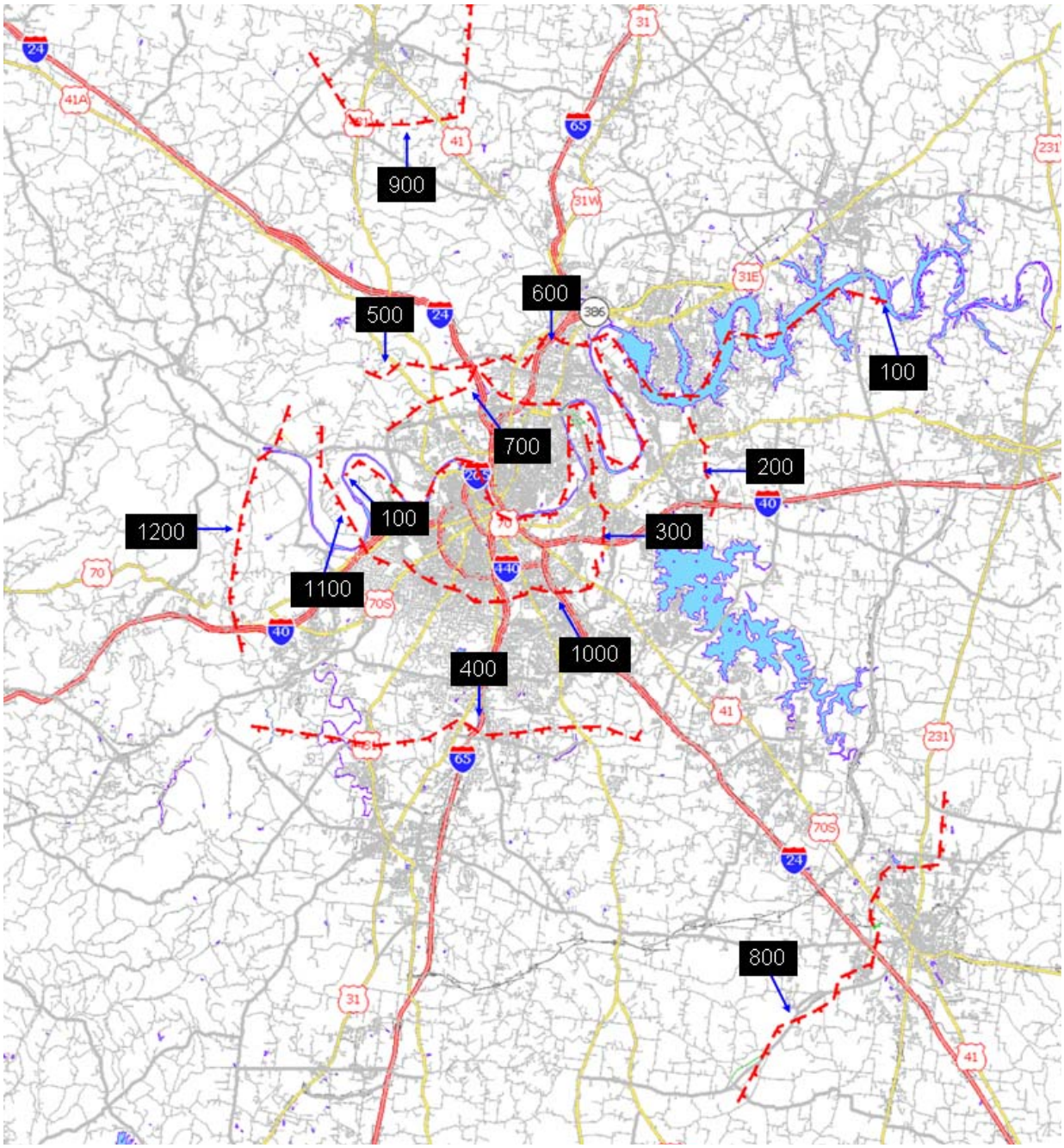
% Difference Between Count & Volume			
Facility Type	Number of Oberservation	Nashville Model	Target Error %
Interstate/Freeway	239	2.39%	± 7%
Principle Arterial	305	1.44%	± 10%
Minor Arterial	437	-2.52%	± 15%
Collector	692	-2.64%	± 25%

- Screen Line analysis, all the screen lines have 10% target volume vs. count error, refer to the map in next page for the screen line locations

Table 6.2.2: Screen Line volume vs. count %

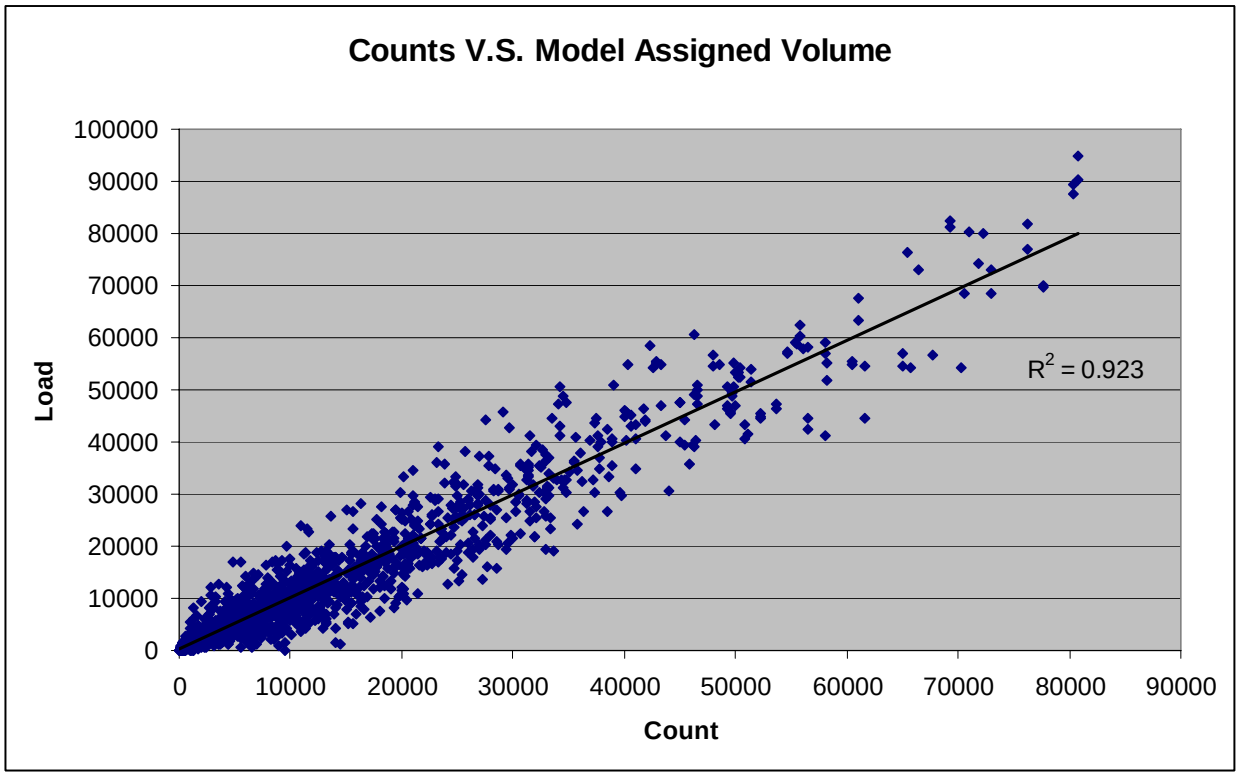
NO.	Screen Line Name	% Volume/ Count difference
100	Cumberland River	6.0%
200	E of Nashville (I-40 Corridor)	7.1%
300	E of Nashville Outside SR155	3.1%
400	N of Franklin(I-65 Corridor)	-8.2%
500	N of Nashville (I-24 Corridor)	7.1%
600	N of Nashville (I-65 Corridor)	-8.2%
700	N of Nashville Outside SR155	8.3%
800	Northwest of Murfreesboro	1.6%
900	Roberson to Davison	-0.7%
1000	S of Nashville Outside SR155	0.4%
1100	W of Nashville (I-40 Corridor)	7.1%
1200	W of Nashville Outside SR155	-2.5%

Figure 6.2.1: Screen Line Locations



- Coefficient of Determination R^2 has to be more than 0.88

Figure 6.2.2: Counts V.S. Model Assigned Volume



- **Root Mean Square Error Percentage (RMSE %)**

Table 6.2.3: RMSE for different volume groups

Volume Range	Model % RMSE	Maximum Desirable % RMSE
0-4,999	78.57%	115.80%
5000-9,999	41.88%	43.10%
10,000-19,999	29.23%	28.30%
20,000-39,999	20.88%	25.40%
40.000-59.999	16.60%	30.30%
>60.000	11.79%	19.20%
Total	30.17%	30%

- **Vehicle Mile Traveled (VMT)**

Table 6.2.4: Model VMT V.S. HPMS Target error Percent

Table: VMT V.S. HPMS Target error %

Functional Class	Source	Davidson	Roberson	Rutherford	Sumner	Williamson	Wilson	Sum	Error %	Target %
	Model	8,622,969	1,457,871	2,324,932	399,012	1,753,656	1,445,338	16,003,779	0.78%	
Interstate	HPMS	8,636,823	1,389,686	2,340,700	355,320	1,753,891	1,403,700	15,880,120		±12%
	Model	1,368,575		166,023	345,816	10,934	22,642	1,913,990	9.31%	
Freeway	HPMS	1,216,511	0	181,977	296,555	20,977	34,997	1,751,017		±22%
	Model	6,995,299	781,379	2,620,053	1,612,846	1,805,638	1,312,500	15,127,715	-7.42%	
Arterial	HPMS	7,304,833	657,506	2,953,051	1,780,147	2,104,422	1,540,999	16,340,958		±27%
	Model	976,306	286,074	759,723	632,329	675,050	471,843	3,801,324	-8.53%	
Collector	HPMS	1,073,693	329,788	814,078	656,290	739,029	542,751	4,155,629		±33%
	Model	17,963,149	2,525,324	5,870,731	2,990,003	4,245,278	3,252,323	36,846,808		
Sum	HPMS	18,231,860	2,376,980	6,289,806	3,088,312	4,618,319	3,522,447	38,127,724	-3.36%	

7.0 Model Application

7.1 What's New

- New Functions
  - Trip Generation is now built in the model interface
  - Trip Balancing is now built in the model interface
  - Added "Performance Measure" for calibration purpose
  - Added "Select Link Analysis" Option
  - Added "Air Pollution" section to calculate the inputs needed for Mobile 62

- Data input
  - SE data input field is removed, all the data in SE file is stored in the TAZ file instead.
  - New input field added for truck volume.

- Trucks
  - All the truck components were removed.
  - Reads Truck O/D Matrix and assign the trips in "Trip Generation" section
  - Assignment result is now coded in the network.

- User Interface
  - Changed the progress bar information. The progress bar now shows more accurate percentage, as well as the current procedure.
  - Added new error handler message, when any error occurs, the error message will pop up and show which part of the process went wrong.

- Others
  - Added Loop function to the repeated functions. This reduced a great number of script lines.
  - External to External Trips are passenger only trips. Truck trips were estimated in the truck model.
  - All the output and temporally files are stored in \output folder instead of the main model folder.
  - Default matrix Column and Row names were changed in TransCAD 5.0. The names where fixed in the script.

Appendix A: Network Dictionary

Name	Type	Description
ID	Integer (4 bytes)	ID number
Length	Real (8 bytes)	Link Length (Mile)
Dir	Integer (2 bytes)	Direction, 0=Two-Way Roadway, 1 or -1, One Way
DIR2006	Integer (2 bytes)	Same As Above, 2006 Scenario
DIR2015E	Integer (2 bytes)	Same As Above, 2015 E+C Scenario
DIR2015L	Integer (2 bytes)	Same As Above, 2015 LRTP Scenario
DIR2025E	Integer (2 bytes)	Same As Above, 2025 E+C Scenario
DIR2025L	Integer (2 bytes)	Same As Above, 2025 LRTP Scenario
DIR2035E	Integer (2 bytes)	Same As Above, 2035 E+C Scenario
DIR2035L	Integer (2 bytes)	Same As Above, 2035 LRTP Scenario
NAME	Character	Link Name
County	Character	County Number where the link is located
HOV_FLAG	Integer (2 bytes)	HOV Lane Flag, 1=Hov Lane
AreaType	Integer (2 bytes)	Generalized Area Type from the Model
FTYPE	Integer (2 bytes)	Facility Type
FUNC_CLASS	Integer (2 bytes)	FHWA Functional Class
FCL2006	Integer (2 bytes)	Same As Above, 2006 Scenario
FCL2015E	Integer (2 bytes)	Same As Above, 2015 E+C Scenario
FCL2015L	Integer (2 bytes)	Same As Above, 2015 LRTP Scenario
FCL2025E	Integer (2 bytes)	Same As Above, 2025 E+C Scenario
FCL2025L	Integer (2 bytes)	Same As Above, 2025 LRTP Scenario
FCL2035E	Integer (2 bytes)	Same As Above, 2035 E+C Scenario
FCL2035L	Integer (2 bytes)	Same As Above, 2035 LRTP Scenario
LANES	Integer (2 bytes)	Number of Lanes
LAN2006	Integer (2 bytes)	Same As Above, 2006 Scenario
LAN2015E	Integer (2 bytes)	Same As Above, 2015 E+C Scenario
LAN2015L	Integer (2 bytes)	Same As Above, 2015 LRTP Scenario
LAN2025E	Integer (2 bytes)	Same As Above, 2025 E+C Scenario
LAN2025L	Integer (2 bytes)	Same As Above, 2025 LRTP Scenario
LAN2035E	Integer (2 bytes)	Same As Above, 2035 E+C Scenario
LAN2035L	Integer (2 bytes)	Same As Above, 2035 LRTP Scenario
PAVEMENT W	Integer (2 bytes)	Pavement Width for all lanes
PAV2006	Integer (2 bytes)	Same As Above, 2006 Scenario
PAV2015E	Integer (2 bytes)	Same As Above, 2015 E+C Scenario
PAV2015L	Integer (2 bytes)	Same As Above, 2015 LRTP Scenario
PAV2025E	Integer (2 bytes)	Same As Above, 2025 E+C Scenario
PAV2025L	Integer (2 bytes)	Same As Above, 2025 LRTP Scenario
PAV2035E	Integer (2 bytes)	Same As Above, 2035 E+C Scenario
PAV2035L	Integer (2 bytes)	Same As Above, 2035 LRTP Scenario
CTL_FLAG	Integer (2 bytes)	Continuous Left Turn Lane Flag, 1=With Left turn Lane
CTL2006	Integer (2 bytes)	Same As Above, 2006 Scenario
CTL2015E	Integer (2 bytes)	Same As Above, 2015 E+C Scenario
CTL2015L	Integer (2 bytes)	Same As Above, 2015 LRTP Scenario
CTL2025E	Integer (2 bytes)	Same As Above, 2025 E+C Scenario

Name	Type	Description
CTL2025L	Integer (2 bytes)	Same As Above, 2025 LRTP Scenario
CTL2035E	Integer (2 bytes)	Same As Above, 2035 E+C Scenario
CTL2035L	Integer (2 bytes)	Same As Above, 2035 LRTP Scenario
LinkID	Integer (4 bytes)	Link ID, for internal use
CBD	Real (8 bytes)	Distance to CBD, for internal Use
DIVIDED	Integer (2 bytes)	Dividing Factor, for Internal use
CONTFACT	Real (4 bytes)	Count Factor, for Internal use
TDOT STA	Character	TDOT Station Number
DAILY_FLOW	Integer (4 bytes)	Daily Flow for the Link
2006_ADT	Integer (4 bytes)	2006 AADT form the Count Station
2006_PASS_ADT	Real (8 bytes)	2006 Passenger Count
2006_COM_ADT	Real (8 bytes)	2006 Commercial Vehicle Count
2006_SU_ADT	Real (8 bytes)	2006 Single Unit Truck Count
2006_MU_ADT	Real (8 bytes)	2006 Multi-unit Truck Count
TIP_N	Character	TIP Project Number
E_C	Character	Existing or Committed Project
S.R.	Integer (4 bytes)	State Route Number 1
S.R.2	Integer (4 bytes)	State Route Number 2
U.S._1	Character	U.S. Route Number 1
U.S._2	Character	U.S. Route Number 2
U.S._3	Character	U.S. Route Number 3
U.S._4	Character	U.S. Route Number 4
SPEED_LMT	Integer (4 bytes)	Speed Limit
CLSS_C_ID	Integer (4 bytes)	Class Count Station ID
CLSS_C_YR	Integer (4 bytes)	Class Count Station year
VHCL_P_COM	Real (4 bytes)	2006 Passenger Percent
VHCL_P_PAS	Real (4 bytes)	2006 Commercial Vehicle Percent
VHCL_PASS	Real (4 bytes)	2006 4-Wheel Vehicle Percent(VHCL_P_PAS+VHCL_P_COM)
VHCL_SU_TR	Real (4 bytes)	2006 Single Unit Truck Percent
VHCL_MU_TR	Real (4 bytes)	2006 Multi-unit Truck Percent
CCSTYLE	Integer (4 bytes)	CCSTYLE, Internal Use
Add / Remove	Integer (4 bytes)	Add/Remove Flag, Internal Use
PROHIBITION	Integer (2 bytes)	PROHIBITION Flag
SPEED	Real (8 bytes)	Free Flow Speed
Capacity	Real (8 bytes)	Hourly Capacity
Alpha	Real (8 bytes)	Alpha for Volume/Delay Function
Beta	Real (8 bytes)	Beta For Volume/Delay Function
Time	Real (8 bytes)	Free Flow Travel Time
TimeOP	Real (8 bytes)	Off Peak Travel Time
CapAM_AB	Real (8 bytes)	Time of Day Directional Capacity
CapAM_BA	Real (8 bytes)	Time of Day Directional Capacity
CapMD_AB	Real (8 bytes)	Time of Day Directional Capacity
CapMD_BA	Real (8 bytes)	Time of Day Directional Capacity
CapPM_AB	Real (8 bytes)	Time of Day Directional Capacity
CapPM_BA	Real (8 bytes)	Time of Day Directional Capacity
CapOP_AB	Real (8 bytes)	Time of Day Directional Capacity
CapOP_BA	Real (8 bytes)	Time of Day Directional Capacity

Name	Type	Description
AMFlow_AB	Integer (4 bytes)	Time of Day Directional Traffic Flow
AMFlow_BA	Integer (4 bytes)	Time of Day Directional Traffic Flow
MDFlow_AB	Integer (4 bytes)	Time of Day Directional Traffic Flow
MDFlow_BA	Integer (4 bytes)	Time of Day Directional Traffic Flow
PMFlow_AB	Integer (4 bytes)	Time of Day Directional Traffic Flow
PMFlow_BA	Integer (4 bytes)	Time of Day Directional Traffic Flow
OPFlow_AB	Integer (4 bytes)	Time of Day Directional Traffic Flow
OPFlow_BA	Integer (4 bytes)	Time of Day Directional Traffic Flow
AMFlow_Tot	Integer (4 bytes)	Time of Day Total Traffic Flow
MDFlow_Tot	Integer (4 bytes)	Time of Day Total Traffic Flow
PMFlow_Tot	Integer (4 bytes)	Time of Day Total Traffic Flow
OPFlow_Tot	Integer (4 bytes)	Time of Day Total Traffic Flow
AMSpeed_AB	Real (8 bytes)	Time of Day Directional Travel Speed
AMSpeed_BA	Real (8 bytes)	Time of Day Directional Travel Speed
MDSpeed_AB	Real (8 bytes)	Time of Day Directional Travel Speed
MDSpeed_BA	Real (8 bytes)	Time of Day Directional Travel Speed
PMSpeed_AB	Real (8 bytes)	Time of Day Directional Travel Speed
PMSpeed_BA	Real (8 bytes)	Time of Day Directional Travel Speed
OPSpeed_AB	Real (8 bytes)	Time of Day Directional Travel Speed
OPSpeed_BA	Real (8 bytes)	Time of Day Directional Travel Speed
AM_VMT	Integer (4 bytes)	Time of Day Vehicle Mile Traveled
MD_VMT	Integer (4 bytes)	Time of Day Vehicle Mile Traveled
PM_VMT	Integer (4 bytes)	Time of Day Vehicle Mile Traveled
OP_VMT	Integer (4 bytes)	Time of Day Vehicle Mile Traveled
DAILY_VMT	Integer (4 bytes)	Daily Vehicle Mile Traveled
TRKAM_AB	Real (4 bytes)	Truck Time of Day Total Traffic Flow
TRKAM_BA	Real (4 bytes)	Truck Time of Day Total Traffic Flow
TRKMD_AB	Real (4 bytes)	Truck Time of Day Total Traffic Flow
TRKMD_BA	Real (4 bytes)	Truck Time of Day Total Traffic Flow
TRKPM_AB	Real (4 bytes)	Truck Time of Day Total Traffic Flow
TRKPM_BA	Real (4 bytes)	Truck Time of Day Total Traffic Flow
TRKOP_AB	Real (4 bytes)	Truck Time of Day Total Traffic Flow
TRKOP_BA	Real (4 bytes)	Truck Time of Day Total Traffic Flow
TOTFLOW	Real (4 bytes)	TOTAL Truck Flow
Pass_PER	Real (4 bytes)	Passenger Vehicle Percentage, Internal Use
PASS_Count	Real (4 bytes)	Passenger Vehicle Count, Internal Use
PASS_Load	Real (4 bytes)	Passenger Vehicle Load, Internal Use
PRELOADAMAB	Real (4 bytes)	Truck and External Trips Preload Volume, Internal Use
PRELOADAMBA	Real (4 bytes)	Truck and External Trips Preload Volume, Internal Use
PRELOADMDAB	Real (4 bytes)	Truck and External Trips Preload Volume, Internal Use
PRELOADMDBA	Real (4 bytes)	Truck and External Trips Preload Volume, Internal Use
PRELOADOPAB	Real (4 bytes)	Truck and External Trips Preload Volume, Internal Use
PRELOADOPBA	Real (4 bytes)	Truck and External Trips Preload Volume, Internal Use
PRELOADPMAB	Real (4 bytes)	Truck and External Trips Preload Volume, Internal Use
PRELOADPMBA	Real (4 bytes)	Truck and External Trips Preload Volume, Internal Use
PRELOADTOT	Real (4 bytes)	Truck and External Trips Preload Volume, Internal Use
TRK_DIS	Integer (4 bytes)	Truck Prohibited Link Flag, 1= Prohibited

Appendix B: Network Node Dictionary

NAME	Attribute	Description
STANUM	Character	TDOT Count Station Number
CCSTYLE	Integer (4 bytes)	99= Centroid 98=External Stations
ExtCount	Integer (4 bytes)	Traffic Count
EEPct	Real (8 bytes)	**Passenger Vehicle** EE percentage
County	Character	County Name
EEProds	Integer (4 bytes)	EE Production
EEAttrs	Integer (4 bytes)	EE Attraction
IEProds	Integer (4 bytes)	IE or EI Production
IEAttrsUnbalanced	Integer (4 bytes)	Special Generator(Not used in this update)
PASS_PER	Real (8 bytes)	Passenger Vehicle Percentage
Name	Character	Route Name (if any)

Appendix C: TAZ Dictionary

Name	Attribute	Description
ID	Integer (4 bytes)	TAZ ID
Area	Real (8 bytes)	TAZ Area
CountyID	Character	County ID
BlkGrp	Character	Census Block Group Number
Tract	Character	Census Tract Number
HH	Real (8 bytes)	Number of Household
AUTO	Real (8 bytes)	Number of Auto
TotPop	Real (8 bytes)	Number of Population
TotEmp	Real (8 bytes)	Number of Employee
Retail_Employment	Real (8 bytes)	Number of Retail Emploee
NonRetail_Employment	Real (8 bytes)	Number of Non-Retail Employee
1P-0A	Real (8 bytes)	Number of Household With x persons and y autos
1P-1A	Real (8 bytes)	Number of Household With x persons and y autos
1P-2A	Real (8 bytes)	Number of Household With x persons and y autos
1P-3A	Real (8 bytes)	Number of Household With x persons and y autos
1P-4A	Real (8 bytes)	Number of Household With x persons and y autos
2P-0A	Real (8 bytes)	Number of Household With x persons and y autos
2P-1A	Real (8 bytes)	Number of Household With x persons and y autos
2P-2A	Real (8 bytes)	Number of Household With x persons and y autos
2P-3A	Real (8 bytes)	Number of Household With x persons and y autos
2P-4A	Real (8 bytes)	Number of Household With x persons and y autos
3P-0A	Real (8 bytes)	Number of Household With x persons and y autos
3P-1A	Real (8 bytes)	Number of Household With x persons and y autos
3P-2A	Real (8 bytes)	Number of Household With x persons and y autos
3P-3A	Real (8 bytes)	Number of Household With x persons and y autos
3P-4A	Real (8 bytes)	Number of Household With x persons and y autos
4P-0A	Real (8 bytes)	Number of Household With x persons and y autos
4P-1A	Real (8 bytes)	Number of Household With x persons and y autos
4P-2A	Real (8 bytes)	Number of Household With x persons and y autos
4P-3A	Real (8 bytes)	Number of Household With x persons and y autos
4P-4A	Real (8 bytes)	Number of Household With x persons and y autos
HBWP	Real (8 bytes)	Number of HBW trips produced by the TAZ
HBWA	Real (8 bytes)	Number of HBW trips attracted by the TAZ
HBOP	Real (8 bytes)	Number of HBO trips produced by the TAZ
HBOA	Real (8 bytes)	Number of HBO trips attracted by the TAZ
NHBP	Real (8 bytes)	Number of NHB trips produced by the TAZ
NHBA	Real (8 bytes)	Number of NHB trips attracted by the TAZ
IEA	Real (8 bytes)	EI Attraction Trips
ccstyle	Integer (4 bytes)	TAZ map Style
BlkGrp_n	Character	Block Group
tag	Real (8 bytes)	Distance to CBD
POPoHH_S	Real (4 bytes)	Single Family persons/HH from Census
POPoHH_M	Real (4 bytes)	Multi Family persons/HH from Census
Vacant_S	Real (4 bytes)	Single Family Household Vacant Percent

Vacant_M	Real (4 bytes)	Multi Family Household Vacant Percent
ALLpop	Real (4 bytes)	All Household Persons/HH from Census
ALLvac	Real (4 bytes)	All Household Vacant Rate from Census
HH_S	Real (4 bytes)	Number of Single Family Household
HH_M	Real (4 bytes)	Number of Multi Family Household
UnweightPop	Real (4 bytes)	Estimated Population before applying the control total
Acres	Real (4 bytes)	Area in Acre
PopDensity	Real (4 bytes)	TAZ population Density
EmpDensity	Real (4 bytes)	TAZ employment Density
AreaType	Integer (2 bytes)	Area type based on Float Population and Emplyment Desity
FloatAcres	Real (4 bytes)	Sum of population of this TAZ and 4 adjecent zones
FloatPop	Real (4 bytes)	Sum of area of this TAZ and 4 adjecent zones
FloatEmp	Real (4 bytes)	Sum of employment of this TAZ and 4 adjecent zones
02pop	Integer (4 bytes)	2002 Population
02emp	Integer (4 bytes)	2002 total employment
EMP_FARM	Real (4 bytes)	Number of Employee in Farming
EMP_MINE	Real (4 bytes)	Number of Employee in Mining
EMP_CONT	Real (4 bytes)	Number of Employee in Construction
EMP_MANU	Real (4 bytes)	Number of Employee in Manufacture
EMP_TRAN	Real (4 bytes)	Number of Employee in Transportation
EMP_WHOL	Real (4 bytes)	Number of Employee in Whole Sale
EMP_RETL	Real (4 bytes)	Number of Employee in Retail
EMP_FIRE	Real (4 bytes)	Number of Employee in Financial Services
EMP_SRVC	Real (4 bytes)	Number of Employee in Service
EMP_GOV	Real (4 bytes)	Number of Employee in Government

Appendix D: Model Structure

Initialization
- Update Facility Type
  - Update the network facility type using link's function class and pavement width. TYPE filed is used to calculate the roadway capacity.
- Update Area Type
  - Update the network area type using TAZ's float business and population density.
- Update Speed and Capacity
  - Generalized Speed and Capacity
- Update TOD Capacity
- Add Fields for External Station Calculation
- Trip Generation and Balance

Create Network
- Create Network

Feedback Loop
- Skimming
- IE-TT
- HBW Trip Distribution
- HBO Trip Distribution
- NHB Trip Distribution
- TOD Trip Distribution
- OP Assignment
- New Network
- AM Assignment
- PM Assignment

Model Result
- Model Result
- Performance Result
- Trip Length Distribution

Appendix F. Air Quality Conformity

As of April 15, 2009, the counties of the Nashville Area MPO are considered in compliance with National Ambient Air Quality Standards and no longer are required to demonstrate conformity with established motor vehicle emissions budgets. The region does remain part of the Tennessee's State Implementation Plan, and as such, continues to be eligible to receive Congestion Mitigation Air Quality funding from the Federal Highway Administration, at the discretion of the Tennessee Department of Transportation.

Appendix G. Certifications

MPO Self Certifications and Federal Certifications

23CFR 450.334

(a) The MPO and state shall certify the metropolitan planning process every 4 years is in accordance with:

X (1) 23 USC 134, 49 USC 5303 (Highways and Transit)

X (2) In non-attainment and maintenance areas, sections 174 and 176 (c) and (d) of the Clean Air Act, as amended 942 U.S.C. 7504, 7506 (c) and (d) and 40 CFR part 93

X (3) Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d-1) and 49 CFR part 21

X (4) 49 U.S.C. 5332, prohibiting discrimination, on the basis of race, creed, national origin, sex or age in employment or business opportunity

X (5) Section 1101 (b) of the SAFETEA-LU (Pub. L 109-59) and 49 CFR part 26 regarding the involvement of disadvantaged business enterprises in USDOT funded projects

X (6) 23 CFR part 230, regarding the implementation of an equal employment opportunity program on Federal and Federal-aid highway construction contracts

X (7) Provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et. Seq.

X (8) The Older Americans Act, as amended (42 U.S.C. 6101), prohibiting discrimination on the basis of age in programs or activities receiving Federal financial assistance

X (9) Section 324 of title 23 U.S.C. regarding the prohibition of discrimination based on gender

X (10) Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and 49 CFR part 27 regarding discrimination against individuals with disabilities

Appendix H. Acronyms and Definitions

Active Transportation: Transportation which requires physical activity as part of the mode. Typically, active transportation refers to walking, bicycling and to transit, as transit trips begin and end with a walking or bicycling trip.

ADA - Americans with Disabilities Act of 1990: Federal law that requires public facilities (including transportation services) to be accessible to persons with disabilities including those with mental disabilities, temporary disabilities, and the conditions related to substance abuse.

ADT - Average Daily Traffic: The number of vehicles passing a fixed point in a day, averaged over a number of days. The number of count days included in the average varies with the intended use of data.

AVL – Automated Vehicle Locator: A device that makes use of the Global Positioning System (GPS) to enable a business or agency to remotely track the location of its vehicle fleet by using the Internet.

AVO - Average Vehicle Occupancy: The ratio of person trips to vehicle trips; often used as a criteria in judging the success of trip reduction programs.

BRT – Bus Rapid Transit: A high speed bus system operated within an exclusive right-of-way. BRT incorporates exclusive transit ways, modern stations, on-board fare collection, high-tech vehicles and frequent service. BRT systems can be built incrementally and designed for vehicles - rather than people - transfer from local bus routes to the high speed lines.

CAAA - Clean Air Act Amendments: 1990 amendments to the federal Clean Air Act which classify non-attainment areas and provide for rules dealing with air pollution in such areas; specifically brought transportation decisions into the context of air quality control.

CMAQ - Congestion Mitigation and Air Quality Improvement Program: A categorical funding program created under ISTEA, which directs funding to projects that contribute to meeting national air quality standards in non-attainment areas for ozone and carbon monoxide.

CMP - Congestion Management Process (previously known as Congestion Management System): A systematic process required under SAFETEA-LU for all TMAs that shall address congestion management through the metropolitan planning process that provides for effective management and operation, based on a cooperatively developed and implemented metropolitan-wide strategy of new and existing transportation facilities eligible for funding under title 23 and chapter 53 of title 49 through the use of travel demand reduction and operational management strategies. The CMP is required under 23 CFR 500.109 and shall include methods to monitor and evaluate the performance of the multi-modal transportation system, identify causes of congestion, identify and evaluate alternative actions, provide information supporting the implementation of actions, and evaluate the efficiency and effectiveness of implementation actions. The CMP is periodically reviewed for efficiency and effectiveness of the implemented strategies, the results of this evaluation shall be provided to decision-makers to provide guidance on selection of effective strategies for future implementation purposes.

Complete Streets – Streets that offer transportation choices that are safe and convenient for all ages and ability levels. These choices may include transit, walking, bicycling and automobile travel.

CONST – Construction (phase of a project): The phase of a project after the preliminary environmental and engineering work is completed, where the project is being built and the improvements are prepared for implementation.

DOT - Department of Transportation: Agency responsible for transportation at the local, state, or federal level. For title 23 U.S.C. federal-aid highway actions, this would mean the Federal Highway Administration and for federal-aid transit actions under title 49 U.S.C, this would mean the Federal Transit Administration.

E+C – Existing plus Committed Transportation Network: Also called a No-Build network, this is a test of how a roadway network, consisting of an existing network plus currently funded future roadway projects, could withstand the demand of projected population and employment growth.

EA – Environmental Assessment: The process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made. The purpose of the assessment is to ensure that decision-makers consider environmental impacts before deciding whether to proceed with new projects

EIS - Environmental Impact Statement: A National Environmental Policy Act (NEPA) document that explains the purpose and need for a project, presents project alternatives, analyzes the likely impact of each, explains the choice of a preferred alternative, and finally details measures to be taken in order to mitigate the impacts of the preferred alternative.

EJ - Environmental Justice: Derived from Title VI of the Civil Rights Act of 1964, and established by Executive Order, EJ requires federally funded plans and programs to assess their impact, either positive or negative, on traditionally underserved (e.g., low-income, minority, etc.) communities or segments of the population. The goal of EJ is to ensure public involvement of low income and minority groups in decision making to prevent disproportionately high and adverse impacts on low income and minority groups, and to ensure that these groups receive equal benefits from transportation improvements.

EPA – U.S. Environmental Protection Agency: is an agency of the federal government of the United States charged with protecting human health and with safeguarding the natural environment: air, water, and land.

Executive Board: A standing committee created for the purpose of serving as spokespersons for the citizens of the metropolitan area and is the designated MPO to prioritize and direct federal transportation funds to local projects. The Board is comprised of elected officials from the cities over 5,000 population and the counties of Nashville-Davidson, Rutherford, Sumner, Williamson and Wilson in the urbanized area. The Executive Board also has representatives from TDOT, representing the Governor. The Board is responsible for creating policies regarding transportation planning issues. The Executive Board meetings are open to the public and where any member of the public can address the MPO on any transportation issue.

FHPP - Federal High Priority Projects: Discretionary projects earmarked by the U.S. Congress as high priorities at the federal level during the Congressional appropriations and re-authorization process. This amounts to roughly 5% of the total transportation budget.

FHWA - Federal Highway Administration: Division of the U.S. Department of Transportation responsible for administrating federal highway transportation programs under title 23 U.S.C.

Fiscal Constraint: A requirement, originally of ISTEA, that all plans be financially – constrained, balanced expenditures to reasonably expected sources of funding over the period of the TIP or Long-Range Transportation Plan.

FTA - Federal Transit Administration: Federal entity responsible for transit planning and programs under title 49 U.S.C.

Functional Classification: Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide. Basic to this process is the recognition that

individual roads and streets do not serve travel independently in any major way. Rather, most travel involves movement through a network of roads. It becomes necessary then to determine how this travel can be channelized within the network in a logical and efficient manner. Functional classification defines the nature of this channelization process by defining the part that any particular road or street should play in serving the flow of trips through a highway network.

FY - Fiscal Year: A federal fiscal or budget year; runs from October 1 through September 30 for the MPO and the federal government. State and local governments operate on a fiscal year beginning July 1 and ending June 30.

HIA – Health Impact Assessment: An assessment conducted ideally in the planning phases of a built environment project which estimates any positive or negative impacts that a project may have on environmental or personal health. The assessment makes recommendations for improvements to the project to mitigate negative impacts such as reducing emissions or improving positive impacts such as increasing physical activity.

GIS – Geographic Information System: a system for capturing, storing, analyzing and managing data which is spatially referenced to the earth. GIS is a tool that allows users to create interactive queries (user created searches), analyze the spatial information, edit data, maps, and present the results of all these operations.

HOV - High Occupancy Vehicle: In Tennessee, vehicles carrying two (2) or more people receive this designation and may travel on freeways, expressways and other large volume roads in lanes designated for high occupancy vehicles. Motorcycles are also authorized to use these lanes.

HUD – United States Department of Housing and Urban Development: Federal agency charged with helping to create strong, sustainable, inclusive communities and quality, affordable homes.

IM – Interstate Maintenance: A funding category created by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the IM authorizes funding for activities that include the reconstruction of bridges, interchanges, and over crossings along existing Interstate routes, including the acquisition of right-of-way where necessary, but shall not include the construction of new travel lanes other than high occupancy vehicle lanes or auxiliary lanes.

IMS - Incident Management System: A systematic process required under SAFETEA-LU to provide information on accidents and identify causes and improvements to the Transportation system to increase safety of all users.

ISTEA - Intermodal Surface Transportation Efficiency Act of 1991: Federal law which restructured transportation planning and funding by requiring consideration of multimodal solutions, emphasis on the movement of people and goods as opposed to traditional highway investments, flexibility in the use of transportation funds, a greater role of MPOs, and a greater emphasis on public participation. ISTEA preceded TEA-21 and SAFETEA-LU.

ITE - Institute of Transportation Engineers: An international society of professionals in transportation and traffic engineering; publishes Trip Generation (a manual of trip generation rates by land use type).

ITS - Intelligent Transportation System: Use of computer and communications technology to facilitate the flow of information between travelers and system operators to improve mobility and transportation productivity, enhance safety, maximize the use of existing transportation facilities, conserve energy resources and reduce adverse environmental effects; includes concepts such as “freeway management systems,” “automated fare collection” and “transit information kiosks.”

Intergovernmental Agreement: Legal instrument describing tasks to be accomplished and/or funds to be paid between government agencies.

LOS - Level of Service: A qualitative assessment of a road’s operating condition, generally described using a scale of A (little congestion) to E/F (severe congestion).

LRT – Light Rail Transit: a particular class of urban and suburban passenger railway that utilizes equipment and infrastructure that is typically less massive than that used for rapid transit systems, with modern light rail vehicles usually running along the system.

LRTP – Long-Range Transportation Plan: A document resulting from regional or statewide collaboration and consensus on a region or state's transportation system, and serving as the defining vision for the region's or state's transportation systems and services. In metropolitan areas, the plan indicates all of the transportation improvements scheduled for funding over the next 20 years. It is fiscally constrained, i.e., a given program or project can reasonably expect to receive funding within the time allotted for its implementation.

MG - Minimum Guarantee: A funding category created in TEA-21 that guarantees a 90% return of contributions on formula funds to every state.

MPO Activities: Are plans, programs and projects related to the MPO process.

MPO - Metropolitan Planning Organization: The forum for cooperative transportation decision-making; required for urbanized areas with populations over 50,000.

MTA – Metropolitan Transit Authority: The public transit agency serving Nashville/Davidson County.

NEPA – National Environmental Policy Act: Passed in 1970, NEPA requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions.

NHS - National Highway System: Specific major roads to be designated September 30, 1995; the NHS will consist of 155,000 (plus or minus 15%) miles of road and represents one category of roads eligible for federal funds under ISTEA.

NOx – Nitrous Oxide: The third largest greenhouse gas, nitrous oxide also attacks ozone in the stratosphere, aggravating the excess amount of UV light striking the earth's surface.

Obligated Funds: Funds that have been authorized by and committed to legally by a federal agency to pay for the federal share of the project cost.

Officials: Are people who have governmental decision-making, planning or administrative responsibilities that relate to MPO activities.

PE – Preliminary Engineering (phase of project): a process to begin developing the design of the facilities and system, to analyze the function and operation of the system, evaluation cost efficiencies and prepare for the final design of the project.

PMS - Pavement Management System: A systematic process utilized by state agencies and MPOs to analyze and summarize pavement information for use in selecting and implementing cost-effective pavement construction, rehabilitation, and maintenance programs; required for roads in the National Highway System as a part of ISTEA; the extent to which the remaining public roads are included in the process is left to the discretion of state and local officials; criteria found in 23 CFR 500.021-209.

Public: Includes citizens, public agencies, advocacy groups and the private sectors that have an interest in or may be affected by MPO activities.

Public Participation: Is an integral part of a planning or major decision-making process. It provides opportunities for the public to be involved with the MPO in an exchange of data and ideas. Public participation offers an open process in which

the rights of the community, to be informed to provide comments to the Government and to receive a response from the Government, are met through a full opportunity to be involved and to express needs and goals.

ROW - Right-of-Way: Real property that is used for transportation purposes; defines the extent of the corridor that can be used for the road and associated drainage.

RTA – Regional Transportation Authority: Nine-county regional agency that plans and develops regional transit in the Nashville area.

RTDM - Regional Travel Demand Model: This is a tool for forecasting impacts of urban developments on travel patterns as well as testing various transportation alternative solutions to traffic patterns. The travel patterns are determined from US Census results and in simple terms tell where residents live and where they go to work or school on a regional wide basis.

SAFETEA-LU - Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users - legislation enacted August 10, 2005, as Public Law 109-59. SAFETEA-LU authorizes the Federal surface transportation programs for highways, highway safety, and transit for the 5-year period 2005-2009. SAFETEA-LU was preceded by ISTEA and TEA-21.

School Siting: the process by which a community decides where to locate a new public school. The placement of schools and the zones of populations assigned to attend a school affect transportation patterns in the community as well as the modal types used to make a home to school trip.

SIP – State Implementation Plan (for air quality): the regulations and other materials for meeting clean air standards and associated Clean Air Act requirements.

SR – State Route: a roadway owned, financed and maintained by a state.

SRTS – Safe Routes to School: the name of a national movement and a component of SAFETEA-LU by which communities provide infrastructure and education to enable and encourage children to walk and bicycle to school.

STA – State gas tax fund: Also called motor fuel excise tax, this is a tax charged by the gallon and collected as consumers pay at the pump. The tax goes primarily towards basic operating costs, highway maintenance contracts, resurfacing, bridges, major reconstruction, new construction, consultant contracts, right-of-way purchases, and to match federal funds.

STIP - State Transportation Improvement Program: A priority list of transportation projects developed by the Tennessee Department of Transportation that is to be carried out within the four (4) year period following its adoption; must include documentation of federal and state funding sources for each project. Transportation projects in the state's 11 urban areas are determined through Metropolitan Planning Organization process.

STP – Surface Transportation Program (L-STP or U-STP): A program funded by the National Highway Trust Fund.

L-STP provides funding to areas of 5,000 to 50,000 in population for improvements on routes functionally classified urban collectors or higher. **U-STP** Provides funding to Census designated urbanized areas over 50,000 in population (e.g. MPO areas based on US Census) for improvements on routes functionally classified urban collectors or higher.

TCC - Technical Coordinating Committee: A standing committee of most metropolitan planning organizations (MPOs); function is to provide advice on plans or actions of the MPO from planners, engineers and other staff members (not general citizens).

TDM – Transportation Demand Management: a method of planning for and implementing transportation improvement in a manner that reduces traffic congestion and pollution by influencing changes in travel behavior.

TDEC – Tennessee Department of Environment and Conservation: State agency responsible for protecting and improving the quality of Tennessee's land, air, water and recreation resources.

TDOT – Tennessee Department of Transportation: State agency responsible for the planning and implementation of Tennessee's multimodal transportation system including roads and bridges, aviation, public transit, waterways, and railroads.

TOD - Transit Oriented Development: a mixed-use development that is anchored by a transit station. The transit mode may include bus or rail, and the development may include uses such as housing, office and retail.

Transportation Disadvantaged: People who are unable to transport themselves or to purchase transportation due to disability, income status or age.

Transportation Enhancements: Specific activities which can be funded with Surface Transportation Program (STP) funds; activities include pedestrian/bicycle facilities, acquisition of scenic easements and scenic historic sites, scenic or historic highway programs, scenic beautification, historic preservation, rehabilitation/operation of historic transportation structures, railway corridor preservation, control/removal of outdoor advertising, archeological planning/research and mitigation of highway runoff water pollution.

TEA-21 - Transportation Equity Act for the 21st Century: Federal Legislation that authorized funds for all modes of transportation and guidelines on the use of those funds. Successor to ISTEA, the landmark legislation clarified the role of the MPOs in the local priority setting process. TEA-21emphasized increased public involvement, simplicity, flexibility, fairness, and higher funding levels for transportation. TEA-21 preceded SAFETEA-LU.

TIP - Transportation Improvement Program: A priority list of transportation projects developed by a metropolitan planning organization that is to be carried out within the four (4) year period following its adoption; must include documentation of federal and state funding sources for each project and be consistent with adopted MPO long range transportation plans and local government comprehensive plans.

TMA - Transportation Management Area: An area designated by the U.S. Department of Transportation given to all urbanized areas with a population over 200,000 (or other area when requested by the Governor and MPO); these areas must comply with special transportation planning requirements regarding congestion management systems, project selection and certification; requirements identified in 23 CFR - 450.300-33.6.

The TMA Group: A local non-profit organization headquartered in Williamson County responsible for carrying out certain transit services on behalf of the Regional Transportation Authority and the Franklin Transit Authority, and for the administration of the regional Clean Air Partnership of Middle Tennessee, under contract to Williamson County and the Nashville Area MPO.

TSM - Transportation Systems Management: Strategies to improve the efficiency of the transportation system through operational improvements such as the use of bus priority or reserved lanes, signalization, access management, turn restrictions, etc.

UPWP - Unified Planning Work Program: Developed by Metropolitan Planning Organization (MPOs); identifies all transportation and planning activities anticipated within the next one to two years, including a schedule for the completion of the identified tasks and activities.

V/C Ratio Volume over Capacity Ratio: This is a roadway performance measure to show how a highway volume compares with a highway's capacity.

VMT - Vehicle Miles Traveled: This is an output of the travel demand model and is a measure of traffic flow over a highway segment. While 1000 vehicles traveling over a mile road and 1 vehicle traveling over 1000 miles are mathematically.

VOC – Volatile Organic Compounds: are organic chemical compounds that have high enough vapor pressures under normal conditions to significantly vaporize and enter the atmosphere. Included among these compounds are dry-cleaning solvents and some constituents of petroleum fuels.

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