Nashville Area Metropolitan Planning Organization

2030 Long Range Transportation Plan

Adopted October 19, 2005
Amended: June 21, 2006

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Acknowledgements

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Federal Highway Administration
Federal Transit Administration
Greater Nashville Regional Council
Regional Transportation Authority
Metropolitan Nashville Airport Authority
Office of the Governor, State of Tennessee
Office of the Mayor, City of Brentwood
Office of the Mayor, City of Fairview
Office of the Mayor, City of Franklin
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Office of the Mayor, Metropolitan Nashville-Davidson County
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Tennessee Department of Environment and Conservation
Tennessee Department of Transportation

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NASHVILLE AREA METROPOLITAN PLANNING ORGANIZATION
EXECUTIVE BOARD

RESOLUTION 2005- 19

CONCERNING THE ADOPTION OF THE
2030 LONG RANGE TRANSPORTATION PLAN

WHEREAS, the Nashville Area Metropolitan Planning Organization is responsible for the development and adoption of a Long Range Transportation Plan through a comprehensive, cooperative, and continuing transportation planning process; and

WHEREAS, the various state, local, and regional agencies concerned with transportation planning for the Nashville Area MPO's study area have cooperatively developed a Long Range Transportation Plan within this framework and provided for public involvement in the policymaking process; and

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

THEREFORE, BE IT RESOLVED, that the Executive Board of the Nashville Area Metropolitan Planning Organization does hereby adopt the 2030 Long Range Transportation Plan re-affirmation for Davidson, Rutherford, Sumner, Williamson and Wilson counties in Middle Tennessee and the portions of Robertson and Maury included in the MPO.

EXECUTIVE BOARD

Date: October 19, 2005

Rogers Anderson

The Honorable Rogers Anderson
Chairman, Executive Board

Attest:

Fred S. Schwartz
Secretary

U.S. Department
of Transportation

Federal Highway Administration
Tennessee Division Office
640 Grassmere Park, Suite 112
Nashville, TN 37211

Federal Transit Administration
Region 4
61 Forsyth Street, S.W., Suite 17T50
Atlanta, GA 30303

November 7, 2005

Mr. Gerald Nicely, Commissoner
Tennessee Department of Transportation
Suite 700, James K. Polk Building
Nashville, Tennessee 37243-0349

Honorable Rogers Anderson
Mayor of Williamson County
1320 West Main Street, Suite 125
Franklin, TN 37064

Subject: 1-hr Conformity Determination for Nashville 2030 Long Range Transportation Plan

Dear Messers. Nicely, and Anderson:

The Tennessee Division of the Federal Highway Administration (FHWA) and Region 4 of the Federal Transit Administration (FTA) in coordination with Region 4 of the Environmental Protection Agency (EPA) have reviewed the Nashville Area Metropolitan Planning Organization's (MPO) 2030 Long Range Transportation Plan and Conformity Determination, adopted on October 19, 2005. The Tennessee Department of Environment and Conservation, the Tennessee Department of Transportation, and the Metro Transit System, also had an opportunity to review and comment on the above-mentioned documents.

The Conformity Determination must be based on a Long Range Transportation Plan that meets the Federal Planning Regulations listed under 23 CFR 450.322. FHWA and FTA have reviewed the Nashville Area MPO's 2030 LRTP for consistency with the Federal requirements, and have determined consistency.

FHWA and FTA found that the Conformity Document for the Nashville Area MPO meets the five primary criteria of the Transportation Conformity Rule (62 FR 43779, August 15, 1997):

- use of the latest planning assumptions;
- use of the latest emissions model;
- use of appropriate consultation procedures;
- consistency with the mobile source emission budgets in the State Implementation Plan (SIP); and
- provisions for timely implementation of transportation control measures in the SIP.

We also found that these documents met the criteria outlined in the Transportation Conformity Rule for the 1-hour Ozone Standard.

Therefore, the FHWA and the FTA approve the Conformity Determination for the 1-hour ozone standard for the adopted Nashville Area 2030 Long Range Transportation Plan.

If you have any questions regarding this approval, please contact Theresa Hutchins (FHWA) at 615-781-5767 or James Garland (FTA) at 440-562-3507.

Sincerely,

Bobby W Blackmon

Bobby W. Blackmon
Division Administrator
Federal Highway Administration, Tennessee Division

Cc: Ed Cole, TDOT - Planning
Angie Midgett, TDOT - Planning
Fred Schwartz, Nashville MPO
James Garland, FTA Region 4
Theresa Hutchins, FHWA
Lynorae Benjamin, EPA Region 4

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ACRONYMS

ADA	Americans with Disabilities Act of 1990
ADT	Average Daily Traffic
AVL	Automatic Vehicle Locator
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CBD	Central Business District
CMAQ	Congestion Mitigation and Air Quality
CMS	Congestion Management System
CONST	Construction
DOT	Department of Transportation
E+C	Existing plus committed network
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FY	Fiscal Year
GIS	Geographic Information Systems
HOV	High Occupancy Vehicle
IM	Interstate Maintenance funds
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITS	Intelligent Transportation Systems
LOS	Level of Service
LRT	Light Rail Transit
LRTP	Long Range Transportation Plan
MPO	Metropolitan Planning Organization
MTA	Metro Transit Authority
NEPA	National Environmental Policy Act
NHS	National Highway System
NOx	Nitrogen Oxides
PE	Preliminary Engineering
ROW	Right-of-Way
RTA	Regional Transportation Authority
SIP	State Implementation Plan (for air quality)
SR	State Route
STA	State gas tax funds
STIP	Statewide Transportation Improvement Program
STP	Surface Transportation Program
TAZ	Traffic Analysis Zone
TCC	Technical Coordinating Committee

ACRONYMS (continued)

TDM	Transportation Demand Management
TDOT	Tennessee Department of Transportation
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Program
TMA	Transportation Management Association
TSM	Transportation System Management
UPWP	Unified Planning Work Program
V/C	Volume to Capacity
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds

OUR CHARGE

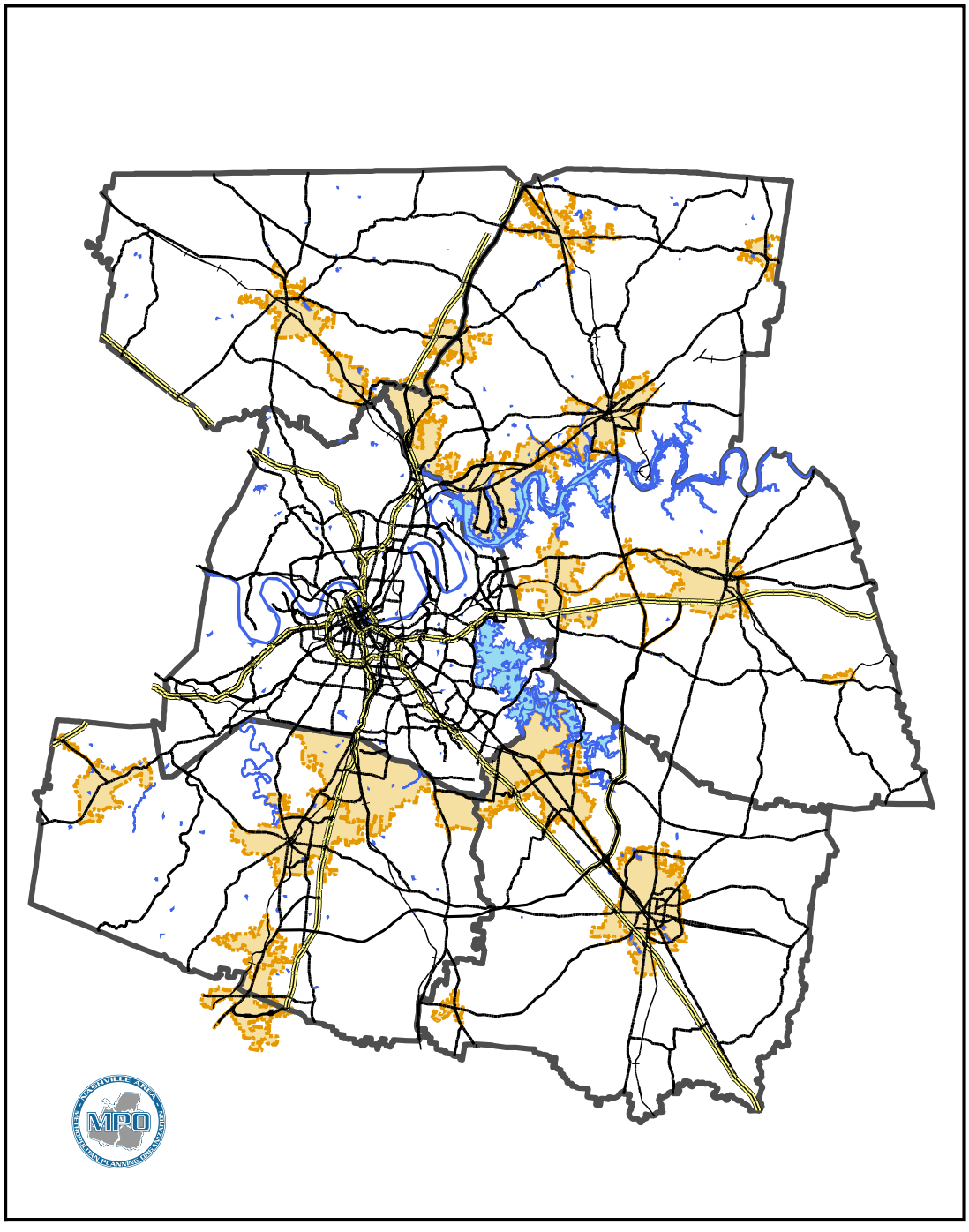
The primary purpose of the Long Range Transportation Plan (LRTP) is to provide a vision for satisfying the existing and anticipated demands on the transportation system serving the five-county Nashville metropolitan area. The five counties include Davidson, Rutherford, Sumner, Wilson, and Williamson. The MPO region also includes the cities of Springfield in Robertson County and Spring Hill in Maury County.

Prepared by the Nashville Area Metropolitan Planning Organization (MPO), the LRTP covers a 25-year planning horizon – through the year 2030 – in which a balanced, multimodal, and sustainable transportation system is sought.

Given the area's rapid and consistent growth in both population and employment, the LRTP is a necessary tool for addressing transportation needs. The plan provides a balanced, financially feasible set of transportation improvements that will facilitate the movement of people and goods by all modes of transportation within the Nashville metropolitan area.

These 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 through the future 25-year planning period.

Nashville Area Metropolitan Planning Organization



Legend

Major Streets
Interstates
Railroad
County Boundary
City Limits
Water

0 2 4 8 Miles

October 13, 2004

2030 Long Range Transportation Plan Update

FEDERAL PLANNING LEGISLATION

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.

This LRTP reflects an emphasis on transportation planning and project programming that is consistent with the Transportation Equity Act for the 21st Century (TEA-21) passed in 1998 and the *Clean Air Act Amendments* (CAAA) of 1977 and 1990. TEA-21 introduced the metropolitan transportation planning provisions that reinforce and complement the Clean Air Act Amendments air quality conformity provisions. MPOs, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the U.S. Department of Transportation (DOT) are responsible for demonstrating conformity of:

1. Long-range transportation plans (LRTPs)
2. Transportation improvement programs (TIPs)
3. Transportation projects that receive federal funding or require FHWA or FTA approval
4. Other projects that may have a regionally significant effect on air quality.

The Clean Air Act Amendments first established national air quality standards for pollutants including carbon monoxide, ozone, particulate matter, lead, sulfur dioxide, and nitrogen dioxide, several of which are produced from motor vehicle emissions. In addition, the Clean Air Act Amendments required the coordination of transportation and air quality planning processes to ensure that local transportation plans and programs are consistent with state air quality plans (called State Implementation Plans, or SIPs) which indicate how metropolitan areas and states will meet or maintain air quality standards.

The U.S. Environmental Protection Agency (EPA) designates areas as attainment, nonattainment or maintenance for any of the six pollutants specified by the Clean Air Act Amendments. The five-county MPO planning area coincides with the five-county area designated by EPA as a nonattainment area for the eight-hour ozone standard. However, in 2003 the five MPO counties elected to participate in an Early Action Compact (EAC). The EAC defers the nonattainment designation until 2007. In return each of the five counties is implementing various control measures to help achieve attainment status by 2007.

Two compounds combine in the atmosphere to form ozone: Volatile Organic Compounds (VOCs) and Oxides of Nitrogen (NOx). These two compounds, also known as precursors, must be forecast by the MPO for the entire LRTP forecast period. This evaluation is known as transportation conformity determination. Basically, it compares the projected Plan emissions of VOCs and NOx to the emissions budget allowed by EPA for the nonattainment area.

This plan also conforms to federal requirements for transportation planning as defined by TEA-21. TEA-21 increased funding for the repair or preservation of existing road systems, the Transportation Enhancements program (bicycle and pedestrian facilities, scenic and historic preservation projects), and the share of total funds likely to go to transit. Changes in funding reflect the growing awareness that non-automobile modes are viable transportation options.

Public involvement is an important element in the transportation planning process and is also required by TEA-21. The LRTP process included three sets of public meetings in each of the five counties in the planning area. In addition, numerous public meetings were held with the MPO's Technical Coordinating Committee and the Executive Board throughout the preparation of the LRTP. A full description of the public involvement process, including a summary of public comments received and how they were addressed, is included in Appendix A.

MPO ROLES, RESPONSIBILITIES, AND STRUCTURE

The MPO is responsible for:

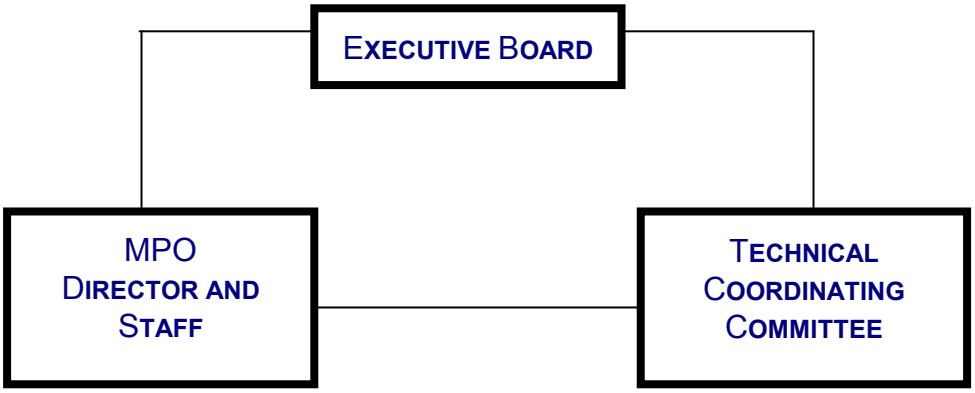
- ✓ Development of a regional, multi-modal transportation planning program,
- ✓ Allocation of funding for the coordinated implementation of transportation projects and services, and
- ✓ Addressing congestion and transportation related air quality through effective management of new and existing facilities.

These tasks are intended to address some of the significant issues facing the area, including the need to improve air quality, balance the needs and requirements of the various modes of travel, and to manage area congestion. In addition, the strong growth in both population and employment that is being experienced throughout the planning area makes it important to address transportation needs in a regional context. The MPO is the forum in which this occurs.

The MPO functions under a committee structure comprised of an Executive Board and Technical Coordinating Committee (TCC). The Executive Board consists of elected officials representing Davidson, Rutherford, Sumner, Wilson and Williamson Counties, cities in those counties with a population of over 5,000, and the City of Springfield in Robertson County and Spring Hill in Maury County. In addition, the Governor and an elected official from the Greater Nashville Regional Council are board members. The Board provides policy direction and a forum for transportation and air quality decisions. The Board meets regularly to discuss issues and review and approve major planning reports and documents.

The TCC consists of administrators of departments and agencies involved in transportation planning. This includes planning commissions, engineering and public works departments, transit authorities, and other transportation related agencies. The basic responsibilities of the TCC include the on-going administration of transportation planning activities and the development of plans and documents such as the LRTP.

The MPO technical staff is physically housed in the Metropolitan Planning Commission of Nashville-Davidson County, but provides professional and administrative services to the entire MPO region and is led by an MPO Director who is appointed by the Executive Board. The following illustration shows the committee structure under which the MPO functions:



WHERE WE ARE

The demand for transportation within this region is directly related to the demographic, economic, and land use characteristics of the area. Population and employment growth increases the demand for transportation. Decisions on land use and zoning at the city and county level also affect transportation demand. Low-density developments will increase trip length while higher urban densities help foster public transportation operations and support non-motorized forms of travel such as walking and bicycling.

The following section highlights current population, employment, and land use conditions.

Historical Population and Employment

The five-county MPO planning area is experiencing strong and steady growth. The 2002 population for the metropolitan planning area now totals almost 1.2 million and is expected to continue this same level of growth.

Historical Change in Population				*(Source: US Census Bureau and MPO estimates)*	
County	**Population**				**1990 to 2002**
	1990	2000	2002	% Change (1990 - 2002)	Absolute Change
Davidson	510,786	569,891	595,124	16.51%	84,338
Rutherford	118,570	182,023	205,415	73.24%	86,845
Sumner	103,281	130,449	140,081	35.63%	36,800
Williamson	81,021	126,436	141,536	74.69%	60,515
Wilson	67,675	88,809	95,849	41.63%	28,174
Region	881,333	1,099,608	1,180,007	33.89%	298,674

- Davidson County is the most populated county in the region, although it saw the lowest rate of population growth over the twelve year period in the above table, it has increased by about 16.5 percent.

- Rutherford County is the second most populated county in the region, and also the second fastest-growing, with a population increase of 73 percent from 1990 to 2002.

- Williamson County is third most populous. Its population increased the most of the five counties from 1990 to 2002 with an increase of approximately 74.5 percent.

- Sumner County has experienced significant growth as well with an increase of approximately 35.5 percent.

- Wilson County continues to have the smallest population size of any county in the region, but grew much faster than the average growth rate for the region, increasing 41.5 percent over the past decade.

Since the mid-1980s, the counties surrounding Davidson County have been developing quickly, resulting in a diversification of economies and the development of a regional economy. In general, the surrounding counties' economies are evolving into a goods market while Davidson County is much more service-oriented.

Historical Change in Employment				
County	**Employment**			**1990 to 2002**
	1990	2002	% Change	Absolute Change
Davidson	420,788	540,142	28%	119,354
Rutherford	63,374	100,525	59%	37,151
Sumner	42,204	58,945	40%	16,741
Williamson	41,616	74,313	79%	32,697
Wilson	27,908	39,822	43%	11,914
Region	595,890	813,747	37%	217,857

Source: U.S. Department of Commerce - Bureau of Economic Analysis

Land Use

Land use patterns significantly affect travel needs, travel lengths, and the modes of travel used. As part of the 2030 LRTP update, major efforts were made to better account for the amount of employment and population growth in the MPO area. One such effort is the incorporation of a land use modeling tool called the Urban Land Use Allocation Model, or ULAM. ULAM utilizes many data sources that enable it to better determine where future population and employment growth may occur over the next 25 years. Some of the data sources used include population by Traffic Analysis Zone (TAZ), employment by TAZ, and current zoning and future land use data for each of the cities and counties in the MPO area. ULAM is discussed in greater detail in the Population & Employment Projections section.

Development patterns throughout the region vary by county. The largest concentration of urban development in the region is located in Davidson County. Urban developments located outside Davidson County are, for the most part, located along one of the radial freeway or highway corridors serving the region.

Davidson County is characterized by high- to medium-density residential, commercial, and industrial development within the urban core. Development densities along the urban fringe are low to medium residential land uses, creating more first- and second-generation suburban environments.

Rutherford, Sumner, Williamson and Wilson Counties are characterized by a higher concentration of commercial and industrial uses within or near primary cities and low-density residential development within surrounding areas.

One of the key factors in planning the transportation system – particularly in deciding where transit services should be provided – is the location of jobs in relation to housing.
In the Nashville region, the strongest concentration of employment is located in the Nashville Central Business District. The region's office, government and service industries remain concentrated in this district. However, in the past decade an increasing number of employers have located in other parts of the region. Suburban employment centers are now well established in Brentwood, in the Interchange City area off Interstate 24 near LaVergne and Smyrna, and in the Cool Springs area of Franklin. Other major employment centers include the area around the Nashville International Airport, the Rivergate/Goodlettsville/Hendersonville area, and downtown Murfreesboro and the Middle Tennessee State University campus. The Interstate 40/Highway 109 interchange in Wilson County has also emerged recently as a major employment center.

Existing Transportation Infrastructure

Roads

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, and it occurs sporadically on other roads in response to temporary lane blockages.

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) 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.

On three radial routes, High Occupancy Vehicle (HOV) lanes (non-barrier controlled) are used to help address congestion:

- Along I-40 East between Old Hickory Boulevard in Davidson County and Mt. Juliet Road (State Route 171) in Wilson County,

- Along I-65 South from Harding Place in Davidson County to State Highway 96 in Williamson County, and
- Along I-24 East from Harding Place in Davidson County to State Highway 96 in Rutherford County.

The placement of HOV lanes on these facilities responds to Nashville commuting patterns. The HOV lanes are enforced between 7:00 – 9:00 A.M. and 4:00 – 6:00 P.M.

HOV lanes are designed to increase the capacity of the roads, by designating a section of the roadway solely for the use of high occupancy vehicles, or HOVs. In Nashville, HOVs have been defined to include buses, vanpools, carpools, and automobiles containing two or more persons.

An HOV study conducted by the MPO identified 5 of the 6 additional radial corridors centered in Nashville and serving the surrounding counties as having the greatest potential to support HOV facilities. The following HOV projects are included in this plan:

- I-65 North (to Sumner County)
  - From north of Trinity Lane to south of Dickerson Pike (2016)
  - From north of Vietnam Veterans Pkwy to State Route 41 (2016)
- I-24 East (to Murfreesboro)
  - From State Route 840 to State Route 96 (2006)
  - From State Route 96 to US 231/SR 10 (2016)
- I-40 East (to Lebanon)
  - From I-24 to State Route 45 (2016)
  - From State Route 171 to State Route 26 (2016)
- I-40 West (to Bellevue)
  - From State Route 155 to US 70S/SR 1 (2016)
- I-65 South (to Williamson County)
  - From State Route 96 to State Route 840 (2016)

Like the existing HOV lanes, the future HOV lanes would only be regulated during the morning and evening peak hours. These lanes are included in plans for future interstate widening in the region.

Transit

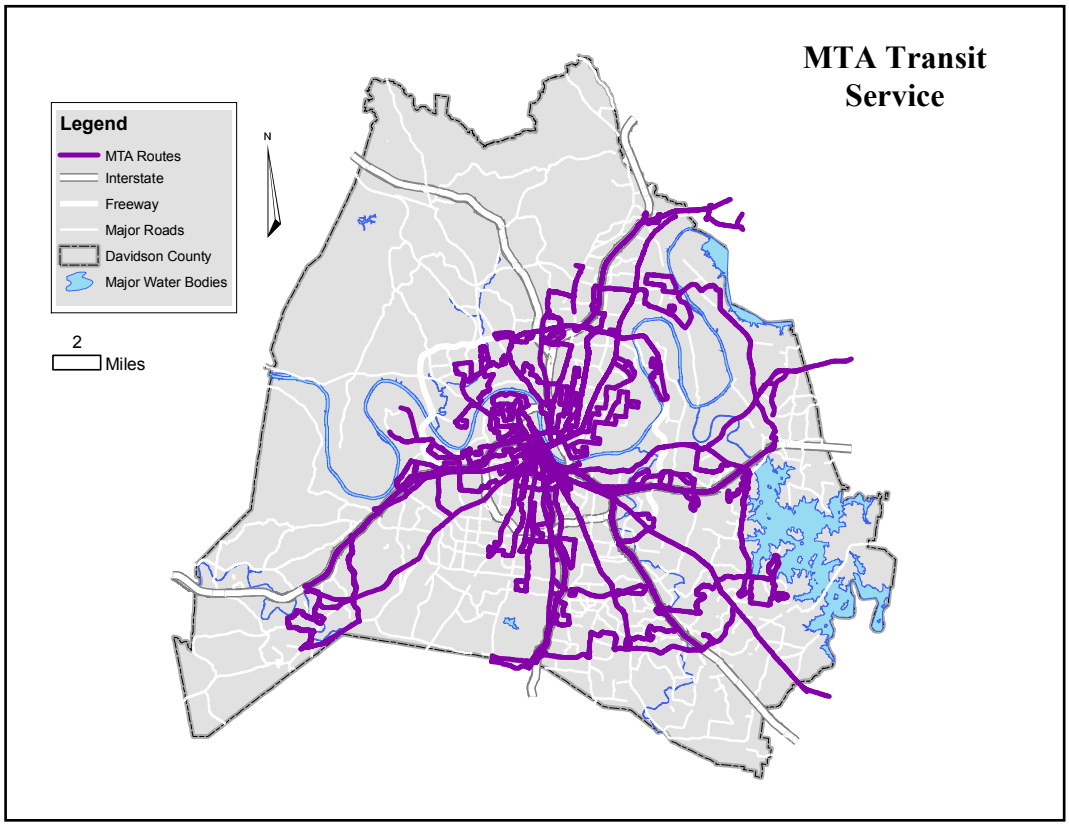
Public transit has been an important component of mobility in Nashville for many years and was newly established in the City of Franklin in May of 2003. The Franklin Transit system is the first new transit system in Tennessee since 1986. The City of Murfreesboro is also currently undertaking studies to consider the possibility of a local transit system.

Metropolitan Transit Authority

In Davidson County, the transit system is operated by the Metropolitan Transit Authority (MTA). Bus service is available in most of Davidson County, accommodating the four regional activity centers, major hospitals, high schools, magnet schools, and park-and-ride lots. MTA provides fixed route transit service as well as demand-responsive paratransit services. The fixed-route service includes:

- Radial routes to serve major trip generators,
- Connective routes to assist transfers, and
- Express routes which focus on the central business district.

The fixed route system operates seven days a week with a fleet of 135 vehicles, providing service on 40 routes. Regular weekday service begins at 5.15 a.m., ending as late as 12:15 p.m. On Saturdays and Sundays, most routes operate at reduced hours. Almost all routes converge at the Petway Transit Center, located downtown on Deaderick Street.



In addition, MTA operates special event service for people attending Tennessee Titans football games called the End-Zone Express. This service brings Titans fans in from outlying parking lots. Once the buses are within the downtown area they use a temporary bus-only lane which allows the End-Zone Express riders to zip past the congested game traffic. This mini "Bus Rapid Transit" service has proved to be very popular and profitable for MTA.

Transit ridership peaked at 13,151,743 on fixed route service in 1980 and by 1992 had declined to 8,162,197. Today, annual ridership is almost 7 million. The Gallatin Pike, Murfreesboro Rd, Nolensville Pike, Hillsboro and Charlotte Pike have the highest ridership levels.

MTA's paratransit service, called AccessRide, is a special transportation service offered on demand for the elderly and persons with disabilities. MTA operates 35 vans and contracts with a number of private contractors to provide additional services. Regional Paratransit services are made available by the Mid-Cumberland Human Resources Agency.

In 1998, two intermodal transportation facilities opened in downtown Nashville. Called Landports, they provide boarding and transfer facilities for individuals using public transit and HOV or private vehicles. Their locations also make them potential sites for future high performance (bus rapid transit, commuter rail, etc.) transit stations. The facility with the most potential for a high performance transit connection is called the Clement Landport. Clement is especially suited for a commuter rail station due to it's proximity to the existing CSX lines on Demonbreun Street, currently this facility is no longer in use due to the temporary closing of the Demonbreun Street Bridge but will re-open once the repairs to the bridge are complete.

The second facility, also on Demonbreun, is called the Nance Landport. This facility is close to the Gaylord Entertainment Center and is currently used twice a day to facilitate bus transfers for routes with high ridership.

Currently, MTA has plans underway to design, develop and construct a modern indoor Central Station for transit riders that will replace the current outdoor hub on Deaderick St. This state-of-the-art facility will serve as a central hub for MTA buses, and will have a climate-controlled waiting area, information and ticket sales outlet, and possibly retail businesses such as a coffee shop or child care center. The expected completion date for the new facility is sometime in 2007.

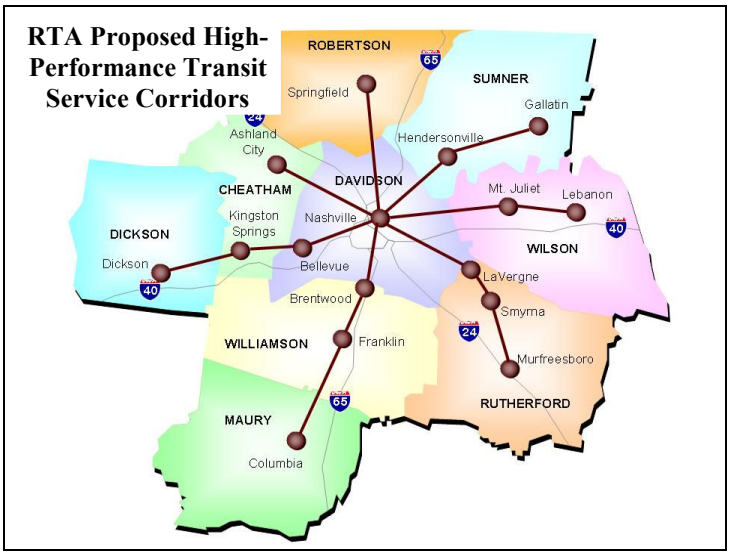
Franklin Transit Authority

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 three routes daily, Monday through Friday, from 6:00 a.m. to 6:00 p.m. and on Saturday, from 9:00 a.m. until 6:00 p.m. The FTA 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.

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 is expected to begin operating the region's first commuter rail line in late 2005 or early 2006. The line will run from Lebanon to downtown Nashville with a total of six stations. RTA also offers the following services:

- RIDE, a commuter rideshare matching program
- Commuter bus services to Murfreesboro, Mt. Juliet, and Hendersonville
- Guaranteed Ride Home Program, which provides regular ridesharers a taxi ride home in case of an emergency
- Employer-based promotions to encourage carpools, vanpools, and transit ridership
- Development of park-and-ride lots
- Assistance with the development of commuter rail and other regional rapid transit options

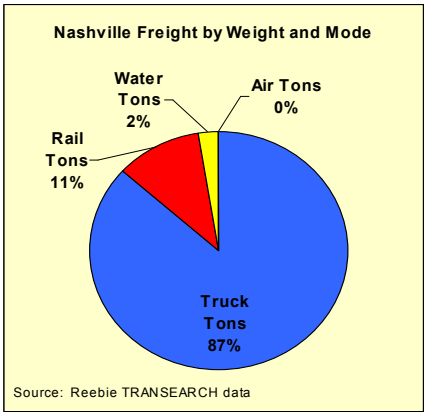


The MPO along with RTA is in the process of conducting an alternatives analysis for the southeast corridor from Murfreesboro to Downtown Nashville. With input from the public and local officials, the study will identify the problems facing the corridor, analyze the possible solutions, and determine a preferred alternative. Similar studies will be conducted in the future for other corridors in the five county region. Currently, the next corridor to be studied is the Northeast Corridor from Nashville to Gallatin.

Freight

In the past year, the MPO completed a regional freight and goods movement study. In this study it was determined that 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. Nashville's location has made it a transportation hub with a wide range of resources essential to moving products and people. Its position as a crossroad city brings to Nashville and the region a set of challenges in dealing with the various aspects of traffic, particularly highway congestion and air quality, as their major sources originate outside of the area.

The region 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 the region with a major classification yard as well as container, automotive, and bulk terminals.



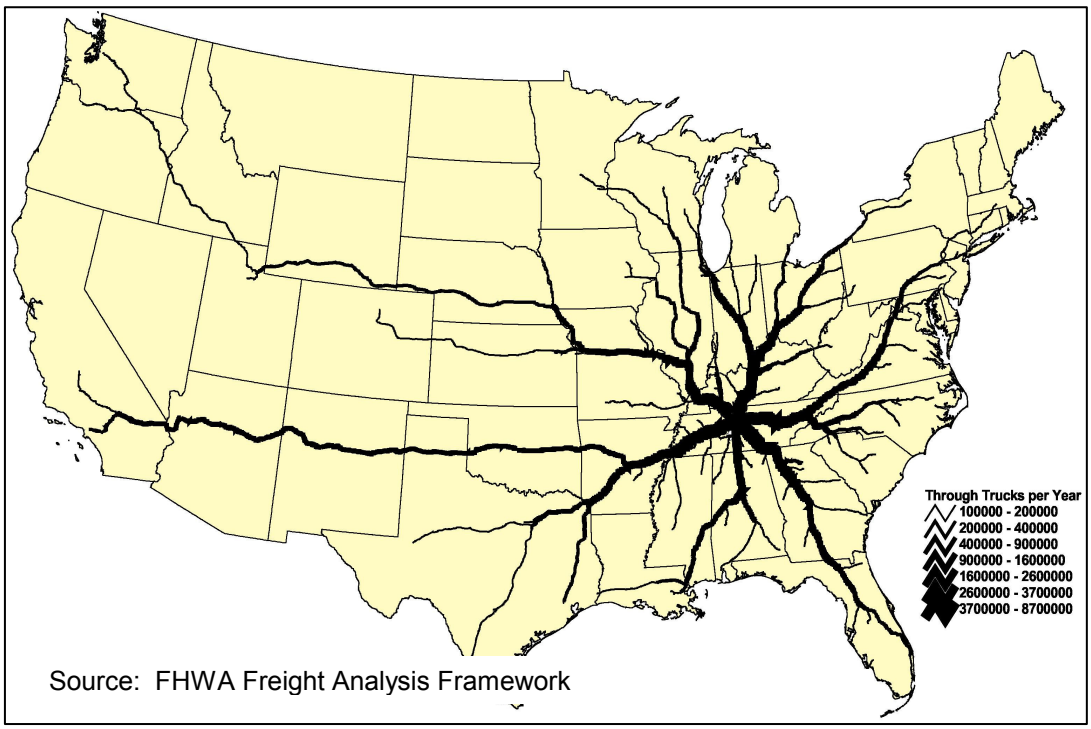
The region's freight infrastructure carries significant tonnage of traffic through the year. The total volume is just short of 300 million tons. While all four modes of transport – truck, rail, water, and air - are represented, trucking far surpasses others in volume. Of the total tonnage moving in the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

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% 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% of area-based tonnage moves by truck, which is slightly above the 79% national average. The rail share of this volume is half the U.S. average, but that is common in markets where the water mode

Nashville Area Truck Activity (2002)

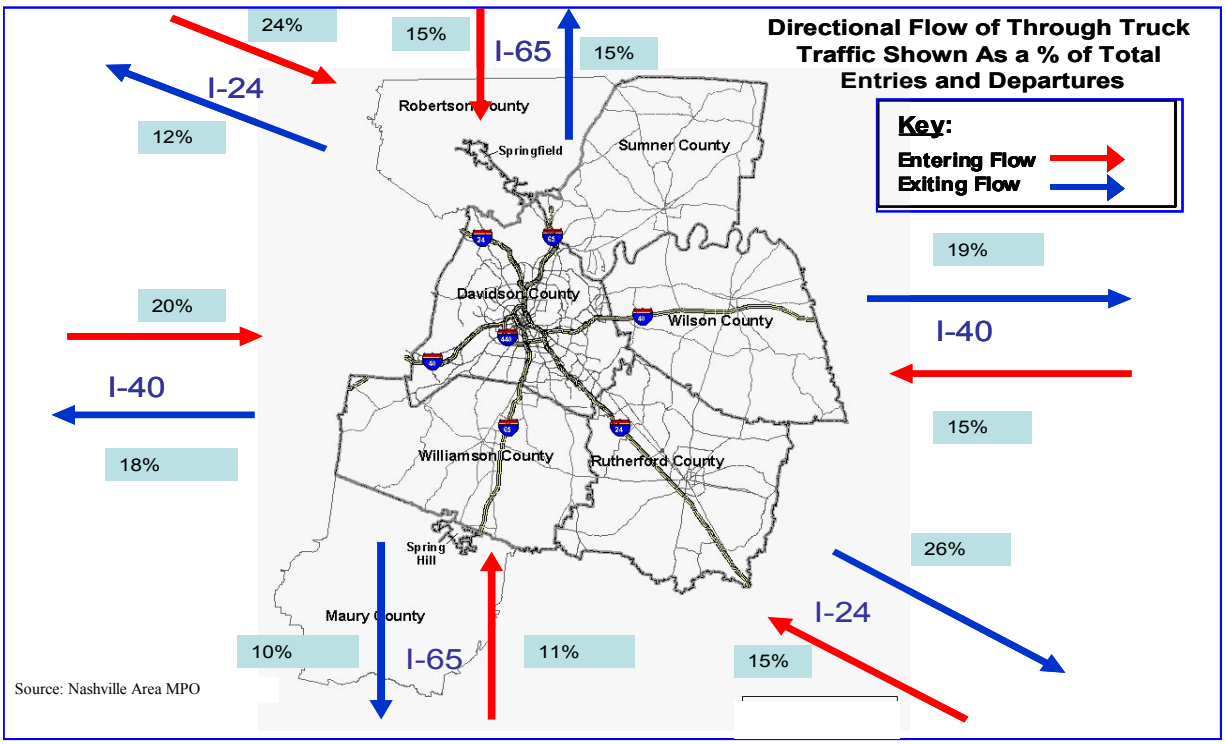
Class of Traffic	Annual Truck Volume	Daily Trucks	% of Total
Local	600,000	1,609	3%
Inbound	2,100,000	5,669	12%
Outbound	2,000,000	5,401	11%
Through	12,600,000	34,485	73%
Total	**17,200,000**	**47,164**	**100%**

also is active. The Nashville region 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%.



Source: FHWA Freight Analysis Framework

Trucks moving through the area travel primarily on the interstate highway system. The crossroads aspect of Nashville is clear in the view of that movement; the map below shows the direction of that through traffic and how its direction shifts when it reaches the Nashville region.



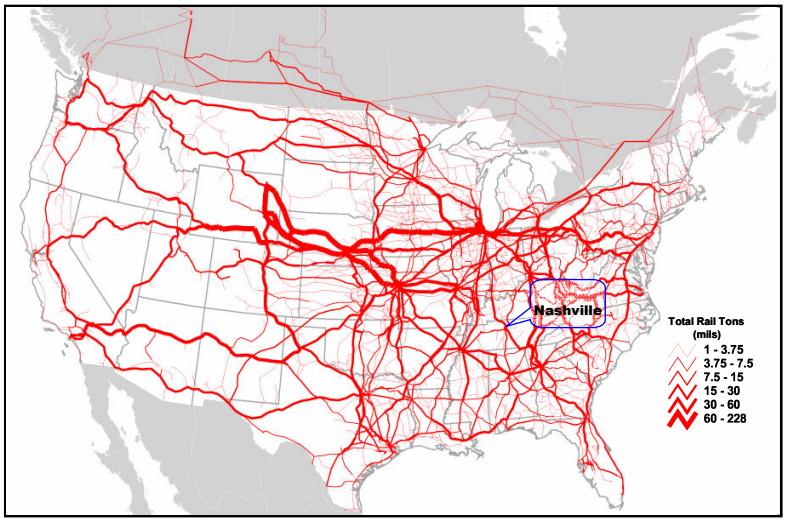
This map specifically shows the flow of through trucks moving into and out of the Nashville Region. The largest truck volumes are on I-24 moving from Northwest to Southeast. The second highest volumes are on I-40 moving West to East. The figures imply:

- I-40 gains about 3% of the total departing through traffic, as it moves west through the city;
- I-24 gains about 2% of the total departing through traffic, as it moves toward the southeast;
- I-65 loses about 5% of its traffic through the city going south, and gains 4% moving north.

Traffic in the freight rail system in the Nashville Area is shaped by the position of Nashville in the eastern and national rail network, and by the structure of the network itself. Ownership, connection, and distance combine to influence the pattern and character of current and prospective freight volume. Nashville is a crossroads for rail as it is for the highway, and it carries a substantial burden of tonnage.

Nashville is served by a single Class I railroad: CSX Transportation, and its related intermodal unit. Class I railroads are the primary freight haulers of the country, accounting for over 90% of railway revenue. The Nashville Area is served in addition by two related short line railways: the Nashville & Eastern, extending from Nashville eastward toward Monterey, and the Nashville & Western, running a briefer distance west to Ashland City.

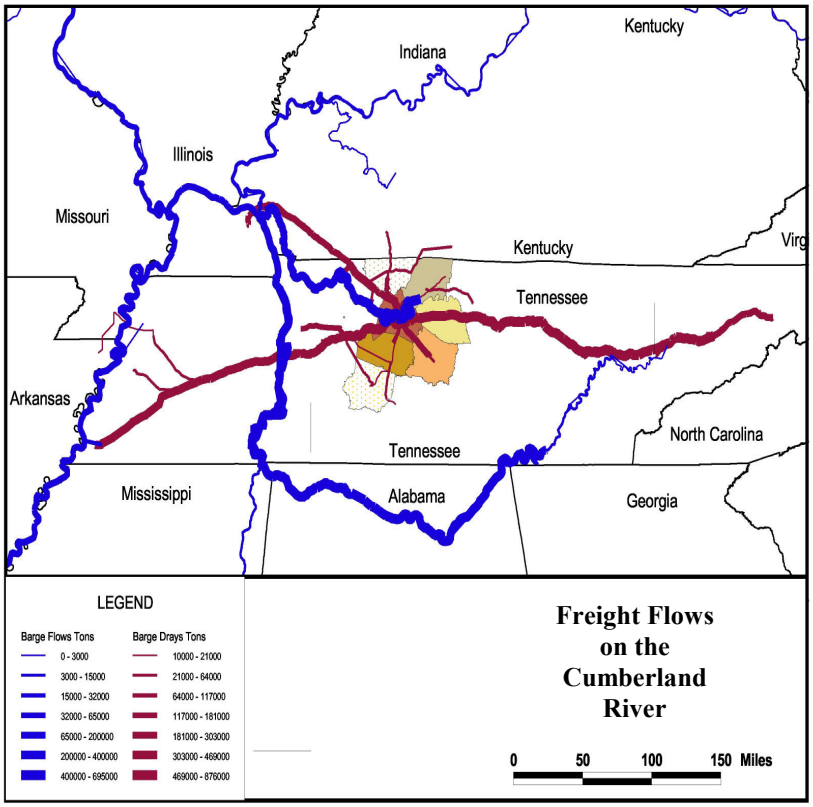
The position of Nashville is a crossroads for CSX as depicted in this map, where the north-south orientation of traffic flow is visible. The map also places Nashville rail volumes in the context of national rail traffic network. Nashville is a key hub in the CSX system, routing sixty trains per day through the Nashville region 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 - much like airline passengers change planes in an air hub. Of the 32 million tons of annual rail volume, 88% travels between other markets and is simply passing through the region. Just under 4 million tons is based in the Nashville market, with two-thirds of that inbound traffic. International containers, metals, chemicals, paper, and automotive products (new cars and auto parts) are the primary inbound goods; automotive products are the chief outbound commodity by rail.



Two primary facilities are used in Nashville. The major CSX terminal and classification operation is Radnor Yard, located on I-65 by state route 255. Three rail-truck transfer facilities are part of the terminal, handling intermodal containers, new automobiles produced outside of the Nashville region, and bulk commodities. Daily service is provided to the auto plants at Smyrna and Spring Hill. Kayne Yard is downtown alongside I-40, in the Gulch; it is a smaller facility serving industrial customers, and performing truck transloading for bulk goods.

The Nashville International Airport covers 4,417 acres and, as previously mentioned is served by 17 scheduled air carriers. The scheduled passenger carriers provide direct service to 81 different markets and make extensive global connections. Freight facilities are located adjacent to the airport's passenger terminal. The Nashville Air Cargo Link all-cargo complex is located across the airfield from the passenger facility. These cargo connections help meet the high speed transportation needs of area industries such as Dell. The automotive manufacturers also are occasionally dependent on air cargo to keep their assembly lines moving, and the health care facilities require rapid transport from time to time.

Nashville lies on the banks of the Cumberland River, 180 miles above the point where the Cumberland and the Tennessee join the Ohio River at Paducah, and continue to the Mississippi at Cairo. The waterway is navigable upriver and east to Celina, then downriver into the American heartland and the Gulf. River barges on the Cumberland carry 7 million tons of freight for the Nashville Area. Ninety percent of it comes inbound, making the river responsible for almost 20% of the inbound commodity tonnage supplied from outside to the Nashville Region.



Coal for electric utilities, aggregates for construction and other uses, and petroleum and chemical products for industry constitute more than 95% of the volume received from the river. Aggregates like sand and gravel are the chief form of outbound traffic, and primarily originate at locations adjacent to the riverbank. The accompanying map portrays barge traffic moving on the Cumberland and truck drayage on roads to and from its shores, as well as volume elsewhere in the state for the Tennessee River.

There are three public terminals in Nashville loading and unloading freight for Cumberland barges: at Robertson Avenue (mile post 174 on the river), Amy Lynn Drive (milepost 180), and Cowan Street (milepost 190). In addition, there are a variety of private facilities along the river handling proprietary goods.

The inland waterway system is maintained by the U.S. Army Corps of Engineers, including its lock and dam structures. There are two single-chamber locks affecting Nashville river traffic: Hickory Lock and Dam upstream between the city and Gallatin, and Cheatham Lock and Dam downstream.

Given the amount of freight being moved through the MPO region by each of the modes and the seven planning factors, it is obvious that freight issues need to be up for consideration when the LRTP is developed. The primary reason for conducting the freight study was to provide the MPO with the necessary data and background to further incorporate freight issues into the planning process. As a result of the study, the scoring criteria include extra points awarded for

projects that improve the movement of freight/goods (see scoring criterion 4 in the Performance-Based Assessment section). While this has been a part of the project scoring criteria in the past, this time around, MPO staff actually has freight related data to determine when a project improves a facility that is important to maintaining the efficient movement of freight and can award those projects with a higher rank.

While the **primary** intent of the freight study was to provide the MPO with data to further incorporate freight issues in the planning process, several other benefits came as a result of conducting the study. One of the benefits is a list of projects that would benefit and promote the efficient movement of freight and goods that need to be included in the LRTP project list. These projects were identified by the freight study through an extensive face-to-face interview process with approximately 40 stakeholders from the trucking and rail industry. In addition, some of the projects were identified as a result of a fax/mail back survey that was sent out to approximately 400 freight stakeholders. Below are the projects that are identified by the freight study and are included in the LRTP project list:

1) Grade separate Beechcroft Road (SR 247) at CSX rail crossing (2025)
2) Improve I-65/I-40 Junction at Fesslers Lane due to congestion (2016)
3) Improve I-24/I-40 Split due to congestion (2016)
4) Improve Murfreesboro Road due to congestion and signal timing (2016)
5) Improve SR 109 in Gallatin due to congestion (2016)

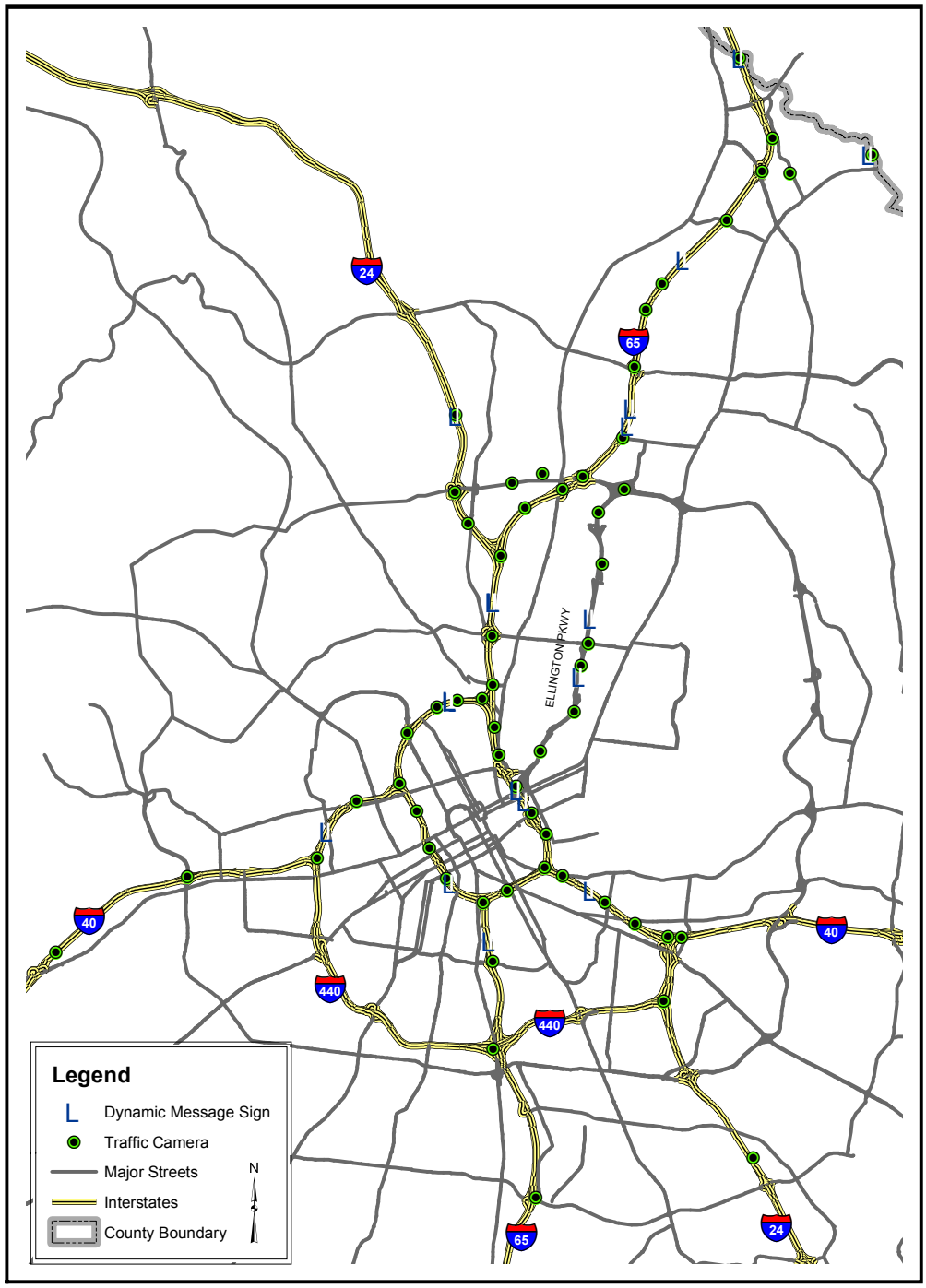
The next step to further incorporating freight into the MPO planning process will be taken in 2006 when the MPO will attempt to utilize the data from its freight study to develop a long range freight and goods movement plan. This process will most likely incorporate a truck modeling tool to anticipate the amount of truck traffic growth in the MPO region and where the growth will most likely occur.

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. A map of these devices and their locations throughout Davidson County are on the following page.

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.

ITS Camera and Dynamic Message Sign Locations



Bicycle & Pedestrian Facilities

Historically, bicycle and pedestrian facilities have not been given significant consideration in urban development throughout the region. Over the past several years, however, our communities have realized the importance of non-motorized means 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. As an MPO, we have been placing an increasing amount of emphasis on projects that support or provide alternatives to the automobile. Funding opportunities offered under TEA-21 – along with a growing interest in fitness, the environment, and energy conservation – have helped to promote a greater interest in non-motorized modes of transportation.

In 2004, the MPO amended the 2025 Long Range Transportation Plan to include a significant bicycle and pedestrian element. MPO staff held public meetings and met with local bicycle and pedestrian advocacy groups to identify areas of need and to establish specific goals and objectives (see page 78) for increasing the presence of non-motorized facilities in our region. These policies encourage local jurisdictions to embrace bicycling and pedestrian development as well as to plan for current and future bicycle and pedestrian needs – both locally and on a regional level throughout the MPO.

The geographic extent of the Nashville Area MPO encompasses over 2800 square miles, includes 5 counties and 17 municipalities. This area is larger than the state of Delaware and almost three times the size of Rhode Island, yet the MPO has established an ambitious goal of developing a comprehensive bicycle and pedestrian network that provides access to and within regional scale activity centers as well as between communities. The primary goal of the bicycle and pedestrian element is to ensure that bicycling and walking are safe, practical, and convenient ways to travel throughout the Nashville Region. While the needs of cyclists and pedestrians are similar, they are also very different. A review of the regional bicycle network and planning process is provided in the pages that follow. Page 33 specifically discusses the approach for expanding the planning efforts for pedestrian facilities as part of the Long Range Transportation Plan process.

Planning for the Regional Bicycle Network

Planning a region-wide network involves many steps, including the identification of needs, assessment of facilities, selection of routes and corridors for future development, and establishing priorities. This process is outlined in the following pages.

Areas of Need – Regional Destinations

To determine where the bicycle network should be established, the MPO first had to identify areas of regional significance, in other words, areas where cyclists or pedestrians would most likely wish to travel to or from. These areas are called “Regional Destinations”. These regional destinations include such things as city centers, universities, parks, large shopping centers, and

connections to transit. The MPO created a draft list of destinations and then reviewed these with both bicycle and pedestrian advocacy groups, as well as held public meetings to gather input and obtain ideas for additional destinations. When the Bicycle and Pedestrian amendment was added to the 2025 Long Range Transportation plan in fall of 2004, the MPO officially adopted the list of regional destinations listed in Appendix D.

After establishing the regional destinations and the corresponding need for connectivity to these locations, the next step of the planning process involved mapping the destinations and identifying potential connections between them.

Drafting the Network

These connections could be roadways or other rights-of-way such as greenways or alongside railroads, or water bodies. Input from the public and through meetings with local cycling groups indicated that direct connections are the most desirable and efficient, rather than meandering paths that tend to follow the banks of waterways or other natural features. In the majority of cases the most direct route is to utilize existing roadways, however, greenways and linear paths can provide significant connectivity. Keeping these recommendations in mind, the MPO created a draft regional network that included both roadway and non-roadway options. The routes shown in the map on page 26 provide the most direct connections to the regional destinations in Appendix D. The routes show a phased approach to developing the network. The first phase identifies corridors that are considered a high priority. These are indicted by solid colored lines. The second phase, indicated by arrows, looks at corridors for future planning and development where the network can expand to include connections to outlying cities and between cities. All of these routes were developed with both public input and upon consultation with local cycling groups throughout the MPO. These routes were also adopted as part of the Bicycle and Pedestrian amendment in 2004. As the map shows, four primary corridors were established that radiate outward from Nashville to Gallatin, Lebanon, Murfreesboro, and Franklin. The primary roadways that provide links to these cities are Gallatin Pike (US-31), Lebanon Road (US-70), Murfreesboro Road (US- 41-70), and Franklin Road (US-31). Most of these routes utilize roadways; however, if other rights-of-way were potentially available, these were identified as well.

The Existing Regional Bicycle Network

Currently, several cities throughout the MPO have existing bicycle facilities; however, only one segment in Davidson County actually falls within the primary network, this is a bike lane on Riverside Drive that connects into the Shelby Bottoms Greenway. In essence, this means that the entire regional network will need to be developed over the life of the 2030 Long Rang Plan. Although the regional network will require significant investment, many jurisdictions already have bicycle and pedestrian plans that show some type of bicycle facilities which coincide with the regional network corridors. As these segments get built, the MPO and local jurisdictions will work together to link the individual segments into a region-wide, comprehensive network.

Future Needs

As mentioned earlier, the current planned routes and corridors were established based on the need to connect the regional destinations and provide travel-way options for cyclists. Due to the absence of any type of bicycle facilities along these corridors, the most important and basic current and future need can be summed up as "Provide bicycle facilities along the regional network".

Although this is the principal need, over time additional factors will need to be considered in developing the regional network. As our communities develop, more regional destinations may be identified and some may become less important. In addition, some communities may increase population and employment density, while others decline. These changes could impact the design of the regional bicycle network and will require that the MPO periodically re-visit and re-evaluate both the network and regional destinations.

As part of the identification of current needs, an analysis was performed to locate areas of dense population and employment (see the maps on the following pages). This analysis provides a tool to monitor the planned network and ensure that it maximizes connectivity to communities and employment areas. To determine potential needs in the future, this analysis must be periodically updated to ensure that dense growth areas are identified and considered when re-evaluating the regional bicycle network.

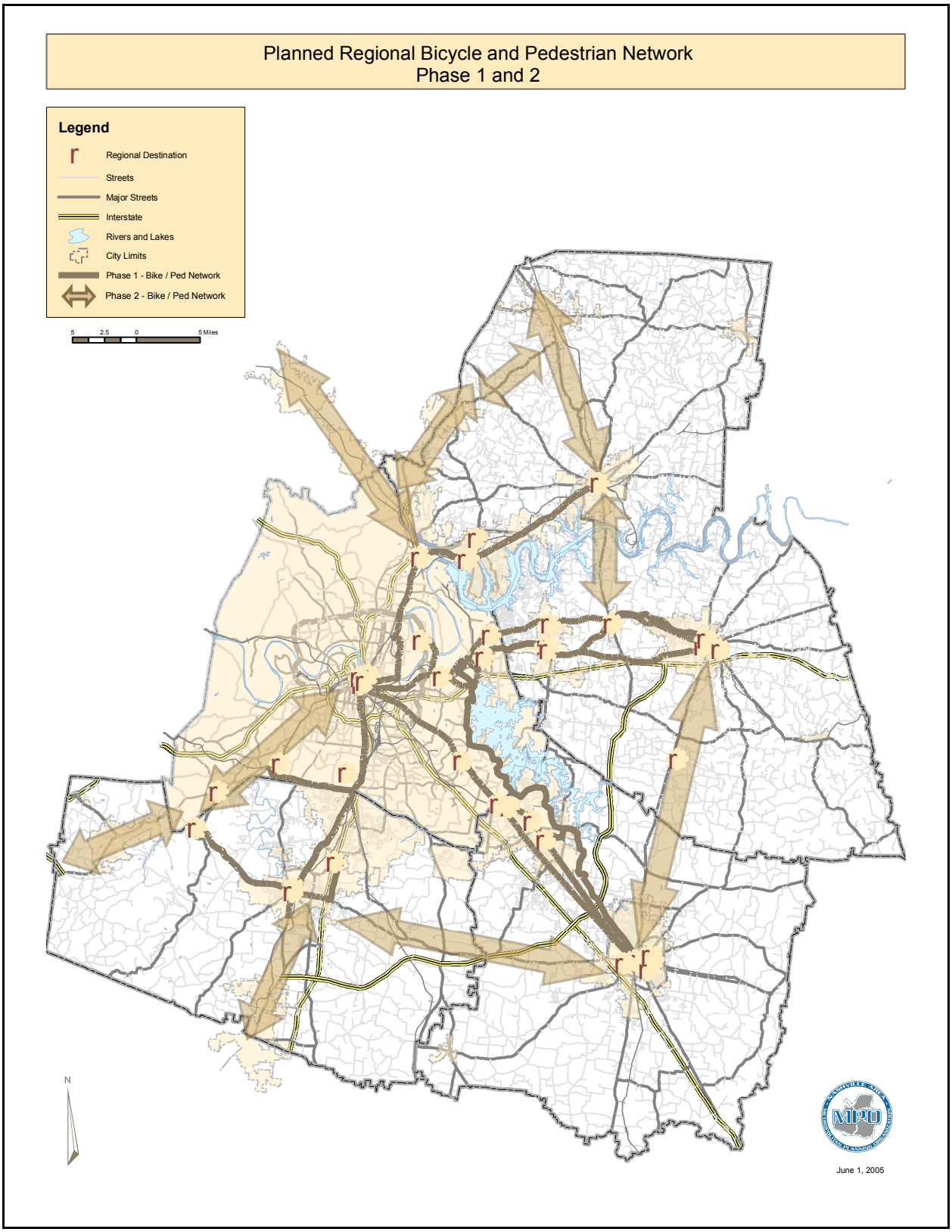
In addition, as segments of the network are completed, the MPO will need to continually assess areas of priority in order to maximize connectivity. As part of the Long Range Transportation Planning process, both the bicycle and pedestrian elements will need to be continually reviewed and refined.

Local Bicycle and Pedestrian Facilities and Plans

While the focus of the MPO bicycle network is on connecting regional destinations, links to and from local bike paths and recreational facilities are important. Over the past several years, many MPO jurisdictions have completed bicycle and pedestrian plans (see table on page 27) and Metro Nashville/Davidson County has completed a Strategic Sidewalks & Bikeways Plan which includes an inventory and assessment of existing sidewalks, as well as a component which prioritizes the location of future sidewalks and integrates useful pedestrian and bicycle facilities into all new street design. The Nashville Area MPO will continue to encourage the development and maintenance of local bicycle and pedestrian plans. An essential part of this process will be to ensure that both existing and new local plans will connect and enhance the regional network as well as establish a local bicycle and pedestrian vision in each community. Municipalities that currently lack bicycle and pedestrian plans will be encouraged to move forward on such activities as well as update some of the older plans such as the 1994 Bicycle and Pedestrian Plan of Murfreesboro. Two specific counties that will be targeted are Rutherford and Williamson. These counties were identified during the 2004 Bicycle and Pedestrian amendment to the 2025 LRTP. The MPO will work with these communities to encourage development of bicycle plans and to assist with identifying possible funding mechanism and strategies.

State Involvement

The Tennessee Department of Transportation (TDOT) recently adopted a policy that recognizes federal requirements that all new road construction or reconstruction in urbanized areas must include bicycle and pedestrian facilities or document why they could not reasonably be included. Projects programmed through the MPO will now be designed according to that policy. A procedure has been established with TDOT by which MPOs are notified of upcoming resurfacing or reconstruction projects. This allows MPO staff to work with local municipalities to confirm whether specific bicycle or pedestrian facilities have been identified in any planning document, and coordinate with TDOT accordingly.


Planned Regional Bicycle and Pedestrian Network
Phase 1 and 2
Legend
Regional Destination
Streets
Major Streets
Interstate
Rivers and Lakes
City Limits
Phase 1 - Bike / Ped Network
Phase 2 - Bike / Ped Network
5 2.5 0 5 Miles
N
MPO
June 1, 2005

Existing Bicycle and Pedestrian Plans

Municipality	Plan Name	Date of Plan
City of Brentwood	Brentwood 2020 Plan	1999
City of Franklin	Bicycle and Pedestrian Plan Update	2003
City of Gallatin	Bicycle and Pedestrian Master Plan	2000
City of Hendersonville	Bicycle and Pedestrian Master Plan	2000
City of LaVergne	Have Draft Plan - Not yet adopted	2000
City of Mt. Juliet & Lebanon & Wilson Co.	Bicycle and Pedestrian Master plan	2002
City of Murfreesboro	Bicycle Plan	1994
Nashville-Davidson County	Strategic Plan for Sidewalks and Bikeways	2002
Smyrna	Have draft plan - MAP has been Adopted by Planning Commission.	2000
Sumner County	Bicycle and Pedestrian Master Plan	2000
Wilson	Bicycle and Pedestrian Master Plan	2002
TDOT	Bicycle and Pedestrian Policy	2003

Municipalities targeted for future bicycle and pedestrian plans	
City of White House	City of Springfield
City of Goodlettsville	Rutherford County
City of Millersville	Williamson
City of Portland	Murfreesboro (Update Plan)

Regional Bicycle and Pedestrian GIS

Over the past few years, the Nashville Area MPO has been assembling a region-wide bicycle and pedestrian Geographic Information System (GIS). This system now includes all completed bicycle and pedestrian plans for the municipalities listed in the above table and shown in the map on page 29. This GIS provides an up-to-date, comprehensive, and interactive mapping tool that will help both the MPO and local communities better coordinate, plan, and analyze their bicycle and pedestrian networks. This GIS will continually be updated and is meant to be a living system. To ensure proper maintenance of the system, the MPO will communicate with each

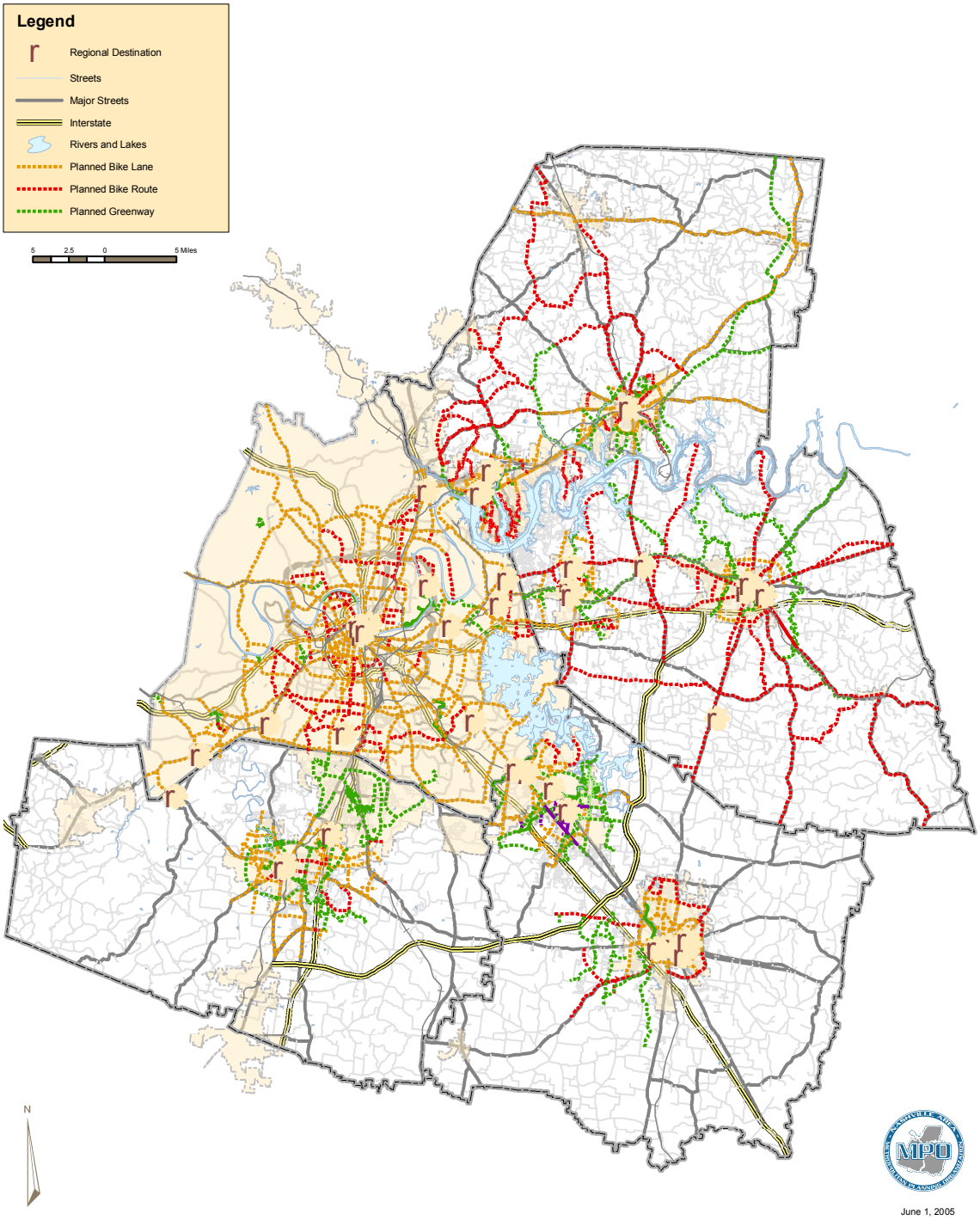
jurisdiction quarterly to obtain information on new facilities or new bicycle and pedestrian plans that have been developed.

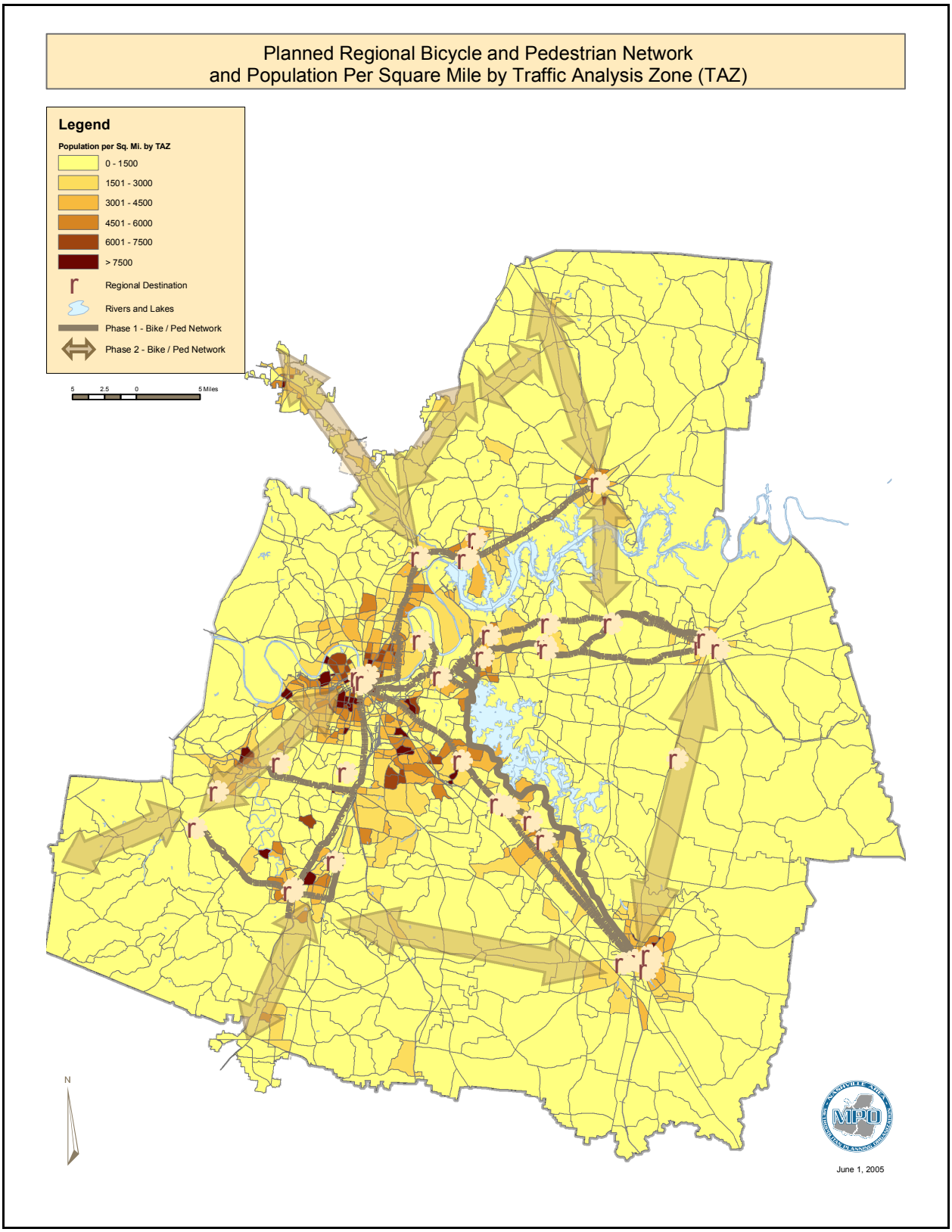
As part of the continued analysis of the bicycle and pedestrian network, the current GIS system was used to identify dense population and employment clusters by transportation analysis zone (TAZ). The map on the following page shows the existing bicycle and pedestrian network, as well as the regional destinations and the population clusters. As the map shows, the bicycle and pedestrian network passes through many of the densest population areas and does a good job of connecting the regional destinations. This will allow the greatest number of users to be able to access the regional network. The Map on page 30 shows the existing bicycle and pedestrian network compared to the employment clusters. By providing a regional network through the dense employment areas, the result is greater access and connectivity between work and home.

Bicycle and Pedestrian Standards

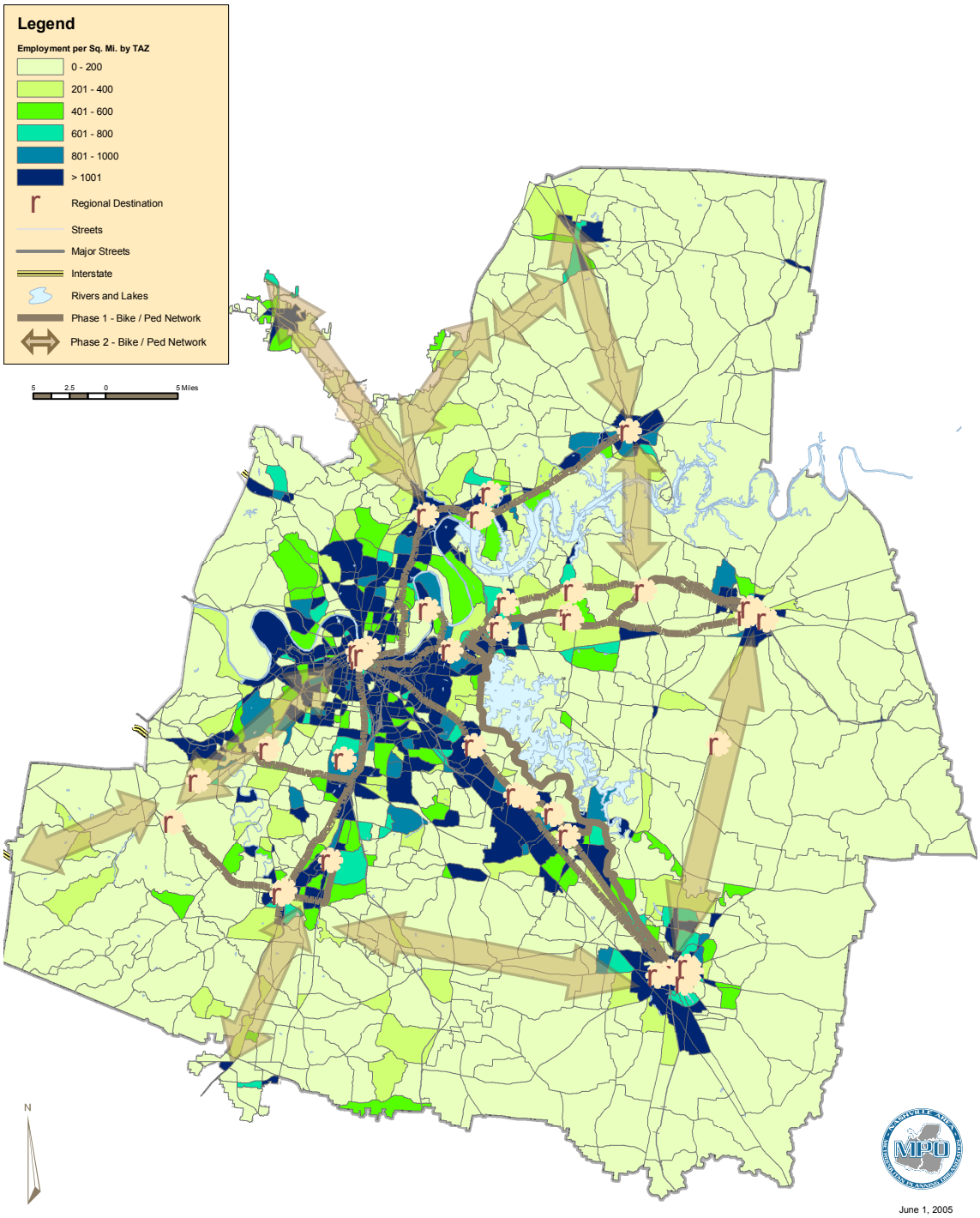
Currently, not all jurisdictions within the MPO maintain an identical standard for bicycle and pedestrian facility design, although many do conform to the American Association of State Highways and Transportation Officials' (AASHTO) guidelines. To maintain consistency for both cyclists and pedestrians, a standardized bicycle and pedestrian guideline document is recommended. The MPO has been working with local jurisdictions to create a standard that may be adopted by all municipalities within the MPO. An example of Nashville-Davidson county's current standards can be seen on Page 31. The MPO will review and consider the adoption of AASHTO bicycle and pedestrian guidelines by all MPO jurisdictions, as well as the creation of consistent ordinances that support the growth of the bicycle and pedestrian network through new roads and/or developments. The establishment of guidelines for appropriate bicycle and pedestrian support facilities such as benches, bike racks, signage, etc., will also be considered, however, these elements tend to have less impact on the quality of the bicycle and pedestrian system.

Existing Local Bicycle and Pedestrian Plans
as of June 2005

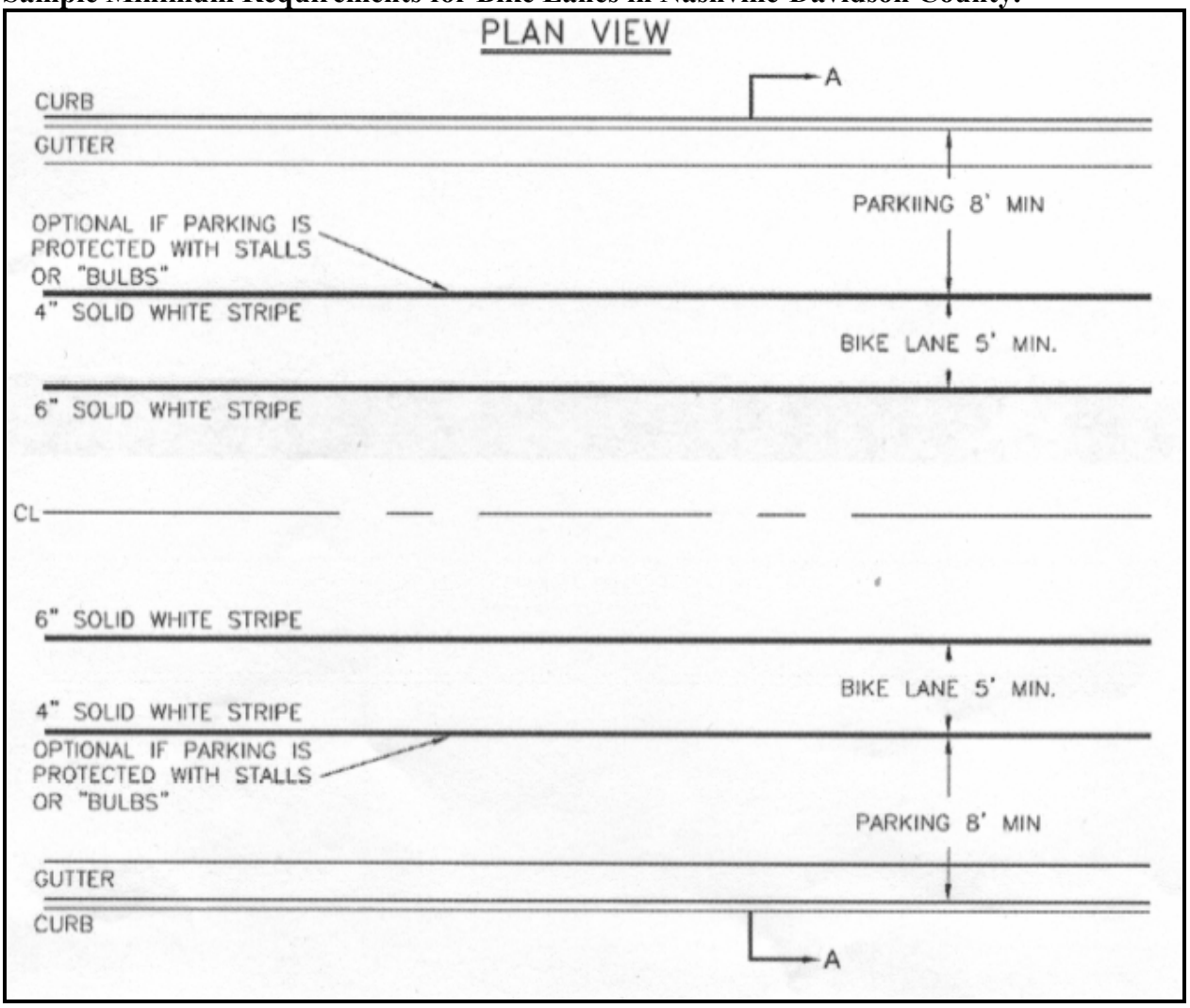


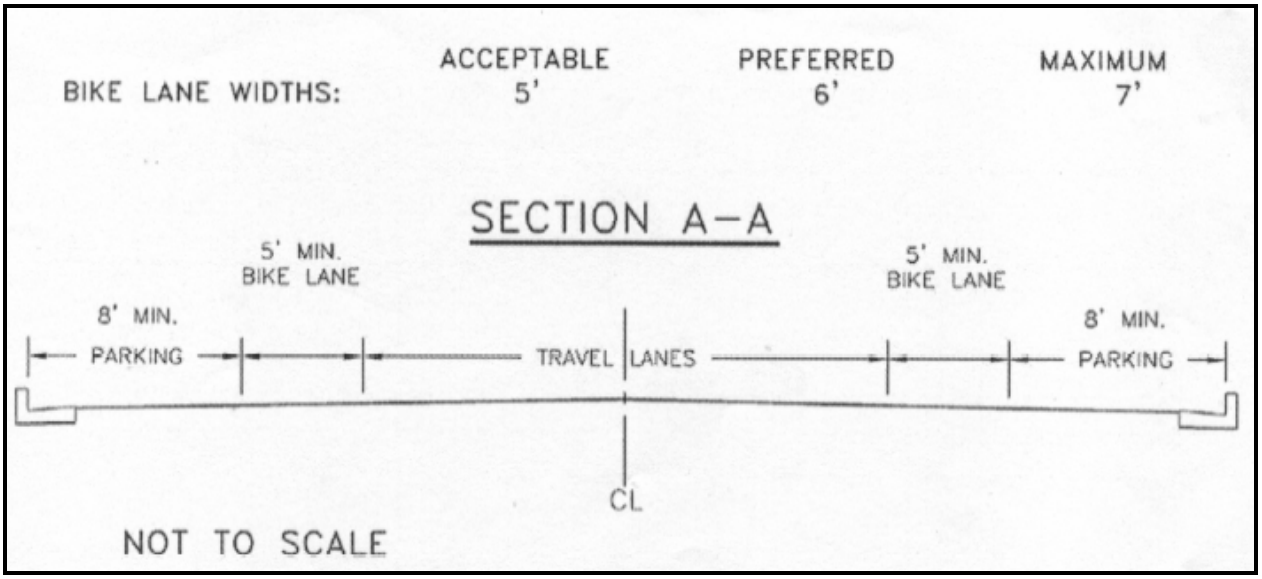

Planned Regional Bicycle and Pedestrian Network
and Population Per Square Mile by Traffic Analysis Zone (TAZ)
Legend
Population per Sq. Mi. by TAZ
0 - 1500
1501 - 3000
3001 - 4500
4501 - 6000
6001 - 7500
> 7500
Regional Destination
Rivers and Lakes
Phase 1 - Bike / Ped Network
Phase 2 - Bike / Ped Network
5 2.5 0 5 Miles
N
MPO
June 1, 2005

Planned Regional Bicycle and Pedestrian Network
and Employment Per Square Mile by Traffic Analysis Zone (TAZ)



Sample Minimum Requirements for Bike Lanes in Nashville-Davidson County.





Planning for a Regional Pedestrian Network

Thus far, much of the discussion for the Bicycle and Pedestrian element to the Long Range Transportation Plan has focused on providing facilities and connections for bicyclists, however, as part of the 2004 Bicycle and Pedestrian amendment to the 2025 LRTP, several policies, goals and objectives were adopted to also provide support and encourage development of pedestrian facilities. The full listing of bicycle and pedestrian goals and objectives can be seen on page 80.

Although walking is not generally considered a means by which to travel long distances, it is important to consider that every trip begins and ends as a pedestrian. In particular, many short distance trips such as dropping the kids off at school or at a friends house, shopping, errands, and walking to the bus stop, are all trips that usually can be done as a pedestrian. Every trip that is not made in an automobile helps reduce the strain on our roadway systems. Accordingly, the MPO as well as TDOT and other transportation planning agencies, support projects that provide pedestrian facilities.

As part of the 2004 Bicycle and Pedestrian amendment, a list of regional destinations was created where increased pedestrian activity, access, and facilities are desired. This list can be found in Appendix D and includes bus stops for regional transit access, major universities, parks, large shopping centers, and city centers. These are all locations where increased pedestrian activity could benefit both pedestrians and the regional transportation network.

As projects are developed around these regional destinations, the MPO will encourage inclusion of the appropriate pedestrian facilities. Further, the MPO will continue to work with local municipalities to consider adopting standard design guidelines for pedestrian support facilities such as benches, provisions for shade, and signage. The MPO will also encourage local jurisdictions to provide bicycle and pedestrian outreach and education activities such as Driver Training and Bicycle Rodeos at schools.

In addition, it is important to consider that TDOT currently has a bicycle and pedestrian policy which requires that both pedestrian and bicycle facilities be routinely integrated into the transportation infrastructure. This includes the consideration of pedestrian facilities for all state highways during both new construction and re-construction projects. Because most regionally significant routes are state highways, TDOT's policy will support the development of many pedestrian facilities throughout the MPO region.

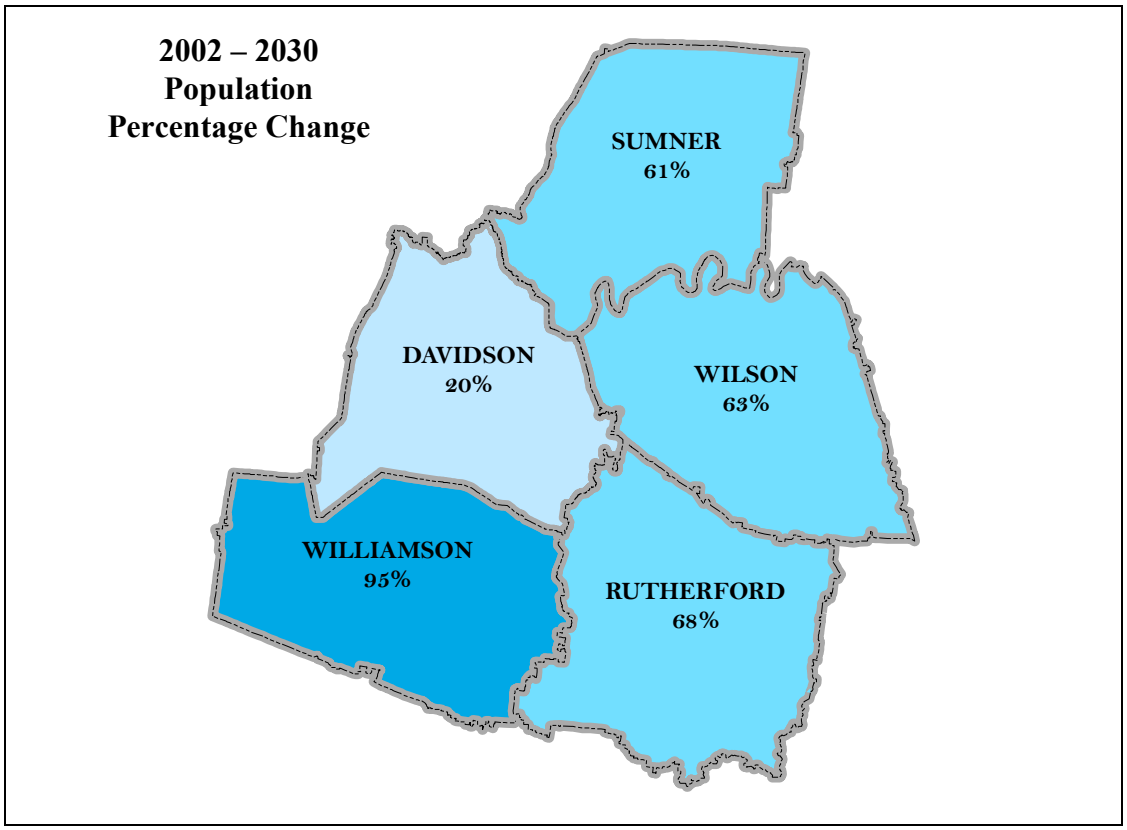
WHERE WE ARE GOING

This section highlights socioeonomic trends that are expected to affect the future of transportation. Where people live and work and the routes they drive are the primary forces that drive the needs of the transportation system. As a result, much of the LRTP is based on these data including the actual LRTP project list and type of projects needed to provide the most efficient movement of people and goods.

Population & Employment Projections

As discussed in the previous section, the Middle Tennessee region is experiencing the same rapid population growth occurring in other "sunbelt" cities. Projections on population and employment indicate that the region will continue to grow through the year 2030. The region's population is expected to grow by 45 percent, while employment projections suggest that the region will nearly double with an increase of 96 percent.

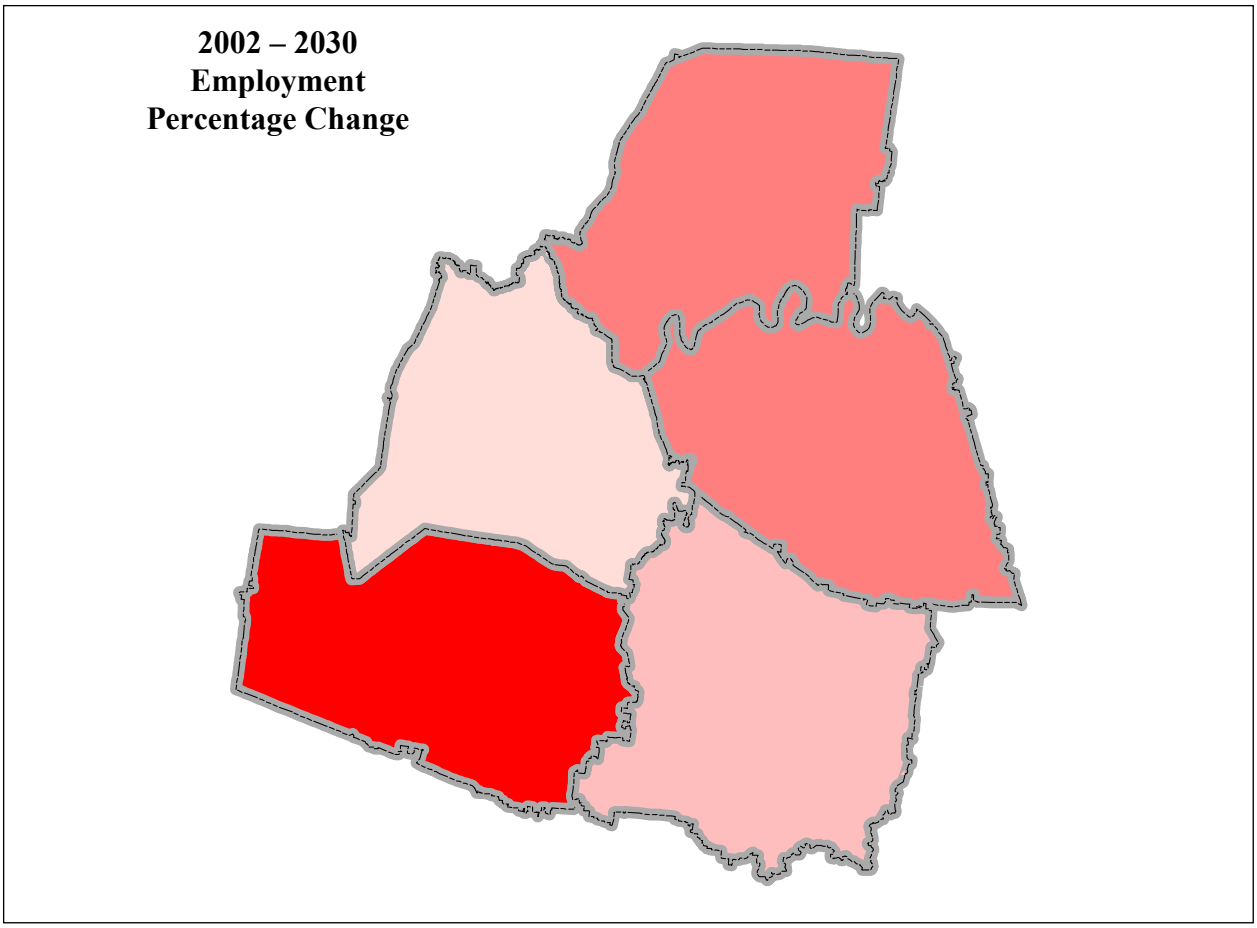
A closer examination of demographic changes at the county level suggests that Rutherford and Williamson County will experience the greatest population increase between 2002 and 2030. Davidson County's population is expected to increase by only about 20%, but it will continue to be by far the most populous county in the region with a projected population of approximately 713,000.



Projected Change in Population				
County	**2002**	**2030**	**Absolute Change**	**% Change**
Davidson	595,124	713,055	117,931	20%
Rutherford	205,415	344,235	138,820	68%
Sumner	140,081	225,524	85,443	61%
Williamson	141,536	276,555	135,019	95%
Wilson	95,849	156,364	60,515	63%
Region	1,180,007	1,715,733	535,726	45%

Source: Nashville Area MPO and CBER

According to forecasts on employment, Davidson County is anticipated to have the largest increase in number of employees, and thus continue to provide the largest employment base. However, the other four counties will each experience job growth in excess of 50%. Specific high employment centers are discussed earlier in the document. The following map and table shows the relative anticipated employment growth for the region through the year 2030.



Projected Change in Employment				
County	2002	2030	Absolute Change	% Change
Davidson	540,142	800,549	260,407	48%
Rutherford	100,525	175,673	75,148	75%
Sumner	58,945	95,758	36,813	62%
Williamson	74,313	135,673	61,360	83%
Wilson	39,822	63,827	24,005	60%
Region	813,747	1,271,480	457,733	56%

Source: Nashville Area MPO

The anticipated growth in population and employment within the planning period will lead to increased demand for transportation services provided by roadway, transit, bicycle, and pedestrian facilities. The Nashville Area MPO has evaluated these projected changes in relation to the effects on transportation infrastructure and has concluded that future transportation facilities should be developed responsibly with respect to land use, congestion mitigation, and air quality.

The MPO has made great strides in its efforts to insure that future transportation infrastructure investments are developed responsibly with respect to land use and congestion mitigation. As part of this LRTP update, the MPO has incorporated a land use modeling process called ULAM to better predict where population and employment growth will occur over the next 30 years. The procedures for implementing ULAM into the LRTP update are described below.

The U.S. Census Bureau, the Tennessee Department of Transportation, the State Department of Labor and Workforce Development, and universities provide employment and demographic/population data that are used as input for ULAM. Prior to running the ULAM model, control totals are established for the employment and demographic/population data for the year 2030. Control totals are extracted from the Tennessee Department of Transportation's Long Range Transportation Plan and the University of Tennessee Center for Business and Economic Research for each of the five MPO counties. Once control totals are established, base year (2002) employment and demographic/population data are developed and allocated to the proper Traffic Analysis Zones (TAZs) using the State Department of Labor and Workforce Development's ES-202 dataset (ES-202 data includes every businesses unemployment insurance records) and a combination of U.S. Census data and building permits gathered from each of the MPO jurisdictions. Once the base year data are established and allocated, ULAM allocates the 2030 projected employment and demographic/population data based on the historical employment and population/demographic growth, amount of available land in each of the counties, and future land use/growth plans for each of the MPO jurisdictions.

Utilizing the future land use/growth plans as input for ULAM is the result of a policy decision made by the MPO's TCC. This decision was also accepted by the Executive Board. The TCC was presented with two different future land use scenarios to be used in allocating the population and employment growth that is expected to occur between 2002 and 2030, the traditional land use scenario and the compact growth land use scenario. The traditional land use scenario simply allocates the population and employment based on the way development has traditionally occurred in the region (suburban sprawl type development). The compact growth scenario allocates the population and employment based on a more desirable form of development that comes out of each of the jurisdictions future land use/growth plans, meaning more dense development and an overall more efficient use of land and resources. Of the two scenarios, the TCC and Executive Board chose to recommend that staff use the compact growth scenario. The TCC felt the compact growth scenario was most desirable given the need for more manageable growth and the current state of air quality and population increase in the region.

Once ULAM has allocated the employment and population/demographic growth to each of the TAZ's a clear picture of where the development is likely to occur in the future is developed. This picture is just one of the tools used by the MPO in developing the Long Range Transportation Plan project list. In addition, the employment and population data that are allocated to each of the TAZ's are used as input into the travel demand model (another of the tools) which is used to project future congestion on existing roadways. This process is discussed in more detail in the Congestion Management System section. In addition, a map of the region's employment and population growth with the resulting congested roadways is provided after the

Congestion Management System section on pages 55 and 56. This allows one to visualize the impact that employment and population growth can have on the transportation system.

Congestion Management System

Long Range Transportation Planning involves more that just the creation of new roadway projects. The Nashville Area MPO is also charged with the task of monitoring and managing the existing transportation system. The Congestion Management System, (CMS) is responsible for developing performance checks as well as providing guidelines towards the creation of specific projects aimed at alleviating congestion while helping mold the most efficient and cost-effective transportation system for years to come.

Managing congestion requires an understanding of congestion and a definition of what constitutes congestion. The definition selected for the Nashville Area CMS is the same one established in the federal regulations, i.e. "The level at which transportation system performance is no longer acceptable due to traffic interference."

Following is a discussion of the various types of data collected as part of the CMS to help determine where congestion occurs and to what level it occurs on the transportation network. Utilizing this data, the MPO is able to determine the most appropriate strategy to address the various congested roadways and corridors. These strategies are implemented through the LRTP project list.

Data Collection and System Performance Evaluation

The amount of traffic data being collected by local governments is relatively low. Most of the roadway data collection being done is performed by TDOT. Yearly Average Daily Traffic (ADT) counts and accident studies are conducted by TDOT on numerous roadway segments throughout Tennessee. Turning movement counts are performed by TDOT on an "as-needed" basis. TDOT also maintains the Tennessee Roadway Information Management System (TRIMS), which includes information about roadway classification, roadway and right-of-way width, roadway surface, and speed limit for many public roadways within the MPO area.

The only other transportation data which is consistently available to measure system performance are the travel times from the travel time study conducted by the MPO, transit travel time information available from the Metropolitan Transit Authority and future travel times produced from the MPO's regional travel demand model. The CMS was developed to make the best possible use of the information which is regularly collected and available.

Transportation Modes Monitoring

Based on present levels of usage for the various modes considered and the cost effectiveness of data collection and analysis, the following modes of transportation are monitored as part of the CMS:

- Private vehicles traveling on highways
- Public transit

Other modes, such as pedestrian, bicycle, and rail, were considered but not included for monitoring. However, alternative modes are a vital part of congestion management.

Transportation System

The majority of congestion problems within the Nashville Area MPO occur on the major roadways and within the urbanized areas. For this reason, the CMS monitoring considers the following components of the transportation system:

- Roadways – Monitoring is performed for all roadways with a minor arterial classification or higher within the Nashville or Murfreesboro urbanized areas.

- Fixed transit routes – All fixed transit routes are monitored.

Performance Measures

The purpose of establishing performance measures is to enable transportation professionals and policy makers to make factual, rational, and cost-effective decisions based on a comprehensive view of the transportation system. The agencies responsible for maintaining and operating an area's transportation system need consistent, systematic, and comprehensive information about the recurrence of traffic congestion on their system.

Federal regulations require that the CMS include performance measures that

1. Describe the extent of congestion, and
2. Help evaluate the effectiveness of various strategies used to reduce congestion.

The performance measures must accurately identify existing as well as potential future traffic congestion, for a range of transportation facilities and modes. They must assist in the analysis of complex traffic congestion problems, yet be relatively easy to understand since they will be used by many different professionals and reviewed by elected officials.

An extensive evaluation of possible performance measures was conducted, including consideration of the data that would need to be collected, ease of application, and effectiveness of the output. After discussion by the MPO's CMS subcommittee, a set of performance measures were selected and are shown in the table on the next page. The performance measures that were selected make up what is known as the "Tier 1" analysis. Tier 1 analysis simply utilizes the following performance measures to identify congested roadways and corridors.

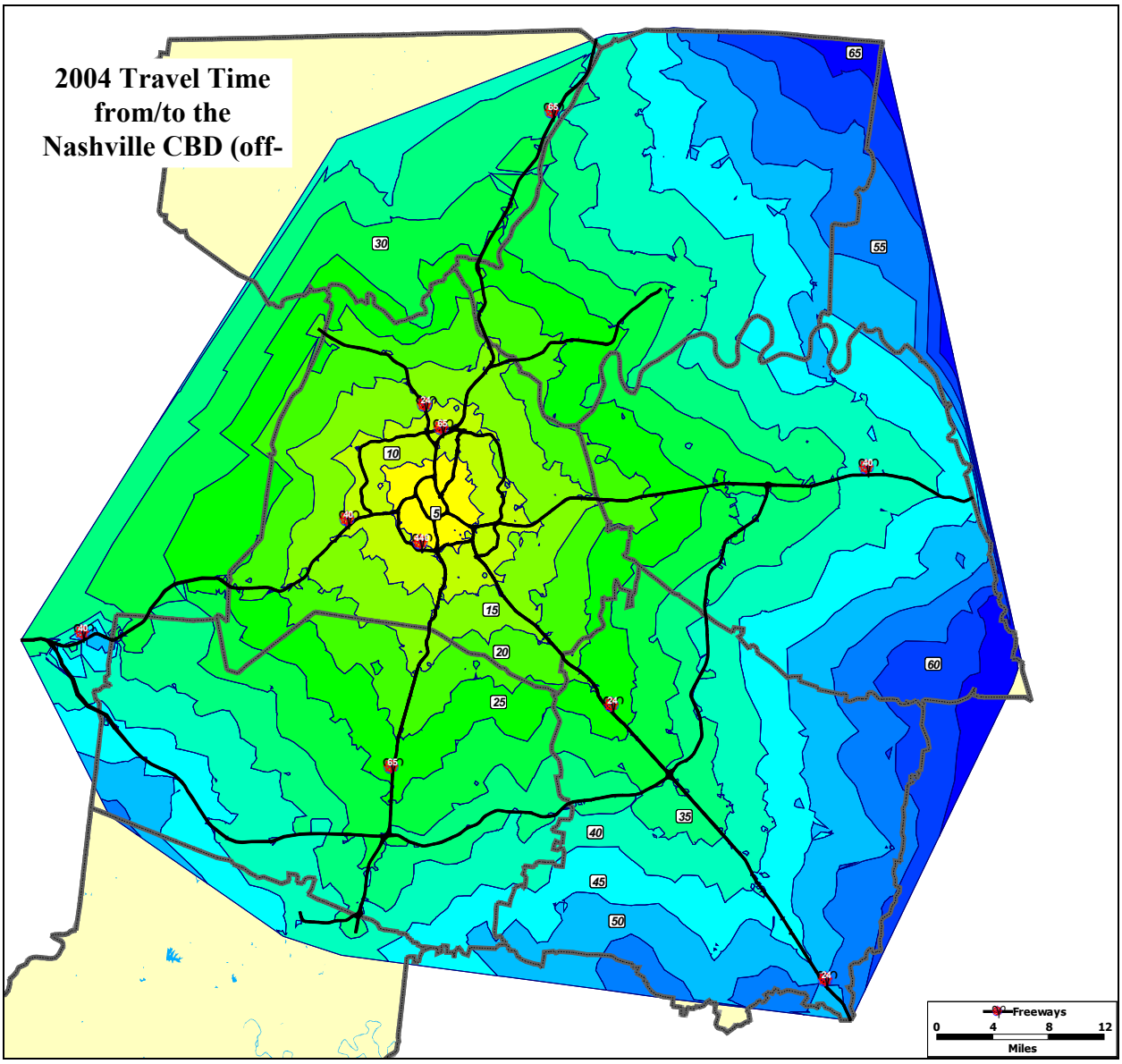
Performance Measure	Area Type	Threshold
Average Route Speed	Urbanized area	<70 % of free flow speed
Transit Delay	Urbanized area	<70% of free flow speed
Vehicle Miles Traveled (VMT) per licensed driver	Entire MPO area	Percent change compared to previous years
Vehicle Occupancy	Urbanized area	Percent change compared to previous years
Citizen Complaints	Rural areas (outside urbanized area)	Three complaints per year at a specific location
Projected Average Route Speed (Future)	Urbanized area	<70% of free flow speed

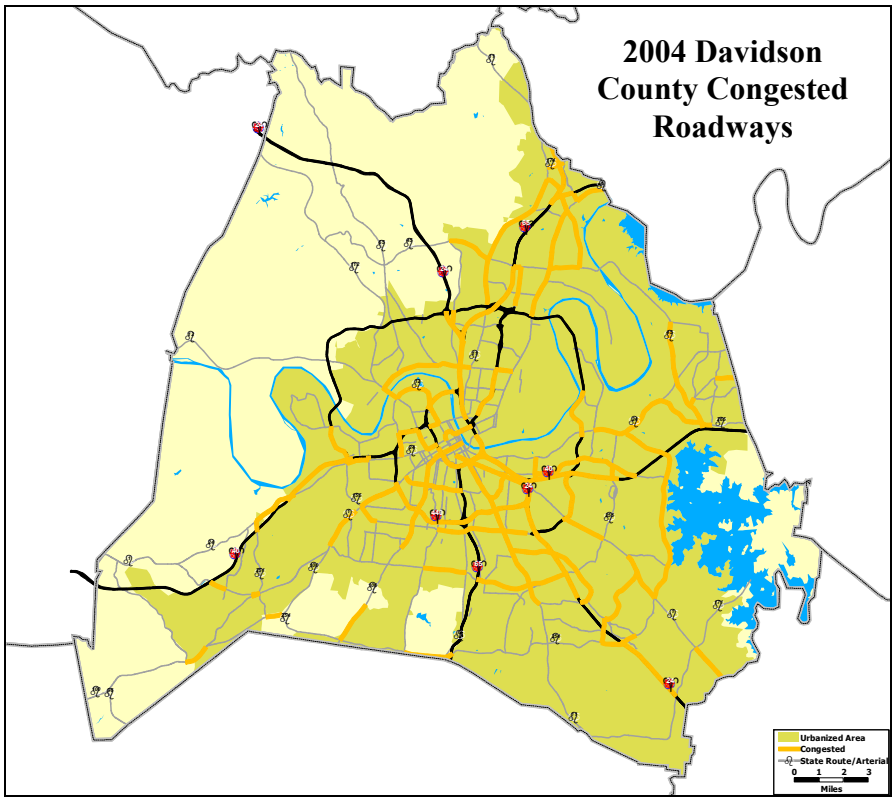
Average Route Speed (travel time)

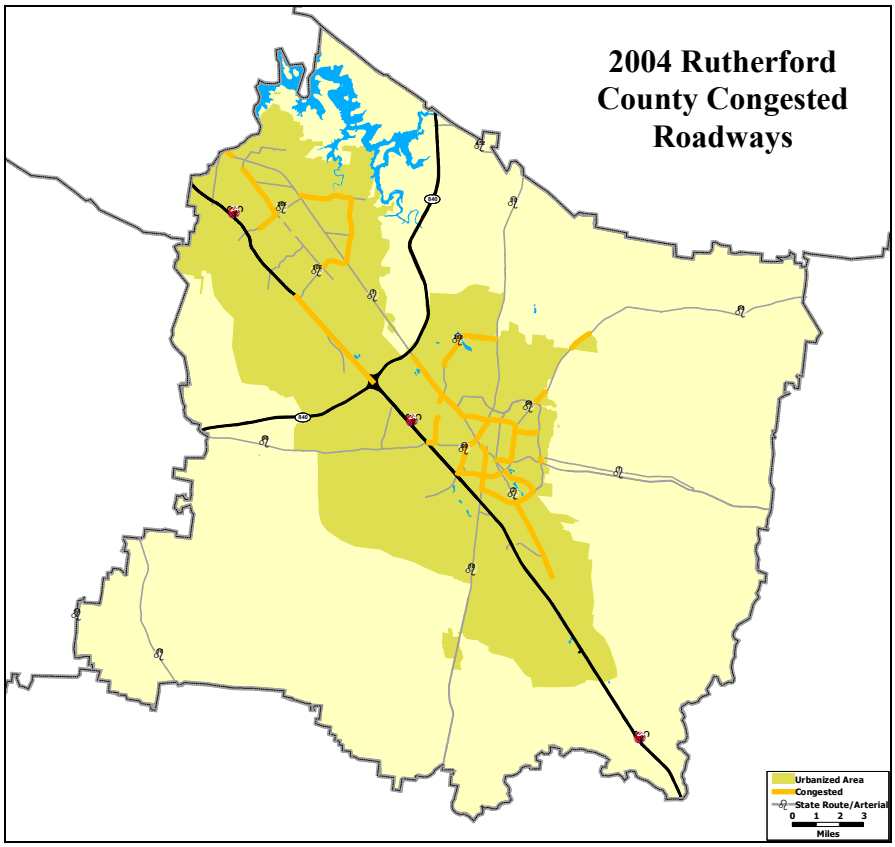
Average route speed is a time-based measurement and is more understandable to most people than a capacity-based measurement such as Level of Service. This performance measure is based on actual vehicle speeds traversing a corridor, whereas Level of Service focuses more on a particular roadway segment with a given cross-section. Unlike Level of Service, which is primarily oriented to the vehicular mode of travel, average route speed is more useful from a multi-modal perspective.

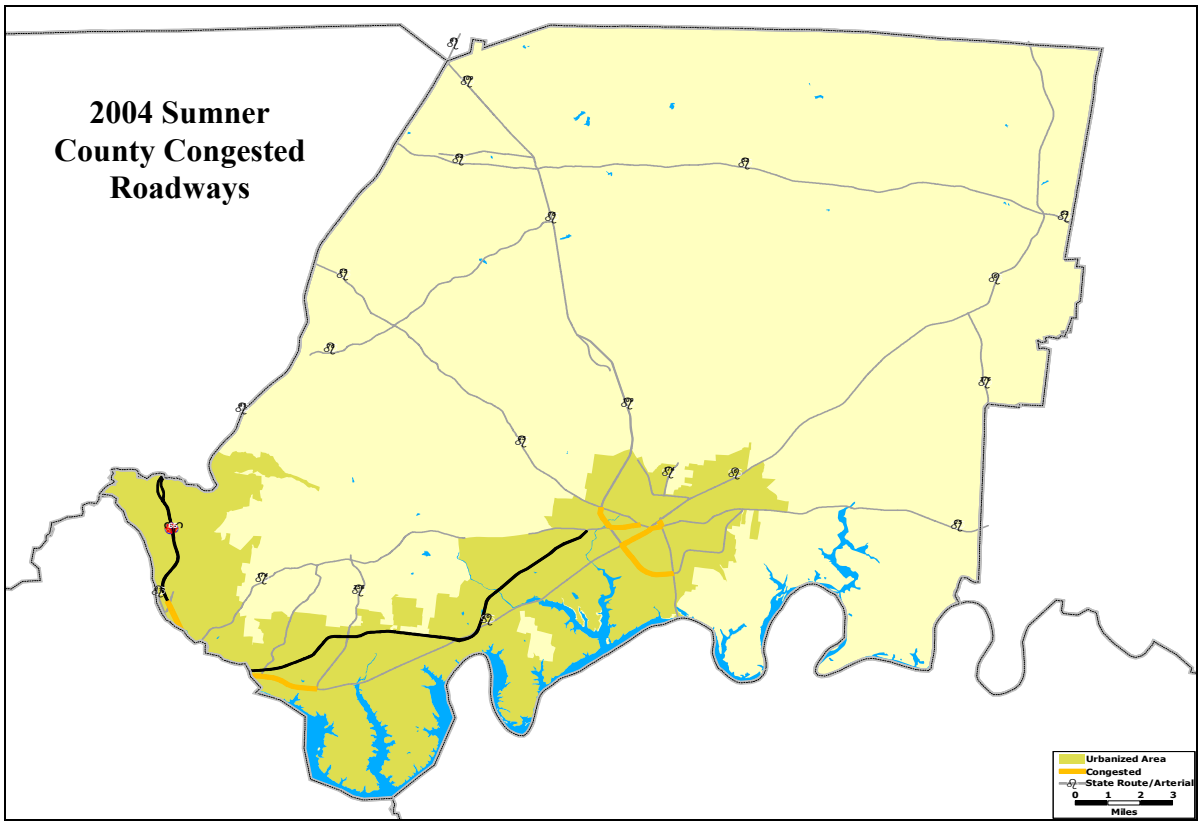
If peak travel times are compared to off-peak travel times, this measure also helps evaluate the reliability of the system, which is particularly important in a region like Nashville's, where the system carries a large percentage of freight traffic. The peak travel times used for this analysis are 6:30 a.m. to 9:00 a.m. and 4:00 p.m. to 6:30 p.m.

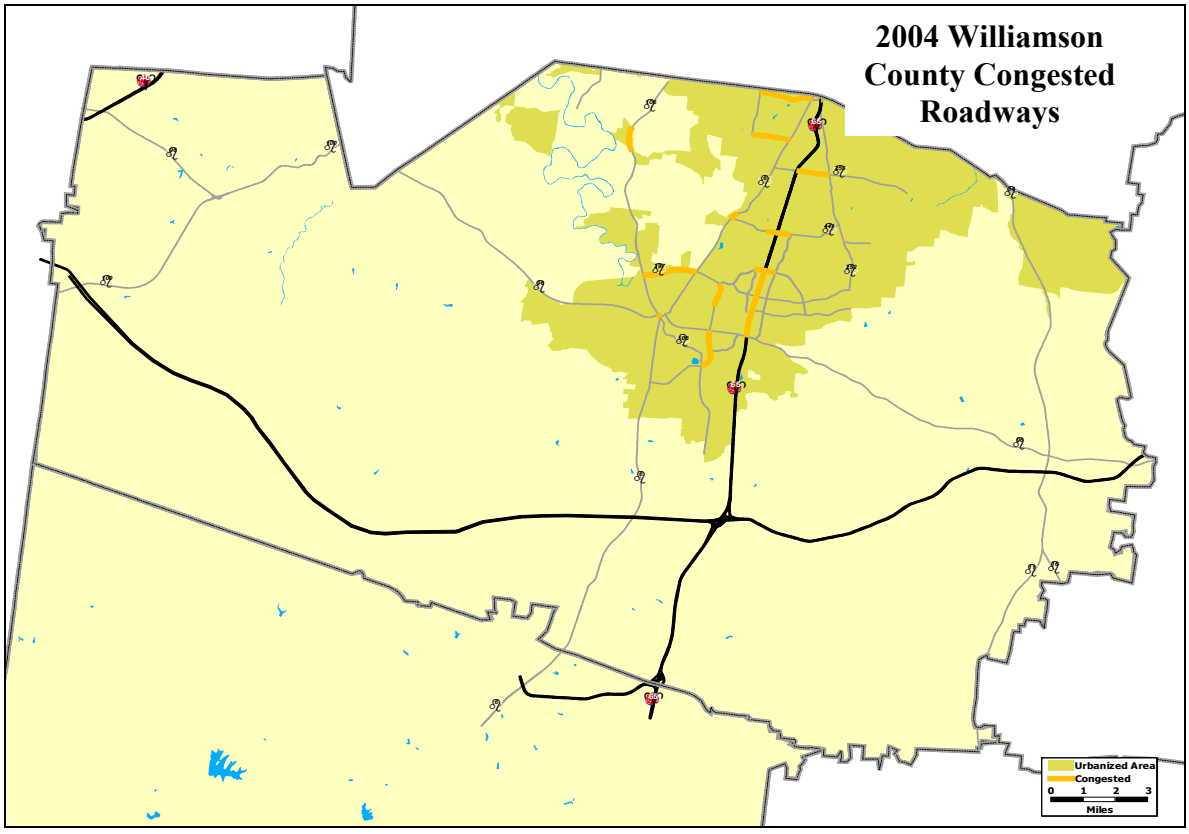
The congestion threshold for urban and suburban roadways was set at a value less than or equal to 70% of the free-flow speed. This value is generally comparable to Level of Service "D" for arterials, as presented in the *Highway Capacity Manual*. Following are maps of the off-peak travel times to the Nashville CBD and congested roadways based on the 2004 peak travel times compared to the 2004 off-peak travel times. These maps are of particular importance when determining how immediate a particular roadway may need to be considered for improvements in the LRTP project list.

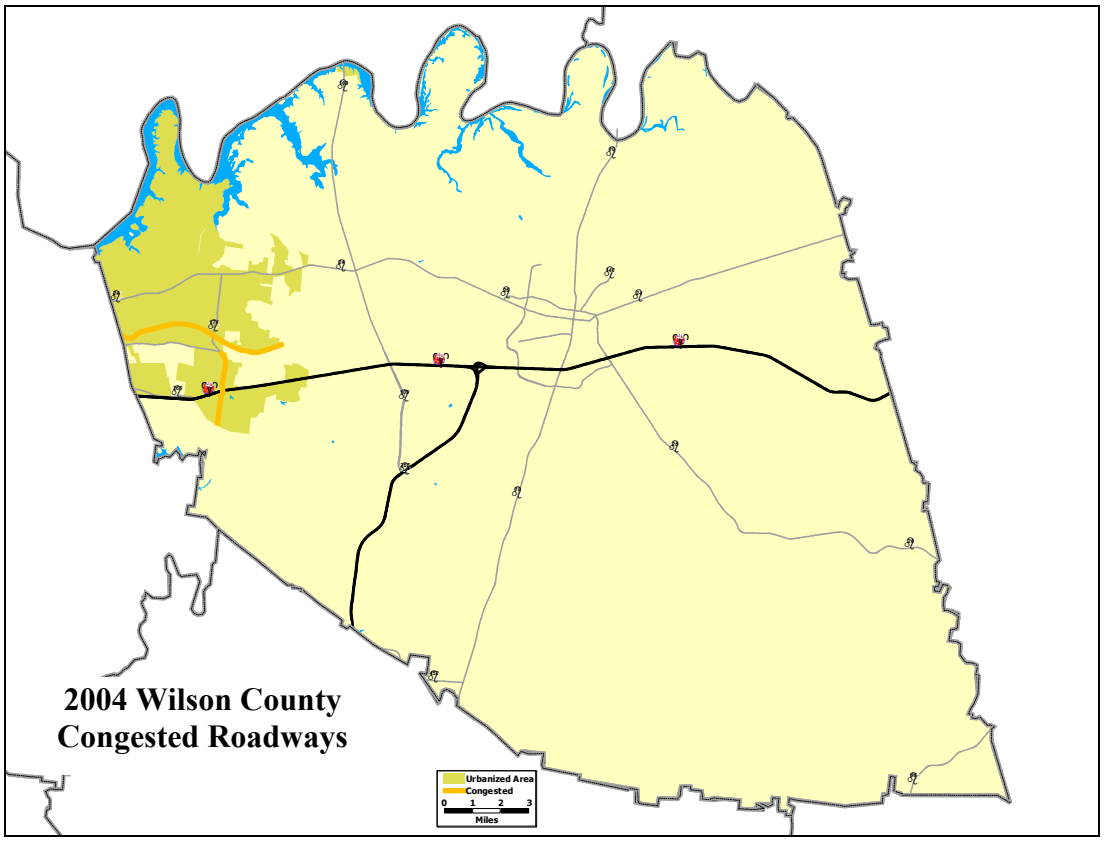

2004 Travel Time from/to the Nashville CBD (off-
65
55
30
10
5
15
20
25
60
35
40
45
50
Freeways
0
4
8
12
Miles


2004 Davidson
County Congested
Roadways
Urbanized Area
Congested
State Route/Arterial
0 1 2 3
Miles


2004 Rutherford
County Congested
Roadways
Urbanized Area
Congested
State Route/Arterial
0 1 2 3
Miles


2004 Sumner County Congested Roadways
Urbanized Area
Congested
State Route/Arterial
0 1 2 3
Miles


2004 Williamson County Congested Roadways
Urbanized Area
Congested
0 1 2 3
Miles


2004 Wilson County
Congested Roadways
Urbanized Area
Congested
0 1 2 3
Miles

Transit Delay

Transit delay is a measure of the average time for which transit users must wait for their rides and are delayed getting to their destinations. This performance measure indicates the efficiency with which transit vehicles are transporting people to their destinations. High delays indicate low efficiency, and passengers may become frustrated with their delays.

The Metropolitan Transit Authority (MTA) currently collects limited data on travel time for bus routes. These data can be used to calculate the transit delay performance measure.

This measure has the following limitation: as defined here, transit delay is affected by the congestion of the street system. Therefore, it should be realized that transit delay is more likely to identify congested routes rather than operational issues with the transit system itself.

The threshold for transit delay – a value of less than or equal to 70% of free-flow speed – was established by reviewing previous data collected for various MTA routes and comparing the results with free-flow speeds of the routes.

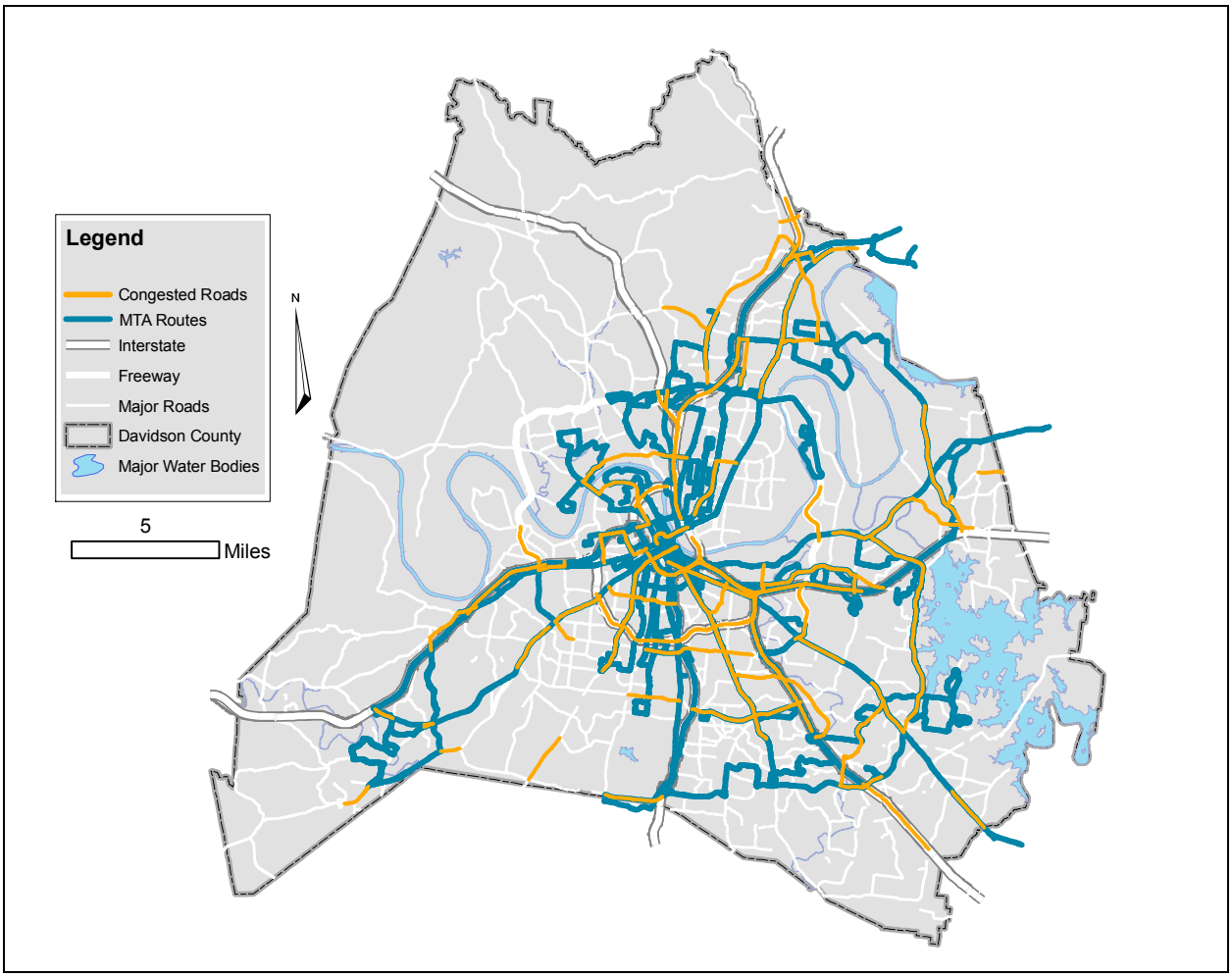
This threshold was re-confirmed with MTA staff as appropriate to maintain for the 2004 CMS update. It was noted that delay should also be analyzed in light of ridership on a given route. If there are significantly more riders on a route, some delay may be created by the need to make more stops, or waiting for a greater number of passengers to board the vehicle.

It was also noted that MTA periodically changes route times if bus drivers have difficulty meeting their schedule due to congestion. MTA will help identify these times that the "congestion alarm" should be triggered, by notifying the MPO whenever it makes such changes to its bus schedules.

It was also noted that MTA periodically changes route timings if bus drivers have difficulty meeting their schedule due to congestion. The result is that congestion is effectively built-in to their schedules. This increases the reliability of the service MTA provides by allowing MTA to arrive at stop locations on time, however, it requires that MTA also look at all routes on their system to coordinate arrivals at the central hub. While changing the timing does help to increase reliability of the service, it also has the effect of increasing the overall trip time making the bus less competitive with the automobile. MTA will help identify routes where the "congestion alarm" should be triggered by notifying the MPO whenever it makes such changes to its bus schedules. This will serve as an indicator that the identified corridor should be reviewed through the CMS process to determine possible actions for addressing the congestion.

The following table identifies MTA Routes that have some portion of the route on a congested roadway. Of MTA's 35 routes, 29 of them (82%) travel over a section of congested roadway (see Map on page 47). MTA has identified route 15 (Murfreesboro Rd), 26 (Gallatin Rd), and 7 (Hillsboro Rd) as having the most occurrences of time delay due to congestion.

Route Number	Route Name
2	Belmont
3	West End
6	Donelson
7	Hillsboro
8	8th Avenue
9	Metro Center
10	Charlotte
12	Nolensville
15	Murfreesboro
16	Madison / Old Hickory
17	12th Avenue South
18	Elm Hill Pike / Airport
22	Bordeaux
23	Dickerson Road
24x	Bellevue Express
25	Midtown
26	Gallatin
28	Meridian
29	Jefferson
30	McFerrin
31x	Harpeth Valley Express
32x	Edge O Lake Express
33x	Hickory Hollow Mall / Old Hickory Express
34x	Music Valley / Opry Mills Express
35x	Rivergate Express
37x	Tusculum McMurray
38x	Una Antioch Express
41	Golden Valley
96	Nashville / Murfreesboro Relax & Ride



The Franklin Transit Authority, which started service in 2003, will collect similar information on route delay. However, it should be noted that Franklin's transit service does not operate any exclusive fixed routes; each vehicle may deviate to provide flexible service within a certain distance from the regular route. Thus it may be difficult to isolate the effects of congestion from other causes of delay.

Vehicle Miles Traveled (VMT) per Licensed Driver

The use of VMT has a multi-modal component, since increases in ridesharing, transit use, pedestrian travel and bicycle travel will result in a reduction in VMT. While not a direct measure of alternative modes, VMT can be an indirect measure of how successful a region's travel demand policies are. Its primary limitation is that it does not provide much information about the actual cause of a VMT increase or decrease.

ADT volumes, which are available from the TDOT annual counts, can be used along with driver licensing information to create a baseline value of VMT per licensed driver. Each year, the

updated ADT counts and license information are used to calculate a new value of VMT per licensed driver. Comparing each year's value to the baseline (and to previous years) shows whether the regional rate of travel demand is increasing or decreasing.

The first year's value of VMT per licensed driver was used as the threshold. Succeeding years are compared to that threshold, and to the previous year's values.

Vehicle Occupancy

This is a measure of the average number of persons in each vehicle. Higher occupancy rates indicate a more efficient use of roadway facilities. Increasing demand for roadway travel can be compensated by increasing vehicle occupancy. Therefore, travel demand and supply strategies which increase the vehicle occupancy rate may replace or delay the need to expand existing roadway infrastructure.

Each year's vehicle occupancy rates are compared to the prior year's threshold, and to the overall trend of previous years' values.

It has been determined that the region's vehicle occupancy rate has remained virtually unchanged for several years including the years since the last LRTP update.

Citizen Complaints

The number and intensity of complaints by facility users and those residing near heavily-traveled routes can provide some indication of how efficiently those routes are operating. Many concerned citizens have valid complaints and can offer feasible solutions to the problems with capacity provisions and the existing infrastructure. Since this measure applies only in rural portions of the MPO (outside the urbanized area), it also helps identify possible problems at locations that would not otherwise receive attention through the current data collection program.

The threshold is established as a total of three citizen complaints received within a year regarding traffic congestion at a specific location on a rural roadway. To date, this has not occurred.

Projected Average Route Speed (Future)

The final performance measure – Projected Average Route Speed (Future) will be determined from the travel demand model outputs. As with existing conditions, congestion is measured as the condition when peak-hour speeds are at 70% or less of the free-flow speed. Following is a brief summary of the model development process used to produce future speeds:

The travel demand model consists of a network of *links* (representing regionally-significant roads) and *nodes* (representing the Traffic Analysis Zones (TAZs) - there are over 1400 TAZs in the Plan area). Each TAZ is coded with the employment and demographic data (discussed in the Population & Employment Projections section) for the required years of the Plan, (2002, 2006, 2016, 2025 and 2030). 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 (i.e. road widenings or new roadways) 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.

For purposes of this analysis and as part of the LRTP, the existing plus committed transportation system is what currently exists on the ground today plus all projects contained within the *MPO's Fiscal Years 2004 through 2006 Transportation Improvement Program (TIP)*, adopted July 16, 2003. A complete list of all E+C projects is included in Appendix C.

Once the model is validated, the existing plus committed network (E+C) is run. Lastly, the future target year (example 2030) is run - once for the no-build scenario, and once for the build scenario (following the recommendations of this plan).

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.

Currently, the Nashville Area MPO is underway with development of a mode-choice model capable of assigning a percentage of trips to transit alternatives. As an interim step toward this goal, 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 complementary document, "*Transportation Conformity for the 2030 Long Range Transportation Plan Update*".

Trip Assignment

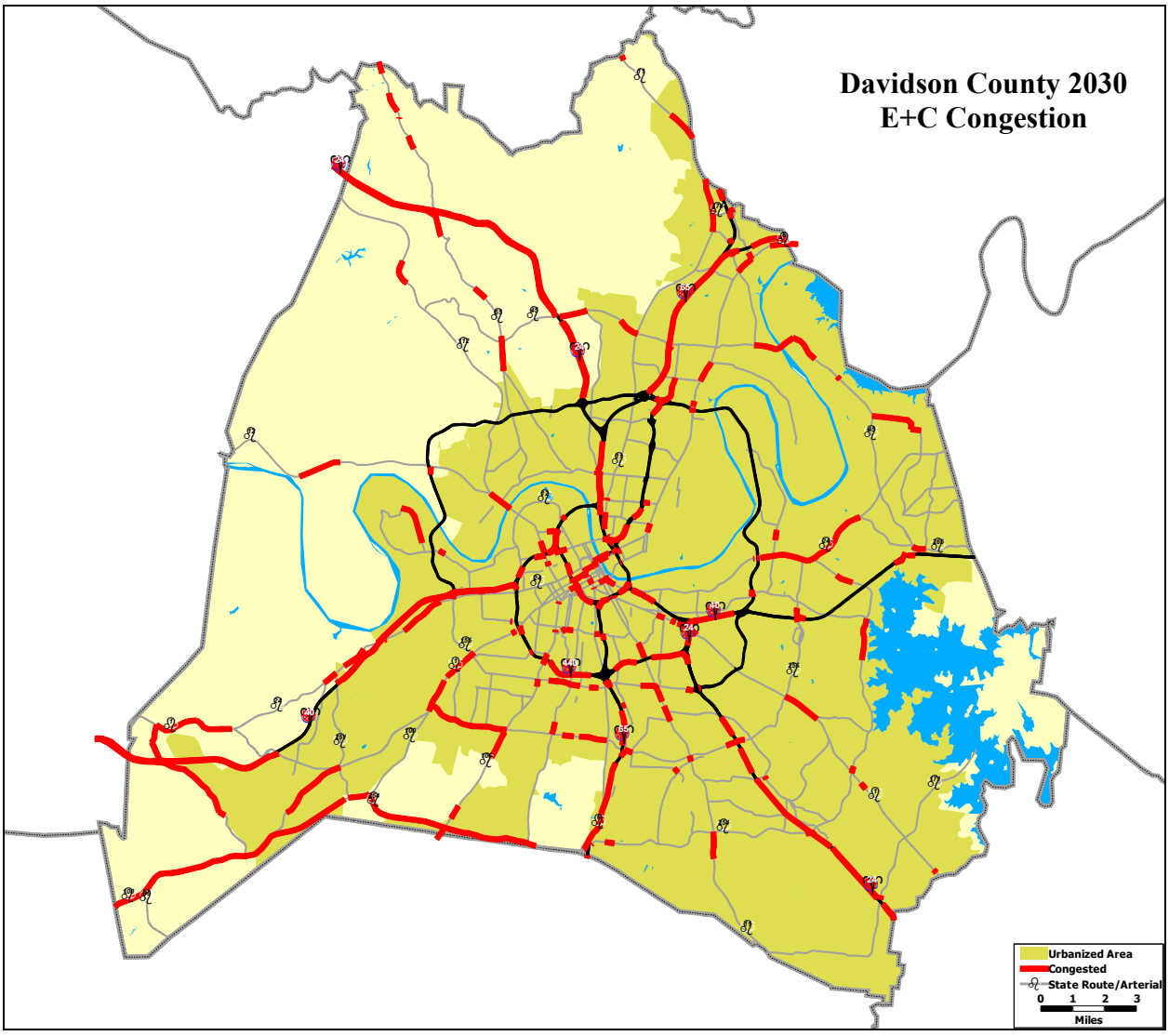
Finally, the model *assigns* trips to the links in the network. The final output of the model shows the estimated volumes and average speed for each link in the network.

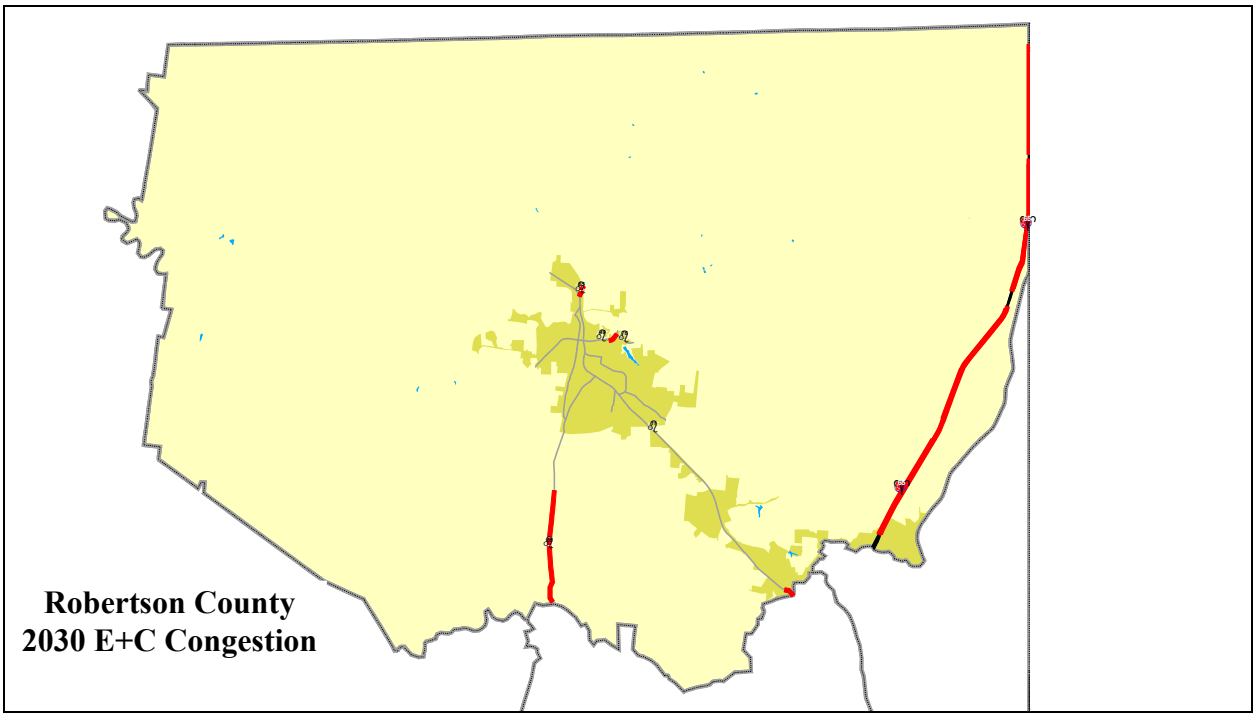
Before the model can be used as a planning tool, the base year (2002) network is adjusted, or *calibrated* until the modeled results are within the established allowable error, (i.e. *validated*), when compared to actual base year traffic data.

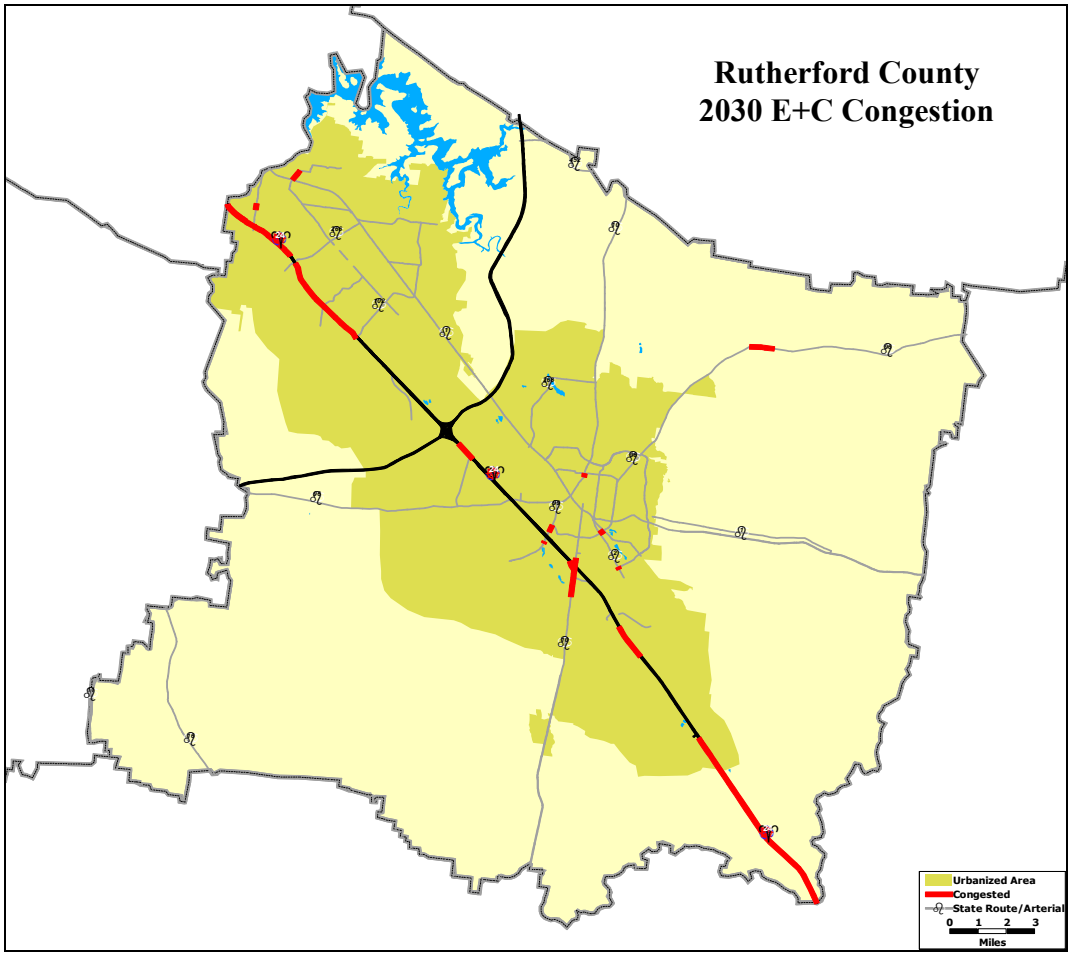
Projected average route speed on major arterials and interstates indicate how well a segment or route is expected to accommodate future travel demand. Even though some segments and routes may be operating efficiently at current levels, they may not be able to handle anticipated future traffic volumes. 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.

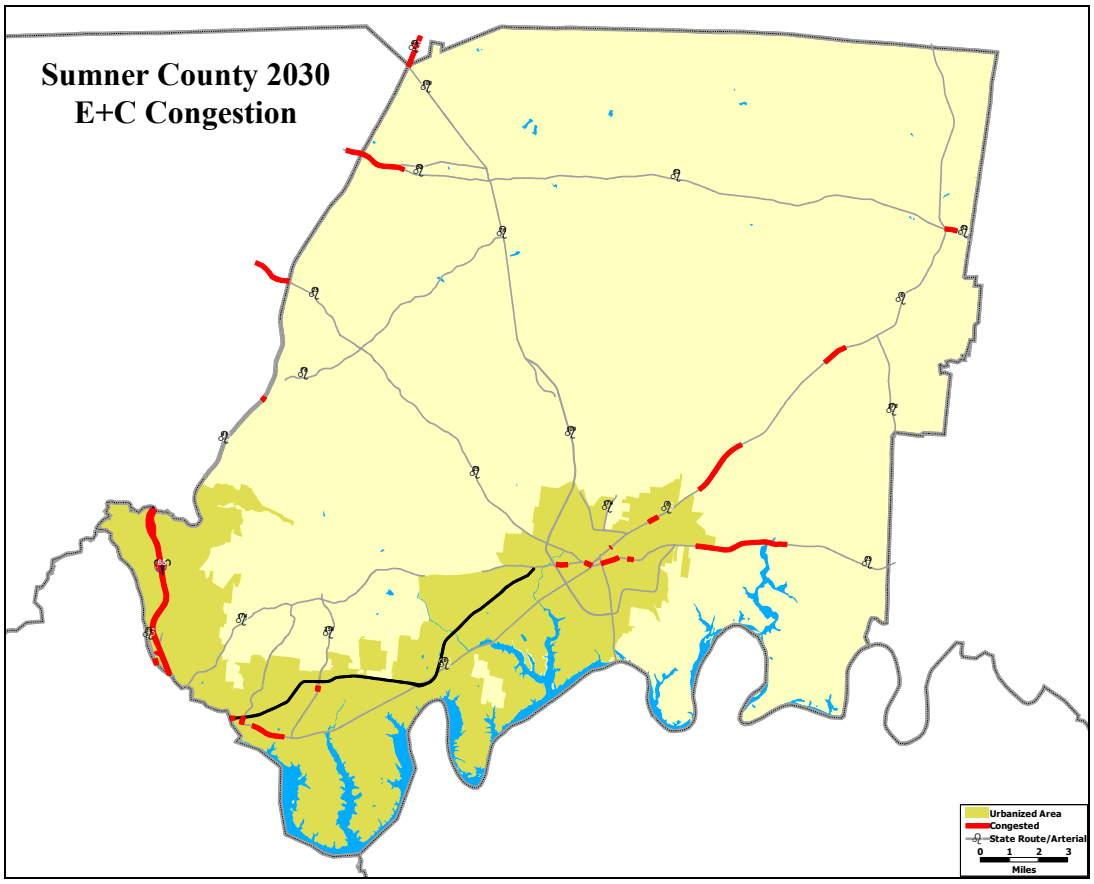
Following are maps of the 2030 congested roadways taken from the travel demand model These data and maps are of particular importance to the LRTP project selection process because they provide the MPO with a picture of the anticipated future congestion levels on the transportation network and trigger the MPO to try and address these particular problem areas with one or a combination of the various tools that can be used for congestion mitigation (see Tier II Analysis section below). When these maps are combined with the previously discussed 2004 congestion maps, the MPO has what is potentially its most important tool for analyzing

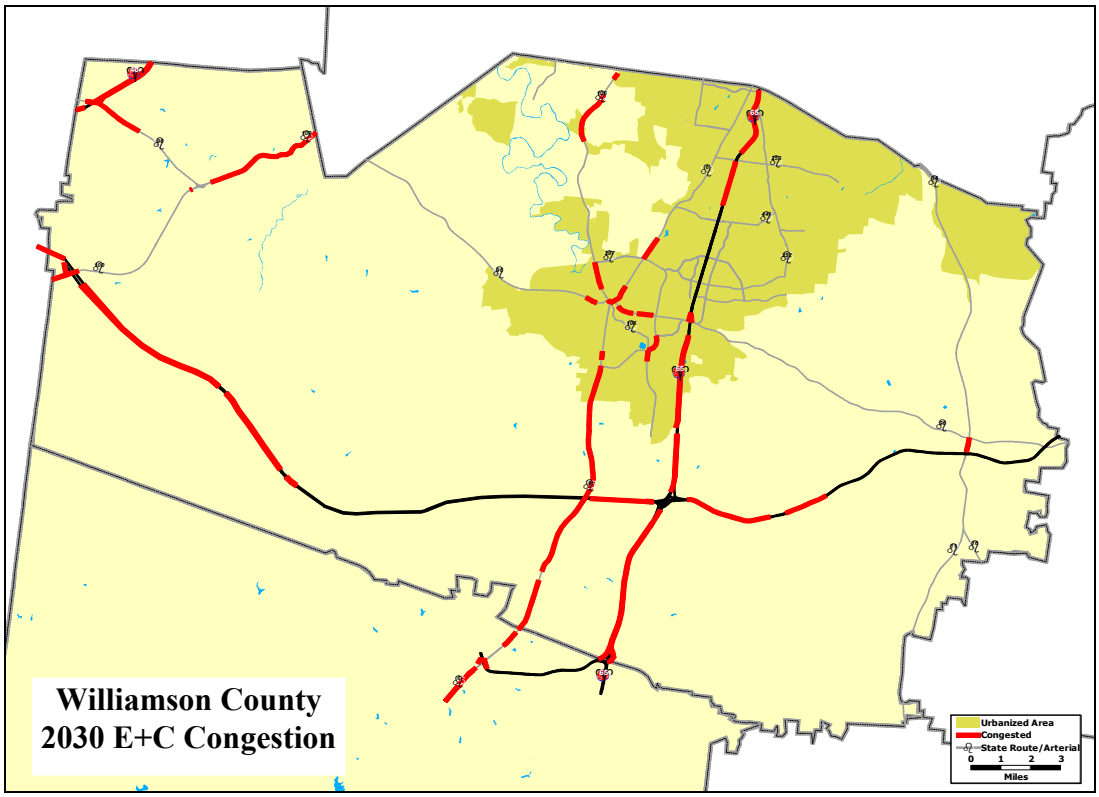
congestion levels and developing projects to address the identified congestion. These projects are identified in the LRTP project list.

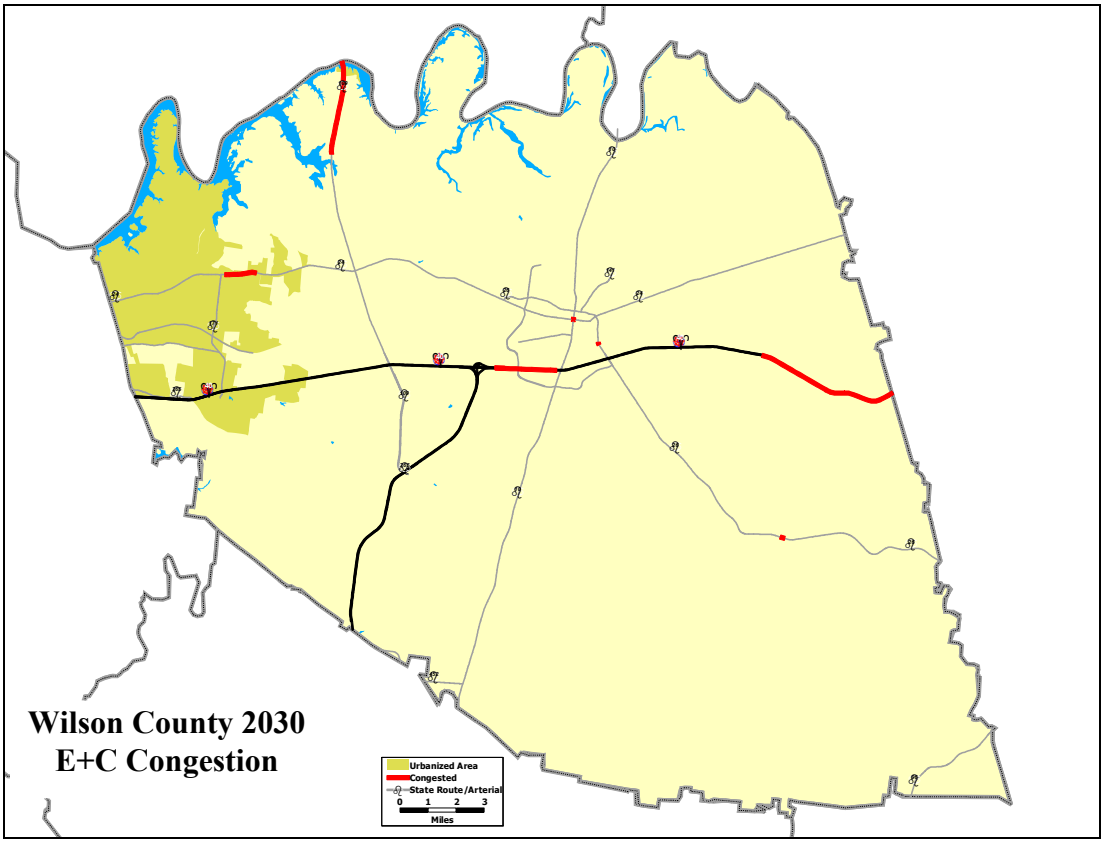


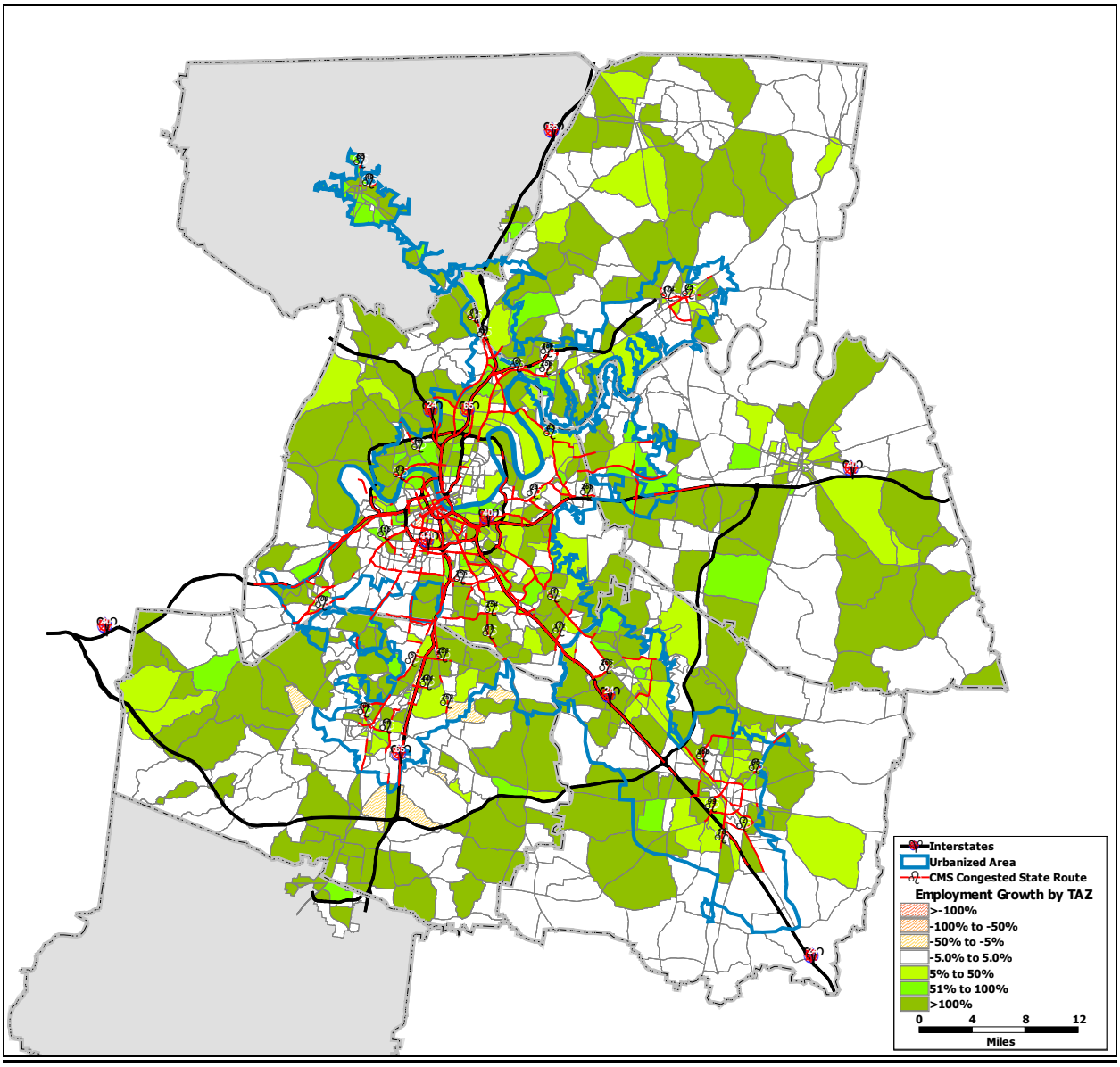

Robertson County
2030 E+C Congestion


Rutherford County
2030 E+C Congestion
Urbanized Area
Congested
State Route/Arterial
0 1 2 3
Miles

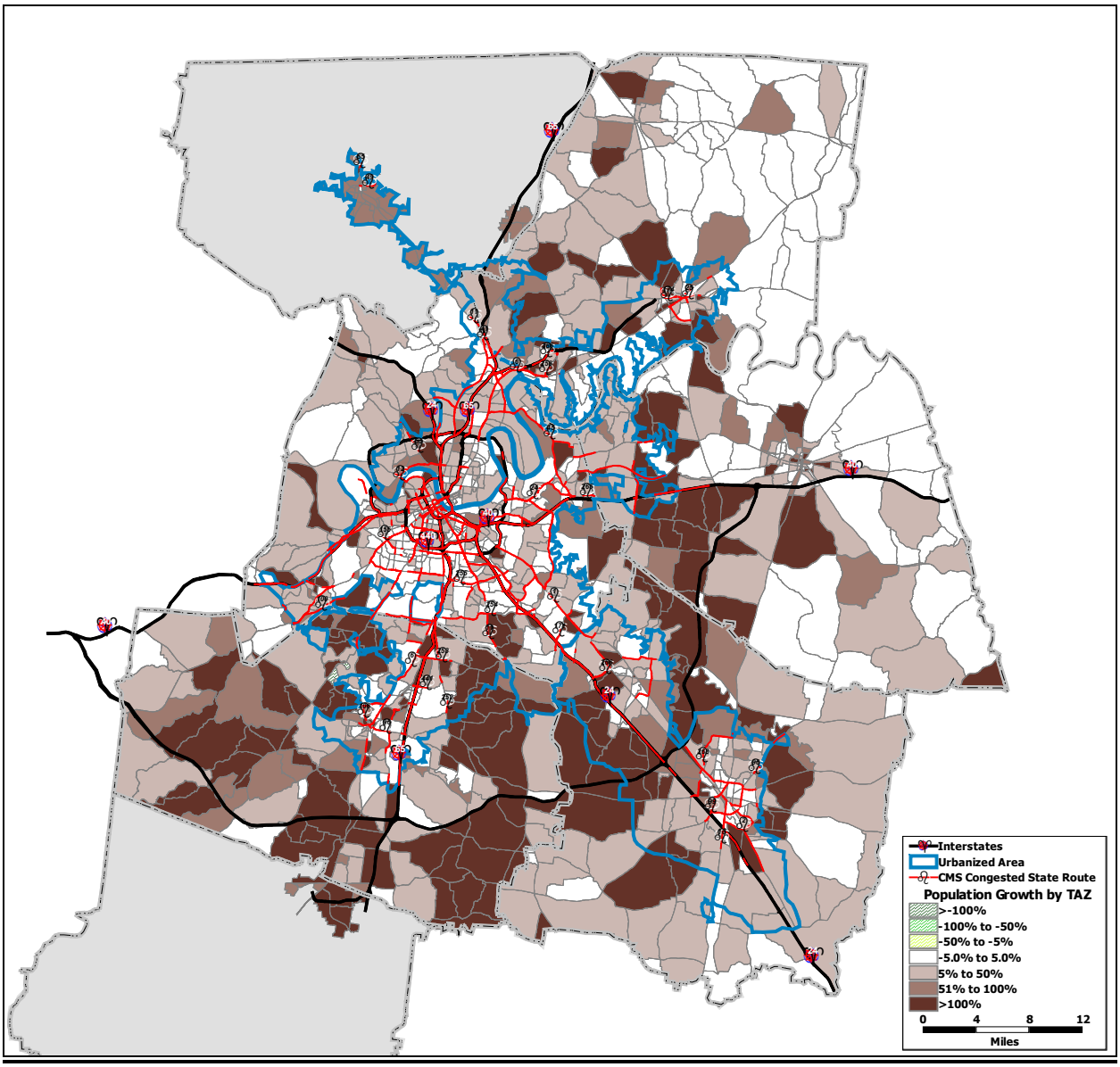

Sumner County 2030
E+C Congestion
Urbanized Area
Congested
State Route/Arterial
0 1 2 3
Miles


Williamson County
2030 E+C Congestion
Urbanized Area
Congested
State Route/Arterial
0 1 2 3
Miles


Wilson County 2030
E+C Congestion
Urbanized Area
Congested
State Route/Arterial
0 1 2 3
Miles



Employment Growth by TAZ from 2002 – 2030 and 2004 (travel time) and 2030 Congested Roadways



Population Growth by TAZ from 2002 – 2030 and 2004 (travel time) and 2030 Congested Roadways

Tier 2 Analysis

Each time an established threshold for a specific performance measure is exceeded and a "congestion alarm" is triggered at the Tier 1 screening level, additional analysis of the location was undertaken.

The additional analysis was conducted by the responsible agency (local jurisdictions) with technical assistance from the MPO staff. The analysis consisted of the following:

- Validate that a congestion problem is actually occurring;
- Define the magnitude and cause of the congestion; and
- Identify the appropriate strategies to manage the congestion and establish a schedule for implementing those strategies.

Once the congestion problem was validated and the magnitude and cause of the congestion was determined by utilizing the Tier 1 performance measures, the MPO along with the responsible agency met to discuss the most appropriate strategies for managing the congestion and determined the time frame for implementing those strategies. The discussion centered on the various methods that could potentially be used to successfully mitigate the congestion. These methods come from the "Toolbox of Congestion Management Strategies" that are included in the CMS plan. The primary tools in the toolbox include the following:

- Transportation Demand Management Strategies (carpool/vanpool, park n' ride facilities, congestion pricing, etc.)
- Traffic Operational Improvements (turn lanes, intersection widenings, traffic signal improvements, traffic and incident management systems, etc.)
- High Occupancy Vehicle (HOV) Use
- Transit Capital Improvements (rail lines, bus rapid transit, intermodal transit center, etc.)
- Transit Operational Improvements (service expansion, reduced fares, traffic signal pre-emption, etc.)
- Non-auto Modes (bicycle and pedestrian facilities)
- Land Use Planning (zoning and subdivision controls, major thoroughfare plans, transit friendly design for development policies, etc.)
- Access Management (access control, access consolidation, etc.)

Based on the discussion and analyses conducted by the MPO and the responsible agency, a recommendation was made as to which tools should be used to manage the identified congestion problems. This resulted in many of the projects that are in the LRTP project list.

The adopted Congestion Management System Plan requires that all projects that propose to increase general purpose capacity must have been identified through a Tier II analysis. The Tier II analysis is intended to assure that all potential alternatives to widenings and new construction have been reviewed and that the alternatives can not reasonably solve the projected congestion.

The Long Range Transportation Plan Project List is composed of four timelines that include Present to 2006, 2007 to 2016, 2017 to 2025, and 2026 to 2030. These timelines are referred to as Horizon years. This means that projects within a particular Horizon year will be opened for operation within that range of years. As an example, projects within the 2016 Horizon year will be open for travel sometime between 2007 and 2016.

Some projects in the 2030 Long Range Transportation Plan have not been through a full Tier II analysis and are shown in the LRTP project list with a (X) in the "Tier 2" column, identifying the project as a 'Place Holder' project'. The term 'Place Holder' means that the project shown may not necessarily be the final project once the full Tier II analysis is complete. For example, upon further study of a congested road, it is determined that instead of widening the road, (as indicated in the project list), the congestion could be managed with a series of intersection improvements or with improved signalization; or that a transit improvement could reduce the congestion by decreasing the number of vehicles during the peak hour. In cases where the congestion only shows up in the 2025 or 2030 Horizon, it may be appropriate to examine the land use pattern leading up to that year and identify changes that could prevent the projected congestion. Either way, if a new alternative is chosen, the "Place Holder' project will be replaced with the appropriate solution and the Long Range Transportation Plan will be amended to include the revised project.

Tier II and the TIP

Normally, projects in the near Horizon (2016) are eligible to be moved directly into a TIP when funding is available. However, 'Place Holder projects in the 2016 Horizon Year will not be allowed to be moved into the TIP until the Tier II analysis has been completed and approved by the MPO. The Tier II analysis may be performed by either the agency sponsoring the project or MPO staff.

The following will describe the process for identifying exceptions to the CMS Tier II Analysis requirement:

- Project was in an adopted Long Range Transportation Plan (LRTP);
- Project was then included in an adopted Transportation Improvement Program (TIP);
- Any phase of PS&E has been initiated prior to the adoption of the CMS of 2004 based on the above.

Some examples of 2016 Horizon year 'Place Holder' projects that will need Tier II analysis prior to inclusion in a TIP are:

Harding Place Extension – Ezell to I-40 (Nashville)
SR 171 - Division Street to SR 24 (Mt. Juliet)
Thompson Lane - Broad Street to Memorial (Murfreesboro)
Sam Ridley Parkway - Nolensville Road to I-24 (Smyrna)

In order to make the cities, counties and state agencies aware of this requirement, MPO staff will send notices to every sponsoring agency. The notice will list those projects that have been designated as Place Holders in the 2016 Horizon Year informing them of the requirements necessary to perform a Tier II analysis. For projects designated as Place Holders for the 2025 and 2030 Horizon, a Tier II analysis will be required to move it into the 2016 Horizon, provided it meets Air Quality Conformity and Fiscal Constraint requirements.

Mobility Options

The primary reason to perform forecasts of future traffic is to be able to identify where in the transportation system congestion will occur or worsen - for this plan, the ultimate target year is 2030. When evaluating forecast model results, the most important factor is not looking at individual segments that are anticipated to be congested, but at how the system will work in entire corridors.

Although many considerations are involved when determining areas to target for future investments, the corridors that are anticipated to be congested should be the ones where investment priority is given. The generic goal in transportation is to improve *mobility*. Before determining exactly what type of investments are needed, we thus have to look at what range of *options* are available to improve mobility in the deficient corridors.

The traditional response has been to add capacity - either by building new roads or widening existing roads. However, there are other ways to improve mobility, such as reducing the number of vehicles that use the roadways in the corridor by providing improved service for other modes of transportation, such as walking, bicycling or transit. Major ways to improve the efficiency of the transportation network in a corridor that is projected to have capacity problems in the future include:

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.

Transportation System Management (TSM)

TSM measures increase capacity for motorized vehicles in a corridor by means other than adding lanes. Examples include traffic signal improvements, reversible lanes, limiting or consolidating driveways and intersections, and incident response programs to clear incidents more quickly from the roadway.

TSM measures typically provide less added capacity than new lanes or road construction, but can be substantially more cost-effective. Further, TSM measures can add capacity more quickly and without the disruptions that re-construction often brings. The Woodland Bridge and Hermitage Avenue both have a "reversible" center lane. The direction of that lane changes during the day to allow more drivers to flow in the peak-hour direction. Most components of the Nashville Regional ITS (Intelligent Transportation Systems) Architecture are of TSM character, for example real-time traffic and incident monitoring, and variable message signs that re-distribute traffic and help manage parking.

Transportation Demand Management (TDM)

While still focusing on roadway throughput, TDM measures reduce the number of vehicles that use the roadway in the first place. The most common way to do this 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.

High-Occupancy Vehicle (HOV) lanes help encourage carpooling by offering faster travel during peak-hour congestion conditions. Other TDM programs that can reduce travel demand include encouraging employers to reduce and/or charge for parking; telecommuting; and flextime. TDM measures can also be more direct and enforcing, such as restricting or banning private auto use during particular days, hours, and areas, or "congestion pricing" programs that charge tolls during peak-hours that are high enough to encourage drivers to carpool, travel at a less congested time, or choose another route.

Provision of Transit

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. The Regional Transportation Authority (RTA), formed in 1988, has been charged with planning and implementing regional transit service, possibly including a high-capacity transit network in the 5 major interstate corridors (see map on page 13) within the Nashville Area MPO region. RTA currently coordinates over 100 vanpools and offers a ride-matching service for carpools, as well as operates several commuter bus services to outlying areas. In addition, RTA is expecting to open commuter rail service to Lebanon in 2006
To facilitate transit planning in the MPO area, RTA and the Nashville Area MPO have been coordinating our planning efforts to both identify the specific transportation problems within each of the five major travel corridors, and to determine the potential for transit solutions. To accomplish a more in-depth review of the problems within each corridor, it is expected that over the implementation of the 2030 Long Range Transportation Plan that an Alternatives Analysis will be conducted for each corridor. Alternatives Analyses are comprehensive and thorough corridor studies that identify the transportation problems, examine possible transit solutions, and determine the most cost-effective way to address the transportation problems with transit. These corridors have been identified in the Illustrative Project List (see appendix B). Currently, the MPO is conducting an Alternative Analysis study for the Nashville to Murfreesboro corridor.

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 2030 Long Range Transportation Plan, it is important that we develop a balanced system that provides choices. 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% 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.

Urban Design and Land Use

Studies have repeatedly shown that the most important factor 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 more 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, its aesthetics, and whether developments are well connected to each other. Thus, the best way to maximize transit's access radius - without adding new route miles - is to increase neighborhood connectivity for pedestrians and provide other amenities (such as shade) that make walking a safe and desirable option.

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.

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 come from automobiles and trucks.

During the Long Range Transportation Plan's life, there are timeframes (also called horizon years) established to create transportation network "checkpoints". These horizon years help stage transportation projects and also help keep the Plan fiscally constrained by distributing costs over a period of time. In air quality analysis, horizon years are used to set benchmarks during the Plan's years where pollutant emissions must fall below a stated budget set forth in the State's State Implementation Plan (described below). For the Nashville Area these horizon years have been set as the following:

Horizon Year	
2006	▪ No more than 10 years from the base year, (2002) ▪ Last year of 1-hour AQ maintenance plan
2016	▪ No more than 10 years from previous horizon year ▪ Last year of 1-hour AQ maintenance plan update
2025	▪ No more than 10 years from previous horizon year
2030	▪ Last year of Plan

One of the functions of this LRTP is to estimate the amount of NOx and VOCs that would result from predicted traffic levels on the transportation network for each of the LRTP horizon years. This is accomplished by the use of EPA's mobile emissions model, MOBILE. The purpose of MOBILE is to produce emission factors based on local inputs. Local inputs include, average speed, minimum and maximum temperature, facility type and the region's vehicle characteristics. Once the emission factors are created, they are multiplied by the travel demand model's vehicle-miles, (VMT), and converted to tons per day of each pollutant.

Each state has a document called the State Implementation Plan (SIP) that contains all relevant air quality information for the entire State. This includes emission budgets for Stationary Sources (power plants, etc.), Area Sources (Airports, combinations of polluters), and Mobile Sources (Road, and Non-Road vehicles). The Mobile Sources emission budget is the measuring-stick against which transportation "conformity" is determined. If the total estimated mobile sources emissions are lower than the budget prescribed for the entire forecast period of the LRTP, then an area is in conformance with the SIP.

Air quality conformity determination is performed on the LRTP and TIP. However, since all projects in the TIP are derived from the LRTP, conformity determination for the TIP is confirmed by the LRTP conformity determination.

The technical analysis and findings of the air quality determination can be found in the Transportation Conformity Analysis for the 2030 Long Range Transportation Plan Update, available as a separate document.

Fiscal Outlook

Federal legislation requires that the LRTP include a financial plan that demonstrates how the plan can be implemented. The financial plan lists resources from public and private sources that are reasonably expected to be available to carry out the plan. It may also recommend any innovative financing techniques to finance needed projects and programs, including such techniques as value capture, tolls and congestion pricing.

This section contains estimates of the anticipated revenues for implementation of the LRTP through the year 2030 for each of the LRTP horizon years (horizon years are 2016, 2025, and 2030 and are described in detail in the above Air Quality section). Revenues are then compared to the costs identified in the LRTP for specific project categories. Estimates have also been developed for other cost categories for which specific projects have not been identified in the LRTP such as operations and maintenance, transportation enhancements, and transportation management activities. The analysis is based upon information supplied by the Tennessee Department of Transportation, local governments, the Metro Transit Authority, Franklin Transit Authority, and the Regional Transportation Authority.

While this analysis uses specific cost and revenue information provided by member governments, it provides only a planning level analysis. More detail will be provided in the shorter-range Transportation Improvement Program (TIP) that is developed every two years. The analysis is subject to the following limitations:

⇒ The financial projections are for a period of more than 20 years, during which time significant changes in travel behavior, local economies, and federal funding priorities are possible.

⇒ Projections of federal funding involve uncertainty due to shifts in federal transportation policy, budget and deficit reduction plans, and because many funds are administered on a statewide basis.

⇒ Cost estimates are general and are based upon a simplified methodology which may not be completely accurate. Costs may change upon submission of specific design plans and the start of actual construction.

Transportation funding currently comes from a continuing resolution based on the expired TEA-21 legislation.

Federal Funding Programs

National Highway System

- The NHS comprises major routes of national significance, including the interstates, the expressways, and those surface arterial roads which are a critical link in the regional transportation system.
- Funds from this program may be used for all types of transportation improvements including construction, reconstruction, operational improvements, and planning.
- The match on this program is 80% Federal and 20% State of Tennessee.

Interstate Maintenance (a subset of NHS)

- Funds from the program can be used for:
  - Restoration, resurfacing, and rehabilitation of existing interstate facilities
  - Reconstruction of bridges, interchanges and crossing structure
  - Preventive maintenance
  - Additional rights-of-way necessary to complete improvements
  - Construction of new High Occupancy Vehicle (HOV) lanes, but not for the construction of new lanes for use by all vehicles
- The match on the Interstate Maintenance Program is 90% Federal and 10% State of Tennessee.

Surface Transportation Program

- STP funds may be used for the same broad range of improvements as NHS funds.
- The significant difference in the two programs is that STP funds may be used to improve the design or operation of any road which is not a local street or a rural minor collector.
- Ten percent of STP funds must be used for the Transportation Enhancement program as provided under TEA-21. Enhancement projects must relate to the transportation system, such as aesthetic and environmental activities like pedestrian or bicycle trails and beautification projects.
- Ten percent of these funds must be set aside for safety projects.
- Transit capital projects are also eligible under this funding category.
- The match on the program is 80% Federal and 20% State of Tennessee/local.

Congestion Mitigation & Air Quality

- CMAQ funds may be used for projects that will contribute to the attainment of air quality standards by reducing miles traveled by residents or fuel consumption, or through other factors.
- The construction of a new highway lane is not eligible for CMAQ funding unless the new lane will be restricted for HOV use during peak hours.
- As part of the continuing effort to meet national air quality standards for ozone in the Nashville area, many of the TSM/TDM projects are programmed using CMAQ funds.
- The match for CMAQ projects is typically 80% Federal and 20% State of Tennessee or local. For park-and-ride and vanpooling projects, 100% Federal funding can be available.

Bridge Replacement & Rehabilitation Program

- This program funds replacement, repair, or enhancement of any public road bridge.
- Thousands of highway bridges in America are undersized for the traffic volumes and loads they are needed to serve and pose a safety hazard until they are improved.
- In the Nashville area, the largest use of this funding is the Shelby Street Bridge replacement and the Demonbreun Viaduct replacement.
- The match on this program is 80% Federal and 20% State of Tennessee.

Demonstration Projects

- These projects are designated by Congress to address one of the following concerns:
  - High cost bridge;
  - Congestion relief;
  - High priority National Highway System corridors;
  - Rural or urban access;
  - Innovative projects.
- Funding for the program is discretionary.

Transit Formula Programs

- Transit formula grant programs including Section 5303, 5307, 5309, and 5310 are included in this classification.
- FTA funds apportioned under these programs can be used for capital costs (Section 5309, 5303, and 5307) and for providing transportation services that meet the special needs of elderly and disabled persons (Section 5310).
- The match on Section 5309 and Section 5303 capital projects is 80% Federal, 10% state, and 10% local.
- The match on the 5310 program is 80% Federal and 20% local. The local share is to be provided by a private non-profit entity.

State Revenue Sources

State revenues are a very important component of the total revenue mix to fund highway and road projects and maintenance.

Gasoline Tax, Motor Fuel Tax

The gasoline tax is the largest state source for funding highway and road projects. The gasoline tax is 21.4 cents per gallon. The motor fuel tax is 18.4 cents per gallon, collected only on diesel fuel, and is also collected statewide. Local governments receive approximately 37% of the revenue generated from these taxes. In fiscal year 2004, statewide revenues from the gasoline tax were $660.8 million, with cities and counties receiving approximately $243.5 million.

Local Sources of Revenue

A large percentage of the projects and programs recommended by the study will be funded through federal and state revenues. Additionally, the use of local sources of revenues will be required to assist in the plan's implementation, both in leveraging state and federal dollars and as single source funding.

Current Local Funding Sources

Surveys of local governments in the Nashville Area MPO indicate recent use of at least twenty different funding sources, including both tax-based revenues and fee-based revenues.

Revenue sources include:	***Transportation expenditures include:***
Property tax	Resurfacing
Sales tax	Widening
Business tax	Maintenance
Wheel tax	Intersection improvements
Severance tax	Drainage
Impact fees	Chipper service
Bonds	Salting

The most frequently used sources of tax-based funding are the local sales tax and the property tax. These revenue generators are largely used for resurfacing and providing local match for federal transportation funds, and to a lesser degree for intersection improvements, road widening and routine maintenance. A substantial amount of revenue is also generated from the gas tax and "wheel tax" registration fees, although in some counties the latter source has been earmarked for public schools funding. About one-third of the communities indicated collecting development or impact fees from developers to fund transportation projects. Municipal bonds can be a substantial source of revenue, although surveys suggest they are not used by a large number of communities.

Revenue & Expenditures for Capital Projects

Revenue- Highway
As detailed above, there are many sources of funding that are considered when projecting revenue in the Long Range Transportation Plan. All of the funds described above (with the exception of discretionary Demo funds) have been included in the MPO's total revenue projections. In the first table below, entitled "Highway", the revenue column is a combination of all of the above identified funding sources, with the exception of transit formula funds. Revenue is identified for each source based on historic funding levels allocated to the Nashville Area MPO region.

The base estimate (FY2006) for State controlled revenues (IM, NHS, S-STP, BRR, etc.) was provided to the Nashville Area MPO by TDOT and was based on TDOT's review of historic funding levels and annual increases. Levels of funding have varied over the years. A recent example of expenditures in the Nashville region comes from a review of the previous allocations in the TIPs. More than $858 million was programmed in the FY2002-2004 and FY2004-2006 Transportation Improvement Programs, including one year in which funding from TDOT exceeded $198 million.

The Tennessee Department of Transportation estimated a base funding level for FY2006 of $85 million annually for the following sources: IM, NHS, S-STP, BRR, and State revenue sources. The base level is estimated to increase 2% annually over the life of the Plan.

CMAQ, Urbanized Area STP and Local STP revenue was projected using a base of the most recent official year of allocation given to the Nashville Area MPO through TDOT. As a new highway bill has not yet been passed, the base year of the allocation was FY2004. Historically, the CMAQ and STP funds given to the MPO has increased annually. This Plan assumes a continued annual increase of 2% for each funding source.

A small amount of revenue was also projected for Enhancement Grants. Although this funding source is competitive and not guaranteed annually, the MPO has consistently received considerable funds through this program and expects to continue to receive a small level of funding annually. The base year for this funding source was assumed using an average of the last 3 years of Grant awards. Funds from this source were not assumed to increase annually.

As all of the funding sources above are flexible and can be spent on a variety of projects, they were combined into one, and simply referred to as highway revenue. It is important to note that highway revenue is not specific only to highway-related projects. It can be used to fund many types of projects, for example: bikeways, sidewalks, ITS, greenways, transit, etc… For purposes of this Plan it is referred to as "highway" to indicate that the agency that controls these sources is the Federal Highway Administration, as opposed to the Federal Transit Administration.

Local government revenue for locally constructed capital projects (local projects) has been included in this Plan, but only to the extent that funds currently show as available in Capital Improvements budgets. Local capital budgets show a total of $92,397,013 to construct

transportation projects that are regionally significant. This amount is included in the table below as a separate line item because the funding is specific to a handful of projects. These projects are included in the local project list of this Long Range Plan.

The following table provides a summary of the estimated revenues available to fund roadway projects through the life of this plan and for each horizon year (horizon years and their impact on the financial outlook are described in detail in the Air Quality section).

Highway	
Horizon Year	Revenue
2016	1,683,090,000
2025	1,320,021,000
2030	821,338,000
Total	3,824,449,000
2016 (Local Projects)	92,397,013
Total including Local	3,916,846,013

Revenue - Transit

Revenue projections for Transit formula funds were estimated based historic levels of allocations. TDOT's Office of Public Transportation provided base year (FY2006) funding estimates for FTA-5307, 5309 and 5310 formula funds. FY2006 revenue was estimated based the most recent year's allocations. A relatively steady allocation of future funds is anticipated, based on historically continually increasing funding levels. FTA-5309 (bus) and FTA-5311 funds are anticipated to increase at a rate of 4% annually over the life of the Plan.

The availability of local and state funds to match federal funds is assumed to continue over the life of the Plan. Historic trends show matching amounts are consistently available. The appropriate % of State funds have been accounted for out of the total $85 million State revenue (as mentioned above) to use as the match to federal funds. A review of local budgets shows that local governments consistently set aside funds to match the federal dollars. Local budget matching dollars are estimated at a starting level of roughly $6 million for highway funded projects and $1.7 for transit funded projects and increase annually in accordance with increases in federal revenue estimates. Local matching dollars have been included in the total revenue for each horizon year as shown below.

The following table provides a summary of the estimated revenues available to fund transit projects through the life of this plan and for each horizon year.

Transit	
Horizon Year	Revenue
2016	193,312,000
2025	140,120,000
2030	85,575,000
Total	419,007,000

Expenditures – Highway and Transit

"Expenditures" in the Plan are a summary of the costs associated with the project list that can be found in Appendix B. The cost estimates in the Plan are based on the best available figures at the time the Plan was developed. Some of the projects, particularly those in the earliest horizon year have completed Advance Planning Reports (APRs). These APRs provide cost estimates for the projects. If an APR has been completed it is used as the basis for the cost estimate.

Many projects in the long range planning stages will not have competed detailed engineering reports. In cases where APRs are not available, project cost estimates are provided by TDOT or the local government's engineering department and are based on previous experience with similar projects. One method of estimating costs is a system developed by TDOT, and is referred to as Eve. Eve is a computerized system that allows the user to enter general details about the project, such as length, number of lanes, location (terrain), type of design, etc… This system was used to estimate the costs of some of the Plan projects.

A similar estimating technique is used for transit projects. Estimates are provided by the Transit agencies based on a documented study or cost estimate that has been completed, or based on previous experience with similar projects. Estimates for projects such as vehicle replacements may come from a contract that the agency currently has in place to purchase various types of buses or vans.

The table below shows project expenditures compared to projected revenues.

Highway			
Horizon Year	Revenue	Expenditures	Difference
2016	1,683,090,000	1,683,018,063	71,937
2025	1,320,021,000	852,515,166	467,505,834
2030	821,338,000	778,182,000	43,156
Total	3,824,449,000	3,313,715,229	510,733,771
2016 (Local Projects)	92,397,013	92,397,013	0,000
Total including Local	3,916,846,013	3,406,112,242	51,07333,771

Transit			
Horizon Year	Revenue	Expenditures	Difference
2016	193,312,000	187,144,020	6,166,980
2025	140,120,000	65,930,300	74,189,700
2030	85,575,000	18,650,000	66,925,000
Total	419,007,000	271,724,320	147,281,680

Operations & Maintenance Plan

Operation and maintenance of our transportation infrastructure and transportation system is essential to the development of the region. Even before providing new transportation facilities, the region must ensure that it is operating and maintaining the existing system as efficiently as possible.

Local governments and TDOT devote considerable funding to the operations and maintenance of their existing transportation system. The table below projects the funds available to both local governments and State agencies to provide for O&M needs for both the existing system and the new system that would result from the various projects proposed in this plan. These funds are not included in the revenue and expenditure funds in the tables above for two reasons: 1) they are funds above and beyond what is projected above, and 2) in order to distinguish and enhance their importance

Operations & Maintenance of Streets & Highways
The most expensive non-capital highway activity is roadway maintenance and operations. Maintenance costs include routine and regular expenditures required to keep highways in usable conditions (such as patching repairs, bridge painting, and other maintenance-of-condition costs) and traffic service costs (such as snow and ice removal, pavement marking, signs, and litter removal). Expenditures for maintenance and traffic services are not eligible for federal aid.

While maintenance expenditures are estimated to increase throughout the region over the next 25 years, several extremely significant safeguards at the state level are in place that addresses the need for continued maintenance of our streets and highways. To remain eligible for state gas tax revenues, state law requires local governments to annually appropriate and allocate funds for road purposes (maintenance) from local revenue sources in an amount not less than the average of the five preceding fiscal years. If a county fails to meet this provision, they in turn lose out on the state gas tax revenues that otherwise would come to that county. In addition, state law requires the set-aside of state highway funds for accelerating the resurfacing of the state system of highways in order to establish a twelve-year cycle of resurfacing.

Identified maintenance needs by the Tennessee Department of Transportation lead the Department to spend about $275 million annually on state-wide highway maintenance. Approximately $20 million in needs are identified and spent annually in the Nashville Area MPO region. TDOT anticipates an annual increase in O&M spending of 2%. Local governments also develop budgets to address operations and maintenance needs.

The two largest jurisdictions in the MPO, Metro Davidson County and the City of Murfreesboro, spend approximately $20,000,000 and $4,000,000, respectively on routine maintenance and resurfacing. Other cities within the MPO annually allocate between $200,000 and $1,000,000 for continued maintenance of their streets and highways. Local spending is also anticipated to increase 2% annually.

The table below totals the projected revenues and expenditures by TDOT and local governments for operations and maintenance needs for both the existing roads and proposed projects listed in this plan.

Highway - Operations & Maintenance		
Horizon Year	Revenue	Expenditures
2016	613,422,000	613,422,000
2025	611,403,000	611,403,000
2030	389,815,000	389,815,000
Total	1,614,640,000	1,614,640,000

Operations & Maintenance of Transit
Operations and maintenance of the transit systems is a key element in enhancing transportation options for people in the Middle Tennessee region. There are three transit systems that have been included in the Long Range Planning estimates, the Metropolitan Transit Authority (MTA), the Regional Transportation Authority (RTA) and the Franklin Transit Authority. Operations and maintenance needs have been analyzed for each of these agencies.

MTA operates bus service for Davidson County. For the fiscal year 2004, operating costs for the Metro Transit Authority totaled approximately $31.3 million. Local funds cover the largest share, at 38% of those costs with federal funding for maintenance and capital acquisition providing for approximately 24 %. Passenger fares cover approximately one-quarter. Advertising is approximately 2% of revenues.

RTA operates rideshare, vanpool and JA/RC services in the 9-county greater Nashville Area. Five of those counties fall within the MPO's planning region. In late 2005, RTA will begin operating a commuter rail service that will extend 32 miles from downtown Nashville to the City of Lebanon State operating assistance, FTA-5307 and fare box revenues have all been planned to cover the annual operating costs of the commuter rail line.

The Franklin Transit Authority (FTA) began operations in May 2003. FTA operates a local transit service in the City of Franklin. Revenue sources funding this agency are identified as: local operating assistance (City of Franklin), state operating assistance, FTA-5307 and fare box revenues.

The tables below show a combined revenue projection and expenditures for operations and maintenance of the three transit agencies in our region for their existing systems and any proposed projects in this plan.

Transit - Operations & Maintenance		
Horizon Year	Revenue	Expenditures
2016	457,216,000	457,216,000
2025	489,422,000	489,422,000
2030	298,240,000	298,240,000
Total	1,244,878,000	1,244,878,000

WHERE WE WANT TO BE

The first step in planning for the future Nashville area transportation system is to define the area's values. Values related to livability, safety, mobility, and the use of land have a major influence on the transportation system.

The MPO Technical Coordinating Committee (TCC) adopted a list of goals and objectives to guide the preparation and implementation of the Long Range Transportation Plan as part of the last LRTP update. It was determined that these same goals and objectives continue to be sufficient for the region. Important transportation issues addressed are the relationship between transportation and land use, multimodal transportation planning, congestion reduction, air quality and energy relationships, and the need for a plan which is financially feasible.

Regional Goals

Goal 1: Link Land Use & Transportation

Encourage local governments to develop land use policies and plans that enhance the quality of life and that recognize the relationship between land use and the transportation system.

- Enhance the residential and economic environment and reduce travel demand by clustering development, encouraging mixed-use development, and providing alternatives to the automobile for short trips.
- Locate the most intense development in areas with the most efficient existing and planned transportation system and infrastructure.
- Maximize the use of existing roadways and minimize the need for new roadways through measures such as ridesharing, transit service, and HOV lanes.
- Encourage local property access management programs which protect the functional integrity of roadways by minimizing the need for individual property access directly onto arterials.
- Evaluate the impact of proposed major developments and land use policies on the operation of the transportation system.

Goal 2: Regional Mobility through a Multi-modal System

Achieve enhanced mobility by providing an intermodal and multimodal transportation system that supports safe, efficient and convenient travel options for the movement of people and goods.

- Acknowledge and address the wide range of trip needs by the public and offer a reasonable choice of transportation alternatives to the low occupancy vehicle to satisfy these needs:

- Provide pedestrian walkways and bikeways and integrate them into the region's transportation system;
- Devise ways to accommodate frequent short trips, such as shuttles and pedestrian walkways, in high density activity centers such as the central business district and suburban residential, retail, and office centers.

- Enhance and encourage intermodal travel by:
  - Integrating local public ground transportation with intercity travel facilities such as airports and bus terminals;
  - Improving air, rail, water and highway freight handling by providing efficient linkages among major shipping facilities;
  - Improving the operation of transportation modes competing with low occupancy automobiles through traffic management techniques such as queue bypass lanes for buses, HOV lanes and priority parking for high occupancy vehicles.

- Promote the development of an effective transit system in the five-county region by:
  - Determining the appropriate transit technology and support facilities to meet the mobility needs of the public throughout the five-county region;
  - Examining the financial feasibility of establishing and/or expanding transit service in various travel corridors and encouraging the adoption of a dedicated funding source to achieve long term service goals;
- Promote the development of a thoroughfare element that complements and supports the multimodal transportation approach by:
  - Recognizing areas where highway services are the most appropriate or where alternative modes cannot meet travel needs in a cost-effective manner.
  - Supporting high-occupancy vehicle use by providing adequate roadway cross-sections and not creating congested points.
  - Identifying gaps, functional discontinuities, and bottlenecks in the highway system and providing for their logical completion or resolution.

Goal 3: Reduce Congestion

Address traffic congestion through strategies that seek first to reduce vehicle-trip demand and second, to increase the operating capacity of the existing and planned transportation system.

- Encourage measures that reduce the number of vehicle trips and miles traveled, such as: transit, high-occupancy vehicle facilities, mixed land use patterns, telecommuting, parking management, and trip reduction ordinances.

- Apply traffic management techniques that increase transportation system capacity and minimize disruptions to normal operations, such as: traffic surveillance and control systems, motorist information systems, computerized and coordinated signal systems, incident management, intelligent transportation systems (ITS), and reversible lanes

- Integrate performance measures, functional standards, and strategies from the Congestion Management System Plan (CMS) into the regional Transportation Plan.

Goal 4: Relationship between Transportation, Air Quality & Energy Conservation

Maintain and improve the quality of the natural environment through the implementation of transportation policies and programs that reduce vehicle emissions and energy demand.

- Encourage the establishment and expansion of regional air quality strategies such as vehicle inspection and maintenance programs and ridesharing.

- Increase person-trip capacity in deficient travel corridors with improvements that carry greater numbers of persons, such as mass transit, park and ride lots, and HOV lanes.

- Implement measures, where appropriate, to improve operating efficiency and reduce idling time such as incident management, motorist information systems, and coordinated traffic signal operations.

- In cooperation with managers of publicly and privately operated fleets of vehicles, encourage the use of clean, alternatively fueled motor vehicles.

Goal 5: Manage Financial Resources Efficiently

The regional transportation plan and the implementation of the Transportation Improvement Program (TIP) must be based on an effective evaluation and screening process that considers cost (capital, operating and maintenance) constraints in selecting the highest priority short and long-range improvements and programs.

- Identify existing and projected transportation funds and life-cycle costs, and include cost with other decision-making criteria as part of the MPO's ongoing planning process.

- Utilize existing transportation facilities and rights-of-way efficiently to provide improved levels of service at minimal capital cost.

- Reduce transportation costs by supporting use of energy-efficient transportation modes and developing intermodal transportation facilities which promote the easy transfer of people and goods between modes.

Bicycle and Pedestrian Goals, Objectives, and Vision

In 2004, the MPO amended the 2025 Long Range Transportation Plan to include a significant bicycle and pedestrian element. MPO staff held public meetings and met with local bicycle and pedestrian advocacy groups to identify areas of need and to establish specific goals and objectives for increasing the presence of non-motorized facilities in our region. The first objective of the bicycle and pedestrian plan is to "Provide for the development of a comprehensive bicycling and walking network." To accomplish this task, the bicycle and pedestrian policies were adopted. These policies were developed with input from the public, local cycling organizations, and local municipalities. These policies encourage local jurisdictions to embrace bicycling and pedestrian development as well as to plan for current and future bicycle and pedestrian needs – both locally and on a regional level through the MPO.

Primary Goals:

- Ensure that bicycling and walking are safe, practical, and convenient ways to travel throughout the Nashville Region.

- Direct planning efforts to increase bicycling and walking for short distance trips such as commute, school, civic, and shopping trips.

Objective 1: Provide for the development of a comprehensive bicycling and walking network.

Policies:

1-A Develop a system of bikeways, greenways, and sidewalks that provide access to and within regional scale activity centers or provide important regional connections between communities.

1-B Implement the regional network, where possible, through construction as part of other planned improvements such as road widening and new construction. Each proposed road project that corresponds with the regional bike/ped network shall include the appropriate bicycle and pedestrian facilities.

1-C Foster the development of local bike-ped plans that are integrated and coordinated with the regional bicycling and walking network.

1-D At the local level, place priority on bicycle and pedestrian investments that are in urbanized areas with a high concentration of trip generators and attractors, these include:
- Schools and Colleges/Universities
- Libraries
- Civic centers
- Transit Stations / Bus Stops

- Significant Shopping Venues
- Major Medical Centers
- Parks and Greenways
- Employment centers

1-E Place priority on projects that serve real transportation needs as opposed to facilities that are primarily recreational in nature.

1-F Ensure that the bicycling and walking network provides opportunities for many levels of walkers and cyclists.

1-G Encourage use of federal and/or state guidelines and standards for design of pedestrian and bicycle facilities on all streets and roadways.

1-H Encourage local jurisdictions to adopt consistent bicycle and pedestrian supportive ordinances for new roads and/or developments. An example might include a requirement to install sidewalks on all new roads in areas with a density equal to or more than 3 units per acre.

Objective 2: Support opportunities for bicyclists and walkers to easily access other types of transportation.

Policies:

2-A Priority will be placed on projects that provide connections between travel options such as bike lanes to transit stations, park n' ride lots, or bus stops.

2-B Encourage transit agencies to provide bicycle facilities such as bike carriers on buses, bike racks at stations, and accommodations for bicycles on trains or other modes of transit.

Objective 3: Encourage the development of support facilities and programs for bicycling and walking.

3-A Strive to provide bicycle and pedestrian support facilities such as bike parking and benches throughout the network.

3-B Work with appropriate jurisdictions to establish ongoing maintenance operations such as street sweeping and vegetation trimming along bicycle lanes or facilities.

3-C Encourage local jurisdictions to adopt ordinances for bicycle parking and shower and locker facilities.

3-D Target roads on the regional network for additional traffic-related bicycle and pedestrian amenities such as pedestrian refuge islands, lighted crosswalks, traffic signals that trip for cyclists, and appropriate signage.

3-E Encourage local jurisdictions to provide bicycle and pedestrian outreach and education activities such as Driver Training and Bicycle Rodeos at schools.

Regional Bicycle Network - Vision and Implementation

Building the Network

During the 2004 amendment process, it was recognized that the most efficient method of establishing the regional bicycle network was through new road development and redevelopment projects where bicycle facilities could be added as appropriate. To ensure that bicycle facility projects were included in the 2030 LRTP, the MPO identified those road projects that also fall on the bicycle network corridors. These road projects have accordingly been modified to include costs for adding the appropriate bicycle facilities.

For each regional bicycle route Appendix F shows the cities that would be linked, the roadway(s), the facility type(s), the regional destinations served, and estimated costs. The tables in Appendix F also provide a listing of the roadway projects from the current Long Range Transportation Plan that coincide with the regional network. The three tables in Appendix F are described below.

The projects identified in Table 1 of Appendix F are the roadway projects that will be used to construct and implement portions of the bicycle network. These projects include costs for adding bicycle facilities and are part of the fiscally constrained LRTP. The column titled *LRTP Projects and Cost to Add Bicycle Facilities* shows:

- The LRTP project number (example - #7030) for more information about these projects see Appendix B
- A very general description of the roadway project such as “widening”
- The LRTP horizon year of the project (example – 2016)
- The estimated cost to incorporate bicycle facilities
- The type of planned facility such as Bike Lanes (example - BL)

As illustrated in Appendix F the 2030 LRTP includes several proposed road projects along the four primary network roadways of Gallatin Pike, Lebanon Road, Murfreesboro Road and Franklin Road. All of those projects have been identified and the cost for providing appropriate bicycle facilities included in the overall project cost.

Table 2 in Appendix F also identifies road projects from the 2030 LRTP, but these projects do not include the cost to add bicycle facilities and are identified as potential alternates in the event bicycle facilities can not be constructed on the primary planned routes.

Table 3 in Appendix F shows the route information for Phase 2 of the planned regional network and includes the same information provided in Tables 1 and 2; however, like table 2 the LRTP projects listed in this table do not include the cost to add bicycle facilities.

Although the routes identified on the regional network map provide the most direct connections to Nashville, there are additional roads or other rights-of-way (ROW) opportunities, such as railroads or rivers, that are also shown. Further, the map illustrates the phased, prioritized approach towards implementing the bicycle facilities. The first phase identifies corridors that are considered a high priority. These are indicated by colored lines and show the four roadways mentioned previously as well as other ROW opportunities. The second phase, indicated by arrows, looks at corridors for future planning and development where the network can expand to include connections to outlying cities and between cities. In some cases, a road project has been proposed in the 2030 LRTP that falls into one of the second phase corridors. Although these corridors have not been identified as high priority areas, the MPO will work with local officials to determine if bicycle and pedestrian facilities may be included as part of the road project.

Gaps in the Network

While utilizing roadway projects is the most cost effective method of adding bicycle and pedestrian facilities, this process does leave a few "gaps" in the regional network. In order to facilitate the development of a fully connected network, cost estimates have been developed for "stand-alone" bicycle facilities that could be used to fill-in the gaps. This stand alone list can be found in Appendix G, however, it is important to note that these are not specific projects as part of the 2030 LRTP, rather, these are simply illustrative. As the bicycle network is developed over the period of this long range plan, this list can be used to look for opportunities of completing various segments of the network. Projects that are submitted from this list, or that would not be implemented as part of the road network, will be scored according to the priority criteria established as part of the 2004 bicycle and pedestrian update. An example of the scoring sheet is provided on page 87. Because the MPO focus is on regional transportation, the priority scoring criteria favor projects that provide a transportation benefit as well as connect to the regional destinations and other modes of transportation such as transit. The scoring sheet is a tool that will assist in determining project priority.

The Regional Network

While the Regional Bicycle and Pedestrian Network map does identify specific roadways and corridors, it is important to consider that it is not the intention of the bicycle and pedestrian plan that all of these roadways must provide bicycle facilities. As an example, in addition to Lebanon Road, several other roadways have been identified for potential connections from Nashville to Lebanon. Included in this corridor are railroad rights of way and potential greenway segments. As the 2030 LRTP is implemented, any appropriate combination of roadways, greenways, or other rights of way may be utilized to complete the connection. When projects move from the Long Range Transportation Plan into the Transportation Improvement Program, the projects that coincide with the regional bicycle and pedestrian network will be considered for bicycle and

pedestrian facilities. For those cases where bicycle and pedestrian facilities are determined to be inappropriate, such as for safety, traffic volumes or speed reasons, the MPO will work with the community and local municipalities to identify a parallel connection.

Continuous Review of the Bicycle and Pedestrian Plan and Network

As the bicycle and pedestrian network expands, the MPO will re-examine the entire bicycle and pedestrian element and obtain public input through the Long Range Transportation Plan process. This will include the overall network, the list of regional destinations, the prioritization scoring system, and policies. Although there have been no changes to the regional destinations since the adoption of the bicycle and pedestrian element this past fall of 2004, it is likely that the needs of the region may change over time, and therefore, an examination of attractors and generators will be considered as well as continual review of the goals and objectives. To ensure that the bicycle and pedestrian component of the LRTP is maintained, the MPO will contact all jurisdictions quarterly to assess any changes in the regional network or to identify any unmet needs.

HOW WE GET THERE

For some, the answer to where we want to be is clear. The difficulty lies in how we make the right choices to get there. Do we continue our separate ways in hopes that at some point in time our paths will cross? Or do we foster our strengths and weaknesses and begin to create a regional transportation system that is capable of meeting both local and regional needs, providing greater transportation options, and is fiscally responsible?

All of these questions have been answered based on study findings presented throughout this Plan. This section attempts to harness this information and establish a recommended plan that is fiscally responsible and environmentally sound, specifically meeting federal air quality conformity requirements. This section includes: a performance based approach to evaluating projects, a method of comparing bicycle and pedestrian projects against one another, an assessment of project needs versus funding availability, an environmental and air quality review, and a recommended plan that includes a bicycle and pedestrian component.

Performance-Based Assessment

Looking at investments from a performance-based approach allows for not only a comparative assessment of projects but also ensures that investments foster community and regional goals. Through the travel demand model, GIS based application, and other qualitative assessments, the following performance measures have been applied to evaluate individual projects and their consistency with plan goals and objectives. However, prior to actually scoring each of the projects, data from the CMS are utilized to determine the needs of the region based on the previously discussed performance measures, their thresholds, and the Tier 2 analysis. A list of roadways and corridors were developed that breach any one of the performance measure thresholds. Then, as previously discussed in the Tier 2 section, MPO staff met to discuss these roadways and corridors with each of the TCC members to determine appropriate solutions to the identified problem areas using the "Toolbox of Congestion Management Strategies".

Once this initial list of problem areas was developed, the scoring procedure was applied. A high score indicates that the project is most consistent with the seven planning factors outlined by TEA-21 and thus is also consistent with the goals and objectives of the region since they are designed with the seven factors in mind. A low score does not mean that the project is not a worthy project but rather, it is less supportive of the seven broad-based planning factors. Considerable importance is placed on infrastructure investments that are consistent with land use policies. By utilizing ULAM, it is now easier to get a better understanding of where future development will occur, thus adequate transportation investments can be implemented.

Projects are placed in each horizon year based on a combination of three important factors: 1) Project Priority, 2) Financial Constraint and 3) Air Quality Impact.

The first factor, Project Priority, is defined as how soon the project is needed. This is based on the level of current and/or future congestion as well as how high the project ranks based on the

following ranking sheet (shown below). For example, if a roadway shows both current and future congestion, it is obvious that there is an immediate need for a project and it will therefore require placement into the closest horizon year, (2016). Another example would be if a roadway doesn't show current congestion, but shows future congestion. In this case, the project may not be an immediate need and should be placed in the mid-term or long-term horizon year, (2025 or 2030).

The second factor, Financial Constraint, means each horizon year's projects must fit within the limits of how much money is available for the individual horizon years based on the financial projections outlined in the Fiscal Outlook section. Using the above example, if a congested roadway shows an immediate need, but all the available funding in 2016 is being used for higher-ranked projects, the project cannot be funded in the 2016 horizon year and will have to be placed in the next available horizon year (2025).

The third element of project placement is the Air Quality Impact. This impact is measured by how the projects in each horizon year increase the amount of low-level ozone-creating pollutants, (i.e. VOC, NO_x). The amount of increase is not allowed to surpass the State's Motor Vehicle Emissions Budget (MVEB), for any horizon year or else the Plan will not conform to Federal regulations. This factor works similar to the Financial Constraint factor, because if the MVEB is exceeded before the financial limit is reached, the lowest ranking project will need to be placed in the next available horizon year until both the financial and air quality impacts are within allowable levels. Further detail regarding air quality impacts can be found in the Environmentally Sound section.

In almost every case, financial and/or air quality constraint is usually reached before projects run out. This is why it is essential to have a method of prioritizing projects using limited available funds. Below is the scoring criteria used to rank projects for this LRTP with the specific goal that it addresses in parentheses.

Support the economic vitality of the metropolitan area

1. Does the transportation investment support/foster economic vitality? *(Based on the concentration of future employment - Is the project located in an area that demonstrates a high concentration of future employment?) (Goal: 1, 2, 5)*

___ Located in a TAZ that has a high level of employment (> 250 of employees per sq. mile) (12 points)
___ Located in a TAZ that has a medium level of employment (> 50 but < 249 of employees per sq. mile) (6 pts)
___ Located in a TAZ that has a low to moderate level of employment (< 49 of employees per sq. mile) (2 pts)

Increase the safety of the transportation system for motorized and nonmotorized users

2. Does the project address a safety concern? (*Examples of projects include geometric improvements, curve correction, grade separation, and a bicycle/pedestrian improvement which*

addresses safety concerns or railroad crossing safety improvements, high accident locations.) (Goal: 2, 3)

___ Yes (10 points) ___ No (0 points)

Increase the accessibility and mobility options available to people and for freight

3. Does the transportation investment support/foster increased accessibility and mobility options to people? *(Based on the concentration of population - Is the project located in an area that demonstrates a high concentration of existing and future population?) (Goal: 1, 2)*

___ Located in a TAZ that has a high level of population (> 1,000 of persons per sq. mile) (12 points)
___ Located in a TAZ that has a medium level of population (> 500 but < 999 of persons per sq. mile) (6 points)
___ Located in a TAZ that has a low to moderate level of population (< 499 of persons per sq. mile) (2 points)

4. Improves a facility which is important to freight movement? *(To answer "Yes", the facility must be designated as a truck route or have significant freight movement.)* (Goal: 2, 3)
___ Yes (5 points) ___ No (0 points)

5. Supports the MPO's Congestion Management System (Goal: 1, 2, 3, and 4):
____Travel Demand Management (TDM) (9 points)
__Carpool __Vanpool __Park-and-Ride Lot __Ridesharing __HOV Improvement/Promotion

____HOV Use (4 points)
__Lanes __Ramp Bypass

____Public Transit Capital Improvements (21 points)
__Rail Line __Busway (Fixed Guideway) __Bus Lane
__Bus Bypass Ramp __Park and Ride Lot __Intermodal Center __Transfer Center
__Inter Site Circular __Service Enhancement __Service Expansion __Improve Transit Stop
__Traffic Preemption
__Transit Information Systems

____Non-Traditional Modes (8 points)
__Bike Facility __Pedestrian Facility

____Additional General Purpose Lanes (8 points)
__New Road __Additional Through Lanes __Bypass Road

Protect and enhance the environment, promote energy conservation, improve quality of life

This is a system-wide analysis which is based on model outputs, i.e. air quality, energy consumption, etc. (Goal: 2, 3, and 4)

Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.

6. Is the project located in a manner which would have a positive impact on transit/HOV? *(To answer "Yes", corridor must have existing/planned transit service, or be adding HOV lanes (Goal: 1, 2, and 4).*

___ Yes (9 points)
___ No (0 points)

7. Is the improvement located within a 3 mile radius of an existing/planned park-and-ride lot? (Goal: 1, 2)

___ Yes (5 points) ___ No (0 points)

8. Does the improvement provide direct access from/to high concentrations of industrial employment? (Goal: 1, 2)

___ Yes (3 points) ___ No (0 points)

Promote efficient system management and operation.

9. Supports the MPO's Congestion Management System (Goal: 1, 2, 3, and 4):

____Access Management (3 points) _Access Controls _Access Consolidation

____Incident Management (8 points)
_Incident Detection _Incident Management _Emergency Vehicle Preemption

____Intelligent Transportation Systems (ITS) (15 points)
_Advance Traffic Management System _Advance Traveler Information System
_Advance Vehicle Control System _Advance Public Transportation System
_Advance Commercial Vehicle Operation __Other (ITS)_____
_Congestion Pricing (2 points) __Toll Roads

Emphasize the preservation of the existing transportation system.

10. Supports the MPO's Congestion Management System (Goal: 1, 2, 3, and 4):

____Traffic Operational Improvement (19 points)
__Intersection Widening __Traffic Surveillance __Motorist Information System __Traffic Control Center __Center Turn Lane __Traffic Signal Improvement __Turn Lanes __Reversible Lane __One-way Street __Grade-Separated Interchange __Intersection Realignment _Other____

11. Is the project eligible for federal and state funding (Based on federal functional class and/or type of improvement) (Goal: 5)?

___ Yes (50 Points) ___ No (0 Points)

Bicycle and Pedestrian Project Priority Criteria

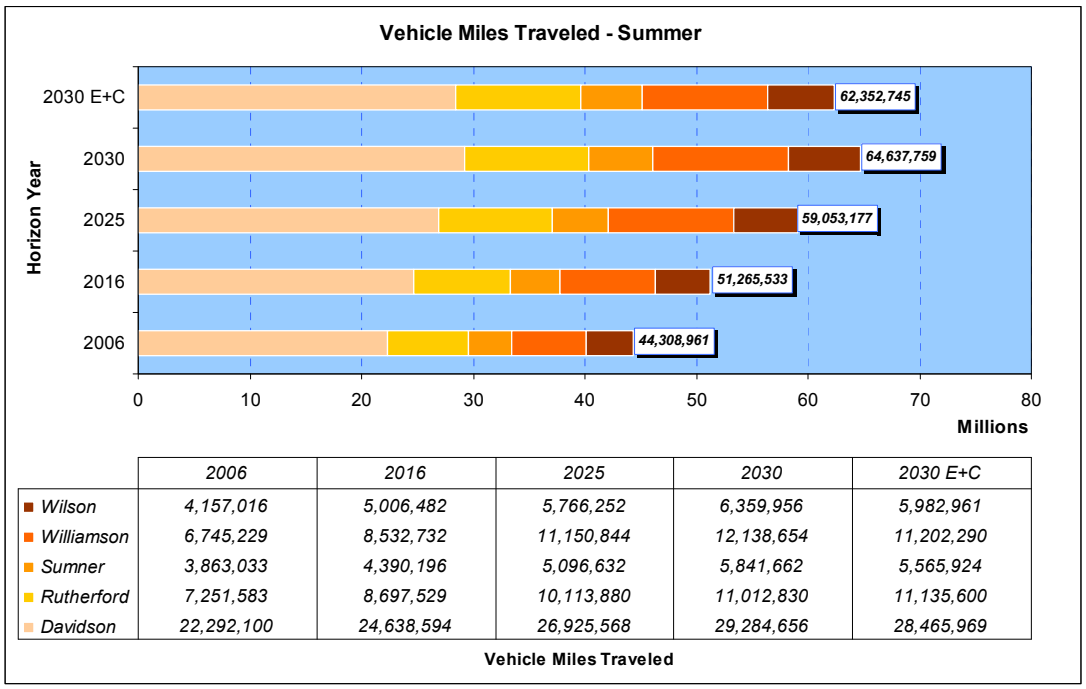
It is expected that many of the regional bicycle and pedestrian routes will be implemented through road projects. For cases that do not fall into that category, the scoring system below will guide which bike/ped projects receive priority.

Bicycle and Pedestrian Priority Scoring

Criteria	Points
URBANIZED AREA	
Projects receive greater priority that are within the urbanized area.	20
CONNECTIONS TO ATTRACTORS AND GENERATORS	
1st Priority - Project actually connects to a regional attractor or generator. 2nd Priority - Project is within 1 mile of a regional attractor or generator. Projects that serve multiple destinations will receive higher ranking. Note: A distance of 3 miles can be traveled by the average cyclist (12.5 mph) within approximately 15 minutes.	22 8
REGIONAL NETWORK	
Projects receive greater priority that help to complete the primary regional network. Note: The goal for this priority is to not duplicate an existing network connection. 1st Priority - Projects that fill-in Phase 1 gaps of the planned regional network. 2nd Priority - Projects that connect to existing local facilities or fill-in Phase 2 gaps of the planned regional network. Projects receive greater priority that address obstacles. (To be determined in 2005 plan update.)	 16 12 n/a
MODAL/TRANSIT CONNECTIONS	
Projects receive greater priority that involve modal connections.	14
USERS	
Projects receive greater priority that serve the most diverse level of users. (Multi-use paths = 8 pts; Bike Lanes = 6 pts; Bike Routes = 4 pt)	8
Total Points Possible	**100**

Environmentally Sound

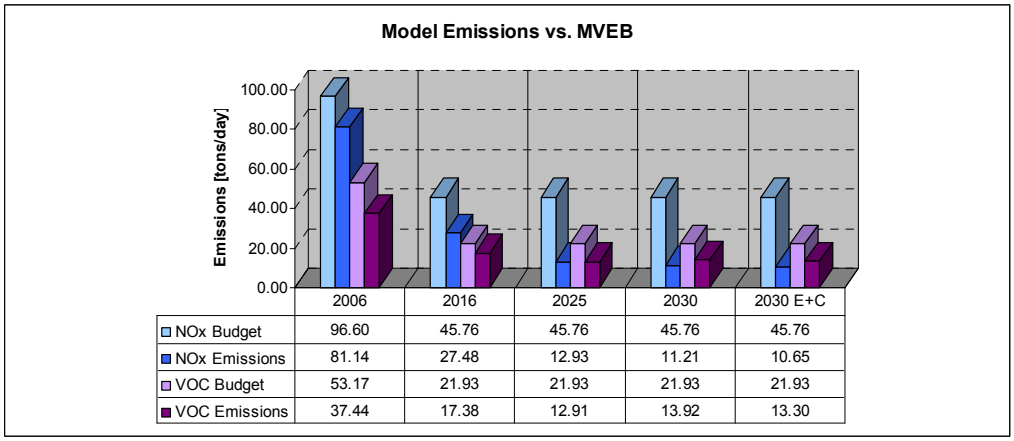
The graphs below illustrate some of the air quality-related results from the forecast model. Emissions are anticipated to be reduced over the 25-year horizon even though vehicle miles traveled (VMT) are projected to increase. This is because of continuous improvements in emissions reduction technology.



	2006	2016	2025	2030	2030 E+C
Wilson	4,157,016	5,006,482	5,766,252	6,359,956	5,982,961
Williamson	6,745,229	8,532,732	11,150,844	12,138,654	11,202,290
Sumner	3,863,033	4,390,196	5,096,632	5,841,662	5,565,924
Rutherford	7,251,583	8,697,529	10,113,880	11,012,830	11,135,600
Davidson	22,292,100	24,638,594	26,925,568	29,284,656	28,465,969

Vehicle Miles Traveled

The Plan is determined to be in conformity based upon the passing of the emissions budget test for each of the required test years. The results of the emissions budget test are below.



	2006	2016	2025	2030	2030 E+C
NOx Budget	96.60	45.76	45.76	45.76	45.76
NOx Emissions	81.14	27.48	12.93	11.21	10.65
VOC Budget	53.17	21.93	21.93	21.93	21.93
VOC Emissions	37.44	17.38	12.91	13.92	13.30

The conformity emissions budget test confirms that in the year 2030, the LRTP passes the emission budget test by 8.01 tons per day of VOC and 32.83 tons per day of NOx. This margin will permit future VMT growth beyond the current plan horizon year.

Recommended Plan

With the growth forecasted in the Nashville Region, it is imperative that the region provide a transportation system that sustains a vital economic base and provides for a superior quality of life. The recommended 2030 Long Range Transportation Plan is based on the seven planning factors in TEA-21 and the Goals and Objectives of the Region.

Keeping those factors in the forefront, the LRTP was built to maximize the reduction of congestion (of all modes) and keep the region's air quality at or below the established standards. In addition, this plan is financially sound, meaning the necessary funds are or will be in place to implement all of the projects.

The LRTP also envisions a larger share of the available funding to be allocated to Operations and Maintenance of the entire transportation system as it ages. As well as use of available funds for lower-cost solutions such as traffic-signal synchronization and coordination, real-time travel information and other aids to improve transportation choices.

The fiscally constrained 2030 LRTP can reasonably envision over $4.3 billion dollars available for all regional transportation system investments in both road and transit related projects.

Appendix B, *2030 Recommended Plan*, contains a listing of complete projects which represents a $3,673,311,042 investment in transportation improvements in the five-county area.