

Nashville Southeast Corridor High-Performance Transit Alternatives Study

Needs Assessment

February 2006



N A S H V I L L E A R E A
M E T R O P O L I T A N P L A N N I N G O R G A N I Z A T I O N

Table of Contents

Executive Summary	ii
Glossary of Acronyms and Terms	1
3.0 Introduction	5
3.1 Study Area	5
3.1.1 Study Area Description	5
3.1.2 Jurisdictions Affected	6
3.2 Summary of Need and Purpose	9
3.2.1 Transportation Options	9
3.2.2 Mobility and Traffic Congestion	9
3.2.3 Land Use Policies / Compact Development	10
3.2.4 Environmental Concerns	10
3.3 Planning Context	11
3.3.1 Previous Studies	12
3.4 Community Structure	16
3.4.1 Demographics	16
3.4.2 Employment and Economic Outcomes	16
3.4.3 Land Development Patterns and Plans	17
3.4.4 Major Activity Centers	17
3.4.5 Natural Environment	20
3.5 Transportation Infrastructure and Function	21
3.5.1 Regional Travel Patterns	21
3.5.2 Public Transportation	37
3.5.3 Park and Ride Lots	44
3.5.4 Railroads	44
3.5.5 Aviation	46
3.5.6 Transportation System Management	47
3.5.7 Travel Demand Management	48
3.5.8 Transportation Funding Overview	49
3.6 Project Statement of Purpose and Need, Goals and Objectives	49
3.6.1 Performance Criteria and Evaluation Measures	52
3.7 Conclusions	52
APPENDIX A	1
DEMOGRAPHICS	A-1
A.1 DEMOGRAPHICS	A-2
A.1 DEMOGRAPHICS	A-2
A.1.1 Population	A-2
A.1.1.1 Income and Poverty	A-6
A.1.1.2 Ethnicity	A-9
A.1.1.3 Population by Age	A-9
A.1.1.4 Housing	A-10
A.1.2 Employment and Economic Outcomes	A-11
A.1.3 Land Development Patterns and Plans	A-16

Executive Summary

This Needs Assessment Task Report is the first element of the Southeast Corridor High-Performance Transit Alternatives Study. Overall, the Southeast Corridor study will answer the following questions:

- What are the transportation problems in the Southeast Corridor?
- What are the underlying causes of these problems?
- What are viable options (both transportation and other) to address these problems?
- What are the costs and benefits of the differing options?
- Which option is preferred as the best solution?

The first step of this study is to identify the transportation problems in the Southeast Corridor. This Needs Assessment Task Report describes and summarizes those problems. It identifies the purpose and demonstrates the need for developing transportation improvements in the southeast corridor. It forms the basis for the development of the project goals, objectives, and the evaluation measures that will be used to determine the best solution. Finally, this report provides a comprehensive understanding of the transportation challenges and opportunities in one of the Nashville Region's highest population and employment growth corridors.

The need for transportation improvements in the Southeast Corridor has been addressed in several studies over the past decade. The region's vision for a multi-county transit system to enhance mobility and provide a safe and efficient multimodal network is illustrated in both the 2025 and 2030 Nashville Area Long Range Transportation Plans. The Southeast Corridor was selected to undergo the next phase of transit corridor planning because:

- The southeast corridor suffers the worst traffic congestion of the five major transportation corridors in the region.
- The corridor has experienced the highest rate of population growth of the five major corridors. (The study area accounts for 10 percent of the region's land area but contains more than 30% of the region's population.)
- The corridor contains a substantial concentration of trip origins and destinations
- The corridor includes one of the highest transit ridership routes in the region
- The corridor has a strategic position and role in the region as home to many of the areas largest employers, including Nissan and Dell Computer, which makes transportation access in the corridor vital to the region's continued economic success.

The Southeast Corridor is projected to be one of the strongest growing employment corridors in the region over the next twenty years. For the Nashville area to remain competitive and continue to enjoy increased development opportunities, high growth corridors such as the Southeast, will need additional mobility options like high performance transit. High-performance transit provides reliable, affordable, and relatively flexible travel within and throughout a corridor.

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

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

There are limited opportunities for roadway expansion due to topographic constraints and development adjacent to the right of way. For example, I-24 in and around downtown Nashville was constructed in the late 1950s and roadway improvements over the last several decades have expanded to the maximum amount of available right-of-way within the corridor. As a result, there is no available median right-of-way. The outside travel lanes are 20 to 30 feet below the surrounding topography and abut rock walls. The physical challenges and potential costs of expanding the right-of-way under these conditions, along with the impacts of taking the highly developed urban and industrial land which surrounds the right-of-way, limits the potential to expand the roadway. Additionally, in other parts of the I-24 corridor, major widening has occurred within the available median right-of-way to avoid affecting development alongside the edge of the roadway. Similar limitations exist along Murfreesboro Road which includes numerous commercial and retail establishments with driveways or parking facilities that directly access the roadway. At another portion along Murfreesboro Road, the Nashville International Airport has a taxiway that crosses over the road and severely limits any roadway widening. Other sections of Murfreesboro Road in the southern portion of the study area bisect the downtowns of LaVergne and Smyrna. Major roadway expansion in these areas would result in the taking of several blocks of downtown businesses. The same development characteristics and roadway expansion implications are true within the City of Murfreesboro at the southern end of the study corridor.

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

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

Glossary of Acronyms and Terms

AA – Alternatives Analysis

Alignment – The route that an improvement, such as a bus or light rail line, could take through a corridor.

Alternative – A feasible transportation improvement that is under consideration.

At-grade – Running on street level.

Bus Rapid Transit (BRT) – A bus system operating on an exclusive bus-only lane.

Bus – Rubber-tired vehicles operating on fixed routes and schedules on roadways. Buses are powered by diesel, gasoline, battery or alternative fuel engines contained within the vehicle.

Capital costs – The expense of designing and constructing a new project.

Commuter Rail – Urban passenger train service for local short-distance travel operating between a central city and adjacent suburbs. Service must be operated on a regular basis by or under contract with a transit operator for the purpose of transporting passengers within urbanized areas, or between urbanized areas and outlying areas.

Corridor – A narrow band of land, usually surrounding a roadway or linking communities.

Environmental Assessment (EA) — An interim decision document prepared for an action where the significance of social, economic, or environmental impact is not clearly established. If the action is determined to have significant impact, an Environmental Impact Statement is then prepared. If no significant impact is determined, a finding of no significant impact (FONSI) is prepared.

Environmental Impact Statement (EIS) — Report which details any adverse economic, social, and environmental effects of a proposed transportation project for which federal funding is being sought.

Environmental Protection Agency (EPA) — Federal agency whose mission is to protect the environment by the control and abatement of pollution in the areas of air, water, solid waste, noise, radiation, and toxic substances.

Federal Highway Administration (FHWA) — Division of the U.S. Department of Transportation that specializes in highway transportation.

Federal Transit Administration (FTA) — Division of the U.S. Department of Transportation that funds transit planning and programs.

Geographic Information System (GIS) — A computer system capable of capturing, storing, analyzing, and displaying geographically referenced information; data identified according to location.

Heavy Rail – High-speed, passenger rail cars operating singly or in trains of two or more cars on fixed rails in separate rights-of-way from which all other vehicular and foot traffic are excluded.

Impact – An effect that a transportation improvement could have on the natural or manmade environment.

Land Use — Refers to the manner in which portions of land or the structures on them are used, i.e., commercial, residential, retail, industrial, etc.

Level of Service (LOS) – A qualitative measurement of the operations conditions within a traffic system and how these conditions are perceived by drivers and passengers. LOS A is free-flow, while LOS F is the worst condition.

Light Rail Transit (LRT) – Lightweight passenger rail cars operating singly (or in short, usually two-car, trains) on fixed rails in right-of-way that is not separated from other traffic for much of the way. Light rail vehicles are driven electrically with power being drawn from an overhead electric line via a trolley or a pantograph.

Locally Preferred Alternative (LPA) – The transportation improvement selected by decision-makers as the solution to the transportation needs and problems in a corridor.

Long Range — In transportation planning, refers to a time span of more than five years.

Long Range Transportation Plan (LRTP) — A document spanning a minimum of twenty years, resulting from a collaborative regional planning process.

Metropolitan Planning Organization (MPO) — The organizational entity designated by law with lead responsibility for developing transportation plans and programs for urbanized areas of 50,000 or more in population. In Tennessee, there are eleven MPOs.

Metropolitan Transit Authority (MTA) – The agency that operates and maintains the local bus system for Nashville/Davidson County.

Mixed-traffic – Automobiles and transit vehicles sharing the same roadway.

Mixed-use – A type of development where residences and businesses are located in the same area.

Mobility — The ability to move or be moved from place to place.

Mode, Intermodal, Multimodal – Form of transportation, such as automobile, transit, bicycle and walking. Intermodal refers to the connections between modes and multimodal refers to the availability of transportation options within a system or corridor.

Monorail — Guided transit vehicles operating on or suspended from a single rail, beam, or tube. Monorail vehicles usually operate in trains.

National Environmental Policy Act (NEPA) — Federal law passed in 1969 which requires an analysis of environmental impacts of federal actions (including the funding of projects).

Notice of Intent — Document prepared to inform the public of the scope of a proposed action or project.

Operations & Maintenance Costs (O & M costs) – The expense of keeping a project running once it is built.

Pedestrian Walkway — A secured path for walking.

Preliminary Engineering Phase (PE) – The project development phase that includes preparation of environmental and construction documentation, such as plans, specifications, and cost estimates. Preliminary Right-of-Way work, appraisal maps and estimates may also be reimbursed with Federal-aid funding for the preliminary engineering phase.

Project - An undertaking to develop, implement, or construct a particular transportation enhancement at a specific location or locations.

Right-of-Way (ROW) - A linear corridor of land used for transportation or other facilities such as highways, roads, streets, railroads, trails, light-rail, utilities, etc.

Regional Transportation Authority (RTA) – Agency responsible for developing a regional transit network for the nine-county Middle Tennessee region. RTA currently operates a rideshare service and will operate the regional transit system.

State Transportation Improvement Program (STIP) – A staged, multiyear, statewide, intermodal program that is consistent with the state and metropolitan transportation plans and which identifies the priority transportation projects to be undertaken over the next three years.

Surface Transportation Program (STP) – Federal-aid highway funding program that funds a broad range of surface transportation capital needs, including many roads, transit, sea and airport access, vanpool, bike, and pedestrian facilities.

Traffic Analysis Zone (TAZ) – The unit of geography most commonly used in conventional transportation planning models.

Tennessee Department of Transportation (TDOT) – State agency responsible for transportation issues and planning in Tennessee.

Transit – Public transportation such as buses or trains.

Transit Oriented Development – (TOD) Mixed-used, higher density development located within ½ mile of a transit station.

Transportation Improvement Program (TIP) — A financially constrained list of prioritized transportation projects developed by a metropolitan planning organization (MPO). The TIP covers a period of at least three years but may cover a longer period for informational purposes. The TIP must include documentation of federal and state funding sources for each project and be consistent with the Long Range Plan and adopted local comprehensive plans.

United States Department of Transportation (USDOT) – A federal agency that establishes the nation's overall transportation policy. Under its umbrella, there are ten administrations whose jurisdictions include highway planning, development and construction; urban mass transit; railroads; aviation; and the safety of waterways, ports, highways, and oil and gas pipelines.

Glossary Sources:

Public Involvement Plan: A Complete Guide to Public Involvement in Decision-Making
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July 2005

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3.0 Introduction

This task report contains an assessment of the transportation conditions within the southeast corridor study area, provides a comprehensive description of the study area, a listing of the jurisdictions affected within the corridor, and identifies the purpose and demonstrates the need for developing transportation improvements in the southeast corridor. The purpose of the report is to provide an understanding of the corridor's current and projected transportation problems. These problems serve as the basis for identifying and evaluating a set of alternative transportation improvement strategies. This report provides information that may subsequently be used in the Purpose and Need chapter of a NEPA document. This task report provides a summary of previous studies in the corridor as well as an overview and analysis of the general social, economic, land use, and major transportation features within the study area. The analysis includes study area demographic trends, employment and economic outcomes, and reviews land development patterns and plans. The final element of the task report describes the transportation infrastructure and services within the corridor, along with the project goals and objectives to be used for evaluating the effectiveness of potential alternatives.

3.1 Study Area

This section describes the corridor and affected jurisdictions within the study area. Overall, the southeast corridor is a subset of the Nashville region that offers a diverse mix of land uses that include office parks, suburban and urban neighborhoods, light industrial, strip commercial, airports and large industry.

3.1.1 Study Area Description

The study area, known as the Southeast Corridor, links the City of Nashville, Davidson County and the cities of LaVergne, Smyrna and Murfreesboro in Rutherford County. Nashville is the second largest city in Tennessee, with a population of approximately 570,000¹. The central business district houses the highest concentration of office employment in the region, which includes State offices and the Capital, as well as Federal and Metropolitan Government offices. Nashville draws approximately 132,000 daily commuters from surrounding counties, about 25,000 of which come from Rutherford County. The Nashville downtown area is also a prominent music and cultural center with venues and activities at the Ryman Auditorium, Frist Art Center, Schermerhorn Symphony Center, Country Music Hall of Fame, the Tennessee Performing Arts Center, the Nashville Convention Center, and the Municipal Auditorium.

In recent years, downtown Nashville has also emerged as a place of sports: the Nashville Predators, an NHL team, play at the Gaylord Entertainment Center; the Nashville Sounds, a minor league baseball team, play at Greer Stadium; and the Tennessee Titans, an NFL team, play at the Coliseum, bringing visitors and fans from across the state and the region.

Murfreesboro is the southernmost terminus of the study corridor and lies about 30 miles southeast of Nashville. It has a population of approximately 75,000 and is home to Middle Tennessee State University (MTSU). MTSU is primarily a commuter-oriented institution that draws students from throughout the region. MTSU has an estimated enrollment of 21,000, of whom about 17,500 live off campus. Between Nashville and Murfreesboro are the City of LaVergne with an approximate population of 22,000, and the Town of Smyrna, with a population of approximately 26,000. LaVergne and Smyrna form a major employment area which is home

¹ Population data throughout this document is from the 2000 US Census, unless otherwise noted.

to a Nissan automobile manufacturing plant, Bridgestone/Firestone, Ingram, and other major employers.

Figure 3-1 shows the general corridor study area. The corridor comprises 357 square miles, representing about 10 percent of the land area of the five county MPO region and containing 30 percent of the region's population. The study area is approximately 30 miles in length from downtown Nashville to just south of Murfreesboro. In downtown Nashville, a three mile radius from the center of downtown has been established as the northern terminus of the study area. This area includes West End Avenue and the Church Street district to the west of downtown which includes Vanderbilt University and Medical Center, Baptist Hospital, and HCA Healthcare. These employers account for nearly 20,000 jobs.

The western border of the study area includes Nolensville Pike and extends southeasterly toward the Davidson County line. In Rutherford County, the western border is approximately three miles west of Interstate 24 (I-24). The southern terminus is approximately six miles south of the city limits of Murfreesboro, capturing the complete corporate and urbanized area of Murfreesboro. The eastern boundary of the study area extends from the three-mile radius of the downtown study area termini and follows I-40 (to the east) toward Nashville International Airport. Just east of the Nashville International Airport, the eastern border of the study area is roughly three miles east of Murfreesboro Road (US-41/70S), traverses Percy Priest Lake to the east and includes the complete corporate and urbanized boundaries of the cities of LaVergne, Smyrna, and Murfreesboro.

The precise study area boundary coincides directly with the boundaries of traffic analysis zones (TAZs) that are used by the MPO to organize population, employment and demographic data for analysis in their regional transportation model. Making the study area boundaries contiguous with TAZ boundaries allows the study area to be defined as an aggregation of TAZs, which facilitates data analysis. The study area boundary may be refined or redefined if transportation needs are identified that would require analysis or solutions outside the present boundary.

The two primary north-south thoroughfares within the corridor are Murfreesboro Road (US-41/70S), and I-24. This corridor experiences significant levels of traffic congestion. The 30-mile segment of I-24 between Nashville and Murfreesboro handles between 64,000 and 176,000 average daily trips. Murfreesboro Road has between 21,000 and 40,000 average daily trips. The estimated corridor population is approximately 331,000. Some of the significant trip attractors/generators along the corridor include Nashville International Airport, MTSU, major employers such as Nissan and Dell Computer and the regional shopping malls, commercial services, office parks, hospitals and downtown Nashville.

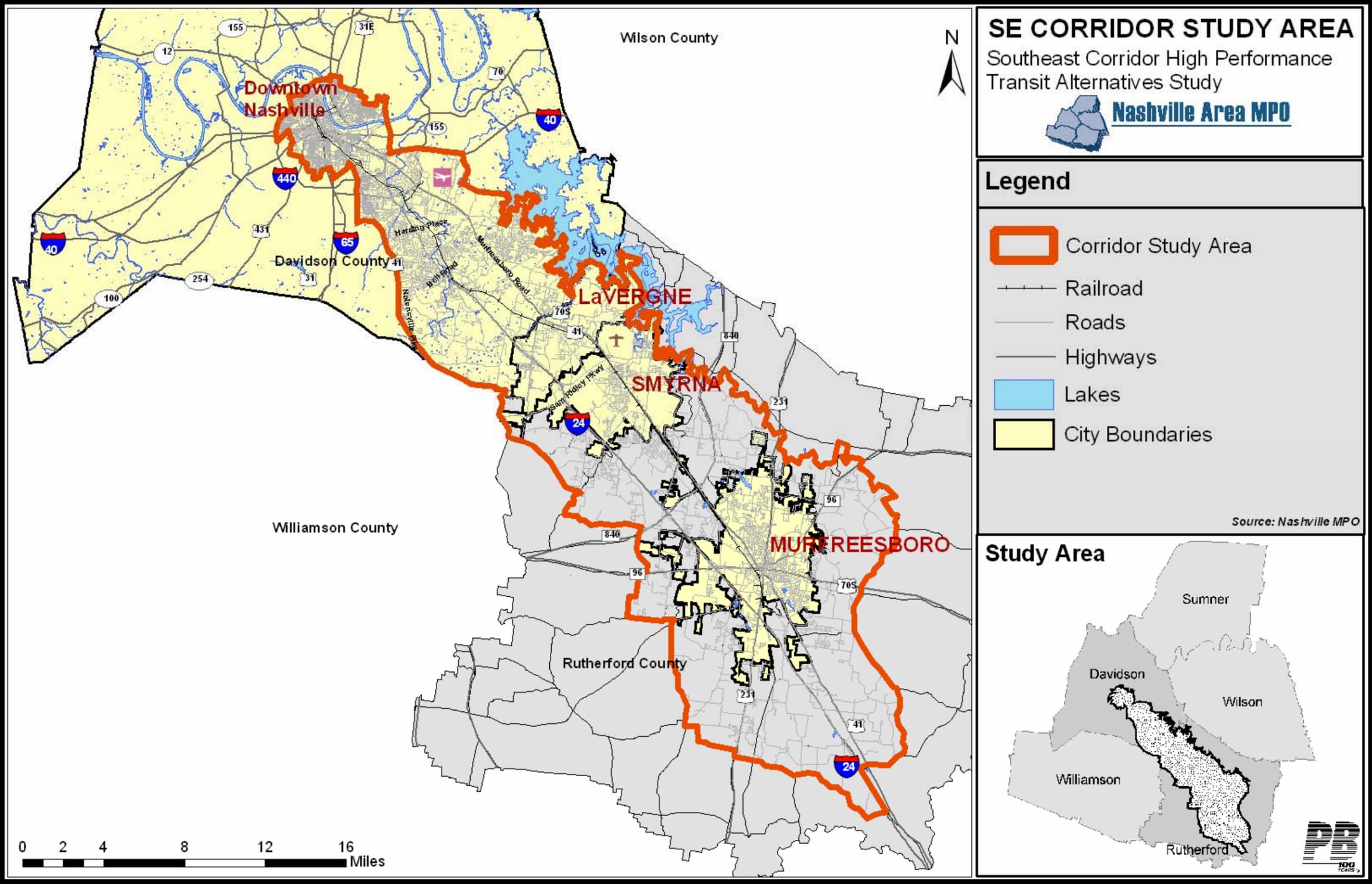
3.1.2 Jurisdictions Affected

The study area includes portions of two counties and three municipalities: Metropolitan Nashville-Davidson County, Rutherford County, and the cities of LaVergne, Smyrna, and Murfreesboro, which are located within Rutherford County.

Nashville and Davidson County is a single form government with its authority encompassing more than a half-million people and 533 square miles. Metropolitan Nashville-Davidson County has operated under its present Metropolitan Charter since 1963. A component of Metropolitan Nashville-Davidson County government is the Metropolitan Transit Authority (MTA), created in 1953 to supervise, regulate, and maintain jurisdiction over public transit in the City of Nashville. With the creation of Metropolitan Government, the service area of MTA was expanded to include all of Davidson County.

Southeast of Nashville-Davidson County, Rutherford County lies at the geographic center of Tennessee and encompasses approximately 612 square miles. The cities of LaVergne, Smyrna, and Murfreesboro are three of four municipalities located in Rutherford County. These cities account for approximately 63 percent of the county's population. Currently, neither Rutherford County nor its municipalities operate, or are served by, local fixed-route transit services.

Figure 3-1
Southeast Corridor Study Area



3.2 Summary of Need and Purpose

The Nashville Area MPO has initiated the Southeast Corridor High Performance Transit Alternatives Study to develop and analyze transit options that address both present and future transportation needs within the corridor. The purpose of the study is to analyze the transportation problems of the corridor and to consider potential transit solutions.

The need for transportation improvements within the study area is based on a number of interacting transportation problems. These include the lack of transit options in the corridor, heavy and worsening traffic congestion on major roadways, land use and development trends that contribute to worsening congestion and make it more difficult to serve the corridor with transit, and environmental concerns associated with increased auto use. If plans are not made now to develop alternative approaches for these transportation problems, they will compound and worsen in the future, threatening the corridor's continued growth and the quality of life of those who live, work, and visit in the corridor.

3.2.1 Transportation Options

Currently, there are few alternatives in the corridor to driving in heavily congested conditions. Options for longer-distance commuters are limited to driving alone; car or vanpools that can use the I-24 HOV lanes; the Regional Transportation Authority (RTA) "Relax-and-Ride" express service that operates during rush hour periods; and MTA routes that operate over shorter segments of the corridor. Ridership on these services is relatively high. None of these transit options operate on facilities that allow them to bypass the heavily congested roadway conditions and there are no other transit services outside Nashville-Davidson County. This includes the City of Murfreesboro, a city of significant size and the site of Middle Tennessee State University.

This lack of mobility options affects many travel markets. Potential commuters that do not have access to private transportation, including reverse commuters, are effectively denied access to jobs in the corridor due to the lack of transit options. In addition, those who depend on public transit for their transportation face limited housing options. Continued economic development could be limited by the lack of access to jobs for transit dependent employees. Students traveling to Nashville from southern areas of the corridor, and students traveling to Murfreesboro from Nashville and areas in the north of the corridor, are also limited in their travel options. Those who are unable or unwilling to drive, or simply prefer to use transit are negatively affected by this lack of transportation options in the corridor. The lack of access to non-drivers of the employment and educational opportunities in much of the corridor is both a social equity and economic development issue. Many disadvantaged persons lack access to jobs and educational opportunities that would allow them to improve their lives. In addition, many employers lack access to workers as a result of this vacuum of transit options.

Identified Transportation Need: Provide transportation alternatives for travelers within the corridor.

3.2.2 Mobility and Traffic Congestion

Growth in traffic volumes is indicative of both population growth and economic vitality. However, growth in travel without growth in the capacity of the transportation system results in traffic congestion. The southeast corridor suffers the worst traffic congestion of the five major transportation corridors in the region. Limited opportunities for roadway expansion exist due to topographic constraints and development adjacent to the right of way. With the rapid growth in the area, congestion along the major roadways is forecast to increase. Traffic volumes rise

annually, with congestion in the corridor showing a consistent increase each year. Traffic congestion wastes resources as well as the time of travelers, and has the potential to reduce economic growth and limit economic development opportunities in the corridor and the region. I-24 and I-40, which converge south of the downtown, is the primary transportation spine of Middle Tennessee, with nearly 176,000 vehicles a day passing to and through the area. I-24, US 41 (Murfreesboro Road) and the CSX rail corridor are the only continuous southeast-to northwest corridors connecting this part of the region to downtown Nashville. I-24 is the only one of these facilities that is a limited-access highway. The terrain and existing development in most of the corridor, especially in areas adjacent to downtown Nashville, constrain adding further capacity or the development of new rights of way. Motorists are beginning to recognize the significance of this congestion with travel speeds nearly 75 percent less than that of the posted speed limit during the morning commute (12 to 13 miles per hour compared to a posted speed of 55 mph).

Identified Transportation Need: Allow economic growth and development in the corridor to continue without overburdening existing roadways. Reduce the negative impacts of congestion on resources, travel times, and mobility.

3.2.3 Land Use Policies / Compact Development

The Nashville region is working to avoid the fate of many other urban areas that are experiencing the negative impacts of sprawl and the deterioration of compact urban centers. Transit can influence, support, and promote more compact land use and development patterns within the corridor. This will allow the corridor to be served by a more efficient mix of transportation options that include walking, cycling, and mass transit. Section 3.4.3 describes land use and development patterns within the corridor in detail, and Figure 3-8 shows existing land use in the study area. Land use patterns in the area tend to be low-density and pedestrian unfriendly with uses widely and strictly separated. Existing development is oriented for the convenience of auto travel, as opposed to pedestrians or users of mass transit. Over time, development has occurred with little, if any, consideration for the ways in which public transportation infrastructure and services might serve the travel needs of those who live, work, or travel within the corridor. This has resulted in a development pattern and transportation system that does not meet all the needs of the various users such as pedestrians, cyclists, and transit riders. The current auto-centric transportation network increasingly suffers from traffic congestion, which indicates that the capacity of the system does not meet the demands of drivers. The result is a transportation system, in terms of its capacity and composition of services that lags behind the demand for transportation services. This development pattern represents a significant threat to farmland and open space and has the potential to significantly diminish the quality of life for Nashville area residents by reducing access to a variety of housing, retail and commercial development types, reducing access to open space, and promoting traffic congestion. Over time, this auto-centric focus toward development increases travel times for all users of the transportation system including drivers and bus riders.

Identified Transportation Need: Provide greater emphasis on mixed-use development, traditional urban and village land use patterns, and design standards that support a diverse range of travel options. Promote land uses that are conducive to a more balanced transportation system with key roles for pedestrian and mass transit.

3.2.4 Environmental Concerns

By reducing or stabilizing the rate of auto use in the corridor, transit improvements help alleviate a number of environmental problems, including air, water, and noise pollution. Automobile use

raises a number of environmental concerns ranging from air, noise and visual pollution to depletion of fixed-supply resources to the pollution generated by leaking fuel storage tanks and the decomposition of scrapped vehicles. Traffic congestion adds to a host of environmental problems ranging from lost time to travelers to air quality “hot spots” caused by idling vehicles. Transit can reduce the impacts of these issues, however, the transit facility must be developed in such a way as to minimize the impacts on property and avoid creating environmental justice impacts on affected populations.

Identified Transportation Need: Transportation alternatives that minimize impacts to the environment and help to improve air quality conditions in the region.

3.3 Planning Context

This section describes the planning context of the study area and provides an overview of previous transportation studies performed in the corridor. These studies have identified assorted transportation problems in the southeast corridor and have recommended various solutions or improvements. Although no one study has recommended a comprehensive program to address all of the transportation needs, the needs identified in these studies offer a starting point for the Southeast Corridor Alternatives Analysis.

The planning context also includes a review of the demographic, socio-economic, land use and natural environment in the corridor. These factors ultimately drive existing and future demand for transportation services and directly impact the mix of roadway and transit improvements that might address the specific needs of the corridor.

Significant findings of the assessment of the planning context revealed:

- The Southeast Corridor represents 30 percent of the region’s population while accounting for only 10 percent of the land area in the region.
- Rutherford County is the second fastest growing county in the region with a near 54 percent increase in population since 1990. This trend is projected to continue as Rutherford County is expected to experience a 75 percent increase in population growth by the year 2025.
- Population density within the corridor represents 927 persons per square mile, which is denser than the third largest city in Tennessee – the City of Knoxville, with a population density of 751 persons per square mile.
- Population diversity in the corridor is comparable with that of Davidson County as a whole; however, nearly 68 percent of both Davidson and Rutherford County’s Hispanic population reside within the study area.
- Between 2000 and 2003, nearly 23,000 new residential units were constructed in Davidson and Rutherford Counties. Of the 23,000 units, 60 percent were in Rutherford County.
- Davidson County has the largest employment base in the region with 51 percent of the employment (or 303,000 jobs). Rutherford County has the second largest employment base in the region with just over 100,000 (or 17 percent of the jobs).

- The top 20 largest employers (in terms of number of employees) in the corridor account for over 50,000 jobs and 13 percent of all jobs in Davidson and Rutherford Counties.
- According to the US Census roughly 27 percent (or 25,297) of the residents of Rutherford County traveled to Davidson County in 2000 for employment. This is a 77 percent increase over 1990 commuting trends, which is greater than the 54% increase in population that occurred in Rutherford County during the same period.
- Existing local land use policies in the corridor provide limited, if any, compact or transit oriented development (TOD) regulations. Current land use policies throughout the corridor do not significantly promote compressed development, limit suburban sprawl, or encourage walking and mass transit as the primary transportation mode.

For more details of the planning context, including discussion of the transportation and planning studies relevant to the corridor, as well as a detailed analysis of the demographic, socioeconomic, and development context of the corridor, see Appendix A.

3.3.1 Previous Studies

Over the past decade, many regional and sub-regional studies have been conducted in the Nashville MPO area. Several of these studies have focused on the entire region while others have been specific to a particular study area. Most of the studies identify specific transportation problems and needs that include the southeast corridor in some fashion. Studies previously conducted in the corridor include:

Nashville MPO Area High Occupancy Vehicle (HOV) Study – The study was commissioned in 1996 by the Tennessee Department of Transportation (TDOT) to develop a concept for incorporating HOV lanes as a transportation strategy for the regional transportation network. The stated goals of the study included: improving air quality, reducing energy consumption, improving regional mobility, improving the overall efficiency of the highway system, and providing a publicly acceptable HOV system.

The HOV Study recommended HOV lanes for I-24 from downtown Nashville to US-231 in Rutherford County (which is approximately 3 miles north of the southern terminus of the Southeast Corridor study area). To date, a large portion of the study recommendations have been implemented within the Southeast Corridor, including the HOV lanes on I-24 from Harding Place in Davidson County to State Route 840 (SR-840) in Rutherford County. There are, however, critical segments of the I-24 HOV lane system in the Southeast Corridor that are called for in the plan but have yet to be constructed. These include the segments from downtown Nashville to Harding Place (approximately 7 miles) and from SR-840 in Rutherford County to US231.

Nashville MPO Area Central Business District (CBD) Access Study – This study was commissioned in 1996 by TDOT to investigate improved access into the southern portions of the Nashville Central Business District (CBD) between the Broadway exit on I-40 and the Fesslers Lane exit on I-40. The study identified three sets of distinct transportation problems in the area, each impacting motorist from the southeast portion of the region traveling into and out of the downtown. First, limited access is caused by prohibited movements from 2nd/4th Avenue interchange with I-40. Second, route continuity is affected where three Interstates converge (I-24, I-40, and I-65) near the CBD. The third and final problem identified is the weaving of local

access and longer-distance traffic on I-40. Each of these problems reduce capacity and cause traffic congestion and other transportation problems on I-24, which is the sole north-south limited access facility in the southeast corridor.

A series of recommendations for this location were proposed each consisting of significant costs and impacts to motorists, businesses, and surrounding properties. In general, recommended improvements included reconstructing three interchanges, replacing five existing structures that flyover five local roads and two interstates, and doubling existing lanes via ramps and through lanes. To date, none of the study recommendations have been advanced.

Nashville Regional Commuter Rail Evaluation Study – This study was commissioned in 1996 by RTA, the MPO, and MTA to explore the feasibility of commuter rail in the Middle Tennessee region. Five corridors were identified for development of commuter rail service in the 20-year planning horizon. One of these was the southeast corridor, which extended from the Landport in downtown Nashville to SR-96 in Murfreesboro. The southeast corridor was identified as one of two standout corridors in terms of high ridership, low operating deficit per passenger, and favorable emission reductions. The study concluded that commuter rail is a feasible future transportation option in the Nashville region, and warrants incorporation in regional transportation and development planning. To date, the east line, from downtown Nashville to the City of Lebanon, is the only rail line of the five under development, and is scheduled to be operational by 2006.

Nashville Regional Commuter Rail Evaluation: Potential Start-up Segments Study - Commissioned in 1998 by the MTA to explore how to begin implementing the original (1996) study findings of the potential start-up segments. The east line, which is under development, was selected as the region's initial start-up line due to the amount of available track capacity along the line. For the southeast corridor, the study concluded that double track existed on the current CSX Transportation track from the downtown toward Thompson Lane (just north of the Hickory Hollow Mall) and could be used as part of an initial start-up commuter rail line. The study noted that consideration should be given to extending beyond this initial location to at least the Hickory Hollow Mall area if not all the way to the cities of LaVergne and Smyrna as an initial start up phase. To date, no additional activities from the study have been pursued.

Park-and-Ride Lot Study – A Middle Tennessee Park-and-Ride Lot Study for the region was first conducted in 1993 by RTA and later updated in 1999. The study resulted in an inventory of existing park-and-ride lots, recommendations for improvements to current locations, and a listing of future park-and-ride lots. The vast majority of the recommendations to existing lots included better signage, lighting, and/or creating formal agreements with lots that are currently used under arrangements that are informal in nature. Four future park-and-ride lot locations were identified in the Southeast Corridor study area. The locations included Harding Road in Davidson County (adjacent to the CSX Railroad), the Hickory Hollow area in Davidson County (near the Crossings), the Town of Smyrna (either at the abandoned CSX Depot or near Sam Ridley Parkway), and the City of LaVergne (near Waldron Road). These sites were identified with the notion that three of the four could be used as future commuter rail stations once service was established in the corridor. To date, many of the short-term strategies have been undertaken, and numerous park-and ride lot improvements, particularly signage improvements, have been made throughout the region.

Nashville Urban Core Light Rail Analysis – Commissioned by MTA in 1999 to explore the feasibility of a phased development of light rail transit (LRT) from downtown Nashville to the West End corridor. The study identified a 4.2 mile system connecting the east bank of the Cumberland River (which is the location of the Tennessee Titans Stadium) via the current

downtown transit center (Petway), the Clement Landport (which is the stated location for a future downtown commuter rail station) and eventually down the West End corridor. In addition to pedestrian and bicycle traffic as the primary access to the LRT, the study calls for feeder bus and park-and-ride facilities to support the system. The study documents the importance of the concentration of activities and employment in the downtown to West End corridor and the ability to interconnect potential commuter rail (via the Landport), providing seamless travel from suburban communities, such as those in the Southeast Corridor, to and through the downtown and West End area. To date, no study recommendations have been advanced.

Beating Gridlock Study – Commissioned by the Nashville Area Chamber of Commerce in 1999 as part of a nine-month effort of the Transportation Division of the Chamber. The study in large part relied on the findings of the various plans mentioned in this section articulating the impact of congestion on the region's infrastructure and the lack of rail transit in the region. The study offers support for rail transit in Middle Tennessee and describes the challenge to the region and the role of the Chamber of Commerce in advancing rail transportation in Davidson and surrounding counties.

Nashville Downtown Transportation Plan – This plan was commissioned by Nashville-Davidson County Metropolitan Government in 2000 and outlines policy options and directions in the downtown relative to transportation, land use, and development. The primary focus of the plan is the creation of a regional multimodal transportation system focused on downtown Nashville. Key points of the plan draw on expanding the base bus system for the region along with the trolley system in the downtown, aggressive steps toward greater transportation demand management (TDM) in the downtown, and support for commuter rail, HOV lanes, and intelligent transportation systems (ITS) in the region to improve mobility to and from the downtown area. Several of the plan's recommendations have been implemented in some form or are under various stages of development.

Regional Transit Development Study – This study was commissioned by the MPO in 2003 to identify areas of the region – today and in the future – where transit services would be a reasonable part of the mobility system. Within the southeast corridor study area, recommendations in the short-term included local transit service in the City of Murfreesboro and further expansion of the existing express transit service from Nashville to Murfreesboro as well as to the cities of LaVergne and Smyrna. The study notes that development of the express service is a logical progression to the long term solution of some sort of fixed-guideway transit. Additionally, in the long term, local circulator systems are recommended for the City of LaVergne and the Town of Smyrna.

Five Year Service Improvement Plan – Completed by MTA in March 2004 to provide a detailed outline of how MTA plans to move from its current form of transportation for those without other transportation options, to a network that attracts riders that normally would not have seen transit as a viable option for their travel needs. This plan outlines recommendations for service improvements over the next five years, commencing August of 2004. There are recommendations made for every route that currently operates as well as suggested new routes. Five routes in the southeast corridor study area would experience increased transit service operations as a result of planned improvements. These routes include Route 11 - Southeast Connector, Route 12 – Nolensville, Route 15 – Murfreesboro, Route 18 - Elm Hill Pike/ Airport, and Route 25 - Midtown.

City of Murfreesboro Transit Feasibility Study – This study was commissioned by the City of Murfreesboro and TDOT in 2001 to evaluate the feasibility of providing local transit service within the City. The study found that the City of Murfreesboro has sufficient population and

other characteristics that warrant the development of public transit service with the potential of an annual ridership of 331,000 fixed route trips and 12,000 demand response trips. The city is currently moving forward with plans to begin a limited transit service by 2007.

Town of Smyrna Intermodal Transportation Center Study – This was commissioned by the Town of Smyrna in 2002 to advance the development of an intermodal transportation station which would offer the greatest options for long term transit needs for the area. Key components of the assessment included identifying a facility and site capable of serving park-and-ride lot needs, potential express bus and commuter rail service, and other intermodal functions such as local bus service, and bicycle and pedestrian travel. Seven locations were evaluated with the preferred location being a site located on the northwest portion of Sam Ridley Parkway bordering on the CSX railroad. The study concluded with a master plan for the development of the transit center.

Nashville Area Long Range Transportation Plans – The Nashville Area MPO completes these plans every three years and recently adopted the 2030 Long Range Transportation Plan in November of 2005. These plans provide a comprehensive assessment of the region's transportation infrastructure and needed improvements to remain competitive in the regional and global market.

Since 1999, the long range plan has identified the southeast corridor as the most congested corridor in the region. One reason for the significant increase in congestion levels is the limited number of north-south roadways serving the communities of LaVergne, Smyrna, Murfreesboro, and Rutherford County and the tremendous amount of development projected within the corridor area. Even with planned roadway improvements in the southeast corridor area over the next twenty years, levels of service on the two major north-south roadways - I-24 and Murfreesboro Road (US-41/70S) are at best, likely to achieve a level of service "E".

The plan states that the region must develop a multimodal transportation system to maintain a relative level of mobility and accessibility in the region. The plan calls for the completion of the HOV lanes along I-24 from US-231 in Murfreesboro to downtown Nashville and the development of a high capacity transit system serving the same geography.

Major Thoroughfare Plans for the Cities of LaVergne, Smyrna, Murfreesboro, and Rutherford County – These plans were commissioned in 2003 by each of the respective jurisdictions in cooperation with the Nashville Area MPO. These plans identify existing and future needs along major roadways throughout their communities. Each plan serves as a comprehensive assessment of transportation needs in the respective community and documents local and regional transportation demands within their geography.

Numerous roadways in these communities are currently classified as congested and are projected to worsen in the future. Important north-south roadways such as I-24 and Murfreesboro Road (US-41/70S) are among some of the most traveled facilities in these communities. Additionally, there are several east-west corridors that are gateways to these communities from I-24 such as Waldron Road, Sam Ridley Parkway, Nissan Drive, SR-96, and US-231 all of which function at levels of service "D" or worse. Each of the studies indicate significant existing and projected future traffic growth along these roadways and indicate that little, if any, congestion relief will be achieved through roadway widening.

3.4 Community Structure

Middle Tennessee and the Nashville Area (which includes Davidson and Rutherford Counties) have experienced significant population and employment growth in the past two decades and forecasts project similar robust growth in the coming decades. The southeast portion of the region from the downtown core of Nashville toward the Cities of LaVergne, Smyrna, and Murfreesboro is the fastest growing area of the region. The southeast corridor has experienced population and employment growth rates that have exceeded those of the region as a whole. This fast rate of growth has brought with it needs for transportation improvements to address traffic congestion, to offer additional transportation options, and to address environmental concerns.

This section discusses population, employment, and land use characteristics of the region and the study area.

3.4.1 Demographics

The Nashville MPO service area, including Nashville-Davidson, Rutherford, Sumner, Williamson and Wilson counties, has a population of over 1.1 million. Population in the region increased 25% between 1990 and 2000, and is projected to increase a further 47% between 2000 and 2025. The region experiences a pattern of internal migration, in which new residents are moving to Nashville-Davidson County from other regions, while established Nashville-Davidson County residents are migrating to surrounding counties. Population in the portions of Nashville-Davidson and Rutherford Counties that lie in the project study area is projected to increase by nearly one-third, from 331,000 to 438,000, between 2000 and 2025. The corridor is significantly more densely populated than the rest of the region or the State of Tennessee, and is increasing in population density.

Median household income in Nashville-Davidson County (\$39,800 in 2000) is slightly higher than the median for the state (\$36,400), while the median for Rutherford County (\$46,300) is considerably higher than that of the State or Nashville-Davidson County. The corridor contains pockets of very high income population as well as some high concentrations of poverty, particularly near downtown Nashville and eastern Murfreesboro. The corridor study area contains a higher percentage of minorities, children and young adults than the State of Tennessee or the region as a whole.

3.4.2 Employment and Economic Outcomes

The Southeast Corridor is, in many ways, the economic engine of the region. Large employers located in the corridor outside downtown Nashville and the Vanderbilt-West End area include Nissan, Dell, Ingram, Bridgestone/Firestone, and Whirlpool, among dozens of others employing significant numbers. Large institutions such as Middle Tennessee State University, Nashville International Airport, the Veterans Administration and other regional medical facilities also employ thousands of residents from throughout the region. Employment has steadily grown and diversified over the past twenty years, with the greatest growth in Rutherford County, and this growth is expected to continue at a rate as great or greater than the rate of population growth in the corridor.

3.4.3 Land Development Patterns and Plans

Land use in the corridor is characterized by older, higher density areas, particularly near the central areas of Nashville and Murfreesboro, and newer, lower density areas in the central and southern areas of the corridor. Much of the new development in the past 30 years has been auto-oriented residential, commercial and industrial developments. A number of higher density mixed use developments are in various stages of planning or construction. These developments will promote a more balanced transportation system and the use of walking, bicycling and transit as alternatives to driving. However, such developments must become more prominent in the mix of future land use if a more balanced transportation system is to support the future growth of the corridor.

Population and employment growth in the region and in the corridor will increase pressure on the transportation facilities in the region. The large population and relatively high density of the corridor, the concentration of younger and lower income residents indicate a future need for improvements to the transit system, and an approach to addressing the region's transportation needs that includes provision for walking, bicycling, and transit, as well as improvements to the roadway system.

3.4.4 Major Activity Centers

The study area has a large and diverse array of major activity centers almost all of which continually struggle to remain accessible for patrons and employees due to traffic congestion, auto-dependency and limited transportation options. A significant element of this accessibility concerns the ability to satisfy parking needs associated with an overwhelming dependence on automobile access. Satisfying parking demands competes with facility expansion desires and/or leads to development of costly parking structures. Traffic generation and localized congestion tends to be a major source of conflict with neighboring residents and businesses. Improved transit could help address access and parking problems of these major traffic generators and could provide an alternative choice of travel for patrons and staff.

The major activity centers within the study area include:

- Malls - Hickory Hollow Mall and Stones River Mall
- Colleges and Universities - Tennessee State University (downtown campus), Vanderbilt University, Belmont University, Trevecca Nazarene University, Middle Tennessee State University
- Medical Centers – Vanderbilt Hospital, Baptist Hospital, Centennial Hospital, Stonecrest, Alvin C York VA Medical Center, Middle Tennessee Medical Center
- Entertainment Centers - Nashville Convention Center, Gaylord Entertainment Center, Tennessee Titans Stadium, Ryman Auditorium, Country Music Hall of Fame, Schermerhorn Symphony Hall, Starwood Amphitheater
- Other Activities - Downtown Nashville, Music Row, Nashville International Airport, and Smyrna Airport

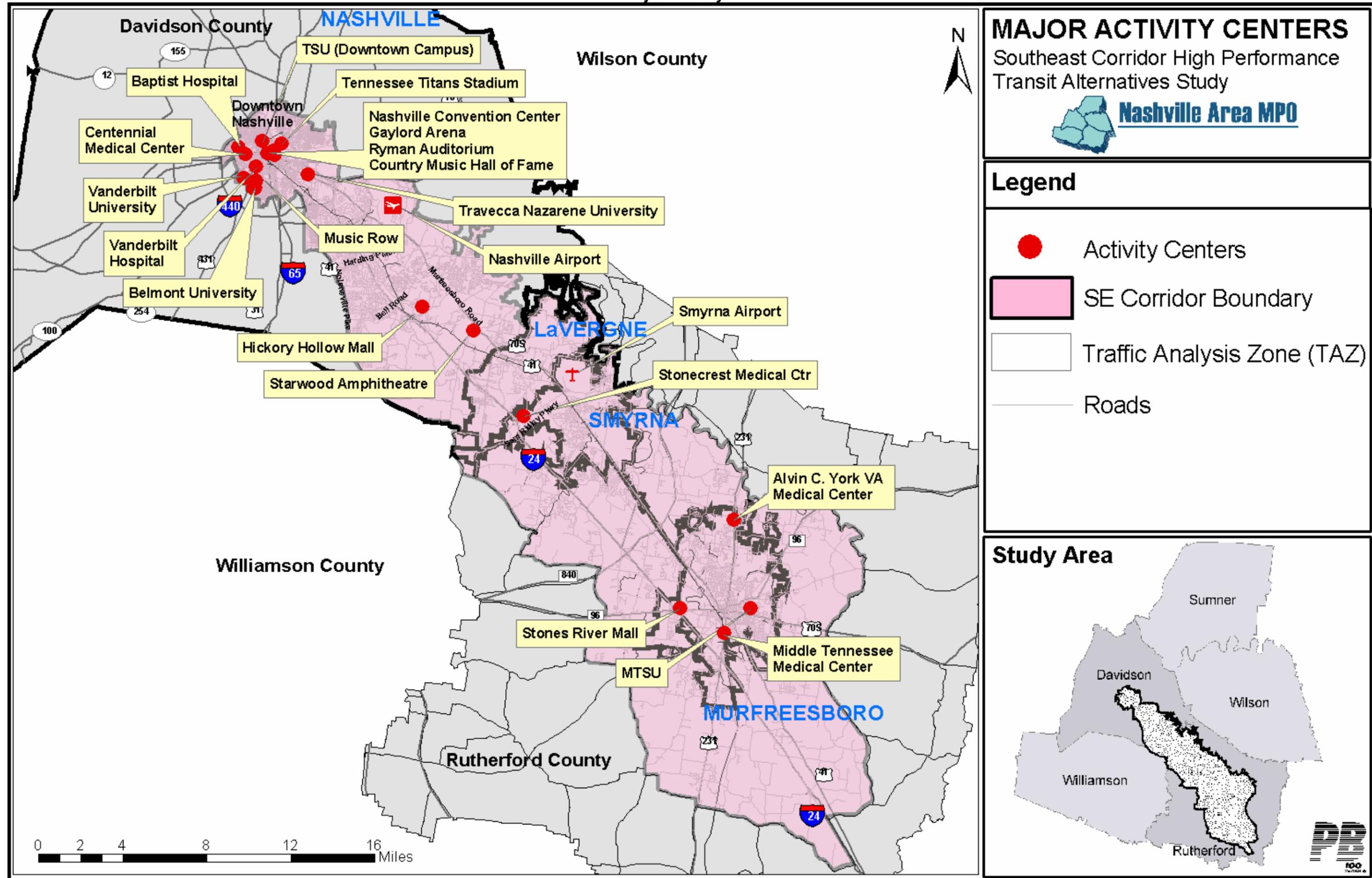
Table 3-1 shows the number of employees and additional information about each of the activity Centers. Figure 3-2 illustrates the location of these major activity centers within the study area.

Table 3-1: Number of Jobs and Other Trip Generating Factors for Activity Centers in the Southeast Corridor Study Area

Activity Center	No. Jobs (2002)	Beds	Seating Capacity	Students	Sq. Feet	Acres
Baptist Hospital	3,100	685				38
Centennial Medical Center	4,500	615				40
Vanderbilt University / Football Stadium	6,400		41,000	11,000		323
Vanderbilt Hospital	7,200	874				
Belmont University	820			4,300		
TSU (Downtown Campus)	200					
Tennessee Titans Stadium	276		68,798			105
Nashville Convention Center					118,675	
Gaylord Entertainment Center	850		20,000		43,000	
Ryman Auditorium			1,300			
County Music Hall of Fame						
Trevecca Nazarene University	330			2,000		
Nashville Airport	3,100					
Music Row	It is an area with many locations not one location.					
Hickory Hollow Mall	3,600					
Starwood Amphitheatre	200		17,000			
Smyrna Airport	200					
Stonecrest Medical Center	400	75			13,526	
Alvin C York VA Medical Center	1,260	491				
Stones River Mall	1,367					
MTSU / Football Stadium	1,670		15,000	23,000		466
Middle Tennessee Medical Center	1,200	286				
Total	36,673	3,026	163,098	40,300		

Source: Nashville MPO Travel Demand Model

Figure 3-2
Major Activity Centers



3.4.5 Natural Environment

The natural environment of Middle Tennessee is beginning to experience the affects of decades of development patterns and single solution transportation decisions. Land use and development patterns have created communities and neighborhoods that are isolated and dependent upon the automobile for nearly all basic trips (e.g. to work, shop, and for pleasure). In addition, auto dependency in the corridor has generated various types of region-wide, corridor-wide and localized pollution. Tremendous growth in vehicle miles traveled, population growth, and other non-transportation related factors have put the region and its residents at risk. Controlling air pollution in the region is a driving factor in Middle Tennessee's success for economic prosperity and over all quality of life. Without a viable solution to dependence on the automobile, the region will begin to see reduced economic growth, increased potential health risks, and less federal funding for roadway projects that improve access to employment centers in the region. The southeast corridor stands to see the greatest impact from this affect given the projected employment growth of the corridor and the amount of available land for future residential and commercial development.

On April 15, 2004, the Nashville region, which includes the counties of Davidson and Rutherford, was designated non-attainment for 8-hour ozone standards violations. In addition to air quality, within the study area there are several large land areas of key importance to the natural environment. These areas include:

- Cumberland River
- Percy Priest Lake
- Stones River
- Stones River National Battlefield

Development pressures have begun to jeopardize these natural features within the study area. Land availability and the demand from developers for roadway access has created an environment whereby quality of life features such as these are becoming adversely impacted. Any transportation solution must balance travel demands while protecting the natural environment.

3.5 Transportation Infrastructure and Function

This section describes the existing transportation facilities, which includes highways, public transit, freight railroads, and other transportation services. The demographic changes and growth in the corridor have outpaced the capacity and function of the transportation system. Further expected growth will overtax the existing infrastructure and transportation systems, creating demand for new approaches and new types of infrastructure in the future.

3.5.1 Regional Travel Patterns

For the past 50 years, Middle Tennessee, like most portions of the state and nation, has devoted most of its transportation dollars to roads, bridges, and interstate highways. Today, Nashville is one of only six cities in the United States located at the intersection of three interstate highways – I-40, I-24, and I-65.

Over this same time period, the web of interstate highways has helped to fuel the rapid growth of the region's economy. While the region is well served by a complex system of roads ranging from interstates and other freeways to city streets and rural local roads, travel on these roadways has been steadily increasing as the region has grown, causing congestion levels to rise.

The interstate system, which comprises I-24, I-40, and I-65, completely encircles downtown Nashville. There are eight (8) interstate access points into and out of the downtown area from the interstate system. There are three interchange access points to the west of the downtown area via I-40/I-65. These interchanges also provide access to the West End, Church Street, and Charlotte Avenue corridors, which serve the Vanderbilt and medical center area. There is one interchange access point to the south of the downtown area via I-40 providing access into the downtown area from 2nd Avenue and access out of the downtown area from 4th Avenue. Each of these roadways are one-way facilities and function as a one-way pair. There are three interstate interchanges east of the downtown area providing access points into and out of the downtown to the east. These interchanges also serve the Tennessee Titan Football Stadium (known as The Coliseum) which seats 68,000 people, and one interchange north of the downtown area (8th Avenue North), which provides access to the downtown area and Metro Center office and industrial park.

From southeast of downtown Nashville toward the City of Murfreesboro, along I-24, there are 10 interchanges located in Davidson County providing access to numerous residential, industrial, commercial, and retail concentrations throughout the study area. From the Davidson County line into Rutherford County along I-24 to Epps Mill Road, which is south of US-231 in the City of Murfreesboro, there are seven interchanges providing access to the communities of LaVergne, Smyrna, and Murfreesboro. Several of the interchanges along this section of the study area have high levels of commercial and industrial activity while others are largely vacant. These vacant portions are slated for future industrial and/or residential development.

Several of the roadways with interchanges on I-24 experience extremely high volumes of traffic which contribute considerably to backups along I-24 and corresponding roadways during peak hours. The most heavily traveled connecting roadways on I-24 in Davidson County are I-40, I-440, and Bell Road (SR254) with 120,000, 100,000, and 41,000 vehicles respectively interchanging to and from I-24. Within Rutherford County, Sam Ridley Parkway, SR840, SR96, and US231 are the most heavily traveled connecting roadways to I-24, with traffic volumes of 31,000, 35,000, 41,000 and 49,000 respectively. The volumes of these interchanging roadways to and from I-24 contribute to the increased delays and congestion levels experienced along I-24 between downtown Nashville and the City of Murfreesboro.

Table 3-2: Traffic Volumes at I-24 Interchanges, 2004

Interchanges (North to South)	Traffic Volume (2004)
I-65 north of Cumberland River	136,513
I-65 south of 2nd/4th Avenue	114,963
Fessler's Lane	27,366
I-40	120,133
I-440	99,681
Briley Pkwy	32,133
Harding Place (SR255)	37,431
Haywood Lane	25,689
Bell Road (SR254)	40,722
SR171	14,650
Waldron Road	19,303
Sam Ridley Pkwy	30,655
SR102	15,622
SR840	35,143
SR96	40,806
US231	49,287

Source: TDOT 2004 ADT Counts

High Occupancy Vehicle (HOV) lanes are currently designated on I-24 North and South between the Harding Road Interchange, several miles south of Downtown Nashville, and SR-840 north of Murfreesboro. These lanes are restricted during high traffic hours inbound (7-9 AM) and outbound (4-6 PM) and are reserved for the exclusive use of vehicles with two or more people, buses, motorcycles, and emergency vehicles. Penalties for single-occupant vehicle drivers abusing the HOV lanes is not severe (the penalty is statutorily limited to \$25) and violations are considered non-moving offenses, like parking violations. Evidence indicates that the HOV lanes are not rigorously enforced.

Data provided by TDOT confirm the lack of enforcement for HOV lanes. While legitimate use of the HOV lanes on I-24 has increased by more than 50% over the past five years, the number of violators has nearly doubled, making it likely that the number of violators—in addition to the lack of through HOV service to downtown Nashville—has suppressed the number of potential legitimate users of the HOV facility.

Congestion on I-24 at the point where the HOV lane ends, south of the Harding Road interchange, is among the most severe of any location in the corridor. Morning peak period congestion at this location is much worse than the general congestion in the area between Bell Road and Briley Parkway where I-24 operates at LOS "D". The reason for this intense congestion is the introduction of vehicles from the HOV lanes—both those using the HOV lanes legally and illegally—into the reduced number of available travel lanes between Harding Road and the merge with I-40. The congestion generated by the merging of the HOV into the general purpose lanes combined with the HOV lane stopping short of the downtown destinations of most commuters, wipes out much of the travel time savings from which HOVs benefit and greatly reduces the utility of the HOV lanes for transit or carpool use.

Table 3-3: Daily Average HOV Usage on I-24 between Old Hickory Blvd. and Waldron Road, 1999-2005

	1999 AM	1999 PM	2002 AM	2002 PM	2005 AM	2005 PM
Legal HOV Users	475	601	403	535	680	653
HOV Violators	485	575	927	1,059	1,265	914
Total Users	960	1,176	1,330	1,594	1,945	1,567

In addition to the interstate system, there are ten major arterial roadways that serve downtown Nashville. Of these arterial roadways, only one, Murfreesboro Road (US-41/70S), serves the complete Southeast Corridor area. Congestion occurs regularly on this corridor as well as on I-24 as traffic approaches and exceeds the roadway's operating capacity, and it occurs sporadically on other roads in response to temporary lane blockages. In the region, historically, congestion has been associated with radial commuting patterns leading in and out of the Davidson County and the central business district from surrounding suburban counties.

Along Murfreesboro Road there are numerous crossing streets both signalized and unsignalized. Additionally, there are several grade-separated roadways given the high volume of traffic along the crossing street. Focusing on the higher volume crossing streets, there are fourteen signalized intersections with crossing traffic of greater than ten thousand vehicles. At these locations, through traffic along Murfreesboro Road suffers delay due to competing time for green time. The most heavily traveled crossing streets along the corridor in Davidson County are Fesslers Lane, Donelson Pike, and Old Hickory Boulevard, with 27,000, 37,000, and 33,000 vehicles respectively crossing Murfreesboro Road. Within Rutherford County, Thompson Lane, SR96, and US231 are the most heavily traveled crossing streets with traffic volumes of 12,000, 42,000, and 26,000 respectively crossing Murfreesboro Road. The volumes of the crossing streets throughout the corridor and at these locations contribute to the increased delays and congestion levels experienced along Murfreesboro Road between downtown Nashville and the City of Murfreesboro.

Table 3-4: Traffic Volumes on Roads Crossing Murfreesboro Road, 2004

Crossing Street (North to South)	Traffic Volume (2004)
Fesslers Lane	27,366
Fosters Avenue	10,562
Thompson Place	12,625
Donelson Pike (SR255)	37,200
Old Hickory Boulevard (SR254)	32,800
SR171	15,090
Waldron Road	13,730
Stones River Road	12,210
Enon Springs Road	13,640
Thompson Lane	19,190
North Field	17,790
SR96	42,220
US231	25,870
TN Boulevard	20,841

Source: TDOT 2004 ADT Counts

Figure 3-3 illustrates commuting patterns between Rutherford and Davidson Counties and other counties within the region. Based on recent U.S. Census data, roughly 27 percent (or 25,000) of the commuters in Rutherford County traveled to Davidson County for work in 2000. In comparison, only 24 percent (or 14,271) of Rutherford County commuters worked in Davidson County in 1990. While the increase in the proportion of commuters traveling from Rutherford County to Davidson increased by only 3 percent between 1990 and 2000, the actual number of commuters increased by roughly 77 percent due to the 54% increase in population that occurred in Rutherford County during the same period.

Travel data from the MPO's regional model indicate that an estimated 108,000 home based work (HBW) trips come into downtown Nashville and the West End/Church Street area during the weekday from residents of Davidson and Rutherford Counties. In 2025, forecasts indicate the number of home based work trips to these areas to increase to more than 134,000 trips daily. Rutherford County commuters account for nearly 6 percent of these trips today and are projected to account for nearly 12 percent in 2025. This is because the rate of growth in Rutherford County is projected to exceed that of other suburban counties and Nashville-Davidson County.

Other major destinations in the study area include the corridors of Briley Parkway, Harding Road, Bell Road, Interchange City, Sam Ridley, and the City of Murfreesboro, which add to congestion on I-24 and Murfreesboro Road. Figure 3-4 illustrates 2002 and 2025 travel and commuting trends of Davidson and Rutherford County residents to major destinations along the corridor.

Looking more closely at all home based work trips originating from within the study area (with a destination within the study area – not just downtown), significant commuting and travel trends exist between several of the major destinations within the study area corridor. Over 110,000 home based work trips originate during the weekday within the study area corridor with over 56,000 (or 51 percent) of those trips destined for one of nine major destinations within the study area, as depicted in Figure 3-8.

These 56,000 home based work trips are longer distance trips, which traverse one of the two major north-south roadways (I-24 or Murfreesboro Road) within the study area corridor. The remaining 54,000 trips are shorter distance trips, which tend to remain within the area of origination.

The zone areas designated as the City of Murfreesboro and the Bell Road area have the largest concentration of shorter distance trips. The relatively high amount of shorter distance trips (intrazonal trips) within these areas is related to the high level of mixed-use development (employment and residential activity) within those zones compared to the other zone areas along the corridor.

Figure 3-3
Commuting Patterns in the Region

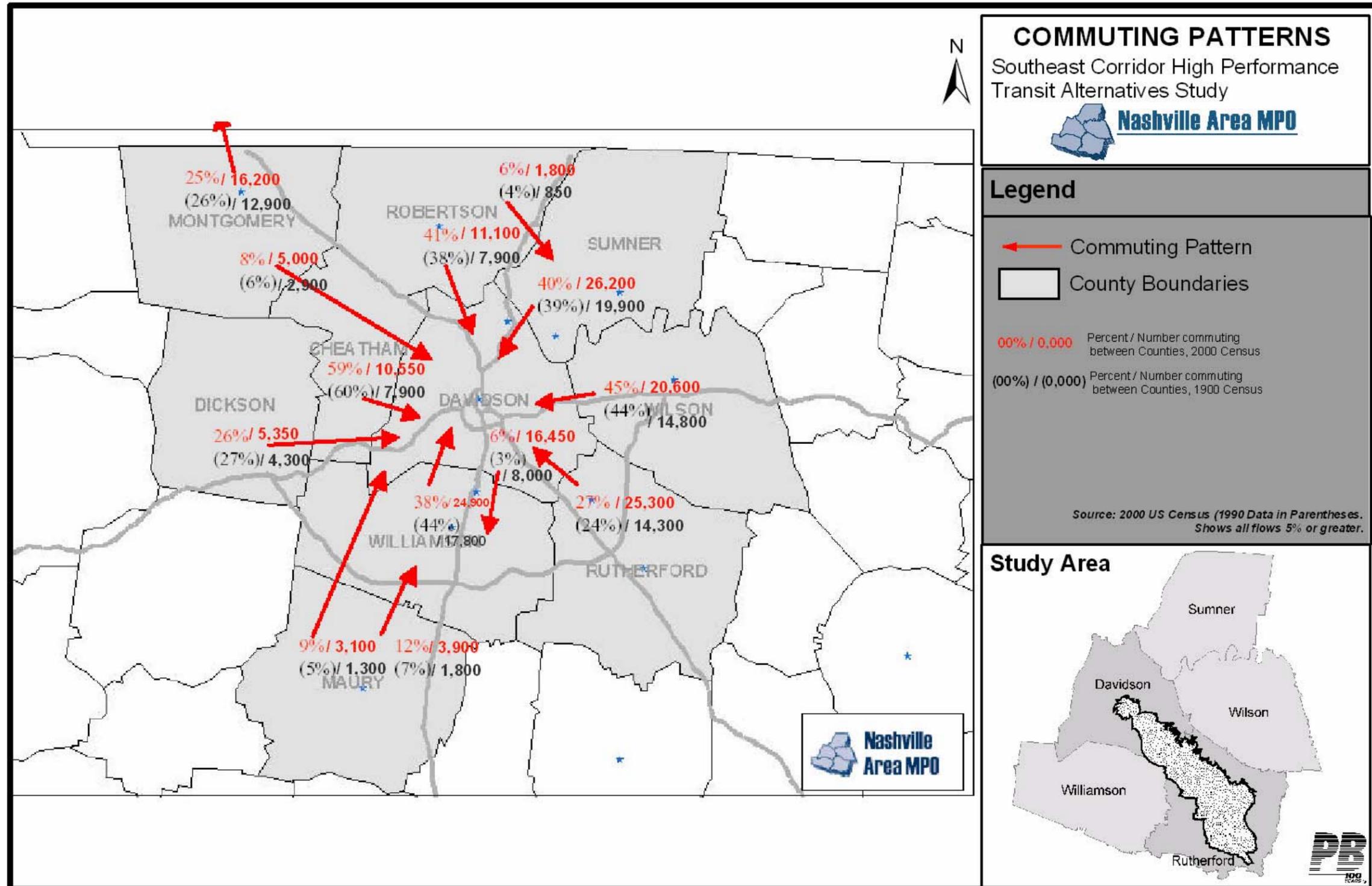
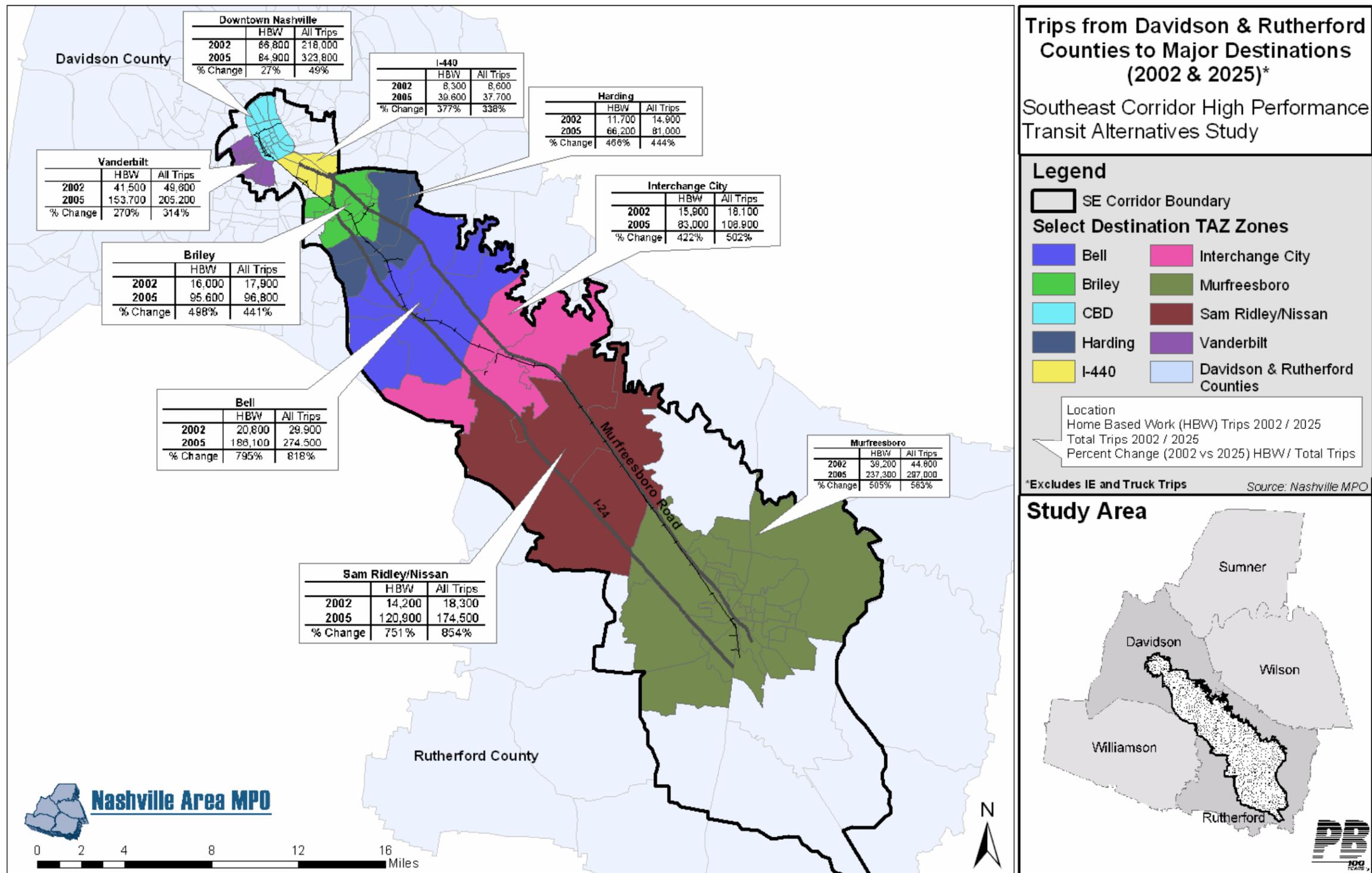


Figure 3-4
Trips from Davidson and Rutherford Counties to Major Destinations within the Study Area (2002 & 2025)



Figures 3-5 through 3-12 and Tables 3-5 through 3-9 depict 2002 and 2025 travel trends for both home based work trips and all trip purposes within the corridor - illustrating both the flows of trips from various concentrations within the study area (such as residential housing) to specific activities destinations within the corridor (such as employment and shopping). The initial graphs in each group compare the interzonal (between zones) and intrazonal (within zones) trips for each type trip destination. The second set shows a breakdown of interzonal trips in each destination zone. Comparing the two sets of graphs allows us to compare all types of trips with home-based work trips (trips between home and work).

Figure 3-5
SE Corridor Interzonal and Intrazonal Trips, All Trip Purposes, - 2002

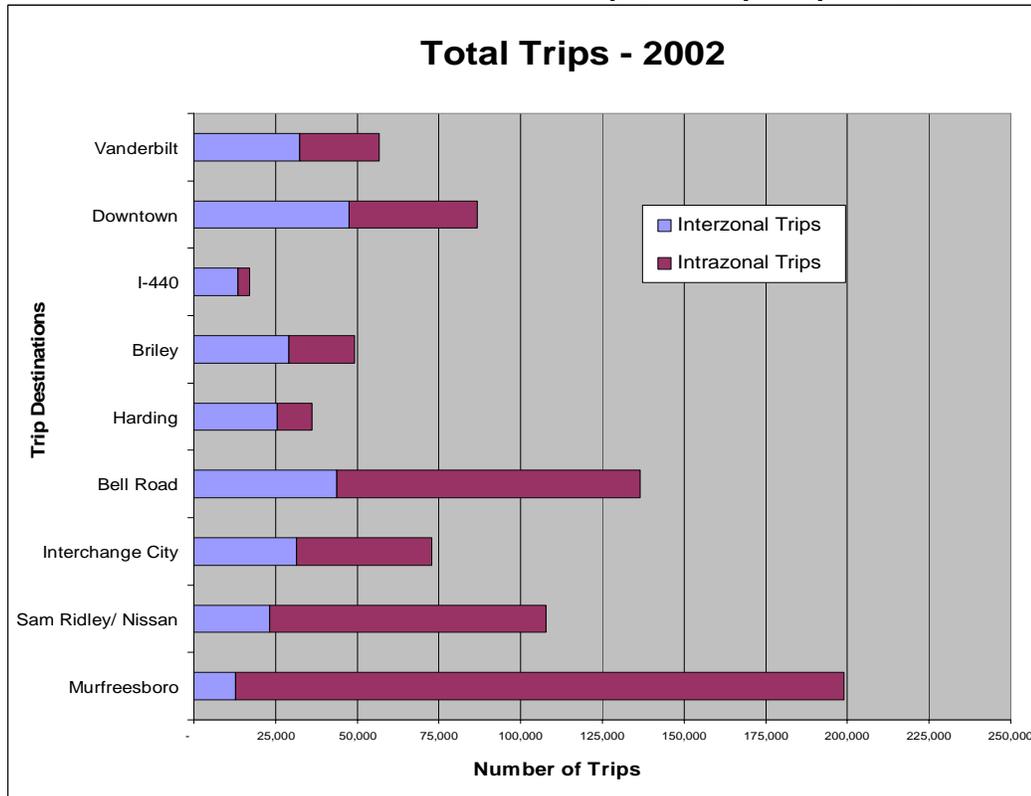
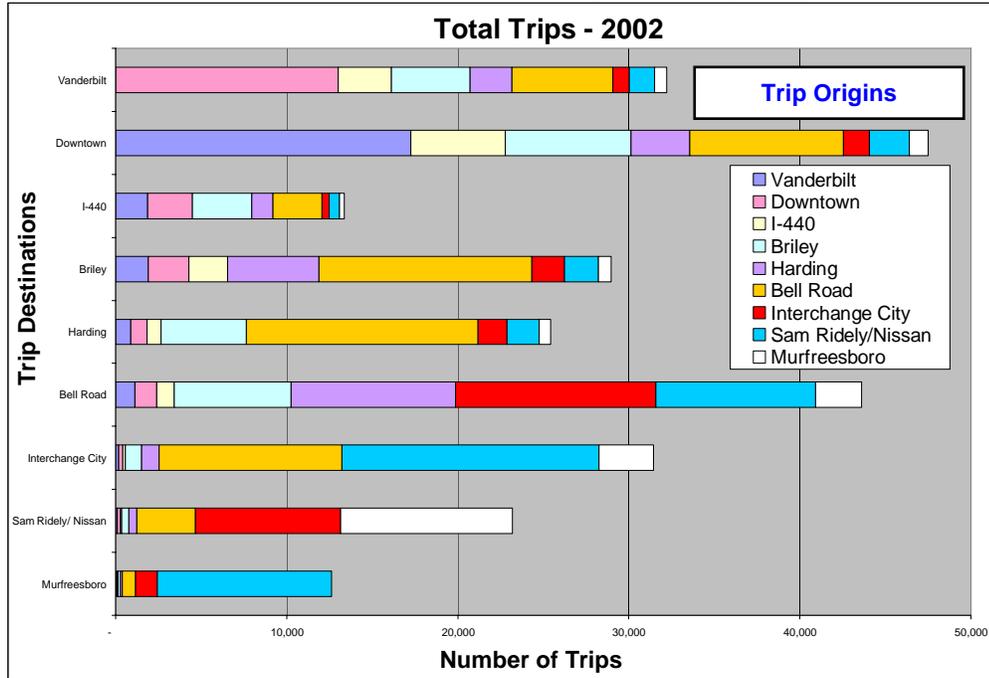


Table 3-5
SE Corridor Distribution of Interzonal Trips, All Trip Purposes, - 2002

2002	TO	Vanderbilt	Downtown	I-440	Briley	Harding	Bell Road	Interchange City	Sam Ridley/ Nissan	Murfreesboro	Total 2002 Trips
FROM	Vanderbilt	24,300	17,300	1,900	1,900	900	1,200	200	100	50	47,850
	Downtown	13,000	39,100	2,600	2,400	1,000	1,300	200	150	100	59,850
	I-440	3,100	5,500	3,600	2,300	800	1,000	150	100	50	16,600
	Briley	4,600	7,400	3,500	20,000	5,000	6,800	950	400	150	48,800
	Harding	2,500	3,400	1,300	5,300	10,700	9,600	1,000	500	150	34,450
	Bell Road	5,900	9,000	2,800	12,500	13,600	93,000	10,700	3,400	800	151,700
	Interchange City	1,000	1,500	500	1,900	1,700	11,700	41,400	8,500	1,250	69,450
	Sam Ridley/Nissan	1,500	2,400	600	2,000	1,900	9,300	15,000	84,600	10,200	127,500
	Murfreesboro	700	1,100	250	750	650	2,700	3,200	10,100	186,200	205,650
	Destine Trips	32,300	47,600	13,450	29,050	25,550	43,600	31,400	23,250	12,750	258,950
	Intrazonal Trips	24,300	39,100	3,600	20,000	10,700	93,000	41,400	84,600	186,200	502,900
	Total Trips	56,600	86,700	17,050	49,050	36,250	136,600	72,800	107,850	198,950	761,850

Intrazonal Trips are shorter distance trips within a given zone

**Figure 3-6
SE Corridor, Distribution of Interzonal Trips, All Trip Purposes, - 2002**



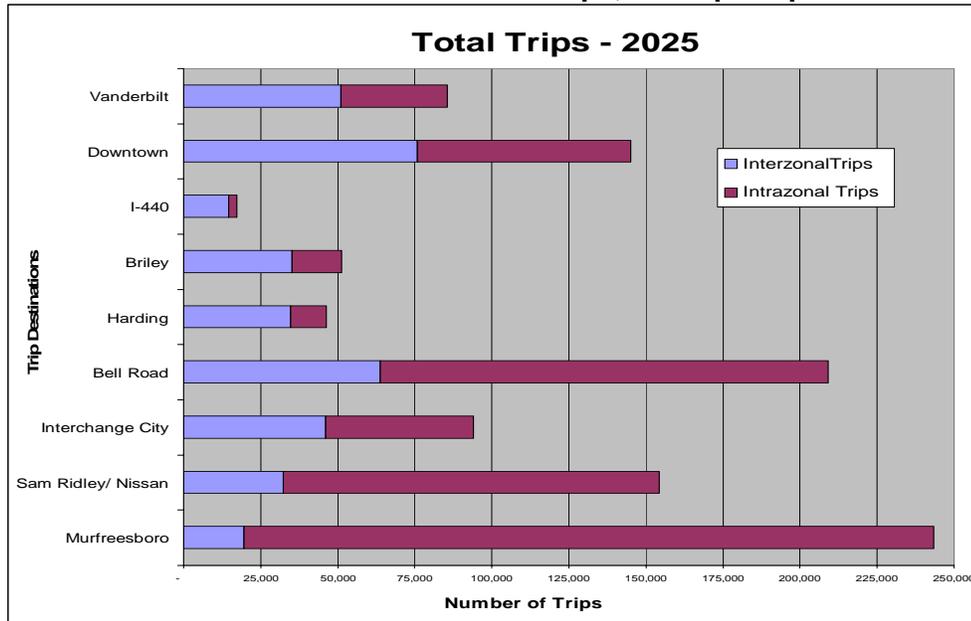
Note: Intrazonal trips, which tend to be shorter distance trips, are not included in the above figure

**Table 3-6
SE Corridor All Trip Purposes – 2002**

2002	TO	Vanderbilt	Downtown	I-440	Briley	Harding	Bell Road	Interchange City	Sam Ridley/Nissan	Murfreesboro	Total 2002 Trips
FROM	Vanderbilt	24,243	17,249	1,861	1,927	882	1,149	190	121	49	47,671
	Downtown	13,000	39,095	2,614	2,342	970	1,273	224	153	65	59,736
	I-440	3,118	5,512	3,597	2,272	812	1,015	150	88	29	16,593
	Briley	4,594	7,376	3,469	19,946	4,960	6,819	945	411	125	48,645
	Harding	2,444	3,409	1,259	5,328	10,715	9,601	1,040	480	131	34,407
	Bell Road	5,915	9,005	2,842	12,460	13,551	93,260	10,684	3,397	782	151,896
	Interchange City	960	1,492	438	1,906	1,715	11,727	41,362	8,504	1,249	69,353
	Sam Ridley/Nissan	1,489	2,356	615	1,989	1,872	9,317	15,016	84,568	10,202	127,424
	Murfreesboro	692	1,083	254	743	645	2,714	3,185	10,057	186,177	205,550
	Destine Trips	32,212	47,482	13,352	28,967	25,407	43,615	31,434	23,211	12,632	258,312
	Intrazonal Trips	24,243	39,095	3,597	19,946	10,715	93,260	41,362	84,568	186,177	502,963
	Total Trips	56,455	86,577	16,949	48,913	36,122	136,875	72,796	107,779	198,809	761,275

Intrazonal Trips are shorter distance trips within a given zone

**Figure 3-7
SE Corridor Interzonal and Intrazonal Trips, All Trip Purposes – 2025**

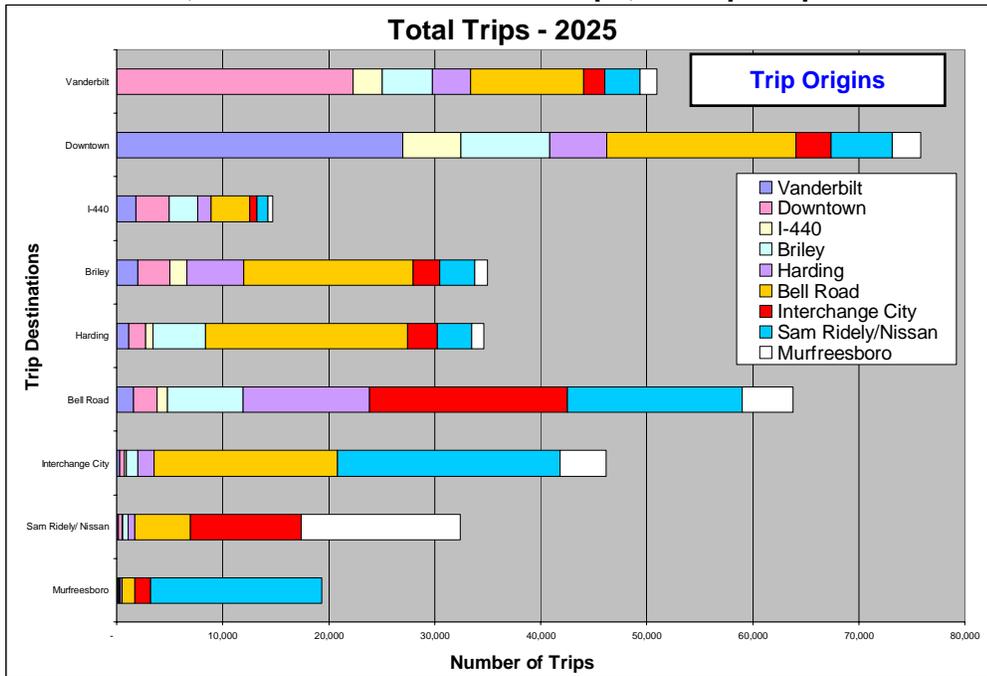


**Table 3-7
SE Corridor All Trip Purposes – 2025**

2025	TO	Vanderbilt	Downtown	I-440	Briley	Harding	Bell Road	Interchange City	Sam Ridley/ Nissan	Murfreesboro	Total 2025 Trips
FROM	Vanderbilt	34,400	27,000	1,800	2,000	1,200	1,600	300	200	100	68,600
	Downtown	22,300	69,200	3,150	3,000	1,550	2,200	450	300	100	102,250
	I-440	2,750	5,500	2,600	1,650	700	1,000	200	100	50	14,550
	Briley	4,800	8,450	2,700	16,250	4,950	7,200	1,100	500	150	46,100
	Harding	3,600	5,300	1,250	5,350	11,700	11,900	1,500	650	200	41,450
	Bell Road	10,700	17,850	3,700	16,000	19,100	145,300	17,300	5,250	1,200	236,400
	Interchange City	2,000	3,350	700	2,550	2,800	18,700	47,900	10,450	1,500	89,950
	Sam Ridley/Nissan	3,400	5,700	1,000	3,300	3,250	16,500	21,000	121,900	16,200	192,250
	Murfreesboro	1,600	2,700	450	1,250	1,150	4,800	4,300	15,000	224,000	255,250
	Destine Trips	51,150	75,850	14,750	35,100	34,700	63,900	46,150	32,450	19,500	373,550
	Intrazonal Trips	34,400	69,200	2,600	16,250	11,700	145,300	47,900	121,900	224,000	673,250
	Total Trips	85,550	145,050	17,350	51,350	46,400	209,200	94,050	154,350	243,500	1,046,800

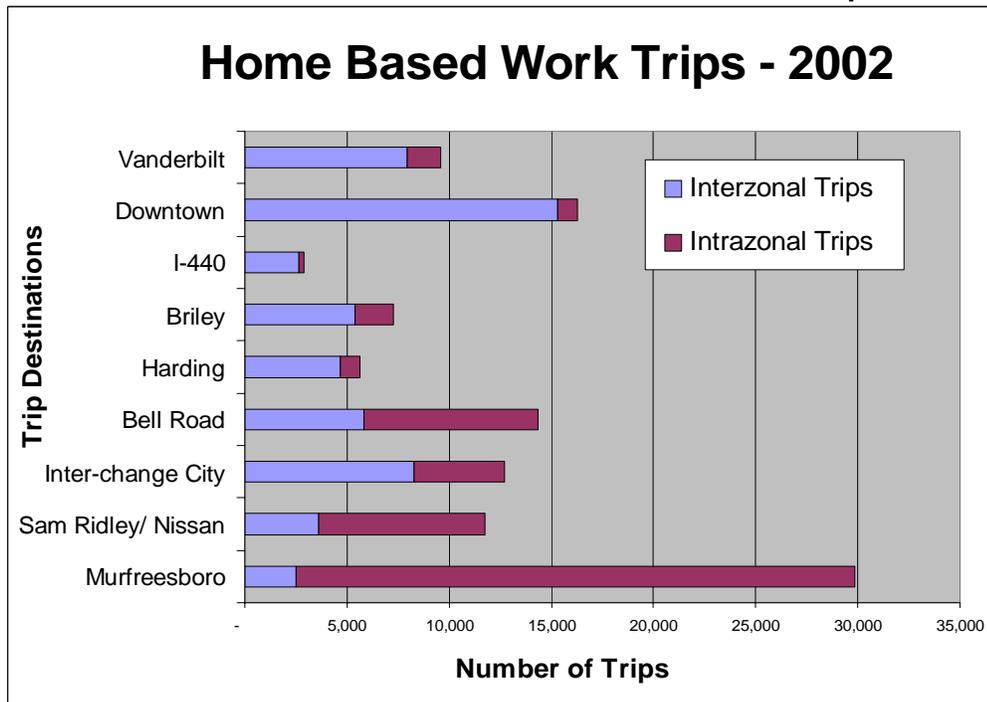
Intrazonal Trips are shorter distance trips within a given zone

Figure 3-8
SE Corridor, Distribution of Interzonal Trips, All Trip Purposes - 2025

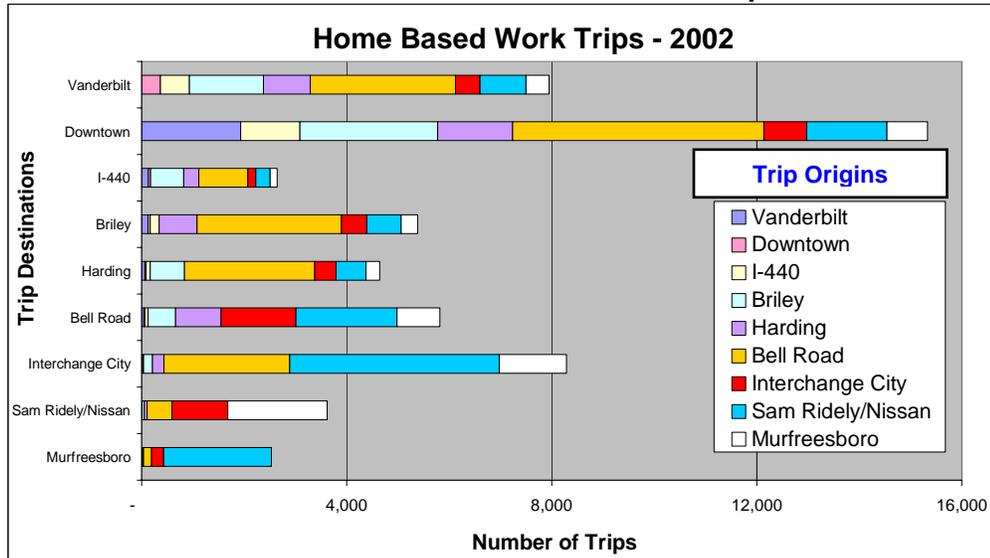


Note: Intrazonal trips, which tend to be shorter distance trips, are not included in the above figure

Figure 3-9
SE Corridor Interzonal and Intrazonal Home Based Work Trips – 2002



**Figure 3-10
SE Corridor Interzonal Home Based Work Trips – 2002**



Note: Intrazonal trips, which tend to be shorter distance trips, are not included in the above figure

**Table 3-8
SE Corridor Home Based Work Trips – 2002**

2002	TO	Vanderbilt	Downtown	I-440	Briley	Harding	Bell Road	Interchange City	Sam Ridley/Nissan	Murfreesboro	Total 2002 Trips
FROM	Vanderbilt	1,650	1,900	150	100	100	50	20	10	-	3,980
	Downtown	400	950	50	50	20	20	10	-	-	1,500
	I-440	600	1,150	250	200	100	50	20	10	10	2,390
	Briley	1,450	2,700	650	1,900	700	550	200	40	20	8,210
	Harding	900	1,500	300	750	1,000	900	200	50	20	5,620
	Bell Road	2,800	4,900	950	2,800	2,550	8,500	2,500	500	150	25,650
	Interchange City	500	850	150	500	400	1,500	4,400	1,100	250	9,650
	Sam Ridley/Nissan	900	1,550	300	700	600	2,000	4,100	8,150	2,100	20,400
	Murfreesboro	450	800	150	300	300	800	1,300	1,900	27,300	33,300
	Destine Trips	8,000	15,350	2,700	5,400	4,770	5,870	8,350	3,610	2,550	56,600
	Intrazonal Trips	1,650	950	250	1,900	1,000	8,500	4,400	8,150	27,300	54,100
	Total Trips	9,650	16,300	2,950	7,300	5,770	14,370	12,750	11,760	29,850	110,700

Intrazonal Trips are shorter distance trips within a given zone

Figure 3-11
SE Corridor Interzonal and Intrazonal Home Based Work Trips - 2025

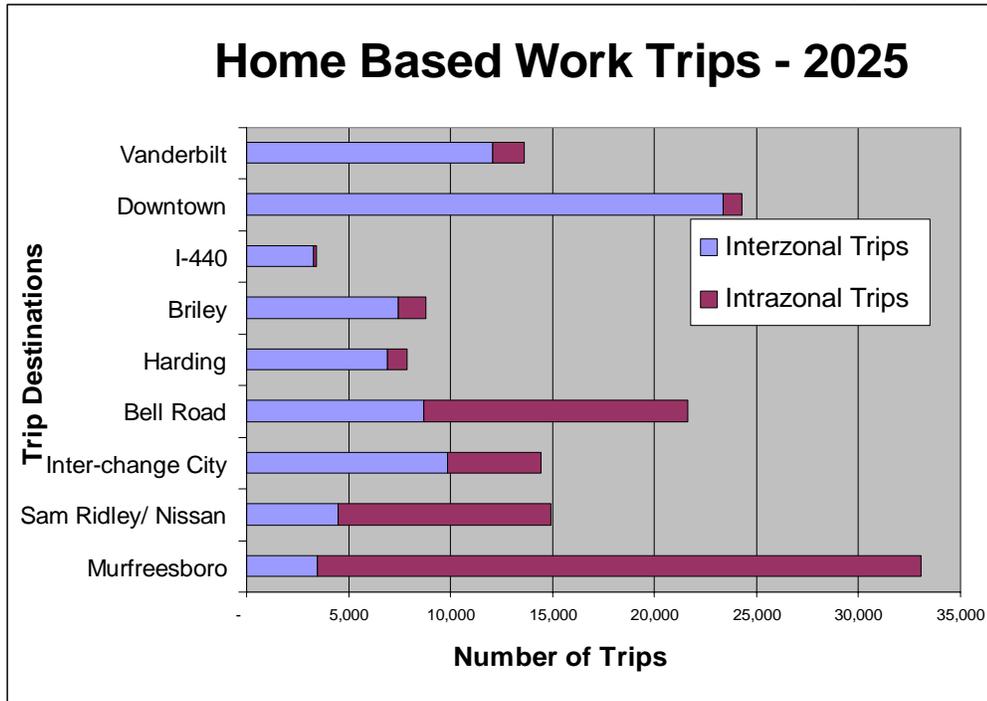
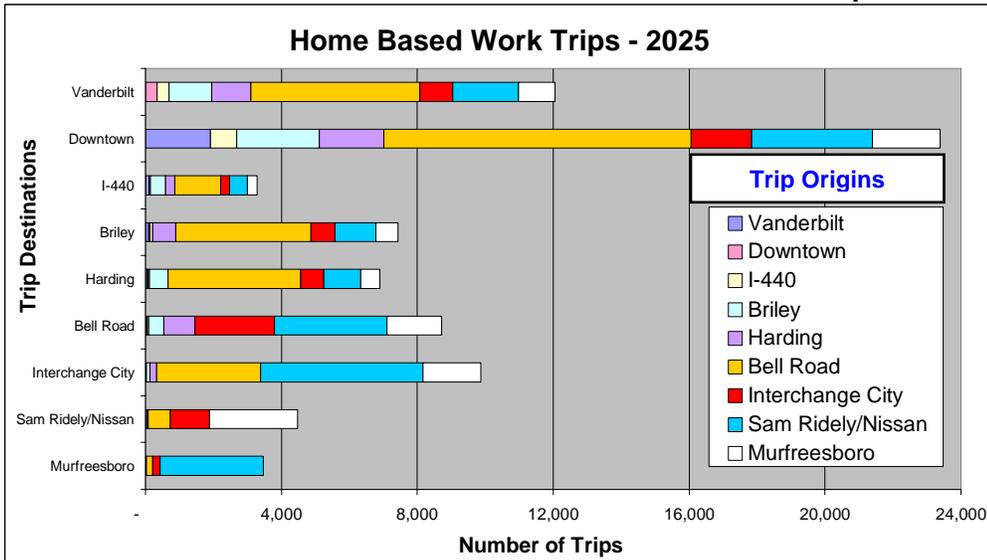


Figure 3-12
SE Corridor Distribution of Interzonal Home Based Work Trips - 2025



Note: Intrazonal trips, which tend to be shorter distance trips, are not included in the above figure

**Table 3-9
SE Corridor Home Based Work Trips – 2025**

2025	TO	Vanderbilt	Downtown	I-440	Briley	Harding	Bell Road	Interchange City	Sam Ridley/Nissan	Murfreesboro	Total 2025 Trips
FROM	Vanderbilt	1,600	1,900	100	100	50	50	10	10	-	3,820
	Downtown	350	900	50	50	20	20	10	-	-	1,400
	I-440	350	800	150	100	50	20	10	10	-	1,490
	Briley	1,250	2,400	450	1,350	550	450	100	50	10	6,610
	Harding	1,200	1,900	300	700	1,000	900	200	50	20	6,270
	Bell Road	5,000	9,000	1,350	3,950	3,900	12,900	3,050	650	200	40,000
	Interchange City	1,000	1,800	250	700	700	2,300	4,600	1,150	200	12,700
	Sam Ridley/Nissan	1,900	3,600	500	1,200	1,100	3,300	4,800	10,500	3,000	29,900
	Murfreesboro	1,100	2,000	300	650	600	1,600	1,700	2,600	29,600	40,150
	Destine Trips	12,150	23,400	3,300	7,450	6,970	8,640	9,880	4,520	3,430	79,740
	Intrazonal Trips	1,600	900	150	1,350	1,000	12,900	4,600	10,500	29,600	62,600
	Total Trips	13,750	24,300	3,450	8,800	7,970	21,540	14,480	15,020	33,030	142,340

Intrazonal Trips are shorter distance trips within a given zone

Travel forecasts for the year 2025 indicate a 42 percent increase in home based work trips (those considered longer distance trips) along the corridor over 2002 travel conditions. Additionally, the longer distance work trips increase from 51 percent to 56 percent of the total home based work trips generated within the study area corridor. Analysis of the interzonal and intrazonal data indicates the need for transportation improvements that will provide improved service for the growing commuter market to downtown Nashville and the Vanderbilt-West End area. The number of intrazonal trips generally exceeds the number of interzonal, even in the case of the home-based work trips, which tend to be longer than average trips. The data for shorter distance trips in the Bell Road area along with Interchange City, Sam Ridley/Nissan Boulevard, and the City of Murfreesboro, rival that of the areas of downtown Nashville and the Vanderbilt area. Downtown Nashville and the growing employment center surrounding Vanderbilt, West End and Music row will remain the primary destination for transit improvements in the corridor. However, and just as importantly, the data indicates that improvements are needed to facilitate a growing volume of shorter trips, including intrazonal trips and trips between adjacent zones, in the corridor. Transit improvements considered in the corridor must not only provide improved access for commuters to downtown Nashville, but must also be capable of providing viable alternatives for these shorter trips, and trips to strong secondary markets in the corridor including Murfreesboro, LaVergne, Smyrna and Interchange City. This suggests that, in addition to line haul rail or bus improvements, increased feeder bus service and local bus services outside Nashville-Davidson County will be required to meet the future needs for transit in the corridor.

3.5.1.1 Level of Service

Consistent with industry standards, traffic operations have been categorized into one of six level of service (LOS) conditions. The volume to capacity ratios used for each LOS are:

- A: 60% of capacity or less
- B: 61 to 70% percent of capacity
- C: 71 to 80% percent of capacity
- D: 81 to 90% percent of capacity
- E: 91 to 100% percent of capacity
- F: Over 100% percent of capacity

The scale sets LOS A as a free-flow traffic condition where motorists experience virtually no obstacles to their movement. Level of service B through E represents gradually declining traffic

operation. LOS F designates a breakdown in traffic flow characterized by bumper to bumper traffic.

In the Nashville area, LOS D is the service level accepted by the MPO as the minimum desired standard. Figure 3-13 illustrates the current and future level of service of I-24 and Murfreesboro Road within the study area.

Tables 3-10 and 3-11 identify the overall travel conditions of I-24 and Murfreesboro Road including the number of lanes, existing traffic counts, and forecasted travel demand. Both of these facilities are the only two radial routes serving the complete length of the southeast area from downtown Nashville to the City of Murfreesboro.

Table 3-10
I-24 from Downtown to Rutherford/Coffee County Line

I-24 From I-40 Downtown Nashville to:	2003					2025		
	Average Daily Traffic (ADT)	Level of Service (LOS)	Average AM Peak Speed (MPH)	Average PM Peak Speed (MPH)	Existing Number of Lanes	Traffic Forecasts	Level of Service (LOS)	Future Number of Lanes*
Fesslers Lane	176,000	F	25	31	8	217,000	F	8
Briley Parkway (SR 155)	121,000	D	17	46	8	134,000	E	8
Bell Road	101,000	D	52	60	8	140,000	E	8
Old Hickory Blvd (SR 171)	102,000	D	54	62	8	132,000	E	8
Sam Ridley Pkwy (SR 266)	85,000	C	63	66	8	124,000	E	8
Nissan Drive (SR 102)	84,000	C	67	68	8	104,000	D	8
SR 840	81,000	E	69	67	8	89,000	C	8
SR 96	64,000	E	65	53	4	93,000	C	8
US 231	53,000	D	69	68	4	89,000	C	8
Rutherford/Coffee Co. Line	39,000	C	70	69	4	63,000	E	4

* Based on Nashville Area MPO 2025 Long Range Transportation Plan
 Bold reflects roadways with a LOS of D or worse. Pink reflects a change of one category in LOS and red reflects a change of two categories in LOS (between 2003 and 2025)
 Source: Nashville Area MPO and TDOT

**Table 3-11
Murfreesboro Road from Downtown Nashville to US-231 in Murfreesboro**

Murfreesboro Road From 8th Avenue to:	2003					2025		
	Average Daily Traffic (ADT)	Level of Service (LOS)	Average AM Peak Speed (MPH)	Average PM Peak Speed (MPH)	Existing Number of Lanes	Traffic Forecasts	Level of Service (LOS)	Future Number of Lanes*
Fesslers Lane	29,000	B	21	28	5	27,000	B	5
Thompson Lane	24,000	B	24	28	5	32,000	D	5
Briley Pkwy (SR155)	28,000	A	32	24	7	39,000	B	7
Bell Road	38,000	F	28	31	4	36,000	F	4
OHB/Hobson Pike (SR 171)	22,000	B	32	36	4	65,000	F	4
Sam Ridley Pkwy	23,000	B	37	35	4	51,000	F	4
Nissan Pkwy	22,000	B	36	37	4	30,000	C	4
SR-840	41,000	F	52	53	4	57,000	F	6
SR 96	32,000	D	35	41	4	32,000	A	6
S Church Street (SR 231)	33,000	B	18	22	6	28,000	A	6

* Based on Nashville Area MPO 2025 Long Range Transportation Plan
 Bold reflects roadways with a LOS of D or worse. Pink reflects a change of one category in LOS and red reflects a change of two categories in LOS (between 2003 and 2025)
 Source: Nashville Area MPO and TDOT

Table 3-12 identifies current roadway improvements under construction or planned for I-24 and Murfreesboro Road.

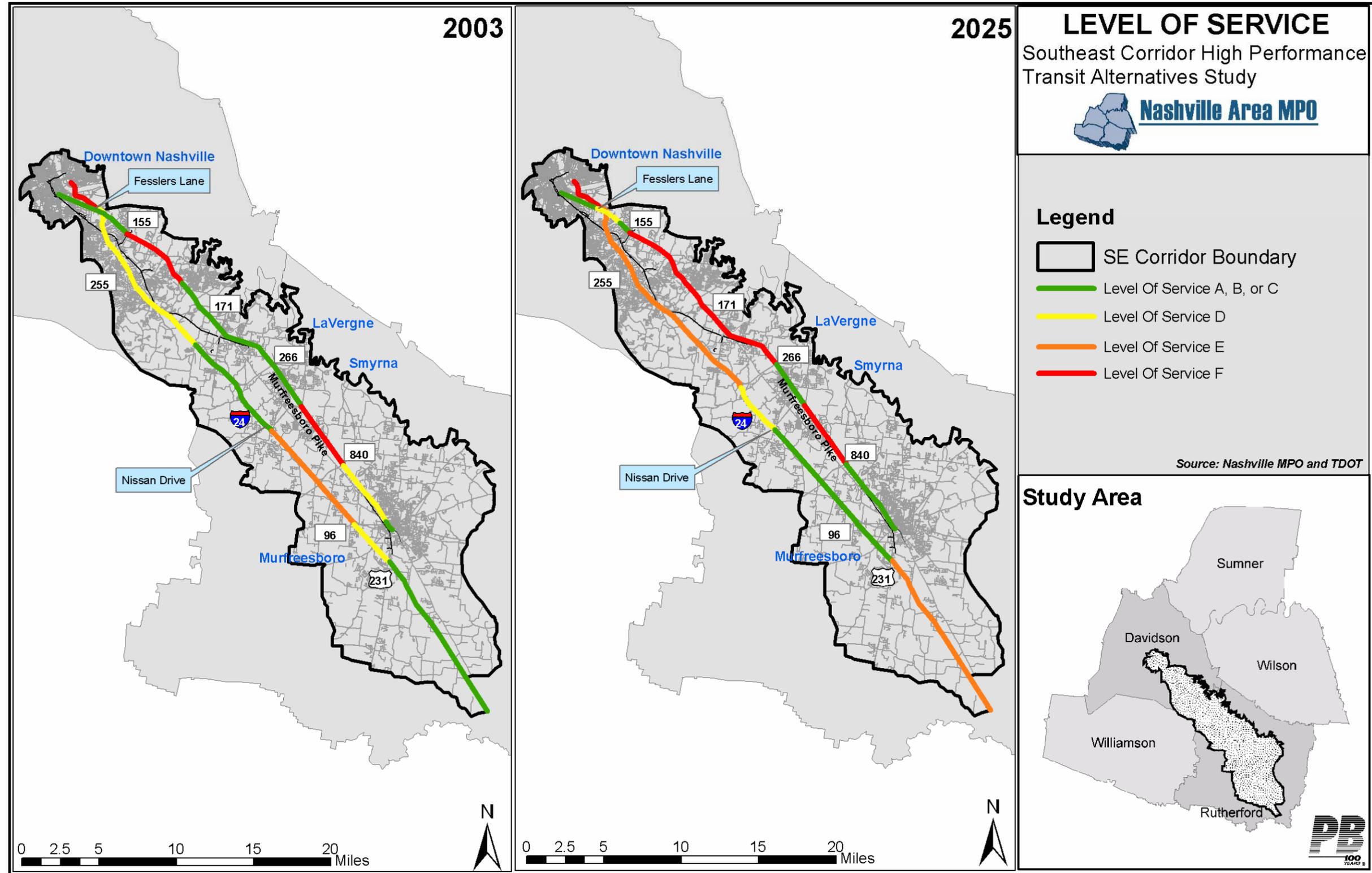
**Table 3-12
Current Planned Roadway Improvements**

Location	Type Improvement	Schedule/Activity
I-24 at Manson Pike	New Interchange	Completed July 2005
I-24 from SR-840 to east of SR-96	Widening from 4 to 8 lanes/2 of which are HOV	Completed September 2005
I-24 from SR-96 to east of US231	Widening from 4 to 8 lanes/2 of which are HOV	Projected Completion June 2008
I-24 at SR-99	New Interchange	Projected Completion June 2008
US-41/70S @ Memorial Ave. (SR-10) & Old Fort Parkway (SR-96)	New Interchange	Under Development

Source: TDOT

The Southeast Corridor continues to experience tremendous increases in both traffic volumes and congestion. This primarily results from the growing population and employment base of the corridor as well as the overall growth in the public's propensity to travel. Even with currently planned roadway improvements, travel demand will continue to exceed the available capacity of the roadway network. Additional improvements will be required to address these problems.

Figure 3-13
Highway Level of Service (2003 & 2025)



3.5.2 Public Transportation

The study area for the Southeast Corridor includes several local, express and commuter bus routes, however, there are a number of gaps in the public transit offerings throughout the corridor. Particularly, there are limitations in terms of geographic coverage, service availability by time of day and day of week, and other issues that affect access to transit. Because of these gaps, many of the transportation markets identified earlier in this report cannot be served with the existing transit system. Ridership increases on the services that exist in the corridor indicate an interest and demonstrate a need for improved transit services in the corridor.

MTA

The Metropolitan Transit Authority (MTA) has a charter to provide bus service within Nashville-Davidson County. The network of transit service operated by MTA is illustrated in Figure 3-14. The Regional Transportation Authority (RTA) contracts with MTA to operate a commuter bus service ("Relax-and-Ride") to the communities of LaVergne, Smyrna, and Murfreesboro. The study area currently supports parts of five local bus routes, parts of four express bus routes and a commuter bus route. In Table 3-13, the MTA bus routes serving the study area are listed by route number and name and includes the hours and headways for each route.

MTA is a component unit of the Metropolitan Government and was created in 1953 to supervise, regulate and maintain jurisdiction over public transit in the City of Nashville. MTA is governed by a five-member board appointed by the Mayor and approved by the Council. The Metropolitan Government partially funds MTA's annual operating and capital budgets. MTA currently employs an active fleet of approximately 140 buses, vans and trolleys serving approximately seven million riders annually.

In July 2004, MTA and Vanderbilt University implemented a new ridership program for the college's faculty and staff. Under the program, a Vanderbilt employee can use his or her university identification card in the bus farebox for free fare; for which MTA then invoices the university. In the first month, the program generated nearly 15,000 boardings, with primary ridership generated from routes within the southeast corridor and the West End Boulevard and Hillsboro Road corridors. Ridership on this program is currently (January 2006) approximately 35,000 per month.

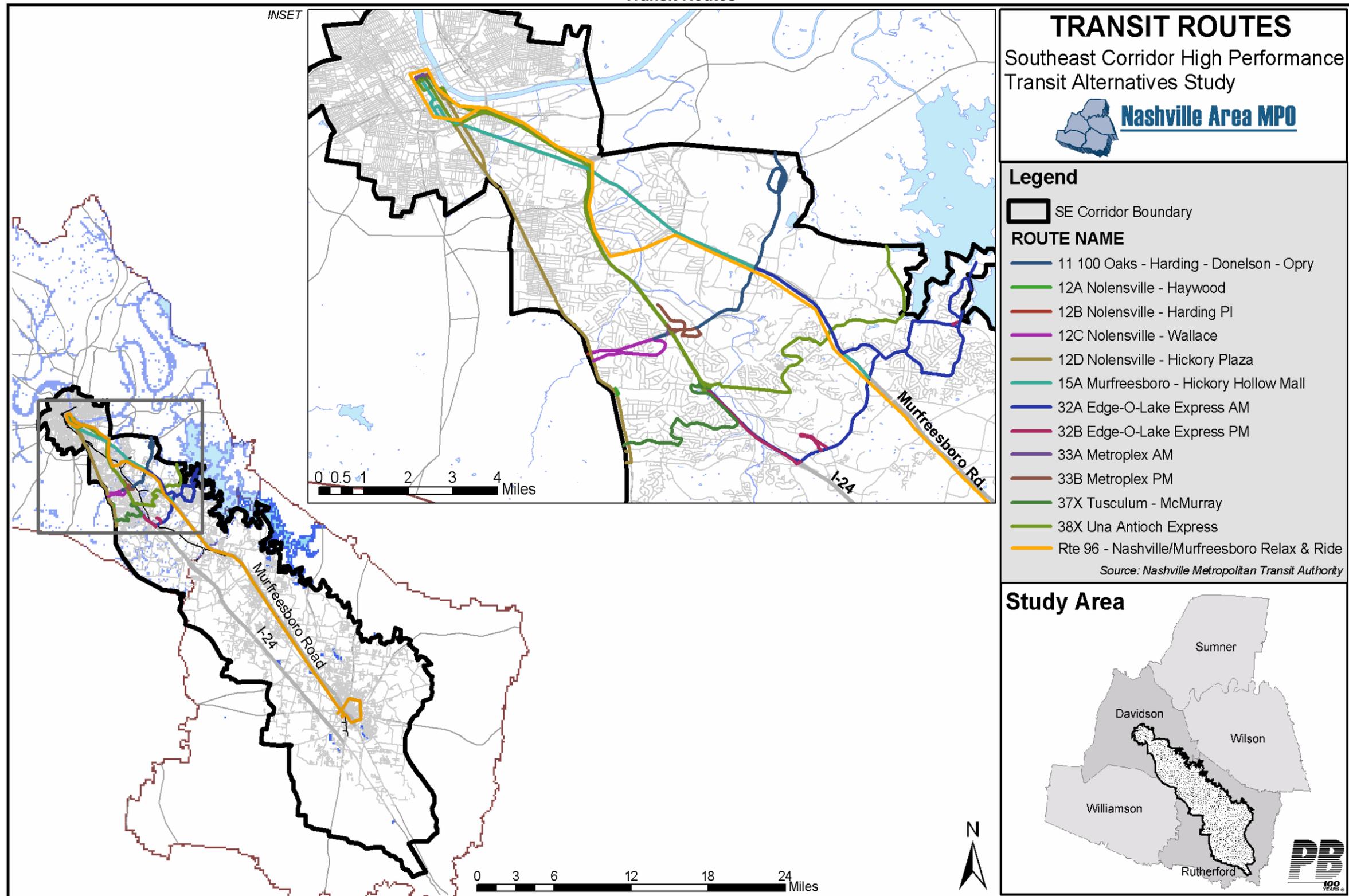
The MTA also operates Access Ride, which is a paratransit service for those with mobility impairments who cannot use fixed-route service. Access Ride provides curb-to-curb service in lift equipped vehicles. The service is required to be equivalent to non-commuter, fixed-route service and is offered within 1 1/2 miles on either side of every fixed-route during the same service hours. Customers beyond this service area are provided trips based on availability. The service is provided from origin to destination on a curb-to-curb basis. Customers are able to make reservations up to the day before their trip, but no more than 7 days in advance.

RTA

Created by state statute in 1990, the Regional Transportation Authority (RTA) is a nine-county regional agency in the Nashville metropolitan area whose mission is to plan and develop a regional transit system including developing a region-wide commuter rail system.

RTA also administers the region's carpool and vanpool program. This program is described further in Section 3.5.7. RTA collaborates with MTA to deliver a number of other commuter and employment related transportation services. MTA operates three regional commuter bus routes under contract with RTA that deliver commuter services between downtown Nashville and Murfreesboro, Hendersonville, and Mount Juliet. These routes serve various park and ride

Figure 3-14
Transit Routes



**Table 3-13
Study Area Transit Routes & Service**

Route No.	Route Name	Area Served	Days of Service	Service Headways (min.) or No. of Express Trips		
				Peak	Off-Peak	Weekend
Local Routes						
11	Southeast Connector	Crosstown Route connecting 100 Oaks Mall, International Airport and Opry Mills Shopping Center	Weekday	40 min.	40 min.	N/A
12	Nolensville	Along Nolensville Road to Old Hickory Road	Weekday, Saturday and Sunday	15 min.	20/30 min.	40/60 min. (40 typ.)
15	Murfreesboro	Murfreesboro Rd to Hickory Hollow Mall	Weekday, Saturday and Sunday	17/20 min.	20 min.	30/60 min. (60 typ.)
18	Elm Hill Pike/ Airport	Elm Hill Pike, Donelson Pike and Airport	Weekday, Saturday and Sunday	60/70 min.	65/75 min.	60 min.
25	Midtown	Loop service along Deaderick St., Charlotte Ave., Patterson St., 20/21 Sts., Edgehill Ave., Ch.Davis Blvd., Hermitage Ave., and 4/5 Sts.	Weekday, Saturday and Sunday	30 min.	60 min.	60 min.
Express and Commuter Routes						
32X	Edge-O-Lake Express	I-40 and Bell Road to Edge-O-Lake neighborhood.	Weekday	8 am/pm peak trips	3 off-peak trips	N/A
33X	Hickory Hollow Mall/ Old Hickory Express	I-24 and Bell Road to Hickory Hollow Mall and Hickory Plaza.	Weekday	6 am/pm peak trips	2 off-peak trips	N/A
37X	Tusculum/ McMurray Express	I-24 or I-40 depending on am or pm trip. Service along Old Hickory Blvd., Edmonson Pike, McMurray Rd., Ocala Ave., and Apache Trl.	Weekday	7 am/pm trips	2 off-peak trips	N/A
38X	Una Antioch Express	I-24 or I-40 depending on am or pm trip. Service along Richards Blvd., Una-Antioch Pike and Bell Rd.	Weekday	6 am/pm trips	2 off-peak trips	N/A
96	Nashville/ Murfreesboro Relax and Ride	Murfreesboro Rd to Murfreesboro and Middle TN State University	Weekday	9 am/pm trips	None	N/A

Source: MTA

locations in outlying counties and are supported by a guaranteed ride home program. Recent ridership on these routes has been more than 50,000 rides annually.

The collaboration of the two agencies extends to the delivery of several services funded by RTA's Job Access grant. These services include extension of regular bus routes to employment sites to meet specific work shift needs during the day. It also includes RTA funding the weekend operation of MTA's night owl service. This is an after midnight service offered on a demand response basis that provides riders a trip from the downtown transit center to bus stop locations within a limited area of central Nashville. These services have been valuable in solving the transportation issues many employees face in reaching employment opportunities. The Job Access funding has provided an estimated 46,000 rides annually the past few years.

3.5.2.1 Operating Characteristics

The MTA transit system operates regular weekday service, Monday through Friday, and weekend service, with different Saturday and Sunday schedules. Hours of service and headways vary among the routes depending on service periods and weekday and weekends. Most local routes operate with 15 to 30 minute peak-period headways, 20 to 45 minute headways during the mid-day, and hourly service during the late evening, on a typical day. A summary of the days of operation and typical headways for the routes throughout the study area is in Table 3-13 above.

In the MTA system, the express and commuter bus routes share many common characteristics with regard to their schedules and service. They both provided a limited, primarily peak hour service during weekdays; no weekend service; faster service at higher travel speeds to outlying neighborhoods and communities; and have less frequent stops than local bus service. The express bus routes make more frequent stops in the outlying neighborhoods and stay within Davidson County. Many of the passengers on these routes are public school students attending various magnet schools within the county. The commuter bus routes provide more limited stop service, focusing on picking up commuters at park and ride lots in larger communities and cities outside of Davidson County.

3.5.2.2 Level of Service

Transit level of service (LOS) is a qualitative assessment of transit service from the user's point of view. The Transit Capacity and Quality of Service Manual (TCQSM) provides six designated ranges of values for a particular service measure, graded from "A" (best) to "F" (worst) based on a transit passenger's perception of a particular aspect of transit service. The LOS of existing public transportation services within the study area can be based on a number of service measures as defined by the TCQSM. These are:

- Service frequency
- Hours of service
- Service coverage
- Passenger loads
- Reliability
- Transit/auto travel time difference

Focusing on the main travel route along Murfreesboro Road in the study area, the LOS of existing service can be quantified using the transit routes that serve these streets. The area is serviced primarily by bus routes 15 and 96. Route 96 is a commuter express route, which provides limited peak-period service on weekdays to the city of Murfreesboro, while route 15 is a local route that travels along Murfreesboro Road as far south as Bell Road and Hickory Hollow Mall.

For the section of Murfreesboro Road served by route 15, the service frequency LOS (based on headway only) would range between LOS C during peak periods and LOS B to E during off-peak periods. This is based on the route's operating headway which ranges from 17 to 60 minutes during peak and off-peak hours. The LOS based on the hours of service criteria would be LOS B. This is a result of the route providing a minimum of hourly service until midnight. The TCQSM identifies LOS B as service being available from 17-18 hours per day.

For the sections of Murfreesboro Road south of Bell Road that are served only by limited, peak-hour route 96, the LOS measures are lower. Based on the operating headways, which range from 57 to 105 minutes, the existing LOS for service for the city of Murfreesboro ranges

between E and F. Service to the town of Smyrna is more frequent, ranging from 26 to 95 minutes, which establishes existing LOS ranges between D and F.

Travel times on route 15 along Murfreesboro Road vary between the peak, mid-day and evening periods. Based on the schedule, the peak period travel times vary between 48 and 62 minutes from Hickory Hollow Mall to the Deaderick Street Mall in downtown Nashville. During mid-day, the same route is scheduled to take 50 minutes and the evening service is scheduled to take 39 minutes. Travel times on route 96, from the Smyrna K-Mart park and ride lot to the Deaderick Street Mall, vary from 50 to 61 minutes according to the schedule during the am and pm peak period service. From Murfreesboro to the Deaderick Street Mall, the scheduled travel times vary between 82 and 88 minutes during the peak period. Later during the study process, these travel times will be compared to the auto travel times generated by the transportation model for this corridor. This will reveal significant information about any disparity between to these different types of transportation.

Service reliability is another measure of service for public transit. Existing transit service reliability, in terms of on-time performance and headway adherence, can be negatively affected by several variables. These variables include school zones along the roadway, accidents, and traffic flow delays. As the previous discussions of traffic congestion indicate, there are a number of locations along Murfreesboro Road where drivers experience congested conditions on a daily basis, exacerbated by accidents and other temporary disruptions. These conditions negatively impact bus schedule adherence and service reliability on the bus system. Service reliability in congested conditions can only be achieved by using bus priority treatments such as dedicated lanes or signals, or by providing additional right of way for transit vehicles over some or all of the right of way. These will be key considerations in developing transit alternatives along both Murfreesboro Road and I-24.

Passenger loadings—the peak number of people on board the bus at a given time period—are another indicator of transit system performance. Information provided by MTA suggests that portions of Route 15 (Murfreesboro Road), Route 12 (Nolensville Road) and Route 18 (Elm Hill Pike/Airport) experience standing loads (more passengers on board than there are seats) during the morning and evening peak periods. This is further indication that additional transit capacity, in the form of more frequent transit service, is required in the corridor to meet existing demand. Travel demand analysis to be performed in the development of alternatives will be used to estimate future demand for transit and recommend an optimum level of transit service to meet this demand in the corridor.

3.5.2.3 Fare Structure

The MTA has a number of fare options associated with use of the current transit system. Their fare options include the following:

- Local Service \$1.45
- Transfer \$0.10
- Elderly and Disabled \$0.70
- Youth \$0.90
- Express Service \$1.75 to \$2.25

An extensive set of fare pass options are available including:

- 20 Ride Local \$24.85
- 7 Day Pass \$14.70

- 31 Day Pass \$48.00
- 20 Ride express \$30.90 to \$40.50

The fare structure for the Access Ride service is \$1.75 for eligible customers with attendants riding for free.

3.5.2.4 Ridership

Average monthly ridership, during the period from September 2003 through May 2004, for the existing transit routes within the study area is summarized in Table 3-27. As identified in the table, average monthly ridership on the local routes is highest on Route 15 Murfreesboro, at 43,154 trips. For Relax and Ride route 96, which provides service to the communities of LaVergne, Smyrna, and Murfreesboro, the average monthly ridership for this period was 2,247 trips. Ridership has spiked approximately 20 percent on route 96 during June and July 2004; and has the potential for further increases with the re-location of two park and ride lots to more accessible locations in LaVergne and Smyrna.

3.5.2.5 Revenues and Costs

In 2002, the MTA operated a total of 8,878,818 annual vehicle revenue miles of service and 629,327 annual vehicle revenue hours. Operating service costs for the year were \$54 million. The operating expense per bus revenue hour was \$66.26 and per bus passenger trip was \$2.60.

**Table 3-14
Average Monthly Ridership (September 2003 through May 2004)**

Route No.	Route Name	Average Monthly Ridership	Passengers per Revenue Hour	Passengers per Revenue Mile
Local Routes				
11	Southeast Connector	1,071	3.1	0.2
12	Nolensville	23,937	24.3	1.8
15	Murfreesboro	43,154	27.3	1.8
18	Elm Hill Pike/ Airport	8,433	20.5	1.3
25	Midtown	11,722	13.2	1.0
Express and Commuter Routes				
32X	Edge-O-Lake Express	4,785	16.0	0.8
33X	Hickory Hollow Mall/ Old Hickory Express	2,593	20.0	1.1
37X	Tusculum/ McMurray Express	3,121	19.8	1.1
38X	Una Antioch Express	3,192	20.6	1.1
96	Nashville/ Murfreesboro Relax and Ride	2,247	11.1	0.4

Source: MTA

3.5.2.6 Planned Service Improvements

The current Five Year Service Improvement Plan for MTA, adopted in March of 2004, calls for service improvements for nearly all MTA routes over the next five years. Table 3-15 illustrates the various service improvements for the transit routes serving the southeast corridor area.

**Table 3-15
Current Planned Transit Service Route Improvements**

Route No.	Route Name	5-Year Plan Recommendations
11	Southeast Connector	<ul style="list-style-type: none"> • Years 1-3 - No changes • Year 4 - 60 minute service during mid-day • Year 5 - Same as Year 4 but adds 60 minute service on Saturday till 6:15pm
12	Nolensville	<ul style="list-style-type: none"> • Year 1 - Addition of 11:15 am weekday trip • Year 2 - 20 minute midday headway • Year 3 - Route operates to Hickory Plaza every trip; Service to Wallace & Harding Loops reallocated; 10 minute peak service; and 20 minute midday service • Year 4 - 30 minute weekday service until 8:15 pm; 20 minute Saturday service until 6:15 pm; 30 minute Sunday service until 6:15 pm • Year 5 – No Changes
15	Murfreesboro	<ul style="list-style-type: none"> • Year 1 - Create a split headway on this route. Alternating service between Hickory Hollow Mall and the Wal-Mart Supercenter on Murfreesboro, past Bell Road; 10 minute headway during peak periods • Year 2 - Reallocation of Vultee deviation to new Route 5 • Year 3 - 20 minute service from 6:15 pm to 8:15 pm; 30 minute service from 8:15 pm • Year 4 - 20 minute service until 6:15 pm on Saturday; 30 minute service until 6:15 pm on Sunday • Year 5 - No changes
18	Elm Hill Pike/ Airport	<ul style="list-style-type: none"> • Year 1 - No changes • Year 2 - Split current routing into two routes: one that operates local to and from the airport via Elm Hill Pike, and one that operates express from the Airport to Downtown via I-40; 20 minute peak service; 30 minute off peak service until 8:15 pm; 60 minute Saturday service until 8:15 pm; 60 minute Sunday service until 6:15 pm • Years 3 through 5 - No changes
25	Midtown	<ul style="list-style-type: none"> • Year 1 - 30 minute service all day until 6:15 pm; All trips to MTA from 8:15 am until 3:45 pm • Year 2 - 20 minute peak service • Year 3 - 20 minute service via Jo Johnson until 8:15 pm ;40 minute service to Hart until 8:15 pm • Years 4 through 5 - No change
32X	Edge-O-Lake Express	<ul style="list-style-type: none"> • Years 1 through 4 - No change • Year 5 - 1 extra am and pm trip
33X	Hickory Hollow Mall/ Old Hickory Express	<ul style="list-style-type: none"> • Years 1 through 4 - No change • Year 5 - 1 extra am and pm trip
37X	Tusculum/ McMurray Express	<ul style="list-style-type: none"> • Years 1 through 4 - No change • Year 5 - 1 extra am and pm trip
38X	Una Antioch Express	<ul style="list-style-type: none"> • Years 1-4 - No changes • Year - 5 - 1 extra am and pm trip
96	Nashville/ Murfreesboro Relax and Ride	<ul style="list-style-type: none"> • Years 1 through 5 – No Changes

Source: MTA 2004

Despite service improvements within Davidson County, there are currently no additional transit service improvements planned within the LaVergne, Smyrna or Rutherford County over the next five years. Murfreesboro however, is looking to begin some type of local service by the 2007.

3.5.3 Park and Ride Lots

Within the study area, there are 16 existing park-and-ride lots, of which six are formal lots and ten are considered informal lots. Of the 16 park-and-ride lots in this corridor, 14 of them are located outside of Davidson County in the communities of LaVergne, Smyrna, Murfreesboro, and Rutherford County.

It is the goal of the RTA and MTA to improve the condition and accessibility of the park and ride lots throughout the system. Many of the lots have limited or no amenities, such as bus shelters or benches and poor pedestrian access. This includes the absence of sidewalks within the facility; from nearby neighborhoods; or alongside the road. The Nashville Area MPO has set aside funds to assist with improvements.

Table 3-16 identifies the location and capacity of the existing park-and-ride locations within the corridor.

**Table 3-16
Existing Park and Ride Lots**

	Location	County	Formal- Informal	Spaces	Shared- Separate
1	Edge-O-Lake Dr/US41 (Plaza)	Davidson	Informal	24	Shared
2	Hickory Hollow Cinemas	Davidson	Formal	267	Shared
3	Stones River/Murfreesboro Rd	Rutherford	Informal	20	Shared
4	I-24E at Waldron Road	Rutherford	Formal	36	Separate
5	I-24 at Sam Ridley Blvd	Rutherford	Formal	31	Separate
6	US41 near Sam Ridley Blvd	Rutherford	Formal	17	Shared
7	I-24 at SR102 Lee Victory Pkwy	Rutherford	Informal	12	Separate
8	SR840 at US41	Rutherford	Formal	215	Separate
9	US41 at Georgetown Square	Rutherford	Informal	20	Shared
10	SR96 Agricultural Center	Rutherford	Formal	129	Shared
11	US41 at Jackson Heights Shop-Center	Rutherford	Informal	30	Shared
12	I-24E at SR96 (Chevron)	Rutherford	Informal	10	Shared
13	US41/Cannonsburgh	Rutherford	Informal	20	Shared
14	I-24 at US231	Rutherford	Informal	20	Shared
15	Mercury Plaza (Murfreesboro)	Rutherford	Informal	25	Shared
16	I-24 and Buchanan Road	Rutherford	Informal	10	Shared

Source: Regional Transportation Authority

The Nashville Regional Commuter Rail Evaluation, conducted in April of 1996, recommended seven commuter rail stations in the Southeast Corridor (see section 3.3.2). The Park-and-Ride Study reassessed the potential locations for functionality and viability as a potential park-and-ride lot, which later could be converted to a commuter rail station. Of the seven locations only three were recommended:

- Crossings/Hickory Hollow Area – Nashville-Davidson County
- US41/70S and Front Street – Smyrna
- Waldon Road/Murfreesboro Road – LaVergne

Considerable investment has gone into development of the existing park-and-ride share program. This system of facilities provides an excellent opportunity for consideration of various transit alternatives within the study area.

3.5.4 Railroads

This section describes the rail transportation system within the Nashville area and the study area. Rail transport is predominately freight for the region with passenger rail service planned

by 2006 for populations east of downtown Nashville (known as the east line to the cities of Mount Juliet and Lebanon).

The Surface Transportation Board (STB) separates railroad companies into three classes based on revenues for each of the railroads. The largest railroad systems are classified as Class I railroads, followed by Class II railroads, which are mid-to-small sized companies (also known as short-line railroads), and Class III railroads, which are small sized companies. In the study area there is one Class I Railroad, one Short-line Railroad, and one planned commuter passenger rail service.

Class I Railroad – CSX Transportation The freight rail network serving Nashville is an important rail hub for the region; at least one hundred trains per day are handled through the main lines and yard facilities in Nashville where extensive swapping of blocks (multi-car segments of freight trains) are accomplished. All of the main lines, which are currently owned by CSX Transportation (CSX) and feed this hub, are single track and already have capacity constraints.

CSX operates 23,357 miles of track in 23 states in the eastern United States. In Tennessee, CSX operates 1,137 miles of track. CSX operates lines from Nashville southward to Birmingham, Alabama, and from Nashville westward to Jackson and onto Memphis. CSX also operates a north-south line from Jellico, Tennessee, at the Kentucky border, southerly to Knoxville and onto Ocoee, Tennessee, near the Georgia border. CSX has approximately 35,000 employees nationwide and 2,600 employees in Tennessee.

Within the study area, the CSX rail line from Nashville to Chattanooga traverses the entire length of the corridor connecting downtown Nashville to LaVergne, Smyrna, and Murfreesboro. This rail line sustains a relatively high level of freight traffic with 30 to 35 trains per day.

CSX is capable of running full double stack clearances through all of Tennessee. CSX does not currently have any bridge clearance problems in Tennessee. Along this rail line, CSX routes trains from Cincinnati to Atlanta through Louisville and Nashville. CSX also routes trains from Atlanta to Chattanooga and then to Nashville.

Short-Line Railroads - Nashville and Eastern Railroad

The Nashville and Eastern Railroad is classified as a short-line and operates 95 miles of main line and 15 miles of branch line in Davidson, Wilson, Smith, and Putnam counties. The railroad's principal connection is to CSX Transportation in Nashville. The line runs from Nashville eastward to Monterey, Tennessee. The Nashville and Eastern Railroad employs 27 full-time staff members and has an annual payroll of \$1.3 million. The railroad provides service to 35 shippers.

Within the study area, the Nashville and Eastern Railroad serves downtown Nashville but leaves the study area just east of I-24/I-40 and extends easterly toward Wilson County.

Passenger Rail – East Commuter Rail

In 1996, the MTA and RTA initiated a study to explore the potential of commuter rail in the Nashville region. From this study, six corridors were considered for further evaluation. A 1998 study analyzed the capital costs for the three most promising corridors. This analysis is discussed in section 3.3.2. Based on the results of these studies and efforts of the Nashville Area Commuter Rail Task Force --- which included the Nashville Chamber of Commerce, area business leaders, the MPO, MTA, RTA, TDOT, CSX, the Nashville and Eastern Rail Authority, and a Nashville Congressional delegation --- the East Corridor was selected as the first corridor to be implemented in the Nashville Area Commuter Rail System.

The Nashville MPO included the East Corridor commuter rail project in its fiscally constrained long range transportation plan in 1999. FTA approved the project to advance into preliminary engineering (during which time an environmental assessment was undertaken) in late 1999. The East Line is slated to be operational in 2006 with service from downtown Nashville, at the riverfront, to the City of Lebanon, which is approximately 35 miles from downtown Nashville.

3.5.5 Aviation

Within the study area, there are three airports, one commercial and two General Aviation (GA) airports. The large amount of employment, commercial, and manufacturing within this area of the region has benefited from relatively convenient access to airport facilities, be it for business travel, product or supply shipping, or pleasure.

Commercial Air Service

The southeast corridor is the focus of commercial air service in the region. Nashville International Airport (NIA), which lies at the northeastern edge of the corridor, is a major regional and corridor traffic generator. Travelers and airport employees, as well as the employees of business located near the airport for various reasons, make the airport area a major employment center and major transportation destination. Smyrna Airport and its surrounding area also is developing as a major regional employment destination.

Nashville International Airport is one of six commercial airports in Tennessee and is located southeast of downtown with direct access to I-40, serving as an important asset to the regional business community. Non-stop jet service to forty-five markets is provided to mid-state businesses and travelers by eleven air carriers, making the airport a major traffic generator.

Nashville International has the highest origination numbers compared to any other airport in Tennessee. (Origination numbers are the number of passengers originating their flight from the Nashville airport.) One of the reasons for this is the low-fare carrier, Southwest Airlines, which makes it attractive for passengers to drive to Nashville from all parts of the State and even from the State of Kentucky. Nashville International is also the second busiest airport in Tennessee in terms of enplanements, or departing passengers, just behind the Memphis Airport. NIA has an average of 4 million enplanements per year.

The Nashville International Airport provides commercial air service to the metropolitan area and all of Middle Tennessee through major commercial carriers. The airport is served by Air Canada, American, American Eagle, Comair, Continental, Corporate Express, Delta, Delta Express, Mesa, Northwest, Skyway, Southwest, Trans States, TWA, United, United Express, US Airways, and US Airways Express. With 400 arrivals and departures daily, the Nashville International Airport serves 96 major markets throughout the country. The airport is nearly adjacent to Rutherford County, just eight miles from LaVergne.

Surface transportation to the airport includes private automobiles and rental cars, taxis and shuttle buses, limousines, charter buses, and MTA transit.

General Aviation (GA) Airports

There are 32 GA airports in Middle Tennessee, two of which are in the study area - the Smyrna Airport and the Murfreesboro Municipal Airport. The Tennessee Statewide Aviation System adopted in 2001 ranked the Smyrna Airport third and the Murfreesboro Municipal Airport fourth in Middle Tennessee relative to business development opportunities. These airports are premier business airports and are anticipated to continue to play a major role in the commercial growth of its market. In addition, they generate business activity in surrounding areas due to

their desirability to businesses, such as air freight, that require proximity to a large general aviation airport.

The Murfreesboro Municipal Airport serves both public and private clients, and has one 3,900-foot runway that can be used for smaller jet aircraft. The airport benefits from its location in Murfreesboro but is constrained in its growth by its residential access and surroundings. However, the proximity to Nashville and I-24 are positive factors that are expected to provide continued pressures on the airport's services. Taxi and rental car transportation are available.

The Smyrna Airport serves both public and private clients, and has one 5,500-foot runway and one 8,037-foot runway. The geographic location of the Smyrna Airport with direct access to I-24 via Sam Ridely Parkway and relative proximity to Nashville International make it among the top ranked GA airports in Middle Tennessee. Smyrna Airport also has the majority of the design features that are required for a regional service airport and are in the midst of a major international expansion to carry international freight and passengers. Courtesy car and rental car services are available.

There are five industrial parks in Rutherford County fostering positive development opportunity for both the Murfreesboro Municipal Airport and the Smyrna Airport. These industrial parks are:

- South Park Distribution Center - a 160 acre industrial park with roughly 70 acres available for future development
- Smyrna Industrial Airpark - a 180 acre industrial park with roughly 140 acres available for future development
- Interchange City - a 50 acre industrial park which is built out
- Stevenson Property - a 50 acre industrial park with nearly 50 acres available for future development
- Murfreesboro property - a 430 acre municipal park located off Murfreesboro Road south of SR-840 which has availability for future development

The success of these airport facilities is relative to their geographic location and proximity to numerous employment and residential communities. Any transit alternative within the study area must consider these trip generators and the economic benefits from continued intermodal connectivity and access.

3.5.6 Transportation System Management

In the Nashville area, the Tennessee Department of Transportation (TDOT) has recently installed an intelligent transportation system (ITS) to assist motorist and emergency and law enforcement officials in responding to highway incidences. Dozens of dynamic message signs, as well as radar detectors and video cameras, are being installed on the interstates in Nashville-Davidson County. I-24/I-40, in the study area, has two dynamic message signs, radar detectors, and video cameras. This initial system is part of a larger regional ITS program that is to be developed in the region over the next 20 years.

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.

Davidson County has operated a combination of direct connect and closed loop traffic signal systems since the 1980s. These systems directly manage approximately 65% of the traffic signals in the County. The direct connect traffic control and monitoring system was upgraded in 2005 using federal funds. Major signal retiming began in 2005, using CMAQ funds and continues in 2006 using local funds. An ITS master plan is currently being developed, and will use federal funding sources for both its planning and for implementation, with additional funding required to complete implementation. There are also major efforts underway in the areas of wayfinding, bus priority systems (which allow buses to bypass congested intersections), emergency vehicle preemption, and signal equipment upgrades using a combination of federal and local funding. Additional funding sources will be required to facilitate full implementation of these programs.

In addition to the ITS system being deployed by TDOT, the State also operates a freeway service patrol which covers all of the interstates within Davidson County. I-24 is patrolled by the local service patrol, which provides assistance to stranded motorists and also playing a major role in mitigating congestion as a result of incidences (a stalled vehicle blocking the travel lane, wrecks, etc.).

Non-reoccurring traffic congestion (collisions, etc.) within the study area has benefited from these services however, at present, services are limited to Nashville-Davidson County. As the program grows, motorists traveling within Rutherford County will benefit from these services.

3.5.7 Travel Demand Management

While not exclusive to the southeast corridor, there are two programs that offer travel demand management options for travelers within the study area. These programs include:

Carpool and Vanpool RideShare Matching Program - In partnership with the RTA, MTA provides assistance with starting a commuter benefits or ridesharing program. RTA maintains a regional database of active carpools and vanpools where individuals can find suitable matches for commuting, including bus routes. Corporations can have a database developed just for their employees. Currently, with 100 vanpools in operation, the program is one of the largest in the southeastern United States. Drawing from a customer base primarily from the outlying counties surrounding Davidson County, downtown Nashville is the destination of a majority of vanpool customers, although many other destinations are served including the hospitals and Vanderbilt University in West End, and the Opryland Hotel and Convention Center. The agency administers a carpool database to complement the vanpool program. Carpools and vanpools are particularly well suited to longer distance travel, such as many of the home-based work trips being made in this corridor, and as such will be a key component of providing future services in this corridor.

Guaranteed Ride Home Program - The Guaranteed Ride Home service is intended to provide free emergency rides home for regular commuters who travel in Davidson, Rutherford, Sumner, Williamson or Wilson counties, who cannot ride home with their normal carpool, vanpool or express bus. Commuters must be pre-registered in the program and will receive a voucher for a taxi or rental car to take you home. Guaranteed ride home programs are an important complement to vanpool, carpool, and commuter transit services, providing users of those services with an emergency trip home in the midday in the event of a family emergency, or in the evenings for people who miss the last available bus or train to their destination.

The greatest number of vanpools has a destination of downtown Nashville. Participation in these programs is voluntary and range in participation from corridor to corridor and year to year, fluctuating in response to changes in employment levels, fuel prices and other variables.

3.5.8 Transportation Funding Overview

Taxpayer funding for transportation projects at the Federal, state and local levels is limited and must be expended prudently. The Southeast Corridor High-Performance Alternatives Analysis must identify improvements that can achieve local consensus, meet state and Federal funding guidelines and demonstrate that they are an efficient use of taxpayer funds. The FTA Section 5309 New Starts Program Funding Process or other Federal Programs could provide up to 80% of the capital funding for design and construction of a qualified major transit project -- though funding at this level is unusual under current Federal Funding conditions. In most cases, Federal funds will not provide more than 50% of the capital and construction costs. The remainder of capital funds for a major transit investment, and all of the operating funding must be generated at the local or State levels.

FTA must approve the project at various points through the planning process. The key to this approval is the development of a locally-preferred alternative (LPA) that represents the region's consensus on a project that best meets the transportation needs in a given corridor. The LPA must represent a local consensus and be capable of gaining support for the level of local funding required to build and maintain the project over the long term. For FTA to approve the project beyond the alternatives analysis level, the project must demonstrably meet a significant transportation need as identified by the alternatives analysis study and meet various external measures of efficiency compared to other projects of its type from around the country. FTA is also increasingly requiring projects to demonstrate that they will be, or are already, supported by changes in regional land use patterns that help to ensure the long-term success of the transit investment.

3.6 Project Statement of Purpose and Need, Goals and Objectives

The statement of Purpose and Need is one of the most important outcomes of this analysis and has been derived with:

- ▲ input from the public
- ▲ discussions with public officials throughout the corridor
- ▲ an analysis of the data as provided in this report

The statement of purpose and need defines the transportation problems and issues within a corridor. These problems are complex and involve facets beyond transportation such as land-use and development patterns. In order for any transportation issue to successfully be addressed, the problem must first be clearly stated so that all reasonable information about the problem can be analyzed. In addition, information from local elected officials, transportation professionals, and the public is vital in determining what types of need are perceived and what combination of solutions should be considered. This statement of purpose and need, including the goals and objectives, will guide the development and assessment of alternative approaches for best meeting the needs of the corridor. It is important to consider that as additional information and public input accumulates over the course of the study, elements of the statement and/or goals and objectives may be modified to meet other identified needs or goals.

The steering committee of the Nashville Southeast Corridor High-Performance Transit Alternatives Study developed the following statement of Purpose and Need:

- ▲ **Provide Transportation Options**
Provide transportation alternatives for travelers within the corridor.
- ▲ **Improve Mobility**
Allow economic growth and development in the corridor to continue without overburdening existing roadways. Reduce the negative impacts of congestion on resources, travel times, and mobility.
- ▲ **Establish Efficient Land Use Policies / Compact Development**
Provide greater emphasis on mixed-use development, traditional urban and village land use patterns, and design standards that support a diverse range of travel options. Promote land uses that are conducive to a more balanced transportation system with key roles for pedestrian and mass transit.
- ▲ **Address Environmental Concerns**
Provide transportation choices that minimize impacts to the environment and help to improve air quality conditions in the region.
- ▲ **Use Limited Transportation Funding Efficiently**
Provide a cost effective investment in the transportation network that results in more transportation options, improved mobility, and supports compact development.

The following goals and objectives have been identified to fulfill the purpose and address the needs of the corridor:

Goal 1: Provide longer-distance travelers in the southeastern corridor with alternatives to driving private vehicles in heavily-congested traffic conditions.

Objectives:

1. Provide transit options serving longer-distance trips (primarily more than 3 miles in length) in the corridor that are competitive with, or ideally superior to, driving a private automobile, in terms of trip time, convenience (in the context of specific time-of-day and day-of-week trips), safety, cost (to the individual user) and comfort.
2. Provide enhanced multi-modal access to home, jobs, services and other activity centers for corridor residents, workers, and visitors.
3. Increase utilization of public transit in the corridor for all trip purposes.
4. Provide transportation options that serve both work and non-work trips.
5. Provide improved transit opportunities for reverse-commuters traveling from the northern areas of the corridor and other parts of the Nashville region to workplaces in suburban areas of the corridor.
6. Improve access to mass transit in areas of the corridor outside central Nashville.
7. Provide greater diversity of transportation options in the corridor by providing improved conditions for pedestrians, bicyclists, and other non-automotive users.

Goal 2: Promote efficient land use and development patterns in Nashville/Davidson County and the Rutherford County communities in the Southeast Corridor Study Area.

Objectives:

1. Promote compact transit-accessible land development in Nashville, Murfreesboro, LaVergne, Smyrna and other communities in the southeastern corridor study area.

2. Concentrate employment and other activity centers within existing and planned transit corridors (fully considering the relationship of transit and parking availability, as associated with such activity centers).
3. Maintain and promote downtown Nashville, other existing established activity centers, including Interchange City, and downtown Murfreesboro as the main employment and activity centers in the corridor.
4. Preserve farmland and open space in existing rural areas of the corridor.
5. Promote development that re-uses existing sites and buildings, and that efficiently uses existing infrastructure and public services.
6. Promote multi-use development combining many activities including commercial, retail, education, recreation, and housing.

Goal 3: Improve and Enhance Economic Development and Employment Opportunities and Expand Access to Jobs.

Objectives:

1. Promote sustainable economic growth throughout the corridor by providing improved access and optional transportation modes.
2. Provide improved access to housing opportunities throughout the corridor by providing improved transportation access and options.
3. Provide improved access to employment centers throughout the corridor by providing improved transportation access and options.
4. Provide high quality transit access to Nashville International Airport from downtown Nashville, Murfreesboro and other areas within the corridor.
5. Enhance reverse commute options providing access for Nashville residents to job opportunities in other areas of the corridor.
6. Provide improved access to special events and other destinations in the study corridor.

Goal 4: Preserve the Natural and Social Environment.

Objectives:

1. Improve air quality.
2. Minimize transportation-related noise impacts.
3. Protect and, where possible, enhance environmentally sensitive areas.
4. Minimize community and neighborhood disruption.
5. Minimize negative aesthetic impacts of transportation investments and, where possible, design systems that add to the aesthetic environment.
6. Address environmental justice concerns by carefully assessing disproportionate impacts and providing improvements that benefit members of socially disadvantaged groups.
7. Promote land use and development policies, and transportation strategies that are consistent and mutually supportive.

Goal 5: Develop a Cost-Effective Transportation System Improvement Strategy that Maximizes Community Consensus and Institutional Support.

Objectives:

1. Assure that total benefits of the preferred transportation investment strategy recommended by the study warrant their total costs.
2. Achieve public consensus and institutional support, including the support of public agencies, local governmental entities and public officials, for the preferred transportation investment strategy recommended by the study.

3. Ensure that the costs and benefits are shared equitably among citizens and governmental entities throughout the region.
4. Maximize the leverage of local funds in obtaining State and Federal funds to support transportation investments in the corridor.

Goal 6: Develop a Strategic Part of a Multi-Modal Transportation System that would facilitate the Development of an Integrated Regional Multi-Modal System

Objectives:

1. Develop alternatives and strategies that complement, rather than conflict with, regional plans for development of a multi-modal system.
2. Develop alternatives that are consistent with the transportation and development goals of the region as identified in the Nashville Area MPO's Long Range Transportation Plan and other regional planning documents.
3. Avoid alternatives that might have the affect of precluding the development of other transportation modes or options to serve other corridors of the region.

3.6.1 Performance Criteria and Evaluation Measures

A series of detailed performance criteria and evaluation measures have been developed based on the above listed transportation goals and objectives to effectively evaluate potential alternatives that meet the *Need and Purpose* for high-performance transit service within the Southeast Corridor study area. For each goal and objective, a measure or series of measures has been identified by which the alternatives can be compared.

The *Task Report 3.8-3-11, Alternatives Analysis Screening Report* describes in detail the development of the mode and alignment evaluation criteria and companion performance measures to be used in the alternatives analysis.

In general, evaluation measures attempt to characterize and quantify the mobility improvements, environmental benefits, operating efficiencies, cost effectiveness, and supportiveness of land use and future development patterns toward transit investments, which are consistent with the goals and objectives of this alternatives analysis.

3.7 Conclusions

The Southeast Corridor has experienced tremendous population growth in recent years and is expected to continue growing at a rapid pace. This increase in population and employment has generated traffic growth that exceeds the growth in capacity of the transportation system. This traffic is expected to increase in the future, generating additional congestion and delays for travelers, as well as other socio-economic and environmental impacts related to congestion.

- Significant congestion occurs within the corridor in both the AM and PM peak hours as commuters traverse from the outer areas of Davidson County and the communities of Rutherford County into downtown Nashville.
- Of the 32 miles of I-24 between downtown Nashville and Murfreesboro, currently 24 miles (or 75% percent) operate at levels of service (LOS) D or worse during peak periods. By 2025, nearly 80 percent of the corridor will operate at LOS D or worse, even after significant road widening of I-24 during this period.

- Portions of Murfreesboro Road are forecast to increase in traffic by 30,000 vehicles per day, with nearly 80 percent of the corridor (or 25 miles) operating at levels of service D or worse during peak periods.
- Limited transit services exist within the corridor leaving vast areas and populations un-served by public transportation. Within the corridor there are 10 bus routes providing service. Of these routes only two serve north-south movements and of these two routes, only one provides service over the complete length of the corridor.

The data presented in this study indicate a steady worsening of congestion. If present trends continue, traffic congestion and the lack of mobility options will threaten the long-term growth of the southeast corridor. The southeast corridor is effectively the engine of economic growth in the Nashville region, therefore the costs of not planning today will be more than just higher financial costs for solving these problems tomorrow; they will include costs to the quality of life of all who live, work and visit in the corridor. As this reports illustrates, the lack of mobility and transportation options, combined with the current and projected growth of population, employment—and traffic congestion—requires that transportation alternatives be developed now to address these needs.

The Nashville region is working to avoid the fate of many other urban areas that are experiencing the negative impacts of sprawl and the deterioration of compact urban centers. Transit can influence, support, and promote more compact land use and development patterns within the corridor. This will allow the corridor to be served by a more efficient mix of transportation options that include walking, cycling, and mass transit. Land use patterns in the area tend to be low-density and pedestrian unfriendly with uses widely and strictly separated. Existing development is oriented for the convenience of auto travel, as opposed to pedestrians or users of mass transit. Over time, development has occurred with little, if any, consideration for the ways in which public transportation infrastructure and services might serve the travel needs of those who live, work, or travel within the corridor. This has resulted in a development pattern and transportation system that does not meet all the needs of the various users such as pedestrians, cyclists, and transit riders. The current auto-centric transportation network increasingly suffers from traffic congestion, which indicates that the capacity of the system does not meet the demands of drivers. The result is a transportation system, in terms of its capacity and composition of services that lags behind the demand for transportation services.

This development pattern represents a significant threat to farmland and open space and has the potential to significantly diminish the quality of life for Nashville area residents by reducing access to a variety of housing, retail and commercial development types, reducing access to open space, and promoting traffic congestion. Over time, this auto-centric focus toward development increases travel times for all users of the transportation system including drivers and bus riders.

For the region to remain competitive and continue to enjoy increased development opportunities, additional mobility options such as high performance transit are warranted. High performance transit is capable of providing reliable, affordable, and relatively flexible travel within the corridor. Findings of this needs assessment demonstrate a viable role for public transportation in the corridor as a means for

- addressing existing and forecasted congestions levels
- accommodating significant projected increases in population and employment growth over the next twenty years
- and influencing land use and development decisions

Cost effective transportation solutions such as mass transit are capable of facilitating continued economic growth in the corridor while balancing desired mobility needs with that of an ever-fragile physical and social environment. Given the current lack of public transportation in the corridor, the projected increase in population and employment, and the likely benefits from increased mobility options, further development of transit alternatives are warranted.

APPENDIX A
DEMOGRAPHICS

A.1 DEMOGRAPHICS

This sub-section discusses the population, housing, income, ethnicity, auto ownership, disability, and age characteristics of the study area.

A.1.1 Population

The Nashville MPO area, which includes the counties of Davidson, Rutherford, Sumner, Williamson, and Wilson accounted for roughly 1.1 million people in 2000, a fifth of the State's total population. The Nashville region as a whole has experienced significant population growth in the recent past and is anticipated to continue to grow in population in the future as identified in Table A-1.

**Table A-1
Nashville MPO Area Population Trends & Forecasts**

	1990	2000	2015	2025	Percent Change 1990 to 2000	Percent Change 2000 to 2025
Davidson County	511,000	570,000	644,000	688,000	12%	21%
Rutherford County	119,000	182,000	260,000	319,000	54%	75%
Sumner County	103,000	130,000	178,000	210,000	26%	61%
Williamson County	81,000	127,000	200,000	252,000	56%	99%
Wilson County	68,000	89,000	122,000	145,000	31%	64%
MPO Area	881,000	1,099,000	1,403,000	1,614,000	25%	47%

Source: US Census, Nashville Area MPO, and UT Center for Business and Economic Research

The MPO area realized a population growth of 25 percent between 1990 and 2000 with Rutherford County being the second fastest growing county in the region. Projected population in the MPO area over the next twenty-five years is estimated to increase by approximately 47 percent with Davidson County showing a 21 percent increase in population and Rutherford County with a 75 percent increase in population.

The counties of Davidson and Rutherford are two of the five most populous counties in Tennessee. As identified in Table A-2, in 2000, Davidson County had a population of 569,891 and Rutherford County had a population of 182,023, ranking second and fifth respectively within the state.

While Davidson County's population has experienced a relatively low percentage of growth compared to the other counties in the region, the region's central county has seen a positive population increase. This lower rate of growth relative to the surrounding counties is an indication of suburbanization of the population, or urban sprawl, that is occurring throughout the region. Rutherford County, the suburbanizing county located in the Southeast Corridor study area, is the second most populated county in the region and also one of the fastest-growing counties in the country, with a population increase of nearly 54 percent from 1990 to 2000. In 2000, the City of Murfreesboro had a population of 68,816, the Town of Smyrna had a population of 25,569, and the City of LaVergne had a population of 18,687. The City of Murfreesboro is the sixth most populous city in Tennessee behind Memphis, Nashville, Knoxville, Chattanooga, and Clarksville. The least populous jurisdiction in the study area is the City of LaVergne; however, LaVergne is one of the fastest growing communities in the state and country and experienced a population increase of 149 percent between 1990 and 2000.

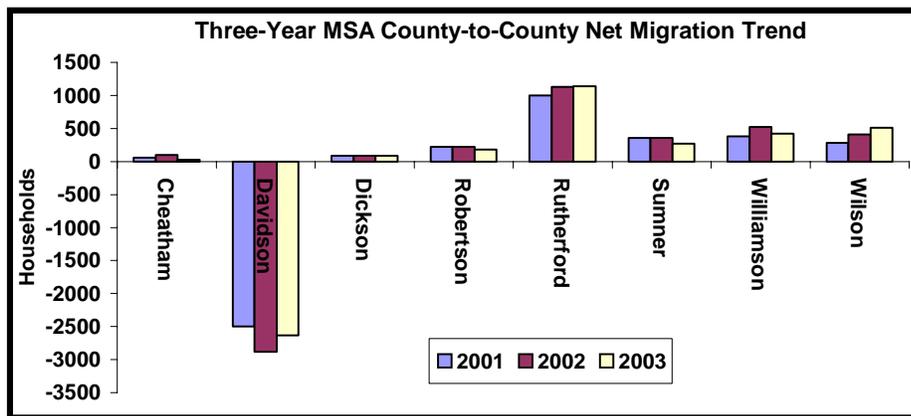
**Table A-2
Davidson County & Rutherford County Population Trends & Forecasts**

	1990	2000	2015	2025
Davidson County	511,000	570,000	644,000	688,000
Rutherford County	119,000	182,000	260,000	319,000
LaVergne	7,500	18,500	30,000	38,500
Smyrna	13,500	25,500	40,000	50,000
Murfreesboro	45,000	69,000	101,000	125,000
Rutherford (Unincorporated)	52,500	69,000	89,000	105,000

Source: US Census and Nashville Area MPO

Trends in the region indicate that internal-migration within the metropolitan area continues to show significant movement of residents from Davidson county to suburban counties, as indicated in Figure A-1. Davidson County is growing in population due to migrants moving to the area from other parts of the country and state. However, Davidson County residents also continue to move to other counties within the region as a result of suburbanization. Rutherford County has seen the largest gain of net in-migration in the metropolitan area. Despite this internal migration, the region as a whole continues to show significant positive population growth.

**Figure A-1
Regional Net-Migration Trends (2000 through 2003)**



Source: MTSU 2003

Table A-3 indicates that the study area is projected to increase in population by 32.5 percent by 2025. Within Davidson County, approximately 31 percent of the total county population is located within the study area, the southeast corridor study area contains most of the developed area of Rutherford County, and 84 percent of Rutherford County’s total population resides within the study area. Should land use and development trends continue as projected, in the future a higher proportion of Davidson County’s residents will live in southeast corridor area of Davidson County than live there today.

**Table A-3
Southeast Corridor Study Area Population: 2000 - 2025**

	2000	2015	2025	Percent Change 2000-2025
Davidson County Portion	177,000	201,000	227,500	28%
Rutherford County Portion	153,500	193,500	211,000	37%
Total Study Area	331,000	394,000	438,000	32%

Source: Nashville Area MPO

This is not the case for Rutherford County, however, as suburbanization and continued out-migration from the corridor will mean that while the absolute number of people living in Rutherford County, and the number of persons living in the Rutherford County portion of the study corridor will increase, this population will represent a smaller proportion of the population of the county, as portions of the county lying outside the study area are developed. This phenomenon is illustrated in Table A-4.

**Table A-4
Percentage of Study Area Population**

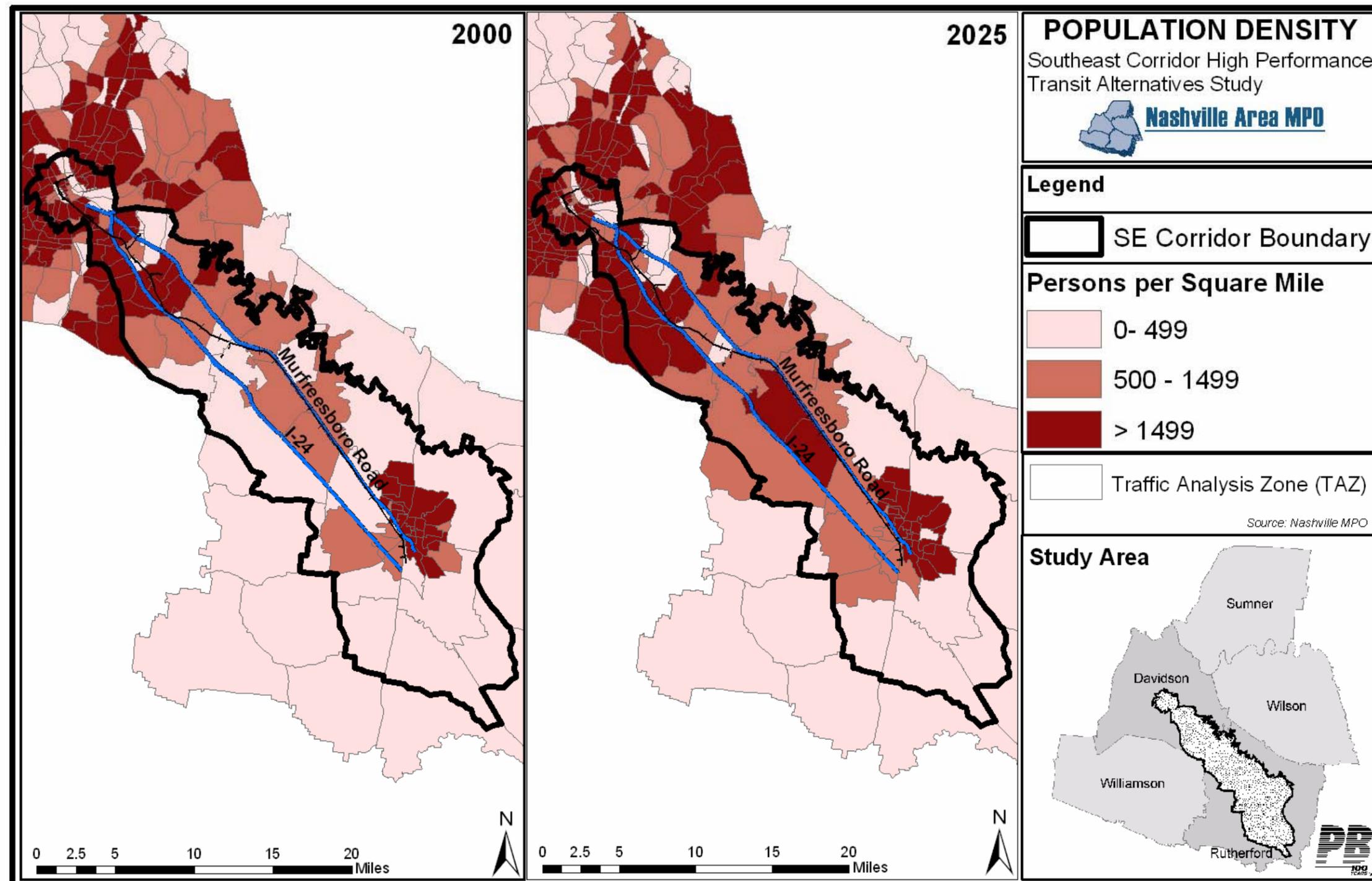
	2000	2015	2025
Davidson County Portion	31%	31%	33%
Rutherford County Portion	84%	74%	66%
Total Study Area	44%	44%	44%

Source: Nashville Area MPO

Regardless, the study area is projected to see tremendous overall population growth with an impressive 42.5 percent of Davidson County’s overall 2025 population growth located in the study area and 41.8 percent of Rutherford County’s overall 2025 population growth occurring within the study area.

The study area comprises approximately 357 square miles. Figure A-2 shows population density of the study area. In 2000, the population density of the study area was an estimated 927 persons per square mile, as identified in Table A-5. This density level is relatively high compared to the population density of Rutherford County as a whole and of the State of Tennessee, with population density levels of 294 and 138 persons per square mile, respectively. However, the corridor’s population density is lower than that of Nashville-Davidson County, which has a population density of 1,135, and is consistent with a low-density suburban development pattern. The Davidson County portion of the study area has nearly three times the population density of the Rutherford County portion. The study area is relatively dense, with a population density level greater than the third most dense county in Tennessee, Knox County, home to the City of Knoxville. Knox County has a population density of 751 persons per square mile.

Figure A-2
Population Density - Persons per Square Mile (2000 & 2025)



**Table A-5
Southeast Corridor Study Area Population Density (2000)**

	Study Area			Davidson County	Rutherford County	State of Tennessee
	Total	Davidson Co. Portion	Rutherford Co. Portion			
Total Population	330,777	177,101	153,676	569,891	182,023	5,689,283
Land Area (sq. miles)	357	100	256	502	619	41,217
Persons per Sq. Mile	927	1,771	600	1,135	294	138

Source: US Census and Nashville Area MPO

As illustrated in Figure A-2, population density within the study area is increasing. Density levels within the communities of Rutherford County are beginning to see the same level of concentration of Davidson County and other large urban areas within Tennessee, which currently are served by public transportation.

A.1.1.1 Income and Poverty

Income is an important variable when considering the choices individuals make about how they travel. On one end of the spectrum are those that live at or below poverty or on a fixed income. These individuals tend to depend on transit and are considered virtually a “captive audience” for public transportation. At the other end of the spectrum are those whose means allow them more choices about their individual mode of travel. Income or wealth is also a factor that helps determine the number of options available for deciding on a place to live. Individuals with higher incomes are called “choice” riders in transit industry jargon because they choose to use public transportation rather than driving their own vehicles.

The median household income within Tennessee is \$36,360. The median household income level of Davidson County is \$39,797, about \$3,000 higher than the State median income level. The median household income level of Rutherford County is \$46,312, which is far higher than that of the State and Davidson County.

Figure A-3 illustrates the concentration of households within the study area that have a household income greater than the state average. Within Davidson County, areas closest to the Percy Priest Lake and west of I-24 near the Rutherford County line have the highest concentration of households with a median income level above that of the State. In Rutherford County, the vast majority of households above the median income level of the State are located to the west and southwest portion of the study area. As with Davidson County, households nearest Percy Priest Lake, within the City of LaVergne, have a concentration of households above the median income level as of the State.

Figure A-4 illustrates concentrations of those living below the poverty rate in terms of income according to the 2000 U.S. Census. Within the study area, the highest concentration of individuals living below the poverty line is within Davidson County closest to the downtown area. Within Rutherford County, the concentration of people living in poverty is highest within the City of Murfreesboro.

Figure A-3
Household Income (2000)

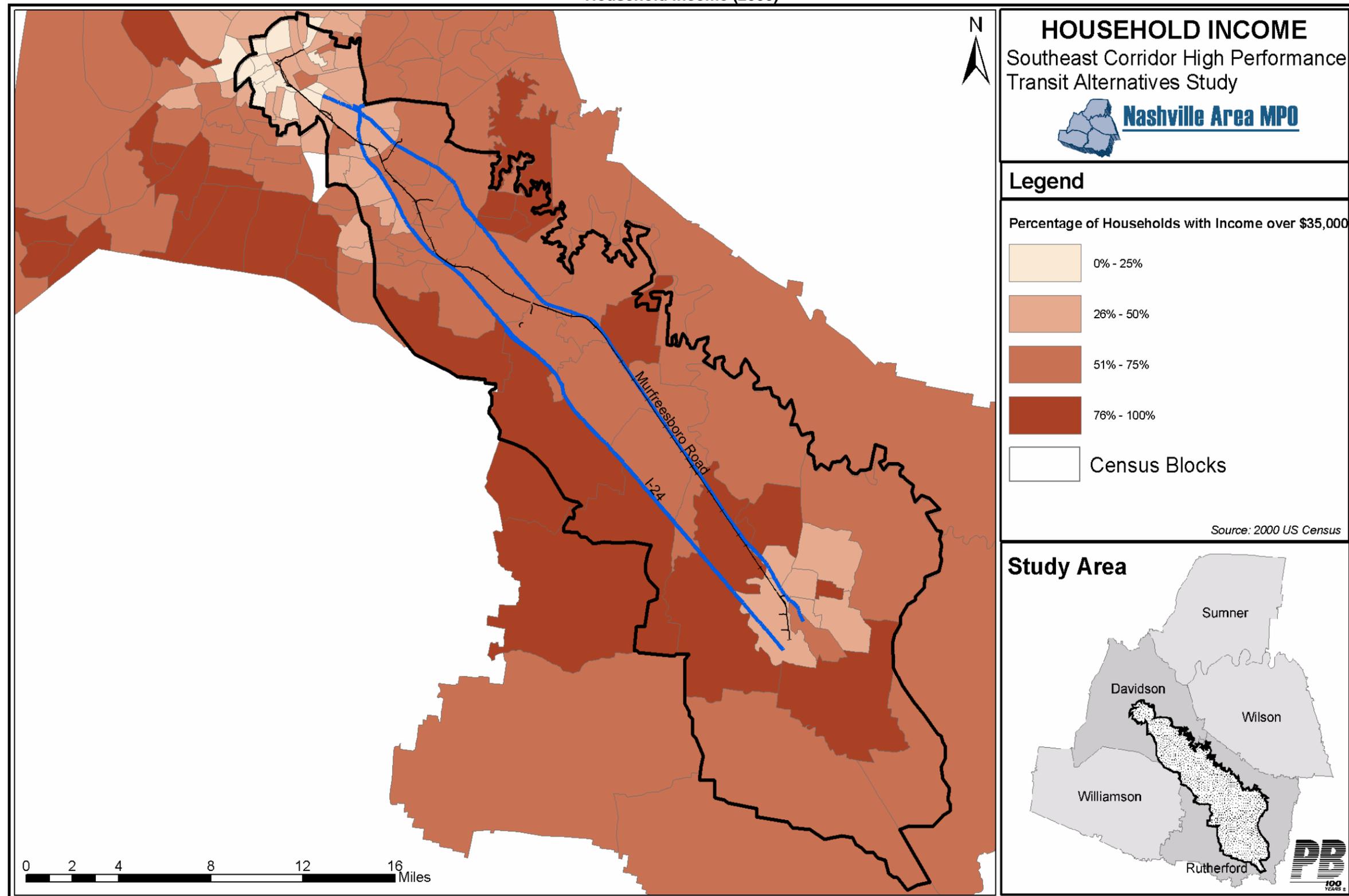
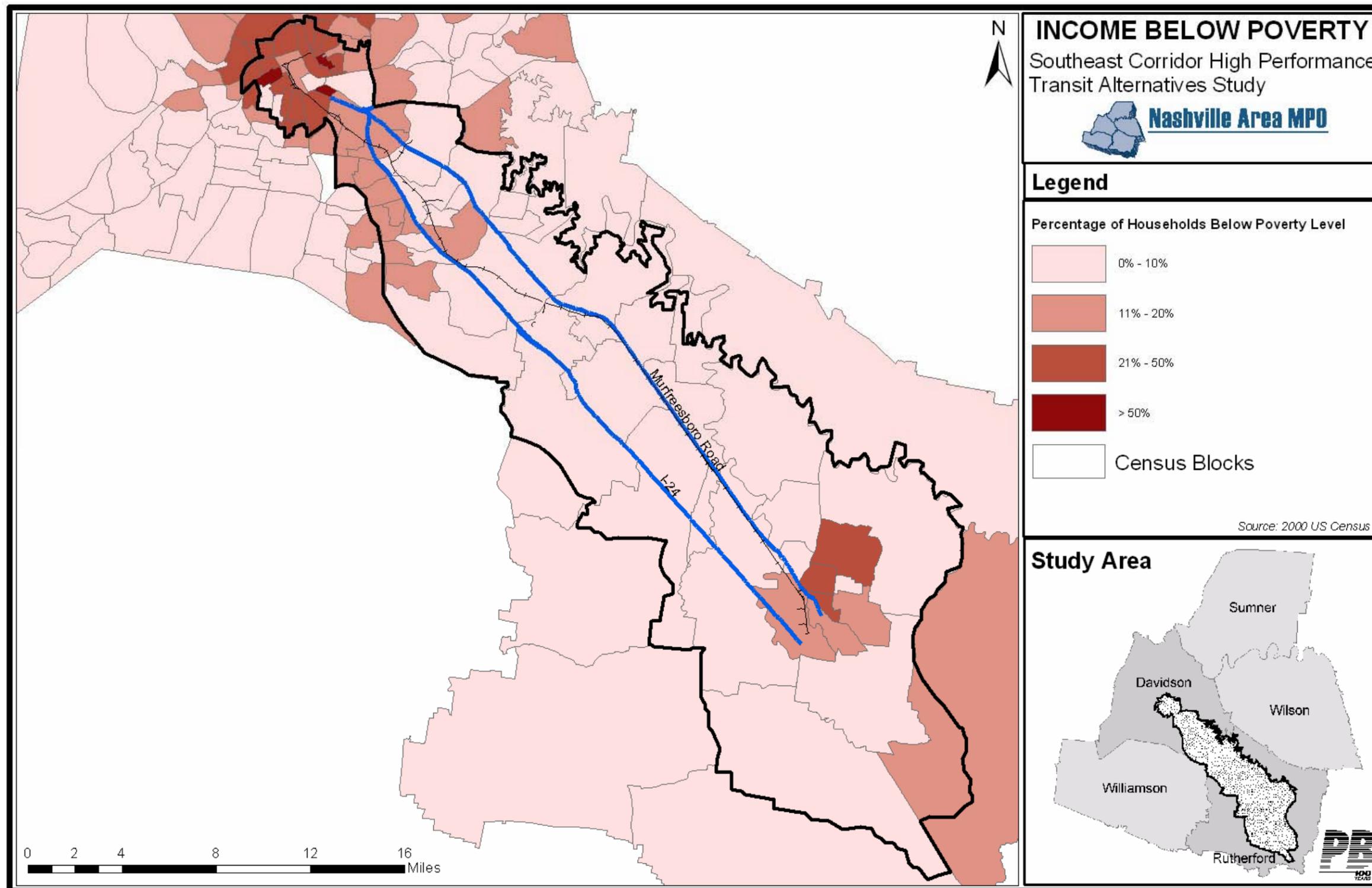


Figure A-4
Persons Below the Poverty Rate (2000)



A.1.1.2 Ethnicity

Table A-6 identifies the community ethnicity of the study area. The study area tends to be more diverse compared to the State as a whole but comparable to Davidson County’s overall demographics. Nearly 31 percent of the population of Davidson County is non-white, whereas the Rutherford County portion of the study area is only 15 percent non-white. The Davidson County portion of the corridor has a higher percentage of non-whites than the population of Davidson County as a whole, while the percentage of non-whites in the Rutherford County portion of the study area is virtually the same as the percentage of non-whites in Rutherford County as a whole.

**Table A-6
Ethnicity of Study Area (2000)**

	White	Black	American Eskimo	Asian	Hawaiian Pacific	Other	Multi Cultural
Davidson Co. Portion	55%	34%	0%	3%	0%	4%	3%
Rutherford Co. Portion	85%	10%	0%	2%	0%	1%	1%
Total Study Area	69%	23%	0%	3%	0%	3%	2%
Davidson County (All)	67%	26%	0%	2%	0%	2%	2%
Rutherford County (All)	86%	10%	0%	2%	0%	1%	1%
State of Tennessee	80%	16%	0%	1%	0%	1%	1%

Source: US Census

As identified in Table A-7, the Hispanic population within the study area totals 21,137 persons, which represents 6 percent of the study area population. While this percentage is approximately consistent with Davidson County’s total Hispanic population of 5 percent, the concentration of the Hispanic population within the study area relative to the two counties is noteworthy.

**Table A-7
Hispanic Population & Non-Hispanic Population (2000)**

	Total Population	Non-Hispanic	Hispanic	Percent Hispanic	Percent of Total Hispanic Population
Davidson Co. Portion	201,259	185,214	16,045	8%	62%
Rutherford Co. Portion	173,025	167,933	5,092	3%	99.5%
Total Study Area	374,284	353,147	21,137	6%	68%
Davidson County (All)	569,891	543,800	26,091	5%	
Rutherford County (All)	182,023	176,958	5,065	3%	
State of Tennessee	5,689,283	5,565,445	123,838	2%	

Source: US Census

Roughly 62 percent of Davidson County’s total Hispanic population and nearly all, 99.5 percent of Rutherford’s Hispanic population (5,092 persons) resides within the study area. About 68 percent of both Davidson and Rutherford County’s total Hispanic population lives in the corridor.

A.1.1.3 Population by Age

As identified in Table A-8, the study area and the State of Tennessee each have similar percentage of children (17 and under) whereas the study area has a lower-than-average number (compared to the state) of persons aged 65 and over.

**Table A-8
Population Age (2000)**

	17 and Under	18 to 64	65 and Over	Median Age
Davidson Co. Portion	23%	69%	8%	30
Rutherford Co. Portion	26%	66%	7%	31
Total Study Area	25%	68%	8%	30
State of Tennessee	27%	60%	12%	36

Source: US Census

The population within the study area tends to be younger than average compared to that of the State of Tennessee, with a median age of 30 compared to the State median age of 36. Most of these people are of working age and tend to be more mobile, requiring greater access to employment and service goods and generating higher than average demand for transportation services.

A.1.1.4 Housing

As identified in Table A-9, there were 132,284 housing units in the study area in 2000. Roughly 56 percent of housing units in the corridor are located within Davidson County and 44 percent within the cities of LaVergne, Smyrna, Murfreesboro, and Rutherford County.

**Table A-9
Housing Supply & Density (2000)**

	Study Area			Davidson County	Rutherford County	State of Tennessee
	Total	Davidson Co. Portion	Rutherford Co. Portion			
Total Housing Units	154,364	87,226	43,348	252,977	70,616	2,439,443
Land Area (Sq. miles)	357	100	256	502	619	41,217
Housing Units per Sq. Mile	432	872	256	504	114	59

Source: US Census and Nashville Area MPO

The housing density (units per square mile) within the study area is 432 units per square mile. That is a density level 7 times that of the State average (59 units per square mile) and a density just below that of Memphis, Shelby County, with a housing density level of 481 units per square mile.

As identified in Table A-10, 57 percent of the housing units in the study area are owner occupied. Less than 7 percent of the housing supply within the study area is considered vacant, which is somewhat lower than the State average of 8 percent.

**Table A-10
Housing Units and Occupancy (2000)**

	Total Housing Units	Owner Occupied	Renter Occupied	Vacant	Percent Renter Occupied
Davidson Co. Portion	87,226	34,333	46,780	6,113	54%
Rutherford Co. Portion	67,138	43,348	19,851	3,939	30%
Total Study Area	154,364	77,681	66,631	10,052	43%
Davidson Co. (All)	252,977	131,340	106,065	15,572	42%
Rutherford Co. (All)	70,616	46,399	20,044	4,173	28%
State of Tennessee	2,439,433	1,561,363	671,542	206,538	28%

Source: US Census

As stated in the population section, growth within the region has been strong. As a result of increased population, areas of the region that are somewhat rural and undeveloped, such as portions of the Southeast Corridor, have seen strong growth in new housing. Much of this housing is for the rental market—the proportion of renter occupied units in the Davidson County portion of the corridor is markedly higher than in the county as a whole, while the proportion of renters in the Rutherford County portion of the corridor is slightly higher than in the county as a whole.

As identified in Table A-11, between 2000 and 2003, Davidson County and Rutherford County added an additional 27,998 residential housing units with roughly 82 percent of them being single family. Of the 23,069 new single family housing units, the distribution between Davidson and Rutherford was even. Relative to higher density housing, which is favorable to generating more transit trips, roughly 15 percent of the new housing units were multifamily (five or more units).

**Table A-11
Number of New Residential Units (2000-2003)**

Item/Year	Davidson	Rutherford	Total	Percentage
Single Family	11,450	11,619	23,069	82%
Two Family	338	40	378	1%
Three & Four Family	68	207	275	1%
Five or More Family	2,561	1,715	4,276	15%
Total	14,417	13,581	27,998	100%

Source: US Census

As identified in Table A-12, more than 82 percent of all the new housing units in Rutherford County between 2000 and 2003 were constructed within the jurisdictions of LaVergne, Smyrna, and Murfreesboro. Relative to multifamily housing units, nearly 100 percent (1,960 units out of 1,962 units) were constructed within one of the three cities within the study area, which encompasses the vast majority of the study area in Rutherford County.

**Table A-12
Number of New Residential Units with Rutherford County (2000-2003)**

Item/Year	Rutherford	LaVergne	Smyrna	Murfreesboro	Percentage
Single Family	11,619	2,412	1,805	4,982	79%
Two Family	40	-	16	22	95%
Three & Four Family	207	50	4	153	100%
Five or More Family	1,715	40	350	1,325	100%
Total	13,581	2,502	2,175	6,482	82%

Source: US Census

The housing market and pattern within the study area is diverse, ranging from low to medium density single-family housing to high-density urban multifamily housing within Davidson County. Within Rutherford County, housing ranges from low-density single-family suburban to rural/ranch-style housing. Given the amount of vacant land within the study area, opportunities exist for changing development patterns which could result in more higher-density and transit-oriented development.

A.1.2 Employment and Economic Outcomes

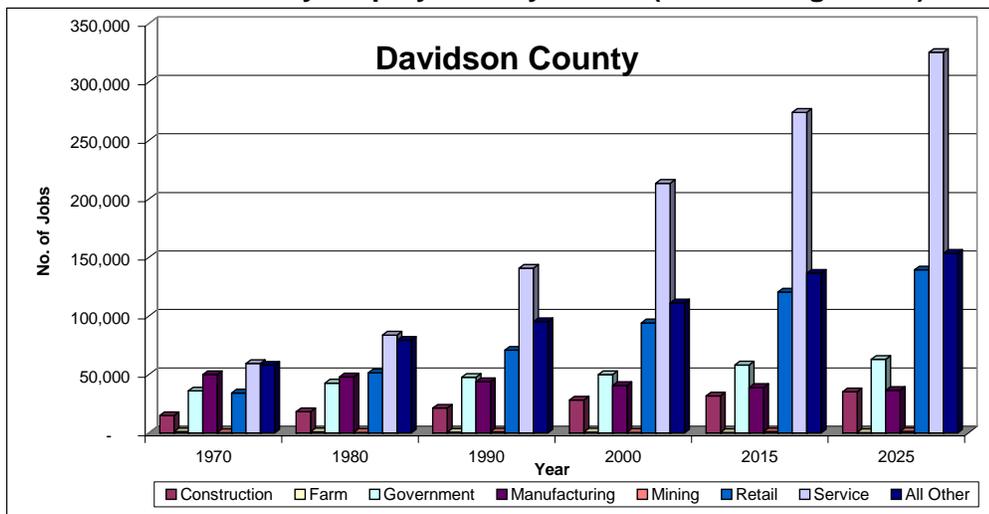
Since the mid-1980s, the counties surrounding Davidson County have been developing quickly, resulting in a diversification of economies in the region and the continued development of a

regional economy. In general, the surrounding counties' economies are evolving into a goods market while Davidson County is much more service-oriented.

As identified in Figure A-5 and A-6, Davidson County's employment over several decades has changed from somewhat of a diverse employment base to one that is highly retail and service oriented. Between 1970 and 2000, manufacturing employment in Davidson County declined while retail jobs doubled and service employment quadrupled. During this same period, Rutherford County has experienced similar growth in service employment; however, manufacturing has and continues to remain a solid employment base for Rutherford County.

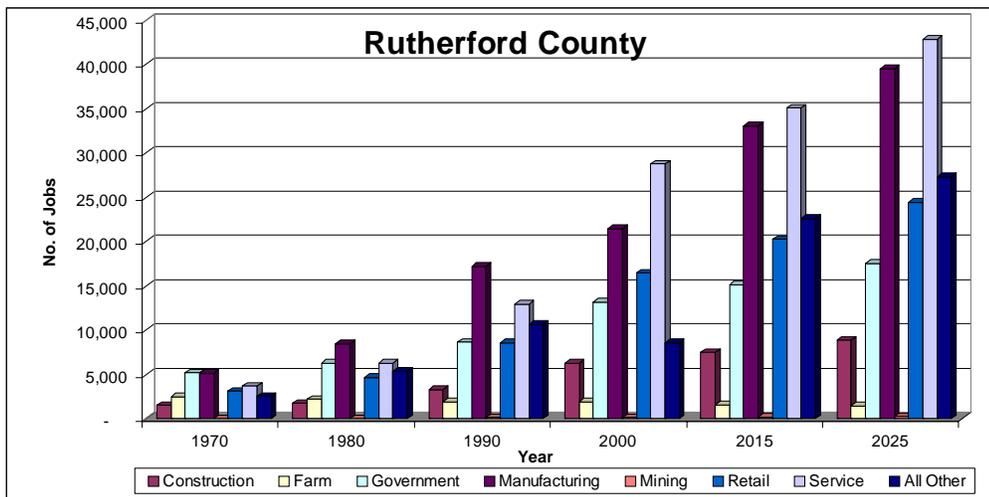
While Davidson County accounts for 51 percent of the employment (or 302,780) in the five county MPO area, Rutherford County has the second largest employment base of just over 100,000 (17.3 percent of the jobs). To a large degree, the Southeast Corridor is the economic engine of Middle Tennessee. This is evident by the number of large employers located within the Southeast Corridor. Table A-13 identifies employers within the study area having more than 250 employees.

**Figure A-5
Davidson County Employment by Sector (1970 through 2025)**



Source: Center of Business and Economic Research, UT

**Figure A-6
Rutherford County Employment by Sector (1970 through 2025)**



Source: Center of Business and Economic Research, UT

Table A-13
Major Employers within the Study Area (Greater than 250 Employees)

Company	Product/Service	No. of Employees
Nashville-Davidson County		
Vanderbilt University & Medical Center	University and Medical	13,601
State of Tennessee	State Government	9,099
Metropolitan Nashville-Davidson County	City Government	6,100
HCA Health Care Corp.	Hospital/Healthcare	4,500
BellSouth	Telephone/Communications	3,500
Baptist Hospital	Hospital/Health Care	3,030
Dell Corporation	Computers	3,000
Ingram Industries Incorporated	Books, Barge Transport, Insurance	2,880
The Tennessean	Newspaper	2,300
LifeWay Christian	Books: Publishing and Printing	1,300
Aerostructures Corp.	Aerospace Components	1,200
Aladdin Industries LLC	Plastic Products	640
RTS Wright Industries, LLC	Machinery & Industrial Equipment	615
Purity Dairies, Inc.	Milk & Ice Cream	550
The United Methodist Publishing House	Books: Publishing and Printing	500
US Tobacco Manufacturing LP	Tobacco, Chewing & Snuff	451
Black & Decker	Electric Household Appliances	400
Coca-Cola Bottling Company	Soft Drinks	400
Gibson Musical Instruments	Musical Instruments	320
Johnston & Murphy/Genesco Inc.	Men Shoes and Apparel	320
Nicholstone Printing Division	Business Forms – Printing	300
Nashville Display/Wire Product Mfg.	Partitions and Fixtures	280
Magnetic Ticket & Label	Plastic Products	250
City of LaVergne		
Ingram Distribution Group	Books, Periodicals & Newspapers	2,010
Bridgestone/Firestone	Tires and Inner Tubes	1,859
Whirlpool Corp.	Refrigeration & Heating Equipment	1,500
Borders Group	Books, Periodicals & Newspapers	950
Hennessy Industries Inc.	Automotive Equipment	365
Allegheny Tech. Metalworking Prod.	Carbide Metal Inserts	340
Ammico Tools	Motor Vehicle Parts & Accessories	326
Cardinal Health Inc.	Drugs, Proprietaries and Sundries	300
Hollywood Video	Video Tape Rental	300
Ingram Entertainment Holdings	Tapes, Audio & Video Recordings	300
Venture Express Inc.	Trucking, Except Local	300
Metal Working Products	Hand and Edge Tools	275
Parthenon Metal Works	Furnaces, Coke Ovens & Steel	260
Perfect Equipment	Motor Vehicle Parts & Accessories	250
Quality Industries	Sheet Metalwork	250
Town of Smyrna		
Nissan Motor Mfg. Corp. USA	Light Duty Trucks/Auto	6,300
Perrigo of Tennessee	Pharmaceuticals	1,000
Cumberland-Swan Inc.	Perfumes, Cosmetics	793
Caradon Better Built Doors and Windows	Metal Doors, Sash, and Trim	500
Square D Company	Electrical Switchgear	500
Distribution & Auto Service	Motor Vehicle Supplies & Parts	400
Tridon, Inc.	Hardware, NEC	360

Table A-13 (continued)
Major Employers within the Study Area (Greater than 250 Employees)

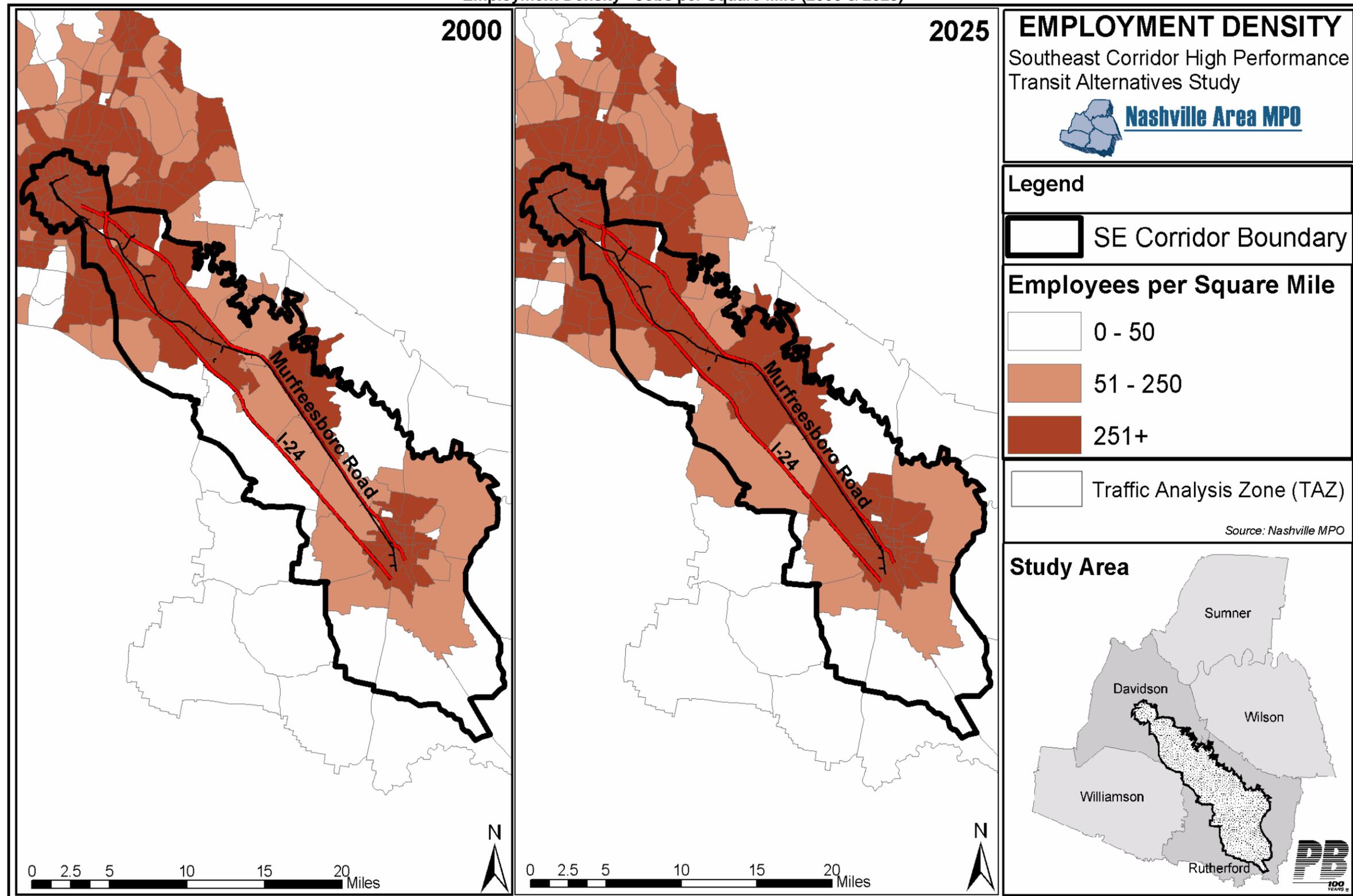
Town of Smyrna, continued		
Town of Smyrna	City Government	350
Menlo/Word Distribution	Christian Music, tapes	300
Taylor Farms TN	Process Fresh Vegetables	300
Tennessee Technical Services	Aircraft Repair	300
City of Murfreesboro		
Middle TN State University	State University	1,670
Alvin C York VA Medical Center	VA Medical Center	1,260
Middle Tennessee Medical Center	Medical Center	1,200
City of Murfreesboro	City Government	1,000
State Farm Operations Center	Insurance	954
National HealthCare (NHC) Corp.	Health Care Management	800
General Mills	Icings, Frozen & Baking Products	650
Pillsbury	Frozen Bakery Products	650
Mahlet/Tennex Industries Inc.	Motor Vehicle Parts & Accessories	400
Straus Boat Group	Boat Building and Repairing	400
Bunny Bread/Lewis Brothers Bakeries	Bread, All Types	390
Johnson Controls	Automotive Seats	335
Rich Products Corp.	Food Preparations	292

Source: Tennessee Department of Economic & Community Development, 2004

As illustrated in Figure A-7, employment within the study area is increasingly dense. Density levels within the communities of Rutherford County are beginning to see the same level of concentration as that of Davidson County. Employment growth within this corridor has made the southeast corridor the leading employment corridor for the region.

While the southeast corridor is one of the strongest corridors for employment growth over the next twenty years, the supply of certain workforce skill levels will become increasingly important to employers as they consider business location. If the income level to the employee is disproportionate to the travel costs (e.g. gas, parking, normal vehicle wear) and commuting time, or if access to the corridor is limited to some employees through lack of transit service, the available supply of employees will be limited and economic growth in the corridor will be affected. For the region to remain competitive and continue to enjoy increased development opportunities, high growth corridors, such as the southeast, must provide a more diverse transportation system that is very closely linked with compact development. The southeast corridor could benefit substantially from additional mobility options such as high performance transit that is capable of providing reliable, affordable, and relatively flexible travel within the corridor.

Figure A-7
Employment Density - Jobs per Square Mile (2000 & 2025)



A.1.3 Land Development Patterns and Plans

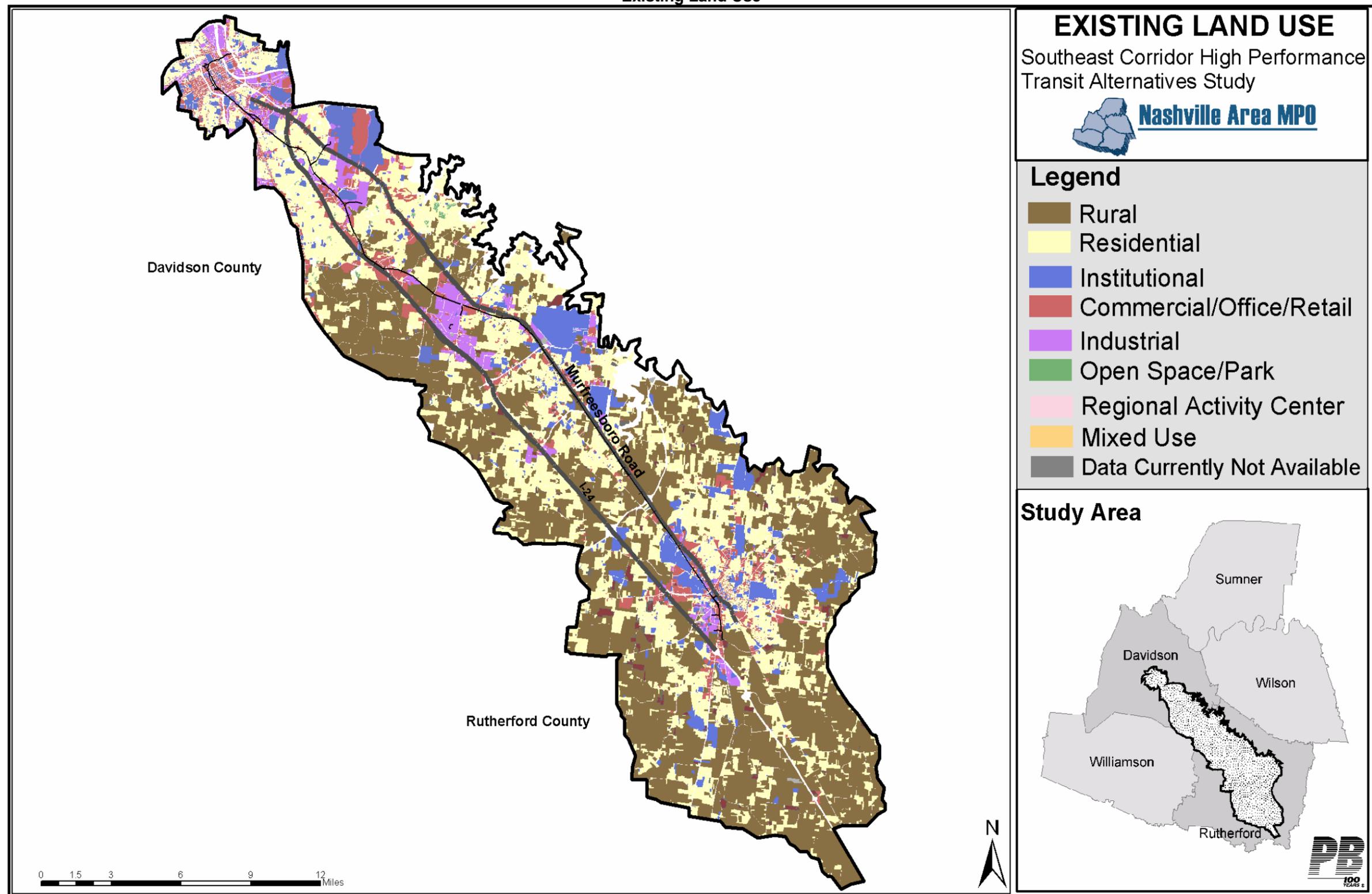
Land development patterns within the region have largely fueled suburbanization and a near dependence on the automobile. Land use and development decisions within Nashville and the surrounding counties are largely consistent with that of many major metropolitan areas in the country, which have focused on new development opportunities rather than the opportunity for urban infill and redevelopment.

Figure A-8, illustrates the current land use patterns within the study area. Within Davidson County, the downtown core has the highest concentration of commercial, office, and retail uses. There are also sizable industrial uses within Davidson County and the I-24 corridor in the City of LaVergne. Relative to residential uses, Davidson County provides a greater continuity of residential uses while such uses in Rutherford County are somewhat dispersed. A large portion of the Rutherford County study area is classified as rural offering significant opportunity for development and land uses that are favorable to public transportation.

Since 1988, Metropolitan Nashville-Davidson County has utilized a sub-area planning process to control land use decisions. Nashville is divided into fourteen planning subareas, which affords residents and city officials the ability to more effectively plan and provide necessary community improvements and shape the areas accordingly.

The study area within Nashville-Davidson County comprises four subareas: Subarea 9 which is the downtown area, Subarea 11, which is just south of the downtown area, and Subareas 12 and 13, each bordering Subarea 11 to the north and encompassing both sides of I-24 throughout Davidson County to the Rutherford County line to the south. The following is a depiction of the corridor starting with the downtown area (Subarea 9) and extending southeasterly toward the Rutherford County line.

Figure A-8
Existing Land Use



Source: Nashville MPC and the Rutherford County Planning Commission

Subarea 9 - The northern most portion of the study area includes the Nashville central business district (CBD), which holds a unique place in the region. It has the highest concentration of jobs, due in large measure to the concentration of state government offices in the CBD, and is the most accessible location for all of the area residents. The CBD and surrounding areas are heavily developed with a mixture of commercial, retail, office and mixed use areas. Over the past several years there has been a resurgence of residential building or residential conversion in the downtown core. Redevelopment is also occurring in underutilized or declining areas, such as the Gulch on the west side of the CBD. Farther west is the region's largest concentration of hospitals and related medical offices and services, as well as Vanderbilt University and Belmont University. Established, medium-density residential neighborhoods are on the periphery of the study area outside the CBD and mixed use areas. A substantial concentration of heavy commercial and industrial establishments is south of the inner loop between the Cumberland River, Briley Parkway, Highway 440 and I-40 East and Nolensville Road. The Cumberland River and tributary streams are the major water features of this portion of the corridor. Scattered throughout this portion of the corridor are public parklands and greenways, such as Shelby Greenway, that provide open space and forested lands.

Subarea 11 - Bounded by the Cumberland River to the north; Spence Lane, Massman and Patricia Drives, Murfreesboro Pike, Briley Parkway, and I-24 to the east; the CSX railroad to the south; and I-65 to the west. Subarea 11 covers approximately 9,787 acres or 15.3 square miles. This area represents 2.9 percent of Davidson County's land area.

The predominant land uses are residential and industrial, together occupying over one-half of the acreage in Subarea 11. Residential properties, however, comprise 66 percent of the parcels, while industrial uses occur on only 7 percent. As might be expected, the average size of a residential property is much less than that for an industrial use. The second tier of land uses, by acreage, are vacant, institutional/utility, and commercial. Together, these three land uses comprise 38 percent of the acreage in Subarea 11 and 23 percent of the properties. The balance of Subarea 11 contains office developments, parks, and parcels strictly devoted to automobile parking. These three land uses occupy 6 percent of Subarea 11 acreage and fewer than 5 percent of its parcels.

Subarea 11 is an older, mixed-use area where the development pattern has essentially been established. The subarea continues to be a viable affordable residential area with a number of different types of homes and living opportunities dispersed throughout. A major planning focus is the retention and expansion of these housing opportunities. Subarea 11 has a number of unoccupied homes and vacant residential lots that are candidates for rehabilitation and new infill development. A major goal of the plan is to promote infill development as a way of providing affordable housing and increasing the stability of neighborhoods.

Subarea 12 - The areas west of I-24 are within Subarea 12. The Southeast Community is largely a bedroom community with a rural fringe, but has a range of land uses and development patterns, including older and newer suburban residential, significant retail centers, and a large rural area. The Southeast Community was one of the fastest-growing areas in Davidson County between 1990 and 2000. Projections show an increase of 12.6 percent by 2010, significantly more than the growth rate projected for Metropolitan Nashville-Davidson County. Projections call for over 30 percent population growth for areas south of Old Hickory Boulevard toward the Rutherford County line. The area is projected to increase to 87,149, which is a 12.6 percent increase over 2000 population numbers. The residential occupants are split fairly evenly between owner-occupants and renters.

The west side of I-24 from I-440 to the Davidson-Rutherford County line is dominated by residential development with scattered commercial and light industrial. Residential developments range from single family on one-acre lots to large multifamily apartment complexes.

Subarea 13 - The southeastern portion of Davidson County, east of I-24 and within this corridor, has recently experienced the highest growth rates in Davidson County because of the availability of land. The area's natural environment creates an attractive setting for new development. The Antioch/Percy Priest Lake community faces high growth pressures, as it has for many years. The community's population has increased 37 percent over the past decade, from 44,101 in 1990 to 60,380 in 2000, and is projected to grow another 25 percent by 2010.

South of the I-440 loop to the Bell Road (Hickory Hollow) area, the land uses on the east side of I-24 are dominated by commercial and industrial, including the Nashville International Airport, Dell and various warehouse commercial enterprises. Further to the east at the Bell Road interchange of I-24, there is heavy commercial and retail development around and including the Hickory Hollow Mall with over 1 million square feet of retail space, as well as the commercial enterprises that have grown up in the vicinity of the mall. This portion of the study area also includes large multi-family complexes and smaller lot single and multi-family subdivisions, with some of the highest densities in the region. Tributaries feeding into the J. Percy Priest Lake at the eastern edge of the study corridor provide the major water features and the major open/green spaces.

The City of LaVergne, bordered on the north by Davidson County and on the south by the Town of Smyrna, is one of the fastest growing communities in the state as well as the country. The largest land use in LaVergne is the Interchange City industrial park. The region's largest industrial/distribution center is located inside the City of LaVergne along the Davidson/Rutherford County line. This area is home to the major manufacturing facilities of Whirlpool and Bridgestone-Firestone, as well as book distributors such as Ingram Book Group, Waldenbooks/Borders Books, Inc., Southwestern/Great American, Haynes and Austin. Residential development includes both single family and multifamily. The greatest growth has been in single family units. Other land uses in LaVergne include commercial, office and retail, as well as public schools, and rural land.

The Town of Smyrna shares a boundary with LaVergne. It has a combination of residential, commercial, industrial and institutional uses. The largest industrial facility in Smyrna is the Nissan car manufacturing plant, which employs about 6,000 people. The Smyrna-Rutherford County Airport is within the corridor to the east of Murfreesboro Road (US-41/70S). Other institutional uses include the Tennessee Army National Guard and the Tennessee Rehabilitation Center, which are in the eastern portion of the corridor. The town also has a mixture of residential land uses, ranging from single family to multifamily complexes.

The City of Murfreesboro, in the geographic center of the state, is about 35 miles south of the Nashville CBD, and it is the largest city in Rutherford County. The largest employer and land use in Murfreesboro is the 500-acre campus of Middle Tennessee State University. MTSU is the second largest and fastest growing university in Tennessee with over 21,000 students. The city also has experienced considerable commercial and industrial development since the early 1990s. This non-residential development is expected to continue for the next several years, particularly commercial growth, to serve the needs of a growing population.

The remainder of the corridor in Rutherford County, outside of the cities, is primarily rural land (a combination of farmland, grazing land and open land) and low density residential areas. The area also has scattered pockets of commercial, retail and office.

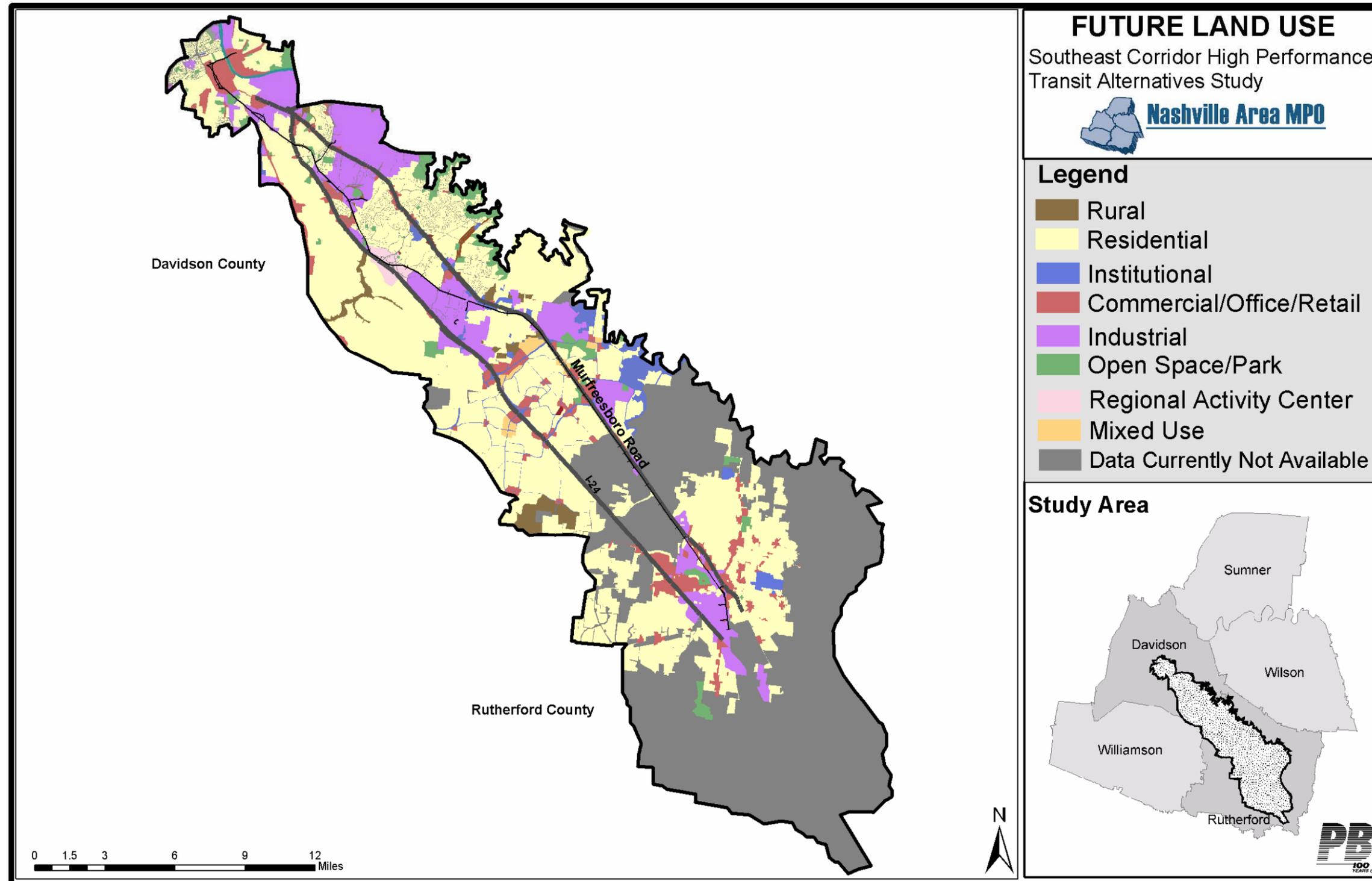
Figure A-9, illustrates the future land use patterns within the study area, which is slowly beginning to see changes in development decisions that are much more supportive of public transportation. Over the last several years, major investments in downtown Nashville and other parts of the study area have resulted in higher concentrations of mixed use and traditional neighborhood design which in time will result in greater transit ridership. There are numerous locations within the study area that are being planned or discussed that offer mixed use or development concentrations that are supportive of public transportation.

A few of these locations and developments include:

- Rolling Mill Hills in Downtown Nashville, which is the site of the old General Hospital
- Nashville Thermal Plant in Downtown Nashville, which is currently planned for development as a mixed use residential and a baseball stadium
- The Gulch, located in Downtown Nashville along CSX railroad
- The Gateway District in the City of Murfreesboro, which is located between I-24 and US-41/70S just north of SR-96 is a 400 plus acre mixed-use site with concentrations of office, residential, and retail
- Blackman Community in Murfreesboro, which is located near I-24 and SR-840, calls for mixed-use residential and employment along with community schools

While these locations and developments represent a good start toward development in the region that is more transit-and pedestrian-friendly, these locations represent only a fraction of the total development in the corridor, and are not located contiguously to form a sustained corridor of transit friendly development. They represent a potential future pattern for development that supports a more balanced future transportation system.

Figure A-9
Future Land Use



Source: Nashville MPC and the Rutherford County Planning Commission