

A map of the Nashville Area Metropolitan Planning Organization (MPO) showing various transit development plan areas. The map is color-coded: yellow for areas like Clarksville, Springfield, Portland, Gallatin, and Dickson; blue for areas like Ashland City, Goodlettsville, Hendersonville, Green Hill, Mount Juliet, and Lebanon; green for areas like Brentwood, Nolensville, La Vergne, and Smyrna; and purple for areas like Berry Hill, Rural Hill, Franklin, and Murfreesboro. Major roads and water bodies are also shown.

Nashville Area Transit Development Plan

Final Report

Nashville Area Metropolitan Planning Organization

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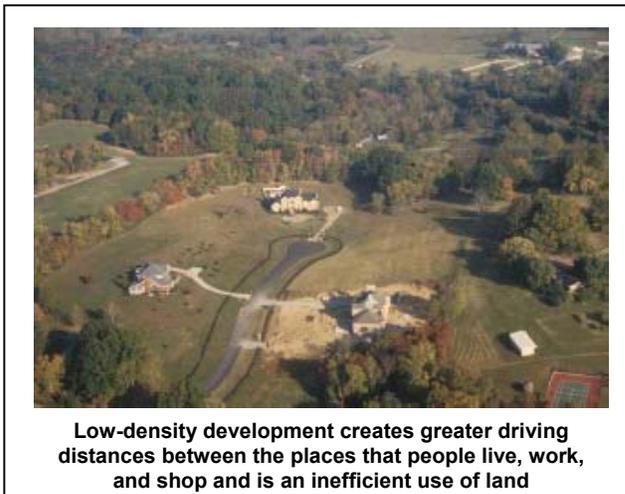
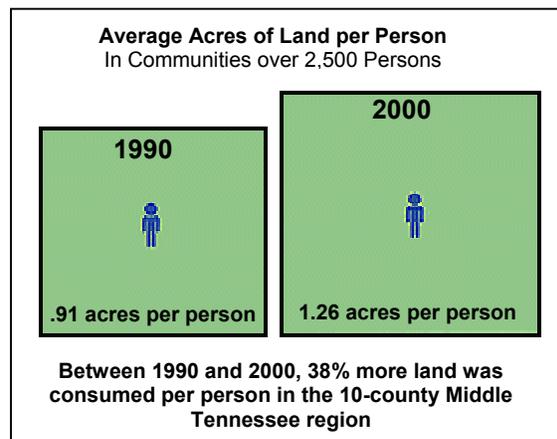
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Introduction

Public transportation has long had a role in improving mobility in the Middle Tennessee region. Several trends of recent years, though, set the stage for an in-depth study of the potential for transit in the region. Current development patterns are creating alarming projections of an outward expansion of the region. The costs of keeping up with the ever increasing roadway needs are making people think more about mobility alternatives. Increased pressure on the existing transit systems and opportunities for expanded services, as well as an aging population, also focus thought on alternatives to the auto. Congestion continues to grow, and air quality has been declining. A brief look at these factors follows.

Development Patterns

The Middle Tennessee region is growing at a rapid rate – between 1990 and 2000, the populations of Rutherford, Sumner, Williamson, and Wilson counties grew by close to 20% and a similar rate of growth is anticipated over the next 20 years. The growing population of the Middle Tennessee region is consuming more and more land over time and the landscape is undergoing a rapid transformation at the suburban fringe. Between 1990 and 2000, the amount of urbanized land within the four-county area increased by 35 percent. Each county's growth plans, if implemented, will result in an increase in urbanized area of 150 percent from the year 2000 to the year 2020. While this phenomenon is not new in this region or elsewhere in the United States, the dramatic changes projected in this area have brought the issue to the forefront of public awareness.



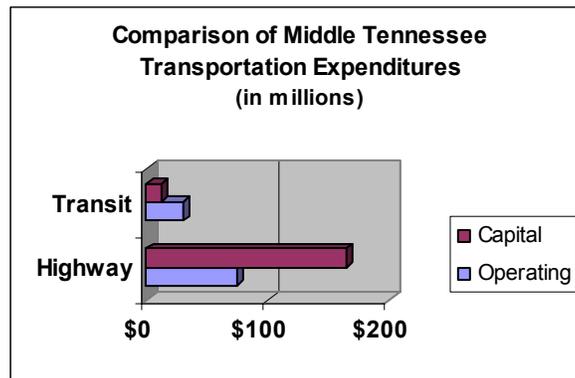
Many communities have reacted to the disappearance of the rural land by adopting development standards intended to preserve rural character by requiring large lots and low densities. However, the result is a uniform blanket of suburban development, rather than the preservation of genuine open space with aesthetic and environmental value. This low-density, dispersed development creates greater driving distances between the places that people live, work, and shop. Additionally, as development is spurred further and further from Nashville, commuters are

spending more and more time in their cars – in fact, Nashville commuters drive an average of 32 miles per person per day.¹

No single factor has had a greater impact on the pattern of land development in American cities over the last century than highways. Highways have decreased the time and cost of transportation within and between urban areas. Highways helped families relocate from housing near their workplaces to housing in the suburbs. Job decentralization followed. The car allowed for easy travel between residential, commercial and industrial areas despite the considerable distances that often separated them. Policy makers of the 1940s and 1950s built roads and highways to accommodate the growing numbers of cars and trucks.

Congestion, Air Quality, and Highway Costs

For nearly 50 years, Middle Tennessee has devoted its transportation dollars to creating an Interstate hub. It began in the 1950s as a series of federal highways connecting Nashville to other Tennessee cities and the surrounding states. Over the past four decades, the interstate highways have helped to fuel the rapid growth of the region’s economy. While highway development has flourished in the Middle Tennessee region, transit investment has not kept pace. In most parts of the region, people do not even have the option of choosing transit for their travel, because it does not exist. In the Nashville / Davidson county area, the MTA system has not been able to keep pace with the changes in development patterns in its service area. To provide context, the following table provides a comparison of typical annual operating and capital expenditures for transit and highways in the 10-county area.



Sources: TDOT [Status of Public Transportation in TN, 2002](#); TDOT Region 3

The changes in the patterns of growth prompted by expanded roadways rapidly increased the demand for trips on those roadways. Expansion of the highway system has continued as congestion has increased. Between now and 2025², an estimated \$322 million dollars will be spent on roadway projects in the 5-county Nashville MPO area to improve efficiency of the system, without increasing capacity. An additional \$405 million will be spent on projects to increase capacity. Even with this investment of \$727 million, about three quarters of the reporting stations on the interstate system are expected to be operating at a peak period level of service E or F (a high level of congestion), a significant deterioration from current congestion levels.

¹ Nashville Metropolitan Planning Organization, Travel Demand Modeling Data

² Nashville Metropolitan Planning Organization, [Nashville Area 2025 Long Range Transportation Plan](#)

As traffic congestion worsens, it has dramatic effects on regional air quality. Currently, the Nashville metropolitan area is in “maintenance” status for the Environmental Protection Agency’s (EPA’s) 1-hour Ozone standard. However, by 2004, the region is expected to be in violation of the EPA’s 8-hour Ozone standard. In response to this, the region’s counties have entered into a voluntary early action compact with the EPA, which states that they will immediately begin addressing air quality issues. A key aspect of dealing with air quality will be to promote long-term land use changes so that transit might become a more feasible option for the region, thus decreasing its dependence on the private automobile.



Seeking Alternatives

Despite the imbalance in support between highways and transit, there are several signs in the region that suggest a desire to develop mobility alternatives in the Middle Tennessee area. For the past several years, the RTA has been pursuing the development of a commuter rail system in the Nashville area. Additionally, the City of Franklin is about to launch a local circulator service in their community. These efforts are coming forth even without a regional focus on the development of mobility alternatives. The time is right to have a broader discussion of the issues and realistic transit alternatives for the Middle Tennessee area.

No single solution will reverse these trends or improve the livability of a region. However, a more balanced transportation system can be created with a strategy that combines multiple approaches: (1) developing alternative land use patterns that provide greater concentrations of residential and employment, (2) increasing the mix of land uses, and (3) developing true mobility options – coordinated system of local and regional transit services – will serve to reduce automobile dependency, and create a more balanced transportation system.

Project Approach

The remainder of this report summarizes the major findings of the Regional Transit Development Strategy. The plan was developed for the Nashville Area Metropolitan Planning Organization. The study area for the plan was the 10-county middle Tennessee region.

The purpose of this study was to identify areas of the region – both today and in the future – where transit services would be a reasonable part of the mobility system. The project also produced guidance on development strategies to increase the potential for transit to be successful.

This study does not replace or revisit more detailed



short to medium-range plans for areas of the region that already have transit service. A number of such studies have been conducted recently, including the *Short-term Service Improvement Plan* (2001) that made a number of route specific recommendations for the Metro Transit Authority and proposed several new ‘mini-hub’ transfer stations throughout Davidson County. MTA also sponsored a study to examine the potential for high-frequency transit service connecting downtown Nashville and the West End Avenue corridor using bus rapid transit or light rail technology. Additionally, the RTA commuter rail studies were used to identify potential corridors for commuter / express services in the region. Other existing MPO plans were also incorporated into this work.

Instead, this study assesses the current environment for transit in a larger, 10-county region surrounding Nashville, identifies the areas where transit service appears to be feasible, and describes strategies that might be used to enhance transit’s potential in areas that are not currently considered feasible.

The following steps are detailed in reports written during the project.

Collect public input: A wide range of public input was collected for this project. Stakeholder interviews with key decision leaders in the region were conducted to develop a context for the project. Focus groups with riders and non-riders throughout the region were conducted to learn about their attitudes and interest in transit. Visual preference survey workshops were held throughout the area to get feedback from the public on their preferred development patterns. All of this input fed directly into the development of study products.

Analyze existing conditions: Population and employment densities, locations of major activity centers, and travel patterns were analyzed to create a data-driven foundation for the project and future recommendations. Special attention was paid to populations needing forms of non-auto mobility.

Identify transit opportunity areas: Based on existing conditions and two alternative future development patterns, areas in the region that would successfully support different types of transit services were identified.

Develop and evaluate transit service alternatives: Service strategies were developed, and estimates of ridership and costs associated with recommended transit in different areas were provided.

Detailed technical documentation is available from the Nashville Area Metropolitan Planning Organization for all of the work done in this project.

Transit Options

The Regional Transit Development Strategy recommends transit services for the Middle Tennessee region for three different scenarios.

The *Existing Conditions Scenario* looks at the existing socioeconomic and development characteristics of the region, and recommends transit services feasible for short-term implementation.

The *Long Term Base Case Scenario* projects existing development patterns into the future (2025). Transit opportunities under these resultant development patterns are recommended.

The *Long Term Vision Scenario* is based on a land use pattern that was developed in a study recently completed by the Cumberland Region Tomorrow non-profit organization. This scenario represents increased concentration of development within existing municipal boundaries, which makes transit a more feasible option in many areas of the region.

The Transit / Land Use Relationship

Development patterns affect the ability for transit to be an effective form of mobility in two ways. First, transit can be most effective when there are concentrations of trip origins and concentrations of trip destinations. Second, the pedestrian ‘friendliness’ of development also has a great affect on the ability of transit to be a successful mobility option.

The impact of alternative future development patterns are illustrated in this project by the two different long term scenarios. Transit opportunity areas were identified under a long term scenario that continues the current development patterns. Using the Vision land use scenario, more transit opportunities are available because the future development patterns represent an increased clustering or concentration of development in already developed areas, improving the conditions for successful implementation of transit.

The second way development patterns affect transit is by the way in which an area is developed. Every transit rider is a pedestrian at some point during their travel experience, whether it is walking to a bus stop, parking a bike near a transit station, or walking from the train to their final destination. If the pedestrian environment is ignored, an area is not likely to see the development of a successful transit system. As part of this project, the team



developed resources to help planners, engineers, policy makers, and citizens understand the steps they could take to improve the pedestrian-friendliness of the Middle Tennessee region.

While the study conducted by Cumberland Region Tomorrow focused on the potential to increase the concentration of population and employment around the region, the guidelines formulated for this project highlight some basic design strategies for improving the region's pedestrian-friendliness. The design guidelines include issues such as focusing on pedestrian pathways and amenities, encouraging mixed-use development, linking neighboring communities, and encouraging development and rehabilitation in town centers. The guidelines include examples of both good and bad development (from a pedestrian perspective), with attention paid to exemplary practices elsewhere in the Southeast. They highlight the fact that making the region more pedestrian-oriented will be key in developing a successful transit network in the Middle Tennessee region.

Identification of Transit Opportunity Areas

Transit opportunity areas were identified by analyzing a number of different factors, including population and employment densities, travel patterns, and concentration of likely transit riders.

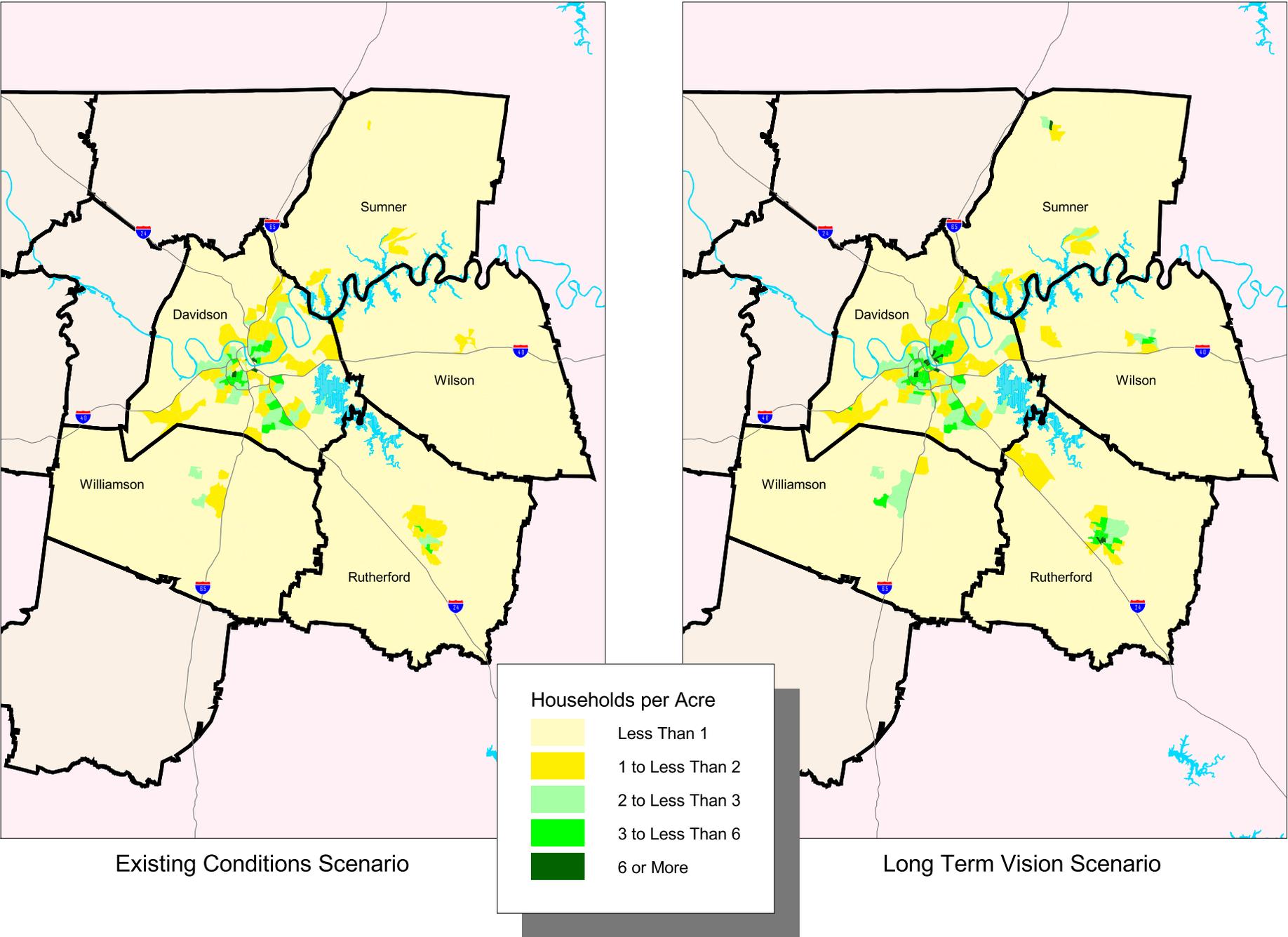
Fixed-route transit services are generally most successful in areas with high population densities. Consequently, population and household densities are measures frequently used to indicate the potential for transit to succeed in a particular area. According to the *Transit Capacity and Quality of Service Manual*, a density of 3 households per acre is typically considered the minimum density to qualify as a transit-supportive environment. This household density translates into a population density of roughly 5,000 people per square mile. A neighborhood with a density of 3 households per acre would likely have quarter-acre lots with detached single-family houses.

Figure 1 shows household density for the 5-county MPO area for the years 2000 and 2025. The long term scenario shown is for the Vision scenario, which represents a shift from current development patterns to increased clustering of development in already developed areas. The figure is an example of the type of analysis that was conducted to identify transit opportunity areas. The areas shown in green are ones that either have or are projected to have transit-supportive household densities. (For the most part, outside of the core 5 county area, these higher densities are not present and are not projected to develop in the future. Exceptions are the Clarksville area, and the communities of Dickson and Springfield.).

Employment density is another key indicator of potential transit success. The *Transit Capacity and Quality of Service Manual* considers an employment density of 4 jobs per acre to be the minimum acceptable in considering whether an area is suitable for transit services. Similar analysis was done for employment densities in the region.

The thresholds described above (3 households/acre or 4 jobs/acre) primarily apply to the viability of fixed route transit services. Alternative types of transit, such as demand

Figure 1: Household Density in the MPO Region, Existing Conditions and Vision Scenario



responsive services (e.g. dial-a-ride, flexibly routed services or vanpools) can be very successful components of the mobility picture in less dense suburban or rural. Because many of the areas surrounding Nashville are rural in nature, demand response services may end up being the most feasible option in much of the region.

Another factor analyzed to identify transit opportunity areas was travel patterns within the study area. Figure 2 summarizes the nature of work travel between and within counties. Inter-county flows above 5,000 daily trips are shown, with the thickness of the arrow representing the magnitude of the travel flow. Flows below 5,000 daily trips are not shown because it would be difficult to generate sufficient transit ridership. The number of trips and percentage of trips from the county that remain within the county are displayed in a box in each county. Throughout the region, high percentages of work trips remain in their county of origin.

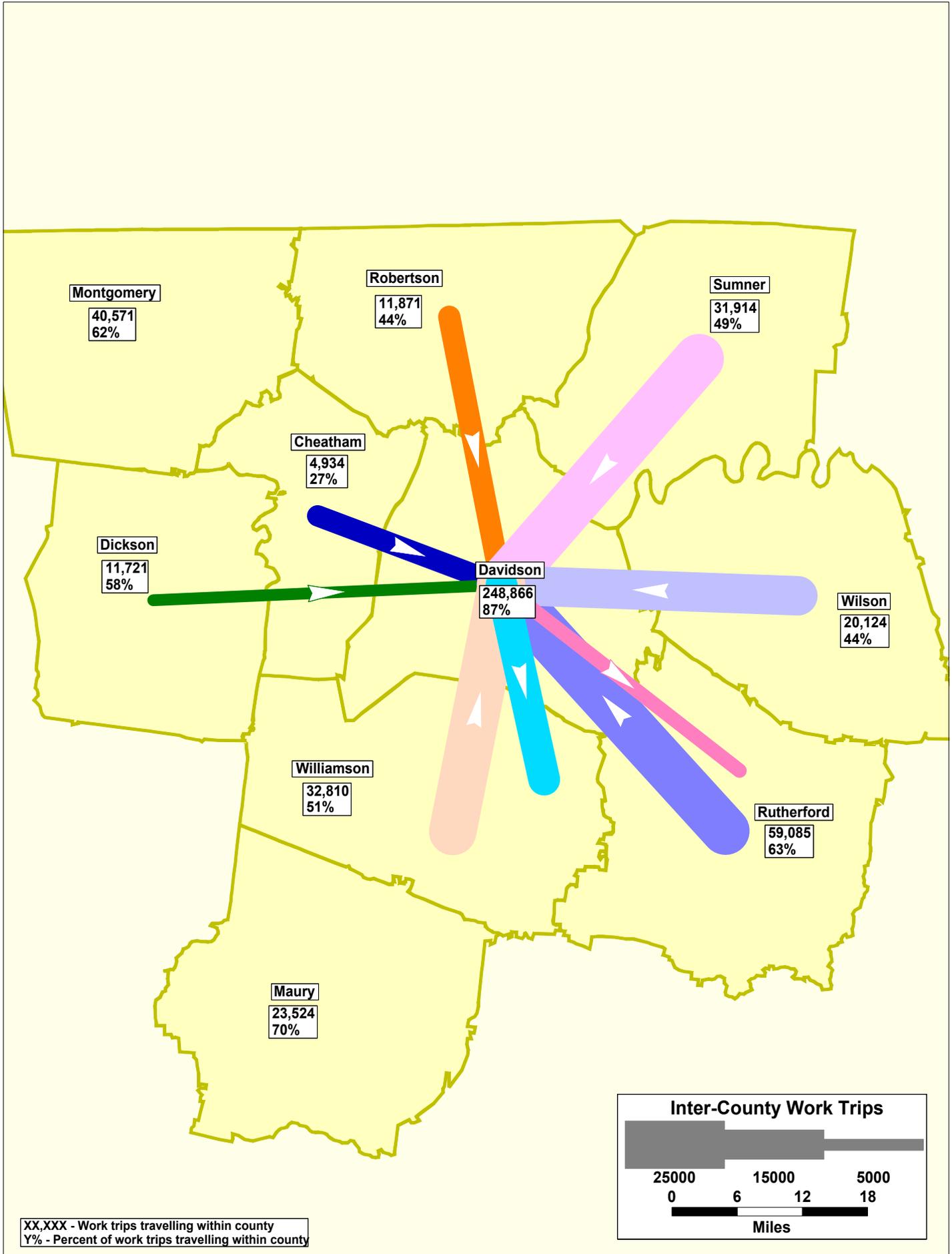
It is important to remember that the arrows represent travel from all locations within one county to all locations in another county. In general, of the travel flows to Davidson County, about half of the trips are destined for the downtown area, with the remaining half traveling to other locations in Davidson County. Thus, while downtown-based commuter services can serve some of the work travel demand, it is clearly important to consider other options for the large number of people who are traveling to non-downtown work destinations – both in Davidson County or within their own county.

Additionally, the concentrations of seniors, low-income households, and households without a vehicle (factors typically associated with transit ridership) were taken into account in identifying transit opportunities. These factors were primarily considered when identifying local services, and are also relevant in the consideration of more extensive demand response service.

Types of Transit Service

In order to serve the mobility needs of Middle Tennessee, the study proposes a ‘family’ of potential transit services based on the nature of the area and the types of trips being made. The following paragraphs describe the types of services that could be used throughout the region. Four different types of transit service were recommended: commuter/express services (express buses, bus rapid transit, commuter rail, etc.); local circulators; dial-a-ride service; and vanpools. Descriptions of each of these service types follows, and are summarized by a matrix of service-type characteristics.

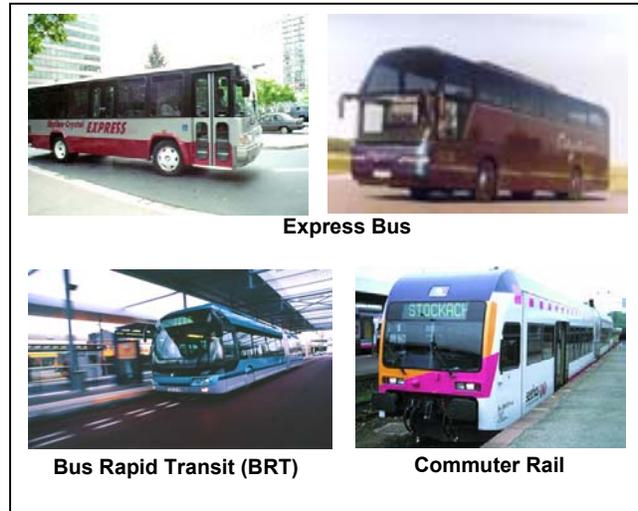
Figure 2: Work Flows in the Middle Tennessee Region



Note: Travel flows represent trips to/from all areas of counties.

Commuter / express services

Commuter / express services provide for the long-distance mobility needs of the region. In most cases, they connect the surrounding communities with the Nashville metropolitan area, primarily the downtown. A number of different transportation modes could be used to serve this need, including express buses, bus rapid transit (BRT), or commuter rail. In some corridors, strategies such as the implementation of continuous high occupancy vehicle (HOV) lanes or bus-only lanes could be used to increase the speed of transit service.



Express buses would be operated with over-the-road coaches, which may include passenger amenities such as cushioned seats and overhead reading lights. Most express bus services would begin at suburban park-and-ride lots and serve the long distance Downtown Nashville work trip market. If other destinations have enough demand to warrant operation of express buses, this type of service could also serve areas other than the downtown.

Bus Rapid Transit can operate in many different ways, from enhanced limited stop bus service or express service to a service resembling light rail with an exclusive guideway and rail-type stations. BRT is typically operated with buses that resemble light-rail vehicles that may operate, at least partially, in their own right-of-way. BRT generally includes advanced technologies that can improve the travel experience for riders, traffic signal priority, station area amenities and real-time travel information.

Commuter rail operates on existing rail right-of-way, connecting widely spaced stops and would serve the work trips to downtown Nashville.



Local circulator services: Some towns and cities in the region have (or are projected to have) population and/or employment densities that would support fixed route transit services. In these places, local circulators have been proposed. The primary purpose of local circulators is to connect area residents and workers with major activity centers in and around town. They would also connect with any regional express services. In some cases, flexible-route services are proposed to maximize the local circulator's coverage. A flexible service is usually shown as a typical bus route surrounded by a flexible zone. The alignment shown on a map would be its default routing, but vehicles operating the route would be permitted to leave that route to serve any location within the flexible zone when requested to do so.

Dial-a-Ride services: For many areas of the Middle Tennessee region with low household and employment densities, the most appropriate form of public transportation will be demand responsive services, such as dial-a-ride or taxis. The Mid Cumberland Human Resource Agency and the South Central Tennessee Development District (in Maury County) currently provide demand responsive services for the elderly and people with disabilities; however, very little service is available for other residents and workers in many of the rural areas in the region. In many cases, dial-a-ride service that is available to the general public would provide a significant increase in the regional mobility.



Vanpools: Vanpools, or other employer-based services, are important ways to serve the commuter market and have been very successful in the Nashville area. Vanpools provide the opportunity to begin an effective transit service, serving dispersed activity centers, with a smaller number of people. They offer flexibility to serve the many major employers in the region that are not located in the downtown area (Interchange City, Saturn, Nissan, Dell, etc.) and would not necessarily benefit from the commuter / express corridors. Vanpools may also operate in the commuter / express corridors from areas where there is not sufficient ridership for an express bus. At times, vanpools can grow to become express bus services. A general rule-of-thumb would be that if four or more vanpools are operating from a given origin (or corridor) to the same destination at approximately the same time of day, the potential may exist to serve this market with a fixed route commuter service. Vanpools can make use of HOV lanes to improve the travel time of their trip.



A matrix summarizing the characteristics of the different types of transit services considered in the Regional Transit Development Strategy is on the following page.

Service Recommendations

The proposed fixed route services for the region are shown in Figure 3. Both short-term and long-term recommendations – including both long term scenarios - are shown on the map. The services illustrated on the map are the commuter / express corridors and the local circulators. Dial-a-ride and vanpool services are anticipated throughout the region, but are not illustrated on the map because of their customized nature.

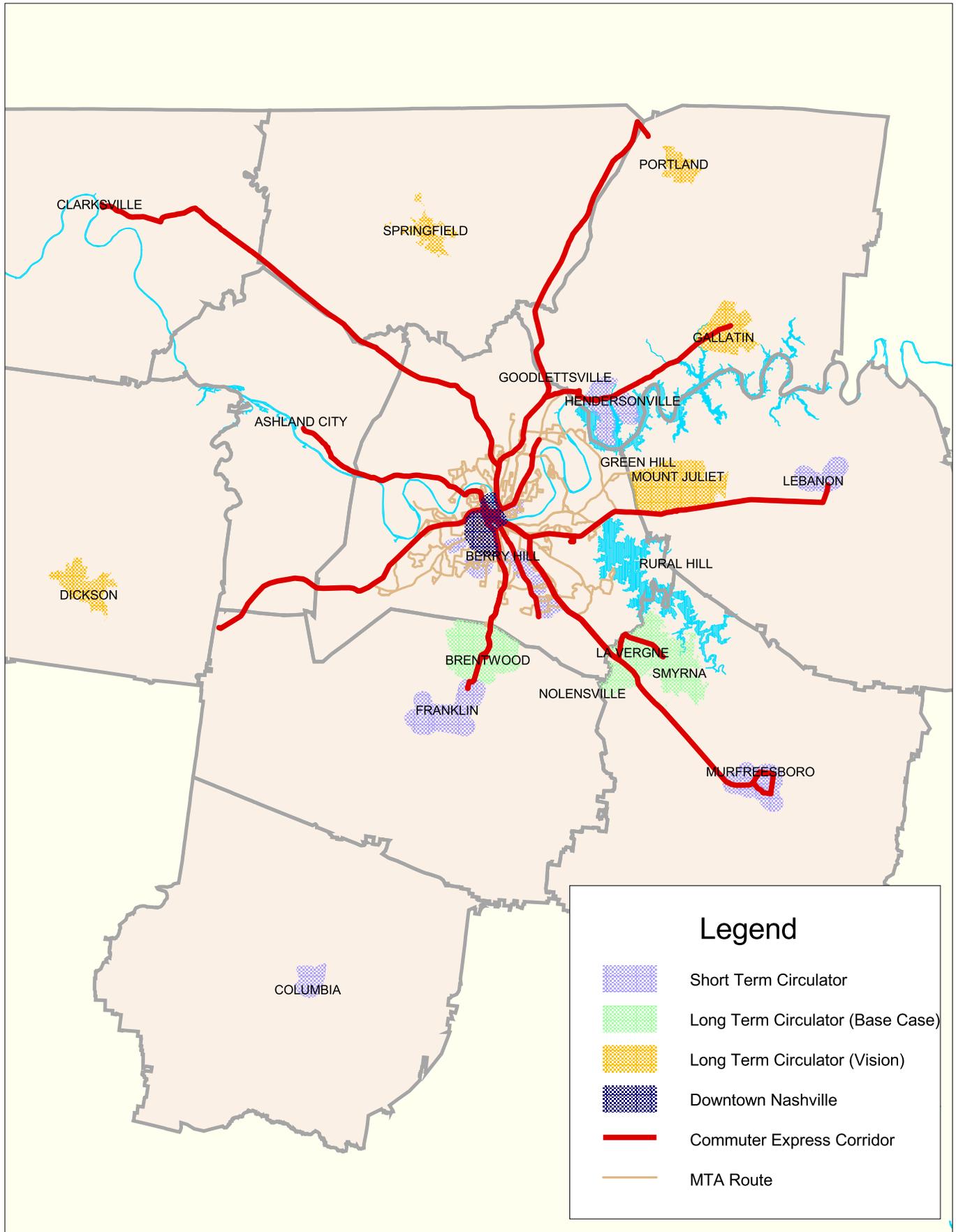
Descriptive detail focusing on the short-term and long-term transit recommendations is provided in the following sections.

Summary Matrix of Service-Type Characteristics

Type of Transit Service	Primary Market Served	Typical Setting	Densities Required	Exclusive Right-of-Way?	Type of Vehicle	Level of In-Vehicle Amenities	Typical Passenger Trip Distance	Stop Spacing	Level of Public Investment Required	Projected Ridership Level
Light Rail	All trips in corridor	High volume travel corridor	12-15+ du/acre	Most of the time	Specialized vehicles	Medium / High	Medium / Long	Medium	High	25-35 pass/hr
Commuter Rail	Work trips to CBD	Suburban area with park-and-ride	10,000 trips* from 5 mi. radius to focused destination	Yes	Trains	Medium / High	Long	Long	High	50+ pass/hr
Express Bus	Work trips to CBD	Suburban area with park-and-ride	1,500 * trips from 5 mi. radius to focused destination	No - Possibly operate in HOV lanes	Over-the-road coach	Medium / High	Long	Long	Medium	20-25 pass/trip
Local Bus	All trips, local travel	Urban	5-7 du/acre (30 min freq); 8-15 du/acre (10 min frequ)	No	Traditional transit bus	Low	Short / Medium	Short	Low / Medium	15-25 pass/hr
Community Circulator	All trips, local travel	Urban / suburban neighborhood	3-6 du / acre	No	Small vehicles (like car rental or hotel shuttles)	Low	Short	Short	Low / Medium	5-15 pass/hr
Dial-a-Ride	All trips, local travel	Low-density suburban or rural	0-4 du/acre	No	Small vans / sedans	Low	Short	-	Low	2-4 pass/hr
Vanpools	Work trips, suburb-suburb and CBD	Suburban - employer-based	0-4 du/acre	No	Vans	Low	Medium / Long	-	Very low	-

* total one way work trips

Figure 3: Proposed Transit Services for Middle Tennessee



Short Term Recommendations

Local Circulators

In the short term, 12 local circulators are recommended for implementation, as follows:

Davidson County Circulators

- East Nashville;
- Cherokee Park;
- Green Hills; and
- Corridor between Nolensville Pike and I-24 (4 circulators).

Circulators in Other Counties

- Hendersonville;
- Lebanon;
- Murfreesboro;
- Franklin / Cool Springs; and
- Columbia.

Commuter / Express Services

A number of express/commuter services connecting to Downtown Nashville are also recommended for development in the short-term time period. It is important to realize that express bus service may be the first step towards the development of a future fixed-guideway transit system. It might also be the most appropriate solution in the longer term as well. Any modes requiring significant capital investment (commuter rail, BRT, or some highway modifications) will require a full alternatives analysis before they can be implemented. In the shorter term, less capital intensive modes of transit (such as express buses) may be the most appropriate way to build up to the more extensive future transit system in the Nashville region.

These corridor services are recommended to be offered utilizing upgraded over-the-road coaches, appropriate for long distance travel. Some of the shorter corridors may be more appropriately served with standard buses. These commuter/express services would serve many of the existing park-and-ride lots in the region, as well as a few newly proposed lots. By pursuing the plans that the MPO currently has for the HOV network (outlined in their HOV study), improvements in express bus travel time can be achieved.

The RTA and MTA have recently taken steps to upgrade the existing express bus service in Nashville by ordering new vehicles with upgraded passenger amenities. They are also working with Metro to pursue construction of a new downtown transit center. Both of these actions are steps in the right direction towards offering a more attractive express bus product.

Areas to consider of commuter / express services in the short term include:

Davidson County Express Services

- Nolensville Pike Express;
- Murfreesboro Pike Express; and
- Gallatin Pike Express.

Express Services from Other Counties

- Lebanon / Mt. Juliet Express;
- Murfreesboro Express;
- Smyrna / LaVergne Express;
- Franklin/Brentwood Express;
- Ashland City Express;
- Dickson County Express;
- Clarksville Express;
- Gallatin Express; and
- Portland Express.

Vanpool and Employer Based Services

Continued expansion of vanpool service is strongly encouraged. The Nashville area consists of many dispersed employment centers and it is important to provide transportation alternatives for people traveling to these non-central locations. Vanpools are a very effective way to provide mobility to these areas. Development of employer-based services, such as vanpools, will continue to be an important part of the transportation system in the MPO region. In the longer-term, vanpool services may have the potential to evolve into express bus service if the demand between the origins and destinations served becomes high enough. In addition to vanpools, which are primarily rider-operated, employers could also choose to contract or operate shuttle services between their facilities and park-and-ride lots served by the regional express routes. While both types of service would not necessarily be operated by a public agency, they could be overseen by an organization such as a transportation management association.

Dial-a-Ride

Currently, dial-a-ride services are provided in the study area by the Mid Cumberland Human Resource Agency (MCHRA) for the elderly and people with disabilities. However, for other residents who do not live within walking distance of the proposed circulators, public transportation will still not be an option. Thus, it may be desirable to implement general public dial-a-ride services in areas that are not covered by the local circulators. The dial-a-ride could operate during the same hours as the local circulators, and may be provided on a day-in-advance reservation basis.

Long Term Base Case Recommendations

These recommendations assume that all short-term recommendations are implemented and that these services would be maintained into the long-term.

Local Circulators

In the Long Term Base Case Scenario, three local circulators are recommended in addition to the circulators described in the short term scenario. These circulators are recommended in the following areas:

- LaVergne;
- Smyrna; and
- Brentwood.

Commuter / Express Services

In either of the long term scenarios, the commuter / express corridors are recommended to be served by a high-speed transit service. The specific type of service would be determined through alternatives analyses, but would likely have an exclusive or reserved right-of-way to enhance the speed of transit travel. Between the short term and the long term, express corridors may migrate from over-the-road coaches to bus rapid transit or commuter rail. This upgrade in service level will depend on future detailed local level analysis and success of the initial services.

Long Term Vision Scenario Recommendations

As in the Base Case, these recommendations assume that all short-term recommendations are implemented and that these services would be maintained into the long-term.

Local Circulators

In the Long Term Vision Scenario, the potential for local circulators becomes even stronger because of the increased concentration of housing and jobs in new development. In addition to the local circulators recommended for the short term and in the Long Term Base Case Scenario, local circulators are recommended to be implemented in the following areas:

- Portland;
- Gallatin;
- Mt. Juliet;
- Dickson; and
- Springfield.

The Long Term Vision Scenario also calls for a significant increase in Downtown Nashville development. Increased intensity of development and use in the broader Downtown Nashville area would make a more extensive MTA downtown service possible in the future. This more extensive service might include higher capacity modes, such as light rail or other exclusive guideway service.

Commuter / Express Services

With this development scenario, higher intensity modes of service (rail, bus rapid transit) would likely fare better in the alternative analysis process as compared to the base case. The increased development of Downtown Nashville anticipated in the Long Term Vision Scenario would increase the commuter traffic to the downtown area. The increased attractiveness of the downtown would serve to boost the performance of any commuter / express services.

Implementation Costs

The Regional Transit Development Strategy developed approximate estimates of the cost to implement the recommendations. Estimates for capital and operating costs were calculated.

Cost of Short Term Recommendations

The short term recommendations consist of local circulators, commuter / express services, dial-a-ride services, and vanpools. For the purposes of this cost estimation exercise, it was assumed that vanpools would be funded through a source other than that used for more traditional transit funding. If all of the recommended short-term local circulators were implemented, 30 small buses would need to be purchased. An additional 30 large buses and over-the-road coaches would be required for the recommended express services. Dial-a-ride services for the 10-county region would require the purchase of 70 vehicles.

The implementation of the short term recommendations would be phased in over time. There will be many factors that combine to determine the implementation timeframe for each service. Issues such as operating and capital funding constraints, political feasibility, and detailed benefit-cost analysis would come into play.

The total operating cost of the fixed-route services recommended for phased implementation in the short term period is \$5 million annually. Initial capital cost (for vehicles and other related capital) is \$18 million³. Capital costs would not be incurred again until vehicles needed to be replaced. Annualized capital costs would be approximately \$1.8 million for fixed route services. Implementation of a more extensive dial-a-ride system in the short-term would require an initial capital expenditure of \$1.25 million. Operating costs for the dial-a-ride services would total approximately \$3.5 million. Thus, the total annual operating cost in the short-term is \$8.5 million and the initial capital outlay would be approximately \$19.25 million (annualized capital cost of \$1.9 million).

Cost of Long Term Recommendations

The cost of implementing additional local circulators in the Long Term Base Case Scenario is estimated to be \$0.7 million annually (2001 dollars). The incremental capital cost for vehicles to support this service is \$1.6 million. This would yield (in 2001 dollars) a total annual operating cost of \$5.7 million and a total initial capital cost of \$19.6 million (annualized capital costs of about \$2 million). Dial-a-ride services in the Long Term Base Case Scenario would require an initial capital investment of \$1.5 million and would have annual operating costs totaling \$4.1 million. Therefore, the total annual operating cost for this scenario is estimated to be \$9.8 million and initial capital costs are expected to total \$21.1 million (annualized capital cost of \$2.1 million).

The Long Term Vision Scenario provides additional opportunities for local circulators to be viable services and contribute to local and regional mobility. The incremental operating cost of the additional circulators in this scenario would be \$2 million annually. The incremental initial capital cost to support this service would be \$2.7 million. Dial-a-ride services under this scenario would not require any additional operating or capital costs. Therefore, this

³ All costs are stated in 2001 dollars.

scenario would yield a total annual operating cost of \$11.8 million. The total initial capital cost would be \$23.8 million, or an annualized capital cost of \$2.4 million.

The cost for long term commuter / express service will depend on the form that service takes over time. In the service recommendations section, it was recommended that as these corridors are established, they should go through the process of being evaluated for future appropriate alternative modes of transit – potentially developing fixed guideway or exclusive right-of-way services in these corridors. There may be corridors where commuter rail is the most appropriate solution. There may be other corridors where bus rapid transit service would be best. In other corridors, express bus may be the best alternative in the long term. Each result depends on the situation, the potential level of use, and the costs.

The specific form of future service on these corridors cannot yet be identified– as a result, long term cost estimates are premature. The current experience with planning and engineering for the proposed East Corridor commuter rail service has cost approximately \$3 million to date. Construction and operation of the service would increase that figure significantly. The scale of potential future costs related to fixed guideway or exclusive right-of-way for transit services will be significantly higher than the cost estimates provided for the bus-based options.

Cost Summary

Currently, approximately \$30 million is spent annually to operate transit services in the 10 county Middle Tennessee area. This includes bus service and dial-a-ride service. All of the mobility enhancements recommended in this Regional Transit Development Strategy increase the estimated annual operating expenses by \$11.8 million. This level of funding would provide for a much broader level of mobility at both the local level as well as throughout the region. These recommendations are fairly conservative, taking into account the potential of transit to effectively serve the patterns of development that are in place. A long-term movement towards more concentrated patterns of development is also encouraged to establish a built environment that can offer different mobility options to the residents of the region.

From Plan to Implementation

This Regional Transit Development Strategy represents the first comprehensive look at the opportunity for transit service throughout the Middle Tennessee area. Moving from plans to implementation requires an assessment of the institutional structure and capacity necessary to take ownership of the various parts of the plan and see them through to implementation. Currently, there is no organization responsible for coordinated transit planning and implementation outside of Davidson County. Identification of potential funding sources is another critical step for plan implementation. Thus, there are several key functions to be accomplished:

- Planning;
- Advocacy;
- Funding; and
- Operations.



It is not essential for one organization to perform all of these functions. It is, however, essential to identify how – and by whom – these functions will be accomplished in order for plan implementation to occur. At this time, there is no clear answer to the question of who will be responsible for these functions. This section discusses some options, but some difficult decisions will need to be made after project completion.

Review of Current Transit Organizations

There are several major organizations providing transit services in the Middle Tennessee region. Different organizations have different service areas, types of services offered, and levels of service provided. None of the organizations receive dedicated local funds for transit nor are they legislatively enabled to establish such a funding source. A brief discussion of each follows.

Key Players

Metropolitan Transit Authority (MTA)

The MTA has a charter to provide service within Nashville / Davidson County. The MTA operates primarily fixed route service with some demand response and commuter vanpool services as well. They have a planning department with responsibility for planning and implementing transit services in Davidson County. The MTA is a designated recipient of federal funds.



Regional Transportation Authority (RTA)

The RTA legislation establishes a service area encompassing the counties of Davidson, Rutherford, Sumner, Williamson, Wilson, (the Nashville metropolitan planning region) and Cheatham, Dickson, Maury and Robertson. The RTA cannot directly operate service. They contract for



three regional express bus routes and run the regional rideshare program, organizing many vanpools and carpools in the region with their small staff. The RTA is the lead agency for the development of commuter rail service in the region as well. To date, the RTA has provided niche services and planning in the region.

Mid-Cumberland Human Resource Agency (MCHRA)

MCHRA provides rural transportation, and other human services, in a twelve county area in Middle Tennessee (all the counties in the RTA service area except for Maury, plus Montgomery, Houston, Humphreys, Stewart and Trousdale Counties). The Mid-Cumberland Regional Transit System is the public transportation service of the MCHRA providing demand responsive transportation to the general public with emphasis on service to senior citizens and people with disabilities. Service is provided by vans and lift-equipped vehicles.



Other Transit

In addition to the transit organizations and providers mentioned, part of the Clarksville Transit System also provides transit service in the study area. The City of Franklin has begun operation of a local circulator, operated by The TMA Group. The TMA Group also coordinates vanpools and other employer based transportation focused on employers in the Williamson County area. The size and scope of these organizations would not suggest that they are logical leaders for regional transit planning activities, but they should clearly be participants in the process.

Assessment of Organizations

The MTA is an operating agency. It plans and operates services in its service area which, by charter, is limited to Davidson County. This makes the MTA an unlikely location for implementation of regional transit plans unless changes in their charter affecting the service area are made or inter-local agreements are made that support this organization providing a planning function for the region.

The service areas of the RTA and the MCHRA both cover the geography that is addressed in the Regional Transit Development Strategy. The key transit opportunities – both in the short and long term, are within the core 5 counties that are part of the Nashville Area MPO. The MCHRA has a broader social service function than transit and focuses on the more rural portions of the service area.

The RTA, with the recent expansion of scope into commuter rail planning and implementation, has moved into a direction where it might be the appropriate entity to play a broader role of coordinating regional transit planning. At this time, the RTA is not viewed regionally in this role. With its small staff and consuming role of planning for commuter rail, significant changes would need to take place in order for the RTA to be seen as the right place for regional transit planning. The types of changes needed might include revised organizational goals or changes to the RTA enabling legislation.

It may also be possible for other organizations in the region to incorporate the regional transit planning function. It is not essential that a transit operator also provide the long range transit planning for the region. It would be possible – with the agreement and cooperation of the local players – for another regional entity to perform the transit planning

and advocacy function. Potential groups to do this include the MPO, the Greater Nashville Regional Council, or a new entity formed for this purpose. The Nashville Area MPO is involved with transit planning at the system level. In some other areas, the MPO has taken on the regional transit planning role. The issue of merging the Nashville Area MPO and the RTA has been considered more than once in the past decade. One of the key barriers to moving forward with this idea was the differing geographic areas that each organization is tasked to serve. Similar types of ideas will be important to consider as a solution to finding a 'home' for regional transit planning in Middle Tennessee. The key to this strategy working effectively would be the full support of the transit operators and the current funding partners, such as the state. It would be important for any group taking on this role to be able to apply for and receive federal / state grants to fund planning activities.

Funding Transit

Moving towards implementation of the plan will require addressing the very real issue of funding. Some of the funding sources and needs are described in this section. Funding sources do not change based on the presence of coordinated planning; however, the ability to generate the required local funding is very much enhanced by a regional approach to transit service.



The Tennessee Department of Transportation (TDOT), Office of Public Transportation has been a statewide supporter of transit. TDOT provides up to 40% of the funding for the net operating cost of transit service (total costs less passenger fares). The local area provides the remaining subsidy required to cover the cost of the operation. TDOT also provides access to federal capital funds for the purchase of equipment and other capital expenses. Federal capital funds cover 80% of the capital costs. TDOT pays an additional 10%, with the local area providing the remaining 10% of the cost.

Other service start-up efforts can be funded with Congestion Mitigation and Air Quality (CMAQ) federal funds. These funds also require a local match. The future of this program is currently under discussion in the emerging federal transportation reauthorization legislation.

There are many other special purpose types of funding that are available for transit services. The important thing is to have a clear vision for the services, and then seek the funds that match the travel purposes that are met.

Regardless of the variety of non-local sources of funding that exist, there remains a significant amount of local funding that needs to be identified and prioritized in order to move towards implementation. This is why it is so important to develop an approach to regional transit planning. Each local government does not feel that they are in a position where they need to support a stand alone transit service – rather they are developing a system that extends and connects to a more comprehensive regional system. Local governments face the difficult decisions of making tradeoffs between funding transit and funding other city services. While eventually these tradeoffs must be made, it is not conducive to the development of transit service to have local governments face those tradeoffs without the sense of participation in a broader system.

Clearly, the ability to fund transit operations will be the ultimate hurdle for any implementation plan. Dedicated funding for the local share of costs does not exist anywhere in the region. While developing a plan that may one day lead to the development of a dedicated transit funding source, the lack of such resources should not be a barrier to moving forward. Development of coordinated transit planning efforts in the region would be effective to enhance the ability of the region to seek planning funds, leverage federal, state and local resources, and develop a track record of success that might then lead to the opportunity to seek dedicated funds.

Summary of Implementation Issues

Regional transit planning does not currently take place in Middle Tennessee. A key recommendation of the Regional Transit Development Strategy project is to establish responsibility for transit planning in the region early on. Transit needs to be viewed as a regional system, much like the highway system is. Transit and highways, together, form the network of mobility.

Establishing responsibility for transit planning with a group that has the mandate to develop transit plans with and for the region will allow transit alternatives to be assessed against other transportation opportunities. It will also allow for the development of a network of services throughout the region that work to support one another.

There is no single clear choice of current organizations for the regional transit planning role in this region. Interested parties should work to establish an acceptable solution and move the regional transit planning process forward.

In making decisions about the appropriate role of any entity tasked with development of transit plans for the region, it must be remembered that the line between implementation and planning can be set in many different places. A regional planning effort can be recommended to take place at the most general of levels, or it could be expanded to develop full implementation planning. If transit planning and implementation are performed by two or more separate organizations, it is essential that a close working relationship, or intergovernmental agreement, be developed between them to assure the continuity and forward progress of planning and implementation.

Planners and decision leaders in the area must make it a priority to identify a solution appropriate for Middle Tennessee. Key issues to determine include:

- Service area – which counties should be included?;
- Identification of organization for planning;
- Establishment of relationship with current and potential operators; and
- Funding.

Some more specific thoughts on some of these issues follow.

Service Area

This project was conducted with a focus on the 10-county Middle Tennessee study area. For the purposes of establishing a coordinated transit planning and implementation process, we

feel this service area is wider than it needs to be. The key opportunities – in the short and the longer term – are in the 5-county core area. The transit planning and implementation continuum must be established to focus on this area at a minimum. An approach to coordinating with the expanded region should be established to facilitate a broader coordinated system as it develops.

Organizational Structure and Roles

Nationally, there are as many solutions to organizational structures and roles as there are places that have grappled with the issue. Every situation is unique because it is affected by the existing organizations and the political relationships in place. Generally, legislation at the state level is required to authorize the establishment of regional transit agencies. The basic structure and powers of organization are often set legislatively. Because of all these factors, any successful solution to identifying a regional framework for transit planning and operations must start with the current players and a regional goal.

There are two basic models for transit planning and implementation – each with many variations. Due to the uniqueness of each situation, there remain many significant differences between the organizations even within one model. In this section, a general overview of the types of models and examples of different regional set-ups for transit planning are provided. The right answer in Nashville is likely to bear resemblance to some of these, yet with its own unique characteristics.

Combined Planning and Service Delivery: One basic model for regional transit planning and operation combines the planning function and the operations within one organization. Often times, these are organizationally established as transit authorities with a specific geographic reach. Some examples of this model include the transit systems in *Philadelphia, Boston, Cincinnati, Portland,* and *Los Angeles*. Los Angeles is in the process of creating geographic based smaller units to be more responsive to the local communities. In some of these examples, the definition of the service area – often made many years ago and not changed with the decentralizing development patterns – has left the regional transit authority responsible for service in an area that does not include key portions of the region. Two other examples of fairly recently formed regional organizations that are responsible for regional transit planning and delivery of service include *Charlotte* and *Minneapolis*. These are interesting because of several factors. Both of these organizations have a charge to be responsible for transit and land use issues. The Charlotte system is managed by the City of Charlotte for the region under a set of negotiated inter-local agreements. In the Minneapolis area, one agency – the Metropolitan Council – is responsible for regional land use issues, overall transportation planning and programming and transit operation.

Planning Oversight with Separate Service Delivery: This second basic model for regional transit planning is one where an entity is responsible for some level of planning and/or financial oversight and other entities are responsible for the delivery of services. There is much more variation within this model than the previously discussed one. The examples of this model include, *Chicago, New York, San Diego, Atlanta,* and *San Francisco*. In the case of Chicago, the RTA has planning and financial oversight responsibility for three transit operators who each have independent boards. In New York, the MTA has a similar role, but the boards of the local operating agencies have continuity with the MTA Board. In San Diego, the Metropolitan Transit Development Board is responsible for policy and overall coordination of public transportation services in the region. Transit, freight service and taxi

administration are part of the MTDB's responsibilities. Atlanta and San Francisco have less direct relationships with the operation of service than the organizations discussed so far. In Atlanta, the recently formed Georgia Regional Transportation Authority is responsible for planning and funding of transportation and air quality issues. It is taking an active role in getting new components of the transit system established outside of the core area of Atlanta including commuter rail and suburban bus services. San Francisco's regional transit planning for years has been based at the Metropolitan Transportation Commission. They operate as the regional planning organization and the regional MPO and have functioned in an active way to encourage coordination among many transit agencies within the region. The transit operators do not report to the MTC, except through the federal funding process.

The above paragraphs show the wide range of organizational possibilities that exist in establishing a regional transit planning function. There are organizations with solely transit responsibilities. There are others where much broader transportation functions are included. In yet others, land use or air quality are part of the mission that guides the formation of the transit organization. In the Appendix, contact information for the organizations discussed is provided as a starting point for Nashville. The right solution for the Nashville area will emerge from the collaborative efforts of the local players, guided by goals for the region.

This project provides a starting point for identification of the regional goal. It points out the critical need to establish a framework to plan, coordinate and implement transit service in the future. An effective framework can only be developed with the active and constructive participation of the many people and organizations with vested interests in the development of a more balanced transportation network in Middle Tennessee.

Project Recommendations

The study of the existing conditions and development of transit alternatives in the Middle Tennessee area can be summarized in the following points.

- There are a number of areas and corridors in the region where transit services (local circulator systems and commuter /express services) could be effective components of the mobility marketplace today.
- Efforts to encourage development within currently developed areas and development that increases the ‘walkability’ of communities will also increase the number of areas where transit will be able to be implemented in the future.
- An entity should be identified to spearhead coordinated transit planning for the region. The existence of coordinated regional plans will enhance the establishment of local transit services.

Appendix

Regional Transit Planning Contacts

Atlanta

Georgia Regional Transportation Authority

http://www.grta.org/about_us/about_us_home.htm

(404) 463-3000

245 Peachtree Center Ave., N.E.

Suite 900

Atlanta, GA 30303-1223

Boston

MBTA

http://www.mbtta.com/insidethet/taag_history10.asp

(617) 222-5000

10 Park Plaza

Boston, MA 02116

Charlotte

Charlotte Area Transit System

<http://www.charmeck.org/Departments/cats/about+us/home.asp>

(704) 336-RIDE

600 E. 4th Street

Charlotte, NC 28202

Chicago

Regional Transportation Authority

<http://www.rtachicago.com/aboutrta/overview.asp>

(312) 913-3200

175 W. Jackson Blvd.

Suite 1550

Chicago, IL 60604

Cincinnati

Southwest Ohio Regional Transit Authority

<http://www.sorta.com/aboutMetro/sorta.html>

(513) 632-7575

1014 Vine Street

Suite 2000

Cincinnati, OH 45202-1116

Los Angeles

Los Angeles Metropolitan Transportation Authority

http://www.mta.net/other_info/about/about_MTA.htm

(800) COMMUTE

One Gateway Plaza
Los Angeles, CA 90012-2952

Minneapolis

Metropolitan Council

<http://www.metrocouncil.org/about/about.htm>

(651) 602-1000

Mears Park Center
230 E. 5th Street
St. Paul, MN 55101

New York

Metropolitan Transit Authority

<http://www.mta.info/mta/network.htm>

(212) 878-7160

347 Madison Avenue
NY, NY 01107

Philadelphia

SEPTA

<http://www.septa.org/>

(215) 580-4000

1234 Market Street
10th Floor
Philadelphia, PA 19107

Portland

Tri-Met

<http://www.tri-met.org/inside/govern.htm>

(503) 962-4831

4012 Southeast 17th Avenue
Portland, OR 97202

San Diego

Metropolitan Transit Development Board

http://www.sdcommute.com/agencies/MTS/MTDB/PDFs/mtdb_factsheet.pdf

(619) 557-4514

1255 Imperial Avenue
Suite 1000
San Diego, CA 92101

San Francisco

Metropolitan Transportation Commission

http://www.mtc.ca.gov/about_mtc/about.htm

(510) 464.7700

101 Eighth Street

Oakland, CA 94607