

Nashville Southeast Corridor Executive Summary

I. Introduction

The southeast corridor is a 30 mile long corridor that connects downtown Nashville to downtown Murfreesboro. While the connection between these two downtowns has long been significant in the history of the region, it is the explosive outward growth in between these two bookends that has made this corridor so important.

The Nashville Area MPO initiated this study to address the existing and future transportation needs of the corridor. In the southeast corridor, residents and commuters are losing significant amounts of time due to heavy traffic congestion, and the area is in danger of losing businesses that must reduce their costs because of their loss of valuable time and money. In addition, a lack of transit options in the corridor restricts mobility for many residents and prevents businesses from accessing needed employees. A potential transit investment can benefit the corridor and the region by reducing transportation costs to citizens and businesses, giving commuters a transportation alternative to the automobile, and promoting strong and sustainable development in the corridor. This study examined potential alternatives for bringing high-capacity, high-quality transit service to the corridor and the benefits such service would have to the lives of those who live in, work in and visit the corridor.

A number of transit alternatives were considered for the southeast corridor, including bus rapid transit, commuter rail, and light rail alternatives. After an extensive evaluation, the Locally Preferred Alternative (LPA) selected was a combination of phased bus service enhancements, including development of express bus and skip stop bus services on I-24 and Murfreesboro Road (US 41/70S), and extended local bus service on Murfreesboro Road. Other improvements include bus “stations” at key locations, queue jump and signal improvements at intersections and interchanges to allow buses to bypass congested traffic conditions, and ultimately short sections of busway to further enhance the speed of bus travel in the corridor.

The foundation of the LPA recommendation is that it will build a market for transit for the southeast corridor and ensure that quality transit service is available throughout the corridor. The proposed LPA would provide basic transit service in portions of the corridor where none currently exists, ensuring that transit-dependent people have access to employment and educational opportunities in the corridor. In addition, express services will further develop the market for high quality, longer-distance travel service, which was successfully demonstrated by RTA’s “Relax-and-Ride” service that currently operates between Murfreesboro and Nashville. The proposed improvements would be phased in over a period of more than 20 years to allow corridor communities to transition development around station sites toward a more compact, transit and pedestrian-friendly pattern and secure the funding required to develop and operate the services from a variety of local, state and Federal sources. The phased approach will gradually build the public transit market in the corridor, positioning the corridor for further enhancements in transit service after 2030.

The overall benefit of the LPA for both the southeast corridor and the Nashville region can have a considerable impact. Transit can provide a viable alternative to driving the corridor’s congested roadways. By providing service where there currently is none, the

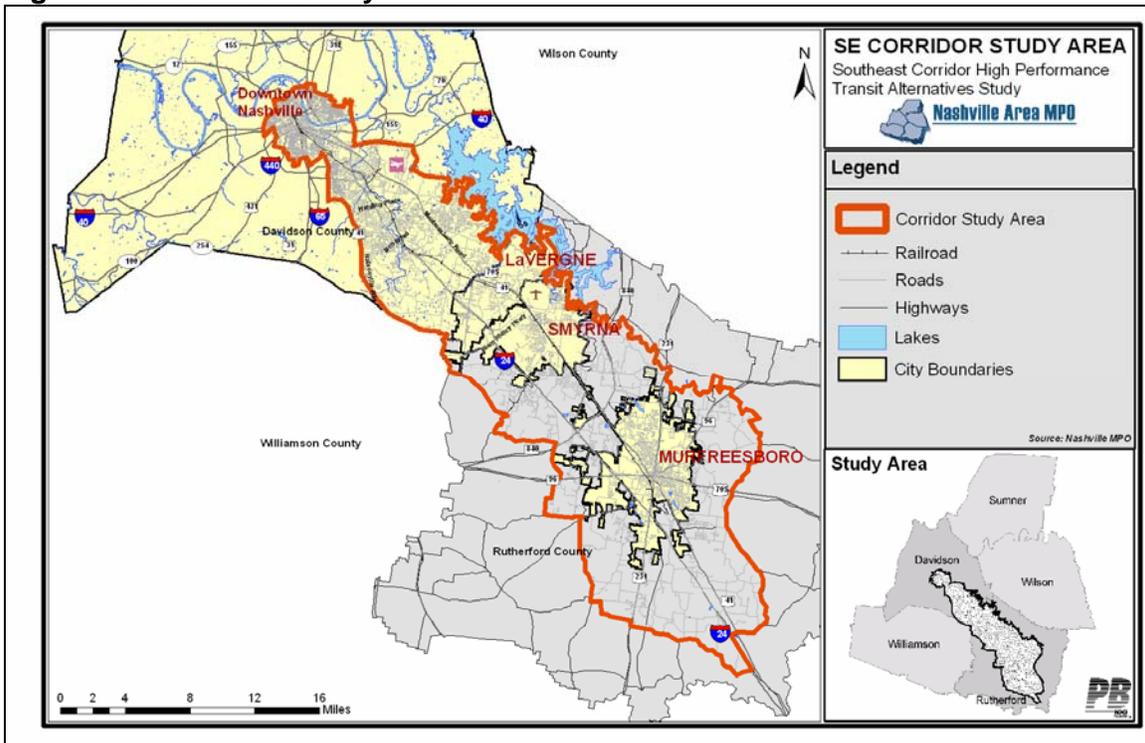
LPA can help people reach jobs, thus opening up new employment and educational opportunities in the corridor to the region's residents. Changes in land use that are expected to occur as a result of the proposed LPA would also benefit the region, providing a much needed alternative to the auto-dominated land use patterns that currently exist in the corridor.

II. Purpose, Needs and Goals of the Study

Study Area

The study corridor included the region's largest employment destinations: downtown Nashville, the Vanderbilt-West End area adjacent to downtown Nashville, and downtown Murfreesboro. Other destinations within the corridor include Nashville Airport, Dell, Interchange City, Starwood Amphitheater, Nissan plant, Treveca Nazarene University, Middle Tennessee State University, and the downtowns of LaVergne and Smyrna. Figure 1 shows the boundary of the study corridor

Figure 1 SE Corridor Study Area



A purpose and need statement was prepared by the study's steering committee in order to identify the needs of the corridor. The following needs were identified:

- **Provide Transportation Options**

Provide transportation alternatives to driving 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 a focus on pedestrians and mass transit.

- **Address Environmental Concerns**

Provide transportation choices that minimize impacts to the environment and help 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 and improved mobility, while supporting compact development.

Goals for the study were also identified based on 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.

Goal 2: Promote Efficient Land Use and Development Patterns in Nashville/Davidson County and the Rutherford County Communities in the Southeast Corridor Study Area.

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

Goal 4: Preserve the Natural and Social Environment.

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

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

III. Evaluation of alternatives

Alternatives were developed to address the identified needs of the corridor and goals of the study. The alternatives evaluation process was extensive, with transportation information gathered at each stage incorporated in the development of the next round of alternatives. There were three stages of evaluation: an initial screening, a detailed screening, and a final refinement of the Locally Preferred Alternative (LPA). The final LPA is the official recommendation for transit improvements in the corridor.

A pre-screening of alternatives was completed by combining potential alignments with potential transit types. The three major alignments considered for the corridor were I-24, the CSX railroad, and Murfreesboro Road (shorter portions of other alignments were considered in combination with these three major alignments). The types of transit initially considered for the corridor included bus rapid transit (BRT), light rail, heavy rail/subway, monorail, commuter rail, and high speed rail. Another choice, bus rapid transit light (BRTL), defined in the study as bus rapid transit service without a full length busway, was also included in the evaluation process.

Table 1 displays the various alignments and transit types in a matrix. The Steering Committee eliminated those combinations of transit or alignment that they thought would be inappropriate or unable to effectively serve the travel needs of the corridor. After this

analysis six viable alternatives remained to be studied in the initial round of alternatives screening.

Initial Screening

An initial screening of these six alternatives was completed by evaluating the characteristics of each alternative with regards to the goals of the project study. In this initial round of screening, many of the alternatives included sub-options in which various alignments to serve Nashville International Airport (BNA) and downtown Nashville were considered.

Table 1 Transit Choice Matrix

Type of Transit	Interstate 24:	CSX Railroad:	Murfreesboro Road:
<i>Commuter Rail</i>	Does not apply	Appropriate	Does not apply
<i>Light Rail</i>	Appropriate	Appropriate	Appropriate
<i>BRT</i>	Appropriate	Does not apply	Appropriate
<i>Heavy Rail/Subway</i>	Does not apply	Does not apply	Does not apply
<i>Monorail</i>	Does not apply	Does not apply	Does not apply
<i>High Speed Rail</i>	Does not apply	Does not apply	Does not apply

These initial alternatives selected were:

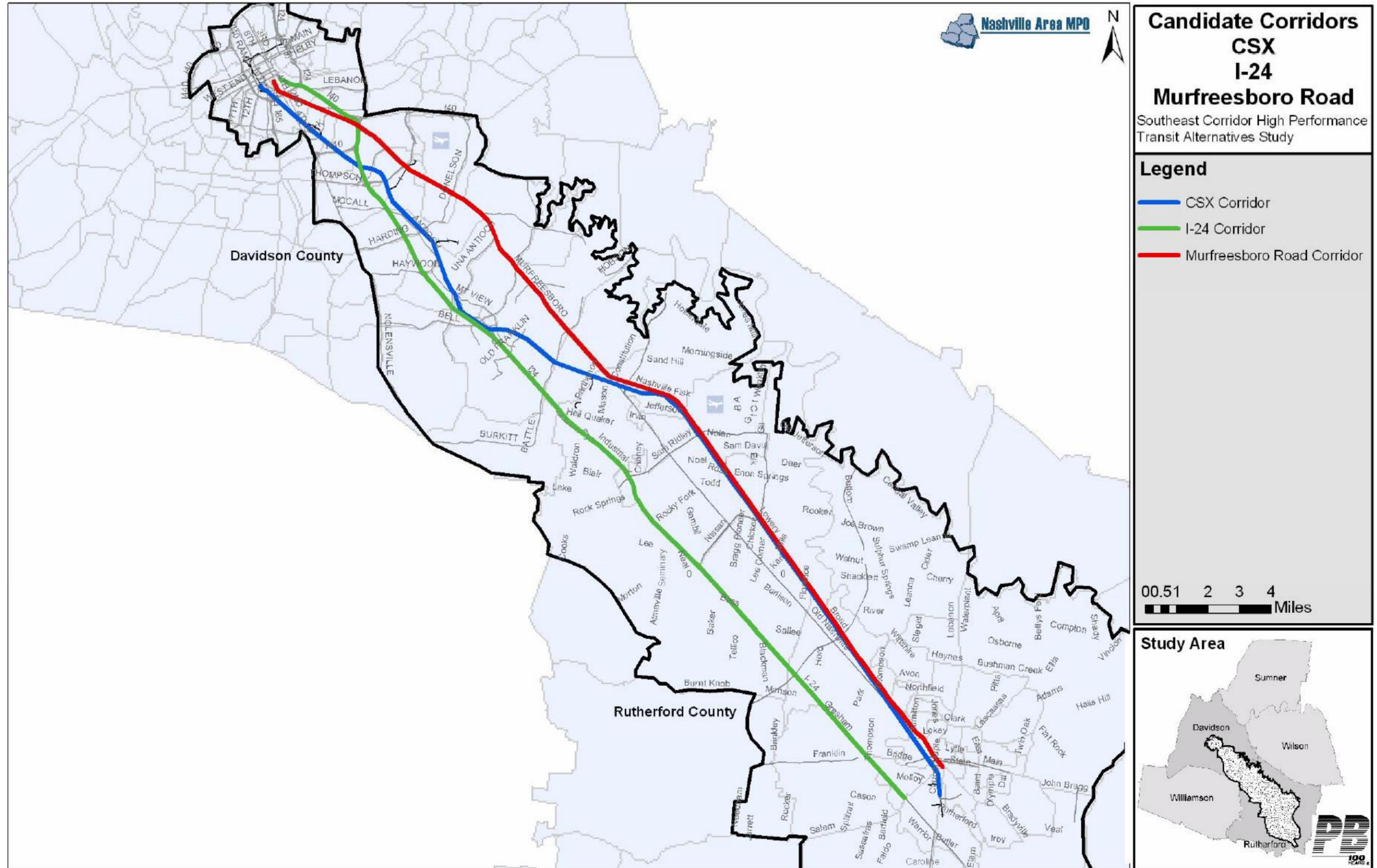
- I-24 BRT
- I-24 Light Rail
- CSX Light Rail
- CSX Commuter Rail
- Murfreesboro Road Light Rail
- Murfreesboro Road BRT

Amongst the findings from this initial screening were that light rail options would have a tremendously high capital cost—many options were well in excess of \$500 million in up front capital cost. The Steering Committee determined that such a costly alternative was unlikely to be justified by ridership and other benefits, and thus, light rail was eliminated from further study. BRT, BRT light, and commuter rail were carried forward for further analysis. The screening also revealed that each alignment had its share of positive and negative aspects for a potential transit investment and all three should be moved forward in the screening process. In addition, the initial screening eliminated the Nashville International Airport from consideration in any of the alignments. The cost of a detour to the airport was considered by the Steering Committee to be far larger than the potential benefit.

Detailed screening

The Steering Committee identified five alternatives to be carried forward to the detailed screening process. Three of these alternatives were carried forward from the initial screening: a BRT alternative on I-24, commuter rail on the CSX rail line, and a BRT alternative operating on Old Nashville Pike. The other two alternatives were used as a comparison with the three build alternatives, including a No-Build Alternative, consisting of the existing system and already funded changes to the transit and roadway networks, and a Low-Cost Alternative that grew out of the bus rapid transit option on I-24.

Figure 2 Evaluation of Alternatives corridors



The detailed screening again considered the goals of the study when evaluating each of the alternatives, but each alternative was evaluated in greater detail. During this screening, costs and ridership estimates were calculated for each of the remaining build alternatives. These are detailed in the figures below.

The high capital costs and low ridership gains for all three build alternatives underscored the need for a low-cost alternative for the corridor. The low ridership also suggested that a phased approach was needed in the corridor to build a transit market over a period of time. As a result of these findings, the Steering Committee developed a low-cost enhanced bus for the Locally Preferred Alternative. This alternative best fit with the characteristics of the corridor and could be tailored to best meet the transportation needs of the corridor and the region.

Figure 3 Estimated 2030 Capital Cost

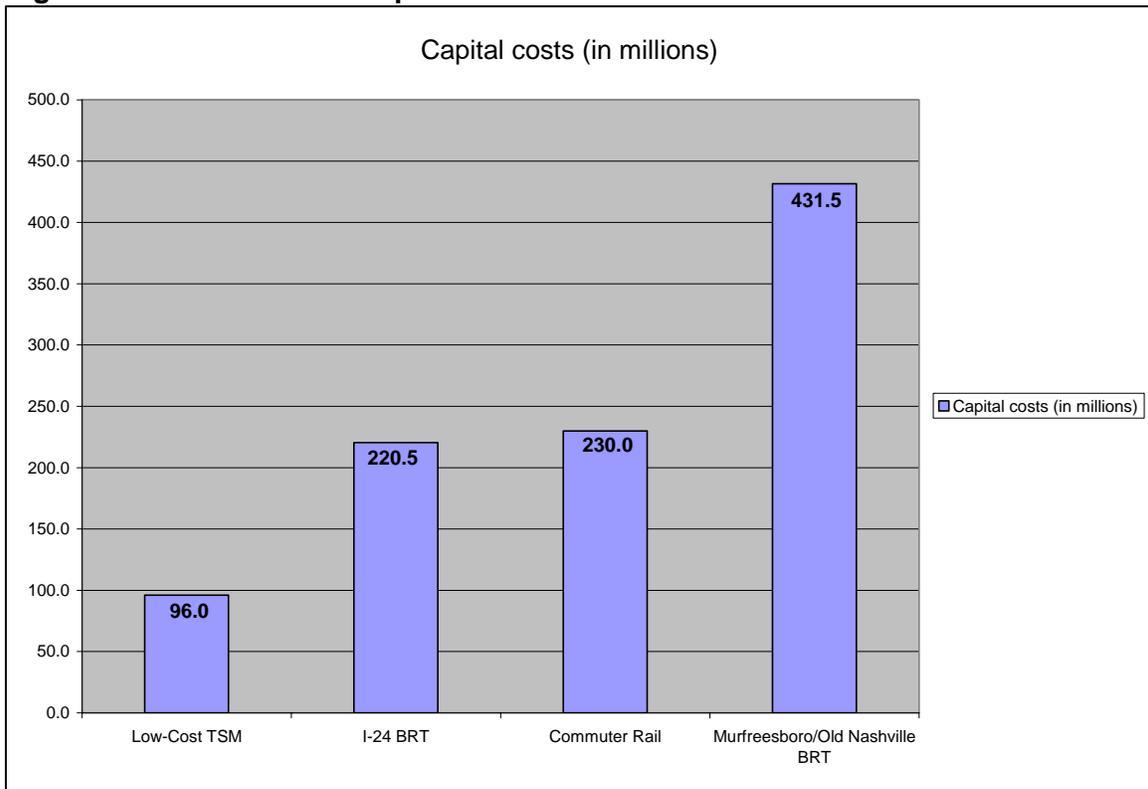


Figure 4 Estimated operating costs

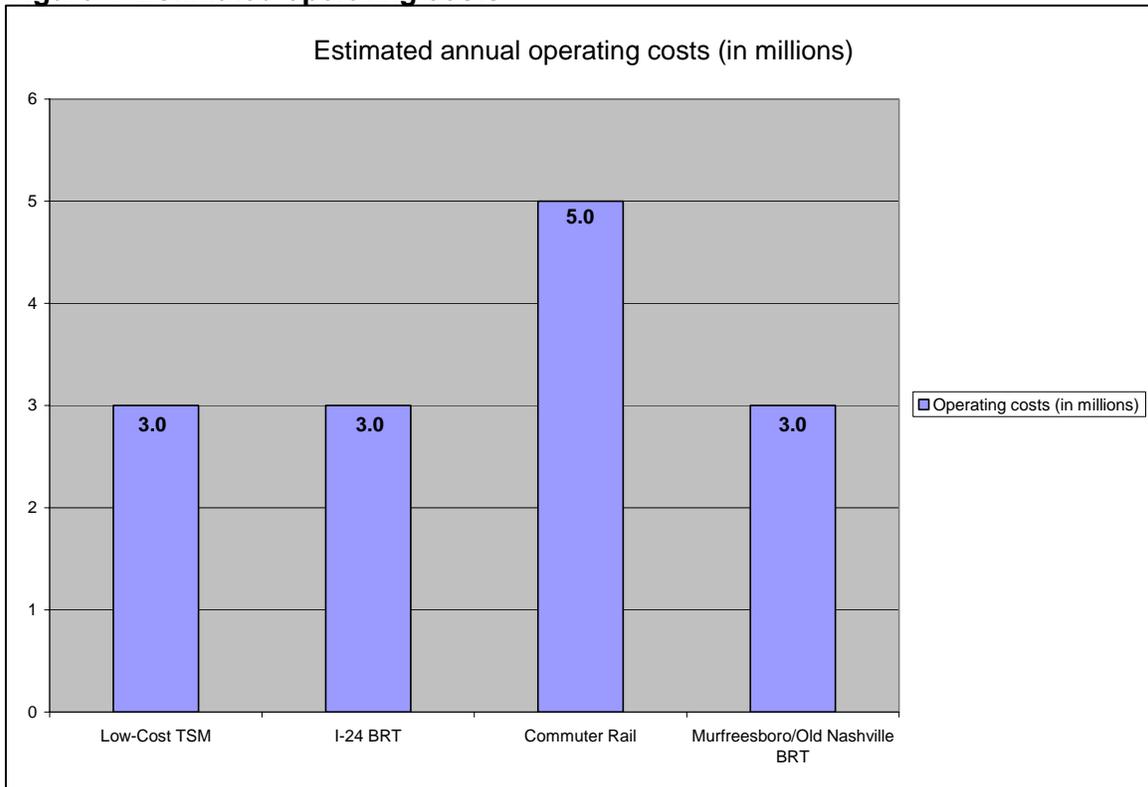


Figure 5 Estimated daily ridership

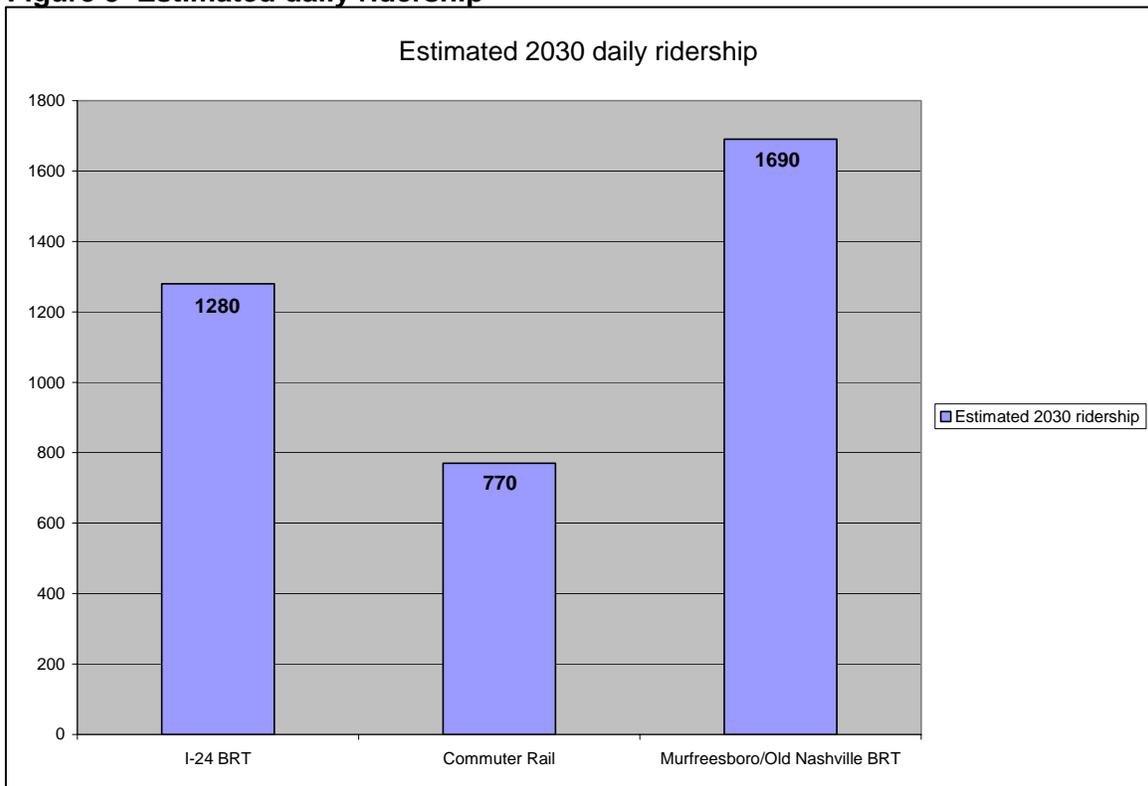
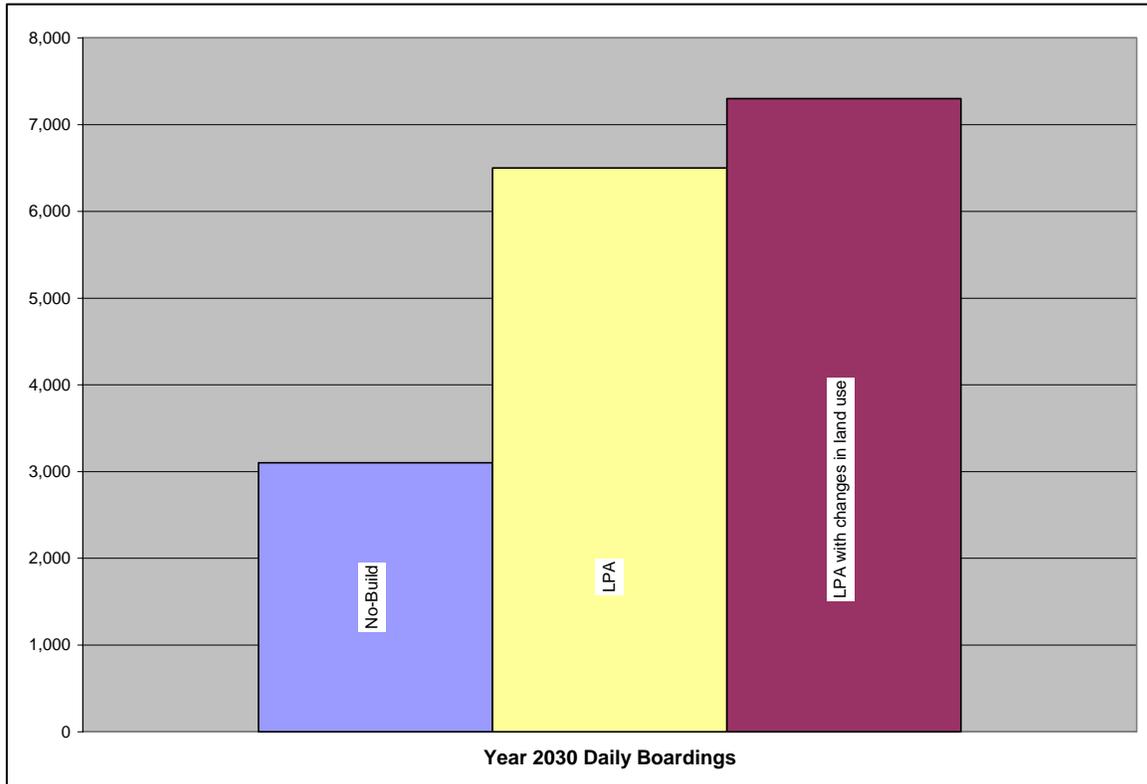


Figure 6 shows the estimated boardings of all the alternatives considered. Clearly illustrated in this chart is the fact the no-build scenario will keep transit boardings at a low level. The improvements proposed in the LPA would significantly increase transit use in the corridor.

Figure 6 Estimated corridor boardings for all transit alternatives



IV. Locally Preferred Alternative

The LPA selected for the corridor is a phased implementation of packages of relatively low-cost transit improvements. This alternative, also known as Transportation System Management (TSM) or Enhanced Bus, proposes new and expanded bus service along two of the alignments in the corridor, I-24 and Murfreesboro Road. The LPA also proposes a limited number of infrastructure improvements to increase efficiency of the system. These improvements are to be phased in three stages over a 25 year period.

Short-term improvements (1 to 5 year period)

Improvements proposed for the short-term are aimed at expanding bus service in the corridor and include new express bus service on both I-24 and Murfreesboro Road alignments serving Smyrna, LaVergne and Murfreesboro. Proposed alignments for these services are shown in Figure 7.

Mid-Term Improvements (5 to 10 years)

Improvements proposed for the mid-term include adding local circulators in LaVergne and Smyrna, introduction of local bus service between Murfreesboro and Bell Road, and construction of queue jump facilities to allow buses to bypass traffic at key I-24 interchanges. Other mid-term improvements include constructing “station” stops at key

bus stops along the corridor, to serve “skip stop” express bus service and to provide a focus for future transit oriented development and further expanded high capacity transit beyond 2030. Proposed locations of improvements are shown in Figure 8.

Long-term improvements (10-25 years)

Long term improvements in the corridor concentrate on infrastructure improvements to maintain or increase transit efficiency in the corridor. Improvements proposed include the completion of the station stop construction program, the construction of single lane busways in identified congestion areas, and the construction of more queue jump facilities at selected intersections. Locations of these improvements are illustrated in Figure 9.

Figure 7 LPA Short-Term Improvements

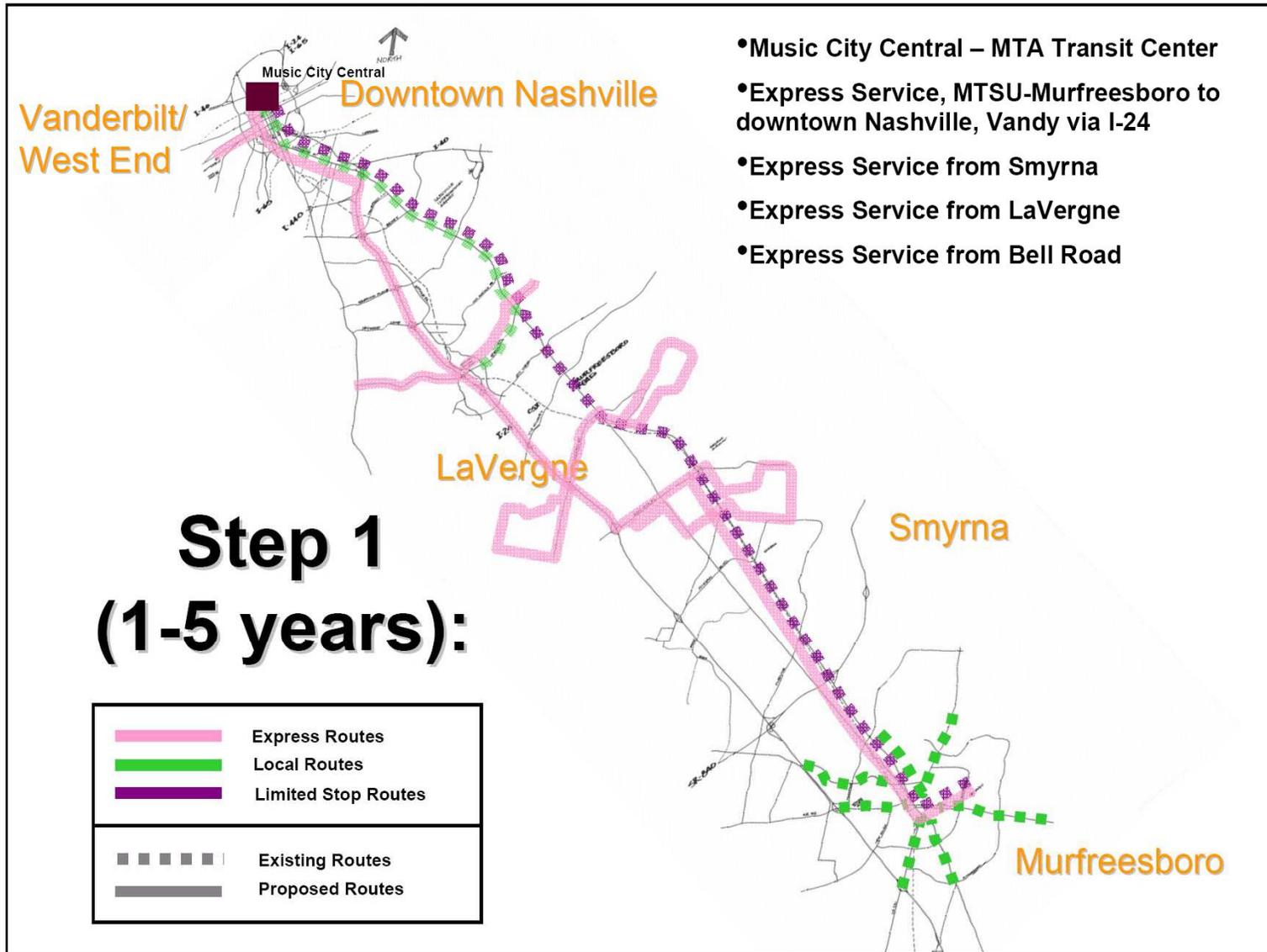


Figure 8 LPA Mid-Term Improvements

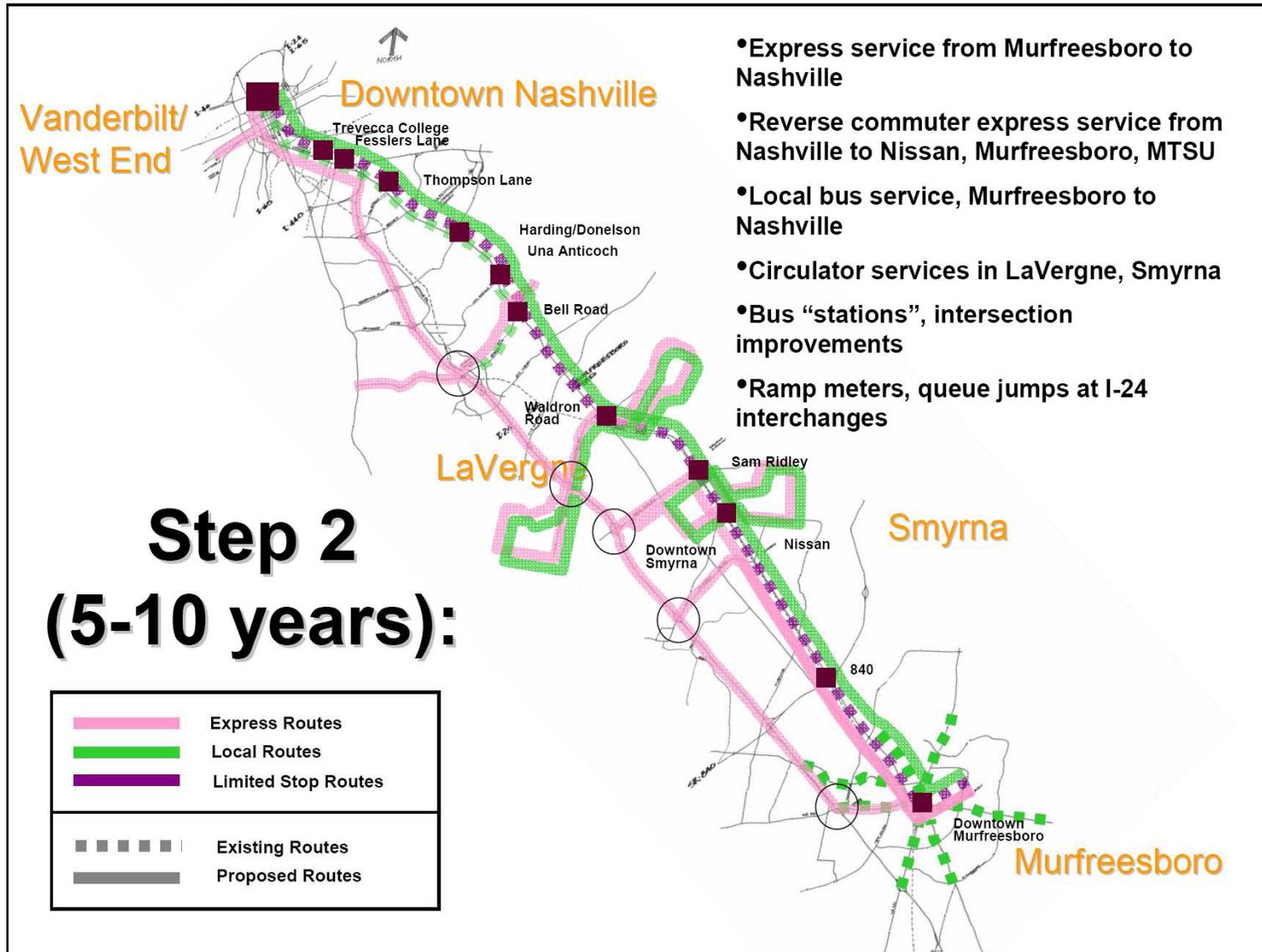


Figure 9 LPA long-Term Improvements

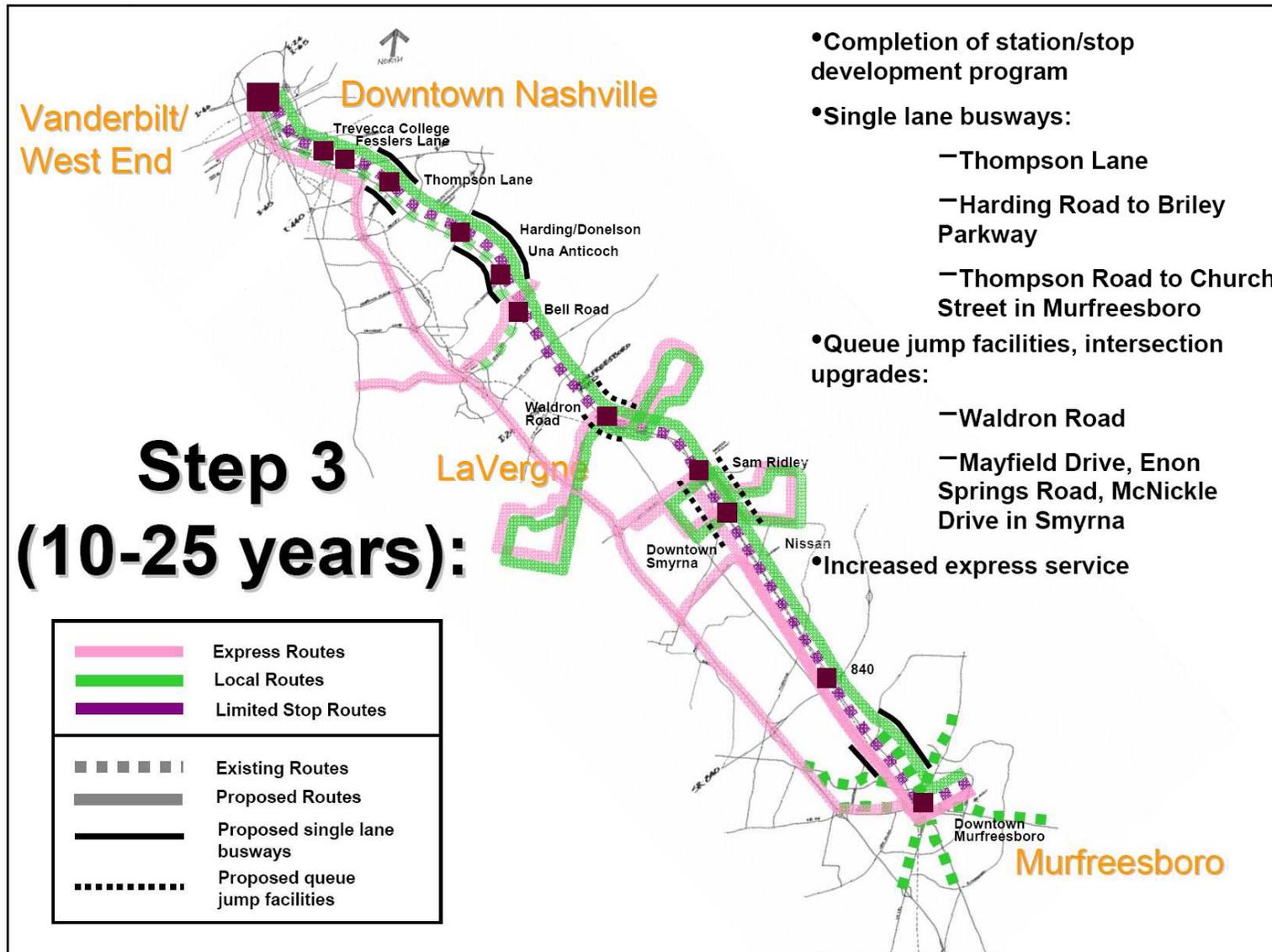


Table 2 summarizes the costs of the LPA broken down into the three phases of implementation.

Table 2 Breakdown of LPA costs by phase (in 2005 dollars)

Cost Summary	Capital					Annual Operating Incremental Cost (over No Build) (\$million)
	Stations	Busway/ Streetscape Miles	Infrastructure Costs	Vehicle Costs	Total Capital	
1-5 Years	4	0	4.7	23.0	27.7	3.9
5-10 Years	12	0	22.5	17.5	40.0	11.1
10-25 Years	4	13.2	65.8	12.5	78.3	13.0
Total	20	13.2	93.0	53.0	146.0	

Two ridership estimates were prepared for the Locally Preferred Alternative at full build out, including short, medium and long-term improvements. One is for implementation of the LPA with land use patterns as they currently exist, while the other considered the benefits of compact land use development. Extrapolating current land use patterns to 2030, transit ridership in the corridor is estimated at 6,500 boardings, or 1,300 to 1,600 new boardings per day over the no-build scenario. A second scenario was developed with all expected development in the corridor up to 2030. In this scenario, development was channeled to within ½ mile of the skip/stop locations identified with the LPA, causing transit ridership in 2030 to be estimated at 7,300 boardings, or 1,600-2,200 new riders per day.

V. Land use recommendations

While the LPA concentrates on increasing transit in the corridor, land use will be important in supporting the new proposed transit service. Many studies have noted the connection between transportation choice and land use. Transportation improvements influence land development, which in turn influences future transportation development in a corridor. Public transit does well in areas with more compact, mixed use and, above all, pedestrian friendly development. This transportation and land use relationship also means that areas with good transit service have the potential for higher density, compact development close to stations.

The existence of I-24 and the land use choices by local officials in the corridor has made the automobile the dominant form of transportation in the corridor. The low-density development pattern in the corridor reflects this fact. The prevailing land use pattern represents a challenge to building cost-effective high capacity transit services in the corridor.

The strategy for implementing the proposed LPA over a 25 year period will allow local officials to prepare the ground for future high capacity transit service by making changes to zoning and land use policies. This will, in turn, allow developers to react to the new zoning and land use policies as well as the increasing availability of high quality transit service in the shaping of their developments. Such a strategy will increase the availability of transit, as well as allow for zoning changes in corridor communities, effecting and gradually shaping development in the corridor in a more transit- and pedestrian-friendly pattern.

Transit Oriented Development

Transit Oriented Development (TOD) is a form of development that is supportive of public transit service as a large-scale provider of transportation services. In TOD, development is clustered within walking distance of a transit station and buildings are

oriented to transit stops rather than to streets or parking lots. Development is mixed, usually with retail, residential, and office uses. While driving is not precluded in a TOD, the mixture of uses can reduce the amount of driving, making walking and taking public transit viable alternatives to driving for many types of trips.

TOD is a natural fit for the southeast corridor because development is occurring at a significant rate and the recommended LPA strategy includes building stations at higher use stops. The land surrounding these higher use stops could be developed (or in some cases redeveloped) to include pedestrian and transit friendly uses, which would support the ongoing development of transit through 2030 and beyond.

VI. Implementation and Conclusions

The southeast corridor has many assets that can help support transit, including walkable downtowns at each end of the corridor, colleges and universities, large retail, office and industrial developments, and a rapidly growing population and employment base. The proposed LPA seeks to build the market for public transportation in the corridor by providing service where there is none, providing improved services and facilities, and generally getting commuters used to the idea that transit is a viable transportation option in the corridor.

Implementation of the proposed LPA will be both a regional and local effort. Regional transit officials must identify a multi-faceted funding strategy for the development of facilities, purchase of vehicles and on-going operation of transit services in the corridor. Local officials must begin addressing both funding and land use issues to support the new facilities and services proposed for the corridor.

Once the LPA has been implemented gradually over the 25 year period, it is likely that further transit improvements, potentially including commuter rail or light rail transit, could be implemented in the corridor at some point after 2030. However, such improvements will depend on the identification of a funding strategy and the implementation of transit supportive land use policies to make the most efficient use of transit investments in the corridor.