LET'S MOVE

NASHVILLE

Metro's Transportation Solution

TRANSIT IMPROVEMENT PROGRAM

DECEMBER 13, 2017

Metro Nashville PUBLIC WORKS

Nashville MTA

RTA

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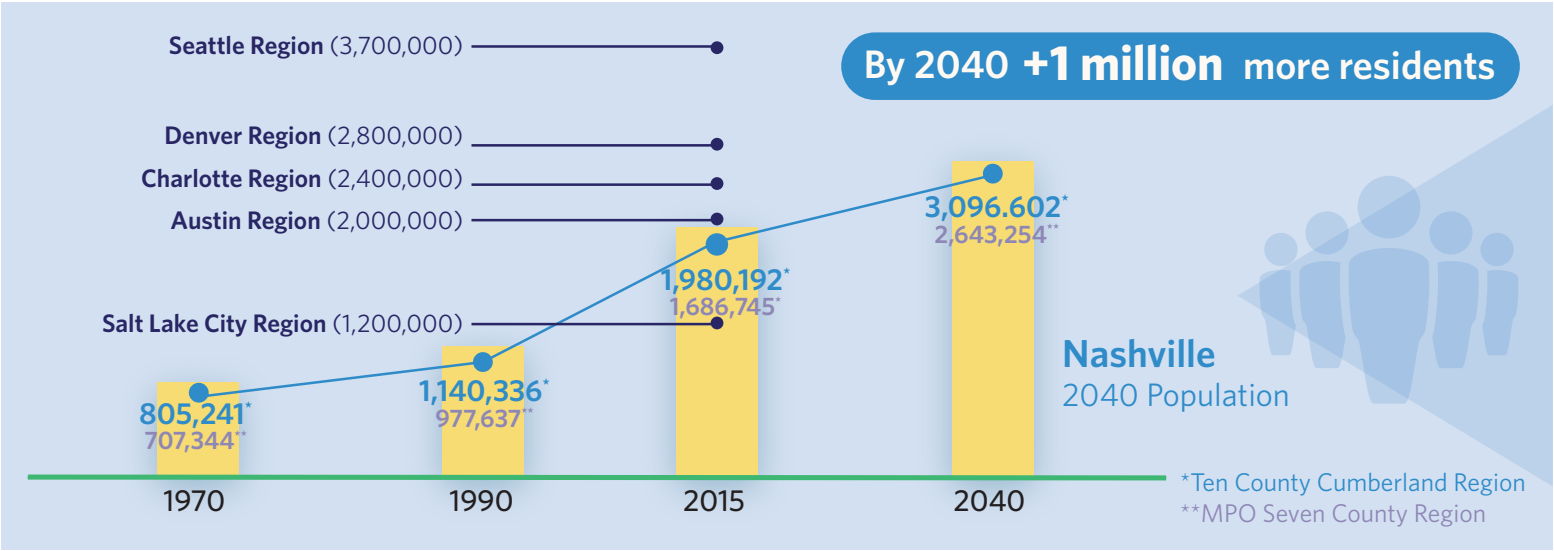
Introduction

Nashville and the Middle Tennessee region are one of the fastest-growing metropolitan areas in the country. The area has a current population of about two million with one million more people expected by 2040 (see **Figure 1**). Davidson County alone is expected to grow from about 658,000 residents to about 813,000 by 2040, an increase of about 24 percent (source: Nashville Area Metropolitan Planning Organization – MPO).

Regional traffic congestion is already a critical concern along several commute corridors. Without a comprehensive range of future travel options, the inability to move people and goods will impede quality of life, economic growth and regional competitiveness. Roadway improvements and capacity expansions will be part of the solutions to relieve traffic congestion. However, the region will be unable to solve congestion through roadway projects alone. Travel and mobility challenges also need to be addressed through a robust transit system that embraces paradigm-shifting technology, such as Light Rail Transit (LRT), Rapid Bus and autonomous vehicles, that integrates a functional network of pedestrian and bicycle pathways, and leverages the capacity improvements to the existing roadway network through a "complete streets" design approach that seamlessly accommodates all modes. Transit will be the catalyst for creating a more livable Nashville by encouraging equitable access, affordable housing, jobs, mobility, quality of life, and safety, all within the City's framework of smart growth initiatives and policies.

To respond to Nashville's challenges and opportunities associated with a growing and changing population, Metro Nashville

Figure 1. Estimated Growth in Nashville Region



Source: Nashville Area Metropolitan Planning Organization

developed a long-range plan for Nashville's future, "NashvilleNext," which was adopted in June 2015. It provided a roadmap to guide growth and development, and preserve the heritage of our City over the next 25 years. It also highlighted the importance of public transit in any responsible, forward-looking scenario for a prosperous and livable region.

In response to the prominent role assigned to public transit in NashvilleNext, the Metropolitan Government of Nashville and Davidson County (Metro), the Nashville Metropolitan Transit Authority (MTA), and the Regional Transportation Authority of Middle Tennessee (RTA), spearheaded the "nMotion Plan," a strategic regional plan aimed to improve transit in Nashville and Middle Tennessee. Adopted in September 2016, this plan provides a comprehensive approach to meet the region's long-range vision for transit. The nMotion Plan looks at how the regional transit system works today and identifies immediate opportunities to enhance, simplify and sustain the transportation network to better connect Middle Tennesseans and meet the growing mobility needs of the region.

The nMotion Plan introduces improvements on key corridors that will provide enhanced transit service with Rapid Bus, LRT, commuter rail and emerging technologies that can reliably and cost effectively build upon the benefits and functionality of these modes. The plan recognizes the need to "grow with intention" - focusing on development of appropriate land use densities that can be supported by transit and do not add to the already unmanageable mobility challenges. The nMotion Plan also recognizes the need to serve downtown Nashville with reliable transit options that allow workers, students, local residents and visitors to conveniently access the downtown hub and its employment and activity centers.

Over the course of developing the nMotion Plan, MTA/RTA actively sought the opinions of Middle Tennesseans as they presented a range of transit strategies now being deployed around the world, and explored the preferences and general receptivity to transit and transit needs of the community. Through these outreach efforts, over 20,000 individual engagements took place, including 9,000 responses to an online survey asking people to indicate preferences with respect to three alternative scenarios for mass transit and regional mobility: Scenario 1 Comprehensive Regional System, Scenario 2 Bus-Focused Expansion, and Scenario 3 Modest Improvements. The overwhelming response was that Middle Tennessee's leaders should pursue Scenario 1, a bold, long-term investment in mass transit, along with ancillary investments in infrastructure to make the system more effective.

Full implementation of the regional nMotion Plan will involve an ongoing and coordinated effort with many communities and stakeholders, including the Metropolitan Planning Organization (MPO) and Tennessee Department of Transportation (TDOT). Currently, the MPO is advancing projects that look at commuter options in the South Corridor and will study other congested corridors in the region as part of its work plan. TDOT has many planned projects in the region to reduce congestion along interstate and arterial corridors with new technologies and capacity improvements.

Nashville and Davidson County leadership have refined the local concepts articulated in the nMotion Plan and have formulated a Davidson County transit program. This program includes the specifications necessary to adequately inform the public in advance of a proposed funding referendum in May 2018. The Davidson

County transit initiative is now recognized as **"Let's Move Nashville – Metro's Transportation Solution."** This Transit Improvement Program ("Program") describes the mobility, societal and economic benefits that will accrue from the Program, and provides a design, cost, operations, prioritization and financing framework under which the program will proceed (see **Figure 2**). The transit elements developed under the Program will be planned in concert with the efforts of the MPO, TDOT and other regional stakeholders to ultimately achieve an integrated regional transportation system that can accommodate the needs of a growing Middle Tennessee.

Figure 3 summarizes the multimodal elements and infrastructure proposed by the Program.

Figure 2. Let's Move Nashville

LET'S MOVE NASHVILLE
Metro's Transportation Solution

- Added mobility to access economic opportunities across the community.
- Enhanced accessibility and independence for those with limited mobility options.
- Connected communities through a network of transit modes and services.
- A more safe and welcoming pedestrian and biking environment.
- Improved access to jobs, education, recreation, entertainment, vital services, and activity centers.

Figure 3. Transit Improvement Program Summary

Frequent Transit Bus Network

- 15 min or better peak service on busiest routes
- Longer hours of service *(5:15 a.m. to 1:15 a.m. Monday to Saturday) (6:15 a.m. to 11:15 p.m. Sunday)*
- Enhanced off-peak frequencies

AccessRide and Mobility on Demand

- Increased access in multiple areas
- AccessRide to include real-time information, call-ahead service and same-day schedule availability
- First-mile/last-mile integrated connections

Light Rail Transit

- NW Corridor *(downtown to Buchanan St.)*
- Gallatin Pike *(downtown to Briley Pkwy.)*
- Murfreesboro Pike *(downtown to Airport)*
- Nolensville Pike *(downtown to Harding Place)*
- Charlotte Avenue *(downtown to White Bridge Road)*

Neighborhood Transit Centers

- Nineteen locations for new transit centers
- Bike-share, digital wayfinding, real-time information and improved pedestrian connections
- Served by two or more bus routes

Crosstown Routes

- Four new routes: Trinity Lane, Edgehill Avenue, Bell Road, Airport-Opry Mills Connector
- Connect activity centers and neighborhoods outside of Downtown without the need for a transfer
- Up to 80 percent reduction in distance/travel time for some trips

Rapid Bus

- Bordeaux *(downtown to Kings Lane)*
- Dickerson *(downtown to Briley Parkway)*
- Hillsboro *(downtown to Mall at Green Hills)*
- West End *(downtown to White Bridge Road to Charlotte Avenue)*

Downtown

- Transit tunnel
- Multimodal transit center *(SoBro)*
- LRT transit station *(5th/Broad)*
- LRT transit station *(MCC)*

Commuter Rail

- Music City Star Improvements
- Longer hours of service *(5:00 a.m. to 11:00 p.m.)*
- Enhance frequencies *(peak – 40 minutes, off-peak – 60 minutes)*

Benefits of Let's Move Nashville

The Let's Move Nashville Program represents Nashville's collective resolve to invest in its future, to promote its highly valued quality of life, and to "grow with intention" to a more prosperous, inclusive tomorrow. It is an investment in the freedom created by mobility. It is a down payment on the infrastructure that will get Nashvillians where they want to go affordably, safely and efficiently. It is an installment on opportunities for residents of all socioeconomic backgrounds, demographics and mobility needs to flourish, for neighborhoods to thrive and for businesses to grow. It is a proactive and bold response to the growth that is inevitable in our vibrant city.

Let's Move Nashville will be completed in 2032 and by 2040 will provide bus, Rapid Bus or LRT service within one half-mile of 76 percent of all Davidson County residents and 89 percent of all Davidson County jobs. AccessRide and Mobility on Demand services will expand this coverage to even more people and jobs throughout the county.

Let's Move Nashville is a Program of projects that will:

- Provide unparalleled **access** for Davidson County citizens and visitors alike.
- Facilitate access to **affordable housing.**
- Create and sustain **jobs.**
- Enhance **mobility** by connecting employees with employers, neighbors with neighborhoods, families with amenities, and tourists with attractions.
- Preserve the **quality of life** so cherished by residents and visitors to Nashville.
- Integrate **safety** into every aspect of the program, for patrons of the transit services, the communities through which they travel, and system employees.

Access

The growth experienced in Middle Tennessee has strained the regional transportation infrastructure and has placed new demands for access that can only be met by expanding traditional transportation modes, supplementing them with service improvements, and introducing new modes such as Rapid Bus and LRT:

- The Program provides improved access for anyone in Davidson County through convenient and efficient transit-based alternatives. It puts everything residents, businesses, and visitors love about Music City within easy reach.
- Nashville's elderly, youth, disabled, disadvantaged and mobility-challenged residents will have more travel options at their disposal, and a newfound independence to get around town and access jobs, vital services, education and all the opportunities that await.
- People who choose public transportation over driving for their daily commute will take advantage of a network of new, affordable and fully accessible Rapid Bus and LRT lines fanning out across the city along nine corridors that are enhanced with sidewalks, bike lanes and parking availability.
- Patrons who rely on multiple modes to get where they are going can count on seamless system interconnectivity that will link local bus, Rapid Bus, LRT, and Music City Star commuter rail with AccessRide, Transportation Network Company (TNC) services (like Lyft and Uber), ride-shares, and private taxi and shuttles for the most efficient and cost-effective routing from origin to destination.
- The Program brings transit to the doorstep of every community, while the community's access to the system will be eased with new sidewalks, bike facilities and community transit centers that serve as inter-line points of transfer, information and ticketing kiosks, activity hubs, parking locations, and security posts.

Affordable Housing

Affordability in Nashville is about more than just housing prices; it is about the entire cost burden on the household. Transit-Oriented Communities (TOCs) allow for a balancing of housing and transportation costs and travel time that, when combined, are in an acceptable range of affordability and desirability. The proposed Rapid Bus and LRT High Capacity Corridors (HCCs) will improve the travel times between relatively more affordable housing markets and the high concentration of jobs in downtown and along the corridors.

With Let's Move Nashville, the Program aims to ensure that housing affordability along the corridors is preserved, not jeopardized, by transit, and that more housing units will be built with access to transit. It is also essential that small businesses be supported and encouraged along TOC corridors and that they share in the full range of community benefits that transit engenders.

The Program supports Nashville's affordable housing agenda by:

- Reducing cost burdens for existing low- to moderate-income households by providing improved, more efficient and affordable transportation options.
- Offering free or reduced fares for Nashvillians who are living in poverty, living with a disability, senior citizens, or under the age of 18.
- Using access to transit as a catalyst for locating employment centers and the places where people learn, access vital services, and play in areas conducive to the creation of affordable housing.
- Helping to create diverse, mixed-income communities that foster improved health and well-being, better education outcomes, and general prosperity.
- Helping to identify and prioritize strategies in areas along transit corridors to prevent displacement of low- to moderate-income residents.

Jobs

The Program will generate five types of local employment:

1. Good-paying jobs directly related to the construction and commissioning of the Program's civil infrastructure over its proposed 15-year implementation schedule. Much of this workforce will come out of the already robust local construction market, or will be derived from the scores of construction workers who continue to move to the region to work in this growing market.
2. Good-paying jobs in industries related to fabrication, assembly and/or installation of vehicle components and electrical and mechanical systems that are already located in the region, or can be incentivized to locate to Davidson County due to the size of the program, as envisioned.
3. Good-paying jobs required to operate, manage and secure the system defined in Let's Move Nashville as it evolves.
4. Jobs attributable to the newly created access and mobility that the workforce from all income levels will have at its disposal to help secure and retain employment. Employers will also have access to a larger, more reliable pool of employees who are able to exercise additional options for getting to work.
5. The Let's Move Nashville Program will be an economic engine that improves neighborhoods, either directly or indirectly, by making them more vibrant places to live, work, learn, receive services and shop. A commensurate number of local jobs will be created as a result of the "halo effect" attributable to the presence of transit.

Investment in transit infrastructure can impact economic activity and support or create jobs in the local economy and beyond. Transit infrastructure capital investments create short-term jobs spanning the development and construction activities, providing a short-term

stimulus to a local economy. While important, this short-term impacts is only one of many ways that transit spending impacts the local economy. Sustained economic growth from operations and maintenance spending and productivity impacts are also major contributors to transit-related jobs and growth (see **Table 1**).

The total capital investment of this Program is estimated to be $5.4 billion (in 2017 dollars), spent over 15 years. It is estimated that this investment will create almost 45,000 annual jobs (full- and part-time jobs lasting one year) and $3.1 billion in labor income for Davidson County.

Mobility

The Program brings the city together by creating and enhancing a multimodal system that connects employees with employers, neighbors with neighborhoods, households with local amenities and services, and tourists with attractions.

- Davidson County residents who do not have cars or choose not to drive can take advantage of:
  - Enhanced bus service going both downtown and crosstown with more frequency, longer hours and better connectivity.
  - High-capacity transit along nine major arteries, including four Rapid Bus routes and five LRT lines coming into and going out of downtown from all directions.
- Expanded Music City Star commuter rail service bringing passengers from Lebanon to Riverfront Station in downtown Nashville.
- Supports an "active transportation" network of bikeways and sidewalks designed for safe, healthier and convenient travel within the community and access to the transit system.

Quality of Life

The Program is a benefit for everyone, putting everything residents, businesses, and visitors love about Music City within easy reach. By loosening gridlock's hold on the City, the Program keeps intact all those things that have made Nashville an attractive place to live and work.

For instance, there is a sense that everything in Nashville is just a few minutes from wherever you are; with an interconnected transportation system, it still can be. Nashville is known as a warm and welcoming place that comes from a friendly, unhurried attitude. Transportation options allow Nashville to keep pace with our rapidly growing city.

These options let you and your neighbor attend a major Nashville event without suffering in traffic. Everyone can take advantage of, and not be inconvenienced by, the city's many amenities, from concerts to sports events to festivals.

A well-integrated transportation system produces significant public health benefits: including reduced traffic accidents and pollution emissions; increased physical activity; less stress and improved mental health; and improved basic access to medical care. Vehicular traffic contributes 37 percent of

Table 1. Davidson County Economic Impact of the Transit Improvement Program Estimate ($M)

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	27,864	$2,060	$2,390	$4,383
Indirect Effect	7,549	$484	$736	$1,187
Induced Effect	9,341	$568	$890	$1,424
Total Effect	44,753	$3,112	$4,016	$6,994

Source: Let's Move Nashville Benefits Analysis Technical Study (2017)

Davidson County's greenhouse gas emissions and 85 percent of its smog.

As the region grows, the transportation and transit improvements advanced by Let's Move Nashville will keep thousands of additional cars off the road, meaning fewer accidents and injuries, and cleaner air. This is especially important to our more vulnerable citizens, such as children and the elderly, who will see a reduction in asthma rates and respiratory issues.

Safety

Every design decision, every operating procedure, and every community interface put forward under the Program will be predicated on safety – passenger, system employee, and contractor safety, and the safety of those who come into contact with the system in the community. In addition to the benefits that will accrue through safety-sensitive design and proven operations protocols, a safe environment will also be dependent on providing a secure environment where modern surveillance and threat detection and deterrence techniques are in practice.

The Program will address safety at many of Davidson County's most dangerous roadway intersections as part of their redesign to accommodate LRT, or Rapid Bus or local bus service at those crossings. Related projects will include realigning intersections, sidewalk and curb extensions in critical locations, and crosswalk and traffic signal improvements across Davidson County.

According to the National Highway Traffic Safety Administration, in 2015 Nashville experienced 2.14 pedestrian fatalities per 100,000 population compared to 1.67 nationally. Nashville has been addressing pedestrian safety, in part, with an ongoing sidewalk improvement program across the city. Let's Move Nashville will build on that safety initiative by investing heavily in sidewalks connecting neighborhoods to transit, neighborhood traffic calming, school zone traffic control, ADA access improvements, and implementation of safety education campaigns. These improvements will allow pedestrians, as well as cyclists and persons with disabilities, to access a safe and reliable public transportation system.

Public transportation is one of the safest ways to travel. It is, in part, 10 times safer per mile than traveling by car because it has less than a tenth the per-mile traffic casualty (injury or death) rate as automobile travel. Public transit-oriented communities are five times safer because they have about a fifth the per capita traffic casualty rate as automobile-oriented communities. In addition, crash rates tend to decline as public transit travel increases in a community. Contrary to popular perceptions, public transit travel is significantly safer than automobile travel.[1]

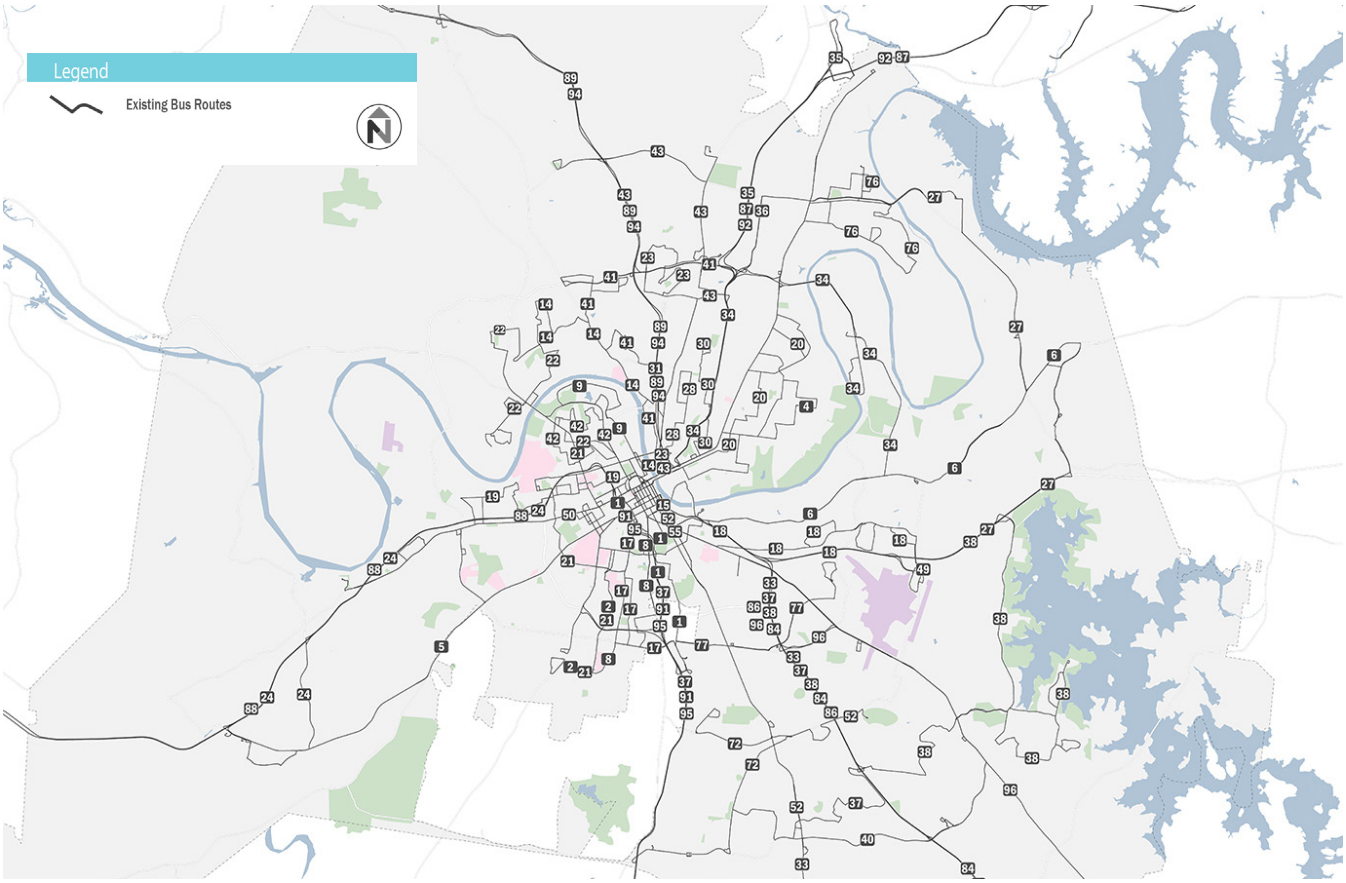
Description of the Let's Move Nashville Program

The following sections describe the overall improvements of the Let's Move Nashville Program proposed for Metro Nashville and Davidson County. For reference, **Figure 4** shows the existing bus service network. Based on the findings, concepts and recommendations adopted under the nMotion Plan, Let's Move Nashville has given greater definition to the proposed Davidson County transit network and its service attributes. The Program's improvements are generally categorized as follows:

- **Bus Enhancements** – A variety of phased improvements to the existing MTA bus services, including regional branding and schedule/fare integration, expanded hours and frequency, upgraded service information and wayfinding, improved station area amenities and access, service

1 The Hidden Traffic Safety Solution: Public Transportation, September 2016, American Public Transportation Association

Figure 4. Existing Bus Service



integration with TNCs such as Lyft and Uber, private carriers, conversion to all-electric bus fleet, and on-board Wi-Fi. In addition, AccessRide and Mobility on Demand will be expanded and improved.

- **High-Capacity Corridors** – Four Rapid Bus and five LRT corridors fanning out in all directions across Davidson County, and advanced in the nMotion Plan because of their characteristic population and employment densities, corridor demographics, redevelopment potential, existing transit-supportive land use characteristics, and current transit ridership.
- **Maintenance Facilities** – A primary LRT maintenance facility is envisioned on the Gallatin Pike Corridor, and a secondary LRT facility and a bus maintenance facility, although estimated for cost, have yet to be assigned to a corridor.
- **Transit Center Network** - In conjunction with the development of new crosstown and through city routes, and with the introduction of Rapid Bus and LRT service to new areas, the Program will develop 19 new or improved transit centers over five years throughout Davidson County. Additional transit centers will be developed and opened with the LRT and Rapid Bus Corridors.
- **Downtown Segment** - Due to the heavily congested downtown and rapidly increasing traffic growth projected over the next five years, the program includes a new LRT and Rapid Bus tunnel to provide reliable transit service in downtown.
- **Music City Star Commuter Rail** - Service improvements on the Music City Star (MCS) will be targeted between Riverfront and Hermitage Stations in Davidson County, and undertaken in a manner that would allow capital and service improvements out to Lebanon if Wilson County chooses to partner with Davidson County.

Bus Enhancements

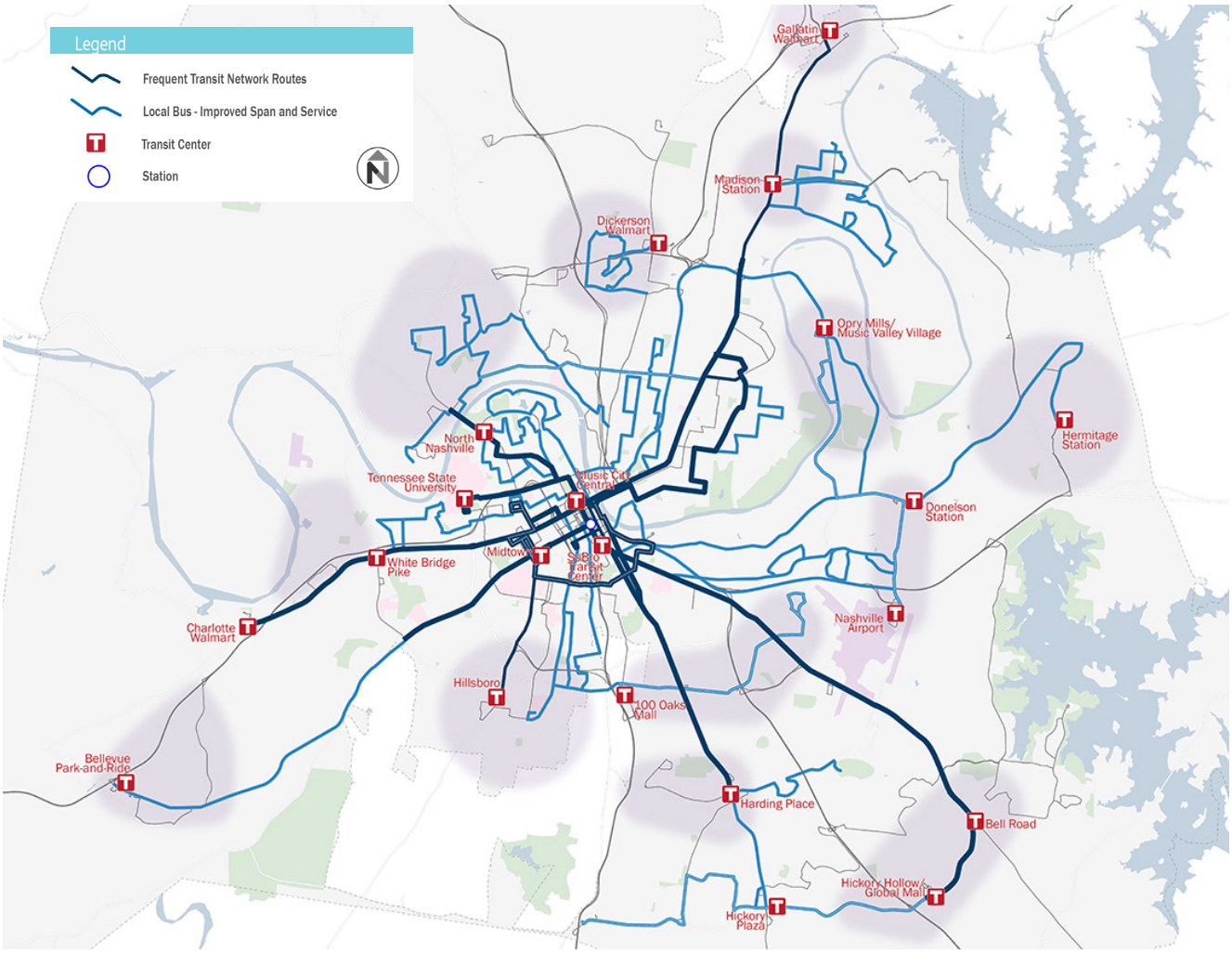
Many of the transit investments included in this Program are improvements to the existing MTA bus system and its facilities, as detailed below (see **Figure 5** for an overview of proposed MTA bus enhancements.)

Easier-to-Use Service

One of the first sets of improvements that the Program will undertake is to make existing local and regional transit service easier to use, including:

- Consistent regional branding to make a seamless system between the MTA and the RTA beginning in late 2018.
- A unified fare system between the MTA and the RTA beginning in late 2018.
- Expanded digital signage (real-time information, wayfinding) including 100 new signs at various high-traffic locations beginning in 2019.
- Customer phone apps offering real-time bus/train location/status, service alerts, trip planning, first-mile/last-mile services, and station area information ("first-mile/last-mile" refers to the legs of a journey to reach a transit stop to begin and end a transit trip).
- Expanded fare vending machines beginning in 2020 and off-board fare collection beginning in late 2023.
- Fare and service integration with TNCs, fixed route buses/AccessRide, car-share and bike-share assuming there is mutual agreement beginning in late 2019.

Figure 5. Enhanced Bus Routes and Transit Centers



- Individual account-based payment systems allowing for third-party fare subsidy beginning in 2019.

Improve Existing Service

The Program will create a frequent transit bus network comprised of 10 frequent routes. Weekday hours of operation will begin at 5:15 a.m. and continue until 1:15 a.m. beginning in the fall of 2018. The frequency of service will improve to at least every 15 minutes during peak travel times and between 20 and 30 minutes during off-peak times beginning in the fall of 2019.

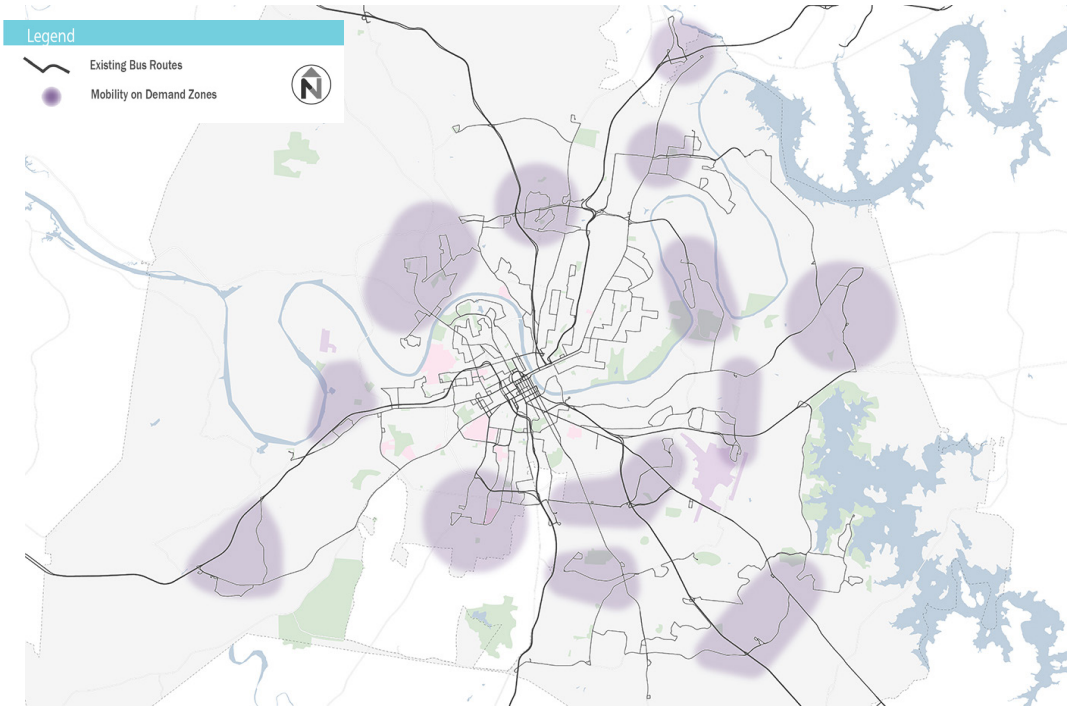
- Frequency and hours of operation improvements on other non-frequent transit network routes will be based on demand and development patterns starting in the fall of 2019.
- Route extensions to serve newly developing areas will begin in fall 2019.
- Improved Access Ride Service including:
  - Real-Time/Advance Call Information beginning in late 2018.
  - Expanded service to address increasing demand beginning in late 2018.
  - Expanded integration with outside taxi providers, TNCs, and private providers beginning in late 2018.
  - Same-day service for access ride beginning in 2019.
- The Program will expand crosstown routes with four new routes beginning in 2019.
  - Trinity Lane
  - Edgehill Avenue (with frequent network service)
  - Bell Road
  - Airport-Opry Mills via Donelson

Improvements to Transit Access

Transit travel requires riders to go to a transit stop and wait for a vehicle to arrive – both of which the Program will attempt to improve. The Program will make using transit more comfortable and safe with improvements such as:

- Access to the improved network for transit patrons with disabilities will be provided in compliance with the Americans with Disabilities Act (ADA) and local ordinances.
- Mobility on Demand is a demand-responsive service focused on connecting more customers to the overall bus network and providing enhanced services for customers

Figure 6. Mobility on Demand Zones



who currently rely on AccessRide. It will include real-time information, online trip reservations, and same-day service options. See **Figure 6** for Mobility on Demand access zones.
- Construction of four park-and-ride facilities at existing transit centers beginning in late 2020.
- Improved pedestrian connections to major bus stops and stations with additional sidewalks beginning in 2023, with more sidewalk additions to follow as development occurs.
- Integration of TNCs and taxis into the fixed route transit network for first-mile/last-mile connections beginning in 2019.

Make Service More Comfortable

The Program calls for implementation of a number of improvements to enhance the passenger experience and increase community benefits, including:

- Conversion to an all-electric bus fleet as buses are replaced during their normal replacement cycle.
- Addition and/or upgrade of 20 shelters or stations per year.
- Offer on-board and in-station Wi-Fi by 2019.
- Continued enhancement of network safety for transit patrons and operating personnel through improved lighting, electronic surveillance, safety- and security-sensitive design of facilities and equipment, and expanded collaboration with and between law enforcement and first responders.

High-Capacity Corridors

Nine HCCs have been identified in the Program, including four Rapid Bus corridors and five LRT corridors as described in this section. Most of these corridors were advanced in the nMotion Plan because of their population and employment densities, corridor demographics, redevelopment potential, existing transit-supportive land use characteristics and current transit ridership. Today these corridors carry some of MTA's highest-ridership bus routes. See **Figure 7** for a system map of the HCCs.

The individual corridor sheets provide a brief description for each of the Rapid Bus and LRT corridors, including length, number and location of stations, over and under bridge structures, and other notable corridor specific features. The population and employment data, as well as the minority and low-income data provided, represent the area within a half-mile buffer on each side of the corridors. A half-mile buffer was chosen because it is considered a "walkable" distance for transit users. Activity density within the half-mile buffers was defined as the population plus the employment per acre. Activity density is only one measure of corridor comparison for LRT or Rapid Bus service.

Conceptual station locations and configurations were generalized for establishing ridership forecasts and program capital and operational costs. Inputs for this high-level planning effort included the nMotion Plan recommendations and industry practices regarding average station spacing. More precise station locations will be determined through detailed planning, design, environmental analysis, and community and stakeholder involvement activities during project development of each corridor.

Likewise, high-level operating plan assumptions were made for cost and ridership estimating purposes only and will be more fully developed in later phases of project development. The intent of the operating plan is to connect the corridors to the downtown tunnel and provide seamless trips to the Nashville Airport and other activity centers. Future extensions of these lines, which are not part of this Program, could service areas outside of Davidson County such as Sumner, Cheatham and Rutherford Counties.

Figure 7. Light Rail and Rapid Bus Concept

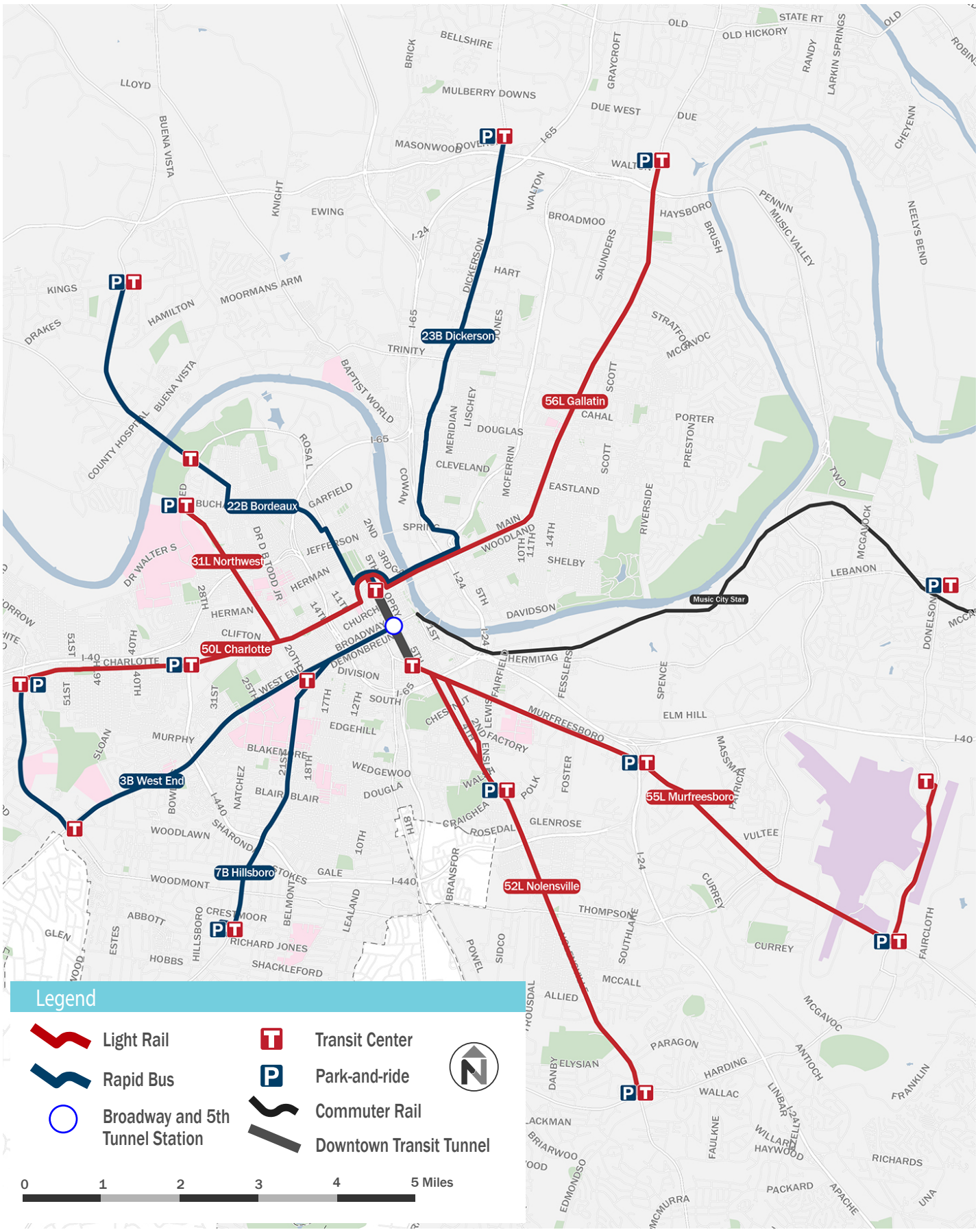
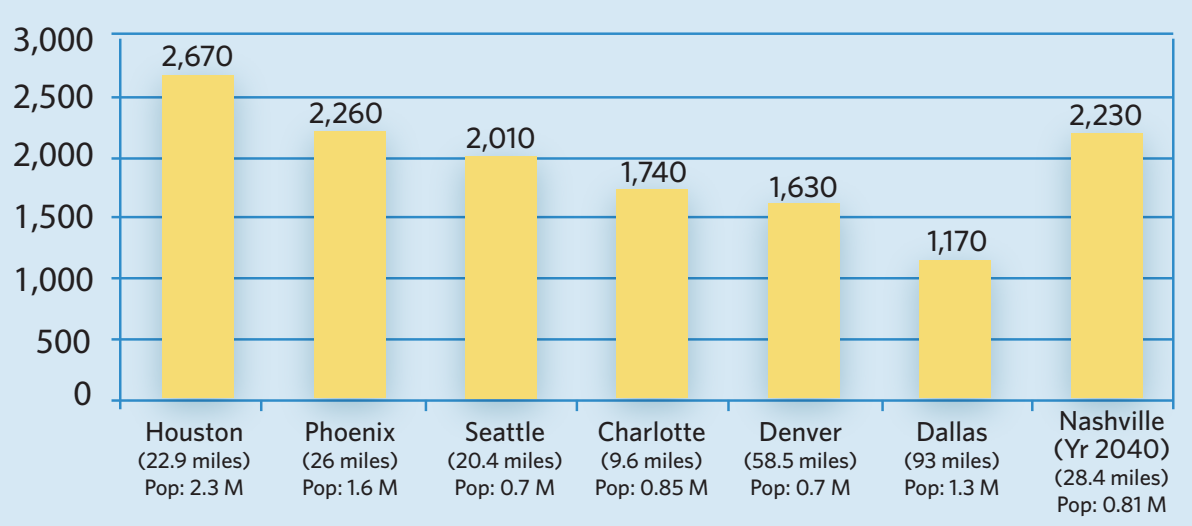


Figure 8. 2015/2016 LRT Average Weekday Boardings Per Corridor Mile



The ridership forecast shown for Nashville in **Figure 8** and those included on the following individual corridor sheets were developed using the Federal Transit Administration's (FTA) Simplified Trips On Project Software (STOPS). The STOPS model is a stand-alone ridership forecasting software package that applies a set of travel models to predict detailed travel patterns on fixed guideway (LRT) systems. The STOPS model has been calibrated using the results of 24 fixed-guideway systems around the country. The ridership forecasts presented in this document are preliminary and subject to further refinement during the development phases of each corridor.

In 2040, it is estimated that Nashville's transit Program will provide between 35 and 40 million rides annually, and the HCCs alone will provide between 22 and 26 million rides annually. In fact, Nashville's 2040 LRT ridership is projected to compare favorably to some of the current larger LRT systems, as shown in **Figure 8**.

Rapid Bus Corridors

The program includes four Rapid Bus Service Corridors (see **Figure 6**). Those corridors are:

- Bordeaux
- West End
- Hillsboro
- Dickerson

The Rapid Bus Corridors include the following key assumptions:

- Rapid Bus transit service using 40- and/or 60-foot electric buses.
- Dedicated bus lanes where feasible.
- Level platform boarding where feasible.
- Use of transit signal priority (TSP) in conjunction with queue jump and/or bus bypass lanes where appropriate.
- Operating hours of service are from 5:15 a.m. to 1:15 a.m. to mirror planned LRT service.
- Frequencies are 10 to 15 minutes during the peak travel time and 20 minutes during off-peak travel times.
- Station or stop spacing nominally half-mile apart, with actual stop locations to be determined.
- Convenient transfers between from other transit routes.
- Designated station amenities may include shelters, benches, lighting, real-time information, and pre-board fare vending and validation.

The menu of infrastructure investments noted above will be strategically developed and applied for each Rapid Bus corridor during the future project development phases. Likewise, the specific station locations, route terminals and route interlining will be determined during the planning process with full public and stakeholder participation to achieve effective solutions with the support of the benefiting communities.

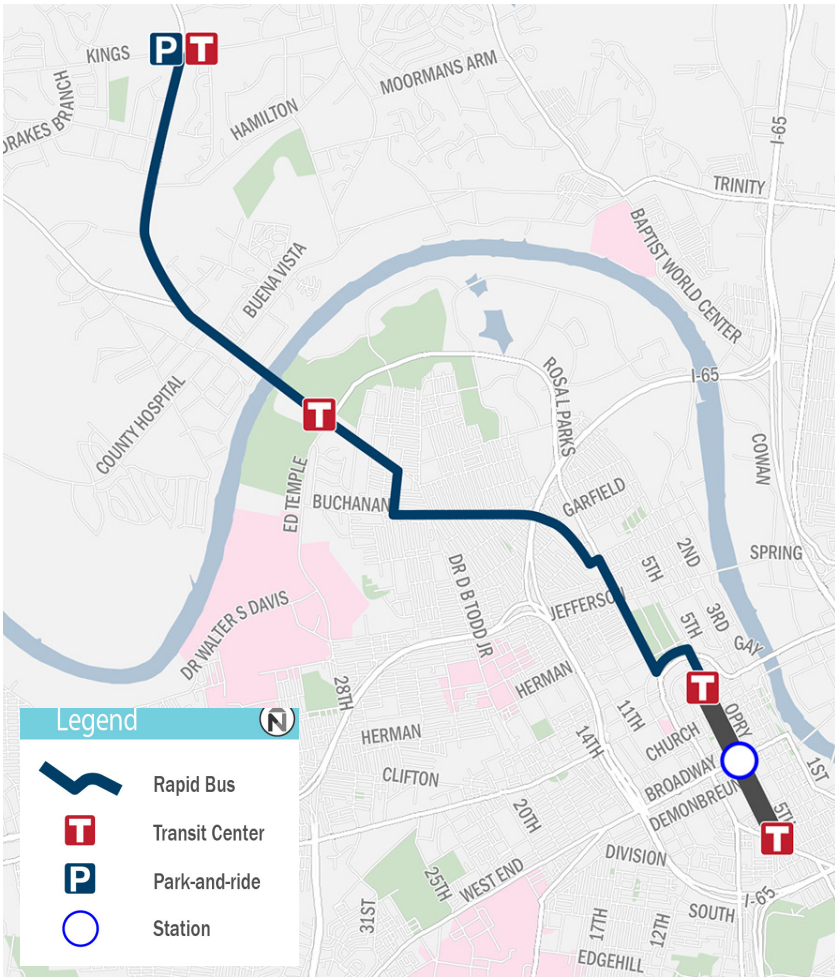
Bordeaux (Rapid Bus)

The Bordeaux Corridor extends from the SoBro Transit Center north through the tunnel to the Music City Central Station and then via Rosa Parks Boulevard to Clarksville Pike for 5.8 miles before terminating at a transit center at Kings Lane (see **Figure 9**). Potential Rapid Bus operations through the tunnel and points beyond are pending the final operating plan.

LENGTH (MILES)	6.9
RIDERSHIP (AVERAGE DAILY WEEKDAY BOARDINGS)	3,400-4,100
CAPITAL COST (2017 $ M)	$59
AVERAGE ANNUAL O&M COST (2017 $ M)	$4
TRAVEL TIME (DOWNTOWN TO END OF LINE IN MINUTES)	32
POPULATION PER ACRE (2015/2040)	8/10
EMPLOYMENT PER ACRE (2015/2040)	30/37
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	37/47
% MINORITY/LOW INCOME (2015)	62%/ 28%
TOTAL POPULATION (2015/2040)	21,600/ 30,100
TOTAL EMPLOYMENT (2015/2040)	57,600/ 74,800

Note: Numbers may not add due to rounding.

Figure 9. Bordeaux Rapid Bus Corridor



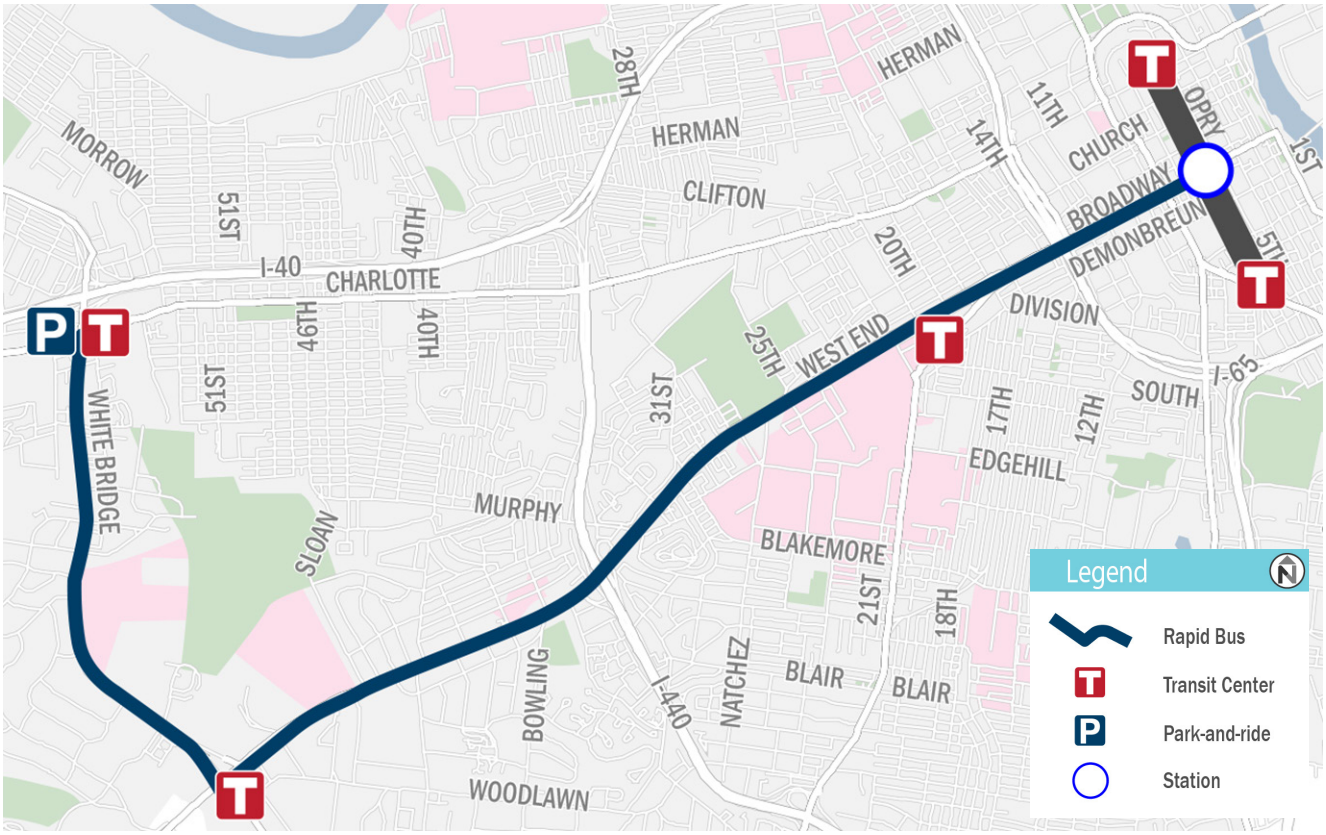
West End (Rapid Bus)

The West End Corridor will extend from Music City Central or from the SoBro Transit Center and head west along Broadway for 7.3 miles. At White Bridge Road, the route turns north and terminates at a transit center at Charlotte, where it would connect with the Charlotte Avenue LRT line. It will also include a transit center near the intersection of West End and Broadway with connections to various Vanderbilt University shuttle services and a transit center near West End and White Bridge (see **Figure 10**). Final routing of Rapid Bus service is pending the final operating plan.

LENGTH (MILES)	7.3
RIDERSHIP (AVERAGE DAILY WEEKDAY BOARDINGS)	1,200-1,500
CAPITAL COST (2017 $ M)	$62
AVERAGE ANNUAL O&M COST (2017 $ M)	$5
TRAVEL TIME (DOWNTOWN TO END OF LINE IN MINUTES)	34
POPULATION PER ACRE (2015/2040)	10/12
EMPLOYMENT PER ACRE (2015/2040)	49/57
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	59/69
% MINORITY/LOW INCOME (2015)	29%/ 17%
TOTAL POPULATION (2015/2040)	34,800/ 41,700
TOTAL EMPLOYMENT (2015/2040)	138,400/ 162,600

Note: Numbers may not add due to rounding.

Figure 10. West End Rapid Bus Corridor



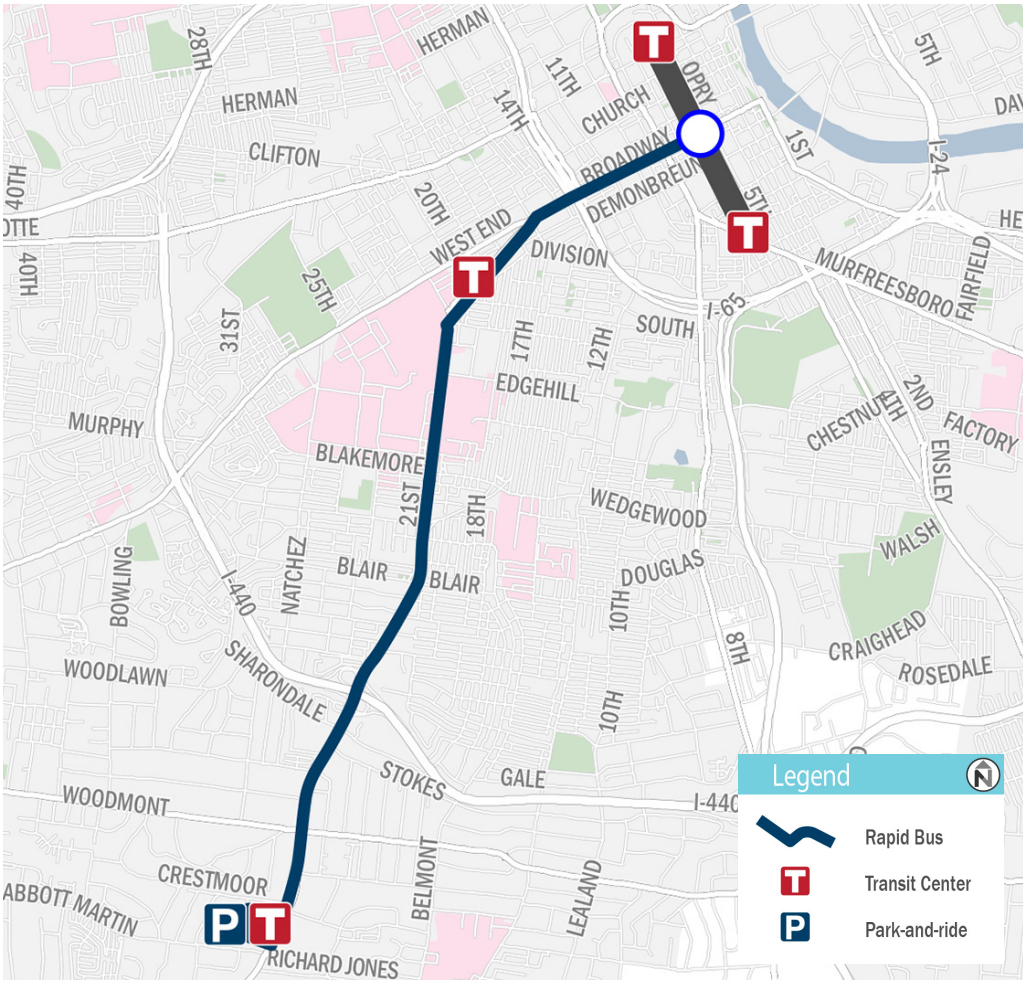
Hillsboro (Rapid Bus)

The Hillsboro Corridor will extend from Music City Central or from the proposed SoBro Transit Center, then travel southwest along Broadway, 21st Avenue, and Hillsboro Road for about 5.4 miles before terminating at a transit center near the Green Hills Mall (see **Figure 11**). It will also include a proposed transit center near the intersection of West End and Broadway with connections to various Vanderbilt University shuttle services. Final routing of Rapid Bus service is pending the final operating plan.

LENGTH (MILES)	5.6
RIDERSHIP (AVERAGE DAILY WEEKDAY BOARDINGS)	1,900-2,300
CAPITAL COST (2017 $ M)	$48
AVERAGE ANNUAL O&M COST (2017 $ M)	$6
TRAVEL TIME (DOWNTOWN TO END OF LINE IN MINUTES)	26
POPULATION PER ACRE (2015/2040)	10/12
EMPLOYMENT PER ACRE (2015/2040)	54/62
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	63/74
% MINORITY/LOW INCOME (2015)	28%/ 16%
TOTAL POPULATION (2015/2040)	29,500/ 35,500
TOTAL EMPLOYMENT (2015/2040)	124,600/ 146,300

Note: Numbers may not add due to rounding.

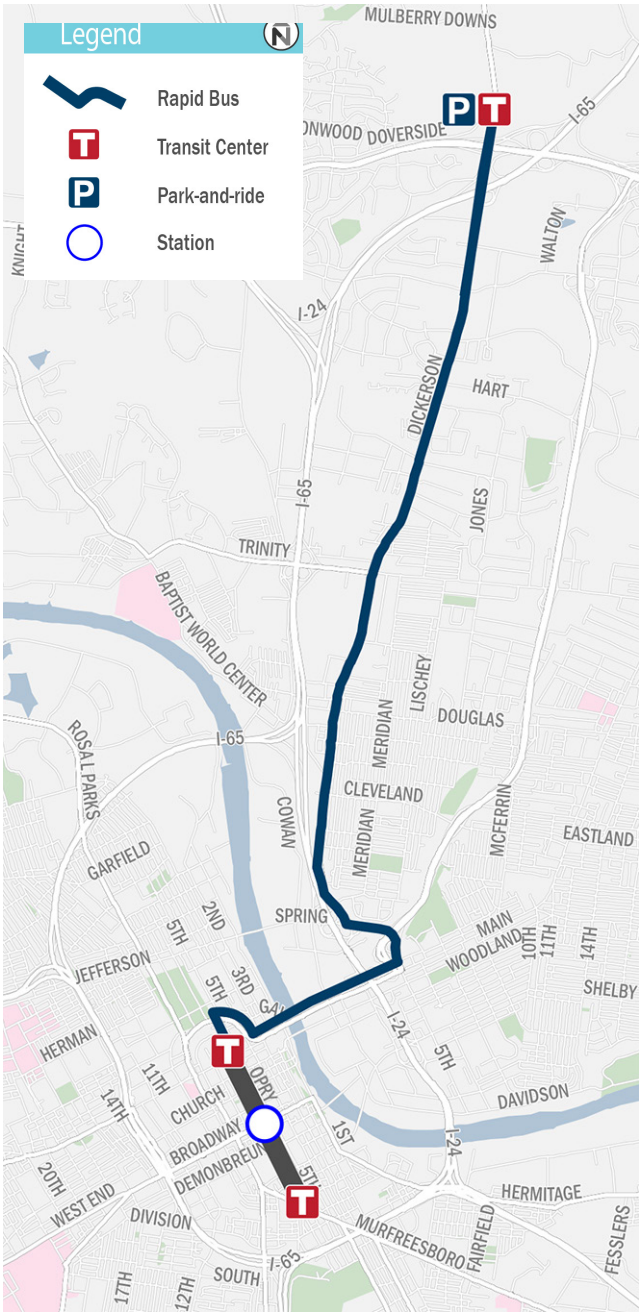
Figure 11. Hillsboro Rapid Bus Corridor



Dickerson (Rapid Bus)

The Dickerson Corridor extends from the SoBro Transit Center north through the tunnel to the Music City Central Station, then east along Main Street and then north along Dickerson Pike for about 6.7 miles before terminating at the transit center near Doverside Drive (see **Figure 12**). Potential Rapid Bus operations through the tunnel and points beyond are pending the final operating plan.

Figure 12. Dickerson Rapid Bus Corridor



LENGTH (MILES)	7.6
RIDERSHIP (AVERAGE DAILY WEEKDAY BOARDINGS)	3,100-3,700
CAPITAL COST (2017 $ M)	$65
AVERAGE ANNUAL O&M COST (2017 $ M)	$4
TRAVEL TIME (DOWNTOWN TO END OF LINE IN MINUTES)	35
POPULATION PER ACRE (2015/2040)	6/8
EMPLOYMENT PER ACRE (2015/2040)	33/38
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	39/46
% MINORITY/LOW INCOME (2015)	56%/ 30%
TOTAL POPULATION (2015/2040)	20,400/ 27,000
TOTAL EMPLOYMENT (2015/2040)	54,100/ 80,100

Note: Numbers may not add due to rounding.

Rail Corridors

Under the Program, five LRT corridors are included (see **Figure 7**):

- Gallatin Pike
- Northwest Corridor
- Charlotte Avenue
- Murfreesboro Pike
- Nolensville Pike

The LRT Corridors include the following key assumptions:

- LRT tracks in dedicated lanes.
- Use of Transit Signal Priority (TSP) where appropriate.
- Corridor sidewalk improvements.
- ADA-compliant access.
- Pedestrian signals and crosswalks.
- Station platforms to accommodate two-car trains but may be extended in the future.
- Station spacing nominally half-mile apart with actual station locations to be determined.
- Convenient transfers between other transit routes.
- Designated station amenities including shelters, benches, lighting, real-time information, and pre-board fare vending and validation.
- Transit center(s) where several bus routes intersect the LRT line.
- Park-and-ride lots to allow for auto access to the LRT line.

The menu of infrastructure investments noted above will be strategically developed and applied for each LRT corridor during the future project development phases. Likewise, the specific station locations, transit centers and park-and-rides will be determined during the planning process with full public and stakeholder participation so as to achieve effective solutions with the support of the benefiting communities.

Nolensville Pike near Joyner Avenue

Nolensville Pike near Elysian Fields Road

Charlotte Avenue near 48th Avenue

Gallatin Pike (Light Rail)

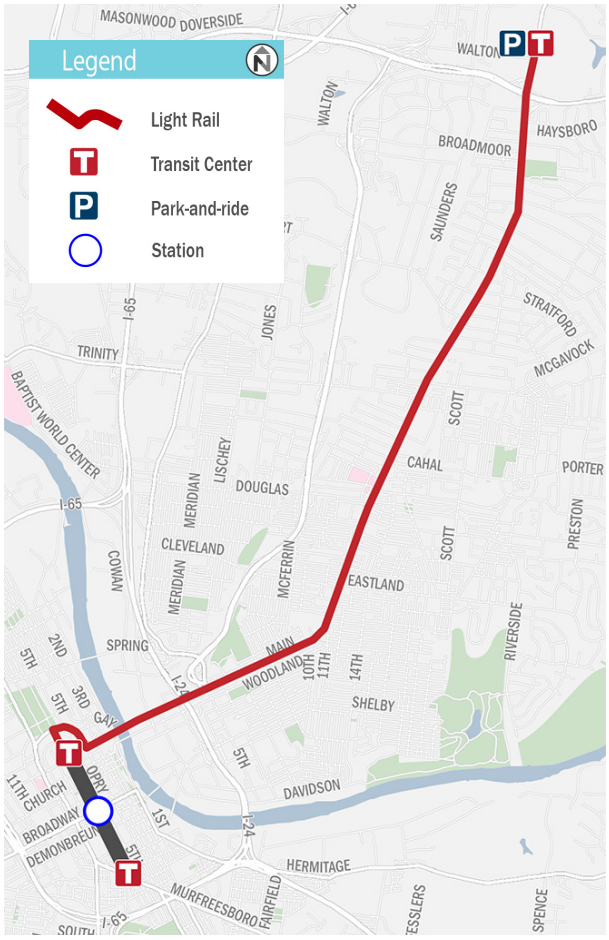
The Gallatin Pike LRT Corridor (see **Figure 13**) extends 6.4 miles northeast from the Music City Central Transit Center station north to Main Street and Gallatin Pike to Briley Parkway. The line will be designed and constructed in a manner that allows for future extension to the Rivergate area consistent with phase two of the nMotion Plan. Approximately nine stations will serve this corridor. A primary operations and maintenance (O&M) facility will be sited along the Gallatin Pike Corridor, as will a transit park-and-ride facility. The Gallatin Pike Corridor will cross the Cumberland River on a new shared LRT/roadway structure that will replace the existing Main Street Bridge. In addition to the Main Street Bridge replacement, the railroad bridge overpass near Iverson will also be replaced with a new structure to accommodate the LRT alignment. Service will extend through the downtown tunnel and beyond pending the final operating plan.

Light Rail on Gallatin Pike

LENGTH (MILES)	6.4
RIDERSHIP (AVERAGE DAILY WEEKDAY BOARDINGS)	5,600-6,500
CAPITAL COST (2017 $ M)	$789
AVERAGE ANNUAL O&M COST (2017 $ M)	$9
TRAVEL TIME (DOWNTOWN TO END OF LINE IN MINUTES)	21
POPULATION PER ACRE (2015/2040)	7/8
EMPLOYMENT PER ACRE (2015/2040)	27/31
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	34/39
% MINORITY/LOW INCOME	43%/ 26%
TOTAL POPULATION (2015/2040)	28,000/ 32,900
TOTAL EMPLOYMENT (2015/2040)	56,100/ 68,500

Note: Numbers may not add due to rounding.

Figure 13. Gallatin Pike LRT Corridor



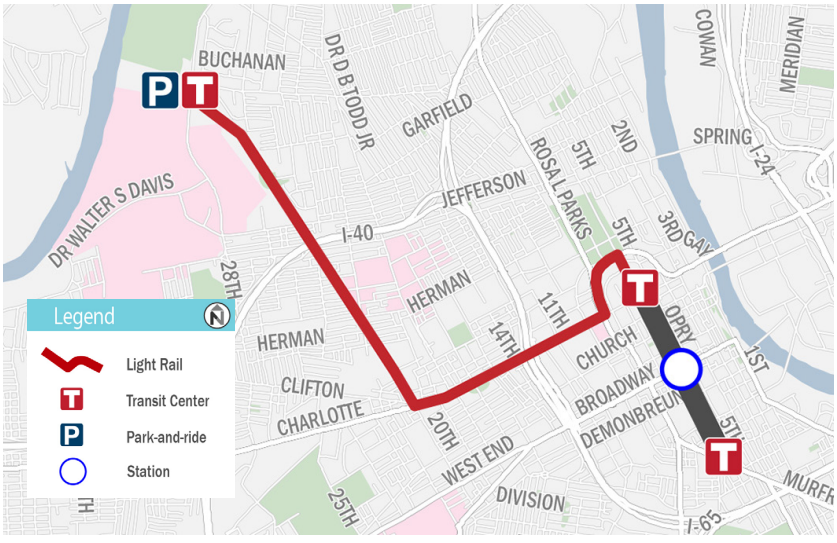
Northwest Corridor (Light Rail)

The 2.2-mile Northwest LRT Corridor (see **Figure 14**) infrastructure begins at the Charlotte Avenue and Spruce Street intersection and extends northward. However, operationally, it will share the Charlotte Avenue Corridor from Spruce Street, east to the Music City Central Transit Center, and continue south through the tunnel to the SoBro Transit Center and possibly to points beyond based on the final operations plan.

The infrastructure improvements begin at Charlotte and Spruce, and the alignment follows Spruce Street north, crosses above the CSX railroad mainline, and connects to the existing Nashville & Western Railroad alignment near Herman Street. From Spruce Street to Herman Street, right-of-way acquisition will be required. The terminus of the Northwest Corridor is at a transit center and park-and-ride facility on Ed Temple Boulevard. Approximately three stations will serve this corridor (in addition to the shared Charlotte Corridor from Spruce Street to the Music City Central). A new LRT bridge will be built over the CSX tracks, with an at-grade crossing of a north and west siding track. Existing railroad bridges over Albion Street, Alameda Street, Meharry Boulevard and an alleyway between Jefferson Street and Meharry will be reconstructed to provide needed vertical and horizontal roadway clearances. Bridge structures will be constructed wide enough to accommodate a future second LRT track.

A single track is to be reconstructed in the existing railroad right-of-way and freight operations will remain in this corridor. However, freight service will be restricted to nighttime service hours. The LRT vehicles will operate on the same physical tracks, but will likewise be restricted to daytime operations.

Figure 14. Northwest LRT Corridor



LENGTH (MILES OF INFRASTRUCTURE IMPROVEMENTS)	2.2*
RIDERSHIP (AVERAGE DAILY WEEKDAY BOARDINGS)	4,400-5,200
CAPITAL COST (2017 $ M)	$252
AVERAGE ANNUAL O&M COST (2017 $ M)	$7
TRAVEL TIME (DOWNTOWN TO END OF LINE IN MINUTES)	16
POPULATION PER ACRE (2015/2040)	7/10
EMPLOYMENT PER ACRE (2015/2040)	45/51
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	52/61
% MINORITY/LOW INCOME (2015)	58%/ 29%
TOTAL POPULATION (2015/2040)	15,400/ 20,800
TOTAL EMPLOYMENT (2015/2040)	86,200/ 102,400

*Ed Temple Boulevard to Charlotte Avenue
Note: Numbers may not add due to rounding.

Charlotte Avenue (Light Rail)

The 5.2-mile Charlotte Avenue LRT Corridor (see **Figure 15**) begins at the Music City Central Transit Center exiting to the northwest along 5th Avenue to Rosa Parks Boulevard and then west along Charlotte Avenue. Near I-440, a transit center and park-and-ride structure are proposed. The existing I-440 overpass will not be affected with the LRT tracks being depressed lower than the existing roadway. The western terminus is planned at White Bridge Road, where an additional park-and-ride facility is planned as well as a transit center providing connections to the West End Rapid Bus service.

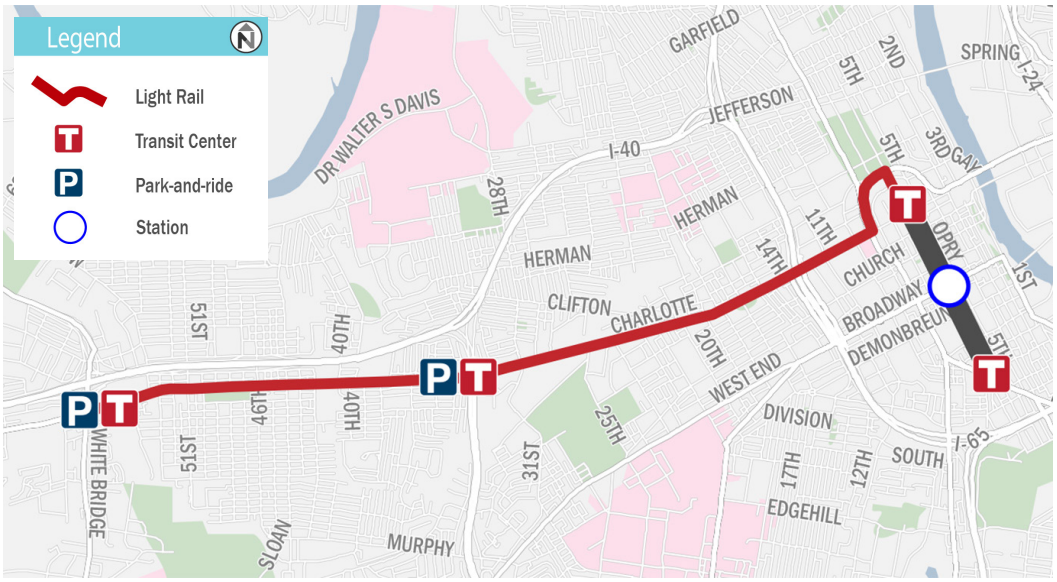
Approximately 10 stations will serve this corridor, with specific locations to be determined in later project phases. The railroad overpass at 10th Avenue will be replaced with a new bridge structure. The existing bridge over the railroad at 25th Avenue will be widened to accommodate LRT tracks. The Charlotte Avenue LRT service will also extend from the Music City Central Transit Center south through the proposed tunnel to the new SoBro Transit Center and to points beyond based on the final operating plan.

LENGTH (MILES)	5.2
RIDERSHIP (AVERAGE DAILY WEEKDAY BOARDINGS)	8,800-10,300
CAPITAL COST (2017 $ M)	$697
AVERAGE ANNUAL O&M COST (2017 $ M)	7
TRAVEL TIME (DOWNTOWN TO END OF LINE IN MINUTES)	17
POPULATION PER ACRE (2015/2040)	7/9
EMPLOYMENT PER ACRE (2015/2040)	34/40
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	41/49
% MINORITY/LOW INCOME (2015)	41%/ 24%
TOTAL POPULATION (2015/2040)	20,800/ 28,500
TOTAL EMPLOYMENT (2015/2040)	90,400/ 112,000

Note: Numbers may not add due to rounding.

Light Rail on Charlotte Avenue

Figure 15. Charlotte Avenue LRT Corridor



Murfreesboro Pike (Light Rail)

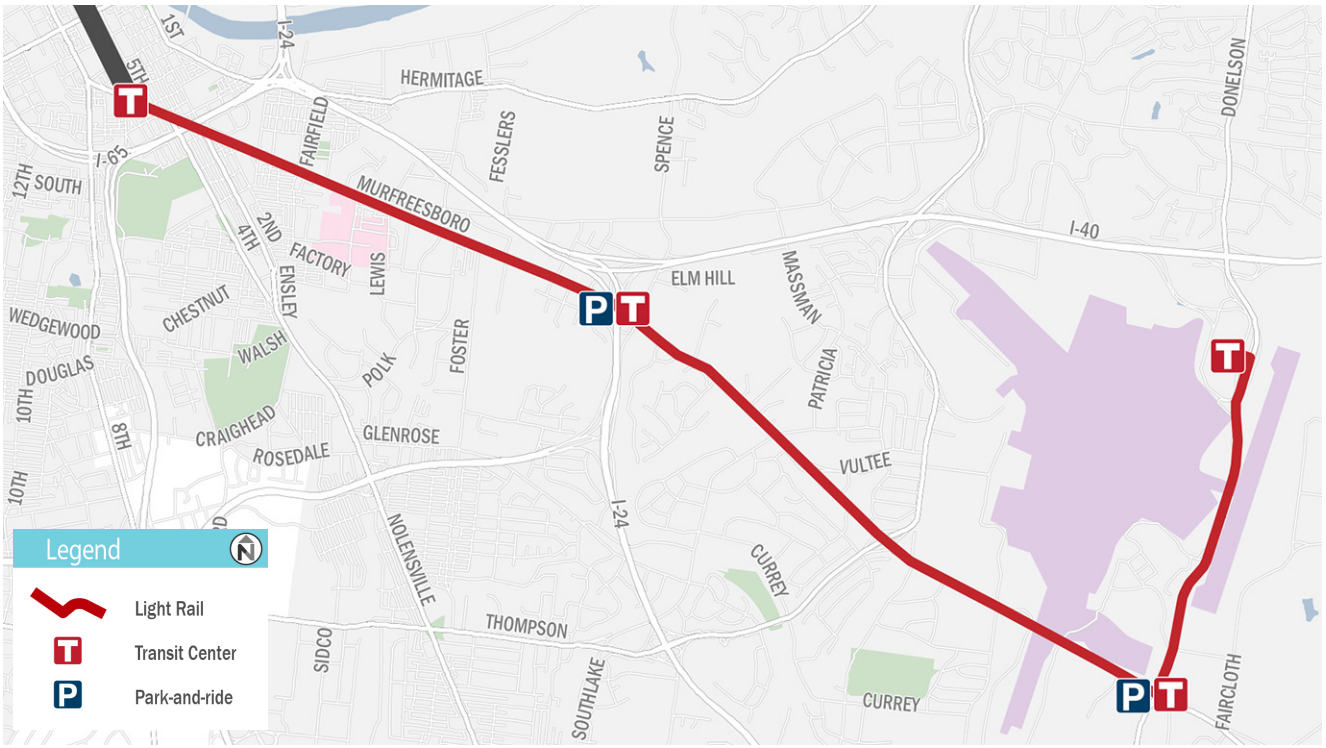
The 8.6-mile Murfreesboro Pike LRT Corridor (see **Figure 16**) begins at the proposed SoBro Transit Center in downtown Nashville with service north through the tunnel. The corridor follows Lafayette Street and Murfreesboro Pike southeast to Donelson Pike. From there, the alignment extends north and along Donelson Pike, ending at a new terminal proposed in the Metro Nashville Airport Authority's Growth and Expansion Plan.

Approximately 10 stations will serve this corridor. Park-and-ride lots will be located near the I-24 and Donelson Pike Transit Centers. Design will allow for a future extension past Donelson Pike along Murfreesboro Pike to Bell Road consistent with phase two of the nMotion Plan. The railroad overpass east of Mezler Road will be replaced to accommodate the LRT. No impact to the airport runway overpass is envisioned. The taxiway bridges over Donelson Pike would be extended to the west to provide increased horizontal clearance for LRT tracks and the secure service road.

LENGTH (MILES)	8.6
RIDERSHIP (AVERAGE DAILY WEEKDAY BOARDINGS)	9,700-11,300
CAPITAL COST (2017 $ M)*	$828
AVERAGE ANNUAL O&M COST (2017 $ M)	$11
TRAVEL TIME (DOWNTOWN TO END OF LINE IN MINUTES)	26
POPULATION PER ACRE (2015/2040)	6/9
EMPLOYMENT PER ACRE (2015/2040)	18/31
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	24/40
% MINORITY/LOW INCOME (2015)	51%/ 27%
TOTAL POPULATION (2015/2040)	14,500/ 19,000
TOTAL EMPLOYMENT (2015/2040)	49,300/ 81,800

*Nashville International Airport will help fund a portion of this line.
Note: Numbers may not add due to rounding.

Figure 16. Murfreesboro Pike LRT Corridor



Nolensville Pike (Light Rail)

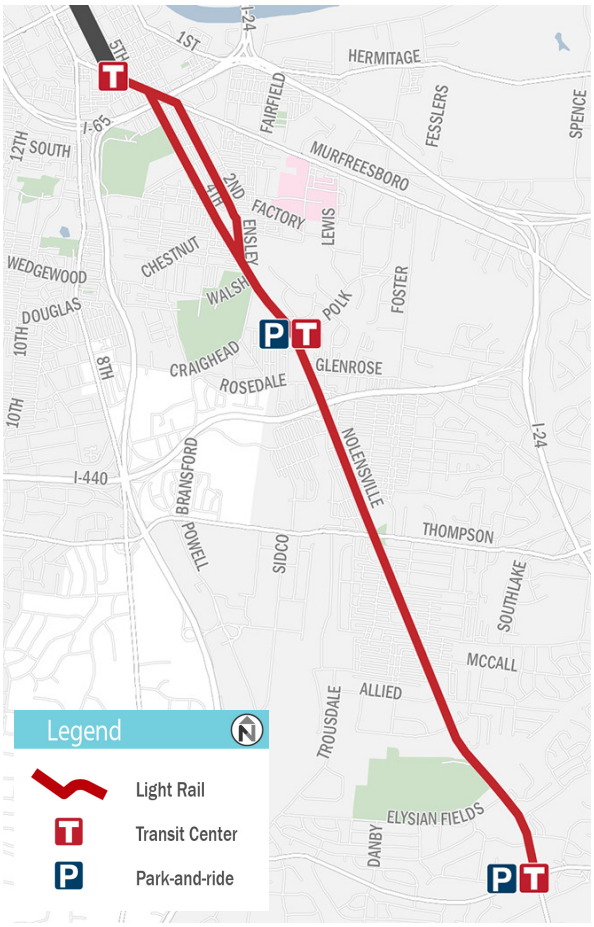
The 6-mile Nolensville Pike LRT Corridor (see **Figure 17**) proceeds southeast on Lafayette Street for a short distance from the proposed SoBro Transit Center. From Lafayette Street, the alignment splits into a single-track southbound alignment on 4th Avenue, and a single-track northbound alignment on 2nd Avenue. Where these two merge to the south as Nolensville Pike, the LRT proceeds further southeast until it terminates at a proposed transit center and park-and-ride facility near Harding Place.

Approximately eight stations will serve this corridor. An additional park-and-ride facility is proposed at Peachtree Street. A new LRT overpass will provide grade separation with the railroad crossing at Hart Street/Houston Street on 4th Avenue. The railroad bridge over 2nd Avenue/Ensley Boulevard will be replaced to accommodate LRT tracks. The railroad bridge near the Nashville Zoo entrance will remain in place but will undergo minor modifications to accommodate LRT operations. LRT service to points beyond the downtown transit centers is pending the final operating plan.

LENGTH (MILES)	6.0
RIDERSHIP (AVERAGE DAILY WEEKDAY BOARDINGS)	8,700-10,200
CAPITAL COST (2017 $ M)	$666
AVERAGE ANNUAL O&M COST (2017 $ M)	$9
TRAVEL TIME (DOWNTOWN TO END OF LINE IN MINUTES)	19
POPULATION PER ACRE (2015/2040)	5/8
EMPLOYMENT PER ACRE (2015/2040)	12/21
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	17/29
% MINORITY/LOW INCOME	52%/ 29%
TOTAL POPULATION (2015/2040)	19,100/ 24,300
TOTAL EMPLOYMENT (2015/2040)	36,400/ 54,300

Note: Numbers may not add due to rounding.

Figure 17. Nolensville Pike LRT Corridor



Supporting Facilities

Maintenance Facilities

The primary LRT operations and heavy maintenance facility is required in the Gallatin Pike Corridor if it is to be the first corridor constructed as planned. A secondary LRT light maintenance facility will be required as the full system buildout progresses. The secondary maintenance facility would store additional vehicles and perform light maintenance services. At this time, a cost for the primary and secondary facilities is included in the capital cost estimate. However, a specific corridor to accommodate the secondary facility will not be determined until full operational analysis is performed and corridor implementation sequencing has been defined.

In addition to the LRT maintenance facilities, the Program includes a third bus operations and maintenance facility to accommodate the additional bus fleet required to operate the improved bus service and the Rapid Bus corridors.

Neighborhood Transit Centers

In conjunction with the development of new crosstown and through-city routes, and the introduction of Rapid Bus and LRT service to new areas, the Program will develop new transit centers throughout Davidson County that will facilitate non-downtown Nashville travel, as well as linkages to the high-capacity services through downtown. The transit centers will be sized and developed based on local conditions and needs, and thus will range in size from large, with a wide range of amenities, to more modest. All will provide a comfortable location to make connections between transit routes and other modes. Typically, the neighborhood transit centers will be located where two to five bus routes intersect.

- Nineteen Neighborhood Transit Center locations (see **Figure 5**) are being considered including:
  - Rivergate Mall/Gallatin
  - Madison
  - Dickerson
  - Opry Mills/Music Valley Village
  - North Nashville
  - Tennessee State University
  - Midtown
  - Hermitage
  - Donelson
  - Nashville Airport
  - 100 Oaks Mall
  - Harding Place
  - Hillsboro/Green Hills
  - White Bridge
  - Charlotte
  - Bellevue
  - Hickory Plaza
  - Hickory Hollow/Global Mall
  - Bell Road
- Up to four Neighborhood Transit Centers would be constructed per year for five years (2019 through 2023), to include amenities such as:
  - Ride-share/car-share parking
  - TNC/ride-share/taxi pickup and transit passenger dropoff locations
  - Climate-controlled passenger waiting area
  - Employee comfort stations
  - Station monitoring and security call boxes
  - Bike-share station
  - Bicycle storage
  - Fare vending
  - Digital wayfinding maps with local information signage at major stops
  - Real-time information on bus/train status
  - "Active Transportation" pedestrian and bikeway infrastructure improvements to surrounding neighborhoods

In addition, several other LRT and Rapid Bus transit centers and park-and-ride lots will be developed and implemented in the HCCs, as shown in the individual corridor descriptions.

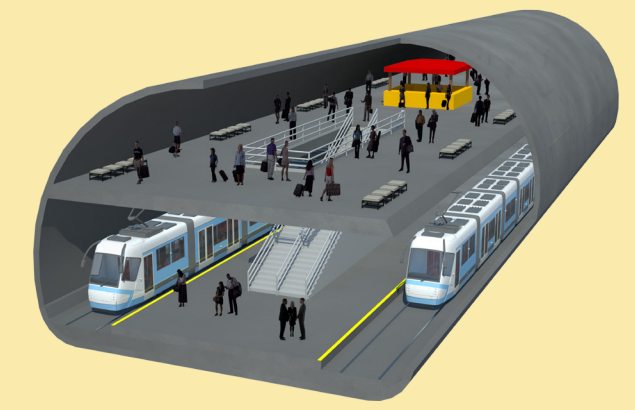
Downtown Segment (Light Rail and Rapid Bus Tunnel)

Downtown Nashville is already heavily congested. Both existing and anticipated future traffic congestion indicate a substantial benefit to creating a new dedicated right-of-way via a proposed tunnel. Early planning and engineering review of geotechnical information, building locations and underground utility data suggests that a tunnel could be a viable way to provide travel time savings and travel time reliability through the heavily congested and constrained rights-of-way of the central business district.

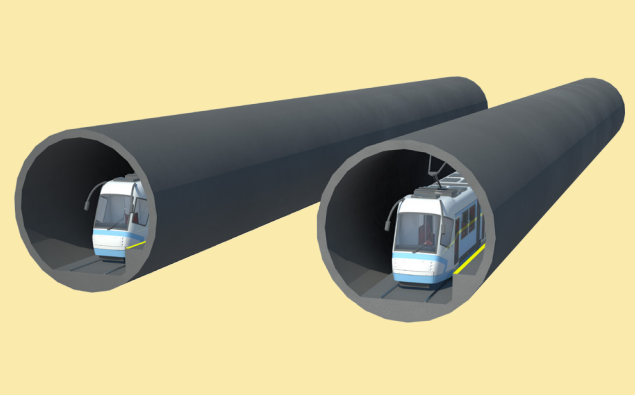
Development of the Program has considered two tunnel types: a deep bore concept and a cut-and-cover concept. Additional data, planning, and engineering are required to fully evaluate the feasibility of the concepts being considered. However, of the two types of tunnels considered at this level of planning, the bored tunnel option appears to be the most suitable for this application. The deep tunnel concept proposes twin tunnels under 5th Avenue and mined stations at Music City Central and Broadway.

With modern electric buses in the fleet, through-routed bus services would be able to utilize the tunnel to avoid downtown surface street traffic. Two underground LRT/Bus transit center stations would be within the tunnel configuration at Music City Central and 5th Avenue and Broadway, along with an at-grade SoBro Transit Center. The two train tunnel entrances (portals) are conceived to be located on 5th Avenue near Gay Street at Music City Central Plaza and on 5th Avenue near Lea Avenue. The length of the tunnel from portal to portal is 1.1 miles.

The 5th Avenue and Broadway Station is roughly halfway between the existing Music City Central Transit Center north of downtown and the proposed SoBro Transit Center south of downtown. This station would be in the tunnel



Downtown Tunnel Station



Downtown Guideway Twin Bored Tunnels

LENGTH (MILES)	1.8*
RIDERSHIP (AVERAGE DAILY WEEKDAY BOARDINGS)	23,900-27,900
CAPITAL COST (2017 $ M)	$936
AVERAGE ANNUAL O&M COST (2017 $ M)	3
TRAVEL TIME (MUSIC CITY CENTRAL TO SOBRO IN MINUTES)	4
POPULATION PER ACRE (2015/2040)	7/11
EMPLOYMENT PER ACRE (2015/2040)	63/81
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	70/92
% MINORITY/LOW INCOME	41%/ 21%
TOTAL POPULATION (2015/2040)	8,600/ 13,200
TOTAL EMPLOYMENT (2015/2040)	66,600/ 90,000

Note: Numbers may not add due to rounding.
*Total downtown segment length including connections to other corridors.

section and is envisioned to exit at street level near Bridgestone Arena. It would be the focal point station for accessing the entertainment venues along Lower Broadway, including the arena, Ryman Auditorium, the National Museum of African American Music, and Music City Center. It will also be a transfer station with other bus routes, and would provide a walkable connection to the existing Music City Star commuter rail service at the Riverfront Station.

The SoBro Transit Center would serve future developments in the southern end of the central business district. It would be a multimodal station with MTA/RTA buses, LRT trains, pedestrian and bike access, and access to Greyhound's intercity bus service.

Some of the routes that would otherwise go to the Music City Central would instead terminate at SoBro, freeing up space at Music City Central to accommodate new transit services and making MTA's bus operations more efficient. The SoBro Transit Center would be largely at-grade or street-level. It would have bus bays, an indoor passenger waiting area, restrooms, bike and pedestrian amenities, and an area for passenger pickup and dropoff by autos, taxis and TNCs, as well as bicycle racks and lockers.

Music City Star

The MCS commuter train is an existing passenger rail service that runs east from downtown Nashville at the Riverfront Station to the Lebanon Station in Wilson County, a distance of 32 miles utilizing the Class III freight rail tracks of Nashville & Eastern Railroad. Today, there are six stations along the rail line with three in Davidson County (Riverfront, Donelson, and Hermitage) and three in Wilson County (Mount Juliet, Martha, and Lebanon). There is a fourth under construction at Hamilton Springs in Wilson County, however only those stations within Davidson County are within the scope of this Program.

Service improvements on the MCS will be targeted between Riverfront and Hermitage Stations in Davidson County, and undertaken in a manner that would allow for full extension to Lebanon if Wilson County were to partner with Davidson County.

Within Davidson County, capital cost improvements include a passing siding and turnouts, a new turnout approaching Riverfront Station, track improvements at Fessler Lane, signals system improvements (including Positive Train Control), and two refurbished coaches. The intent of these capital improvements is to allow for additional trips as described in the operations section of this document.

LENGTH (MILES)	32
CAPITAL COST (2017 $ M)	$30*
AVERAGE ANNUAL O&M COST (2017 $ M)	4
TRAVEL TIME (DOWNTOWN TO END OF LINE IN MINUTES)	44
POPULATION PER ACRE (2015/2040)	6/8
EMPLOYMENT PER ACRE (2015/2040)	40/51
POPULATION + EMPLOYMENT PER ACRE (2015/2040)	46/60
% MINORITY/LOW INCOME	38%/ 20%
TOTAL POPULATION (2015/2040)	22,600/ 28,700
TOTAL EMPLOYMENT (2015/2040)	69,300/ 96,600

*Prorated for Davidson County only.
Note: Numbers may not add due to rounding.

Capital Costs

This section describes the methodology used to develop planning-level capital cost estimates for the Program's improvements.

Bus Capital Costs

For estimating capital costs for the facilities along local bus corridors (bus shelters, park-and-ride lots, and neighborhood/local stations), a "typical" condition was developed for several transit facilities of various sizes, including appropriate improvements (sidewalks, landscaping, public art) and amenities (covered seating, real-time information, Wi-Fi) that would be provided for each type. Unit costs for each of the major elements/amenities were then developed for each station type based on available data from similar projects both locally and nationally, including recent transit projects in Indianapolis. These costs were then applied to a "typical" configuration for each facility type to develop construction costs.

The construction costs were totaled and percentages applied for engineering, construction engineering/inspection, and utilities. These costs were summed and a contingency factor applied. For land costs, the amount of land required for the "typical" location was developed based on other observed locations throughout the Nashville Metro area. These were then summed and a cost per acre was applied. These costs were then multiplied by the number of locations of each size for an overall cost.

In addition, Other Transportation Improvements are included to support the benefits of the Program, which may or may not be directly connected to these transit investments. These can include improvements for pedestrians, bikeways, ADA access, bus stops, intersections, traffic signals, and other transportation improvements that can be located anywhere in Davidson County.

The Reduction of Existing MTA Subsidy included in capital costs (see **Table 2**), represents a shift of current MTA subsidies from the current source to the Program. This shift will occur over a six-year period starting in 2018.

Rapid Bus Capital Costs

For Rapid Bus corridors, per-mile costs were developed using data collected from other operating corridors nationwide. The costs for Rapid Bus projects can vary significantly depending on station type and quantity, whether the project will require rehabilitation of existing transportation infrastructure including road widening or repaving, and other factors. A detailed cost estimate from the Indianapolis Red Line BRT was used as the primary source to estimate per-mile costs. The detailed IndyGo estimate provided a segment-by-segment cost breakdown, which allowed an isolated comparison for only those sections of the Red Line most comparable to the Rapid Bus corridors envisioned by this plan. These per-mile costs were then applied to the length of each proposed corridor. These costs are meant to be inclusive of all Rapid Bus corridor program elements, including right-of-way, stations, vehicles and contingencies.

The capital cost for bus facilities and Rapid Bus corridors is intended to provide a high-level estimate; it is not intended as a detailed cost estimate (see **Table 2**).

Rail Capital Costs

Establish Project Segments

The Program cost estimate includes the LRT and Commuter Rail alignments within Davidson County. The corridors have been divided into segments to provide options for assembling and reporting costs including both transit corridors and support facilities that comprise the program. Construction costs and associated non-construction costs are summarized by the following segments:

Table 2. Bus Program Capital Cost Expenses (2017 $M)

Bus Program Capital Expenses	Initial Capital Expenses	Vehicle Expansion and Vehicle Replacement	Mid-Life Vehicle Rehabilitation	Totals
	Costs: 2018 to 2032			
Make Service Easier To Use	**$29.5**	**$0.0**	**$0.0**	**$29.5**
Replace Fare Collection System	$23.0	$0.0	$0.0	$23.0
Expand Fare Vending Machines/Off-Board Fare Collection	$6.0	$0.0	$0.0	$6.0
Digital Wayfinding Signage	$0.5	$0.0	$0.0	$0.5
Improve Existing System	**$190.0**	**$83.0**	**$14.8**	**$287.8**
Improve Service Frequency, Eventually Achieving 10/15 peak and 15/30 off-peak	$0.0	$44.6	$8.3	$52.8
Frequency, Span, Reliability Improvements on Non-FTN Routes	$0.0	$16.2	$3.0	$19.2
Expand AccessRide Services to Address Increasing Demand	$0.0	$3.4	$0.0	$3.4
Secondary Transit Hub	$40.0	$0.0	$0.0	$40.0
Create and Operate Up to 4 Additional, New Crosstown Bus Routes	$0.0	$18.9	$3.5	$22.4
Develop and Construct a Third Bus Operating Facility to Accommodate Fleet Growth	$100.0	$0.0	$0.0	$100.0
Rehab Nestor Facility for Long-Term Use	$50.0	$0.0	$0.0	$50.0
Improve Access To Transit	**$1.0**	**$7.5**	**$0.0**	**$8.5**
Expand Availability of "Mobility on Demand"	$1.0	$7.5	$0.0	$8.5
Make Service More Comfortable	**$10.8**	**$72.4**	**$0.0**	**$83.2**
Expand and Upgrade the Number of Passenger Waiting Shelters	$7.4	$0.0	$0.0	$7.4
Convert Fixed Route Transit Fleet to All Electric Vehicles – Existing Fleet	$0.4	$36.4	$0.0	$36.8
Convert Fixed Route Transit Fleet to All Electric Vehicles – Expansion Fleet	$3.0	$36.0	$0.0	$39.0
Develop a Network of Regional Transit Centers	**$145.5**	**$0.0**	**$0.0**	**$145.5**
Acquire Land and Construct Up to 12 Neighborhood Transit Centers	$37.5	$0.0	$0.0	$37.5
Acquire Land and Construct Up to 7 Local Transit Mini-Hubs	$108.0	$0.0	$0.0	$108.0
Rapid Bus Corridors	**$233.3**	**$0.0**	**$0.0**	**$233.3**
Dickerson Road	$64.7	$0.0	$0.0	$64.7
Hillsboro	$47.7	$0.0	$0.0	$47.7
West End	$62.1	$0.0	$0.0	$62.1
Bordeaux	$58.7	$0.0	$0.0	$58.7
Reduction of Existing MTA Subsidy	**$90.0**	**$0.0**	**$0.0**	**$90.0**
Other Transportation Improvements	**$114.0**	**$0.0**	**$0.0**	**$114.0**
Subtotal – Bus Program Initial Capital Expenses	**$814.1**	**$162.9**	**$14.8**	**$991.7**

Note: Numbers may not add due to rounding.

- Gallatin Pike (LRT)
- Murfreesboro Pike (LRT)
- Nolensville Pike (LRT)
- Charlotte Avenue (LRT)
- Northwest Corridor (LRT)
- Music City Star (Commuter Rail)
- Primary and Secondary O&M Facilities
- Downtown Transit Connection – Tunnel

Identify Project Elements and Approximate Quantities

A list of project elements was developed that was comprehensive enough to adequately define aspects of project construction while reflecting the level of program development and quantities that could be readily measured from current documentation. In general, project elements were based on typical sections and cross sections developed as part of the planning effort. Allowances for items not fully developed at the planning level are included in the base cost as unquantified items and are based on similar projects.

Standard Cost Categories

In 2005, the Federal Transit Administration (FTA) established a consistent format for reporting, estimating, and managing capital costs for New Starts projects. The costs for this Program were organized into the same categories for ease of reference when comparing to other projects as shown in **Table 3**.

Contingencies

Contingency is included in the Program cost estimate based on FTA's Program Management Oversight Procedures (OP), which provide guidance for Program Management Oversight contractors and others on FTA's review process, deliverables, and reporting requirements. At this conceptual level of project development, an approximate 30 percent contingency is applied to construction, right-of-way, and vehicles, and an approximate 10 percent contingency is applied to professional services. This results in an overall net contingency of about 26 percent.

Table 3. Capital Cost Summary by LRT Corridor (2017 $M)

	Gallatin Pike	Operations and Maintenance Facility - Primary	Downtown - Bored Tunnel	Northwest Corridor	Charlotte	Murfreesboro	Operations and Maintenance Facility - Secondary	Nolensville	Music City Star	Program Total Costs
Guideway & Track Elements	$125	$0	$328	$17	$48	$117	$0	$66	$9	**$710**
Stations, Stops, Terminals, Intermodal	$29	$0	$105	$10	$76	$30	$0	$25	$0	**$275**
Support Facilities: Yards, Shops, Admin Bldgs	$0	$45	$0	$0	$0	$0	$24	$0	$0	**$69**
Sitework & Special Conditions	$117	$7	$67	$34	$105	$140	$2	$119	$0	**$591**
Systems	$86	$4	$13	$25	$68	$105	$4	$85	$10	**$400**
Construction Subtotal	**$357**	**$56**	**$513**	**$86**	**$297**	**$392**	**$30**	**$295**	**$19**	**$2,045**
Row, Land, Existing Improvements	$63	$5	$49	$15	$85	$30	$10	$51	$0	**$308**
Vehicles	$82	$0	$0	$68	$68	$101	$0	$82	$4	**$405**
Professional Services	$124	$20	$188	$29	$103	$134	$11	$100	$0	**$709**
Subtotal	**$626**	**$81**	**$750**	**$198**	**$553**	**$657**	**$51**	**$528**	**$23**	**$3,467**
Contingencies	$163	$19	$186	$54	$144	$171	$13	$138	$7	**$895**
Total Segment Costs	**$789**	**$100**	**$936**	**$252**	**$697**	**$828**	**$64**	**$666**	**$30**	**$4,362**

Operations and Maintenance Plan and Costs

Bus Operations and Maintenance

The bus O&M costs were determined by calculating estimated net increases in revenue service hours for routes/corridors with service enhancements, then multiplying those increases by a set hourly rate ($105/hour for heavy duty bus and $80/hour for crosstown buses). The hourly rates are estimated "all-in" costs for operating service based on recent MTA financial numbers and include maintenance and administrative overhead. The estimated net increases in service hours were calculated separately for a typical weekday, Saturday, and Sunday. **Table 4** illustrates the weekday frequencies for the frequent transit bus network during peak and off-peak travel times. **Table 5** illustrates the frequency and network hours of operation for the non-frequent transit bus network. **Table 6** summarizes the operating bus system improvement costs.

To ensure access to the system for those with the greatest need, the Program includes a Low Income Fare Subsidy in the annual operating costs to provide free or reduced fares for Nashvillians who are living in poverty, living with a disability, senior citizens, or under the age of 18.

Rail Operations and Maintenance

The LRT and Commuter Rail O&M costs for each alternative were estimated using a resource build-up model where labor and materials costs were calculated as a function of supply variables. The model is a function of unit costs multiplied by expected units of the proposed service.

Unit Costs

Four variables were identified for the cost model:

- **Cost per revenue hour** - the average cost for a transit vehicle to supply transportation

Table 4. Frequent Transit Bus Network

Route	Weekday Frequencies During Peak Travel Times	Weekday Frequencies During Off-Peak Travel Times
3 White Bridge/5 Bellevue (West End)	10 minutes	15 to 20 minutes
4 Shelby	15 minutes	20 to 30 minutes
7 Hillsboro	15 minutes	15 to 30 minutes
15 Murfreesboro Local/ 55 Murfreesboro BRT Lite	10 minutes	10 to 15 minutes
22 Bordeaux	10 minutes	15 to 25 minutes
23 Dickerson Road	10 minutes	15 to 30 minutes
26 Gallatin Local/56 Gallatin BRT Lite	10 minutes	10 to 15 minutes
10 Charlotte Local/ 50 Charlotte BRT Lite	10 minutes	15 minutes
52 Nolensville BRT Lite	10 minutes	15 minutes
60 Music City Blue Circuit	15 minutes	20 to 30 minutes

Table 5. Non-Frequenct Transit Bus Network

Route	Weekday Frequencies During Peak Travel Times	Weekday Frequencies During Off-Peak Travel Times
6 Lebanon Pike	15 minutes	30 minutes
8 8th Avenue South	20 minutes	40 to 60 minutes
9 MetroCenter	15 minutes	25 minutes
14 Whites Creek	20 minutes	30 minutes
17 12th Avenue South	20 minutes	20 to 30 minutes
18 Airport/Downtown	30 minutes	30 minutes
19 Herman	20 minutes	30 minutes
28 Meridian	25 minutes	25 to 50 minutes
30 McFerrin	30 minutes	60 minutes
34 Opry Mills	45 minutes	45 minutes
42 St. Cecilia/ Cumberland	30 minutes	30 to 60 minutes
76 Madison Connector	30 minutes	30 to 60 minutes

Table 6. Uninflated Annual Operations Costs: (Year 2032)

Bus System Improvements	Annual Operating Cost (2032) 2017 $M
Make Service Easier To Use	**$0.9**
Replace Fare Collection System	$0.7
Expand Fare Vending Machines/Off-Board Fare Collection	$0.2
Improve Existing System	**$35.4**
Extend Service Hours/Days on High Ridership Routes	$2.0
Improve Service Frequency, Eventually Achieving 10/15 peak and 15/30 off peak	$14.5
Frequency, Span, Reliability Improvements on Non-FTN Routes	$5.3
Expand AccessRide Services to Address Increasing Demand	$8.5
Provide Same-Day AccessRide Trip Availablity (Likely with Premium Pricing)	$1.3
Create and Operate Up to 4 Additional, New Crosstown Bus Routes	$3.3
Develop and Construct a Third Bus Operating Facility to Accommodate Fleet Growth	$0.5
Improve Access To Transit	**$9.3**
Expand Availability of "Mobility on Demand"	$9.3
Make Service More Comfortable	**$0.1**
Expand and Upgrade the Number of Passenger Waiting Shelters	$0.1
Develop a Network of Regional Transit Centers	**$1.0**
Acquire Land and Construct Up to 12 Neighborhood Transit Centers and Seven Local Mini-Hubs	$1.0
Bordeaux	Included in existing bus operating budget, Improve Existing Bus Frequency, and Span of Service Costs
Dickerson	
Hillsboro	
West End	
Low Income Fare Subsidy*	**$2.5**
Total	**$49.2**

*Low-income fare subsidy for bus and rail.

services to the public for one hour. Includes layover and recovery time.[2]

- **Cost per revenue mile** - the cost of operating mile of train service in revenue service, i.e. allowing customers to board and the transit vehicle. Operating costs include recurring expenses associated with the daily operation of public transit service, including items such as drivers' and dispatchers' wages, maintenance, insurance, and vehicle registration.[3]
- **Cost per peak vehicle** - the cost per peak period train operated with highest frequency service and related to general administration cost of the agency not otherwise tied directly to operations.
- **Cost per guideway mile** - the cost per LRT mile to maintain tracks and overhead wires that power the train.

Costs for each of the above four categories were developed based on experience with other systems that operate many of these services for LRT, and commuter rail. Costs that were used in the model for the four inputs are shown in **Table 7**.

Operating Statistics

A range of operating statistics were developed based on a number of factors in the transit service plan. These include corridor or alignment length, vehicle travel speed, span of service, headway, peak service, days of operation, number of days per year and, in the

2 https://www.sfmta.com/about-sfmta/reports/performance-metrics/goal-3-environment-and-quality-life/average-annual-transit

3 http://www.dot.state.oh.us/Divisions/Planning/Transit/Documents/Document%20Sharing/Transit%20Needs%20Study/PTI%20Indices/PTI%20Revised%20Cost%20efficiency-cost%20per%20revenue%20mile.doc

Table 7. Cost Inputs

O&M Unit Costs	Revenue Hours	Revenue Miles	Peak Vehicles	Guideway Miles
Light Rail	$80.87	$6.65	$86,218	$137,680
Commuter Rail	$75.93	$6.24	$80,956	$129,277

case of LRT, the number of vehicles in a train set. During peak periods, the trains would be two-car trains. In the off-peak and on weekends and holidays, they operate with a one-car train (see **Table 8**).

Other inputs are the number of weekdays and weekend days the service operates. For this analysis the assumption is 254 weekdays and 111 weekends and holidays. **Table 10** depicts each corridor, their individual termini, one-way travel time (based on assumed average travel speeds), cycle time,[4] and one-way distance.

For the Commuter Rail Service (Music City Star), which travels from Lebanon to Riverfront Station, the trains will provide bidirectional service and operate daily from 5:00 a.m. to 11:00 p.m., or 18 hours of service. During the morning and afternoon weekday peak period (total of four hours), the trains will operate on a 40-minute headway[5] and at all other times, including weekends and holidays, the trains will operate on a 60-minute headway (see **Table 9**).

Based on one-way travel time, along with service span, headways and the number of cars per trains, the number of trips for the weekday peaks, off-peaks and weekends is calculated.

The number of trips, and the distance each vehicle travels, expressed in guideway miles,

4 Cycle time is the one-way travel time x 2 (for bidirectional service) with an additional 10% to account for layover.

5 Headway is the frequency with which trains arrive at a station.

Table 8. LRT Service Plan Operating Assumptions

Weekday Service		
Early Morning	5:15 a.m. – 6:00 a.m.	20 minutes
AM Peak	6:00 a.m. – 8:00 a.m.	10 minutes
Day	8:00 a.m. – 4:00 p.m.	10 minutes
PM Peak	4:00 p.m. – 6:00 p.m.	10 minutes
Evening	6:00 p.m. – 10:00 p.m.	10 minutes
Late Evening	10:00 p.m. – 1:15 a.m.	20 minutes
Weekend Service		
Early Morning	*No Service*	
Morning	6:00 a.m. – 8:00 a.m.	30 minutes
Day	8:00 a.m. – 4:00 p.m.	30 minutes
Afternoon	4:00 p.m. – 6:00 p.m.	30 minutes
Evening	6:00 p.m. – 10:00 p.m.	30 minutes
Late Evening	*No Service*	
Days of Service		
Weekdays	254	
Weekends	111	

Note Two-car trains from 6:00 a.m. - 10:00 p.m. weekdays, one-car all other times.

Table 9. Commuter Rail Service Plan Operating Assumptions

Weekday Service		
Early Morning	5:15 a.m. – 6:00 a.m.	60 minutes
AM Peak	6:00 a.m. – 8:00 a.m.	40 minutes
Day	8:00 a.m. – 4:00 p.m.	60 minutes
PM Peak	4:00 p.m. – 6:00 p.m.	40 minutes
Evening	6:00 p.m. – 10:00 p.m.	60 minutes
Late Evening	10:00 p.m. – 11:00 p.m.	60 minutes
Weekend Service		
Early Morning	5:00 a.m. – 6:00 a.m.	60 minutes
Morning	6:00 a.m. – 8:00 a.m.	60 minutes
Day	8:00 a.m. – 4:00 p.m.	60 minutes
Afternoon	4:00 p.m. – 6:00 p.m.	60 minutes
Evening	6:00 p.m. – 11:00 p.m.	60 minutes
Late Evening	*No Service*	
Days of Service		
Weekdays	254	
Weekends	111	

Note: Three-car trains in a.m. and p.m. peaks, one-car trains all other times.

Table 10. Cycle Time

Corridor	Terminus	One-Way Travel Time	Cycle Time	One-Way Distance
Gallatin Pike LRT	MCC	21.1 minutes	46.4 minutes	6.4 miles
Northwest Corridor LRT	SoBro	15.5 minutes	34.0 minutes	5.1 miles*
Charlotte Avenue LRT	MCC	17.1 minutes	37.5 minutes	5.2 miles
Murfreesboro Pike LRT	SoBro	26.4 minutes	58.0 minutes	8.6 miles
Nolensville Pike LRT	SoBro	19.1 minutes	41.9 minutes	6.0 miles
Music City Star Commuter Rail	Riverfront Station	44.3 minutes	97.4 minutes	32.0 miles

*2.2 miles from Charlotte Avenue LRT to Ed Temple Boulevard

the number of hours of service, the number of miles of service, as well as the number of peak trains, were calculated and summarized in **Tables 11 and 12**.

The vehicle requirements, which are the number of cars required for operations in the peak, are also calculated. Peak operation is when the highest number of train cars is needed, with two cars for LRT or three cars for commuter rail, and come by more frequently. The total number of trains was calculated based on the number for the peak periods multiplied by 1.2, indicating a 20 percent "spare" ratio, which provides

Table 11. Revenue Hours

Corridor	Annual Weekday Revenue Hours	Annual Weekend Revenue Hours	Annual Revenue Hours
Gallatin Pike LRT	23,368	4,440	27,808
Northwest Corridor LRT	18,288	4,440	22,728
Charlotte Avenue LRT	18,288	4,440	22,728
Murfreesboro Pike LRT	27,432	4,440	31,872
Nolensville Pike LRT	23,368	4,440	27,808
Music City Star Commuter Rail	10,160	3,996	14,156

Table 12. Revenue Miles

Corridor	Annual VEH Revenue Miles	Peak Passenger Cars/ Vehicles Per Train	Off-Peak Passenger Cars/ Vehicles	Weekend Passenger Cars/ Vehicles	Annual Weekday Passenger Car Rev. Miles	Annual Weekend Passenger Car Rev. Miles
Gallatin Pike LRT	407,962	2	1	1	663,245	56,832
Northwest Corridor LRT	323,564	2	1	1	526,034	45,075
Charlotte Avenue LRT	331,469	2	1	1	538,886	46,176
Murfreesboro Pike LRT	548,198	2	1	1	891,235	76,368
Nolensville Pike LRT	382,464	2	1	1	621,792	53,280
Music City Star Commuter Rail	452,992	3	1	1	520,192	127,872

"backup" vehicles in case they are out of service for maintenance or other purposes. The number of vehicles required by corridor is shown in **Table 13**. The vehicle requirements do not include additional reserve vehicles for special event service (e.g. major concerts).

Contingency

Finally, to account for other types of costs that affect operations, such as special event operating costs and overall planning contingency such as service disruptions, an additional 6 percent operating cost contingency has been included.

Music City Star County Apportionment

An apportionment calculation was used to distribute the O&M costs of the Music City Star service between Davidson County and Wilson County based on their proportion of the total system mileage. The total mileage is 32 miles, of which Davidson has 13.6 miles, or 42.5 percent, and Wilson County has 18.4 miles or 57.5 percent. Based on this apportionment, the estimated costs are:

- Davidson County - $4,037,147
- Wilson County - $5,462,022

At this time, Wilson County has not committed to fund their portion of these improvements. However, there have been discussions between the counties that are expected to continue.

O&M Summary

Based on the inputs and outputs and related calculations, the total base O&M costs per corridor are summarized in **Table 14**.

Table 13. Vehicle Requirements

Corridor	Directional Guideway Miles	Peak Vehicles Required	Spares (20%)	Total
Gallatin Pike LRT	6.4 miles	10	2	12
Northwest Corridor LRT	5.1 miles*	8	2	10
Charlotte Avenue LRT	5.2 miles	8	2	10
Murfreesboro Pike LRT	8.6 miles	12	3	15
Nolensville Pike LRT	6.0 miles	10	2	12
Music City Star Commuter Rail	32.0 miles	9	2	11
*2.2 miles from Charlotte Avenue LRT to Ed Temple Boulevard				

Table 14. Annual Rail O&M Cost Summary (2017 $M)

Gallatin Pike LRT	$8.8
Northwest Corridor LRT	$7.1
Charlotte Avenue LRT	$7.2
Murfreesboro Pike LRT	$11.4
Nolensville Pike LRT	$8.5
Downtown Tunnel Dual Mode	$3.3
Music City Star Commuter Rail	$4.0
Total	**$50.3**

Program Implementation

The implementation agencies responsible for carrying out the Program will be Metro Public Works, MTA, and RTA (for Music City Star).

Program implementation will require incremental steps for operational improvements to the bus system as well as capital improvements (see **Figure 18**), both modest and major, for the remaining system buildout. Metro and the MTA are committed to engaging the public as both operational and capital improvements are made. Operational bus system improvements and rail projects must be designed and vetted with the public and existing transit users.

Title VI of the Civil Rights Act analysis will be performed to identify potential disproportionate negative effects on minority and low-income populations, and if identified, avoided or mitigated. Capital improvements must undergo detailed planning; environmental review including public and stakeholder involvement; preliminary and final design; property acquisition (as needed); construction; and safety certification and testing before opening to revenue operations. See **Table 15** for the Program implementation process.

An implementation schedule was developed for financial planning purposes and to conceptually avoid having multiple major corridors in close proximity to each other under construction at the same time. Consideration was also given to the timely and equitable distribution of benefits throughout Davidson County. However, as individual projects advance through planning, project development and design phases, there will be unpredictable schedule delays as well as opportunities to accelerate certain projects. This will lead to variations of the schedule shown in **Table 15**.

The Program will be implemented with construction of improvements along and across state routes and will overlap the limits of other projects proposed by the Major and Collector Street Plan, the Tennessee Improving Manufacturing, Public Roads and Opportunities for a Vibrant Economy (IMPROVE) Act, and the MPO's Transportation Improvement Plan. Individual projects will be developed with full planning and coordination with Metro Planning, TDOT, the MPO, and other key stakeholders. Where possible, it is the intent of the Program to partner with other roadway improvement projects planned along these corridors to share resources, streamline project development, and minimize disruptions due to construction. Projects involving federal funds will follow the MPO's planning process and all TDOT, Federal Highway Administration (FHWA), and FTA requirements for environmental protection, design, right-of-way acquisition, and construction standards.

Figure 18: Implementation Process

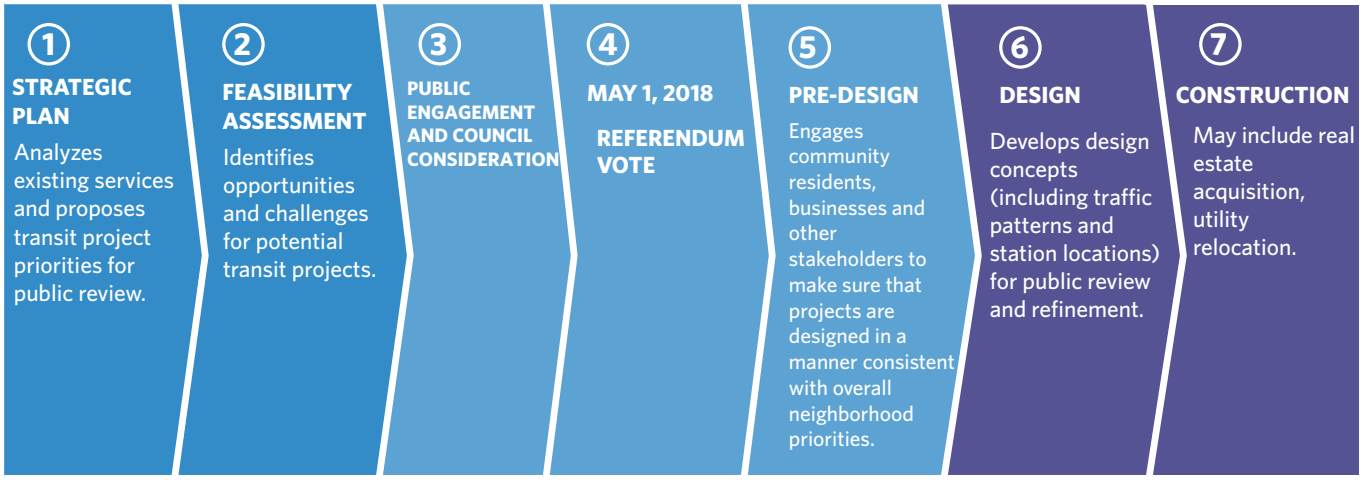


Table 15. Transit Improvement Program Implementation Schedule

System Improvement	Description of Improvements	Planning/ Development	Implementation Complete
Frequent Transit Network	15 min peak service on busiest routes	2018 to 2021	2019 to 2021
	Longer hours of service *(5:15 a.m. to 1:15 a.m. weekdays)*		
Neighborhood Transit Centers	Nineteen Neighborhood Transit Centers	2018 to 2023	2019 to 2023
	Bike-share, digital wayfinding, real-time information and improved pedestrian connections		
Mobility on Demand	Increased access in multiple areas	2018 to 2021	2018 to 2021
	AccessRide to include real-time information, call-ahead service and same-day schedule availability		
	First-mile/last-mile integrated connections		
Crosstown Routes	Four new routes: Trinity Lane, Edgehill Ave., Bell Road, Airport-Opry Mills Connector	2018 to 2021	2019 to 2021
	One-seat rides through Downtown to outer neighborhoods		
Light Rail Transit	Gallatin *(downtown to Briley)*	2018 to 2022	2026
	Downtown tunnel and stations	2018 to 2023	2027
	Charlotte *(downtown to White Bridge)*	2021 to 2025	2028
	NW Corridor *(downtown to Buchanan)*	2021 to 2025	2028
	Murfreesboro *(downtown to Airport)*	2022 to 2026	2031
	Nolensville *(downtown to Harding)*	2024 to 2028	2032
Rapid Bus	Bordeaux *(downtown to Kings Lane)*	2018 to 2021	2021 to 2023
	Dickerson *(downtown to Briley)*	2018 to 2021	2021 to 2023
	Hillsboro *(downtown to Green Hills Mall)*	2018 to 2021	2021 to 2023
	West End *(downtown to White Bridge to Charlotte)*	2018 to 2021	2021 to 2023
Music City Star	Davidson County Upgrades	2027 to 2029	2031

In an effort to engage and inform the community on the Program, the Mayor's Office, Metro Public Works, and MTA hosted a series of open houses for public comment throughout Davidson County, starting with neighborhoods along the light rail corridors:

- Downtown Corridor: Nashville Farmers' Market Food Court area – Thursday, October 26; 5:30 p.m. – 7:30 p.m.
- Northwest Corridor: Tennessee State University – Thursday, November 2; 6:00 p.m. – 8:00 p.m.
- Charlotte Avenue Corridor: Lentz Public Health Center – Thursday, November 9; 6:00 p.m. – 8:00 p.m.
- Murfreesboro Pike Corridor: Trevecca – Tuesday, November 14; 6:00 p.m. – 8:00 p.m.
- Nolensville Pike Corridor: Coleman Park – Saturday, November 18; 12:00 p.m. – 2:00 p.m.
- Gallatin Pike Corridor: East Nashville Magnet High – Monday, November 20; 6:00 p.m. – 8:00 p.m.

- Madison Discussion: Fifty-Forward Madison - Tuesday, November 28; 5:30 p.m. -7:30 p.m.
- Bellevue Discussion: Bellevue Middle School - Thursday, November 30; 5:30 p.m. -7:30 p.m.
- West Nashville Discussion: West Police Precinct - Wednesday, December 6; 5:30 p.m. - 7:30 p.m.[6]
- Donelson Discussion: Fifty-Forward Donelson - Thursday, December 7; 5:30 p.m. -7:30 p.m.[6]
- Antioch Discussion: Southeast Community Center - Saturday, December 9; 10:00 a.m. - 12:00 p.m.[6]

Plan of Finance Overview

The Let's Move Nashville Program will be funded by a combination of new voter-approved local surcharges, federal grants and loans, long-term financing, fares, and other revenues. These surcharges will terminate on December 31, 2068.

Local Option Transit Surcharges

The IMPROVE Act – signed into law by Governor Bill Haslam in April 2017 – provided Nashville and other local governments with the option to levy additional local surcharges specifically for transit purposes. The Program will be funded in part by newly authorized surcharges on: the local option sales and use tax, hotel occupancy tax, business tax, and local rental car tax. The surcharges require local voter referendum approval, anticipated on May 1, 2018, with revenue collections beginning mid-2018. Nashville must receive majority approval from the Metropolitan Council to add the referendum to the primary ballot.

Table 16 summarizes the total capital costs for implementation years 2018 - 2032 and the first full year of service (2032) operating costs of the Program are in today's dollars (2017).

6 Scheduled meetings

However, a number of factors might increase the costs of the program over time. The actual capital and operating costs incurred will increase with inflation and are expressed as year of expenditure (YOE) dollars. Additionally, the annual operating costs will be incurred year-over-year for the duration of the Plan of Finance. Financing the construction cost also increases the total cost of the Program (similar to the way one would pay interest on a loan to purchase a home). These factors, together with the sources and uses of funds, are described in detail in the Plan of Finance located in the Appendix.

The Metro Council must approve by ordinance the language of the referendum placing the sucharges and Program on the ballot.

Local Option Sales and Use Tax

Prior to the passage of the IMPROVE Act, Tennessee levied a 7 percent state sales tax and authorized counties to assess an optional 2.75 percent local sales tax with the requirement that half of the local option revenues be dedicated to public education. Davidson County, which includes the City of Nashville, currently levies a 9.25 percent tax, including a 7 percent state sales tax and 2.25 percent local option sales tax. In 2017, the IMPROVE Act authorized counties to levy up to a 100 percent increase in the existing local option sales tax for transit purposes, allowing Davidson County to levy up to an additional 2.25 percent in local option sales taxes for transit purposes.

The Plan of Finance assumes an incremental increase of the local option sales tax. Specifically, the Program will be funded in part by a proposed 0.5 percent local sales tax increase for the period from August 1, 2018 through December 31, 2022, and will increase an additional 0.5 percent local sales tax on January 1, 2023, for a total of 1 percent thereafter.

Table 16. Summary of Capital and Operating Costs for 2018 to 2032

Bus System Improvements	Mode	Total Capital Cost (2018 to 2032)	Annual Operating Cost (2032)
		2017 $M	
Make Service Easier To Use	Bus	$29	$0.9
Improve Existing System	Bus	$288	$35.4
Improve Access to Transit	Bus	$9	$9.3
Make Service More Comfortable	Bus	$83	$0.1
Develop a Network of Regional Transit Centers	Bus	$145	$1.0
Bordeaux	Rapid Bus	$59	Included in Improve Existing System Operating Costs
West End	Rapid Bus	$62	
Hillsboro	Rapid Bus	$48	
Dickerson	Rapid Bus	$65	
Reduction of Existing MTA Subsidy	Other	$90	NA
Low-Income Subsidy	Other	NA	$2.5
Other Transportation Improvements	Other	$114	NA
	Subtotal	**$992**	**$49.2**

Rail Corridors	Mode	Total Capital Cost (2018 to 2032)	Annual Operating Cost (2032)
		2017 $M	
Gallatin Pike	LRT	$789	$8.8
Northwest Corridor	LRT	$252	$7.1
Charlotte Avenue	LRT	$697	$7.2
Murfreesboro Pike	LRT	$828	$11.4
Nolensville Pike	LRT	$666	$8.5*
Downtown Tunnel	LRT & Rapid Bus	$936	$3.3
O&M Facility - Primary	LRT	$100	NA
O&M Facility - Secondary	LRT	$64	NA
Music City Star	Commuter Rail	$30	$4.0
	Subtotal	**$4,362**	**$50.3**
	Grand Total	**$5,354**	**$99.5**

Note: Numbers may not add due to rounding.

*Nolensville Pike LRT will open in 2032 with its first full year of operating costs occurring in 2033. A full year of operating cost is shown here to better represent ongoing operations and maintenance costs.

In terms of the potential impact on individuals, a resident or visitor purchasing $100 worth of taxable goods within Davidson County would pay an additional 50 cents in sales tax from August 1, 2018 through December 31, 2022, and a total of $1 in additional sales tax from January 1, 2023 and thereafter. According to the Nashville Area Chamber of Commerce, Davidson County receives nearly $6 billion annually in direct visitor/tourist spending.

The Chamber of Commerce estimates that approximately 47 percent of all sales tax collected in Davidson County is from visitors, tourists, or out-of-county residents.

Hotel Occupancy Tax

Prior to the passage of the IMPROVE Act, Davidson County levied a maximum 6 percent hotel occupancy tax plus a $2.50-per-night additional occupancy tax. The IMPROVE Act authorized up to a 20 percent increase in the existing local hotel occupancy tax, allowing Davidson County to levy up to an additional 1.2 percent in local hotel occupancy taxes for transit purposes.

Similar to the local option sales and use tax, the Plan of Finance assumes an incremental ramp-up of local hotel occupancy taxes. The Program will be funded in part by a proposed 0.25 percent local hotel occupancy privilege tax increase from July 1, 2018 through December 31, 2022, and a 0.375 percent increase from January 1, 2023 and thereafter.

In terms of the potential impact on individuals, a person spending $200 for a room in a Davidson County hotel would pay an additional 50 cents from July 1, 2018 through December 31, 2022, and 75 cents from January 1, 2023 and thereafter.

Business Tax

The IMPROVE Act also authorized up to a 20 percent increase in the existing local business tax for transit purposes. The business tax rates currently range from one-fiftieth of 1 percent to three-tenths of 1 percent of the business's gross income depending on the business's classification. At the current rate, the average business in Davidson County pays $1,673 per year (the median paid is $255). Exemptions are available for some businesses conducting amusement, farming, and other activities. Nashville's Transit Improvement Program will be funded in part by a proposed 20 percent local business tax increase. For a Davidson County business that currently pays $1,000 in taxes, the increase would mean an additional $200.

Local Rental Car Tax

Prior to the passage of the IMPROVE Act, Davidson County assessed a 1 percent local rental car tax. The IMPROVE Act authorized up to a 20 percent increase in the existing local rental car tax for transit purposes, allowing Davidson County to levy up to an additional 0.2 percent in local rental car taxes for transit purposes. Nashville's Transit Improvement Program will be funded in part by a proposed 20 percent rental car tax increase.

Long-Term Financing

Program financing is expected to be supported by up to $500 million in federal financing

through the Transportation Infrastructure Finance and Innovation Act (TIFIA) program. In addition to TIFIA, long-term financing through bonds and/or public-private partnerships will be used to help implement the Program. TIFIA represents approximately 6 percent of the funding through the design and construction period. Long-term financing through bonds and/or public-private partnerships represent approximately 34 percent.

Federal Support

The Plan of Finance assumes combined federal funding of $1.5 billion from the Capital Investment Grant (CIG) Program and formula grants during the anticipated design and construction period from 2018 to 2032.

The discretionary CIG program provides funding for fixed guideway investments such as new and expanded light rail, commuter rail, and bus rapid transit investments. Proposed investments must meet statutorily defined eligibility requirements in order to apply and compete for these grants administered by FTA and appropriated by Congress. The two categories of CIG Grants that would be pursued are:

- **New Starts projects** are new fixed guideway projects or extensions to existing fixed guideway systems with a total estimated capital cost of $300 million or more, or that are seeking $100 million or more in CIG program funds.
- **Small Starts projects** are new fixed guideway projects, extensions to existing fixed guideway systems with a total estimated capital cost of less than $300 million and which are seeking less than $100 million in CIG program funds.

In recent years, transit agencies that have obtained FTA CIG funds have requested grant awards of approximately 50 percent of total project costs. The Program assumes that the projects would receive CIG grant awards of approximately 25 percent of the total costs.

Total estimated federal CIG funding is estimated to be $1.4 billion, which is approximately 16 percent of the sources during the 2018-2032 construction period.

Additionally, the Plan of Finance anticipates the use of annual federal formula funds to support the implementation of the bus program improvements and life-cycle costs associated with bus and rail car vehicles rehabilitation and replacement. Over the 15-year period from 2018 to 2032, total estimated federal formula funds and capital replacement grants are anticipated to total $153.3 million.

Farebox and Other Revenue

The Program reflects passenger fare revenue for bus service enhancements that will result in a 23 percent farebox recovery rate and operating revenue for ADA service will result in an 8 percent fare box recovery ratio. The assumptions are based on MTA's 2014 and 2015 National Transit Database reports.

For the HCC's, it is assumed that passenger fare revenue for the high-capacity corridor services will result in a 28 percent farebox recovery rate. This is based on a review of the differentials in LRT and bus fare box recovery ratios achieved by transit systems across the country. In the systems reviewed, the LRT farebox recovery ratio ranged from 3 percent to 10 percent higher than bus farebox recovery. For this analysis, it was assumed that the farebox recovery ratios for high-capacity corridors would be 5 percent higher than MTA's bus system.

During the anticipated design and construction period from 2018 to 2032, the Program is anticipated to generate approximately $192 million in farebox revenue, representing approximately 2 percent of the sources during that period.

The Other Revenues category includes a combination of funding participation from the Nashville International Airport, contributions from the Music City Center, and investment income. Specifically, the finance plan includes $200 million in revenues from the BNA to support the Murfreesboro LRT line to the airport. Revenues from the Music City Center, which is currently being funded by an existing hotel occupancy tax, will start in 2018 at $3 million per year beginning in 2028.

During the anticipated design and construction period from 2018 to 2032, total funding from Other Revenues is anticipated to provide 3 percent of sources.

State Funding

While the Nashville MTA currently receives approximately $4.7 million in State Operating Assistance for the existing transit system; the Program currently anticipates the State will not increase this amount for this Program.

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Appendix

Plan of Finance

Financing Plan Methodology

1. **Model annual project cash flows**

   — Use ‘Transfer Sheet’ from HDR model for line items and reserve balances

2. **Project local option surcharges (sales tax, hospitality tax, business tax and rental car tax increases)**

   — Use 2017 base year collection data from Nashville Office of Management and Budget and growth rates from UT Tax Study

3. **Solve for required annual capital requirements and/or debt issuance to fill funding gaps**

4. **Structure debt service and capital repayments**

Financing Plan Assumptions (1/2)

Category	Description
Local Option Surcharges	■ Local sales tax — Base amount: 2017 tax base projection from Nashville — 5-year tax increase ramp: – August 1, 2018 – December 31, 2022: 0.5% increase ($88.7 mm base year) – January 1, 2023 – thereafter: 1.0% increase — Growth rates: UT tax study (2018-2032) ■ Hospitality tax — Base amount: 2017 tax base projection from Nashville — 5-year tax increase ramp: – July 1, 2018 – December 31, 2022: 0.250% increase ($2.9 mm base year) – January 1, 2023 – thereafter: 0.375% increase — Growth rates: UT tax study (2018-2032) ■ Business tax — Base amount: 2017 tax base projection from Nashville — Tax increase: $7,340,000 (base year) – Starting January 1, 2020 — Growth rates: Moody's Nashville CPI Projections ■ Rental car tax — Base amount: 2017 tax base projection from Nashville — Tax increase: $316,101 (base year) – Starting July 1, 2018 — Growth rates: Moody's Nashville CPI Projections
Long Term Financing (Revenue Bonds or P3)	■ Issuance on June 1 of any year with required capital to meet funding gap ■ Term: 30 years ■ Interest rate: 5.5% ■ Amortization: Sculpted for 7 years after project completion, aggregate level debt service thereafter ■ Issuance expenses: 1% of par + $1 million per issuance

Financing Plan Assumptions (2/2)

Category	Description
TIFIA	■ Amount: Up to $500 mm ■ Disbursements: Annual, beginning June 1, 2021 ■ Interest rate: 4.75% ■ Term: 35.5 years ■ TIFIA project completion: 12/1/2027 ■ Amortization based on recent TIFIA precedent: — Accrete interest through 5 years following “TIFIA project completion” — Interest only for 5 years — Amortize 50% of accreted balance over succeeding 15 years — Amortize remaining 50% with level debt service payments over final 10 years
Other Cash Flow Line Items	■ BNA Airport Participation: $200 mm in 2026 ■ Convention Center Contribution: $3 mm through 2027, $5 mm thereafter ■ Reduction to existing MTA subsidy: $15 mm (annual) from 2019 through 2024 ■ Subsidy for low-income passengers: $2.5 mm (annual) ■ Other transportation projects: $9.5 mm (annual); average $10.4 mm during construction ■ Investment income: 0.5% of beginning cash balance each year ■ Arranger fee: 0.5% for each respective corridor ■ Professional fees: COI + legal issuance fees (see ‘*Long Term Financing*’ assumptions)

Project Costs (2018-2032)

($ in millions)

	$ 2017 (Uninflated)	$ YOE
Gallatin Pike – Light Rail Transit	789	952
Charlotte – Light Rail Transit	697	876
Nolensville Pike – Light Rail Transit	666	904
Murfreesboro (Excluding Airport) – Light Rail Transit	663	860
Murfreesboro (Airport) – Light Rail Transit	165	214
Northwest Corridor – Light Rail Transit	252	316
Music City Star – Commuter Rail	30	40
Downtown Transit Connection	936	1,108
O&M Facilities	164	204
Total Rail Corridor Improvements	**$ 4,362**	**$ 5,475**
Rapid Bus Corridor Improvements	233	261
Existing System Expansion	758	886
Total Bus System Enhancements	**$ 992**	**$ 1,146**
Total Project Costs	**$ 5,354**	**$ 6,621**

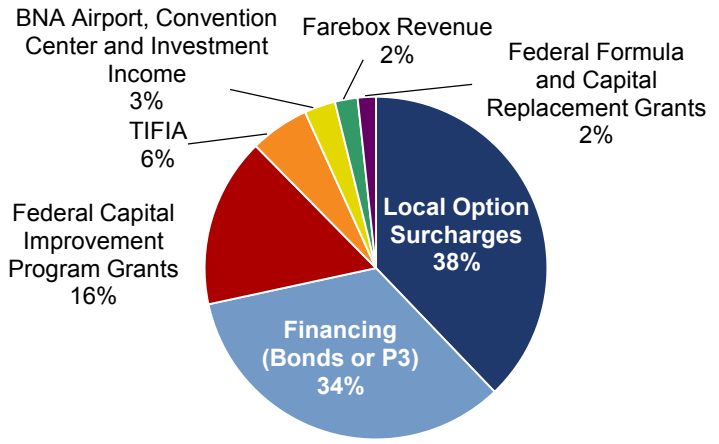
Sources and Uses During Construction (2018-2032)

($ in millions)

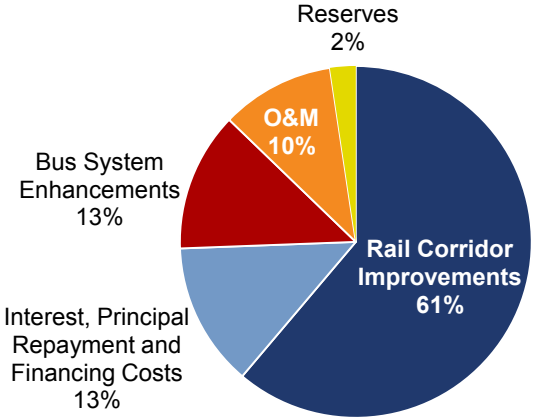
Sources	$ mm	%
Local Option Surcharges	$ 3,387	37.8 %
Farebox Revenue	192	2.1 %
Financing (Bonds or P3)	3,022	33.8 %
TIFIA	500	5.6 %
Federal Capital Improvement Program Grants	1,434	16.0 %
Federal Formula and Capital Replacement Grants	153	1.7 %
BNA Airport Participation, Convention Center Contribution and Investment Income	262	2.9 %
Total Sources	**$ 8,951**	**100.0 %**

Uses	$ mm	%
Rail Corridor Improvements	$ 5,475	61.2 %
Bus System Enhancements	1,146	12.8 %
Interest, Principal Repayment and Financing Costs	1,185	13.2 %
O&M	934	10.4 %
Reserves	211	2.4 %
Total Uses	**$ 8,951**	**100.0 %**

Breakdown of Sources

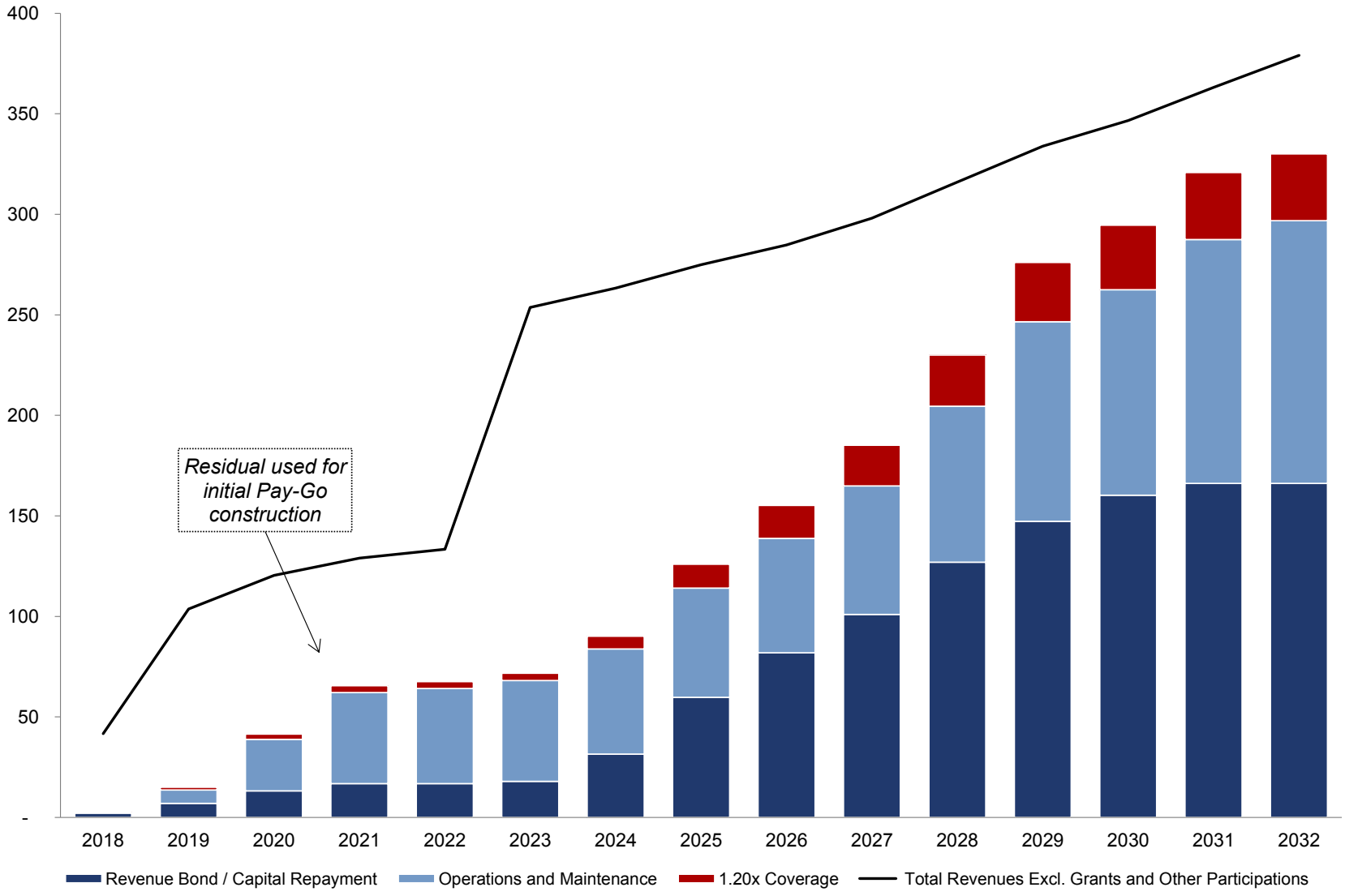


Breakdown of Uses

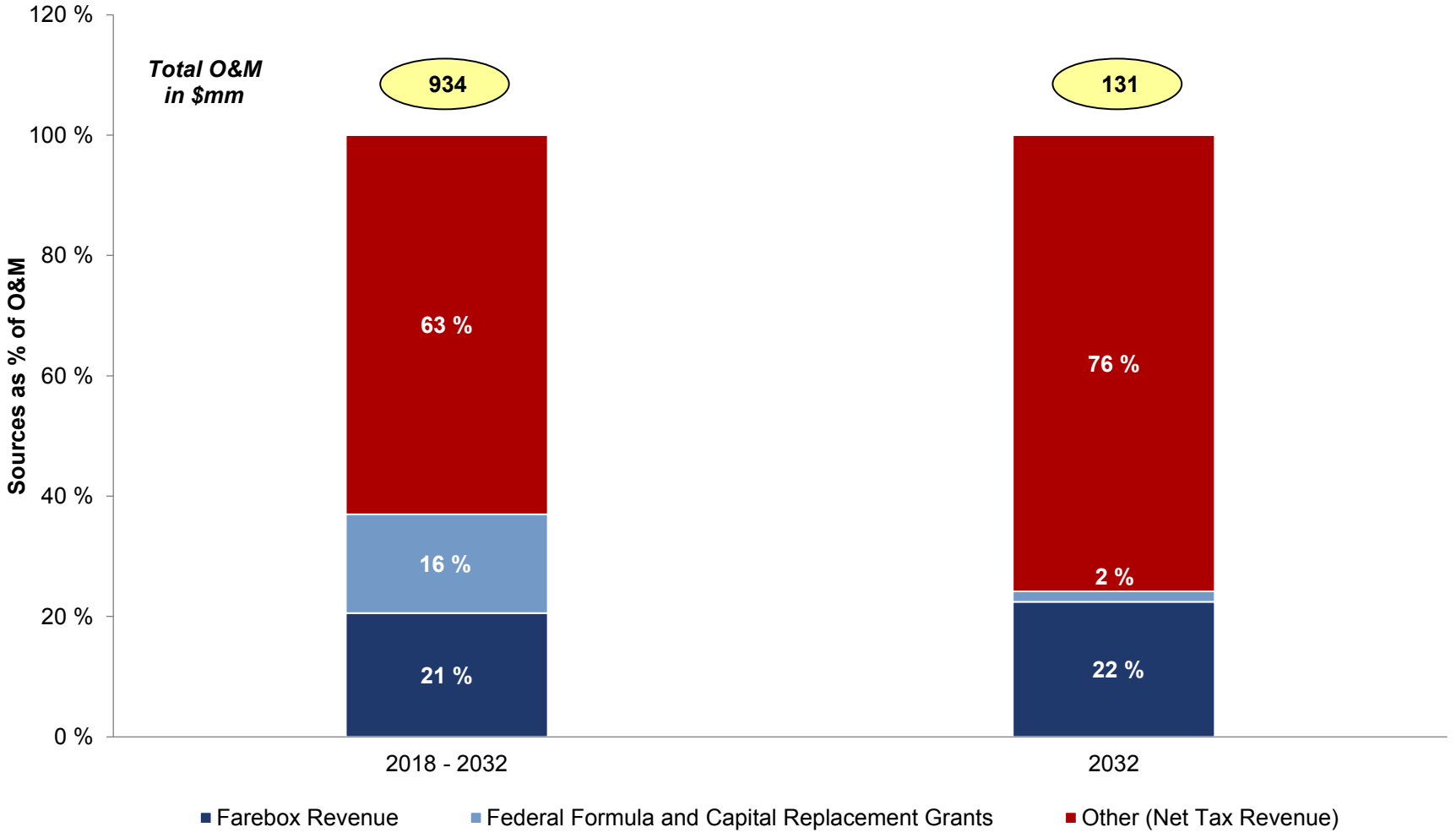


Annual Operating Cash Flow

($ in millions)



O&M Recovery Rates from Farebox Revenue and Federal Formula Grants



Annex A: Detailed Cash Flows

Detailed Cash Flows (1/2)

2018-2026
($ in YOE 000s)

Calendar Year	2018	2019	2020	2021	2022	2023	2024	2025	2026
Beginning Cash Balance	**-**	**54,463**	**60,210**	**70,891**	**71,510**	**67,377**	**70,504**	**92,660**	**121,637**
Funding Sources									
Operating Sources									
Farebox Corridor Revenues	-	-	-	-	-	-	-	-	-
Farebox - Bus Service Increases	-	491	4,582	8,865	9,072	9,282	9,494	9,708	9,929
Farebox - access-a-Ride Increases	-	149	235	282	331	382	435	489	610
Total Operating Sources	**-**	**640**	**4,817**	**9,147**	**9,403**	**9,664**	**9,929**	**10,196**	**10,539**
Non-Operating Sources									
Local Sales Tax Increase	38,502	96,256	100,580	104,371	108,043	225,564	234,213	244,756	253,523
Hospitality Tax	1,523	3,250	3,477	3,694	3,932	6,321	6,745	7,208	7,680
Business Tax	-	-	7,916	8,103	8,292	8,483	8,678	8,873	9,075
Local rental car surcharge	158	325	333	341	349	357	365	373	381
Long Term Financing (Bonds or P3)	78,000	97,000	131,000	-	-	40,000	456,000	569,000	237,000
TIFIA Loan Proceeds	-	-	-	236,000	161,000	103,000	-	-	-
Capital Sources (5307 - Urbanized Area Formula, Etc)	2,095	39,890	6,896	7,059	7,797	5,648	7,236	14,914	4,116
Federal Capital Improvement Program Grants	-	-	-	-	143,396	143,396	143,396	143,396	143,396
Other Federal Grants	-	-	-	-	-	-	-	-	-
BNA Airport Participation	-	-	-	-	-	-	-	-	200,000
Convention Center Contribution	1,500	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Investment Income	-	272	301	354	358	337	353	463	608
Total Non-Operating Sources	**121,778**	**239,993**	**253,504**	**362,921**	**436,166**	**536,106**	**859,985**	**991,984**	**858,779**
Total Sources	**121,778**	**240,633**	**258,321**	**372,068**	**445,569**	**545,770**	**869,914**	**1,002,181**	**869,318**
Funding Uses									
Operating Uses									
Service Increases - Bus	-	2,312	20,104	39,177	40,469	42,706	43,986	45,282	46,311
Service Increases - ADA	-	1,861	2,933	3,526	4,141	4,778	5,434	6,107	7,625
Rapid Bus Corridor Operating Expenses	-	-	-	-	-	-	-	-	-
Rail Corridor Operating Expenses	-	-	-	-	-	-	-	-	-
Free Transit Passes for Low-Income Passengers	-	2,500	2,568	2,632	2,694	2,757	2,821	2,885	2,950
Total Operating Uses	**-**	**6,674**	**25,606**	**45,335**	**47,305**	**50,241**	**52,241**	**54,274**	**56,886**
Capital Uses									
Initial Capital Costs (Bus & ADA)	20,951	62,184	54,049	55,321	62,344	40,499	40,264	41,170	23,282
Lifecycle Maintenance Costs (Bus & ADA)	-	-	-	-	-	-	-	18,098	-
Vehicle Expansion and Replacement Costs (Bus & ADA)	-	67,343	2,983	3,053	3,124	3,197	6,420	3,497	3,576
Reduction in Existing MTA Subsidy	-	15,000	15,409	15,793	16,164	16,541	16,924	-	-
Local Transportation Improvements	-	-	-	9,966	10,200	10,438	10,680	10,924	11,170
Rapid Bus Corridor Initial Capital Costs	4,475	13,137	63,853	104,569	74,595	-	-	-	-
Rail Corridor Initial Capital Costs	37,964	48,997	70,203	120,583	213,177	397,024	684,100	774,271	676,120
Rapid Bus Lifecycle Maintenance Costs	-	-	-	-	-	-	-	-	-
Rail Lifecycle Maintenance Costs	-	-	-	-	-	-	-	-	-
Rail Vehicle Expansion and Replacement Costs	-	-	-	-	-	-	-	-	-
Total Capital Uses	**63,390**	**206,661**	**206,496**	**309,284**	**379,605**	**467,699**	**758,387**	**847,960**	**714,149**
Capital Repayment									
Revenue Bonds Debt Service / Payment Availability	2,145	6,958	13,228	16,830	16,830	17,930	31,570	59,758	81,923
TIFIA Loan Debt Service	-	-	-	-	-	-	-	-	-
Total Capital Repayment	2,145	6,958	13,228	16,830	16,830	17,930	31,570	59,758	81,923
Total Professional Fees	1,780	14,593	2,310	-	5,963	6,771	5,560	11,212	3,370
Total Uses	**67,315**	**234,885**	**247,640**	**371,449**	**449,703**	**542,642**	**847,758**	**973,204**	**856,328**
Net Cash Flow	**54,463**	**5,748**	**10,681**	**619**	**(4,133)**	**3,128**	**22,156**	**28,977**	**12,990**
Ending Cash Balance	**54,463**	**60,210**	**70,891**	**71,510**	**67,377**	**70,504**	**92,660**	**121,637**	**134,627**
Operating Reserve - Bus & HCC (3 Months)	-	1,043	4,716	4,916	477	719	484	492	637
Debt and Capital Repayment Reserve (5% Par)	3,900	8,750	15,300	15,300	15,300	17,300	40,100	68,550	80,400
TIFIA Debt Service Reserve	-	-	-	-	-	-	-	-	-
Ending Unrestricted Cash Balance	**50,563**	**50,417**	**50,875**	**51,294**	**51,600**	**52,486**	**52,077**	**52,595**	**53,591**

Detailed Cash Flows (2/2)

2027-2032 and Totals
($ in YOE 000s)

Calendar Year	2027	2028	2029	2030	2031	2032	2018 - 2032
Beginning Cash Balance	**134,627**	**158,746**	**185,945**	**201,266**	**266,914**	**227,359**	
Funding Sources							
Operating Sources							
Farebox Corridor Revenues	1,185	4,468	9,943	10,170	14,871	16,835	57,472
Farebox - Bus Service Increases	10,159	10,396	10,636	10,879	11,126	11,380	125,998
Farebox - access-a-Ride Increases	743	811	883	958	1,038	1,122	8,467
Total Operating Sources	**12,087**	**15,674**	**21,462**	**22,007**	**27,035**	**29,337**	**191,938**
Non-Operating Sources							
Local Sales Tax Increase	264,422	275,914	287,168	298,423	308,848	321,761	3,162,345
Hospitality Tax	8,211	8,766	9,163	9,814	10,331	11,045	101,158
Business Tax	9,285	9,502	9,721	9,943	10,169	10,401	118,440
Local rental car surcharge	390	399	409	418	428	437	5,462
Long Term Financing (Bonds or P3)	457,000	486,000	254,000	217,000	-	-	3,022,000
TIFIA Loan Proceeds	-	-	-	-	-	-	500,000
Capital Sources (5307 - Urbanized Area Formula, Etc)	2,230	2,696	4,613	2,587	43,304	2,257	153,341
Federal Capital Improvement Program Grants	143,396	143,396	143,396	143,396	143,396	-	1,433,958
Other Federal Grants	-	-	-	-	-	-	-
BNA Airport Participation	-	-	-	-	-	-	200,000
Convention Center Contribution	3,000	5,000	5,000	5,000	5,000	5,000	53,500
Investment Income	673	794	930	1,006	1,335	1,137	8,921
Total Non-Operating Sources	**888,608**	**932,467**	**714,400**	**687,587**	**522,809**	**352,038**	**8,759,125**
Total Sources	**900,695**	**948,141**	**735,862**	**709,595**	**549,844**	**381,375**	**8,951,062**
Funding Uses							
Operating Uses							
Service Increases - Bus	47,385	48,490	49,611	50,744	51,897	53,079	581,554
Service Increases - ADA	9,283	10,136	11,035	11,980	12,975	14,026	105,841
Rapid Bus Corridor Operating Expenses	-	-	-	-	-	5,807	5,807
Rail Corridor Operating Expenses	4,234	15,957	35,511	36,322	53,110	54,320	199,452
Free Transit Passes for Low-Income Passengers	3,017	3,087	3,159	3,232	3,306	3,381	40,990
Total Operating Uses	**63,918**	**77,670**	**99,315**	**102,278**	**121,288**	**130,613**	**933,643**
Capital Uses							
Initial Capital Costs (Bus & ADA)	4,008	8,240	9,332	5,420	5,543	1,179	433,788
Lifecycle Maintenance Costs (Bus & ADA)	-	-	-	-	-	-	18,098
Vehicle Expansion and Replacement Costs (Bus & ADA)	3,659	3,745	7,360	4,091	85,499	4,279	201,826
Reduction in Existing MTA Subsidy	-	-	-	-	-	-	95,830
Local Transportation Improvements	11,424	11,689	11,961	12,238	12,518	12,802	136,010
Rapid Bus Corridor Initial Capital Costs	-	-	-	-	-	-	260,628
Rail Corridor Initial Capital Costs	686,989	686,598	441,742	356,507	198,343	82,587	5,475,203
Rapid Bus Lifecycle Maintenance Costs	-	-	-	-	-	-	-
Rail Lifecycle Maintenance Costs	-	-	-	-	-	-	-
Rail Vehicle Expansion and Replacement Costs	-	-	-	-	-	-	-
Total Capital Uses	**706,080**	**710,272**	**470,395**	**378,255**	**301,902**	**100,848**	**6,621,383**
Capital Repayment							
Revenue Bonds Debt Service / Payment Availability	101,008	126,940	147,290	160,243	166,210	166,210	1,115,073
TIFIA Loan Debt Service	-	-	-	-	-	-	-
Total Capital Repayment	101,008	126,940	147,290	160,243	166,210	166,210	1,115,073
Total Professional Fees	5,570	6,060	3,540	3,170	-	-	69,899
Total Uses	**876,576**	**920,942**	**720,540**	**643,947**	**589,400**	**397,670**	**8,739,998**
Net Cash Flow	**24,118**	**27,199**	**15,322**	**65,648**	**(39,555)**	**(16,295)**	**211,064**
Ending Cash Balance	**158,746**	**185,945**	**201,266**	**266,914**	**227,359**	**211,064**	
Operating Reserve - Bus & HCC (3 Months)	1,741	3,420	5,393	723	4,734	2,312	
Debt and Capital Repayment Reserve (5% Par)	103,250	127,550	140,250	151,100	151,100	151,100	
TIFIA Debt Service Reserve	-	-	-	-	-	-	
Ending Unrestricted Cash Balance	**53,754**	**54,974**	**55,623**	**115,092**	**71,525**	**57,651**	