















Tennessee Statewide Rail Plan

TN TDOT
Department of
Transportation



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1. ROLE OF RAIL IN TENNESSEE'S TRANSPORTATION SYSTEM

The Tennessee State Railroad Plan (SRP) is a companion piece to TDOT's 25-Year Long-Range Transportation Policy Plan and Statewide Multimodal Freight Plan. The Tennessee Rail Vision and associated Goals, Objectives, and Strategies closely align with those developed from the companion plans. Tennessee Department of Transportation (TDOT) Multimodal Transportation Resources and Long Range Planning Divisions have developed this update to respond to the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). PRIIA reauthorized the National Railroad Passenger Corporation (Amtrak) and strengthened the U.S. intercity passenger rail network. This was accomplished by directing Amtrak, the Federal Railroad Administration (FRA), states, and other stakeholders to improve service, operations, and facilities, and by authorizing funding for these activities. Section 303 of PRIIA provides for enhanced state involvement in rail policy, planning, and development efforts.

Purpose and Authority

Governor Bill Haslam designated TDOT as the State Rail Transportation Authority (SRTA) and State Rail Plan Approval Authority in June 2016. The Tennessee SRP reflects the role of rail mobility in serving Tennessee's passenger and freight demands. As a companion to TDOT's 25-Year Long-Range Transportation Policy Plan and the Tennessee Statewide Multimodal Freight Plan, the SRP addresses the rail aspects of the transportation program. As with all transportation planning activities, rail planning is coordinated with Tennessee's regional planning partners, particularly the Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs). This coordination ensures that publicly funded rail program investments are compatible with statewide and regional planning as required under 23 USC § Section 134 and 135.

Outreach to freight rail operators, transit operators, local industries, and other users of the state's rail system was essential in the development of the SRP. The stakeholder involvement has provided insight into the strengths and weaknesses of Tennessee's rail system. The State's Freight Advisory Committee (FAC) comments, derived from the development of the Statewide Multimodal Freight Plan, were also included. Other stakeholders and the public were also encouraged to provide comments, make observations, and share information during the development of this plan. This 2018 SRP documents that the rail network is primarily privately owned and that some form of private/public partnership arrangement must characterize planning for and investment in that network.

Vision Statement

To serve the public by providing the best multimodal transportation system in the nation.

Mission Statement

To provide a safe and reliable transportation system for people, goods, and services that supports economic prosperity in Tennessee.

1.1 GOALS, OBJECTIVES, AND STRATEGIES

1.1.1 Goal: Preserve and Manage the Existing System

Balance maintenance and preservation needs with critical capacity enhancements and operations.

Objectives and Strategies:

- **Encourage the sharing of freight and passenger rail assets where appropriate**
 - Respond to local efforts to explore possible addition(s) of passenger and/or freight service
 - Foster discussions between railroad companies, authorities, transit agencies, and TDOT
- **Encourage continued rail service and expansion of services on active lines where viable**
- **Encourage the preservation of critical rail transportation corridors**
 - Work with railroad operators, authorities, and local partners to rail bank or purchase inactive lines
 - Work with railroad operators, authorities, and the Tennessee Department of Environment and Conservation (TDEC) to convert inactive or abandoned right of way into multipurpose trail use
- **Provide an inventory of the State's rail system and its components including location, use, and condition**
 - Host a database of rail asset location, condition, use, and ownership
 - Maintain the asset database

1.1.2 Goal: Provide for the Efficient Movement of People and Freight

Deliver an integrated, multimodal transportation system that optimizes the movement of people and goods by providing greater access to transportation services for all people and by building better connections among different modes of transportation.

Objectives and Strategies:

- **Promote investment to increase capacity, service frequency, and accessibility**
 - Invest in infrastructure when it provides a benefit to the public that exceeds the cost, when funding is available
 - Invest in operations when it provides a benefit to the public that exceeds the cost, when funding is available
- **Provide opportunities for additional options to move people and freight through multimodal channels**
 - Make viable connections between the various freight and passenger links and nodes
 - Provide transportation choices for freight and passenger movement

- Reduce the time variability of goods and passenger movement with infrastructure enhancements, when funding is available.

1.1.3 Goal: Support the State's Economy

Invest in transportation infrastructure that advances quality economic development and redevelopment, economic competitiveness, tourism, and increased access to people, places, goods, jobs, and services throughout the State.

Objectives and Strategies:

- **Promote infrastructure investment to increase rail access**
- **Promote connectivity to the national rail system and the global marketplace, increasing the State's economic competitiveness**
- **Encourage transit-supporting development along passenger rail corridors**
- **Promote awareness of rail served areas**
- **Assist economic development groups throughout the State to identify the location of rail-served industrial sites**
- **Investigate opportunities for investment with infrastructure enhancements, when funding is available**

1.1.4 Goal: Maximize Safety and Security

Reduce and eliminate dangerous or hazardous conditions for railroad employees and the general public.

Objectives and Strategies:

- **Ensure the proper condition and maintenance of rail assets**
 - Continue coordination with FRA, railroad companies, and rail authorities with the State's Rail Regulation and Inspection Program to support safe conditions on the rail system
 - Conduct periodic inspection of railroad infrastructure for safe movement of goods and passengers
- **Invest in safety improvements at rail-highway grade crossings**
 - Promote rail and highway safety by conducting crossing inspections and requiring railroads to promptly repair inadequate grade crossing surfaces.
 - Upgrade or evaluate warning devices and pursue road closures and grade separations where appropriate
 - Measure, monitor, and report performance in improving safety
 - Support Operation Lifesaver and other organizations promoting rail safety
- **Continue coordination to provide a secure rail system**
 - Promote efforts to enhance security of passenger and freight railroad operations
 - Partner with Tennessee Emergency Management (TEMA), public and private entities to plan for, coordinate, and respond to disasters and emergencies

- Assist law enforcement or railroad in the event of disaster or emergency
- Promote the safe transportation of hazardous materials via railroads

1.1.5 Goal: Build Partnerships for Sustainable and Livable Communities

Provide early and ongoing opportunities for broad public input on plans and programs; work closely with local public and private planning efforts; proactively coordinate land use and transportation planning to optimize the efficiency and long term viability of the transportation system.

Objectives and Strategies:

- **Better integrate rail and transit into the public planning process**
 - Involve the railroads and local partners in the TDOT planning process, including the development of TDOT's Statewide Transportation Plan, TDOT's Statewide Transit Plan, and the Tennessee SRP
 - Involve transit agencies and local partners in the TDOT planning process, including the development of TDOT's Statewide Transportation Plan, TDOT's Statewide Transit Plan, and the Tennessee SRP
- **Provide better communication between the rail industry, transit, and the public**
 - Partner with railroads, transportation advocates, and others in the exchange of current information and ideas regarding the rail industry
 - Develop and nurture partnerships with communities, agencies, and other transportation stakeholders

1.1.6 Goal: Protect Natural, Cultural, and Environmental Resources

Responsibly plan and manage the transportation system to: maintain the integrity of communities, historical sites, and the natural environment; minimize and mitigate impacts of transportation projects; and develop a transportation network that improves congestion, fluidity and addresses air quality issues.

Objectives and Strategies:

- **Encourage rail transport, which provides for the efficient movement of freight while reducing energy consumption and highway congestion by reducing truck traffic**
 - Promote the Congestion Mitigation and Air Quality (CMAQ) program for use on freight rail projects
 - Promote the CMAQ program for use on passenger rail projects
- **Develop and nurture partnerships with communities, agencies, and other transportation stakeholders**
 - Identify transit-dependent and Environmental Justice populations, environmentally sensitive areas, and historically significant locations within close proximity to rail infrastructure

1.1.7 Goal: Emphasize Financial Responsibility

Provide accountability; maximize Tennessee's share of federal transportation funding; develop

alternative funding strategies; select projects based on identified regional needs; allow flexibility in local management of projects where feasible.

Objectives and Strategies:

- **Develop performance measures to aid in program evaluation, decision-making, resource utilization, and product delivery**
- **Assess and document transportation system needs and available revenues**
- **Identify funding mechanisms that can be used for rail projects**
- **Consider the impact of rail projects on highway maintenance costs when selecting projects**
- **Use public funds to leverage private investments**
- **Develop a clear policy for when State investment in rail projects is appropriate**

1.2 INSTITUTIONAL GOVERNANCE STRUCTURE

There are several public agencies involved in providing rail services throughout Tennessee. Their various roles include planning, improvement, operations, and administrative assistance. This section outlines the organization of agencies and the various programs used to improve the State's rail system.

1.2.1 Tennessee's Authority to Conduct Rail Planning and Investment

PRIIA requires that, in developing a SRP, a "State Rail Transportation Authority" be established or designated "to ensure that the state rail plan documents the state's policy on freight and passenger rail transportation – including commuter rail – within the state's boundaries, establishes priorities and implementation strategies to enhance rail service in the public interest, and serves as the basis for Federal and state rail investment." In Tennessee, the designee is TDOT. PRIIA also requires the state to establish or designate a "State Rail Plan Approval Authority" (SRPAA) to review and provide final approval of the SRP. TDOT has been designated as both the State Rail Transportation Authority (SRTA) and the State Rail Plan Approval Authority. The Tennessee SRP is administered and coordinated by TDOT and provides for a fair distribution of resources.

TDOT is authorized to:

- develop, promote, supervise, and support safe, adequate, and efficient rail transportation;
- employ sufficient qualified and trained personnel; and
- maintain adequate programs of investigation, research, promotion, and development with opportunity for public participation.
- In connection with its role as SRTA, TDOT is charged with taking all practicable steps (by itself or with other State authorities) to improve rail transportation safety and reduce energy use and pollution related to transportation.

1.2.2 Tennessee Department of Transportation (TDOT) Rail Functions

TDOT was first involved in rail with Governor Ray Blanton's charging of TDOT to promote and develop efficient rail transportation services for the State in response to the abandonments of the 1970's. TDOT has since provided assistance to railroads within the State through various programs so that they may continue to operate successfully.

Nationally, the Local Rail Service Assistance Act of 1978 made rail service continuation, acquisition, rehabilitation or improvement, substitute service, rail facility construction, planning, and program operations assistance available to states. Access to these funds required an SRP for eligibility. Although this was a big first step, Federal funding for these programs was greatly reduced over time and the program authorization expired in 1996.

Tennessee completed its first Tennessee Rail Plan in March 1978. TDOT's initial involvement with this program began by attempting to save rail service on the L&N branch line operating from Dickson to Hohenwald, which had been abandoned in October 1977. The Tennessee General Assembly created the first railroad authority in the spring of 1978, and the South Central Tennessee Railroad began operating as a short-line on July 1, 1978.

To aid in this effort, the Tennessee General Assembly enacted legislation that formed the basis for the Tennessee Short-Line Track and Bridge Rehabilitation programs administered by TDOT. The establishment of railroad authorities and rehabilitation programs ensured that the infrastructure of Tennessee's short-line railroads remains in a state of good repair. The Railroad Authority Act of 1983 authorized municipalities, counties, and combinations thereof to establish railroad authorities to "... provide for continuation of rail service within the area of the governments establishing the authority." The Act provided the policy basis by authorizing the authorities: "Within the region of the authority, it may acquire, construct, operate, maintain, and dispose of railroad facilities, properties, and equipment, and may, in addition to continuing railroad service, provide any other rail service in the region as it is needed and feasible." (Section 7-56-201, Act 1983, ch. 221, § 1)

TDOT provides assistance to both freight and passenger rail services for Tennessee. This is provided through several funding programs which are managed in different Offices and Divisions within the Environment and Planning Bureau.

Long Range Planning Division

TDOT's Long Range Planning Division is responsible for the planning, development, and management of statewide transportation studies and planning tools that help guide the policies and programs of TDOT and its various divisions. The Long Range Planning Division identifies transportation needs through the analysis of travel and safety data, and engages communities to obtain public input on transportation investments. Specific responsibilities include developing the statewide long range transportation plan, preparation of corridor studies, university research, travel data collection, feasibility studies, metropolitan and rural transportation planning coordination, and GIS mapping. These plans, studies, and research initiatives help identify the most critical needs in Tennessee's transportation infrastructure. The Long Range Planning Division is also responsible for programming federal and state funds on projects. The programming of funds seeks to address those critical needs.

One of the products that the Long Range Planning Division is responsible for is the development of the Statewide Multimodal Freight Plan. The purpose the freight plan is to define strategic goals for the Tennessee freight system and establish a strategy to achieve freight-related goals that align with TDOT's guiding principles. Building on input from public and private stakeholders, the plan inventories the existing assets of the freight transportation system, evaluates the economic benefits of the system, anticipates future trends and economic growth, and determines implementable strategies for Tennessee to improve freight movement across all modes of transportation, as well as the equally important connections between modes. The plan culminates with a list of short- and long-term projects that address future needs of the Tennessee freight system. Once on the needs list, projects become eligible for funding, including rail and intermodal facility improvements.

Multimodal Transportation Resources Division

The Division of Multimodal Transportation Resources includes Multimodal Planning, Public Transportation, Rail and Waterways, Office of Rail Inspection, and the Office of Highway-Railroad Grade Crossing Safety. Each Office is discussed below.

Office of Multimodal Planning

The Office of Multimodal Planning handles the FTA's Statewide Transit Planning Program (5304), participates in transit and bicycle/pedestrian planning efforts of partner agencies, and handles the Bicycle and Pedestrian Program. The Bicycle and Pedestrian Program monitors TDOT resurfacing projects and works with other divisions to include appropriate treatments for bicycles and pedestrians.

Office of Public Transportation

The Office of Public Transportation is responsible for administering an array of state and federal grants for public transit as well as the Swipe-and-Ride program for state employees. Additionally, the Office participates in park and ride lot development, promotion of efficient transit systems, and provision of technical assistance to transit agencies.

Office of Rail and Water Transportation

The Office of Rail and Water Transportation administers and provides grants for track and bridge rehabilitation for short-line railroad authorities that have applied for and have been accepted into the Shortline Railroad Program. Funds are used for rail and track structure improvements. The Office also has funding available for assistance in waterway studies. The Office of Rail and Water Transportation is responsible for conducting the short-line Track Needs Assessment and producing the SRP.

Office of Rail Inspection

The goal of the Office is to reduce and eliminate dangerous or hazardous conditions for railroad employees and the general public. There are federal and state regulatory components to the program.

Federal Rail Inspection Program

The Office of Rail Inspection enforces federal regulations related to rail safety standards, rules, and practices. State-employed inspectors are certified by the Federal Railroad Administration (FRA) and issue federal notices of violation to railroads when necessary. Currently inspectors are certified in the disciplines of Operating Practices, Hazardous Materials, Track, and Railroads Signals.

State Rail Inspection Program

The Office of Rail Inspection is also charged with the enforcement of state laws concerning rail safety. The section reviews new railroad construction, conducts inspections of industrial sites for walkway & close clearance, coordinates with Tennessee Emergency Management Agency (TEMA), and responds to railroad emergencies. State railroad inspectors monitor the condition of at-grade railroad-highway crossing surfaces and notify the responsible railroad of the need for repairs when rough crossing conditions exist.

Oversight of Fixed Guideway Transit Systems

TDOT is designated as the State Safety Oversight Agency (SSOA) per FTA requirements, providing oversight for rail fixed guideway systems (RFGS) that carry passengers but are not regulated by FRA. RFGS include any heavy, light, or rapid transit system, monorail, inclined plane, trolley, or automated guideway for the movement of passengers. In Tennessee these include the trolley system in Memphis operated by MATA and the incline railroad in Chattanooga operated by CARTA. As mandated by the FTA (49 CFR Part 659.15), TDOT has developed a System Safety Program Standard (SSPS) that governs the conduct of the oversight program as the state oversight agency and provides guidance to the regulated rail transit properties concerning processes and procedures they must have in place in order to be in compliance with the state safety oversight program.

Office of Highway-Railroad Grade Crossing Safety (Section 130)

Tennessee's Highway-Railroad Crossing Program, commonly referred to as the Section 130 Program, is a federal aid program authorized by United States Code Title 23, Section 130, and is administered through the State by the Federal Highway Administration (FHWA). Typically, Section 130 funds are used to install warning devices, such as train-activated flashing lights, automatic gates, and warning bells, at Tennessee's public highway-railroad grade crossings. These funds may also be used to provide various other safety improvements at existing crossings and to assist in the closure of unneeded crossings. The Highway-Railroad Crossing Program maintains a crossing inventory database which includes information about warning devices and signage for each public crossing in Tennessee. This information is used to prioritize crossings for projects and to update the national crossing inventory database maintained by FRA. Priority for the available funds is given to crossings with the greatest likelihood of a collision occurring based on an FHWA accident prediction model as well as other factors.

1.2.3 Other State Agencies with Rail-Related ResponsibilitiesTennessee Department of Economic and Community Development (TNECD)

TNECD administers the FastTrack Infrastructure Development Program (FIDP). This Program works with local communities with a goal of improving public infrastructure in order to create new jobs and business investment. With some exceptions, applications must be for specific projects and must be tied to a company commitment to create or retain a defined number of jobs. Qualifying projects must involve companies engaging in manufacturing or other economic activities beneficial to Tennessee. FIDP grants require local community matching funds calculated along a varying scale based on a community's ability to pay. Rail spurs that provide access to these companies are eligible for this program.

Tennessee Department of Environment and Conservation (TDEC)

TDEC's Recreation Educational Services Division is the agency responsible for the Rails-to-Trails Program. This Program works with railroads, railroad authorities, local jurisdictions, and non-profits to preserve abandoned or inactive rail corridors. The rail right-of-way is converted to a trail or multi-use path for recreational use. There are currently 16 Rails-to-Trails projects in Tennessee. It is worth noting that it is difficult to bring back rail service on a line that has been converted to a trail. For this reason, Rails-to-Trails should only be pursued on lines that are not viable for the foreseeable future. It is, however, a great way to utilize existing infrastructure while maintaining the rail corridor.

1.2.4 Local Entities with Rail Related ResponsibilitiesMetropolitan Planning Organizations (MPOs) & Transportation Planning Organizations (TPOs)

Federal transportation legislation requires every Census-designated Urbanized Area (UZA) with a population of 50,000 or greater to maintain a continuing, comprehensive, and cooperative transportation planning process. The organization responsible for carrying out this transportation planning process is called a Metropolitan Planning Organization (MPO).

MPOs are required to maintain and continually update a Long Range Transportation Plan (LRTP) as well as a Transportation Improvement Program (TIP), which is a multi-year program of transportation projects to be funded with federal and other transportation funding sources. As MPO planning activities have evolved to address the movement of freight as well as passengers, they have also included consideration of multimodal solutions, improved intermodal connections, and more specific rail and rail-related project solutions. MPOs must work cooperatively with area transportation stakeholders to understand and anticipate the area's travel needs and to develop these documents. In Tennessee, MPOs are also known as Metropolitan Transportation Planning Organizations (MTPOs) or Transportation Planning Organizations (TPOs). Eleven MPOs/MTPOs/TPOs serve Tennessee:

Bristol MPO

This MPO serves Bluff City and Bristol (Sullivan County in Tennessee). The Bristol MPO also serves Bristol (Washington County in Virginia).

Chattanooga-Hamilton County/North Georgia TPO

This TPO serves Chattanooga, Chickamauga, Collegedale, Lakesite, Lookout Mountain, Red Bank, Ridgeside, Signal Mountain, Soddy Daisy, and Walden (Hamilton County in Tennessee). This TPO also serves Fort Oglethorpe, Ringgold, and Rossville (Catoosa, Dade, and Walker Counties in Georgia).

Clarksville Urbanized Area MPO

This MPO serves Clarksville (Montgomery County in Tennessee) and Oak Grove (Christian County in Kentucky).

Cleveland Area MPO

The Cleveland MPO serves Cleveland (Bradley County in Tennessee).

Jackson Urban Area MPO

The Jackson MPO serves the Jackson urbanized area (Madison County in Tennessee).

Johnson City MTPO

The Johnson City MTPO serves the municipalities of Johnson City, Elizabethton, Jonesborough, Watauga, and Unicoi (Carter, Sullivan, Unicoi and Washington Counties in Tennessee).

Kingsport MTPO

The Kingsport MTPO serves Church Hill, Kingsport, and Mt. Carmel (Sullivan, Hawkins, and Washington Counties in Tennessee). The Kingsport MTPO also serves Gate City and Weber City (Scott County in Virginia).

Knoxville Regional TPO

The Knoxville TPO serves Alcoa, Clinton, Knoxville, Lenoir City, Loudon, Maryville, Oak Ridge, and the Town of Farragut. It also serves areas of Knox, Anderson, Blount, Loudon and Sevier Counties.

Lakeway MTPO

This MTPO serves Jefferson City, Morristown, and White Pine (Hamblen and Jefferson Counties in Tennessee).

Memphis Urban Area MPO

The Memphis MPO serves the Memphis urbanized area, including the jurisdictions of Arlington, Bartlett, Braden, Collierville, Galloway, Germantown, Lakeland, Memphis, Millington, Oakland, Piperton, and Rossville. The Memphis MPO also serves West Memphis in Arkansas and Byhalia, Hernando, Horn Lake, Olive Branch, and Southaven (DeSoto and Marshall Counties in Mississippi).

Nashville Area MPO

The Nashville MPO serves Brentwood, Columbia, Fairview, Franklin, Gallatin, Goodlettsville, Greenbrier, Hendersonville, LaVergne, Lebanon, Millersville, Mt. Juliet, Murfreesboro, Nashville, Nolensville, Portland, Smyrna, Springfield, Spring Hill, and White House (Davidson, Maury, Robertson, Rutherford, Sumner, Williamson, and Wilson Counties in Tennessee).

Rural Planning Organizations (RPOs)

Rural Planning Organizations are responsible for the coordination of the long range transportation

planning process in the State's 12 RPOs as set forth in TDOT's 2005 Long Range Transportation Plan. The purpose of the RPOs is to involve local officials in multimodal transportation planning through a structured process. The goal is to ensure quality, competence, and fairness in the transportation decision making process. RPOs consider multimodal transportation needs on a local and regional basis, review long-term needs as well as short-term funding priorities, and make recommendations to TDOT. Figure 1-1 shows the location of Tennessee's MPOs/MTPOs/TPOs and RPOs.



Figure 1-1 MPO and RPO Planning Areas

Transit Authorities

Middle Tennessee Regional Transit Authority (RTA)

The Middle Tennessee Regional Transit Authority (RTA) operates 9 regional bus routes between downtown Nashville and its outlying cities. RTA works closely with the Nashville Metropolitan Transit Authority (MTA) to link riders with 46 routes provided throughout Davidson County. In addition, RTA's rideshare program organizes vanpools and carpools for commuters throughout the 10 counties that comprise Middle Tennessee.

The RTA also oversees the Music City Star regional rail, the State's only commuter rail, which connects Davidson and Wilson counties. The East Corridor utilizes a 32-mile section of track belonging to the Nashville & Eastern Railroad Authority. Tracks, signals, and bridges were upgraded and replaced, and various grade crossings have been improved to allow for passenger service. The line serves six stations located at Riverfront, Donelson, Hermitage, Mt. Juliet, Martha, and Lebanon. Three trains provide weekday morning and evening service for each peak period. The RTA also conducts planning studies to identify future needs and possible alignments for expanding the regional rail system.

Memphis Area Transit Authority (MATA)

The Memphis Area Transit Authority (MATA) is the public transportation provider for the Memphis area. The system is governed by a seven-member policy board appointed by the City Mayor and approved by the Memphis City Council. MATA operates a vintage trolley rail system on three different lines in downtown Memphis. MATA is also responsible for the Memphis Central Transit Station. This station serves as a bus, trolley, and intercity passenger rail station.

State Railroad Authorities

The purpose of the state's Railroad Authorities is to support the continuation of service on low-density lines. Tennessee's first railroad authority was created in 1978 in response to the large-scale abandonments of the 1970's. Subsequently, the Railroad Authority Act of 1983 authorized the creation of local railroad authorities elsewhere in the state, enabling local governments to support short-line rail service that they felt was critical for the well-being of their communities. Since that time, Tennessee has grown to 20 railroad authorities, all of which are eligible to receive state funding. There are a variety of arrangements between the railroad authorities, railroad operators,

and railroad right-of-way owners. Typically, the railroad authorities do not operate the railroads, but in some cases they do own and manage the right-of-way. Authorities also serve as the recipients of state grants for the benefit of the railroads they represent.

2. HISTORY OF TENNESSEE'S RAIL SYSTEM

2.1 EARLY HISTORY

Predating Tennessee's statehood, traveling trails and rivers were the main trading routes from the coast inland. Traveling trails by wagon and rivers by flatboat were commonplace at the end of the eighteenth century. After the 1811 voyage of the New Orleans¹, steamboat commerce soon became the predominant way to transport goods to and from Tennessee. The first railroads in the United States were horse-drawn coaches and wagons on top of flat iron bars². It was this type of railroad that was first considered by Tennessee, but the first rails in the state were years away. In 1830, Peter Cooper's Tom Thumb locomotive was the first American-built steam locomotive used on a common-carrier railroad, which was successful in convincing the Baltimore & Ohio Railroad to use steam locomotion over horses³. Soon after, railroad fever swept across America. Early railroads were intended to supplement steamboat transport by bringing coal from the mines and cotton from the fields. As technology improved, steam powered rail superseded steamboats as the choice for transport.

Tennessee's Bank and Improvement Act of 1836 intended to make Tennessee more accessible by offering state aid in transportation investments. The Act required the state to subscribe to one-third of railroad and turnpike company stock. The Hiwassee Railroad did not qualify for subscription, but was the state's first railroad construction in 1837. Only the LaGrange and Memphis Railroad was eligible for subscription. As a result of the Panic of 1837, the state decided to invest in Middle Tennessee turnpikes instead of rail. This change in investment priorities would set railroad building in Tennessee back a decade.

The Hiwassee Railroad failed in 1842 without ever operating. The LaGrange and Memphis Railroad was the first to operate, but failed months after its opening in 1842. East Tennessee garnered most of the interest in the building of railroads in the state. However, it was difficult to build good roads on the terrain, and river access to the Mississippi was inadequate due to steamboats' inability to navigate the Muscle Shoals section of the Tennessee River. As a result, none of the efforts to bring rail to East Tennessee were successful.

During the 1840s, Georgia built their state-owned Western and Atlantic line, which reached Chattanooga by 1850. In 1845, the Southern and Western Convention was held in Memphis with hopes of fostering railroad construction through the issuance of state bonds to grant loans for railroad building. This, along with success in surrounding states, re-sparked interest in Tennessee railroads. . The General Internal Improvement Law of 1852 provided state loans to railroads and was responsible for providing funds to every antebellum railroad except the Nashville & Chattanooga (N&C). At that time, railroads in the South constructed broad-gauge track with a 5-foot width. This was incompatible with the standard gauge track (four foot, eight and one half inches) built by the northern railroads. By 1860, almost 16 lines and 1,197 miles of track had been built in Tennessee, as seen in Figure 2-1⁴.

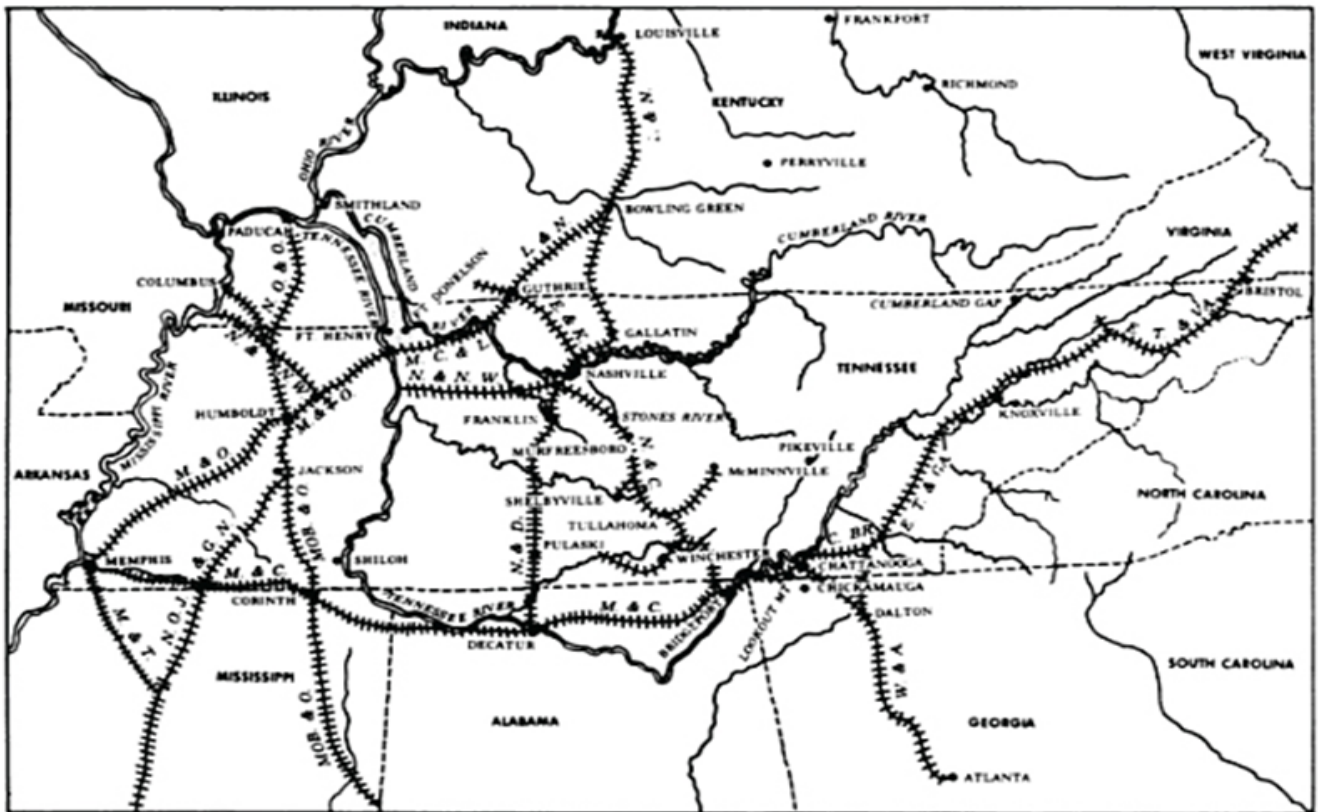
1 Allen, Michael. The Tennessee Encyclopedia of History and Culture, Steamboating. <http://tennesseeencyclopedia.net/entry.php?rec=1261>

2 Wilson, William Hasell (1895). A Brief Review of Railroad History from the Earliest Period to the Year 1894.

3 B&O Railroad Museum Website. <http://www.borail.org/Tom-Thumb.aspx>

4 Johnson, Edward A. The Tennessee Encyclopedia of History and Culture, Railroads. <http://tennesseeencyclopedia.net/entry.php?rec=1104>

Figure 2-1 Railroads at the Time of the Civil War



KEY TO RAILROAD NAMES

C. Br. Cleveland Branch, East Tennessee and Georgia	M.&O. Memphis and Ohio
E.&K. Edgefield and Kentucky	M.&T. Mississippi and Tennessee
E.T.&Ga. East Tennessee and Georgia	Mob.&O. Mobile and Ohio
E.T.&Va. East Tennessee and Virginia	N.&C. Nashville and Chattanooga
L.&N. Louisville and Nashville	N.&N.W. Nashville and Northwestern
M.&C. Memphis and Charleston	N.O.J.&G.N. New Orleans, Jackson, and Great Northern
M.C.&L. Memphis, Clarksville, and Louisville	N.O.&O. New Orleans and Ohio
	N. & D. Nashville and Decatur
	W.&A. Western and Atlantic

Source: Corlew, Folmsbee, & Mitchell (1990). *Tennessee: A Short History*

2.2 IMPACT OF CIVIL WAR ON RAIL

Railroads played a key role during the Civil War. The Union utilized rails to deploy supplies and troops quickly. In the South, Union troops damaged rails and rolling stock to immobilize the Confederates. In an effort to gain European support, Confederates ceased shipment of cotton overseas, a tactic that did not work and ultimately caused many southern railroad companies to fail.

With the southern railroads damaged after the war, the Tennessee General Assembly appropriated funds to help reconstruct the state's railroads. Corruption by railroads and government officials during Reconstruction led to a shift of finance and control from local parties to northern investors. The result was the consolidation of the state's railroads into three major systems: Southern Railways, Louisville and Nashville, and Illinois Central. The shift of ownership to the North and consolidation allowed for the building of once-blocked transcontinental railroads and improved railroad technology. In 1886, perhaps the most important impact to the South's rail system was the change from broad gauge track to the standard gauge track. Tennessee railroads expanded substantially during this time, growing track mileage to 3,131 by 1900⁵.

5 Johnson, Edward A. The Tennessee Encyclopedia of History and Culture, Railroads. <http://tennesseeencyclopedia.net/entry>.

2.3 INTERSTATE COMMERCE ACT OF 1887

In the late nineteenth century, the railroad industry was booming. Tycoons profited from the consolidation of railroads, which spanned several states. In response to monopolistic practices of some railroads and their owners, Congress passed the Interstate Commerce Act of 1887. The Act required railroads to make rates public and made rebates and customer discrimination illegal. More importantly, it created the Interstate Commerce Commission (ICC) to regulate the railroad industry. One of the tycoons, J.P. Morgan, set up conferences with railroad presidents to help the industry follow the new laws and write agreements for the maintenance of “public, reasonable, uniform and stable rates.”⁶ In response to this attempt to monopolize trade and commerce, Congress enacted antitrust legislation to prohibit monopolies with the Sherman Antitrust Act in 1890. Several other acts followed. In 1906, the Hepburn Act authorized the ICC to set maximum shipping rates. In 1910, the Mann-Elkins Act gave the ICC the power to suspend rate increases as well as other regulations. Regardless of these new regulations, railroads continued to expand.

2.4 TWENTIETH CENTURY DEVELOPMENTS

2.4.1 Effect of World War I

With the U.S. entering World War I, President Woodrow Wilson put the nation's railroads under federal control of the United States Railroad Administration. In 1917, the United States Railroad Administration standardized and reduced duplicative service throughout the system. In 1920, Tennessee peaked with track mileage of 4,078. However, the temporary nationalization also reduced competition between railroads. Federal control was lifted by the Esch-Cummins Act in 1920. The Act granted authority to the ICC to set minimum shipping rates, oversee railroad financial operations, regulate acquisitions and mergers, and create a plan to consolidate the country's railroads into several large systems. This increased regulation, coupled with years of no competition, left railroads facing financial problems. In 1929, the ICC published its proposed Complete Plan of Consolidation (Ripley Plan), which divided the nation's railroads into 21 regional systems and 100 terminal railroads. This consolidation plan faced opposition from the railroad industry. Congress removed the Ripley Plan and consolidation requirements included in the Esch-Cummins Act with the Transportation Act of 1940⁷. Many of the smaller railroads failed during the Great Depression of the 1930s. By 1940, track in Tennessee had diminished to 3,573 miles⁸.

2.4.2 Effect of World War II

The U.S. entry into World War II increased rail traffic as a result of increased manufacturing for the war effort. Unlike World War I, the railroads remained private during World War II. During the 1940s, Tennessee railroads first started using diesel locomotives. Railroad companies remained profitable by operating less track mileage and using more efficient technology. However, railroads declined after the war ended and continued the abandonment of unprofitable lines, in part due to excessive regulations and the rise of highway and air travel.

2.4.3 Creation of USDOT and FRA

In 1966, Congress created the Federal Railroad Administration (FRA) as a part of the newly created United States Department of Transportation (USDOT). The FRA was to issue and enforce rail safety regulations, which were transferred from the ICC, administer railroad assistance programs, and conduct research and development in support of improved railroad safety and national rail transportation policy.

php?rec=1104

⁶ Carosso, Vincent P. (1987). *The Morgans: Private International Bankers, 1854-1913*

⁷ Rose, Mark H., Seely, Bruce E., Barrett, Paul (2010). *The Best Transportation System in the World: Railroads, Trucks, Airlines, and American Public Policy in the Twentieth Century*

⁸ Johnson, Edward A. *The Tennessee Encyclopedia of History and Culture, Railroads*. <http://tennesseeencyclopedia.net/entry.php?rec=1104>

2.4.4 Passenger Service Initiatives

The competition of air and highway travel, specifically the building of the National System of Interstate and Defense Highways, forced many rail passenger services out of operation. Several efforts were started to revitalize passenger rail service. The High Speed Ground Transportation Act of 1965 marked the start of a Federal effort to develop and demonstrate contemporary and advanced High Speed Ground Transportation (HSGT) technologies. In 1969, with funding from the High Speed Ground Transportation Act of 1965, the FRA deployed modern HSGT technologies, such as self-propelled Metroliner cars and the TurboTrain, in the Northeast Corridor (NEC). The Act also introduced a multi-modal, long-term planning effort for the NEC.

In 1968, two of the largest remaining railroads, the Pennsylvania Railroad and the New York Central, merged to form the Penn Central. At the insistence of the ICC, the New York, New Haven, and Hartford Railroad was added to the 1969 merger. In 1970, the Penn Central along with several other Northeastern and Midwestern companies declared bankruptcy. In response, Congress passed the Rail Passenger Service Act of 1970. This Act created the National Railroad Passenger Corporation (Amtrak) to ensure continued operation of an intercity rail passenger network in the United States. In 1971, Amtrak assumed the responsibility for operating intercity rail service in most of the United States, including the passenger lines from the NEC and Penn Central⁹.

2.4.5 Regional Rail Reorganization Act of 1973 (3R Act)

Bankruptcies not only affected passenger lines, but freight lines as well. To address these bankruptcies Congress passed the Regional Rail Reorganization Act of 1973 (3R Act). The Act formed the United States Railway Association (USRA), a government corporation which took over the powers of the ICC with respect to the disposition of bankrupt railroads to abandon unprofitable lines. The Act also created the Consolidated Rail Corporation (ConRail), another government-owned corporation under the oversight of USRA. Conrail was created to try and salvage the profitable freight lines of bankrupt companies, including those of the Penn Central.

Large scale railroad failures were not confined to the Northeast and Midwest. In response to the abandonments of operating railroad properties within the state, the Governor of Tennessee designated the Tennessee Department of Transportation (TDOT) as the agency in state government with the authority and administrative jurisdiction to promote and develop efficient rail transportation services for the state.

2.4.6 Deregulation

Occurring over the course of nearly two decades, it took four presidential administrations to change transportation regulatory policy to a pro-competitive direction. Deregulation of the transportation industry took several Acts of Congress. The common theme of these Acts was to lessen barriers to entry in transport markets and promote more independent, competitive pricing among transport service providers, substituting the freed-up competitive market forces for detailed regulatory control of entry, exit, and price making in transport markets.

2.4.7 Railroad Revitalization and Regulatory Reform Act of 1976 (4R Act)

For rail, deregulation began with the passing of the Railroad Revitalization and Regulatory Reform Act of 1976 (4R Act). The 4R Act established financing mechanisms to ensure adequate rehabilitation and improvements to the railway system of the United States. It also reformed regulations on rate making and abandonment, and expedited the procedure for mergers and consolidations. By doing this, railroads would remain viable in the private sector of the economy and would be able to provide energy-efficient, ecologically compatible transportation services with greater efficiency, effectiveness, and economy.

⁹ Federal Railroad Administration Website. <https://www.fra.dot.gov/Page/P0140>

2.4.8 Staggers Rail Act of 1980

Following the 4R Act was the Staggers Rail Act of 1980. This Act granted greater pricing freedom, streamlined merger timetables, expedited the line abandonment process, allowed multi-modal ownership, and permitted confidential contracts with shippers. The Staggers Rail Act further reduced the authority of the ICC and allowed the carriers to discontinue unprofitable routes.

2.4.9 Effects of Deregulation

By removing restrictive regulations, railroads became more competitive with the trucking industry. These changes led to the current system of fewer, but profitable, Class I railroads covering larger regions. The railroads immediately divested themselves of unprofitable passenger business and began to concentrate on their core freight activity. The business which was most profitable and least subject to competition from other modes was bulk freight. The unfortunate result of deregulation was the accelerated abandonments of unprofitable lines.

The U.S. Government added to Tennessee's involvement in supporting railroads by providing rail planning and assistance through passage of the Local Rail Service Assistance Act of 1978. Despite some success in salvaging lines, deregulation had accelerated the abandonment process. During the period 1976 through 2001, Tennessee railroads proposed 1,045 miles for abandonment.

After decades of various deregulation measures, most of the ICC's powers had been eliminated. Congress finally abolished the agency with the Interstate Commerce Commission Termination Act and transferred its remaining functions to a new agency, the Surface Transportation Board (STB). When this occurred in 1995, Tennessee's track mileage was 2,634. From 1995 through 2003, Tennessee added 278 miles of previously abandoned railroad.

3. EXISTING FREIGHT RAIL SYSTEM

U.S. freight railroads operate over a system of nearly 140,000 miles, serving tens of thousands of rail customers. When compared to other modes, the rail share of ton-miles is approximately 40 percent. This can be attributed to the fact that rail shipments are typically larger volume commodities, hauled over longer distances. Although bulk and merchandise shipments are most commonly associated with rail, intermodal container shipments have been the fastest growing rail segment over the last 25 years. Every day, railroads deliver an average of 5 million tons of goods to ports, distribution centers, businesses, and more.¹⁰



Several different types of railroads make up the national system. The Surface Transportation Board (STB) divides freight railroads into different classes based on annual revenues.¹¹ Typically, the Class I, or major railroads, provide long-distance service. They depend on connections to Class II, regional railroads, and/or Class III, short-line railroads, to bring goods directly to their customers. Regional railroads are typically the result of lines sold off from the Class Is. They usually operate in multiple states, connecting to other Class I railroads. Short-line railroads are typically the result of branch lines sold off from the Class Is or the reactivation of abandoned lines. They usually operate in one to two states, connecting local customers to a Class I system. Together, regional and short-line railroads operate nearly 45,000 track miles throughout the country. This is almost 32 percent of all U.S. railroad track miles.

In Tennessee, Class I railroads provide a 2,940-mile backbone for long-haul service. Short-line, or Class III, railroads operate 763 miles, providing short-haul service. Individual railroad maps and descriptions are provided in Appendix 1.

Table 3-1 Breakdown of Rail Systems

	# of Railroads	Track Mileage
Total		
U.S.	574	138,524
Tennessee	34	2,940
Class I		
U.S.	7	95,311
Tennessee	6	2,133
Class II and III		
U.S.	567	43,213
Tennessee	28	806

10 Association of American Railroads

11 The 1991 revenue values are adjusted annually by applying the railroad revenue deflator formula.

3.1 CLASS I RAILROADS

Class I railroads are the nation's largest in terms of size and revenue. They are defined as having annual operating revenues above \$379 million and operating over 95,000 miles of the system. There are seven Class I railroads operating in the United States, with the following six operating in Tennessee:

- CSX Transportation (CSX)
- Norfolk Southern (NS)
- Canadian National Railway (CN)
- Burlington North Santa Fe Railways (BNSF)
- Union Pacific (UP)
- Kansas City Southern (KCS)

Tennessee sits in the middle of the southeastern United States between major distribution hubs. Memphis in particular serves as a gateway from the east coast to the western U.S., providing one of the few connections between the Class I railroads across the Mississippi River. Tennessee's central location and presence of a gateway to the west make it a critical piece to the national rail system. Many major corridors criss-cross the state, connecting the interior U.S. to international ports and allowing for cross-country and North American trade. These corridors continue to receive heavy investment from railroads and federal grants. As these investments continue, they broaden Tennessee's access to global markets and lower the cost of sourcing and shipping goods throughout the state.

Of the major Class I railroads currently operating in Tennessee, three (BNSF, KCS, and UP) have only a small amount of their overall system in Tennessee. CSX, CN, and NS have a much larger presence in Tennessee, with CN operating north-south in West Tennessee, while CSX and NS have tracks throughout the state. The Class I railroads provide connections to customers through intermodal yards, an international port, and connections with short-lines. Table 3-2 shows the system overview for the six Class I railroads that operate in Tennessee, with each railroad discussed briefly below.

Table 3-2 Breakdown of Class I Railroads Operating in Tennessee, by Route Mile

Railroad	Operated	Owned	Operated Under Lease	Operated Under Contract	Operated Under Trackage Rights
In the United States					
BNSF	32,643	23,297	84	34	9,228
CN	6,091	5,838	2	-	251
CSX	20,769	15,792	734	170	3,861
KCS	3,339	2,751	3	-	585
NS	19,759	14,991	360	6	4,402
UP	37,974	26,012	317	-	5,645
In Tennessee					
BNSF	137	17	-	-	127
CN	161	161	-	-	-
CSX	989	827	15	2	146
KCS	5	5	-	-	-
NS	827	662	136	-	46
UP	14	9	-	-	5

3.1.1 CSX Transportation (CSX)

Headquarter in Jacksonville, Florida, the CSX network encompasses approximately 36,752 track miles in 23 states, the District of Columbia, and Canada, serving 70 ports and major markets in the eastern United States. CSX has thousands of production and distribution customers through track connections to more than 240 short-line and regional railroads. In the U.S., CSX's system is comprised of three major corridors, the Coal Network, a supporting network, and 36 yards that are key hubs in their system. CSX has a large presence in Tennessee. Two of their major networks cross the state, the Southeastern Corridor and the Coal Network.

Figure 3-1 CSX Rail System



Source: 2013 CSX Annual Report

Southeastern Corridor

The Southeastern Corridor runs between CSX's western gateway of Chicago through the cities of Nashville, Birmingham, Atlanta, and other markets in the Southeast. The Southeastern Corridor is the premier rail route connecting these key cities, gateways, and markets. This corridor allows CSX to efficiently handle projected traffic volumes of intermodal, automotive, and general merchandise traffic. The corridor also provides direct rail service between the coal reserves of the southern Illinois basin and coal markets in the Southeast. In Tennessee, the Southeastern Corridor consists of three sections of CSX mainlines. Generally, it includes sections from Guthrie, Kentucky to Nashville, Nashville to Chattanooga, and Nashville to Ardmore. In Nashville, Radnor Yard serves this corridor as a major reclassification and intermodal yard.

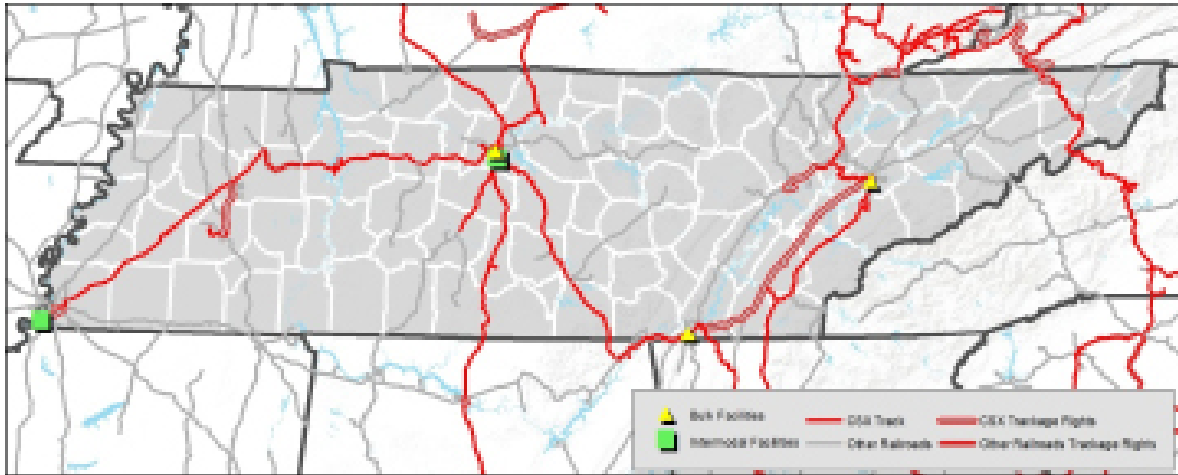
CSX's Coal Network

The CSX coal network connects the coal mining operations in the Appalachian mountain region and Illinois basin with industrial areas in the Northeast and Mid-Atlantic, as well as many river, lake, and deep water port facilities. CSX's coal network is positioned to supply utility markets in both the Northeast and Southeast and to transport coal shipments for export outside of the U.S. Almost half of the coal exported and nearly all of the domestic coal that CSX transports is used for generating electricity. In Tennessee, the Coal Network consists of two sections of CSX mainlines. Generally, it includes sections from Claiborne County through Knoxville to Polk County and from Sullivan County through Johnson City to Unicoi County. Until CSX closed the facility in 2016, Erwin Yard in Unicoi County served this network as a major yard for the transfer of coal and grain. The closure is one of the early signs of the impact of diminishing coal volumes on the Class I railroads.

CSX in Tennessee

The Tennessee portion of CSX, as it stands today, consists of lines that were once operated by the Louisville and Nashville Railroad and the Nashville, Chattanooga, and St. Louis Railway. CSX owns the most rail mileage in Tennessee at approximately 31 percent. Their network has coverage in east, middle, and west Tennessee and serves all of the state's major cities directly. Working together with 12 short-lines, CSX provides smaller cities and towns access to the national system. CSX employs approximately 1,700 people in the state, which represents approximately 40 percent of all railroad jobs in Tennessee. Figure 3-2 displays Tennessee's CSX system.

Figure 3-2. Tennessee's CSX System



3.1.2 Norfolk Southern Railway (NS)

Headquartered in Norfolk, Virginia, the NS network encompasses approximately 36,119 track miles in 22 states and the District of Columbia, serving 43 ports and major markets in the eastern United States. NS has thousands of production and distribution customers through track connections to more than 262 short-line and regional railroads. In the U.S., NS's system is comprised of four major corridors and supporting networks.

Figure 3-3. Norfolk Southern Rail Corridors



Source: <http://www.nscorp.com>

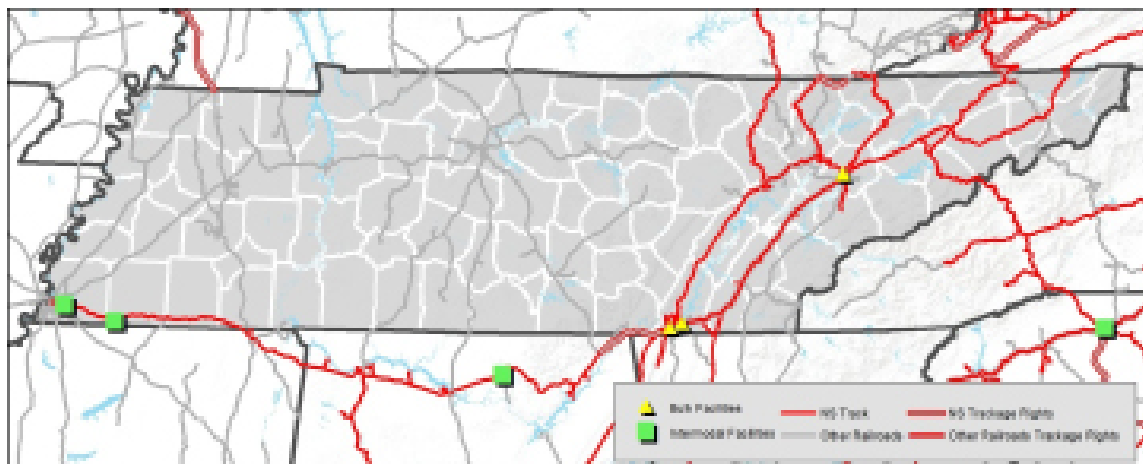
The Crescent Corridor

The Crescent Corridor is a rail infrastructure project that spans 11 states and 1,400-miles. The corridor seeks to increase the capacity of intermodal traffic along the I-81 corridor. Providing one of the fastest, most direct routes from the Southeast to the Northeast, the Crescent Corridor's high-capacity intermodal routes are truck competitive, fuel efficient, and dependable. In Tennessee, the Crescent Corridor runs from Bristol to Chattanooga. From there, it dips into northern Alabama before coming back into Memphis. Just outside of Memphis is the new Rossville Intermodal Yard, which was built with USDOT TIGER grant funds, TDOT funding, and NS private capital.

Norfolk Southern in Tennessee

The Tennessee portion of the NS system, as it stands today, consists of the surviving lines that were primarily operated by the Southern Railway. NS owns the second most rail mileage in Tennessee at over 22 percent. Their network has coverage mainly in east Tennessee, but the Memphis West End line does serve Memphis after dipping into Northern Alabama from Chattanooga. NS does not serve Middle or Northwest Tennessee. Working together with 10 short-lines, NS provides smaller cities and towns access to the national system. NS employs 1,896 people in the state, which represents approximately 45 percent of all railroad jobs in Tennessee. Figure 3-4 displays Tennessee's NS system.

Figure 3-4. Tennessee's Norfolk Southern System



3.1.3 Canadian National Railway Company (CN)

Figure 3-5 CN Railways



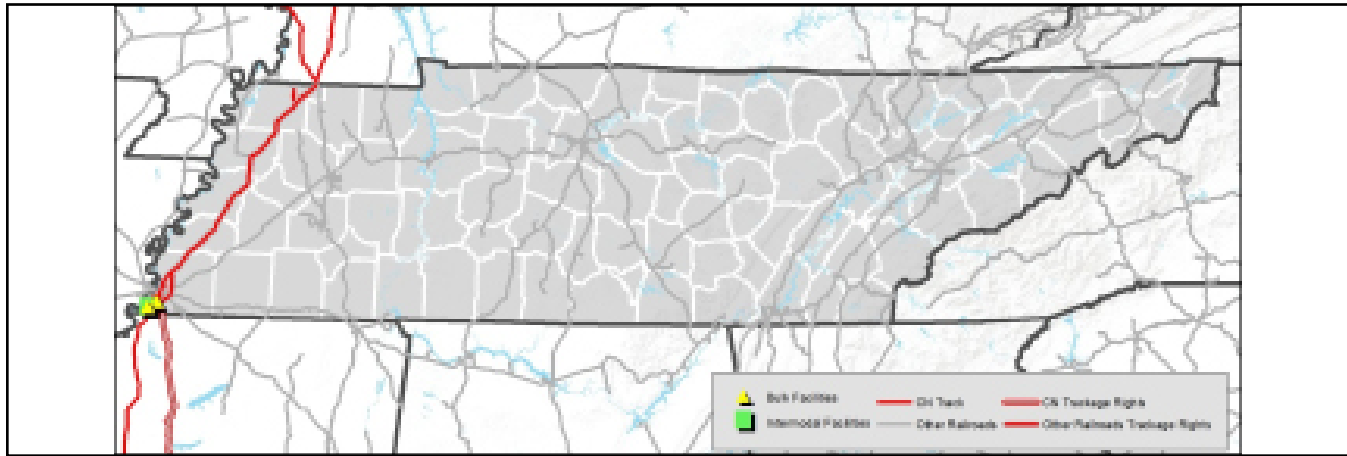
Headquartered in Montreal, Quebec, the CN network encompasses over 21,000 track miles in 10 states and Canada, serving five ports and major markets in the central U.S. and Canada and reaching three coasts. The Grand Trunk Corporation is the subsidiary holding company for the CN properties in the U.S. CN has thousands of production and distribution customers through track connections to 57 short-line and regional railroads.

Source: [http:// www.cn.ca](http://www.cn.ca)

Canadian National in Tennessee

The Tennessee portion of CN, as it stands today, consists of the surviving lines that were primarily operated by the Illinois Central Gulf Railroad. CN owns approximately four percent of the total rail mileage in Tennessee. Their network has coverage in west Tennessee, connecting Canada and the Upper Midwest to the Gulf Coast. Working together with two short-lines, CN provides smaller cities and towns access to the national system. CN employs 500 people in the state, which equates to approximately 12 percent of all railroad jobs in Tennessee. Figure 3-6 displays Tennessee's CN system.

Figure 3-6. Canadian National Railroad in Tennessee



3.1.4 Burlington Northern Santa Fe Railway (BNSF)

Figure 3-7 BNSF Railways

Headquartered in Fort Worth, Texas, the BNSF network encompasses about 32,500 track miles in 28 states and Canada, serving 40 ports and major markets in the Western United States. BNSF has thousands of production and distribution customers through track connections to more than 195 short-line and regional railroads. In the U.S., BNSF's system is comprised of three major Corridors of Commerce, the Coal Network, the Automotive Network, the Intermodal Network, and a supporting network.



The TransCon Corridor

The TransCon Corridor has 4,647 route miles traversing 13 states, connecting the eastern U.S. with the west coast. From T-shirts and TVs to clothes and cars, this major route serves as a gateway for imports and exports for the nation's consumers and businesses. There are 18 intermodal facilities along this premier corridor where freight moves between rail, truck, and ship without any handling of the cargo itself. The majority of the freight moving across this Corridor is agricultural, consumer, and industrial products. In Tennessee, the TransCon Corridor runs approximately 17 miles in the southwestern portion of the state. The Memphis Intermodal Facility serves as the regional hub of this corridor.

Figure 3-8 BNSF TransCon Corridor

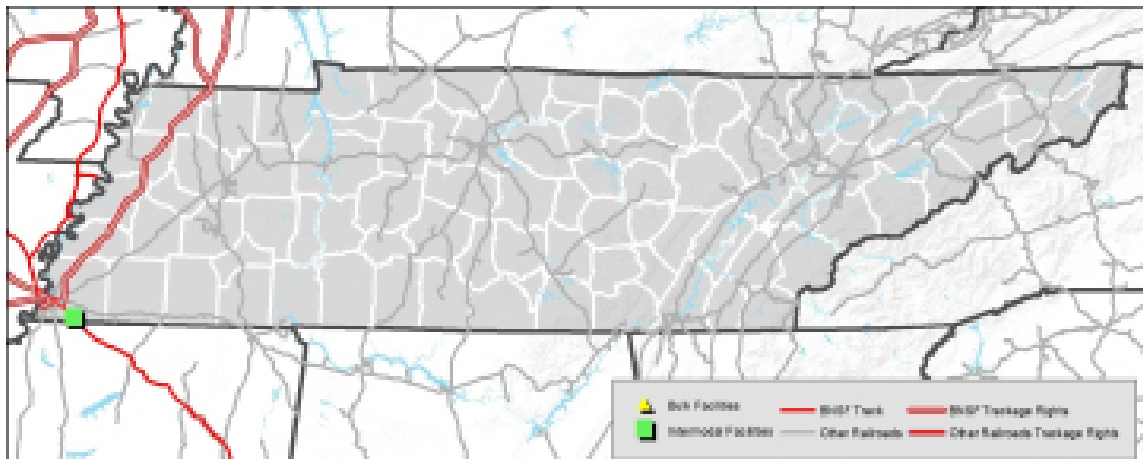


Source: <http://www.corridorsofcommerce.com>

Burlington Northern Santa Fe in Tennessee

The Tennessee portion of the BNSF system, as it stands today, consists of the surviving lines that were primarily operated by the St. Louis-San Francisco Railway. BNSF owns approximately four percent of the total rail mileage in Tennessee. Their network has coverage in west Tennessee, connecting the Western U.S. to the South. Working together with two short-lines, BNSF provides smaller cities and towns access to the national system. BNSF employs 353 people in the state, equating to approximately eight percent of all railroad jobs in Tennessee. Figure 3-9 displays Tennessee's BNSF system.

Figure 3-9 BNSF System in Tennessee



3.1.5 Union Pacific Railroad (UP)

Headquartered in Omaha, Nebraska, the UP network encompasses approximately 50,861 track miles in 23 states, serving eight ports and major markets in the Western United States. UP has thousands of production and distribution customers through track connections to more than 194 short-line and regional railroads. UP's system is comprised of 20 major lines and the supporting network.

Figure 3-10 UP Railways



Memphis to Oakland Intermodal Corridor (Old SP Sunset Route)

In April 1999, UP introduced a new premium intermodal service between Memphis and Northern California via Dallas and Los Angeles. By using UP lines in Texas and Arkansas and the former Southern Pacific Sunset Route, the new service saves almost 600 miles over UP's old Central Corridor route. The rail transit time is competitive with the fastest truck service but at a lower cost to the shipper, while the premium service offers better margins to UP. Per container, this priority intermodal service requires approximately one-third the fuel and one-thirtieth of the labor as comparable truck service. Marion Intermodal Yard is in West Memphis, Arkansas, but has a big impact on Tennessee transportation with most of the freight originating in or destined for Tennessee and North Mississippi.

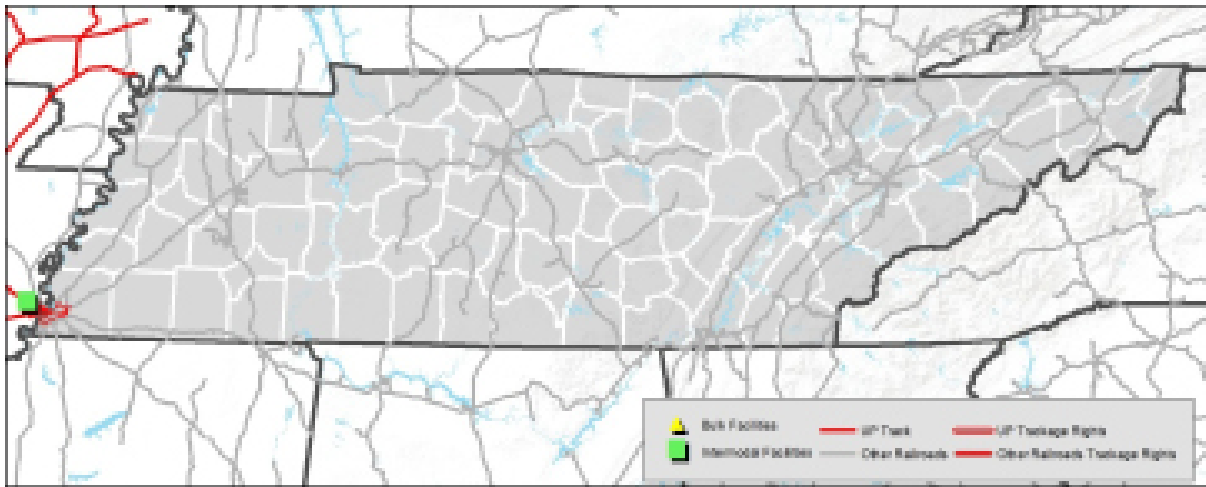
Third-Morning Service between Port Laredo and Memphis

In 2014, UP started the third-morning service between Port Laredo and Memphis that features seamless intermodal service five days per week. This new service enables customers to ship containers both northbound and southbound with truck-competitive transit times. Additionally, having access to the largest container fleet provides the capacity to take advantage of the growing opportunities between Memphis and Laredo. Door-to-door services are available into Mexico, simplifying border crossings.

Union Pacific in Tennessee

The Tennessee portion of the UP system, as it stands today, consists of the surviving lines that were primarily operated by the St. Louis Southwestern Railway. UP owns less than one percent of the total rail mileage in Tennessee. Their network has coverage in west Tennessee, connecting the Western U.S. to Memphis. UP employs 56 people in the state, equating to approximately one percent of all railroad jobs in Tennessee. Figure 3-11 displays Tennessee's UP system.

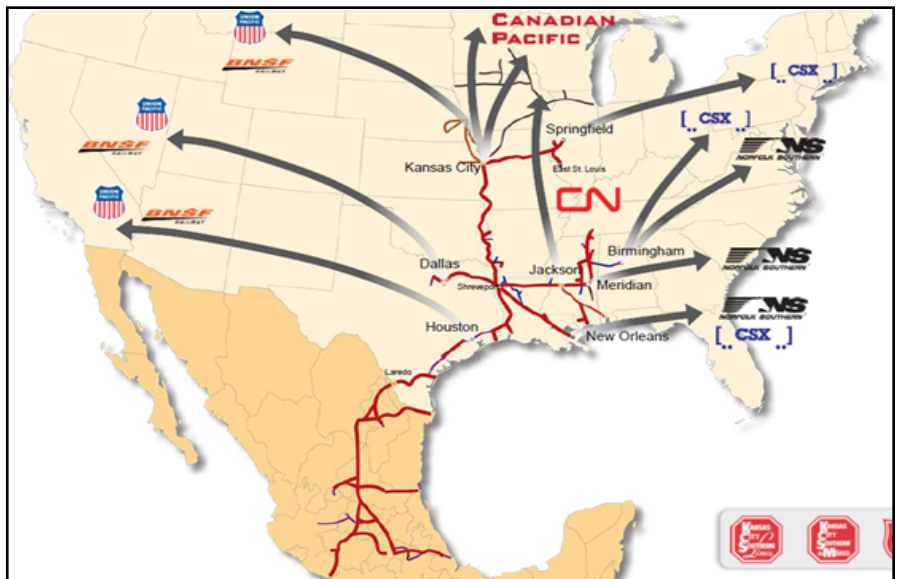
Figure 3-11 Union Pacific System in Tennessee



3.1.6 Kansas City Southern Railway (KCS)

Figure 3-12 KCS Railways

Headquartered in Kansas City, Missouri, the KCS network encompasses more than 6,400 track miles in 10 states, serving 15 ports and major markets in the central and south central United States and international holdings in northeastern and central Mexico. KCS has thousands of production and distribution customers through track connections to 41 short-line and regional railroads. KCS's system provides a connection between U.S. railroads and Mexico. For Tennessee, KCS provides service to Texas and Mexico.

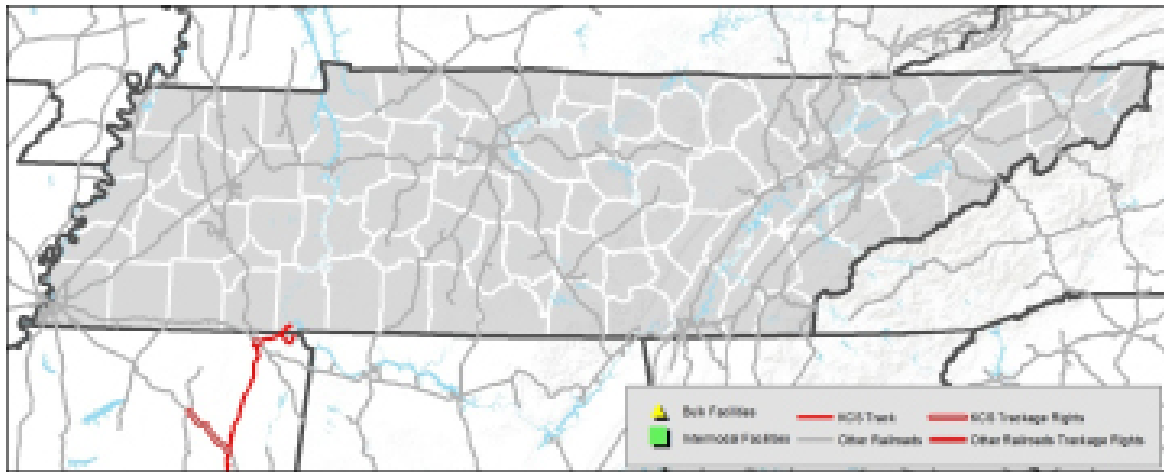


Source: [https:// www.kcsouthern.com](https://www.kcsouthern.com)

Kansas City Southern in Tennessee

The Tennessee portion of the KCS system, as it stands today, consists of the surviving lines that were primarily operated by the Corinth and Counce Railroad. KCS owns less than one percent of the total rail mileage in Tennessee. Their network has coverage in west Tennessee, connecting Tennessee to Mexico. Working together with one short-line, KCS provides smaller cities and towns access to the national system. Figure 3-13 displays Tennessee's KCS system.

Figure 3-13 KCS System in Tennessee



[https:// www.kcsouthern.com](https://www.kcsouthern.com)

3.2 CLASS II RAILROADS

Class II railroads are smaller than Class I railroads. According to the Surface Transportation Board (STB) and American Short Line & Regional Railroad Association (ASLRRA), the definition of a Class II “regional” railroad is any with annual operating revenues greater than \$36.633 million but less than \$457.913 million. The Association of American Railroads (AAR) also defines them as “line haul” carriers maintaining at least 350 route miles. As with Class I’s, a regional’s classification is updated annually to meet inflation and other market factors (using the base year of 1991 according to the ASLRRA). Currently there are twenty-one Class II’s in service; some are independently owned (like the Iowa Interstate) while others are part of large corporations/state agencies (such as Watco’s Wisconsin & Southern). There are no Class II railroads operating in Tennessee.

3.3 CLASS III RAILROADS

Class III railroads are smaller than Class II railroads. They are defined as having annual operating revenues below \$36.633 million and operating less than 350 miles of track. Currently, there are more than 550 Class III railroads operating in the United States, with the following 23 operating in Tennessee:

- Chattanooga and Chickamauga Railway (CCKY)
- Caney Fork & Western Railroad (CFWR)
- East Chattanooga Belt Railway (ECBR)
- East Tennessee Railway, L.P. (ETRY)
- Franklin Mineral Railroad (FRKM)
- Heritage Railroad Corporation (HRC)
- Hiwassee River Railroad Company (HRRC)
- Kentucky West Tennessee Railway (KWT)
- Knoxville & Holston River Railroad (KXHR)
- Mississippi Central Railroad Co. (MSC)
- Mississippi Tennessee Railroad, Inc. (MTNR)

- Nashville & Eastern Railroad Corporation (NERR)
- Nashville & Western Railroad Corporation (NWRR)
- R.J. Corman Railroad Company- Eastern Tennessee Line (RJCR)
- R.J. Corman Railroad Company-Memphis Line (RJCM)
- R.J. Corman Railroad Company- Tennessee Terminal (RJCK)
- South Central Tennessee Railroad Company (SCTRR)
- Sequatchie Valley Railroad (SQVR)
- TennKen Railroad Company (TKEN)
- Tennessee Southern Railroad (TSRR)
- Tennessee Valley Railroad Museum (TVRM)
- Walking Horse & Eastern Railroad (WHOE)
- West Tennessee Railroad Co. (WTNN)

Tennessee is served by 23 Class III, or short-line, railroads. These railroads provide short-haul and switching services to/from/for the Class I railroads and comprise 25 percent of Tennessee's total rail mileage. They are shown in Figure 3-14. Table 3-3 shows a summary of Tennessee short-line railroads' key characteristics. Table 3-4 shows how each of the Tennessee short-lines is organized and operated. Individual railroad descriptions are provided in Appendix 1.

Figure 3-14 Class III Railroads in Tennessee

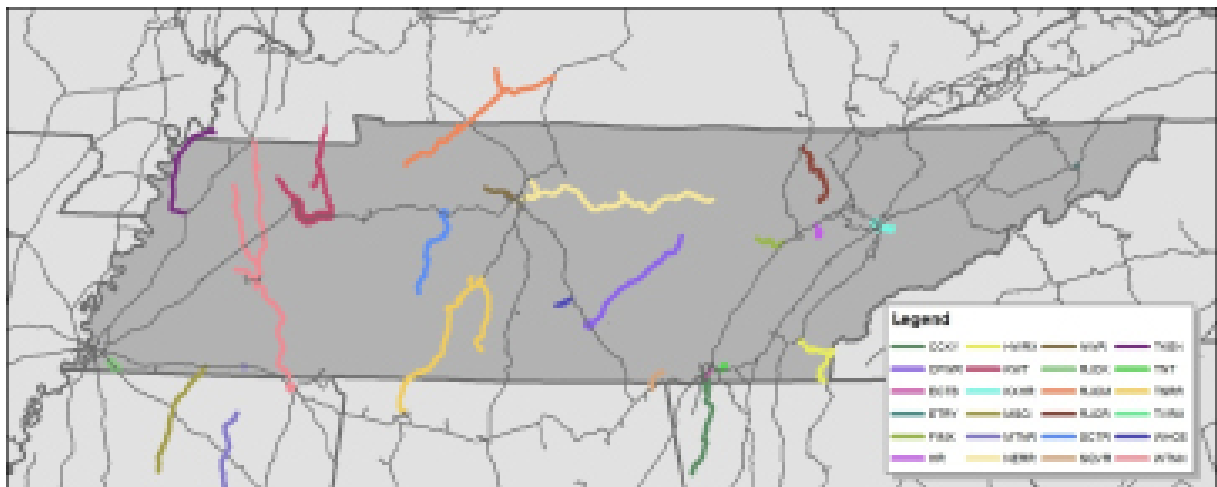


Table 3-3 Tennessee Short-line Railroad Characteristics

Railroad	Reporting Mark	Track Mileage Total	Gross Rail Load Weight	Interchanges
Chattanooga and Chickamauga Railway	CCKY	3.9	263K	NS
Caney Fork & Western Railroad	CFWR	65.3	Partial	CSXT
East Chattanooga Belt Railway	ECBR	6.2	263K	NS
East Tennessee Railway, L.P.	ETRY	7.1	286K	CSXT & NS
Franklin Mineral Roadway	FRKM	14.6	263K	NS
Heritage Railroad Corporation	HRC	12.2	263K	NS
Hiwassee River Railroad Company	HRRC	49.7	263K	CSXT
Kentucky West Tennessee Railway	KWT	27.2	263K	CSXT
Knoxville & Holston River Railroad	KXHR	27.3	Partial	CSXT & NS
Mississippi Central Railroad Company	MSC	5.5	263K	BNSF & NS
Mississippi Tennessee Railroad, Inc.	MTNR	6.2	286K	NS
Nashville & Eastern Railroad Corporation	NERR	128.7	Partial	CSXT
Nashville & Western Railroad Corporation	NWR	18.0	263K	CSXT
R.J. Corman Railroad- Eastern Tennessee	RJCR	41.9	286K	NS
R.J. Corman Railroad Company- Memphis Line	RJCM	47.8	286K	CSXT
R.J. Corman Railroad- Memphis Tennessee Terminal	RJCK	48.2	286K	BNSF
South Central Tennessee Railroad Company	SCTRR	51.6	Partial	CSXT
Sequatchie Valley Railroad	SQVR	8.6	286K	CSXT
TennKen Railroad Company	TKEN	56.6	263K	CN
Tennessee Southern Railroad	TSRR	98.5	Partial	CSXT
Tennessee Valley Railroad Museum	TVRM	2.7	263K	NS
Walking Horse & Eastern Railroad	WHOE	8.7	263K	CSXT
West Tennessee Railroad Co.	WTNN	178.3	Partial	CN, CSXT, NS, & KCS

Table 3-4 Tennessee Short-lines' Organizational Structure

Reporting Mark	Track Ownership	Railroad Operator	Parent Company	Authority
CCKY	State of Georgia	Chattanooga and Chickamauga Railway	Genessee & Wyoming	NA
CFWR	Tri-County Railroad Authority	Caney Fork & Western Railroad	Ironhorse Resources	Tri-County Railroad Authority
ECBR	Leased from NS	East Chattanooga Belt Railway	Tennessee Valley Rail Museum	Hamilton County Railroad Authority
ETRY	Genessee & Wyoming and leased from CSX	East Tennessee Railway, L.P.	Genessee & Wyoming	East Tennessee Railroad Authority
FRKM	Franklin Mineral Roadway	Franklin Mineral Roadway		Cumberland County Railroad Authority
HRC	Heritage Railroad Corporation	Walden Ridge Railroad Company	Energy Solutions	Oak Ridge Heritage Railroad Authority
HRRC	Tennessee Overhill Heritage Association	Hiwassee River Railroad	Tennessee Valley Rail Museum	NA
KWT	Genessee & Wyoming and CSX through trackage rights	Kentucky West Tennessee Railway	Genessee & Wyoming	Carroll-Henry County Railroad Authority
KXHR	Gulf & Ohio Railways, KXHR, KCRA, and leased from CSX and NS	Knoxville & Holston River Rail-road	Gulf & Ohio Railways	Knox County Railroad Authority
MSC	Pioneer- Railcorp	Mississippi Central Railroad Co.	Pioneer- Railcorp	NA
MTNR	Mississippi Tennessee Railroad Authority	Mississippi Tennessee Railroad, Inc.	Ironhorse Resources	Mississippi Tennessee Railroad Authority
NERR	Nashville & Eastern Railroad Authority	Nashville & Eastern Railroad Corporation		Nashville & Eastern Railroad Authority
NWR	Cheatham County Railroad Authority	Nashville & Western Railroad Corporation		Cheatham County Railroad Authority
RJCR	R.J. Corman	R.J. Corman Railroad	R.J. Corman	North East Tennessee Railroad Authority
RJCM	R.J. Corman	R.J. Corman Railroad Company	R.J. Corman	Montgomery County Railroad Authority
RJCK	leased from BNSF	R.J. Corman Railroad	R.J. Corman	NA

SCTRR	South Central Tennessee Railroad Company	South Central Tennessee Railroad Corp.		South Central Tennessee Railroad Authority
SQVR	Sequatchie Valley Railroad	Sequatchie Valley Railroad		Marion County Railroad Authority
TKEN	Hickman River City Development Corporation	TennKen Railroad Corp.		TennKen Railroad Authority
TSRR	Patriot Rail	Tennessee Southern Railroad	Patriot Rail	Tennessee Southern Railroad Authority
TVRM	TVRM	Tennessee Valley Railroad Museum	Tennessee Valley Rail Museum	Hamilton County Railroad Authority
WHOE	Bedford County Railroad Authority	Walking Horse & Eastern Railroad		Bedford County Railroad Authority
WTNN	Kenton branch: WTNN Main line: leased from NS	West Tennessee Railroad Corp.		Gibson County Railroad Authority/ West Tennessee Railroad Authority

3.4 RAIL LINE ABANDONMENTS AND RAILS-TO-TRAILS PROGRAM

3.4.1 Rail Line Abandonments and Discontinuance of Service

As noted earlier, Tennessee's rail system mileage decreased under the ICC's oversight. Under STB oversight, the state's rail system has not experienced the previous rate of abandonments. Since 2005, there have been only seven rail abandonments in Tennessee, totaling 25.34 miles. Rail line abandonments in Tennessee are shown in Table 3-5. In addition, three lines have discontinued service over the same time period. Rail line discontinuance of service in Tennessee is shown in Table 3-6.¹²

49 USC 10903 grants the STB jurisdiction for the abandonment of rail lines and discontinuance of service by common carriers. Rail carriers must apply to the STB for permission to discontinue or abandon freight service on a line. The abandonment or discontinuance of service processes follow strict requirements and timelines to ensure that affected shippers and service areas are provided fair notice and response to applications.

49 CFR Part 1152 provides the procedures for the abandonment and discontinuance of service. The applicant must file a Notice of Intent prior to the official application. At this time the STB provides the docket number, which is used to track the application through the process. Next the applicant files the application for a 120-day review by the STB. During this time, a series of proceedings occur, including hearings, protests, comments, and replies. Requests for public use and trail use are done during these proceedings. One hundred and twenty days after the application is filed, the STB issues its decision.

¹² Surface Transportation Board Railroad Map Depot. <https://stb.maps.arcgis.com/home/webmap/viewer.html?webmap=75df-ce41d64f4f149404bac7e4e76439>

Table 3-5 STB Rail Line Abandonments in Tennessee (2005-2015)

Docket	Railroad	Length	County	State	Comments	Approved	Consummated
AB 33 (Sub-No. 258X)	Union Pacific Railroad Co.	2.61	Shelby	TN		2008	2010
AB 290 (Sub-No. 309X)	Norfolk Southern Railway Co.	0.66	Blount	TN		2009	2012
AB 55 (Sub-No. 699X)	CSX Transportation, Inc.	0.22	McMinn	TN		2009	2012
AB 290 (Sub-No. 280X)	Norfolk Southern Railway Co.; The Cincinnati, New Orleans & Texas Pacific Railway Company	1.1	Roane	TN	Line reclassified as private track.	2007	2007
AB 290 (Sub-No. 280X)	The Cincinnati, New Orleans, and Texas Pacific Railway Co.	1.1	Roane County	TN	Line reclassified as private track	2007	2007
AB 868 (Sub-No. 1X)	Mississippi Tennessee Holdings, LLC; Mississippi Tennessee Railroad, LLC	19.4	Hardeman; Tippah; Union	TN; MS	Mississippi Tennessee Holdings, LLC abandoned the line and Mississippi Tennessee Railroad, LLC discontinued service	2006	2007
AB 290 (Sub-No. 277X)	Norfolk Southern Railway Co.	0.25	Madison	TN		2007	2007
AB 290 (Sub-No. 355X)	The Cincinnati, New Orleans & Texas Pacific Railway Co	12.63	Scott	TN			
AB 1128X	Heritage Railroad Corp.	7.0	Anderson; Roane	TN	Proposal to abandon line, but continue contract carriage		

Table 3-6 STB Discontinuance of Service in Tennessee (2005-2015)

Docket	Railroad	Length	County	State	Comments	Approved	Consummated
AB 55 (Sub-No. 722X)	CSX Transportation, Inc.	4.85	Anderson	TN		2012	2012
AB 868 (Sub-No. 1X)	Mississippi Tennessee Holdings, LLC; Mississippi Tennessee Railroad, LLC	19.4	Hardeman; Tippah; Union	TN; MS	Mississippi Tennessee Holdings, LLC abandoned the line and Mississippi Tennessee Railroad, LLC discontinued service	2006	2007
AB 290 (Sub-No. 358X); AB 55 (Sub-No. 732X)	Norfolk Southern Railway Co.; CSX Transportation, Inc.	5	Claiborne; Bell	TN; KY		2013	2014

3.4.2 Rails-to-Trails and Rail Corridor Preservation

As mentioned before, governments or private organizations can file for interim trail use of the right-of-way during the abandonment and discontinuance of service process. Through negotiations with the railroad, the right-of-way can be transferred for interim trail use with an STB-issued Certificate of Interim Trail Use (CITU). The interim trail sponsor agrees to take full responsibility of the right-of-way, any legal liability, taxes, and future restoration of rail service (49 CFR Part 1152.29). This process is also known as rail-banking and is one option for rails-to-trails programs.

TDEC's Recreation Educational Services Division is the agency responsible for the Rails-to-Trails Program in Tennessee. This Program works with railroads, railroad authorities, local jurisdictions, and non-profits to preserve abandoned or inactive rail corridors. The rail right-of-way is converted to a trail or multi-use path for recreational use. In Tennessee, this is mainly achieved by purchasing previously abandoned railroad right-of-way. As of 2015, the Tweetsie Trail in Johnson City is the only Rails-to-Trails project that was rail-banked using the STB process. This is a great way to utilize existing infrastructure while maintaining connections, should future rail service be needed. There are currently 16 Rails-to-Trails in Tennessee, shown in Table 3-7.

Table 3-7 Summary of Rails-to-Trails Projects in Tennessee

Rail to Trail	Location	Line	Length	Planned
Betsy Ligon Park & Walking Trail	Erin, TN	L&N	2	Plans call for extending the trail to the town boundary and beyond
Brian Brown Memorial Greenway	Martin, TN	Seaboard System	1.1	The paved trail will soon be extended eastward on the out-of-service rail line to downtown Martin
Clarksville Greenway	Clarksville, TN	Tennessee Central	4.6	None
Cumberland River Bicentennial Trail	Ashland City, TN	Tennessee Central	6.5	None
Guild-Hardy Trail	Lookout Mountain, TN	Chattanooga & Lookout Mountain Railway	5	None
Mountain Goat Trail	Sewanee, TN	Sewanee Mining Company rail (later to become CSX)	1.8	There are plans to continue the Mountain Goat Trail another 14 miles, from Sewanee through Monteagle to Tracy City.
Richland Creek Greenway	Nashville, TN	CSX	5	Rail history buffs will want to stop at the White Bridge Road trailhead, where there is a historical marker for Dutchman's Curve, the site of the Great Train Wreck of 1918, one of the worst rail accidents in the country's history.
Riverbluff Walkway	Memphis, TN	MATA Trolley-Riverfront Loop	1.2	None
Shelby Farms Greenline	Memphis, TN	CSX	6.7	None
South Carthage Rail Trail	Carthage, TN	Carthage Branch of the Tennessee Central Railroad	2	None
Tennessee Central Heritage Rail Trail	Monterey, TN	NERR	0.5	Will eventually run 19 miles alongside refurbished railroad tracks from Cookeville to Monterey.
Tweetsie Trail	Johnson City, TN to Elizabethton, TN	ET&WNC	9.7	Future phases will continue the trail east through downtown Elizabethton to its end on Stateline Road near the Betsytowne Shopping Center.
Upland Trail	Clarksville, TN	Tennessee Central	0.6	None
V&E Greenline	Memphis, TN	L&N	1.7	None
Wes Davis Greenway (Bristol)	Bluff City, TN	Southern	0.8	There are plans to link the rail-trail with another that runs from the TN/VA border in Bristol, VA, to Mendota, VA.
Wolftever Creek Greenway	Collegedale, TN	NS	2.9	Future plans to extend the trail will include a Robinson Farm connection
Eureka Trail	Athens, TN	CSX	4.8	Gravel trail that will eventually connect Athens to nearby Englewood

3.5 MAJOR FREIGHT TERMINALS

Rail freight terminals are locations where rail freight can be loaded, unloaded, or transferred. Rail freight terminals can include classification yards, intermodal facilities, and transload facilities. Rail classification yards are locations where freight cars are stored, sorted, and assembled into trains according to their destination. Intermodal rail terminals are facilities where large freight, generally in shipping containers, is transferred between rail and other modes. Intermodal rail transfers occur between rail and either highway or water modes. Transload facilities allow for transfer of bulk commodities between rail and highway modes.

3.5.1 BNSF Facilities

BNSF has one intermodal yard in the state, Memphis Intermodal Facility, and one major classification yard at the same location, Tennessee Yard. BNSF offers two automotive facilities at Yale Yard in Memphis and Memphis Intermodal Facility-Tennessee Yard.

3.5.2 CN Facilities

CN has one intermodal yard in the state that is co-operated with CSX in Memphis' Intermodal Gateway at Frank C. Pidgeon Industrial Park. They also operate two CargoFlo® (transload distribution service for bulk goods) transloading terminals, one at Harrison (Johnston) Yard in Memphis and the other in the RidgePort Logistics Center. RidgePort Logistics Center is also located in Frank C. Pidgeon Industrial Park. CN also serves International Port of Memphis' Presidents Island.

3.5.3 CSX Facilities

CSX has two intermodal yards in the state. One is in Nashville's Radnor Yard and the other is co-operated with CN in Memphis' Intermodal Gateway at Frank C. Pidgeon Industrial Park. They also operate three TRANSFLO® (subsidiary of CSX) bulk transfer terminals in Nashville, Chattanooga, and Knoxville. CSX offers four TDSI® (Total Distribution Services Inc., subsidiary of CSX) auto distribution terminals in Memphis, Nashville, Spring Hill, and Smyrna. Two of CSX's major rail classification yards are in Nashville and Erwin. CSX also serves a terminal at the International Port of Memphis Dock in Helena, Arkansas.

3.5.4 NS Facilities

NS has two intermodal yards in the state. One is in Memphis' Forrest Yard and the other the Rosville Intermodal Terminal outside of Memphis. It also has one major classification yard in Chattanooga, DeButts Yard. They also operate three Thoroughbred Bulk Transfer (TBT®) transloading terminals. Two are in Chattanooga and one is in Knoxville. NS offers two auto distribution terminals in Memphis and on-site at Chattanooga's Volkswagen Plant. NS also serves a terminal at the International Port of Memphis Dock in Helena, Arkansas.

4. EXISTING PASSENGER RAIL SYSTEM

Passenger rail service comes in different forms based on the type of technology employed, frequency, travel speed, and station spacing. Passenger rail transit provides service within major metropolitan areas with a focus on commuters. Local passenger rail transit typically travels in the downtowns of major urban areas, with many stops and lower speeds. Regional commuter rail transit travels longer distances to connect suburban areas to central business districts. They typically have fewer stops and higher speeds. Passenger rail transit varies in service type, from a network of subway lines connecting throughout a city, to a single line providing peak hour service. Intercity passenger rail typically travels long distances at higher speeds, connecting major destinations with few stops. In the U.S., intercity passenger rail typically runs on the same track with freight rail, but it can operate on its own dedicated guide way. Several types of passenger rail service relevant to Tennessee are discussed below.

4.1 TYPES OF PASSENGER RAIL SERVICE

4.1.1 Trolley

A tram, streetcar, or trolley system is a rail-based transit system that runs mainly or completely along streets with relatively low capacity and frequent stops. Passengers usually board at street- or curb-level, but some also allow for level boarding. This service typically operates with single-car trains powered by overhead catenaries or underground cables. In Tennessee, the Memphis Area Transit Authority (MATA) has historically operated heritage trolleys on Main Street, Front Street, and Madison Avenue. MATA discontinued trolley operations in late 2014 due to a series of three fires on their trolleys. Since that time MATA has been working toward safety recertification of their trolley system in cooperation with TDOT and FTA. Other than resumption of service in Memphis, there are no other streetcar systems planned in Tennessee at this time.

4.1.2 Incline Railway- Funicular

A funicular is a rail-based transit system that moves tram-like vehicles up and down steep slopes using a cable to counterbalance the ascending and descending vehicles. The Chattanooga Area Regional Transportation Authority (CARTA) operates the Lookout Mountain Incline Railway. There are no other funiculars planned in Tennessee at this time.

4.1.3 Light Rail

Light rail is a rail-based transit system that has both higher capacity and speed than a streetcar. Light rail systems vary significantly in terms of speed and capacity, ranging from infrequent, peak hour based systems to systems that are essentially rapid transit with level crossings. They are characterized by one or two car trains operating on fixed rails in shared or exclusive right-of-way (ROW). The stations can have low or high platform loadings and the vehicle power is drawn from an overhead electric line. There are approximately 25 light rail systems in the U.S., with none currently in Tennessee. Let's Move Nashville was a local referendum in Nashville that would have funded a light rail system and other transit improvements. The plan was based on the recommendations of nMotion, a 2016 regional transit strategic plan. Let's Move Nashville was defeated by voters on May 1, 2018.

4.1.4 Commuter Rail

Commuter rail (also known as a regional rail, suburban rail, or local rail) system operates on mainline trackage that may be shared with intercity rail and freight trains. Commuter rail systems tend to operate at lower frequencies than light rail transit systems, but tend to travel at higher speeds and cover longer distances. Commuter rail can use an electric or diesel-propelled railway for urban

passenger train service consisting of local, short-distance travel operating between a central city and adjacent suburbs. Service must be operated on a regular basis by, or under contract with, a transit operator for the purpose of transporting passengers within urbanized areas or between urbanized areas and outlying areas. Such rail service is generally characterized by multi-trip tickets, specific station to station fares, and usually only one or two stations in the central business district. There are around 30 commuter rail systems in the U.S., including one in Tennessee (American Public Transportation Association, 2018). The Middle Tennessee Regional Transportation Authority (RTA) started the Music City Star (more detail below) commuter rail service in 2006. RTA is currently studying the Northwest corridor (Nashville to Clarksville) for possible commuter rail service. The city of Chattanooga received a TIGER IV grant to study the possibility of a rail transit line from downtown Chattanooga to the Chattanooga Municipal Airport and other large business centers in the area. It has not been determined what type of rail transit would be used, but it is likely to utilize existing freight rail tracks.

Transit Solutions Group LLC (TSG) operates passenger service under contract with RTA and the Nashville & Eastern Railroad Authority. Beginning in 2006, the Music City Star commuter train operates weekday service between Lebanon and Nashville on the Nashville & Eastern Railroad (NERR) mainline. The schedule is shown in Table 4-1. This route generally follows I-40 east of Nashville. Serving around 1,000 passengers daily, the Music City Star has six stations as identified in Figure 4-1: Riverfront, Donelson, Hermitage, Mt. Juliet, Martha, and Lebanon¹³. A seventh station at the 220-acre Hamilton Springs transit oriented development is scheduled to open in 2018.

Figure 4-1 Music City Star Route and Stations



13 National Transit Database Website. <http://www.ntdprogram.gov>

Table 4-1 Music City Star Schedules

TRAIN SCHEDULES						
■ A.M. ■ P.M.						
TRAIN NUMBER	TO NASHVILLE (MONDAY - FRIDAY)					
	Lebanon	Martha	Mt. Juliet	Hermitage	Donelson	Riverfront
150	5:45	5:56	6:05	6:12	6:20	6:35
152	6:40	6:51	7:00	7:07	7:15	7:30
154			7:45	7:52	8:00	8:15
156	3:20	3:31	3:40	3:47	3:55	4:10
158	3:55	4:06	4:15	4:22	4:35	4:50
160			5:00	5:07	5:20	5:35
FRIDAY NIGHTS ONLY						
162	6:40	6:51	7:00	7:08	7:15	7:30
TRAIN NUMBER	FROM NASHVILLE (MONDAY - FRIDAY)					
	Riverfront	Donelson	Hermitage	Mt. Juliet	Martha	Lebanon
151	6:58	7:09	7:22	7:32		
153	7:45	7:56	8:09	8:17	8:26	8:40
155	8:25	8:36	8:43	8:51	9:00	9:15
157	4:20	4:32	4:39	4:49		
159	5:05	5:17	5:24	5:32	5:41	5:55
161	5:45	5:57	6:04	6:12	6:21	6:35
FRIDAY NIGHTS ONLY						
163	10:30	10:42	10:49	10:57	11:06	11:20

Source: <http://www.musiccitystar.org/Middle-TN-RTA-schedules.asp> (1/18/18)

4.2 INTERCITY PASSENGER RAIL

In the U.S., intercity passenger rail was once the predominant mode of travel. It provided cross-country passenger transportation on the same private railroad lines that were used for freight. As a result of the nation's reliance on automobiles and increasing popularity of airplane travel that led to the declining use of passenger trains, Congress passed the Rail Passenger Service Act of 1970. This legislation established the National Railroad Passenger Corporation (Amtrak) to take over the intercity passenger rail service that had been operated by private railroads. Amtrak began service in 1971, serving 43 states with a total of 21 routes. In 2008, Congress passed the Passenger Rail Investment and Improvement Act (PRIIA). This Act set out to create a vision for the next phase of intercity passenger rail service in the U.S.

TDOT has partnered with its surrounding states to study the potential for connecting both conventional and high speed rail service to major cities in Tennessee. The Virginia Statewide Rail Plan identified a link from Roanoke to Bristol as a possible addition for Amtrak to consider. Georgia and Kentucky Statewide Rail Plans and USDOT's vision include a potential high-speed rail corridor from Atlanta to Louisville via Chattanooga and Nashville. The Arkansas Statewide Rail Plan identified the corridor connecting Little Rock and Memphis as a consideration for high-speed rail.

Headquartered in Washington, D.C., the Amtrak network encompasses approximately 49 routes comprised of 21,200 route miles in 46 states, Washington, D.C., and Canada. Amtrak serves more than 500 destinations, carrying nearly 30.2 million riders annually¹⁴.

14 Amtrak: America's Railroad, 2012 System Statistics and Achievements. <http://www.amtrak.com/ccurl/640/872/System-Stats-Achievements-2012.pdf>

Seventy percent of Amtrak routes operate on private railroad tracks through trackage rights agreements. Figure 4-2 shows Amtrak's National network.

Figure 4-2 AMTRAK Network



One Amtrak route currently provides service to Tennessee. The City of New Orleans operates a daily train on the Canadian National line between New Orleans, LA and Chicago, IL via Jackson, MS, Memphis, TN, and Carbondale, IL, stopping at intermediate stations and smaller communities along the way, as shown in Figure 4-3. Tennessee has stops in Newbern-Dyersburg and Memphis. Table 4-2 provides the current schedule for the City of New Orleans (overnight stops in TN). The name of the route comes from the famed predecessor Illinois Central train of the same name, about which a famous folk song was also written by Steve Goodman and recorded by Arlo Guthrie. The City of New Orleans train normally operates with a consist of seven cars including a Transition Dorm/Sleeper, a Superliner Sleeping Car, a Cross Country Café, a Sightseer Lounge Car, and three Superliner Coaches (one of which is a baggage coach). The train operates over a distance of 934 miles almost exclusively over track owned and dispatched by the Canadian National railroad. It also operates on a short Amtrak-leased and dispatched segment within the New Orleans area and an Amtrak-owned segment in the Chicago area¹⁵.

Figure 4-3 Tennessee Amtrak Routes



Source: <http://www.amtrak.com/pdf/factsheets/TENNESSEE13.pdf>

¹⁵ Amtrak PRIIA Section 210 FY12 Performance Improvement Plan. <http://www.amtrak.com/ccurl/676/676/PRIIA-section-210-FY-12-performance-improvement-plan-amtrak,0.pdf>

Table 4-2 Current Schedule for the City of New Orleans Amtrak Route

City of New Orleans	◀ Train Name ▶		City of New Orleans
59	◀ Train Number ▶		58
Daily	◀ Normal Days of Operation ▶		Daily
	◀ On Board Service ▶		
Mile		Symbol	
0	Dp	CHICAGO, IL (CT) --Union Station --Madison--see back	Ar
24		Homewood, IL (METRA/IC Line)	
57		Kankakee, IL	
82		Gilman, IL	
115		Rantoul, IL	
129		CHAMPAIGN-URBANA, IL --Davenport, Indianapolis--see back	
173		Mattoon, IL (Charleston)	
200		Effingham, IL	
253		Centralia, IL	
289		Du Quoin, IL	
309	Ar	CARBONDALE, IL --St. Louis, Kansas City--see back	Dp
406		Fulton, KY	
442		Newbern-Dyersburg, TN	
528	Ar	MEMPHIS, TN	Dp
654		Greenwood, MS	
706		Yazoo City, MS	
751		JACKSON, MS --Mobile, Dallas--see back	
784		Hazlehurst, MS	
805		Brookhaven, MS	
828		McComb, MS	
881		Hammond, LA	
934	Ar	NEW ORLEANS, LA (CT) --Union Passenger Terminal --Baton Rouge, Montgomery, Mobile--see back	Dp

Source: <http://www.amtrak.com/pdf/factsheets/>

4.3 TOURIST/EXCURSION TRAINS

4.3.1 Southern Appalachia Railway Museum (SARM)

Until late 2015 the SARM sponsored the operation of the Secret City Excursion train in Oak Ridge, TN, a scenic and historic rail service, which operated many times throughout the year. The train was operated and maintained by a group of volunteers of all ages and professions along the Heritage Railroad. The Operating Agreement between the Heritage Railroad and SARM was not renewed and excursions were discontinued in May 2016.

4.3.2 Tennessee Central Railway Museum (TCRM)

TCRM operates an excursion train twice monthly on Saturdays along the Nashville & Eastern Railroad. They pay trackage rights to Nashville & Eastern Railroad for use of the line. Leaving from the Museum site at 220 Willow Street, destinations vary between Watertown, Del Monaco Winery, Monterey, Cookeville, and Lebanon. The trips are roundtrip and range between 25 minutes to 11 hours. TCRM averages approximately 13,600 passengers annually.

4.3.3 Tennessee Valley Railroad Museum (TVRM)

TVRM operates excursion trains on Fridays, Saturdays, and Sundays. Leaving from Chattanooga Grand Junction at 4119 Cromwell Road, they have 13 different excursions that use TVRM, ECTB (East Chattanooga Belt), CCKY (Chattanooga and Chickamuga), and NS tracks. Leaving from Etowah Station at 727 Tennessee Avenue South, they have two different excursions that use Tennessee Overhill Heritage Association's tracks for which they pay trackage rights.

4.3.4 Three Rivers Rambler (3RR)

The Knoxville and Holston River Railroad operates the Three Rivers Rambler, a scenic train ride in Knoxville, Tennessee along the Tennessee River. The ride starts at the boarding area in Volunteer Landing in the downtown riverfront area in Knoxville. It continues five miles out to Marbledale Quarry, where it turns around and returns to Knoxville. The trip takes an average of 90 minutes. 3RR operates on a seasonal weekend basis with four themed trains and averages approximately 5,000 passengers annually.

4.4 MAJOR PASSENGER TERMINALS

Rail passenger terminals, or stations, are locations where rail passengers board, disembark, transfer, and wait for trains. In addition to serving as terminals for passengers, rail stations also serve as gateways for the cities in which they are located. Rail stations are centers for activity and can spur economic development and historic preservation. Amenities provided at passenger stations can include parking, ticketing, connections to other modes, concessions, and many other services.

4.4.1 Amtrak Stations

Newbern Station

Tennessee has stops in Newbern-Dyersburg and Memphis following US-51. The Newbern-Dyersburg station (NBN) is an unstaffed flag stop, where passengers can get on or off a train, but cannot purchase tickets or get baggage services. It is located in a former Illinois Central Railroad depot, built in 1920¹⁶.

Memphis Central Station

The Memphis Central Station (MEM) is a full service station, offering ticketing and baggage service. It was built on the site of a former station known as Calhoun Street Station in 1914 and was recently renovated in 1999¹⁷. Currently MEM serves connections to five local bus routes and two trolley lines. It offers 413 parking spaces and bike parking facilities.

Recently, MEM has announced their plans for a \$55 million redevelopment project. Of the \$55 million, \$52 million would be private investment. The remaining \$3 million will be provided by FTA. A required \$600,000 local match from the city could include capital funding and donated or philanthropic grants. The proposal includes replacing existing apartments in the train station building with a boutique hotel, building a 5-screen movie theater onto the power house building, and possibly adding a new downtown grocery store. Redevelopment of Central Station was completed in 2019.

4.4.2 Rail Transit Stations

Music City Star Stations

Riverfront Station

Riverfront Station is the destination station for the Music City Star regional train. It is located at 108 1st Avenue South in downtown Nashville at the foot of Broadway, adjacent to the Flag Court and the Shelby Street Pedestrian Bridge. The station does not include parking facilities; however, space is incorporated into the facility to accommodate efficient connections between regional rail and MTA bus services. Complimentary bus service is provided from the station to nearby areas.

¹⁶ Visitors Guide to the Middle Mississippi River Valley Website. <http://greatriverroad.com>

¹⁷ Amtrak Website. http://www.amtrak.com/servlet/ContentServer?pagename=am/am2Station/Station_Page&code=MEM#

Donelson Station

Donelson Station is located at 2705 Lebanon Pike. It is directly north of the intersection of Donelson Pike and Bluefield Avenue and is adjacent to Fifty Forward with direct access to the park & ride lot from Donelson Pike. Route 6-Lebanon Pike and Route 34-Opry Mills buses operated by the Nashville MTA also serve the park & ride lot. Approximately 230 parking spaces are provided at this station. RTA has an interest in creating a transit oriented development at this station. Pennrose Properties was recently selected to negotiate a contract for development of a 5.1 acre transit-oriented development around the Donelson train station.

Hermitage Station

Hermitage Station is located at 4121 Andrew Jackson Parkway. It is directly off of Andrew Jackson Parkway near Old Hickory Boulevard. Route 6-Lebanon Pike buses operated by the Nashville MTA also serve the park & ride lot. Approximately 280 parking spaces are provided at this station.

Mt. Juliet Station

Mt. Juliet Station is located at 22 East Division Street. Approximately 220 parking spaces are provided at this station and have direct access from Division Street. RTA has entered negotiations with a private sector developer to explore transit oriented development opportunities around the station that can generate long-term revenue in support of the Music City Star operation.

Martha Station

Martha Station is located at 65 Martha Circle (State Route 109 and Powell Grove Road) in Lebanon. It opened as a temporary station when Music City Star service first began due to pending track realignment for improvements to Highway 109. Construction of the permanent station began in December 2009 and was completed in February 2011. Approximately 74 parking spaces are provided at this station.

Hamilton Springs Station

Construction of the Hamilton Springs station began in 2017 and is expected to be completed in early 2018. The station will serve Tennessee's first transit oriented development (TOD). At build-out, Hamilton Springs is projected to have approximately 980 permanent jobs and over 6,000 new residents living within a half mile of the proposed multimodal station. Hamilton Station Boulevard and the proposed greenway will provide multimodal connections to the existing neighborhoods where 556 workers currently reside within a one-mile radius of the proposed station. The final deliverable will be a permanent operational station. By creating a new point of access to the existing commuter rail, total new ridership is expected to reach 10,000 in the first year and expand to over 123,000 by the twentieth year of the proposed station's operation. Construction of the station began in May 2017 with completion planned for 2018.

Lebanon Station

Lebanon Station is the origination point for the Music City Star regional train. It is located at 334 W. Baddour Parkway. Early morning train service begins here and makes stops at the other stations along the route before arriving at Riverfront Station in downtown Nashville. Lebanon Station is located on an old factory site, which is bordered by Baddour Parkway, Greenwood Street, and Hill Street. Approximately 140 parking spaces are provided at this station with direct access off of Baddour Parkway.

4.5 PASSENGER RAIL SERVICE OBJECTIVES

Since TDOT does not own or operate any of the intercity or commuter passenger rail services in the state, the Department does not have direct control over the services. The City of New Orleans is a long distance service, operated by Amtrak over CN track, and the Music City Star is commuter rail, operated by RTA over NERA track. However, TDOT still supports passenger rail service in Tennessee,

noting that providing mobility choices for residents strengthens the overall transportation system. This can be seen in the goals and objectives established in this plan. TDOT can and does help Amtrak and RTA achieve their desired service objectives if they align with the SRP goals and objectives, to the extent that funding is available.

4.6 PERFORMANCE EVALUATION OF PASSENGER RAIL SERVICES

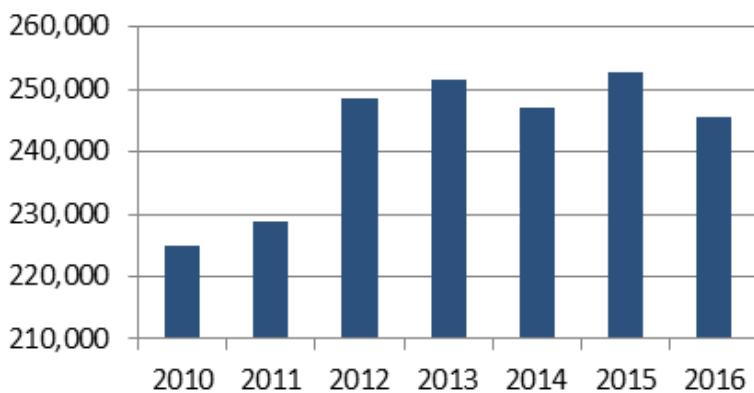
This section provides an overview of performance metrics for passenger rail in Tennessee. This includes discussions on both commuter and intercity passenger rail. The intercity passenger rail section fulfills the PRIIA requirement for the reporting of performance measures.

4.6.1 Intercity Passenger Rail Performance

Ridership

In 2015, the City of New Orleans had 255,458 passengers¹⁸. Figure 4-4 shows that ridership for this route has been increasing over the past seven years.

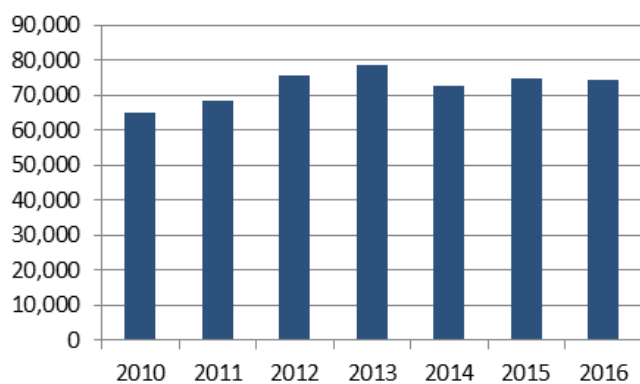
Figure 4-4 Annual Passengers for the City of New Orleans



Source: http://media.amtrak.com/wp-content/uploads/2015/10/Updated_FY15Ridership_Revenue_Fact_Sheet_7-7-16.pdf

In 2013, the City of New Orleans had 78,675 boardings and alightings at Tennessee stations. Over 94.6 percent of them were in Memphis. An additional 83,420 passengers passed through the state with origins and destinations elsewhere.¹⁹ Figure 4-5 shows that ridership for Tennessee stations has levelled off the past three years.

Figure 4-5 Annual Boardings and Alightings at Amtrak Stations in Tennessee



¹⁸ National Association of Railroad Passengers Website, Ridership Statistics. <http://www.narprail.org/uploads/3/0/4/0/30401991/trains.pdf>

¹⁹ National Association of Railroad Passengers Website, Ridership Statistics. <http://www.narprail.org/uploads/3/0/4/0/30401991/states.pdf>

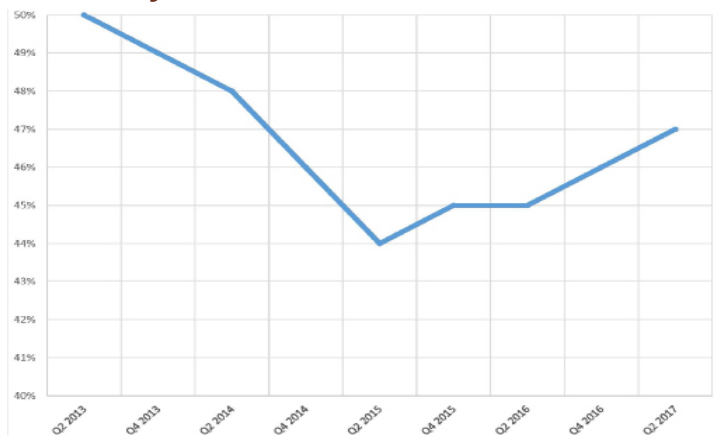
City of New Orleans Route Metrics

Under Section 207 of PRIIA, the Tennessee Rail Plan must include a performance evaluation of the passenger services operating in the state according to metrics established under PRIIA and by the FRA. The FRA publishes quarterly performance and service quality reports²⁰ for all Amtrak routes using metrics established under Section 207 of PRIIA. This evaluation looks at the following factors:

Farebox Recovery

Fully-Allocated Operating Costs include direct, shared, and overhead costs that were allocated to an Amtrak route. Direct costs include costs directly associated with operating a route, such as labor, fuel, commissary, and equipment maintenance costs. Shared costs are cost categories that benefit more than one route. Examples of shared costs are shared stations and marketing costs. Overhead costs are the general and administrative, maintenance, and crew overhead. Passenger-Related Revenue is comprised of Net Ticket Revenue plus Food and Beverage Revenue. The City of New Orleans is not a state-supported route, so the values shown do not include the subsidies that are provided from State-Supported routes. The system that generated this metric is the Amtrak Performance Tracking system (APT), a component of the SAP Enterprise Resource (SAP) system that Amtrak uses for financial and managerial accounting. Because this metric looks at Operating Costs, Capital Charges (Depreciation and Interest) are not included. This metric is reported for each route in Amtrak's System. Shown in Figure 4-6, the City of New Orleans covers between 44 and 50 percent of fully-allocated costs with passenger related revenue.

Figure 4-6 Percent of Fully Allocated Operating Costs Covered by Passenger-Related Revenue on the City of New Orleans Route



Adjusted (Loss) per Passenger-Mile

Adjusted (Loss) is defined as Net Operating Loss (before net interest expense) less Depreciation, Other Post-Employment Benefits (OPEB's), and Project costs covered by capital funding. A Passenger-Mile is defined as one passenger traveling one mile; for example, 10 passengers, each traveling 100 miles, would generate 1,000 passenger-miles. The Adjusted (Loss) per Passenger-Mile for the City of New Orleans is shown in Figure 4-7. In order to make the revenue and cost figures for this metric comparable to earlier years, the U.S. Office of Management and Budget (OMB's) GDP Chain Deflator is being applied. This metric is reported at the Amtrak Corporate level.

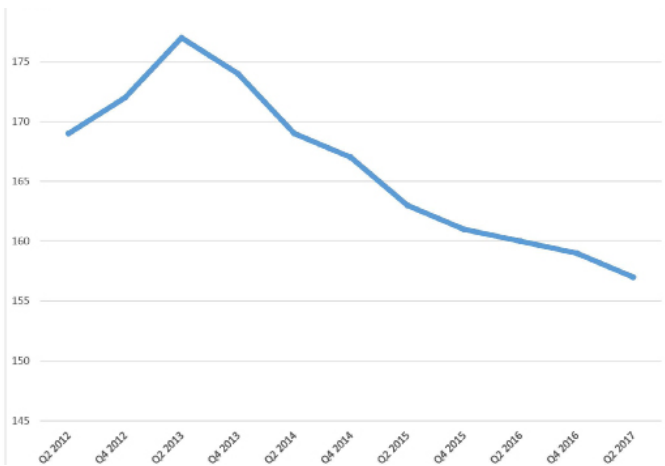
Figure 4-7 Adjusted Loss per Passenger Mile for the City of New Orleans Route



Passenger-Miles per Train-Mile

Similar to a Passenger-Mile, a Train-Mile is one train moving one mile. For each route, therefore, the Passenger-Miles per Train-Mile is the total passenger-miles divided by the total train-miles. This metric depicts the average passenger loading on a route's trains over the course of the period. Figure 4-8 shows the historic Passenger-Miles per Train-Mile values for the City of New Orleans.

Figure 4-8 Passenger-Miles per Train-Mile for the City of New Orleans



On-Time Performance (OTP)

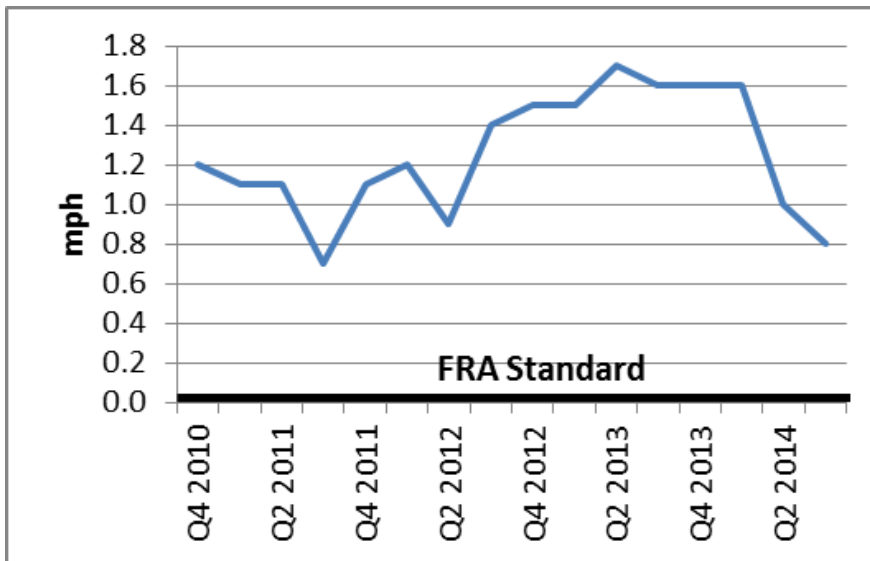
This congressionally-mandated metric consists of three tests - change in effective speed, endpoint on-time performance, and all-stations on-time performance. The standards apply to the route and therefore combine trains in opposite directions.

Effective Speed

Effective Speed is a metric that uses the scheduled departure time from the origination point of a train, the actual arrival time of that train at the scheduled endpoint, and the normal mileage that the train operates between the normal scheduled origination and arrival points. Calculations are performed using the above parameters on each train that operated in FY 2008 to establish a baseline Effective Speed for the train. Calculations are then performed using the above parameters on each train that operated during the last 12 months to determine the current Effective Speed. A

comparison is then completed for each train to determine the actual deviation between the current Effective Speed and the baseline Effective Speed. The standard is that the Effective Speed for each four-quarter period be equal or better than the FY 2008 Baseline Effective Speed. The City of New Orleans typically meets this metric standard with the exception of the second quarter of 2017, as shown in Figure 4-9.

Figure 4-9 Increased Effective Speed Compared to FY 2008 Baseline for the City of New Orleans



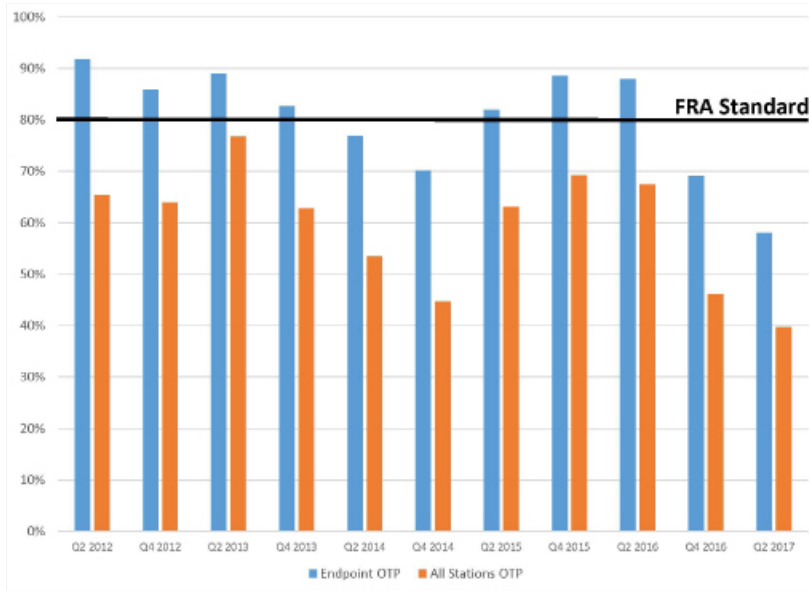
Endpoint On-Time Performance

Endpoint OTP measures how a train actually performs by comparing the published schedule at the final destination station to the actual arrival at the final destination station. A measured arrival at each station may be considered an "instance;" if a route offers one round trip per day, then it would generate two "instances" per day and 60 instances in a 30-day month. Each instance that deviates from schedule by 30 minutes or less is considered "on time." For each route, the total number of "on time" instances is divided by the total number of instances for the measurement period and expressed as a percent to derive Endpoint OTP. The standard for Endpoint OTP is above 80 percent for the City of New Orleans. As is evident in Figure 4-10, this standard is not consistently met under current operations.

All-Stations On-Time Performance (OTP)

All Stations OTP is a measure that compares actual performance data to the published schedule at each station from the origin station to the final destination station. The metric for OTP uses the actual departure time at the origin point of a train and the actual arrival time at each passenger station along the train route for all operations of a train for the measurement period. Each measured departure or arrival at each station may be considered an "instance;" if a route offers one round trip per day, serving 10 stations each way, then it would generate 20 "instances" per day, and 600 instances in a 30-day month. Each instance that deviates from schedule by 15 minutes or less is considered "on time." If there is no time recorded at a station for a train and date, that instance is excluded from the calculations. For each route, the total number of "on time" instances is divided by the total number of instances for the measurement period and expressed as a percentage to derive All-Stations OTP. The standard for All-Stations OTP is above 80 percent for the City of New Orleans. This metric standard is not met under current operations, as illustrated in Figure 4-10.

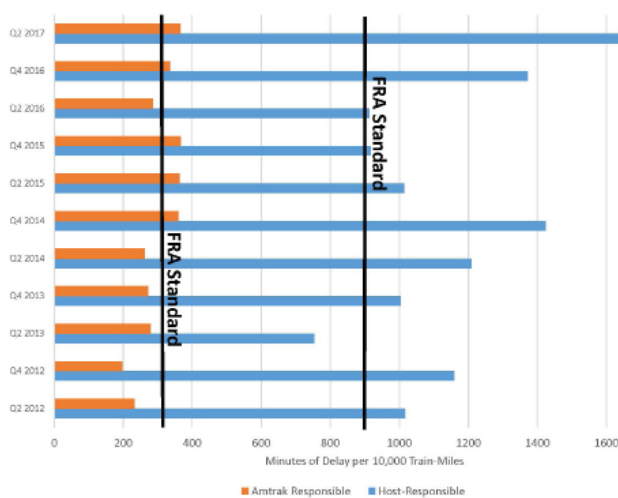
Figure 4-10 On-Time Performance, for the City of New Orleans



Train Delays

This congressionally-mandated metric measures the amount of time trains are delayed and the responsibility of such delay. The metric is calculated as minutes delayed per 10,000 train-miles of the specific route. Delays are categorized as Host Responsible if the Amtrak Conductor Delay Report is coded as Freight Train Interference, Slow Orders, Signals, Routing, Maintenance of Way, Commuter Train Interference, Passenger Train Interference, Debris Strikes, Catenary or Wayside Power System Failure, or Detours. Delays are categorized as Amtrak Responsible if the Amtrak Conductor Delay Report is coded as Passenger-Relate, Car Failure, Cab Car Failure, Connections, Engine Failure, Injuries, Late Inbound Train, Services, System, or Other Amtrak-Responsible. The standard for Host Responsible delays is below 900 minutes per 10,000 train-miles. The standard for Amtrak Responsible delays is below 325 minutes per 10,000 train-miles. As shown in Figure 4-11, the metric for Amtrak Responsible delays on the City of New Orleans route generally meet the standard; however, the metric for Host Responsible delays frequently does not meet the standard.

Figure 4-11 Train Delays, for the City of New Orleans



Customer Satisfaction Indicator

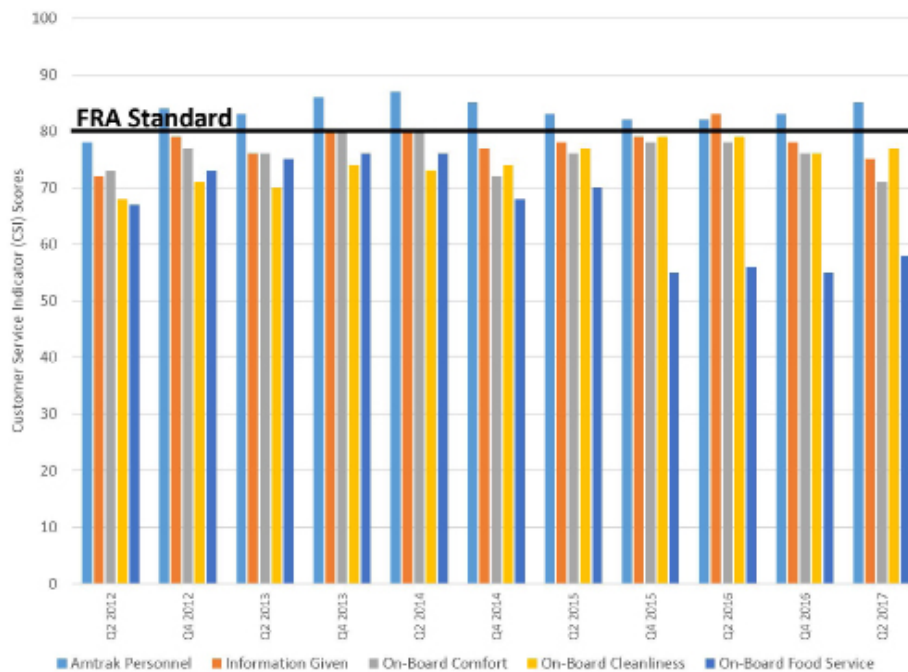
Amtrak conducts regular surveys of passengers, asking them to rate their satisfaction of the train travel experience in areas including overall service, Amtrak personnel, information given, on-board comfort, on-board cleanliness, and on-board food service. The metric is calculated by the percent of passengers indicating they are "Very Satisfied" for each category. "Very Satisfied" with the service

quality is defined as a score in the top three steps on a scale of 11 evaluation ratings that respondents can ascribe to each facet of the service. The categories surveyed include:

- Overall Service is the measure for the respondents rating their overall trip experience.
- Amtrak Personnel is the measure for the respondents rating Amtrak reservations personnel, station personnel, train crew, and on-board service crew.
- Information Given is the measure for the respondents rating all information they received pertaining to their trip.
- On-Board Comfort is the measure for the respondents rating seat or sleeping compartment comfort, air temperature, and ride quality.
- On-Board Cleanliness is the measure for the respondents rating the cleanliness of the train and on-board restrooms.
- On-Board Food Service is the measure for the respondents rating the quality of the food and snacks purchased on-board the train.

The FRA standard for overall customer satisfaction is above 82 and above 80 for all other categories. The metric for overall customer satisfaction on the City of New Orleans route hovers around the standard, but many of the individual categories consistently do not meet the standard (Figure 4-12).

Figure 4-12 Service Quality in Different Categories, For the City of New Orleans



4.6.2 Rail Transit Performance

RTA's Music City Star

In 2014, the Music City Star had 492,132 boardings and alightings, and almost half of them were at the Riverfront Station. Figure 4-13 shows the distribution of boardings by station. In 2014, annual ridership for the Music City Star was 246,066. Figure 4-14 shows that the ridership remains consistent with a peak in 2012. In 2014, the average service frequency for the Music City Star was 44 minutes.

Figure 4-13 Average Weekday Boardings by Station (2017)

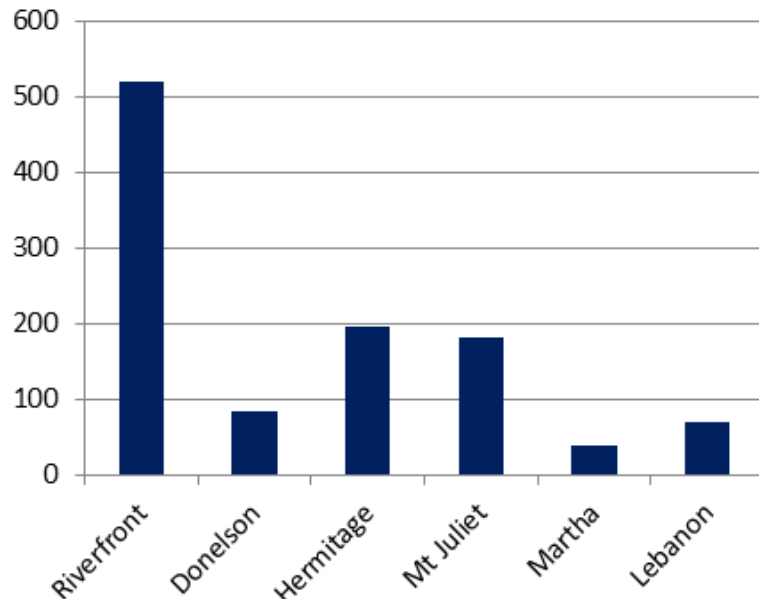
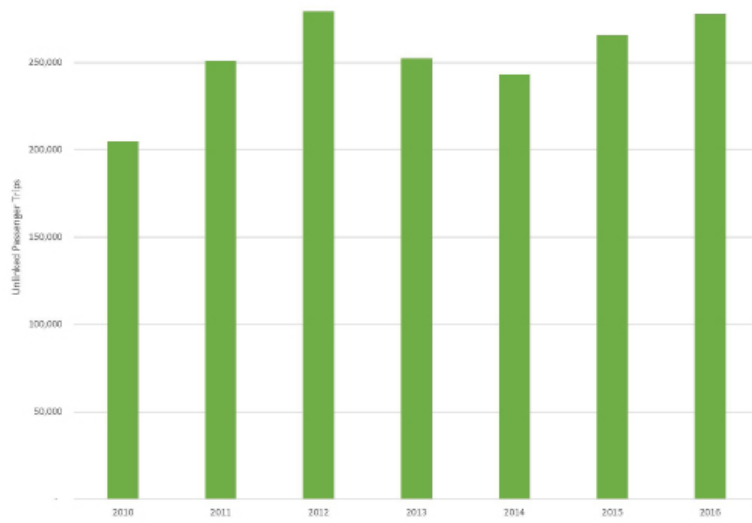


Figure 4-14 Annual Ridership

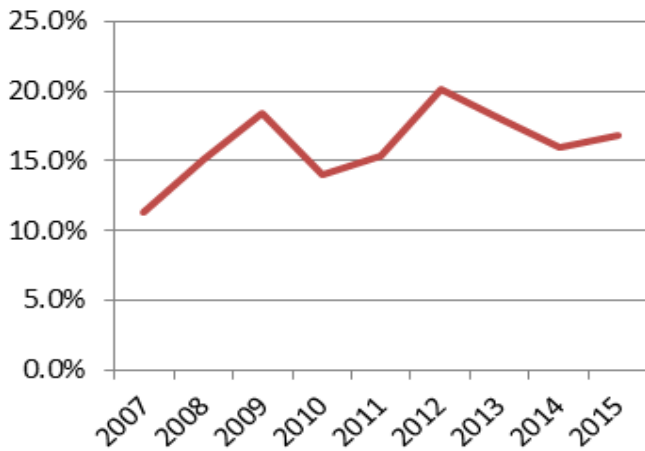


Source: National Transit Database Tables

Operating Expenses Covered by Fare Revenues

This metric looks to see how the route is operating financially by comparing the costs associated with providing the service with the amount of revenue collected from passengers. Ideally the expenses would rise at a low and steady rate, being outpaced by fare revenues from an increase in ridership. As shown in Figure 4-15, the Music City Star saw a peak of 20.1% in this metric in 2012, while in 2015 the number started to rise once more after a two year decline.

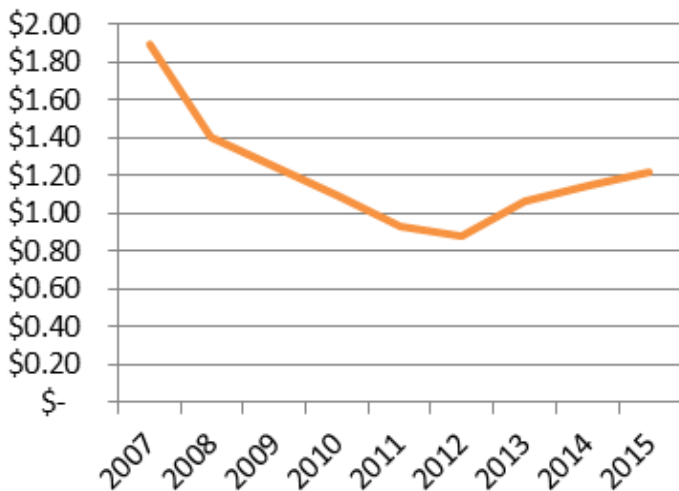
Figure 4-15 Percentage of Operating Expenses Covered by Fare Revenue



Operating Expense per Passenger-Mile

This metric looks to see how the route is operating financially by comparing the costs associated with providing the service with the number of passenger-miles provided. Ideally the expenses fall as efficiencies in service allow for the movement of more passengers for less investment per passenger. As shown in Figure 4-16, the Music City Star saw a decrease of over \$1.00 per passenger mile from 2007 to 2012. Since 2012, this metric has risen to \$1.22 as of 2015.

Figure 4-16 Operating Expense per Passenger-Mile on the Music City Star



MATA's Trolley

Figure 4-17 Unlinked Passenger Trips on MATA's Trolley System: 1994-2014

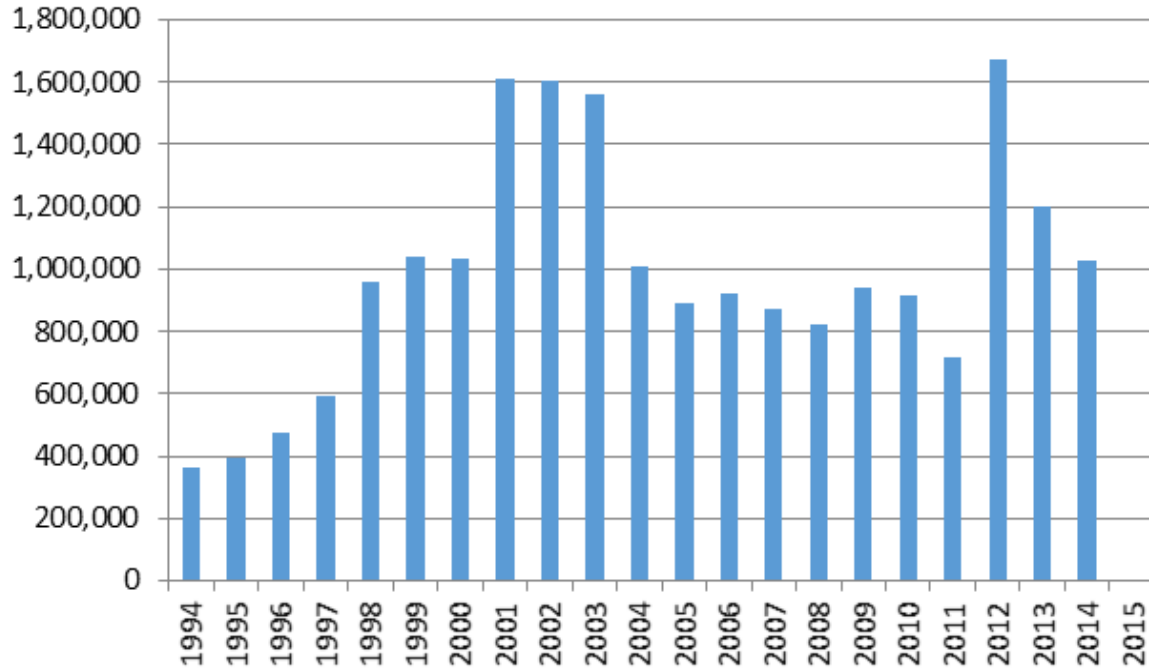
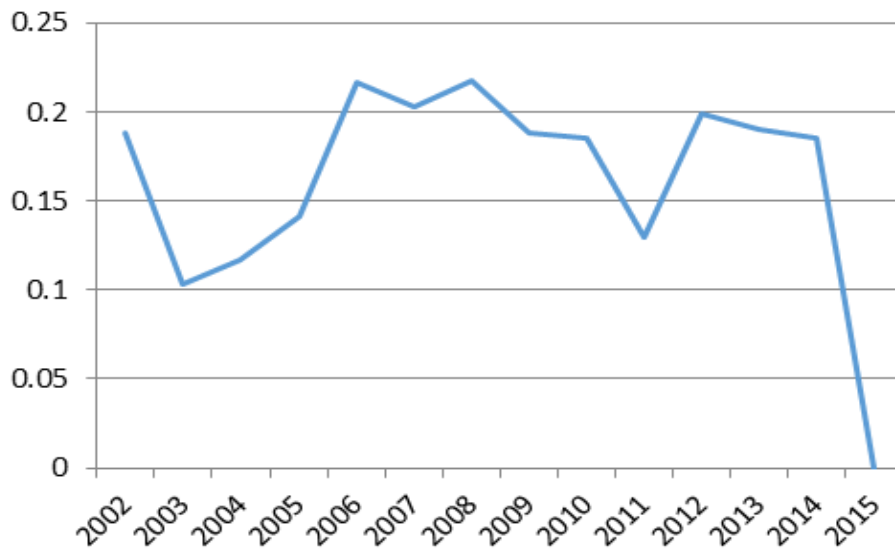


Figure 4-18 MATA Trolley Operating Expenses Covered by Fare Revenues



CARTA Incline Railway

Figure 4-19 Unlinked Passenger Trips on CARTA's Incline Railway

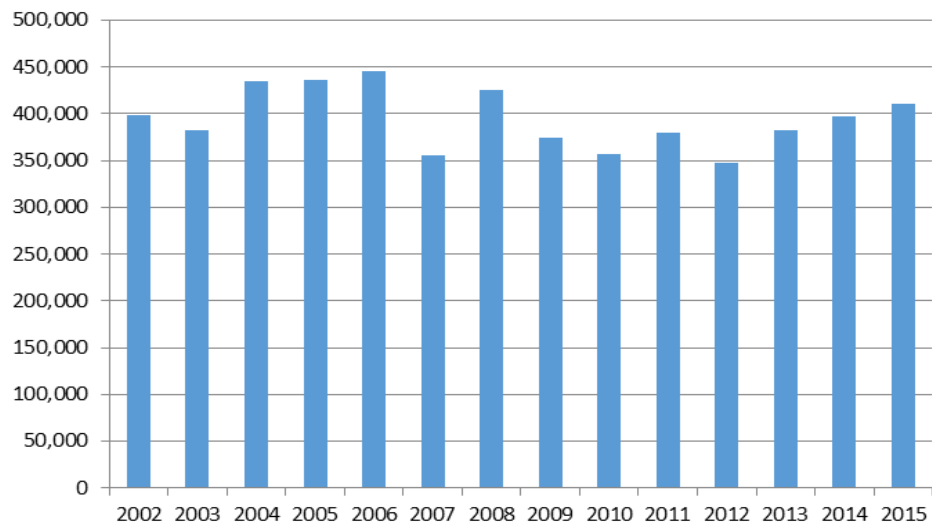


Figure 4-20 CARTA Incline Railway's Operating Expenses Covered by Fare Revenues

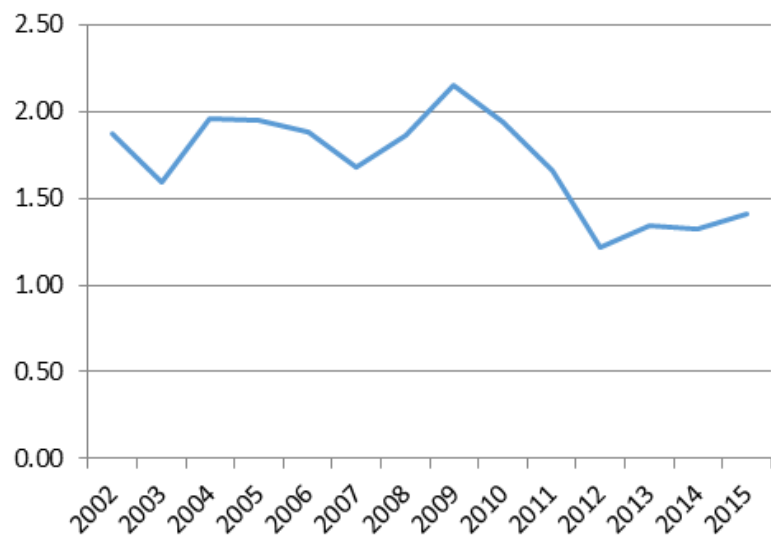
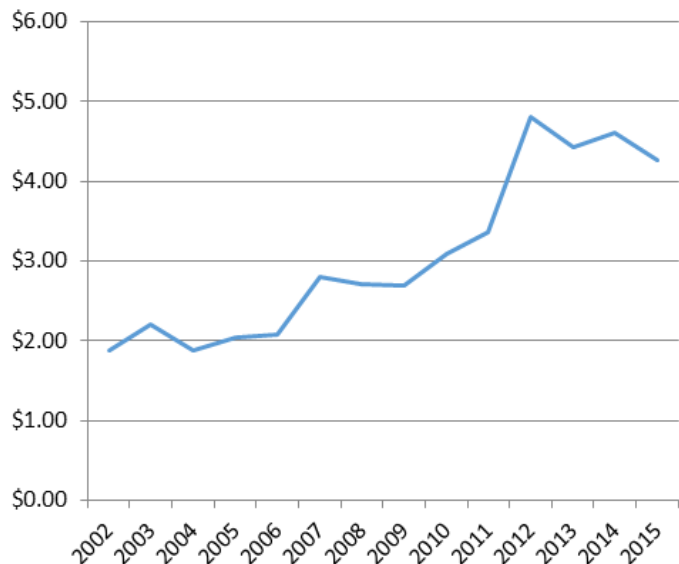


Figure 4-21 Operating Expense per Passenger-Mile for CARTA Incline Railway



5. PUBLIC FUNDING FOR TENNESSEE'S RAIL SYSTEM

Typically, rail improvements in Tennessee are funded by the private sector railroad owners and operators. There are, however, federal and state funding sources available for rail improvements and operations. Depending on the improvement type, the funding source will vary based on eligibility. Tennessee utilizes several federal and state funding mechanisms to pay for rail improvements to public capital and operating funding resources relating to rail operations and infrastructure development.

Tennessee has utilized several federal and state financing programs for rail infrastructure improvements. TDOT provides required matching funds for federal financial assistance programs such as grade crossing improvement and separation projects. State-sponsored rail investment in Tennessee is provided through TDOT and the various local Rail Authorities. A summary of funding sources utilized for rail infrastructure improvements is described below.

5.1 STATE REVENUE SOURCES FOR RAIL IMPROVEMENTS

5.1.1 Transportation Equity Fund - Short-Line Railroad Rehabilitation Program

The Tennessee General Assembly created the Transportation Equity Fund to direct taxes paid on diesel fuel used by aeronautics, railroads, and towboats to be placed in a designated fund for the benefit of those modes of transportation (T.C.A. § 9-4-207). The railroad portion of this fund is granted to railroad authorities, which are local authorities enabled by the legislature to preserve and maintain essential rail transportation to communities threatened with abandonment or loss of rail service. Until the program was put on hold in 2013, TDOT allocated funds to the local railroad authorities. In 2013, TDOT had allocated \$15 million to railroad authorities before litigation led to the sequestration of railroad-related funds in the Transportation Equity Fund. Approximately \$73 million was allocated from 2009 to 2013.

Between 1988 and 2013, Tennessee's short-line railroad programs were funded through the state's Transportation Equity Fund (TEF) which also supported commercial navigation and aviation activities. Historically, the TEF derived all revenues through a 7% sales tax levied against the off-road fuel purchases of railroads, water carriers, and commercial aviation providers. In Tennessee, motor carriers do not incur a sales tax on diesel purchased for on-road use, but instead face a 17 cent per gallon excise tax. Also, Motor Fuel tax revenues do not accrue to the TEF, but instead (mostly) are deposited in the state's highway fund.

A legal challenge to the historic 7% tax on rail fuel brought the state short line grant program to a halt in 2013. The basis of the legal challenges to Tennessee's tax policies lies in the 1976 Railroad Revitalization and Regulatory Act which, among other things, prohibits jurisdictions from "imposing a, . . . tax that discriminates against a rail carrier providing transportation subject to the jurisdiction of the [Surface Transportation] Board under this part." In the case of Tennessee's policy, the alleged discrimination rested on the potential difference between the effective sales tax rate levied against railroad fuel purchases and a similarly calculated rate for the excise tax levied against fuel purchased by motor carriers. Specifically, when fuel prices are relatively high (above \$2.44 per gallon), the effective per-gallon tax paid by railroads is greater than the 17 cents per gallon paid by motor carriers. The course of the original legal activity has, so far, included a number of suits in federal and state courts.

In May of 2014, the Tennessee Legislature passed and Governor Haslam signed the Transportation Fuel Equity Act with the aim of remedying the tax issue underlying the existing litigation. This legislation effectively exempts Tennessee's railroads from further fuel-related sales tax obligations and replaces those obligations with a 17 cents per gallon excise charge identical to the tax paid by motor carriers for on-road diesel purchases. However, as ultimately amended, the changes contained in the statute do not apply to commercial navigation. Instead, the legislation specifically states:

"Means of transportation" means any vehicle or other device employed by a commercial carrier for the purpose of transporting passengers or goods for a fee, including, but not limited to, motor vehicles, trains, and aircraft; provided, that "means of transportation" does not include any marine vessels, boats, barges, or other craft operated on waterways."

Based on this distinction, the Class I railroads contend that Tennessee's freight-related fuel tax policies continue to discriminate against railroads and are, therefore, prohibited under federal law. Indeed, the passage of the Transportation Fuel Equity Act has led to a new round of additional litigation and TEF funds continue to be unavailable.

5.1.2 FastTrack Infrastructure Development Program (FIDP)

Local communities that apply to TNECD with a goal of improving public infrastructure in order to create new jobs and business investment may be eligible to receive FIDP funds. With some exceptions, applications must be for specific projects and must be tied to a company commitment to create or retain a defined number of jobs. Qualifying projects must involve companies engaging in manufacturing or other economic activities beneficial to Tennessee. Companies for whom more than 50 percent of the product or service is involved in the manufacture of products for export are also eligible. FIDP grants require local community matching funds calculated along a varying scale based on a community's ability to pay. Rail access to industrial sites is an eligible activity under this program. Typical total funding amounts are \$15-20 million per year but are dependent on Tennessee's Legislature and the annual budget (T.C.A. § 4-3-716).

5.2 FEDERAL RAIL REVENUE SOURCES

5.2.1 Formula Funding Programs

Highway-Railroad Grade Crossing Program (Section 130 Program)

This program seeks to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned public roads and roads on tribal lands. The Section 130 Program requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. TDOT is typically allocated around \$5 million per year for Section 130, totaling over \$26.8 million from 2014 to 2018.

The Section 130 Program is authorized by United States Code Title 23, Section 130, and administered through the state by the Federal Highway Administration (FHWA). Section 130 is one component of the broader Highway Safety Improvement Program (HSIP). A highway safety improvement project is any strategy, activity, or project on a public road that is consistent with the data-driven State Strategic Highway Safety Plan (SHSP) and corrects or improves a hazardous road location or feature or addresses a highway safety problem. Specifically, Section 130 is used on railway-highway crossings. At least half of a state's apportionment is dedicated for the installation of protective devices at crossings. The remainder of the funds apportioned can be used for any hazard elimination project, including protective devices. Section 130 projects are funded at a 90 percent federal share.

Urbanized Area Transit (Section 5307)

The FTA provides 5307 funds to Urbanized Areas (UZAs) for public transportation capital, planning, job access, and reverse commute projects, as well as operating expenses in certain circumstances. These funds constitute a core investment in the enhancement and revitalization of public transportation systems in the nation's urbanized areas, which depend on public transportation to improve mobility and reduce congestion. TDOT is not the direct recipient of these funds from the FTA, but provides a state match for capital expenditures, which typically has been half of the local share required by the FTA (MAP-21 §20007; 49 USC § 5307). RTA typically receives \$1.5 million in 5307 and flexed FHWA U-STBG funds, which are spent on preventative maintenance for the Music City Star.

State of Good Repair Formula Grants (Section 5337)

A new formula-based State of Good Repair program is FTA's first stand-alone initiative dedicated to repairing and upgrading the nation's rail transit systems along with high-intensity motor bus systems that use high-occupancy vehicle lanes, including bus rapid transit (BRT). These funds reflect a commitment to ensuring that public transit operates safely, efficiently, reliably, and sustainably so that communities can offer balanced transportation choices that help to improve mobility, reduce congestion, and encourage economic development. Eligible recipients include state and local government authorities in urbanized areas with fixed guideway public transportation facilities operating for at least seven years (MAP-21 §20027; 49 USC § 5337). RTA typically receives \$2 million in 5337 funds, which are spent on the purchase of new or rehabilitation of existing rolling stock and track improvements for the Music City Star.

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

The CMAQ program was continued in the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation (FAST) Act to provide a flexible funding source to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas).

CMAQ is funded by contract authority from the Highway Account of the Highway Trust Fund. Funds may be used for transportation projects likely to contribute to the attainment or maintenance of a national ambient air quality standard, with a high level of effectiveness in reducing air pollution. Eligible activities of CMAQ-funded rail projects include the construction of intermodal facilities, rail track rehabilitation, diesel engine retrofits, idle-reduction projects in rail yards, and new rail sidings.

MAP-21 has a new approach to core formula program funding, authorizing a lump sum total instead of individual authorizations for each program. Once each state's combined total apportionment is calculated, an amount is set aside for the state's CMAQ program via a calculation based on the relative size of the state's CMAQ apportionment. The federal matching share for these funds is 80 percent (MAP-21 §1113; 23 USC § 149).

FAST Act Freight Funding

The FAST Act of 2015 established the National Highway Freight Program (NHFP) to improve the efficient movement of freight on the National Highway Freight Network (NHFN), which is a component of the larger National Multimodal Freight Network (NMFN). As it relates to rail investments, up to 10% of a State's annual apportionment can be allocated to freight intermodal or freight rail projects. Funding for this program only extends through FY 2020.

5.2.2 Competitive Federal Funding Programs

Fixed Guideway Capital Investment Grants-Section 5309 (New Starts or Small Starts Grants)

This program provides grants for new and expanded rail, bus rapid transit, and ferry systems that reflect local priorities to improve transportation options in key corridors. This program defines a new category of eligible projects, known as core capacity projects, which expand capacity by at least 10 percent in existing fixed-guideway transit corridors that are currently at or above capacity, or are expected to be at or above capacity within five years. The program also includes provisions for streamlining aspects of the New Starts process to increase efficiency and reduce the time required to meet critical milestones. The maximum federal share for this program is 80 percent (MAP-21 §20008; 49 USC § 5309). This funding source has not been used in Tennessee, but is a potential source for new rail services.

Transportation Investment Generating Economic Recovery Discretionary Grants Program (TIGER)

The TIGER grant program allows local and state governments to apply for funding for capital investment in rail, highway, bridge, public transportation, and port projects and is awarded by USDOT on a competitive basis. USDOT has held eight rounds of TIGER applications since 2010.

Tennessee rail-related projects that have received TIGER grants include:

- Crescent Corridor Intermodal Freight Rail Project (2009) for \$105,000,000
- Appalachian Regional Short-Line Rail Project (2010) for \$2,800,000
- City of Chattanooga Rail Transit Implementation Plan (2014) for \$400,000

United States Department of Agriculture Programs

The U.S. Department of Agriculture (USDA) Community Facility Program and Rural Development Program provide grant or loan funding mechanisms to fund construction, enlargement, extension, or improvement of community facilities providing essential services in rural areas and towns. Grant assistance is available for up to 75 percent of the project cost. Eligible rail-related community facilities include transportation infrastructure for industrial parks and municipal docks.

Nashville & Eastern Railroad Authority (NERA) and the Nashville and Eastern Railroad (NERR) used the Community Facility Program and Rural Development Program to secure a \$7.5 million loan to reopen their line from Cookeville to Monterey. At this time, NERR has been working with the financial institution providing the loan and the US Department of Agriculture due to the lack of grant funding from the Transportation Equity Fund.

Table 5-1 outlines the array of state and federal funding sources that are available for freight and passenger rail improvements.

Table 5-1 Current and Prospective Public Rail Funding Sources

Program	Funding Source	Dedicated Rail Source	Program Type	Eligibility	Previously Used in TN for Rail Projects
Highway Safety Improvement Program (HSIP)- Section 130	FHWA	Yes	Safety	Installation of protective devices at crossings or any hazard elimination project	Yes
Transportation Investment Generating Economic Recovery (TIGER)	FHWA	No	Discretionary Grant	Capital investment in rail, highway, bridge, public transportation, and port projects	Yes
Infrastructure for Rebuilding America (INFRA) Grants	USDOT	No	Discretionary Grant	Capital investment in rail, highway, bridge, and port projects	No
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	FHWA	No	Formula Grant	Construction of intermodal facilities, rail track rehabilitation, diesel engine retrofits and idle-reduction projects in rail yards, and new rail sidings	Yes
Surface Transportation Program (STP)/ Surface Transportation Block Grant Program (STBG)	FHWA	No	Formula Grant	Transit capital projects	Yes
Transportation Alternatives Program (TAP)	FHWA	No	Formula Grant	Conversion and use of abandoned railroad corridors for trails for pedestrians, bicyclists, or other non-motorized transportation users	No
Amtrak Capital Grants	FRA	Yes	Discretionary Grant	Improvements to Amtrak Intercity Passenger Rail Service	No
Railroad Rehabilitation & Improvement Financing (RRIF) Program	FRA	Yes	Loan	Provides direct loans and loan guarantees to acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, bridges, yards, buildings and shops; refinance outstanding debt incurred for the purposes listed above; and develop or establish new intermodal or railroad facilities	No
Rail Line Relocation and Improvement Capital Grant Program (RLR)	FRA	Yes	Discretionary Grant	Provides financial assistance for local rail line relocation and improvement projects that involve a lateral or vertical line relocation and also mitigate the adverse effects of rail traffic on safety, motor vehicle traffic flow, community quality of life, or economic development	No
National Highway Performance Program (NHPP) Flexible Funding	FHWA/FTA	No	Formula Grant	Provides funding for construction of a public transportation project in the same corridor as, and in proximity to, a fully access-controlled NHS route	No

5307	FTA	Yes	Formula Grant	Public transportation capital, planning, job access and reverse commute projects, as well as operating expenses in certain circumstances in urbanized areas	Yes
5309 (New Starts)	FTA	No	Discretionary Grant	New, extensions, or capacity improvements of fixed guideway transit systems	Yes
5337	FTA	Yes	Formula Grant	Repairing and upgrading the nation's rail transit systems that have operated for at least 7 years	Yes
Transportation Infrastructure Finance and Innovation Act (TIFIA)	USDOT	No	Loan	Federal credit assistance to eligible surface transportation projects, including highway, transit, intercity passenger rail, some types of freight rail, and intermodal freight transfer facilities	No
Community Facility Program and Rural Development Program	USDA	No	Discretionary Grant	Transportation infrastructure for industrial parks and municipal docks	Yes
Transportation Equity Fund- Short-Line Program	TDOT	Yes	Formula Grant	Rehabilitate tracks and bridges for short-line program eligible railroads	Yes
FastTrack	TNECD	No	Discretionary Grant	Rail access to industrial sites	Yes

6. RAIL SAFETY

Rail safety is a priority for railroads and TDOT as it has an impact not only on the general public, but also on the efficiency of railroad operations. This section provides an overview of rail safety efforts in Tennessee and safety statistics related to Tennessee's rail system.

There are several initiatives to improve rail safety in Tennessee at both the federal and state level. This section describes these efforts, which include programs operated by the FRA, TDOT, and the non-profit organization Operation Lifesaver.

6.1 FRA SAFETY OVERSIGHT

The FRA's mission is "to enable the safe, reliable, and efficient movement of people and goods for a strong America, now and in the future."²¹ It accomplishes this mission primarily through issuance, implementation, and enforcement of safety regulations, selective investment in rail corridors across the country, and research and technology development. The FRA employs approximately 400 safety inspectors operating out of eight regional offices throughout the country. Tennessee is in FRA's Region III, headquartered in Atlanta, Georgia. Regular inspections are conducted for compliance with safety regulations out of TDOT's Rail Regulatory and Safety Office. Safety areas include:

- Hazardous materials,
- Motive power and equipment,
- Operating practices,
- Signal and train control, and
- Track.²²

6.2 STATE RAIL SAFETY PROGRAMS

6.2.1 State Railroad Inspection Program

The Office of Rail Inspection enforces state and federal regulations pertaining to railroad safety. The Office of Rail Inspection partners with the FRA to enforce federal law (CFR Part 49). Other specific duties include monitoring railroad worker safety and conducting inspections of rail yards and highway-rail at-grade crossings. The goal of the Office is to reduce and eliminate dangerous or hazardous conditions for railroad employees and the general public. This is accomplished by reviewing new railroad construction, conducting industrial site walkway & close clearance inspections, coordinating with Tennessee Emergency Management Agency (TEMA), and sending responders for railroad emergencies. The Office of Rail Inspection currently employs inspectors that specialize in Operating Practice, Hazardous Materials, Track, and Signal and Train Control.

6.2.2 State Safety Oversight of Fixed Guideway Rail Transit

The State Safety Oversight (SSO) program oversees rail fixed guideway systems (RFGSs) that are not monitored by the FRA. Commonly referred to as rail transit agencies (RTA), RFGSs include any heavy, light, or rapid transit systems, monorails, inclined planes, trolleys, or automated guideways for the movement of passengers that are not regulated by the FRA. TDOT serves as the State Safety Oversight Agency per the Federal Transit Administration's (FTA) requirements. As mandated by the FTA (49 CFR Part 659.15), TDOT has developed a System Safety Program Standard (SSPS) that governs the conduct of the oversight program as the state oversight agency and provides guidance to the regulated rail transit properties concerning processes and procedures they must have in place in order to be in compliance with the state safety oversight program.

²¹ Federal Railroad Administration Website, About Page. <http://www.fra.dot.gov/Page/P0002>

²² Federal Railroad Administration Website, Railroad Safety Page. <http://www.fra.dot.gov/Page/P0010>

6.2.3 Highway-Railroad Grade Crossing Safety Program (Section 130)

The objective of TDOT's Highway-Railroad Crossing Program is to improve safety and reduce crash risk at Tennessee's public highway-railroad grade crossings. "Grade" crossings refer to those crossings at which the highway and railroad are on the same level, as opposed to "grade separated" crossings, in which there is a bridge to allow one to pass over the other. The Highway-Railroad Crossing Program, commonly referred to as the Section 130 Program, works to eliminate hazards at railway-highway crossings. Section 130 is a federal aid program authorized by United States Code Title 23, Section 130, and is administered through the state by the Federal Highway Administration (FHWA). The funds are set aside from the Highway Safety Improvement Program (HSIP) apportionment. Fifty percent of a state's apportionment is dedicated for the installation of protective devices at crossings. The remainder of the apportionment can be used for any hazard elimination project, including protective devices. Typically, Section 130 funds are used to install warning devices, such as train-activated flashing lights, automatic gates, and warning bells. These funds may also be used to provide various other safety improvements at existing crossings and to assist in the closure of unneeded crossings. According to FRA data, Tennessee has 5,849 railroad crossings, 2,779 of which are public at-grade railroad crossings and are eligible for Section 130 funding.

Section 130 projects are funded at a 90 percent federal share. Tennessee receives about \$5 million in Section 130 funds annually totalling over \$26.8 million from 2014 to 2018. The typical cost of a Section 130 Program safety improvement project is from \$180,000 to \$280,000. Priority for the available funds is given to crossings with the greatest likelihood of a collision occurring. This is determined using an FHWA accident prediction model, which takes into consideration many factors including:

- Average daily traffic on the highway;
- Number of train movements per day;
- Maximum train speed; and
- Crash history, if any.

6.2.4 Operation Lifesaver Program

Operation Lifesaver is one of the most widely known and effective programs working to make rail lines and highways safer. It is a nationwide, non-profit organization dedicated to ending collisions, deaths, and injuries at highway rail intersections and along railroad rights-of-way. It accomplishes its task through promoting the "three E's": Education, Engineering, and Enforcement. Operation Lifesaver's programs are co-sponsored by federal, state, and local governmental agencies, highway safety organizations, and individual railroads.²³ Tennessee's Operation Lifesaver Program is a non-profit, volunteer organization funded by a number of state, local, and private partners who participate in the program.²⁴

6.3 TENNESSEE RAIL ACCIDENT STATISTICS

The following is a statistical review of rail safety in Tennessee over the past decade. It addresses the rail accident and incident trends and provides details as to the type of rail accidents, those affected, and causes. Table 6-1 shows statistics for the total number of rail accidents and incidents in Tennessee over the past decade. These totals include Train Accidents, Highway-Rail Incidents, and Other Accidents and Incidents.

The total number of rail accidents and incidents in the state has generally been trending downward over the past decade. The first half of the decade saw an average of 207 total events, 15 deaths, and 107 injuries, while the most recent 5-year period saw averages of 176 total events, 13 deaths, and 132 injuries. Rail accidents and incidents occurring over the 10-year period were distributed

²³ Operation Lifesaver Website. <http://oli.org/>

²⁴ Operation Lifesaver Tennessee Website. <http://www.tnol.org/>

among a number of railroads operating within the state, with almost 90 percent occurring on Class I railroads.

Table 6-1 Total Rail Accidents and Incidents in Tennessee

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total Events	225	237	200	172	201	169	200	183	168	159
Deaths	13	25	6	10	19	14	7	16	16	10
Injuries	108	118	107	95	107	82	109	101	282	88

Source: FRA Office of Safety Analysis. Ten Year Accident/Incident Overview: Tennessee.

6.3.1 Train Accidents

Train accidents include train derailments, collisions with other trains, and other events involving on-track rail equipment that result in fatalities, injuries, or monetary damage above a threshold set by FRA. Train accident statistics in the state over the past decade are provided in Table 6-2. In a single incident on July 1, 2015, a CSX train derailed in Blount County, a car caught fire, and hazardous material was released with 197 injuries reported.

Table 6-2 Train Accidents in Tennessee

Train Accidents	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total Accidents	60	68	53	38	42	30	54	41	46	35
Deaths	0	0	0	0	0	0	0	0	0	0
Injuries	1	2	1	1	0	0	1	2	200	0

Source: FRA Office of Safety Analysis. Ten Year Accident/Incident Overview: Tennessee.

The trend in train accidents in the state has generally been downward over the past decade. The first half of the decade saw an average of 52 total accidents fall to 41 for the most recent 5-year period. Table 6-3 provides information regarding the type, location, and causes of the train accidents over the past decade.

As shown in the Table 6-3, most rail accidents occurred on yard tracks as opposed to main line tracks. Human error and miscellaneous causes were the leading causes of train accidents over the past decade, while equipment defects and track defects comprised lesser shares of rail accidents in the state.

Table 6-3 Train Accident Type/ Locations/ Causes in Tennessee (2007-2016)

Type of Track	Signalization	Method of Operation	Cause of Accident					Total
			Equipment	Human Factor	Misc.	STC	Track	
Industry	Non-Signaled	Other than Main	0	7	3	0	3	13
	Signaled	Other than Main	0	2	0	0	0	2
Main	Non-Signaled	Block Register	0	0	2	0	0	2
		Dir Train Control	0	1	3	0	2	6
		Other than Main	0	0	1	0	0	1
		Yard Restricted	0	2	2	0	8	12
	Signaled	Dir Train Control	0	1	1	0	0	2
		Signal Indication	7	3	13	0	5	28
Side	Non-Signaled	Other than Main	0	1	0	0	1	2
	Signaled	Signal Indication	0	1	0	0	0	1
Yard	Non-Signaled	Other than Main	18	78	38	17	29	180
	Signaled	Other than Main	1	6	3	1	1	12
Total			26	102	66	18	49	261

Source: FRA Office of Safety Analysis

6.3.2 Other Rail Accidents or Incidents

Other rail accidents or incidents include events other than train accidents or crossing incidents that caused a death or injury to any person. Most fatalities in this category are rail trespassers. Most injuries in this category involve rail workers and contractors in activities such as getting on or off equipment, doing maintenance work, throwing switches, setting handbrakes, falling, etc. Rail passenger-related casualties are included in this category and often involve falling. Statistics for this category of rail incidents are shown in Table 6-4.

Table 6-4 Other Rail Accidents or Incidents in Tennessee

Other Accidents/ Incidents	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total Accidents	92	106	91	87	96	72	84	80	83	78
Deaths	7	20	4	7	14	10	5	8	13	8
Injuries	86	90	89	83	87	63	83	72	74	71

Source: FRA Office of Safety Analysis. Ten Year Accident/Incident Overview: Tennessee.

In general, rail-related fatalities in the state, excluding highway-rail incidents, result primarily from trespassers on railroad property who are struck by trains or other equipment. Trespass-related deaths accounted for 100% of the other accident/incident deaths over the decade.

6.3.3 At-Grade Crossing Incidents in Tennessee

A total of 5,849 railroad crossings exist in Tennessee. Of these, 2,779 are at-grade crossings on public roads, with the remaining crossings considered as private or grade-separated. At-grade crossings may have one of three types of warnings devices. Passive warnings consist of warning signs, regulatory signs, and pavement markings. Active with Flashing Lights have, in addition to Passive warnings, train-activated flashing lights. Active with Gates have train-activated flashing lights

and gates. Table 6-5 shows the types of warning devices at Tennessee public at-grade crossings. Approximately fifty one percent (51%) of Tennessee public at-grade crossings have active warning devices. Forty nine percent (49%) of Tennessee public at-grade crossings have passive warnings. Most passive crossings are located on low-volume roads and are rural in nature.

Table 6-5 Types of Warning Devices at Tennessee Public At-Grade Crossings

Warning Device Type	Active with Gates	Active with Flashing Lights	Passive	Total
Number of Crossings	883	541	1,355	2,779

Source: FRA Office of Safety Analysis

Table 6-6 shows the number of total incidents, deaths, and injuries occurring on public at-grade crossings over the past decade. These figures show a slight decrease in number of total incidents and deaths comparing the first five years of the decade to the last five years.

Table 6-6 Highway-Rail At-Grade Crossing Incidents in Tennessee

Highway-Rail Incidents	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total Incidents	73	63	56	47	62	67	62	62	39	46
Deaths	6	5	2	3	5	4	2	8	3	2
Injuries	21	26	17	11	20	19	25	27	8	16

Source: FRA Office of Safety Analysis. Ten Year Accident/Incident Overview: Tennessee.

6.3.4 Hazardous Materials (HAZMAT)

Hazardous material regulations apply to all interstate, intrastate, and foreign carriers by rail, air, motor vehicle, and vessel. The TDOT Rail Regulatory Office enforces the hazardous materials regulations in Tennessee in cooperation with the FRA. Hazardous Materials Safety Programs are generally composed of four main components:

- Inspection of railroad and shipping facilities to ensure compliance with Part 49 Code of Federal Regulations (CFR); USDOT received the authority to regulate the transportation of hazardous materials through the Hazardous Materials Transportation Act of 1975;
- The provision of technical assistance, education, and outreach activities to shippers/ consignees, rail carriers, emergency responders, and the general public;
- The inspection and transport of nuclear materials; and
- Inspection of employee training records, security procedures, and quality assurance programs to ensure safety standards are met.

In most cases, the response to hazardous materials incidents is handled by the local jurisdiction, typically by the fire department and sometimes by a specialized HAZMAT team. Railroads contract with special HAZMAT companies to perform cleanup and remediation for a HAZMAT release. TEMA has plans in place to respond to any HAZMAT spill on highways, rivers, rails, or public property. The first responders are nearly always local city and county responders who are trained by TEMA. OSHA requires hazardous materials teams to be qualified based upon published standards in consolidated federal regulations (CFR), which then become law. TEMA provides specialized training for two levels of HAZMAT expertise, technician level and specialist level. TEMA routinely provides an area coordinator, who will usually also be a qualified HAZMAT technician or specialist, to assist or advise local jurisdictions with significant releases. TEMA will always support and back-up those

responders with whatever resources or manpower requested. If necessary, TEMA will either contract HAZMAT companies, request federal resources and manpower to assist in the response, or both.

TEMA will utilize any communication means available to notify the public of hazards caused by accidents or other HAZMAT release. Citizens will be notified by radio and television, which will be first informed through public announcements, 911 services (24-hour warning points), TEMA warning networks with county emergency management agencies, and by National Weather Service systems. Often, additional warnings may be provided by public sirens and electronic sign-boards.

TEMA can call out certain environmental personnel, such as the state's Department of Environment and Conservation's Water Pollution Control Division, to assist local agencies in dealing with the consequences of releases. Additionally, TEMA routinely notifies the National Response Center of activities associated with HAZMAT releases in Tennessee. Frequently, state and local officials contact the federal Environmental Protection Agency and the U.S. Coast Guard for assistance in dealing with technical aspects of HAZMAT incidents.

The federal, state, and local chain-of-command is as follows: the national emergency management system calls this system Incident Command System (ICS) and National Incident Management System (NIMS). It works the same way in every city, county, and state in the nation. Local, state, and federal officials work very closely with private or public transportation carriers to assure a quick and effective response. Often, the fastest clean-up can be achieved by privately-owned emergency HAZMAT companies hired by the transporters. The shipper or originating facility is responsible for the costs of the response and remediation of affected areas.

Table 6-7 below shows the history of incidents involving rail cars carrying hazardous material in Tennessee over the past 12 years.

Table 6-7 Rail Incidents Involving Hazardous Materials in Tennessee

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Incidents Involving Hazmat Releases	1	1	3	0	1	1	0	1	0	0	0	0
Cars Carrying Hazmat	113	235	211	344	238	248	177	81	228	160	169	77
Hazmat Cars Damaged or Derailed	9	27	17	29	25	20	15	15	19	14	14	7
Cars Releasing Hazmat	1	2	4	0	1	1	0	1	0	0	0	0

Source: FRA Office of Safety Analysis

The trend of rail incidents involving hazardous materials in the state has generally been declining over the past 12 years. The first six saw an average of 1.2 incidents per year, 232 cars carrying hazmat involved in incidents, and 22.7 cars either damaged, derailed, or releasing hazmat. Meanwhile the most recent 6-year period saw averages of 0.2, 149, and 14.2, respectively.

6.4 POSITIVE TRAIN CONTROL

Positive Train Control (PTC) refers to technologies designed to automatically stop or slow a train before certain accidents can occur. PTC is designed to prevent collisions and derailments caused by excessive speed, trains operating beyond their limits of authority, incursions by trains on tracks

under repair, and by trains moving over switches left in the wrong position. PTC systems are designed to determine the location and speed of trains, warn train operators of potential problems, and take action if operators do not respond to a warning.

The Rail Safety Improvement Act of 2008 required railroads to place PTC systems in service by December 31, 2015 under the following circumstances:

- On all rail main lines over which regularly-scheduled commuter or intercity passenger trains operate and
- On all Class I railroad main lines with over 5 million gross ton-miles per mile annually over which any amount of toxic or poison-by-inhalation hazardous materials are handled.

CN's Amtrak City of New Orleans corridor, as well as NERR over the Music City Star corridor fell into the first category. Other major CN lines along with major BNSF, CSXT, KCS, NS, and UP main line routes would also need to be equipped with PTC by the December 31, 2015 deadline. The mandate for PTC excludes all Class II and III railroads regardless of tonnage or number of toxic or poison cars handled as long as no passenger trains travel over the lines, and as long as the Class III railroads' locomotives operate less than 20 miles on PTC-equipped lines belonging to other railroads.

In August 2014, FRA finalized rule modifications that allowed railroads not to implement PTC on rail segments that will not transport toxic or poison-by-inhalation contents or passengers. Per FRA's Status Report of PTC implementation to the House and Senate Committees on Appropriations, it was unlikely that all required segments would be implemented by the December 31, 2015 deadline. This caused the railroads to ask for an extension for implementation of PTC with several unsuccessful congressional bills. However, in October 2015 the deadline for implementing PTC was extended to December 31, 2018. Table 6-8 shows each railroad's PTC implementation status for railroads that operate in Tennessee.

Table 6-8 PTC Implementation Status per FRA

Railroad/ Agency	Locomotives to be Equipped (to date)	Radios to be Installed (to date)	Miles of Track to be Mapped (to date)	Spectrum Obtainment Complete (estimated date)	Submitted Safety Plan	Estimated Revenue Service Demo Start Year
Passenger						
Amtrak	521 (515)	310 (40)NEC 17 (17)ITCS 310 (27) I-ETMS	367 (232)	Acquired	Conditionally certified	2015 (Northeast Corridor) 2016-2018 (other routes)
Nashville RTA	14 (0)	14 (0)	32 (32)	Acquired	No	
Freight						
BNSF	5000 (4572)	6,000 (2,389)	22,050 (19,886)	Yes (NA)	Conditionally certified	2015
CN	586 (232)	1,546 (72)	4,300 (257)	Yes (NA)	No	2016
CSXT	3,200 (1759)	3,600 (812)	21,565 (21,565)	Yes (NA)	Conditionally certified	2015
KCS	614 (96)	614 (0)	2,227 (0)	Yes (NA)	No	2016
NS	2900 (1530)	3,411 (310)	10,904 (10,904)	Yes (NA)	Conditionally certified	2015
UP	5656 (507)	6,532 (1,855)	21,150 (21,150)	Yes (NA)	Conditionally certified	2015

Source: FRA Status Report 15-15

6.5 RAIL SECURITY

Rail security has seen increased national attention due to the potential for terrorists using the rail mode to disrupt transportation or to harm large numbers of citizens. Rail is also viewed as a potential terrorist target due to the transportation of hazardous materials and crude oil. In response to potential terrorist threats to the transportation system, new federal and state agencies have been established to oversee and provide assistance to ensure the security of transportation modes. The primary agencies responsible for security related to transportation modes in Tennessee are the U.S. Department of Homeland Security and TEMA. These agencies, in coordination with federal and state transportation agencies, have addressed transportation security largely through identifying critical infrastructure assets, developing protection strategies for these assets, and developing emergency management plans.

The U.S. Department of Homeland Security addresses rail system security through the following means:

- Training and deploying manpower and assets for high risk areas;
- Developing and testing new security technologies;
- Performing security assessments of systems across the country; and,
- Providing funding to state and local partners.

The Association of American Railroads (AAR), working with the U.S. Department of Homeland Security and other federal agencies, has organized the Rail Security Task Force. This task force developed a comprehensive risk analysis and security plan for the rail system that includes:

- A database of critical railroad assets;
- Assessments of railroad vulnerabilities;
- Analysis of terrorism threats; and,
- Calculation of risks and identification of countermeasures.

The railroad sector maintains communications with the U.S. Department of Defense, the U.S. Department of Homeland Security, USDOT, the Federal Bureau of Investigation, TDOT, TEMA, and state and local law enforcement agencies on all aspects of rail security.

7. IMPACTS OF THE RAIL SYSTEM

7.1 ECONOMIC

The economic impact of railroads in Tennessee reaches far beyond the financial success of the railroads. Employees and stockholders of railroads benefit directly from their success with increased wages and dividends. Beyond this, railroads enable recruitment and retention of industry to Tennessee. These businesses generate a tax base that leads to the success of the state. Railroads provide a connection for industries in economically-distressed areas to remain viable. This provides communities that would otherwise not be competitive with a transportation advantage. Passenger rail service, particularly surrounding station locations, also generates investment. These areas thrive from the development associated with residential and commercial growth within close proximity to rail stations.

7.2 ENERGY

In an independent study for the FRA, the AAR states that, on average, railroads are four times more fuel efficient than trucks on a ton-miles transported basis²⁵. The study also states that America's railroads moved a ton of freight an average of 479 miles on one gallon of fuel. The American Association of State Highway Transportation Officials (AASHTO) noted that each percent of long haul freight currently moving by truck, if moved by rail instead, would save approximately 111 million gallons of fuel per year.

Passenger rail is also more energy efficient than other modes of travel. According to the U.S. Department of Energy's 2012 Transportation Energy Data Book, intercity rail passenger service is six percent more efficient than commercial aviation and 25 percent more efficient than the automobile. Estimates by the U.S. Department of Energy show an energy consumption of 2,435 Btu per passenger-mile for intercity passenger rail and 2,812 Btu per passenger-mile for commuter rail compared to 2,901 Btu per passenger-mile for air travel and 3,528 Btu per passenger-mile for automobile travel.

In addition to energy efficiencies in the movement of freight, rail is also responsible for the movement of commodities which are used to generate energy. As stated earlier, coal is the most transported commodity for rail in Tennessee. Most of this coal is used to fuel power plants throughout the southeast. As such, maintaining the rail network is crucial to the continued operation of these plants to provide power.

7.3 AIR QUALITY

Tennessee has significant air pollution in urban areas, with several counties classified as "non-attainment" or "maintenance" areas for clean air by the U.S. Environmental Protection Agency (EPA). Anderson, Blount, Hamilton, Knox, Loudon, and Roane counties are designated as "non-attainment" for Particulate Matter (PM) 2.5. Blount, Knox, and Shelby counties are designated "non-attainment" for 8-hour ozone. Sullivan County is designated "non-attainment" for lead. Anderson, Blount, Jefferson, Knox, Loudon, Montgomery, Sevier, and Shelby counties are designated "maintenance" for 8-hour ozone. Much of this air pollution is associated with transportation equipment emissions, especially from motor vehicles. Comprehensive data on environmental impacts and environmental costs by mode of transportation in Tennessee are difficult to quantify. However, an independent study for the FRA reports that freight transport by rail generates significantly fewer negative air quality impacts and costs than truck transport²⁶. According to the AAR, every ton-mile of freight moved by rail instead of truck reduces greenhouse gas emissions by 75 percent.

²⁵ Association of American Railroads. The Environmental Benefits of Moving Freight by Rail. (2015)

²⁶ Association of American Railroads. Freight Railroads Help Reduce Greenhouse Gas Emissions. <https://www.aar.org/BackgroundPapers/Railroads%20and%20Greenhouse%20Gas%20Emissions.pdf>

EPA programs for diesel locomotive engines built after 2015 will cut particulate matter (PM) and nitrogen oxide (NOx) emissions by requiring the application of high-efficiency catalytic after treatment technology. In addition, requirements are in place to reduce idling for new and remanufactured locomotives.

7.4 LAND USE

By 2040, Tennessee is expected to experience more than a 30 percent increase in population, with urban areas expected to see the majority of this growth²⁷. The I-75, I-65, and I-40 corridors, which are important freight corridors, pass through many of these high growth areas. These projected increases will place additional demand on the State's public infrastructure and services, including the transportation system. With expectations for growth in freight volumes as described in section 2.2.2, the all-too-common misalignment between industrial land use and freight transportation facilities will be an issue that needs to be addressed.

Transportation and land use are indisputably linked. Enhancements to the rail network can encourage transit-supportive development around station locations. The coordination of both land use planning and transportation planning is necessary to provide an efficient and effective system. The trend towards more intermodal freight may also have impacts on the local area surrounding these facilities. While rail can move commodities long distances, intermodal facilities are still dependent on trucks to complete the first mile/last mile transport to distribution facilities or the customer's door²⁸.

Residents living in proximity to rail lines or rail yards may be exposed to noise and air concerns. Also, high volume freight rail operations in urban areas can create congestion and safety concerns at grade crossings, separate neighborhoods, and use property for rail operations that could be utilized for more valuable development purposes.

A major issue associated with freight rail is the compatibility of freight activities with surrounding land uses. The proximity of residential or commercial land uses to rail facilities presents environmental concerns, especially near residential areas. Rail operations can cause noise, vibration, and air pollution. Noise pollution is the result of diesel locomotives, screeching wheels, whistle blows, and the coupling of railcars. This may result in nuisance and annoyance for occupants of nearby residential and other sensitive land uses. At-grade rail crossings can create safety hazards by exposing vehicular traffic to the path of moving trains, increasing the potential for collisions. Train collisions and derailments pose a potential hazard for surrounding property owners, especially if they are carrying hazardous materials. Although the positive impacts of rail service usually outweigh the negative, new development of rail service should always consider the potential for negative impacts in the community.

7.5 ROADWAY CONGESTION IMPACTS

Increased freight rail activity can help replace some of the existing truck travel on highways. According to AAR, one train can carry as much freight as several hundred trucks. It would have taken approximately 12.4 million additional trucks to handle the 223.5 million tons of freight that originated in, terminated in, or moved through Tennessee by rail in 2012. The Texas Transportation Institute concluded that cities with significant passenger rail systems have a slower rate of per capita congestion growth than cities with small rail or no rail²⁹. Increases in rail mileage reduce congestion costs, while increases in bus mileage increase congestion costs, based upon regression analyses conducted by The Brookings Institute³⁰.

27 Woods & Poole

28 Federal Highway Administration Freight and Land Use Handbook, April 2012

29 Texas Transportation Institute. Transportation, Social and Economic Impacts of Light and Commuter Rail, 2009. <http://tti.tamu.edu/documents/0-5652-1.pdf>

30 Federal Highway Administration. The Effect of Government Highway Spending on Road Users' Congestion Costs. <http://www.fhwa.dot.gov/policy/otps/060320c/060320c.pdf>

7.6 SAFETY

Rail is one of the safest transportation modes for both passenger travel and freight movement. According to USDOT data between 2003 and 2007, large trucks were involved in approximately six times more accidents with fatalities and 17 times more accidents with injuries per billion ton-miles than freight rail³¹. Rail passenger travel is also safer, with intercity and commuter rail passengers having approximately one-twentieth the traffic fatalities per 100 million passenger-miles as automobile travel³².

7.7 LIVABILITY AND COMMUNITY IMPACTS

Both passenger and freight rail have positive impacts on the communities they serve. Passenger rail supports smart growth by encouraging Transit Oriented Development (TOD), which increases density near transit stations. This type of development provides travel options and promotes active transportation and a healthy lifestyle. Freight rail provides access for a community to the global market place. Freight rail service allows for reduced transportation costs, which lead to lower costs of goods to a community. Many industries also seek sites with rail access. They provide employment opportunities and tax revenues, which contribute to the success of a community.

31 United States Government Accountability Office. GAO-11-134. <http://www.gao.gov/new.items/d11134.pdf>

32 Litman, Todd. Journal of Public Transportation, Vol. 17, No. 4, 2014

8. TRENDS AND FORECASTS

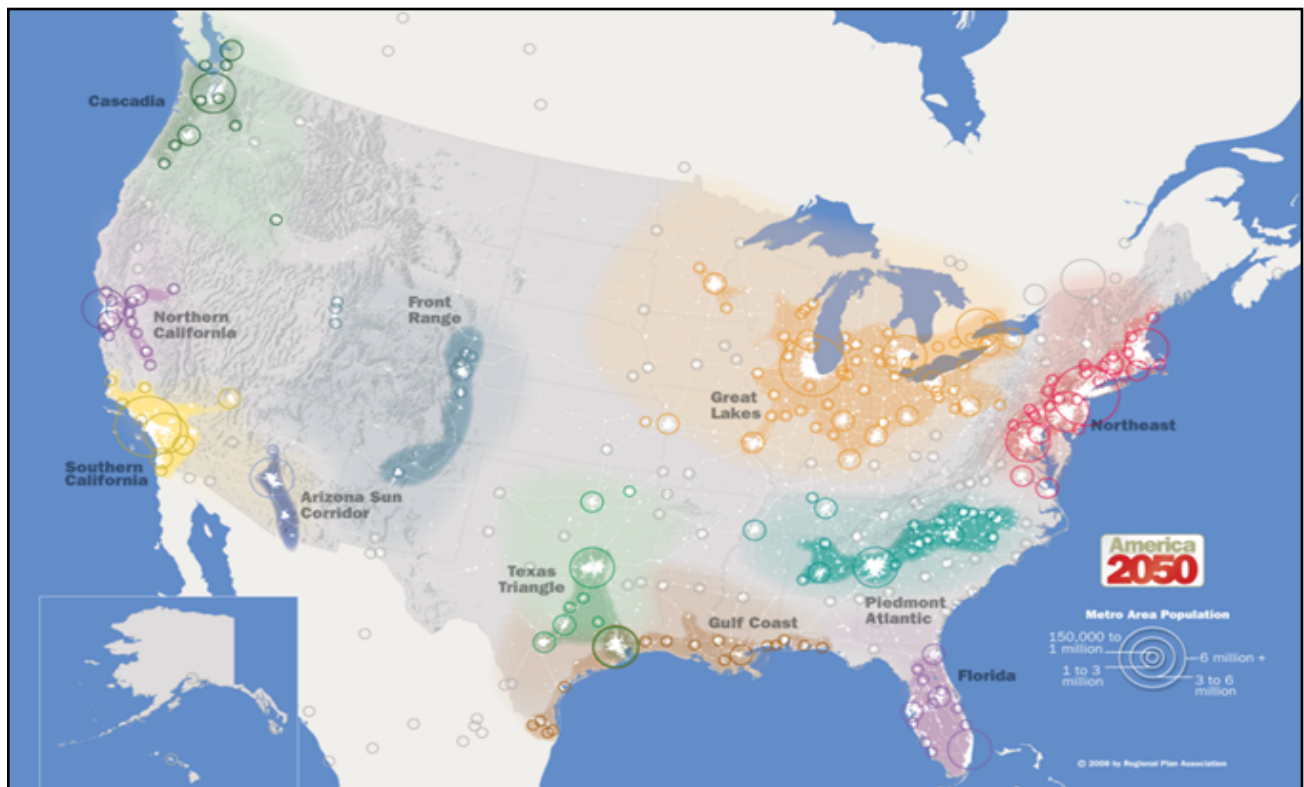
Freight and passenger movements are influenced by a plethora of factors, some local, and others national or global in scope. At the local level, TDOT recognizes that changes in population and employment, as well as in market sectors, are inevitable and will affect freight and passenger movement in Tennessee. Consideration of demographic, economic, and technological trends will help Tennessee chart a path forward.

The purpose of this section is to describe trends that could affect rail needs for Tennessee in the future. Demographic and economic growth, transportation system congestion, and future land use are all trends which will impact the demand of both passenger and freight rail. This section shows a starting point and anticipated changes for helping to determine future rail service needs.

8.1 DEMOGRAPHIC AND ECONOMIC GROWTH FACTORS

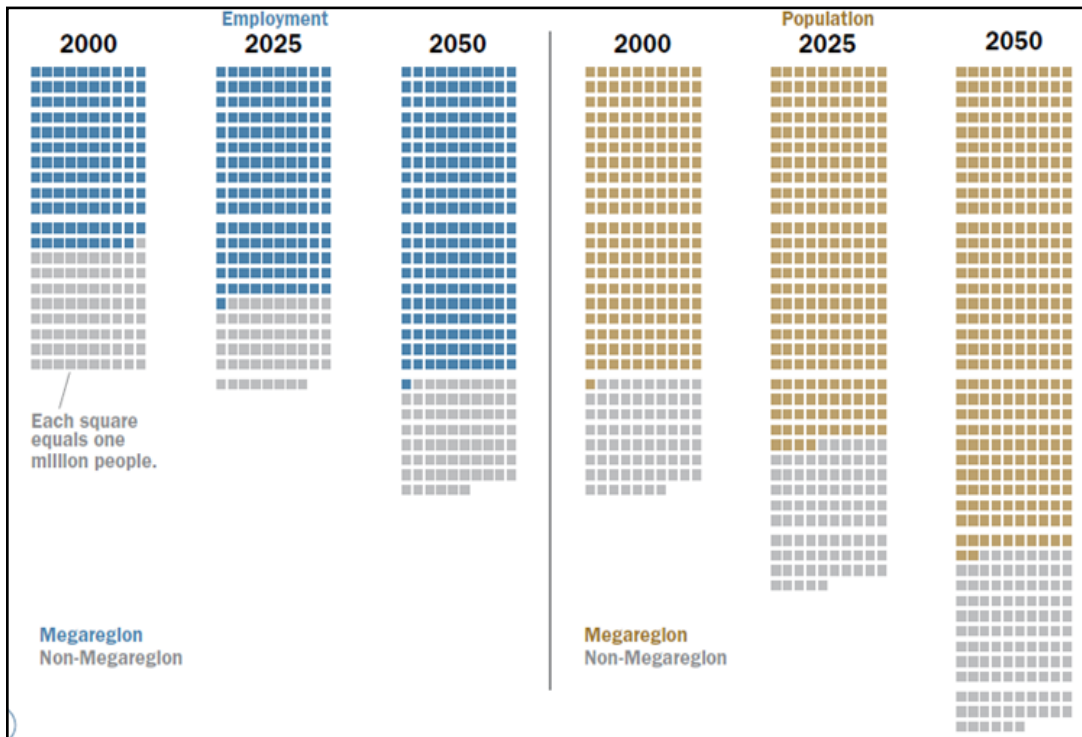
In 2014, the total statewide population for the United States was over 318.8 million³³. Rapid population growth is expected to continue nationwide. According to Regional Plan Association's America 2050 A Prospectus, more than 70 percent of the nation's population and economic growth is expected to take place in extended networks of metropolitan regions called "Megaregions," as shown in Figure 8-1 and Figure 8-2. Tennessee is included as an "Area of Influence" in the Piedmont Atlantic Region, but is also situated in the middle of several other regions.

Figure 8-1 U.S. Megaregions with Areas of Influence



Source: <http://www.america2050.org/maps/>

Figure 8-2 Megaregion and Non-Megaregion Growth, 2000-2050

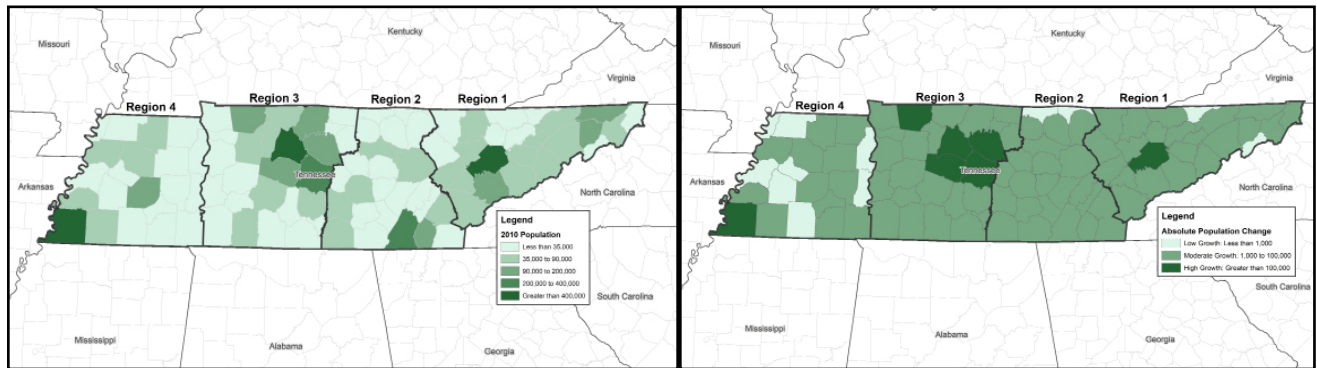


Source: <http://www.america2050.org/maps/>

8.1.1 Population

In 2014, the total statewide population for Tennessee was over 6.5 million³⁴. This ranks as the 17th most populous state in the U.S. The state's population grew 11.5 percent from 2000 to 2010. This is above the national average of 9.7 percent and ranks 19th nationally. Figure 8-3 shows the distribution of Tennessee's population by county in 2010. As expected, the urban areas contain the highest number of residents followed by those suburban counties and then the rural areas of the state.

Tennessee's population is projected to increase approximately 34 percent over the next 25 years from 6,357,436 in 2010 to 8,528,963 in 2040. Based on projections from Woods & Poole, Shelby, Davidson, Rutherford, and Knox Counties will see the greatest amount of population growth and many rural counties will grow at about half the rate of urban counties from 2010 to 2040. While the relative share of the State's population living in urban and rural counties is projected to remain about the same over the next 25 years (62 to 64 percent urban and 36 to 38 percent rural), 70 percent of the projected population growth is forecasted to occur in urban counties. Figure 8-3 shows the location of counties with the highest forecasted growth.

Figure 8-3 2010-2040 Population Growth by Tennessee County

Understanding the changing demographics of Tennessee can help to identify the needs of current users of the transportation system. Of the statewide population, 79 percent are age 16 and over, representing the potential driving population and labor force.

As demographic shifts occur over the next 25 years, an increasing portion of the state's population will be classified as seniors; transportation systems will need to recognize their unique needs and be designed with this demographic in mind. Senior populations, those ages 65 and older, are a unique segment of the population when it comes to transportation needs. Individuals in this age group are more likely to be retired and less likely to travel during peak commute hours. Many seniors also utilize urban and rural transit services in order to maintain their independence after they are no longer comfortable or physically able to drive. Within the State, urban centers have the highest number of seniors followed by suburban counties.

In Tennessee, the trend in land use is sprawling development. Six of Tennessee's Metropolitan Statistical Areas (MSAs) rank in the top 25 most sprawling in the U.S., according to Smart Growth America's Measuring Sprawl 2014 report. Sprawling MSAs pose a set of issues. Sprawl leads to an inefficient transportation system. Congestion usually increases, with more people becoming dependent on automobiles. This type of growth limits the ability for transit to become a viable transportation option. It also leads to higher transportation costs, with a more dispersed delivery pattern. Although some efforts have been made by the planning community, Tennessee's MSAs remain some of the most sprawling areas in the country.

8.1.2 Employment

Total employment across all sectors for Tennessee in 2012 was 3,682,605. A large portion of Tennessee's economy is considered goods-dependent industry, meaning that it relies on freight transportation to sell goods and receive inputs. This includes the sectors of Mining, Manufacturing, Construction, and Agriculture. The services-providing industry also includes sectors that are goods-dependent. Specifically, the Wholesale, Retail, and Transportation/Warehouse sectors rely on the freight transportation system. In Tennessee, these sectors account for 36 percent of all jobs.

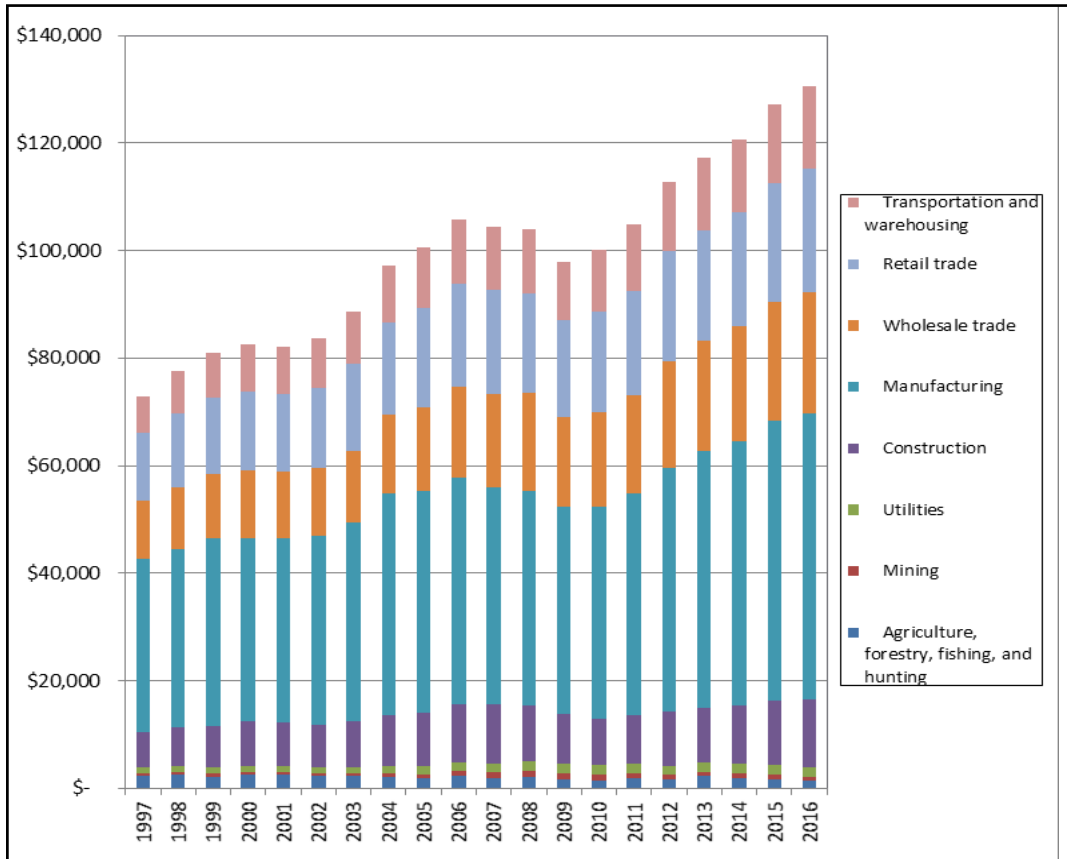
Looking at the diversity of employment across the state, Shelby County leads Tennessee not only in total jobs, but also in the number of jobs in Manufacturing, Wholesale Trade, Retail Trade, and Transportation and Warehousing. The State's next highest county in total employment is Davidson County, which has the second highest goods-dependent employment base in Tennessee, except for manufacturing employment.

By 2040, the State of Tennessee is expected to see employment grow to 5,470,861 jobs, which is a 32 percent increase. The majority of this growth is expected to occur in the urban areas. The goods-dependent industries of Farming, Forestry, Mining, Construction, and Manufacturing are expected to make up approximately 12 percent of the work force. In addition, approximately 18 percent of the work force in the state will come from the service-dependent industry.

Per capita personal income in Tennessee is \$40,654 (2014 dollars). This ranked 34th in the United

States and was 88 percent of the national average, \$46,129. Tennessee's economy has experienced steady expansion over the last 15 years. Between 1997 and 2016, the output of the Tennessee economy increased from just over \$155 billion to approximately \$329 billion. Tennessee's GDP in 2013 was \$287.6 billion. Manufacturing, real estate, and healthcare lead all other employment sectors in contributions to state GDP.³⁵ As in most states, the majority of the economy is in private sector service-providing industries. In 2016, this sector represented 68 percent of the State's total economy with \$223 million. The goods-producing portion of the economy has grown from \$40 billion in 1997 to \$70 billion in 2016, a growth of 63%. As shown in Figure 8-4, the size of this portion of the economy has grown from approximately \$73 billion in 1997 to over \$131 billion in 2016.

Figure 8-4 Tennessee GDP by Economic Sector 1997-2016 (millions)



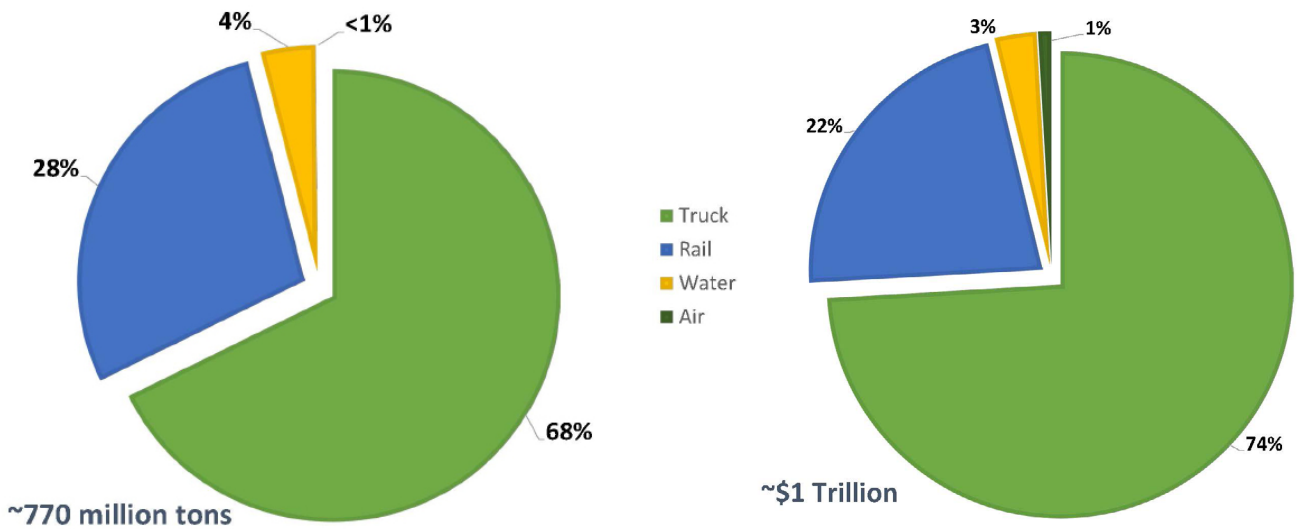
Source: Bureau of Economic Analysis 2017. <https://www.bea.gov>

8.2 FREIGHT DEMAND AND GROWTH

Like Tennessee's population and employment, Tennessee's demand for freight rail service is anticipated to continue to grow substantially. A total of approximately 770 million tons of freight was moved via Tennessee's infrastructure in 2012,³⁶ which equates to approximately \$1 trillion value of goods. By the year 2040, it is expected that 1.2 billion tons of commodities will be moved by the Tennessee freight system. Overall, trucks carried 576 million tons of goods to, from, within, and through Tennessee in 2012. Rail is the second largest mode in the state in terms of tonnage, with 240 million tons moved in 2012. The rail portion equates to approximately \$259.5 billion of goods. Nearly two-thirds of the freight rail in the state is from through flows.

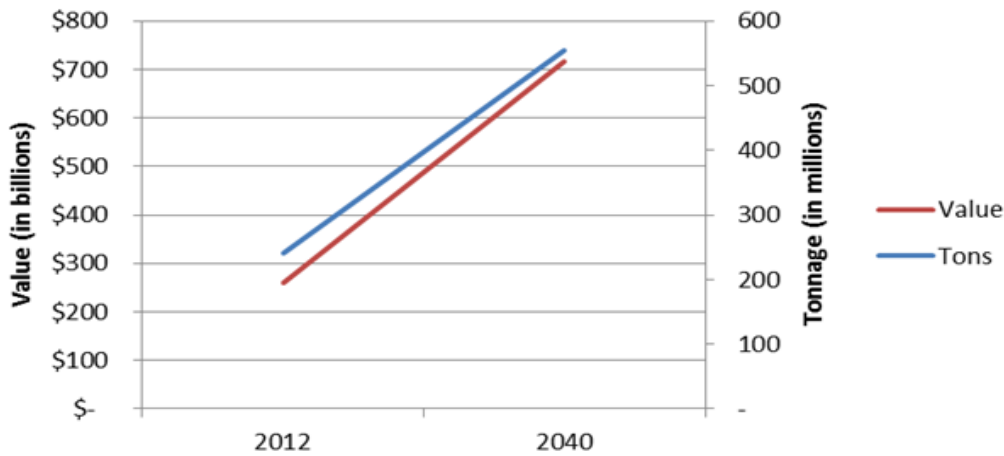
35 United States Bureau of Economic Analysis
 36 Global Insight Transearch Database

Figure 8-5 Modal Split, by Tonnage and Value (2012)



Trucking is expected to remain the top mode of freight transportation in the state for the foreseeable future, but tonnage shipped on the state's rail infrastructure is expected to increase by approximately 130 percent. Figure 8-6 shows that in 2040, Tennessee's rail infrastructure is expected to carry over 555 million tons of goods valued at approximately \$715.8 billion. All freight forecasts are determined using Transearch data for 2012 and 2040.

Figure 8-6 Forecasted Growth in Rail Movement



Origins and Destinations of Rail Shipments

The directional split of rail movements in Tennessee is expected to remain constant into the future, although the tonnage shipped and the values are expected to increase significantly. As stated before, through rail movements in the state account for two-thirds of rail tonnage. Inbound and outbound rail movements are similar, representing 18 and 14 percent shares, respectively. Internal rail movements account for only one percent of total tonnage in the state.

Table 8-1 Tennessee Rail Movements by Direction (Tonnage and Value)

Direction	2012 Tonnage	2040 Tonnage	% Change	2012 Value	2040 Value	% Change
Inbound	43,090,116	98,102,632	128%	\$44,568,145,239	\$24,020,790,034	178%
Outbound	32,291,722	76,352,009	136%	\$45,380,595,419	\$137,871,373,575	204%
Internal	3,326,109	7,813,027	135%	\$4,521,015,627	\$13,674,558,671	202%
Through	161,497,518	372,983,680	131%	\$165,063,827,306	\$440,277,374,245	167%
Total	240,205,465	555,251,348	131%	\$259,533,583,590	\$715,844,096,526	176%

Through Movements

Through-movements in rail freight have a significant impact on Tennessee. This is due to the state's geographic location and presence of six Class I railroads. The major through movements are to the Southeastern U.S. with origins in the Midwest. Although Wyoming remains a large contributor to through traffic, Table 8-2 shows that rail shipments originating in Illinois and Indiana are increasing the fastest. The corridors impacted most by through movements include CN's Fulton Subdivision and northwest to southeast NS and CSX lines.

Table 8-2 Top Origin-Destination Pairs for Rail Movements Passing Through Tennessee

Origin	Destination	2012 Tons	2040 Tons	% Change
WY	AL	11,895,256	19,471,888	64%
IL	LA	8,338,520	19,846,677	138%
KY	GA	8,051,934	13,938,974	73%
KY	FL	7,402,365	12,388,853	67%
IL	GA	6,959,570	17,072,543	145%
KY	SC	6,573,215	10,873,128	65%
IL	FL	6,149,091	14,539,231	136%
IN	GA	4,687,479	12,042,654	157%
IL	AL	4,523,571	9,453,275	109%
KY	AL	2,518,608	4,504,252	79%
All Others		94,397,909	238,852,205	153%
Total		161,497,518	372,983,680	131%

Trading Partners

Tennessee shipped and received 74.4 million combined tons of goods by rail in 2012. That is expected to increase to over 171.5 million tons in 2040. Tennessee's top domestic trading partners are Georgia for freight originating in Tennessee and Wyoming for freight terminating in Tennessee. In 2012, these two states accounted for 39 percent of the total tonnage moved by rail. In 2040, these two states are expected to only contribute 30 percent of total tonnage, shifting portions of their share to California, Illinois, and Texas.

Intrastate Movements

Within Tennessee, 3.3 million tons of goods were shipped by rail in 2012. That is expected to increase to over 7.8 million tons in 2040. Shelby and Roane Counties are responsible for a combined 60 percent of intrastate rail movements, with 40 and 20 percent respectively. The corridors impacted most by intra-state movements include NS's Memphis West End and Third District CNOT&P Subdivisions, along with CSX's EG Line.

8.2.1 Commodities Shipped

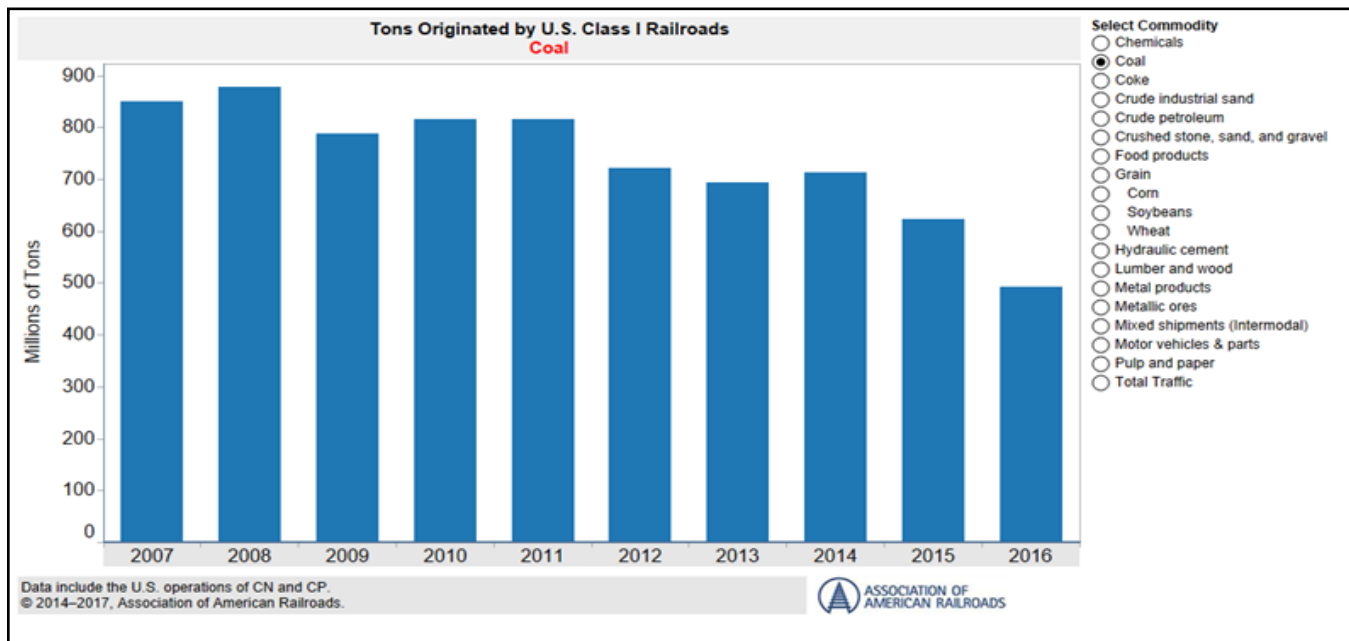
Taking into account all modes of freight movement, the top commodities moving through Tennessee have been consistent in recent years. Gravel is the top commodity by tonnage moved on the system. It is interesting to note that 31.8 million tons are imported while almost the same amount, 36.5 million tons, is exported, and most is moved by truck. In 2012, coal traffic represented 92 million of the rail tons moved in Tennessee. Over two-thirds of this amount was coal shipments from states north of Tennessee, such as Kentucky and West Virginia, moving to locations south of Tennessee. With the three automotive companies located in Tennessee, vehicles are the top commodity shipped into, out of, through, and within the state based on value. Farm products (agricultural products and other food products) make up the third and fourth largest commodities with a combined 82.3 million tons. This is over 10 percent of the total flows for the state. Other key commodities for Tennessee, including miscellaneous transported products, cereal grains, and chemical products, were the only other commodities with over 10 million tons shipped by rail in 2012. Other top commodities by value moving through Tennessee in 2012 include electronics, machinery, chemical products, and plastics.

Coal dominates as Tennessee's top commodity shipped by rail. Shown in Table 8-3, coal is expected to continue as the top commodity shipped by rail in the state. Cereal grains, miscellaneous transported products, basic chemicals, and other foodstuffs also are expected to be top commodities in the future for rail movement.

Table 8-3 Modal Distribution of Top Five Commodities by Tonnage Moved in Tennessee (2012 and 2040)

Commodity	Code	2012 (million tons)				2040 (million tons)			
		Hwy	Rail	Water	Air	Hwy	Rail	Water	Air
Gravel	12	119.1	4.2	2.8	-	192.8	6.9	4.9	-
Non-Metallic Mineral Products	31	32.4	2.2	1	-	74.3	4.4	1.6	-
Coal	15	0.8	91.6	13.5	-	0.6	62.2	17.2	-
Agricultural Products (Except Live Animals, Cereal Grains, & Forage Products)	3	34.8	7.4	1.6	-	47.4	22.5	2.9	-
Other Food Stuffs	7	29.6	8.6	0.2	-	47.1	14.4	0.4	-

Although coal is currently the top commodity shipped by rail in the state, the future volume of coal shipments is uncertain. Tennessee's Multimodal Freight Plan projects a decrease in coal shipments by rail. Additionally, basic chemicals, cereal grains, and other foodstuffs are expected to occupy the largest rail volumes by 2045 (Freight Analysis Framework).

Table 8-4 National Data on Carloads of Coal Shipped by Class I Railroads

8.2.2 Freight Trends

Traditional bulk shipments comprise the largest amount of rail movements and are expected to remain that way in 2040. These are movements travelling exclusively by rail and are mostly bulk commodities. Intermodal shipments, which use a combination of rail and truck to move finished goods in shipping containers and trailers-on-flatcars, are growing at a faster pace despite their smaller market share. Almost half of Tennessee's intermodal shipments terminate or originate in California, the vast majority of which move through coastal port. This trend is expected to continue into the future, but the amount of containers moved is expected to more than double by 2040. Located along "Auto Alley," Tennessee has attracted automakers such as Nissan, Volkswagen, and General Motors. Along with the major automakers, Tennessee is also home to a number of automaker suppliers. An increasing share of automotive components is being moved by rail using intermodal shipping containers.

8.3 PASSENGER TRAVEL DEMAND AND GROWTH

8.3.1 Vehicular Travel

Tennessee has more than 95,000 miles of roadways. Every roadway in the state is classified as one of the following:

- Freeway/Interstate
- Principal Arterial
- Minor Arterial
- Collector
- Local Road

A roadway's classification is typically characterized by the trade-off between access and mobility. Local roads provide access to a driver's final destination. Arterial roads are intended for mobility by providing for higher speeds over longer distances. Freeways/Interstates provide the highest level of service and are actually arterial roadways with controlled access. Connecting arterials and local roads are the collector roads, which serve moderate levels of both access and mobility.

Traffic counts are typically reported in terms of Annual Average Daily Traffic (AADT). AADT counts represent an estimate of the number of vehicles that cross a specific count location on an average day in the year. Vehicle Miles Traveled (VMT) expands upon traffic counts to provide an estimate of usage by calculating the distance traveled by each vehicle counted. VMT estimates can be compiled to show highway usage by geography or roadway classification for a certain time period. VMT estimates are an indicator of travel demand and can be forecasted based on growth trends. Much like population, employment, and freight movement, travel demand in Tennessee is expected to grow in the future.

Table 8-5 provides a breakdown of the mileage and traffic characteristics of each roadway functional class in Tennessee. The estimates show that the Tennessee roadway network currently handles approximately 70.9 billion VMT each year. Freeway/Interstate roads make up only 1.3 percent of the state's roadway mileage, but carry more than 32.5 percent of all highway traffic. Alternatively, local roads account for more than 70.3 percent of the state's total roadway mileage and only carry 13.4 percent of the roadway traffic.

Table 8-5 Roadway Mileage and Daily Vehicle Miles Traveled (VMT), by Classification

Functional Classification	Total Miles*	% of Total Miles	2010 VMT**	% of Total VMT
Total Interstate/ Freeway	1,259	1.3%	63,260,655	32.5%
Total Principal Arterial	3,484	3.6%	44,283,438	22.8%
Total Minor Arterial	5,666	5.9%	36,127,523	18.6%
Total Collector	17,994	18.8%	24,677,470	12.7%
Total Local	67,133	70.3%	26,068,000	13.4%
Total	95,536	100%	194,417,086	100%
Urban				
Urban Interstate/ Freeway	572	0.6%	39,231,450	20.2%
Urban Principal Arterial	1,561	1.6%	29,493,264	15.2%
Urban Minor Arterial	2,428	2.5%	22,656,461	11.7%
Urban Collector	2,346	2.5%	8,231,654	4.2%
Urban Local	18,557	19.4%	17,362,000	8.9%
Urban Subtotal	25,464	26.7%	116,974,830	60.2%
Rural				
Rural Interstate/ Freeway	687	0.7%	24,029,205	12.4%
Rural Principal Arterial	1,923	2.0%	14,790,173	7.6%
Rural Minor Arterial	3,180	3.3%	13,471,062	6.9%
Rural Collector	15,648	16.4%	16,445,816	8.5%
Rural Local	48,576	50.8%	8,706,000	4.5%
Rural Subtotal	70,014	73.3%	77,442,256	39.8%
*Mileage calculated from TDOT TRIMS Database				
** VMT Estimated from TDOT Travel Demand Model				

The information in Table 8-6 was extracted from the state's travel demand model and represents an estimate of the changes in regional travel conditions between 2010 and 2040. Estimated at an average annual growth rate of 2.1 percent, annual VMT in the state would reach 115.8 billion by 2040. Overall, vehicle travel is forecasted to grow by approximately 63.3 percent. Although urban travel comprises over 60.2 percent of total travel in the state, rural travel is expected to grow at a faster rate.

Table 8-6 Vehicle Miles Traveled (VMT) for Urban and Rural Areas, 2010 and 2040

	2010 VMT	2040 VMT	% of Total 2010 VMT	% of Total 2040 VMT	VMT % Change
Urban	116,974,830	185,691,000	60.2%	58.5%	58.7%
Rural	77,442,256	131,715,848	39.8%	41.5%	70.1%
Total	194,417,086	317,406,848	100.0%	100.0%	63.3%
*Daily Vehicle Miles Traveled from TDOT Travel Demand Model					

Table 8-7 shows the split between freight (truck) and passenger (car) demand. Although passenger travel accounts for the majority of VMT at 88.5 percent, freight VMT is expected to grow at a faster rate. This indicates that freight travel demand will continue to grow in overall significance between 2010 and 2040 as the population and economy grow.

Table 8-7 Vehicle Miles Traveled (VMT) for Freight and Passenger Travel

	2010	2040	% of Total 2010 VMT	% of Total 2040 VMT	VMT % Change
Truck VMT	22,295,179	38,206,576	11.5%	12.0%	71.4%
Passenger VMT	172,121,907	279,200,272	88.5%	88.0%	62.2%
Total	194,417,086	317,406,848	100%	100%	63.3%
*Daily Vehicle Miles Traveled from TDOT Travel Demand Model					

8.3.2 Intercity Passenger Rail

Amtrak's Long Distance service saw a 1.23 percent compound annual growth rate (CAGR) increase from 2008 to 2014. After slight declines in 2014 and 2015, ridership began to rise again in 2016. The City of New Orleans route experienced a 5.14 percent compound annual growth rate increase from 2007 to 2013. From 2013 to 2016 ridership declined on the City of New Orleans by an average of 0.3% annually. Stations in Tennessee saw a 6.13 percent compound annual growth rate increase from 2007 to 2013, but from 2013 to 2016 declined by an average of 1.7% annually. The Memphis station is a crucial one for the City of New Orleans, representing 29 percent of the route's ridership.³⁷

Although the Long Distance service is expected to grow at a slower rate, the City of New Orleans, and specifically the Memphis Central Station, is expected to grow at a much faster rate. Table 8-8 shows the expected ridership figures based on historical ridership growth trends.

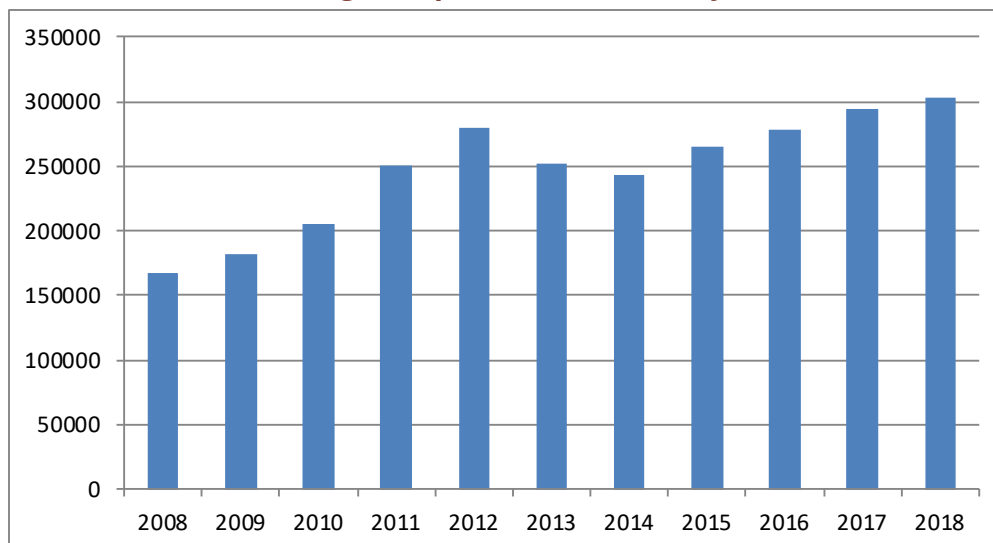
Table 8-8 Actual and Forecasted Amtrak Ridership

	Long Distance Sector	City of New Orleans	Stations in Tennessee	Memphis Central Station	Newbern-Dyersburg Station
2013	4,753,900	251,500	78,675	74,483	4,192
2014	4,543,199	251,106	72,589	68,662	3,927
2015	4,488,542	255,458	74,933	71,033	3,900
2016	4,655,599	248,960	74,667	70,977	3,690
2040	5,260,496	516,355	158,811	129,483	3,436
CAGR	1.23%	5.14%	6.13%	5.00%	1.92%
CAGR 2008-2013	1.23%	5.14%	6.13%	5.00%	1.92%
CAGR 2013-2016	-0.7%	-0.3%	-1.7%	-1.6%	-4.0%
CAGR 2008-2016	0.5%	3.1%	3.2%	2.5%	-0.3%

*Source: Amtrak

8.3.3 Commuter Rail

RTA's Music City Star ridership steadily increased from the beginning of service until 2012. Since 2012 ridership has declined somewhat, following a national trend that is likely due to low gas prices, a strong economy, and the rise of ride-hailing services such as Uber and Lyft. Over the long term, ridership on the Music City Star is expected to have modest growth as traffic congestion increases and several transit oriented development projects locate around station areas and service on the line is improved. Additional capacity, frequency, connectivity, and better access to stations are the limiting factors for ridership growth.

Figure 8-7 Unlinked Passenger Trips on the Music City Star 2008-2015

8.3.4 Ride-Sharing and Autonomous/Connected Vehicles

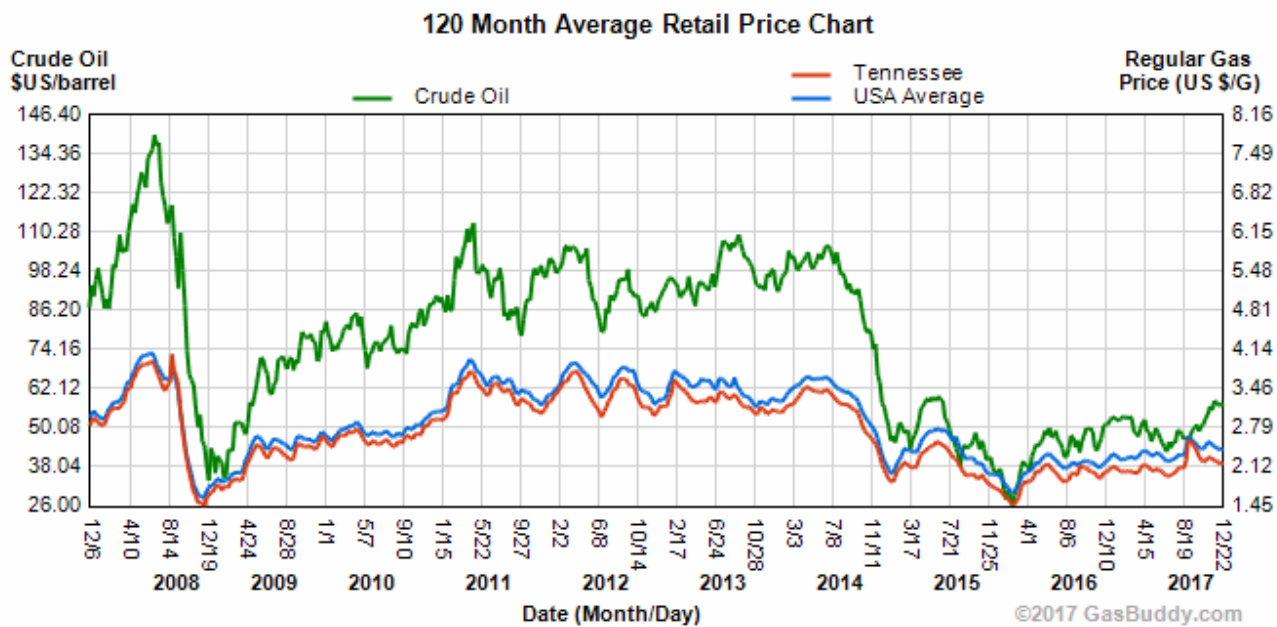
Ride-sharing services have emerged and grown rapidly in the past 5 years. Such services, nominally Uber and Lyft, allow users to order a car directly from their smartphone. Such personalized service has reduced the number of choice riders utilizing traditional public transit. There is also an expectation that, with the growth of such on-demand services, vehicle ownership will decline, particularly amongst millennial and Gen-Z Tennesseans.

While the effects of ride-sharing services are generally becoming clearer, the effects of connected and autonomous vehicles on the transportation system are more difficult to predict. The anticipated integration of such vehicles into the transportation system in significant amounts is still a dozen years away or more, but companies like Uber and Google are already piloting self-driving cars out on public roadways. Some analysts predict an overall decline in VMT, while others expect such technologies to contribute to urban sprawl, thereby further increasing VMT.

8.4 FUEL COST TRENDS

Trends in crude oil and regular gasoline fuel costs since 2007 are shown in Figure 8-8. Costs for fuel rose steadily until the 2008 recession. Between 2008 and 2014, fuel costs steadily increased and leveled off. In 2014, they fell again and have remained at lower levels since. Due to the lower cost of fuel, modal diversion is moving at a slower pace than when fuel prices remain the same or increase.

Figure 8-8 Trends in Crude Oil and Gasoline Costs 2007-2017



8.5 RAIL CONGESTION TRENDS

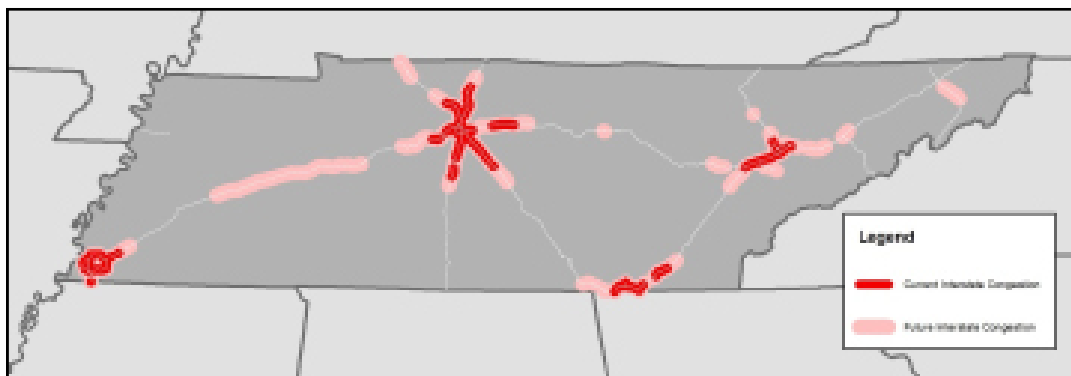
Nationally, class I rail track miles have experienced a slight decrease since deregulation. Meanwhile, freight demand for rail has increased significantly. Tennessee has experienced recent additions of track mileage with new short-line and corridor capacity improvements. However, these capacity additions may not keep pace with the anticipated growth in rail freight demand in Tennessee. The result will likely be congested corridors and terminals, which should be addressed with appropriate infrastructure improvements. It may also require higher maintenance due to faster deterioration caused by higher volumes. This may also have an impact on intercity passenger rail service. As noted earlier, the performance metric for host responsible delays frequently exceeds the FRA standard. Performance delays are likely to continue and increase with the expected increase of demand on freight rail lines unless new corridor capacity is created.

8.6 HIGHWAY AND AIRPORT CONGESTION TRENDS

8.6.1 Highway

Tennessee's highways are heavily used and congested. Cities and urban areas in Tennessee consistently rank in the top of congestion reports such as The Urban Mobility Report, INRIX Scorecard, and TomTom Traffic Index. Congestion has increased across the state and that trend is expected to continue. Figure 8-10 shows the increase in highway segments considered to have congestion. These maps represent 2010 and 2040 congestion, based on TDOT's Statewide Travel Demand Model. Lane mileage of interstates considered to have congestion is expected to more than double by 2040, particularly in urban areas, which are currently experiencing the worst congestion. Significant increases in congestion along each interstate segment in urban, suburban, and rural areas can be expected in 2040.

Figure 8-10 Congestion on Tennessee's Interstates in 2010 and 2040



8.6.2 Airport

Tennessee is home to 79 public use airports. This includes the six commercial service airports shown in Table 8-9, two of which are international airports. The remaining facilities are regional or local service (e.g. county or municipal) airports. In addition to the public airports, there are 132 private air facilities throughout Tennessee. Public facilities are managed through the TDOT Aeronautics Division and make use of Department and FAA Block Grant Funds for maintenance costs. New infrastructure plans are first included in the airport master plans as reviewed and approved by the FAA.

Table 8-9 Enplanements for Commercial Service Airports in Tennessee (2015-2016)

Rank	Code	City	Airport Name	Classification	2015 Enplanements	2016 Enplanements	% Change
33	BNA	Nashville	Nashville Int.	Primary	5,715,205	6,338,517	10.9%
62	MEM	Memphis	Memphis Int.	Primary	1,873,716	2,016,089	7.6%
95	TYS	Alcoa	McGhee Tyson	Primary	848,390	887,103	4.6%
130	CHA	Chattanooga	Lovell Field	Primary	393,680	422,442	7.3%
179	TRI	Bristol, Johnson, & Kingsport	Tri-Cities Regional TN/VA	Primary	216,426	204,926	-5.3%
496	MKL	Jackson	McKellar-Sipes Regional	Non-primary Commercial Service	1,800	3,661	103.4%

Source: FAA Passenger Boarding (Enplanement) and All-Cargo Data

By 2035, U.S. commercial air carriers are projected to fly 1.71 trillion available seat miles (ASM) and transport 1.14 billion enplaned passengers a total of 1.44 trillion passenger miles. Planes will remain crowded, with load factors projected to grow moderately in the short-term, then tapering in the long-term to 84.2 percent in 2035. Passenger trip length is forecasted to increase by more than 139 miles over the forecast period to 1,270 miles in 2035. The growth in passenger trip length reflects the faster growth in the relatively longer international and domestic trips as compared to shorter-haul flights.

9. PROPOSED FREIGHT RAIL IMPROVEMENTS AND INVESTMENTS

This section describes proposed improvements and investments that could address freight rail needs in the state. In the review of prior plans, studies, and stakeholder comments, several recommendations were identified to address the needs and opportunities concerning freight rail in Tennessee. The discussion to follow includes an illustrative list of projects that is financially unconstrained. Each identified project would need to be evaluated in light of costs, benefits, and availability of funding.

9.1 POLICY AND INITIATIVE RECOMMENDATIONS

Some of the recommendations identified in the review include the continuation of programs that provide safety and maintenance improvements while other recommendations are to initiate studies to increase capacity and operational efficiencies. The Tennessee Statewide Multimodal Freight Plan recommended several initiatives to improve safety and operations in the State including:

- Continued communication and collaboration with railroads, particularly for updates on their respective network developments including the Crescent Corridor and Mid-America Corridor capacity improvements
- Continued use of the Section 130 program to address railroad highway crossing safety
- Continued partnership with FRA to inspect rail facilities and practices
- Statewide study of intermodal facility locations
- Container on barge service study in Nashville
- Study corridor improvement options for better freight flow between I-40 west of Nashville and I-24 near Clarksville; I-24 corridor study completed in 2014, I-40/I-81 corridor study began in 2019 to be completed in 2021
- Updated Track Needs Assessment Study for shortline railroads

9.2 CLASS I IMPROVEMENTS AND INVESTMENTS

Some of the recommendations identified in the review include specific projects aimed to improve the safety, maintenance, capacity, and operations for Class I railroads. The Class I railroads in Tennessee have not indicated their needs or planned improvements for inclusion in this plan, but needless to say that the Class I railroads are likely to continue capital investment in their systems, and the vast majority of those investments will be funded by the Class I railroads themselves. Improvements to Class I railroads listed below reflect the desires of local communities and customers identified in the Tennessee Statewide Multimodal Freight Plan. Projects from that plan and from stakeholder input to this planning effort include:

- Construction of a third Mississippi River bridge for additional rail and roadway capacity between Memphis and the western United States
- Intersection improvements and expansion of Lamar Avenue in Memphis to improve access to the BNSF intermodal yard. Though not a rail project, the capacity at the bottleneck entrance through and around the facility is impacted by the highly congested conditions on Lamar Avenue.
- Study of market needs for inland port and intermodal container transfer facility in East Tennessee
- Redevelop Kingsport intermodal yard to be used as a truck/rail transfer facility
- Improve Cessna Road at-grade crossing with NS in Knoxville
- Improve South C Street at-grade crossing with NS in Lenoir City

- CSX bridge improvement for larger barges to pass in Nashville on the Cumberland River
- Explore relocation of CSX Radnor Yard to outlying location (possibly Smyrna) to increase capacity of the yard and open up potential for passenger rail service in Nashville region
- Construct a rail line spur 18 miles to the CN Fulton Subdivision providing second Class I access for Memphis Regional Megasite
- Construct a rail spur from CSX Memphis Subdivision to the I-40 Advantage Industrial Park Site in Brownsville
- Bulk transloading facility on NS in Bradley County
- Third Street Flyover NS in Cleveland to eliminate low clearance for trucks and at-grade crossing for vehicular traffic
- Grade separation project on Saundersville Road in Hendersonville
- Implementation of positive train control (PTC) where required

9.3 SHORTLINE IMPROVEMENTS AND INVESTMENTS

Some of the recommendations identified in the review include specific projects aimed to improve the safety, maintenance, capacity, and operations for shortline railroads. Projects on shortline railroads identified in the Tennessee Statewide Multimodal Freight Plan and through stakeholder input to this planning effort include:

- Upgrades and continued maintenance to enable Tennessee shortline railroads to accommodate 286K loads
- Maintenance and/or replacement of numerous bridges on short line railroads
- New rail service to the Port of Cates Landing provided by TennKen to create a connection between water and rail modes in Tiptonville. On April 19, 2016 the Surface Transportation Board granted authorization for the Northwest Tennessee Regional Port Authority to construct 5.5 miles of new rail.
- Construction of a shortline spur to CN in order to provide the Memphis Regional Megasite with rail access to two Class I railroads.
- East-West Trans-Tennessee Rail connection including the completion of NERR from Algood to Oliver Springs
- Create rail access to Hailey's Harbor terminal that connects to nearby NWR line in Nashville
- Re-work or Replacement of Bordeaux Bridge on NWR in Nashville, currently an impediment to navigation
- Construct two additional storage tracks at ETRY Yard in Johnson City
- Construct siding at ETRY Carnegie Spur in Johnson City
- Purchase of new fuel efficient locomotives for Tennessee Southern Railroad (TSRR)
- Removal of Walking Horse and Eastern (WHOE) track and elimination of at-grade crossings in Shelbyville
- Implementation of Positive Train Control (PTC) for Class I railroads and Class II and III railroads in come circumstances
- Preservation of short lines with low traffic volume (or which may have low volume in the future due to expected decreases in coal traffic) but which have potential for future economic development

10. PROPOSED PASSENGER RAIL IMPROVEMENTS AND INVESTMENTS

This section describes proposed improvements and investments that could address passenger rail needs in the state. In the review of prior plans, studies, and stakeholder comments, several recommendations were identified to address the needs and opportunities concerning passenger rail in Tennessee. Potential improvements to intercity passenger rail and fixed-guideway local/regional rail transit are discussed separately below.

10.1 INTERCITY PASSENGER RAIL IMPROVEMENTS AND INVESTMENTS

Potential improvements to intercity passenger rail range from modest upgrades to existing services to development of future higher speed intercity service.

10.1.1 Improvements to Current Amtrak Service

As discussed in Section 3, current Amtrak service suffers from several deficiencies that reduce ridership and revenue growth, resulting in a lower revenue/cost ratio. Efforts to improve the revenue/cost ratio of the existing service are critical to improve the economic performance of passenger rail service in Tennessee.

Amtrak undertook analysis of its long-distance train services to develop strategies to improve service, as required by Section 210 of PRIIA.³⁸ Included in these studies was the City of New Orleans route.

A list of improvements common to all Amtrak routes and with specific improvements for each route was developed. Recommended improvements included the following:

- **Modify the seat pitch on Superliner Coaches** from 50-52 inches to 46-48 inches, allowing for four or six additional seats in each coach, with an estimated annual benefit of \$1.8 million. The slightly smaller seat pitch (or distance between seats) would have no discernible impact on customer satisfaction and actually would improve a customer's ability to use the fold down table, which is difficult with the current pitch.
- **Modify the current Superliner Transition Sleeping Car** interior to increase the number of sleeping car rooms available for sale by 10. The current design of these cars includes 15 roomettes on the upper level, with a lounge area and restrooms on the lower level. On all trains which feature this car, 8-11 rooms are reserved for on-board crew use and up to four rooms are offered for sale to the public. Other rooms can be reserved for employee business travel or Conductor/Chief use. This retrofit would re-locate the Conductor's space to the former Chief's Room upstairs, and convert the downstairs, largely unused area, into a fully functional sleeping area with an additional four roomettes, Family Bedroom, and Accessible Bedroom. The re-design, which would require major capital expenditures, would greatly improve both the customer service quality and revenue performance.

Even though these improvements are system-wide, any improvements in the revenue/cost ratio of a route helps to improve economic performance of the service.

In Amtrak's 2012 PRIIA study, two improvements were proposed that were specific to the City of New Orleans route. The first was adding a new station stop at Marks, Mississippi. For several years, Amtrak has been working with local and state officials to explore the possibility of creating a flag stop in Marks. In addition to ridership that would originate to/from Marks, there would also be the opportunity for additional ridership from nearby communities such as Clarksdale, host of the Blues Museum, Tunica, and Oxford, home of the University of Mississippi. Ground breaking for the new Marks station occurred in October 2016, with completion scheduled in 2018.

38 Amtrak. PRIIA Section 210 Performance Improvement Plan. (2012)

The second proposal directly related to the City of New Orleans route was adding “thruway” bus services for Jackson-Meridian and Jackson-Vicksburg. An analysis was performed to determine if new markets might be served by offering connecting bus services. These two proposed bus routes had a positive financial benefit and have since been implemented. One of the thruway bus routes (Jackson-Meridian) has the additional benefit of providing connections between cities on two Amtrak routes (the City of New Orleans and the Crescent) at the attractive and comfortable Jackson, MS station which was renovated nearly 10 years ago.

10.1.2 Other Near-Term Intercity Passenger Rail Improvements and Investments

Additional Frequency on the City of New Orleans Route

Amtrak, with the support of the Memphis City Council, is interested in increasing service on the City of New Orleans line. The idea stems from a recent expansion of service in Illinois from Chicago to Champaign and Carbondale. Two more trains are now running on the route linking the two towns to Chicago. The trains from the new service could potentially run to Memphis. If extended to Memphis, there would be twice-daily service to Carbondale and Chicago. However, before any new service can begin, feasibility studies must be conducted. An initial study would show the cost, benefits, and possible ridership numbers for the new service. A subsequent, more in-depth study would evaluate the cost of necessary capital improvements on privately-owned Class I rail lines in order to prevent a negative impact on freight rail operations.³⁹ The State of Tennessee needs to carefully weigh the costs and benefits of the proposed increased service.

Memphis Central Station Redevelopment

In 2015, Memphis announced plans for a \$55 million redevelopment of the Memphis Central Station. Of the \$55 million, \$52 million represents private investment, while the remaining \$3 million is provided by the FTA. The proposal for the Central Station includes replacing existing apartments in the train station building with a boutique hotel, building a 5-screen movie theater onto the power house building, and possibly adding a new downtown grocery store. The hotel opened in 2019.

10.1.3 Long-Term Intercity Passenger Rail Improvements

Intercity passenger rail in Tennessee is limited to the north-south service on the City of New Orleans. However, several studies have been conducted to evaluate the potential of providing passenger rail service elsewhere in the state. This section will discuss past, present, and future efforts that look at the potential corridors and their intended benefits for intercity passenger rail in Tennessee.

On April 16, 2009, President Obama, together with Vice President Biden and U.S. Transportation Secretary LaHood announced a new vision for developing high-speed intercity passenger rail in America, calling for a collaborative effort by the federal government, states, railroads, and other key stakeholders to help transform America's transportation system through the creation of a national network of high-speed rail corridors. To achieve this vision, the FRA published the High-Speed Rail Strategic Plan in April 2009 and launched the High Speed Intercity Passenger Rail (HSIPR) Program in June 2009. Congress made \$8 billion in HSIPR funds available through the American Recovery and Reinvestment Act of 2009 (ARRA). Congress continued to build upon ARRA by making available an additional \$2.1 billion through annual appropriations for federal fiscal years 2009 and 2010, using the framework initially established by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA).

Currently, FRA is developing a number of regional rail plans with a long term planning horizon. TDOT has participated as a Lead Stakeholder in the development of the Southeast Rail Plan, along with representatives from Georgia, Florida, South Carolina, North Carolina, Virginia, and Washington, DC. The FRA's consultant team has developed network scenarios and the Lead Stakeholders have

³⁹ Sells, Toby. Amtrak Looks to Expand Memphis Service. Memphis Flyer, 8-14-14. <http://www.memphisflyer.com/memphis/amtrak-looks-to-expand-memphis-service/Content?oid=3722278>

provided feedback to identify a network of passenger rail corridors that maximizes performance measures such as cost effectiveness and ridership. The FRA anticipates that the study will be completed in 2018.

Corridors that have potential for future passenger rail development are discussed below.

Jacksonville-Atlanta-Chattanooga-Nashville-Louisville- Chicago

A portion of this corridor (Atlanta-Chattanooga-Nashville-Louisville) was evaluated in the Georgia Department of Transportation's High Speed Rail Planning Services, Final Report (March 2012). The purpose of this high speed rail planning study was to evaluate the feasibility of high-speed rail for three corridors in the southeastern United States. The feasibility of implementing and operating high-speed intercity passenger rail was examined within each corridor for Emerging High-Speed Rail (90-110 mph) and Express High-Speed Rail (180-220 mph) in all three corridors and Maglev (220+ mph) in the Atlanta-Chattanooga-Nashville-Louisville corridor. It should be noted that the representative routes are not preferred or recommended alternatives, but are presented as an example of an alternative to develop reasonable estimates for each corridor's high-speed rail performance. Each representative route may have a variety of specific alignments that will be analyzed through the NEPA process should the route be selected for future analysis.

The Atlanta-Chattanooga-Nashville-Louisville corridor extends between the Hartsfield-Jackson Atlanta International Airport (H-JAIA) and Downtown Louisville, KY. As documented in the Georgia State Rail Plan, the Atlanta-Chattanooga Corridor has been a subject of study for over 10 years and was part of the GDOT 1997 Intercity Rail Plan. The Atlanta Regional Commission (ARC) analyzed the corridor from 1999 to 2003. Both the Tennessee and Kentucky State Rail Plans explored options and the opportunity for high-speed service in their previous and current plans.

The Georgia Department of Transportation (GDOT) and TDOT have developed a Tier I EIS considering 180 mph high-speed rail and Maglev within the Atlanta-Chattanooga section of the corridor. The Draft Tier I EIS, released for public comment in October 2016, identified three build alternatives in addition to a no-build alternative. The three corridor alternatives included:

- **The I-75 Corridor**, beginning on the east side of HJAIA and following I-75 north to downtown Chattanooga.
- **The East Corridor**, beginning on the east side of HJAIA and following I-75 to just north of Cartersville where it then follows existing an CSX rail corridor northward to the Chattanooga Metropolitan Airport and then along I-75 into downtown Chattanooga.
- **I-75/Rome Corridor**, beginning on the east side of HJAIA and following I-75 to Cartersville where it then follows the US-411 corridor into Rome. From Rome it follows the CSX H-line NE to I-75 and then along I-75 into downtown Chattanooga.

A Tier I Final EIS was published in the summer of 2017 and identifies a Preferred Corridor Alternative as the corridor that follows I-75. The FEIS does not identify a preferred technology (i.e. maglev vs. steel wheeled). If funding for additional study becomes available, then GDOT, TDOT, and FRA may conduct a Tier 2 NEPA process that examines potential alignments within the Preferred Corridor Alternative.

The FRA's draft Southeast Rail Plan identifies the segment between Orlando and Atlanta as "Core Express" service, indicating a relatively high potential of feasibility relative to other corridors. The Atlanta-Chattanooga-Nashville segment was rated "Regional/Core-Further Analysis." The Draft Southeast Rail Plan did not evaluate the Nashville-Louisville-Chicago segment.

Little Rock to Memphis

The Federal Railroad Administration (FRA) and Arkansas State Highway and Transportation

Department (AHTD) are studying the feasibility of high speed rail in the state. The High-Speed Passenger Rail Feasibility Study consists of the evaluation of extending the South Central High-Speed Rail Corridor from Little Rock to Memphis. The \$380 million study was funded with federal and state transportation and general funds. Three potential routes have been identified though no funding exists.

The FRA's Draft Southeast Rail Plan did not evaluate this potential route because it was not located within the study area. A future study that includes Arkansas could evaluate that corridor.

Roanoke to Bristol

Amtrak is extended service on the Northeast Regional from Lynchburg to Roanoke on October 31, 2017. The extension has raised interest in exploring how the line could be further extended to Bristol. This connection is identified in Virginia's recently adopted Statewide Rail Plan (2014) as a long-term solution, but Virginia has indicated that they would like to see several years of performance data for the Roanoke extension before considering extending service to Bristol. Virginia must carefully weigh the costs and benefits of the new service, since PRIIA requires the state to pay for capital costs and operating losses associated with new service under 500 miles. Providing bus service that is interlines with Amtrak ticketing from Bristol to the Roanoke station would be a first step toward demonstrating the level of demand for service from Bristol.

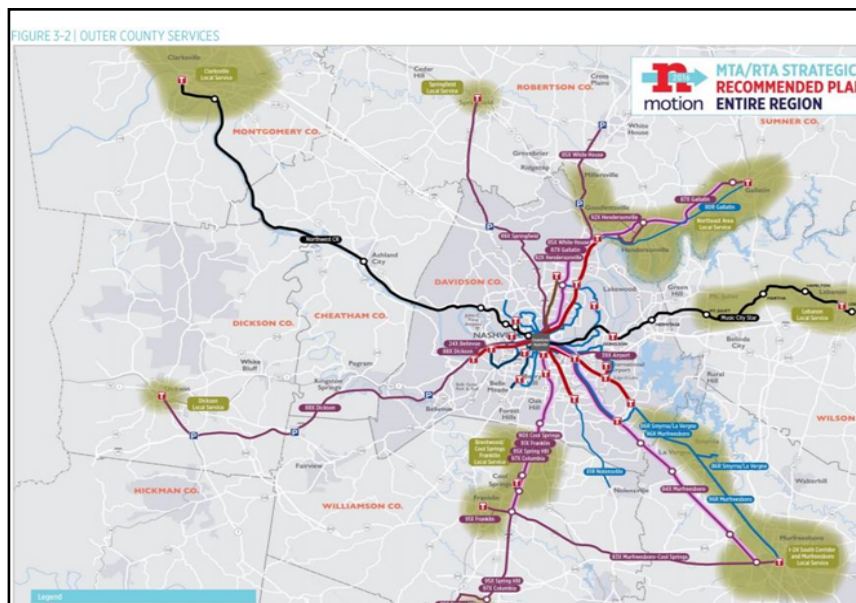
10.2 COMMUTER RAIL IMPROVEMENTS AND INVESTMENTS

Commuter rail in Tennessee started in 2006 with the establishment of the Music City Star. The Star is considered a "starter" project to demonstrate the effectiveness of commuter rail service to the metro Nashville area. Expansion plans for the region include as many as six more lines, terminating in Gallatin, Columbia, Murfreesboro, Dickson, Springfield, and Clarksville via Ashland City. Within Davidson County, MTA has done a preliminary feasibility assessment of high-capacity transit on six routes: Gallatin Pike, Dickerson Pike, Murfreesboro Pike, Nolensville Pike, and Charlotte Avenue. Nashville Mayor Megan Barry has indicated that development of high-capacity transit on Gallatin Pike is a top priority. In this section, short- and long-term improvements and investments for the Music City Star and other rail transit improvements are discussed.

10.2.1 Short-Term Commuter Rail Improvements and Investments

Location	Project	Project Description
Memphis	Resumption of Service on the Main Street Trolley Line	
Memphis	Rehabilitation of Trolleys	
Nashville	Commuter Rail Capitalization and Preventative Maintenance	This project, funded with nearly \$11 million of both traditional FTA 5307 and flexed Urban Surface Transportation Program (U-STP) FHWA funds will address operation of and preventative maintenance for the Music City Star Commuter Line East Corridor between downtown Nashville and the City of Lebanon. Increasing ridership is a key to improving transit opportunities and garnering support for future transit investment. This commuter rail capitalization and preventative maintenance will make rail service more efficient and easier for the customer to use. This project will enhance the quality of life in the region by increasing travel choices and efficiency. This project will increase appeal of public transportation, which, in turn, can help to increase ridership and support for transit investment
Nashville	Purchase and/or Rehabilitation of Locomotive and Rail Cars	This project is expected to be funded with \$5 million of FTA 5307 and 5337 funds. The purchase and/or rehabilitation of locomotive(s) and rail cars for use on the Music City Star service includes painting the exteriors of passenger cars to cover rusted areas and improve image of service, painting recently purchased locomotives to match the paint schemes of current equipment, and rehabilitating interiors on 30+ year old equipment used on Music City Star service.
Nashville	Storage and Maintenance Yard for Music City Star Railcars	This project is expected to be funded with \$5 million of FTA 5307 funds to purchase land, buildings, and equipment for a new maintenance facility to allow RTA to effectively maintain current and future service levels.
Nashville	Positive Train Control (PTC)	This project is expected to be funded with \$20 million of FTA 5307 funds for an initial consultant study to determine the requirements of mandatory Positive Train Control, purchase equipment, and identify upgrades as necessary to implement Positive Train control requirements. In late 2015 Congress extended the deadline for implementation of PTC to December 2018. The major tasks will include a study by an independent consultant to determine how PTC will be implemented, procurement and installation of equipment along the rail lines and on the locomotive itself, and system testing prior to obtaining FRA approval.

Nashville	Ticket Vending Machines	This project is expected to be funded with \$392,000 of flexed U-STP funds to purchase and place eight ticket vending machines (TVMs) at the Music City Central transit depot (downtown Nashville) and further the development of "smartcard" technology so that these TVMs can handle renewals of expired cards. This technology will reduce MTA's costs associated with fare collection, expand payment and access convenience for MTA customers, and reduce operations delays attributable to [cash] fare-box collections at time-of-boarding.
Nashville	Miscellaneous Support Equipment & Passenger Amenities	This project is expected to be funded with \$168,000 of FTA 5307 and 5309 funds and includes the purchase of schedule display racks, shelters, benches, and associated sidewalk infrastructure, commuter rail signs, and flags for the Music City Star. These improvements will promote safety and enhance the experience of Music City Star passengers.
Nashville	Spare Parts for Stock	This project is expected to be funded with \$600,000 of FTA 5307 funds for the purchase of spare parts to rebuild and replace parts and equipment for the commuter rail. This will benefit the region by providing faster and safer service on the Music City Star rail line. This means shorter wait times on repairs for passengers and more reliable travel, all of which will help promote the service to all commuters.
Nashville	Music City Star Passing Siding	This project includes matching track with curb length, thus allowing the switches to be placed on the tangent at each end of the curve. This allows the siding to be situated closer to the station, which is lengthening the amount of track and placing the switches as needed. Passing siding will improve operational efficiency.
Wilson County	Hamilton Springs Station	This project involves the construction of a permanent multimodal commuter rail station along the existing Music City Star Rail Line. It is funded with \$3.59 million of CMAQ, STBG, and local funding.



10.2.2 Longer-Term Improvements on Existing Rail Transit Corridors

Location	Project	Project Description
Memphis	Upgrade and Extension of Madison Trolley Line	
Nashville	Rail Rehabilitation	This project includes a total rehabilitation of rail line tracks for the Music City Star. The rehabilitation will remove old track ties and mud, install fabric, and restore with new track ties. It will also resurface rail, rebuild crossings, install ballasts, and add additional ties, spikes, ballasts, culverts, and weld of rail needed to improve safety, ride comfort, and speed on Music City Star rail line. This project's estimated cost is \$3.6 million.
Nashville	Station Rehabilitation	This project includes the rehabilitation of Music City Star stations. It involves striping parking areas and platforms, repairing and replacing Plexiglas, shelters, signs, and other equipment as needed, and installing security equipment. This project's estimated cost is \$610,000.
Nashville	Siding at Martha Station	This project constructs passing siding at Martha Station. It will match track with the curve length allowing the switches to be placed on the tangent at each end of the curve. This allows the siding to be situated closer to the station, which lengthens the amount of track needed. Passing siding will improve operational efficiency. This project's estimated cost is \$1.1 million.

10.2.3 Longer-Term Development of New Rail Transit Corridors

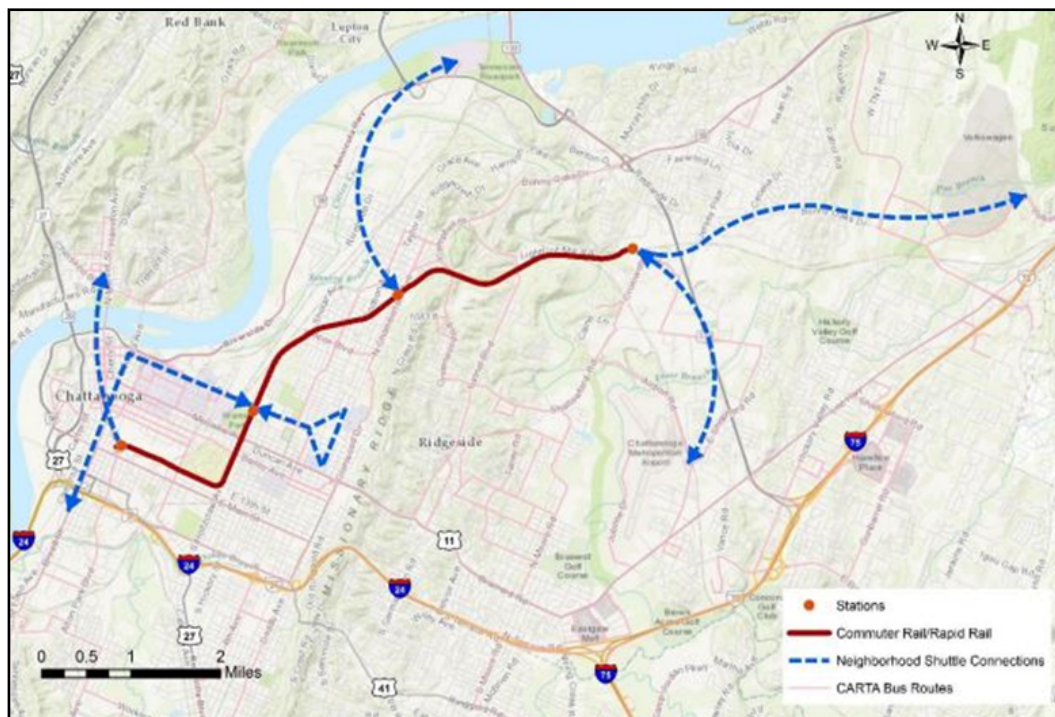
Though much of the focus on rail transit has been on Middle Tennessee, other large urban areas in the state have explored fixed guideway transit alternatives to varying degrees. The status of high capacity transit planning in each of these urban areas is outlined in Table 10-1.

Table 10-1 Status of Planning for High Capacity Transit

Chattanooga	City of Chattanooga was awarded \$400,000 of TIGER IV funds for a \$700,000 rail transit implementation plan. The plan will evaluate the feasibility of using an existing 21-mile freight rail facility for passenger service. The plan will also look at an implementation strategy for a 23-mile long passenger rail system in the city.
Knoxville	Knoxville Long Range Transportation Plan (LRTP) does not call for any rail transit. Where high capacity transit is recommended, Knoxville's LRTP calls for bus rapid transit (BRT) rather than steel-wheeled transit.
Nashville	<p>Of the four large urban areas in Tennessee, Nashville has the most ambitious plans for high capacity transit. A number of studies and plans have been developed in the last decade that have included rail transit as an option, including the following:</p> <ul style="list-style-type: none"> • Tri-County Transportation & Land Use Study • Northeast Corridor Mobility Study • 2035 Regional Transportation Plan (2010) • Southwest Area Transportation & Land Use Study (2012) • Broadway West End Corridor Alternatives Analysis (2012) • MTA/RTA nMotion Strategic Plan (2016) • RTA Northwest Corridor Study (Draft 2017) • MTA High Capacity Transit Briefing Book: Opportunities and Challenges (2017) • Southeast Corridor Alternatives Analysis (2007) • Southeast Corridor Study (Underway)

Table 10-2 Potential New Rail Transit Corridors

MPO	Corridor	Plan(s) Recommending Future Rail Transit in Each Corridor
Chattanooga		Cite TIGER study
Memphis	Madison Avenue	Extension of Madison Trolley Line [add plan title]
Nashville	Gallatin Pike	MTA/RTA nMotion Strategic Plan (2016) MTA High Capacity Transit Briefing Book: Opportunities and Challenges (2017) Mayor Megan Barry's Let's Move Nashville Plan
Nashville	Nolensville Pike	MTA/RTA nMotion Strategic Plan (2016) MTA High Capacity Transit Briefing Book: Opportunities and Challenges (2017) Mayor Megan Barry's Let's Move Nashville Plan
Nashville	Murfreesboro Pike	MTA/RTA nMotion Strategic Plan (2016) MTA High Capacity Transit Briefing Book: Opportunities and Challenges (2017)
Nashville	Charlotte Avenue	MTA/RTA nMotion Strategic Plan (2016) MTA High Capacity Transit Briefing Book: Opportunities and Challenges (2017) Mayor Megan Barry's Let's Move Nashville Plan
Nashville	Northwest Corridor	MTA/RTA nMotion Strategic Plan (2016) (commuter rail Nashville to Clarksville) Mayor Megan Barry's Let's Move Nashville Plan (Light Rail Downtown to TSU)



11. TENNESSEE RAIL SERVICE AND INVESTMENT PROGRAM

TDOT aims to attain their vision to provide the best multimodal transportation system by carrying out the strategies associated with its goals and objectives. However, the implementation of these strategies is highly dependent on the availability of funding and cooperation with railroads. Given private ownership of most railroads, the overwhelming majority of future investment will be privately funded. TDOT will continue to manage the rail programs as described in Section 1 within the limitations of available funding. TDOT will also monitor the activities of surrounding states. TDOT will benchmark off of these states, participate in any efforts and work with them, when appropriate, to benefit the state.

11.1 PROGRAM COORDINATION

This State Rail Plan (SRP) is intended to integrate with and expand upon other transportation plans. These include overall transportation and rail specific plans at the national, state, and local levels.

11.2 RAIL AGENCIES

As a part of this SRP update, stakeholders were asked if any organizational, proposed policy, legislative, or programmatic changes were planned within the 4- and 20-year time horizons. No changes to MPOs/TPOs' or railroad authorities' rail activities are expected. With regard to TDOT's rail programs, there remains concern over the future of the Transportation Equity Fund and the Shortline Rehabilitation Program. There is currently much unresolved litigation, and it is unclear how long it will be before all potential appeals are exhausted. In the event that litigation is finally resolved in the State's favor, TDOT will again make funds available to rail authorities. However, the rail rehabilitation program is likely to be restructured to some degree, with an increased emphasis on bridge condition and greater attention to the viability of railroads receiving assistance. Since the rail program is intended to support economic development, it is also likely that increased attention will be given to the connection between current rail investments and economic development and/or business retention. TDOT will seek to strike a balance between the competing needs of rail preservation and rail system development.

11.3 PROGRAM EFFECTS

Given the uncertainties of the Transportation Equity Fund and TDOT's Shortline Program, the proposed rail projects in this plan are dependent on private investment and federal funds. With these constraints, most proposed improvements focus on preservation, maintenance, service improvements, and safety. For the purpose of this plan, projects are considered to be short-range if funding has been identified and are expected to be completed in a 4-year time horizon. Should more funding become available, many of the projects considered long-term could be implemented. The continued success and operation of rail service in Tennessee offers many potential benefits. Rail passenger improvements are expected to provide a more extensive and diverse intercity transportation network, less traffic congestion, walkable development patterns, transit oriented development, increased tourism, access to job opportunities, and increased energy efficiency. The success and continuation of freight rail service provides increased transportation competition resulting in lower cost to shippers, less highway congestion and damage, and reduced environmental and energy impacts. At-grade crossing improvement projects increase transportation safety for both freight and passenger rail services as well as highway users.

11.3.1 Short-Range Projects

Proposed Short-Range Passenger Rail Projects

Short-range passenger rail projects in Tennessee are all related to the State's only commuter rail service, the Music City Star. As described in Section 10, these improvements focus on maintenance

and the continuation of safe and efficient commuter rail service. The primary expected impact of these projects is providing transportation options for the safe and efficient travel of workers to and from their homes to employment or other activities in the area. The benefits include increased safety, efficiency, ridership, and access. Secondary benefits include an impact on emissions reduction, highway congestion, and dependence on fossil fuels. The projects considered short-range have identified funding by inclusion in the Nashville Area MPO's Transportation Improvement Program and expected benefits are described in Appendix 2.

Proposed Short-Range Freight Rail Projects

With the Transportation Equity Fund's Shortline Program on hold, improvements for freight rail in Tennessee in the short-range are uncertain. Class I improvements are not included in this plan, as those railroads did not provide any information on their planned improvements. It is expected that Class I railroads in Tennessee will use private funds to operate, maintain, and make capacity improvements to ensure the success of their overall networks. Short-range freight rail projects in Tennessee, which have identified funding, are limited to mostly shortline railroads using their private funds for improvements. These projects are expected to increase safety, efficiency, and access by maintaining and upgrading their lines to the 286K standard. Tennessee's short-range freight rail projects and expected benefits are described in Appendix 2.

11.3.2 Long-Term Projects

Proposed Long-Term Passenger Rail Projects

Improvements to Amtrak's intercity passenger rail service are limited to the recommendations from the PRIIA Section 210 FY12 Performance Improvement Plan. Tennessee's long-range passenger rail projects and expected benefits are described in Appendix 2. Increased frequency on the City of New Orleans and the possibility of extending Amtrak service to Bristol from Roanoke are additional potential long term projects, but funding has not been identified.

There are a number of proposed long-term rail transit projects in Tennessee. In Middle Tennessee there are proposed improvements to the to related to the Music City Star, as well as proposed construction of new light rail lines along several major corridors. As described in Section 10, these improvements primarily focus on maintenance and the continuation of safe and efficient commuter rail service. The expected impact of these projects is providing transportation options for the safe travel of workers going to their place of employment. The benefits include increased safety, efficiency, ridership, and access. Secondary benefits include an impact on emissions reduction, highway congestion, and dependence on fossil fuels.

Proposed Long-Term Freight Rail Projects

Long-term freight rail projects in Tennessee were identified through stakeholder surveys, past plans, and studies. With the Transportation Equity Fund's Shortline Program on hold in Tennessee, many long-term freight rail improvements for shortlines include projects that were expected to be funded in the short-range but lack a dedicated source. Long-term Class I improvements included in this plan are limited to recommendations by governmental agencies and customers, as the Class I railroads did not provide any information on their planned improvements. It is expected that Class I railroads in Tennessee will use private funds to operate, maintain, and make capacity improvements to ensure the success of their overall networks. Long-term freight rail projects in Tennessee are mostly shortline railroad projects, which include maintaining and upgrading their lines to the 286K standard (increasing line capacity) or providing service to new customers by constructing new rail lines. The impacts of these improvements are expected to increase safety, economic development, efficiency, access, potential for truck diversion, and reduced highway congestion. Secondary benefits include a reduction in emissions, highway maintenance, and dependence on fossil fuels. Tennessee's long-term freight rail projects and expected benefits are described in Appendix 2.

11.4 PASSENGER ELEMENT

FRA's state rail plan guidelines require states to describe how capital projects were analyzed with regard to their impacts on passenger rail ridership, potential diversion from highway and air to rail, passenger rail revenues and costs, etc. States are also required to describe their 4-year and 20-year (or more) financing plans for passenger rail capital and operating costs. Discussion of these analytical areas for passenger rail projects is described below.

11.4.1 Passenger Rail Capital Program Impact

Most significant intercity passenger or commuter rail projects have a positive impact on overall rail passenger ridership, rail passenger miles travelled, modal diversion from highway and air, and increased rail passenger revenues and/or reduced costs.

As noted in Section 3, TDOT and regional agencies have conducted studies of potential new intercity and commuter passenger rail services, which will allow them to evaluate the estimated ridership, passenger-miles, revenues, and costs for new services or service extensions. These studies provide the benchmark information necessary to determine whether further analysis and potential investment in the proposed services are merited.

Commuter Rail and Light Rail

The Music City Star's capital improvement projects are aimed to maintain the current system and enhance passenger amenities. The continued investment to keep current service levels while making the experience better for passengers is likely to attract new customers. RTA monitors and analyzes ridership, passenger-miles, performance, and revenues to determine the impact of past, current, and future investments. Passenger Rail Capital Financing Plan

Intercity Passenger Rail

Tennessee currently has a limited amount of control over the intercity passenger rail operations within the state. Amtrak operates intercity passenger rail, and, as these services in Tennessee are multi-state long-distance routes, operations within the state represent only a portion of the total service area.

Tennessee is limited in the means available to increase the frequency and level of service of its intercity passenger trains. Any capital investments related to the overall corridors must be made at the regional level with concurrence by Amtrak, other states served by the route, and the rail line owners.

Depending on identified needs and the availability of funding, TDOT may contribute to the preservation and the expansion of these routes by leveraging all available opportunities to increase ridership. This includes station improvements and supporting studies required to add or increase intercity passenger rail service, when deemed appropriate.

Because Tennessee has very limited funding available for rail projects, public investments need to be limited to specific, strategic projects that help secure or improve service, increase ridership, and provide commensurate public benefits. If appropriate, the state could also investigate the feasibility of expanding the reach of rail passenger service through the implementation of shuttle bus service connections and coordination with other states toward larger, regional solutions.

Commuter Rail

Financing for the Music City Star's capital improvements is expected to originate from federal formula grants and local matching funds. RTA utilizes FTA urban, FTA State of Good Repair, and Flexed FHWA U-STP/STBG sources to finance capital improvements. This is accomplished through the MPO process by including projects in the Nashville Area MPO's Regional Transportation Plan and Transportation Improvement Program.

11.4.2 Passenger Rail Operating Financing Plan

Intercity Passenger Rail

Tennessee's intercity passenger rail service is limited to Amtrak long distance routes. Amtrak has sole fiscal responsibility for these long-distance routes. Amtrak service differs from state-supported intercity passenger corridor services where states have the financial responsibility for operating losses, but also a voice in the expected performance and operation of the service. Amtrak operates most state-sponsored intercity service as a contractor to states.

The establishment of new corridor services without federal financial assistance would require Tennessee to not only provide the financing for capital improvements necessary to upgrade routes to passenger service standards, but also to bear the responsibility for service operating losses in accordance with PRIIA legislation.

In light of the current uncertainties with regard to federal rail funding and lack of state funding, decisions to move ahead with an aggressive passenger rail program must be supported by a comprehensive planning effort. If pursued, the more detailed studies of expanded intercity passenger rail will include a comprehensive examination of all potential financing sources and alternatives to ensure that the public is kept aware of the financial benefits and costs of each alternative. Given the importance of freight rail operations to Tennessee's economy, expansion of passenger rail services will require sufficient capital investment to prevent that expansion from having a negative impact on freight rail operations.

Commuter Rail

RTA finances the operations of the Music City Star with a combination of fare-box revenue and FTA-5307 funds. Fare-box revenue typically comprises between 15 and 20 percent of operating expenses. While federal sources are expected to remain steady, fare-box revenue will increase with the expected increase in ridership.

11.4.3 Passenger Rail Program Economic Impacts

As noted in Section 2, the impacts of passenger rail services in Tennessee provide sizable impacts in terms of cost savings and employment. Expected benefits of passenger rail improvements include lower transportation costs, enhanced mobility, and economic development opportunities. TDOT's proposed short- and long-range rail investment plans are intended to have a high correlation between the public funding provided and their intended benefits. New or improved passenger rail operations provide more cost effective travel alternatives to both commuters and longer distance travelers.

TDOT's proposed short-range program is primarily directed at the continuation of commuter and intercity passenger rail service in the State. As most proposed long-range projects have yet to be analyzed with regard to their economic feasibility, it is premature to identify any correlation between the level of public investment and benefits.

11.5 FREIGHT ELEMENT

11.5.1 Freight Rail Program Financing Plan

With private ownership and operation of most rail infrastructure, the overwhelming majority of future investment in freight rail will come from the private sector. TDOT's ability to address the needs identified in the State's rail system is limited with the lack of a funding mechanism to comprehensively plan for improvements in the freight rail infrastructure. With the State's Transportation Equity Fund frozen due to pending litigation, funding for shortline railroad improvements is expected to be provided by the individual short line railroads or authorities. If funding becomes available in the

future, TDOT will evaluate proposed projects and their impact on the transportation system. TDOT will also consider public-private partnerships with railroads to finance projects under consideration in the future.

11.5.2 Freight Rail Program Economic Impacts

Tennessee's proposed short- and long-range freight rail projects are based on safety, preservation, and increasing the efficiency of rail operations on its freight railroads. Typical benefits related to upgrading shortline railroads include the increase of operating efficiency, and thereby the financial health, of both the railroad and the shippers being served.

The existing economic and socio-environmental impacts of the state's freight and passenger services have been documented in Section 2. In general, any increases in operating efficiency and improved access to rail service for either rail passengers or freight users through continued improvement of the network would enhance these impacts. With regard specifically to the proposed long-range projects, these have yet to be analyzed with regard to their individual economic impacts and feasibility.

Through this SRP process, TDOT has also developed a better understanding of the rail industry's plans for growth within the state and the projects deemed necessary to facilitate this growth. Therefore, private sector rail projects, if deemed to provide sufficient public benefits in the future, may receive increased public financial assistance in the future should additional funding become available.

11.6 RAIL STUDIES AND REPORTS

Analysis of Tennessee's rail network and comments and recommendations provided during stakeholder outreach resulted in a number of recommendations for studies to determine the feasibility of future projects or state-sponsored services to improve rail operations in Tennessee. The funding for these studies, in some cases, has not been identified. Potential rail studies, which will be considered in the future pending the available staff and/or financial assets required, center on the following areas:

- Intercity passenger rail service studies;
- Regional commuter-type service studies; and
- Freight service, safety, and other rail studies.

11.6.1 Intercity Passenger Rail Studies

There are several studies under consideration to evaluate the feasibility of improved or additional intercity passenger rail service in Tennessee. Currently, TDOT is not intending to contribute financially to the studies outlined below, but will continue to monitor their movement and could potentially participate, depending on staff, funding, and potential benefits.

- City of New Orleans Ridership and Revenue Study
- Northeast Regional Extension Feasibility Study for potential new service from Roanoke to Bristol
- Atlanta-Chattanooga Corridor , Tier 1 NEPA Document and Service Development Plan
- FRA Southeast Regional Rail Plan
- Arkansas Statewide Rail Plan identification of possible high speed rail corridor between Little Rock and Memphis

11.6.2 Regional Commuter Rail Studies

The following local and regional studies address commuter rail. These studies explore potential alignments, ridership, station locations, and service type for regional transit solutions. They ultimately help determine the feasibility for success of the service and make the case for public investment.

- South Area Transportation & Land Use Study, Nashville MPO
- Southeast Corridor Study, Nashville MPO and RTA
- Regional Transit Master Plan Update, Nashville MPO and RTA
- Rail Transit Implementation Plan, Chattanooga Department of Transportation

11.6.3 Freight, Safety, and Other Rail Studies

Other potential studies were identified through stakeholder outreach as outlined below. These studies look to provide recommendations for specific projects or the evaluation of a project concept and determination of its need and cost.

- Statewide Rail Congestion Study
- 3rd Mississippi River Bridge Study, in Memphis
- Feasibility study of rail lines running parallel to Tennessee interstates
- Study of statewide intermodal facility locations
- Study of container-on-barge service in Nashville
- Study Corridor Improvement Options for better freight flow between I-40 west of Nashville and I-24 near Clarksville
- Study Market Needs for Inland Port and Intermodal Container Transfer Facility in East Tennessee
- Track Needs Assessment for shortline railroads
- Operational Improvements to CSXT from Tennessee to Charlotte, NC

11.7 PASSENGER AND FREIGHT RAIL CAPITAL PROGRAM

Per FRA's guidelines for SRPs, the Tennessee SRP is required to present the State's Rail Service Investment Program (RSIP) and list its capital rail projects. For the purpose of this plan, projects have been organized for priority by time horizon. Projects are considered to be short-range if funding has been identified and are expected to be completed in a 4-year time horizon (2016-2019). Those projects with no funding source identified or an expected completion beyond four years are considered long-term. Should more funding become available, many of the projects considered long-term could be implemented in the short-range horizon. Some programmatic projects are not specific in recommendations, but yield capital improvements and are expected to continue spanning both time horizons. Tennessee's RSIP and project listings are displayed in Appendix 2.

12. COORDINATION AND REVIEW

This section describes how rail stakeholders were involved in the development and coordination of the various components of the Tennessee Statewide Rail Plan (SRP). The Tennessee Department of Transportation (TDOT) built on past and continuing efforts to provide an ongoing stakeholder and public involvement process for all aspects of its SRP.

12.1 PUBLIC PARTICIPATION OUTREACH APPROACH

TDOT, along with the state's Metropolitan Planning Organizations (MPOs), are either in the process of or have recently completed several documents providing input on passenger and freight rail in Tennessee. The SRP utilizes these recent efforts and their outreach. The state's 25-Year Long-Range Transportation Plan, Statewide Multimodal Freight Plan, and various supporting statewide and local studies identified stakeholders who provided many comments included in this document. Outreach to freight rail operators, transit operators, local industries, and other users of the state's rail system was essential in development of the SRP. The stakeholder involvement has provided insight into the strengths and weaknesses of Tennessee's rail system. The state's Freight Advisory Committee (FAC) comments, derived from the development of the Statewide Multimodal Freight Plan, were also included. Other stakeholders and the public were also encouraged to provide comments, make observations, and share information during the development of this plan. The coordination of these different efforts and stakeholder comments ensured a comprehensive approach to develop this plan.

12.2 COORDINATION WITH SURROUNDING STATES

Rail coordinators in all neighboring states were contacted at the beginning of the SRP development to identify any major portions of their current plans, so that coordination between plans would be made, where appropriate. In addition, the rail coordinators were also contacted to inform them as to the availability of the draft SRP and to solicit their comments. TDOT remains in communication with various states such as Virginia, North Carolina, Georgia, Kentucky, and Mississippi via AASHTO's committee on Freight and Rail Council. TDOT will work to build relationships with other surrounding states as the need for coordination increases.

12.3 STAKEHOLDER INVOLVEMENT IN THE DEVELOPMENT OF THE STATEWIDE RAIL PLAN (SRP)

Stakeholder involvement was accomplished through a variety of ways during the development of the SRP. Building from the efforts of recent plans and studies, the SRP sought additional involvement to gain a true understanding of rail in Tennessee. This section describes the outreach efforts used to develop this plan.

12.3.1 Recent Plans and Studies

As stated previously, the SRP utilized outreach efforts and comments received through recent plans and studies. Locally, the State's MPOs adopted long-range transportation plans (L RTPs), and TDOT conducted studies on its major interstate corridors. Projects and needs identified in these documents were incorporated into this document. Additionally, some of the MPOs have recently completed regional freight and/or transit plans. These regional plans offered greater detail on rail needs and opportunities, as L RTPs typically are highway focused due to funding eligibilities.

National Rail Plan

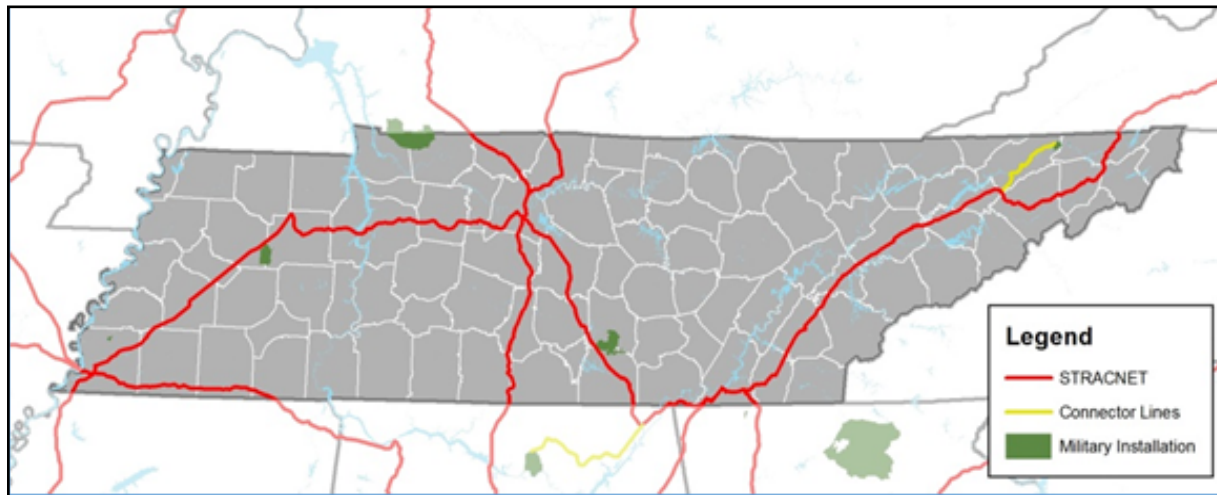
PRIIA legislation directed FRA to develop a Preliminary National Rail Plan to address the rail needs of the U.S. The preliminary plan, published in October 2009, provided objectives for rail as a means of improving the performance of the nation's transportation system, which included:

- Increased passenger and freight rail performance;
- Integration of all transportation modes to form a more complementary transportation system;
- Identification of projects of national significance; and,
- Providing for increased public awareness.

Since 2009, FRA's concept of developing a national rail plan has evolved toward capturing state rail planning findings and reflecting the issues and priorities addressed in various state rail plans. An outcome of this process is expected to be development of regional rail plans and multi-state corridor plans inclusive of solutions for freight and passenger service issues on a regional rather than state-by-state basis. TDOT will work with FRA and other states in the region to ensure that Tennessee's perspectives and issues are adequately addressed within the national rail planning process.

In addition to the need to coordinate Tennessee's SRP with a national rail plan process and the existing freight rail network, Tennessee will also coordinate as necessary with the U.S. Military Surface Deployment and Distribution Command's Transportation Engineering Agency, which oversees the National Strategic Rail Corridor Network (STRACNET) through the Railroads for National Defense (RND) Program. The STRACNET is an over 32,000-mile interconnected network of civil rail corridors and associated connector lines most important to national defense. Figure 12-1 depicts the STRACNET system within Tennessee. The STRACNET ensures sufficient clearances and capacities for the efficient deployment of military cargo. In addition to providing main line corridor throughput capability, these lines provide access to major defense contractors, logistics sites, and military facilities critical to national defense.

Figure 12-1 Tennessee Strategic Rail Corridor Network



TDOT Long Range Transportation Plan

In 2013, TDOT started the process of updating their Long Range Transportation Plan (LRTP). This effort consisted of a sizable interactive outreach and public awareness campaign. This campaign included public meetings, online surveys and mapping, the "Book-A-Planner" program, and a dedicated website for information dissemination. This effort resulted in comments, needs, and opportunities for Tennessee's transportation system. Many of these comments were specifically regarding passenger and freight rail needs and opportunities.

The 25-Year LRTP includes outreach, comments, and recommendations for Tennessee's investment in transportation infrastructure. Companion documents to the plan, including the Statewide Multimodal Freight Plan and Freight Policy Paper, address the freight component of the 25-Year Plan. These companion documents provided project recommendations for rail.

TDOT Multimodal Freight Plan

Concurrently with the LRTP update, the Statewide Multimodal Freight Plan was developed. To enhance stakeholder involvement, the Statewide Multimodal Freight Plan used the recently-created FAC to help guide the document and provide comments. The plan recommended a Freight Improvement Strategy by identifying policies and strategies to improve the state's freight landscape. This included a list of potential projects identified through the plan development and in coordination with previous local and corridor studies.

Surrounding State Rail Plans

As Tennessee shares rail corridors and services with other states, it is essential to coordinate with other states through both direct interaction and through comprehensive review and analysis of state rail plans prepared by other states in the region. Collaboration with other state DOTs has taken place through the group of Lead Stakeholders for the FRA's Southeast Rail Plan. TDOT will continue to monitor the progress of any recommendations resulting from other states' rail plans and their potential effect on rail in Tennessee.

Regional Plans

Tennessee, through its coordination with Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs), also looked at regional plans. In addition to all of the MPO's/TPO's long range transportation plans (LRTPs), supplementary plans and studies were also reviewed. These supplementary plans and studies can take several forms, but are usually either freight or transit specific and produce recommendations for inclusion for the long range transportation plans. Regional freight plans typically look at the regional freight flows and determine overall freight needs for a region, including all modes. They may have recommendations specifically for the rail mode. Regional transit plans typically look at regional commuting patterns and the potential use of commuter rail and rapid transit. Regional transit plans can also address potential connections and supporting recommendations for intercity passenger rail.

Beyond each MPO's/TPO's LRTP, there are several significant regional plans in Tennessee. The Nashville Area, Memphis Urban Area, and Chattanooga-Hamilton County/North Georgia MPOs/TPOs have developed regional freight plans. Although these plans and studies are mostly focused on the highway mode, their rail recommendations have been included in the needs identification of the SRP. TDOT will continue to monitor recommendations as MPOs/TPOs update or develop new freight plans and studies. The Nashville Area MPO and Chattanooga-Hamilton County/North Georgia TPO have or are developing regional transit plans. The rail recommendations from these plans and studies have been included in the needs identification of the SRP. TDOT will continue to monitor recommendations as MPOs/TPOs update or develop new transit plans and studies.

12.3.2 Freight Advisory Committee (FAC)

TDOT recognizes the importance of coordination with all stakeholders involved in the freight industry. With this in mind, TDOT established an FAC for the state of Tennessee made up of public representatives from TDOT, MPOs, counties, cities, chambers of commerce, port authorities, airports, and universities. The private industry representatives include rail companies, trucking companies, distribution and logistics companies, and manufacturing companies. The statewide committee meets quarterly and has been divided into the West, Middle, and East sub-committees, which are encouraged to meet on a quarterly basis.

Utilization in the 25-Year Long-Range Transportation Plan

During the development of the 25-Year Plan, the FAC was involved in several ways. TDOT hosted quarterly FAC meetings and presented updates on the plan. This included an interactive survey used to gather freight needs and priorities from the freight community. The FAC was also given the opportunity to provide comments and input for draft plan documents including a policy paper on freight logistics and planning.

Utilization in the Statewide Multimodal Freight Plan

Outreach to the FAC members occurred through several efforts throughout the development of the Statewide Multimodal Freight Plan. The first part of the outreach to the members was requesting a response to an e-mail with specific freight-related questions including:

- Roadblocks or limitations seen from funding or from policies and programs
- Gaps in the freight system
- Congestion and performance issues on arterials or collector roads
- Accessibility issues to industry such as first mile/last mile
- Identify low-cost, readily implementable projects for freight movement
- Identify freight programs and initiatives or travel information systems utilized in other states that Tennessee should consider

Committee members responded with information that helped the team begin to form an enriched understanding of barriers and opportunities to improving freight mobility in Tennessee. Additionally, input also resulted in a number of specific project and program recommendations, which form a large portion of the recommendations within the freight plan.

The next part of the outreach included an online survey and a request to each FAC member to set up an interview to discuss the freight assets, strengths, and challenges in the state. Both of these requests received a multiple responses from FAC stakeholders. The online survey gave the stakeholders the opportunity to identify more freight projects as well as to rank the freight goals established for the plan. Additionally, phone interviews gave TDOT invaluable knowledge of the freight system in Tennessee. The primary outcome of the online survey and phone interviews was additional insight into statewide freight transportation needs as well as project-specific recommendations across all state geographies.

From this input, a draft project list was created. Attendees were given the opportunity to prioritize the projects for their geography and to provide input on critical strategic freight corridors in Tennessee. In addition, an interactive portion of the presentation was aimed at determining the stakeholders' priorities in addressing the needs. For FAC members that were unable to attend the statewide FAC meeting, members were called directly and given the opportunity to provide information regarding freight transportation system needs. The guidance received from the meeting and the culmination of additional input from committee members was used to shape the prioritization of the projects.

In addition to reaching out to external stakeholders, the team also conducted meetings with the different divisions within TDOT as part of the 25-Year Plan effort. The purpose of this was to identify freight initiatives within the division. Feedback from TDOT staff helped form the policies and projects described in this plan.

Utilization in the Statewide Rail Plan

The FAC provides a great resource for TDOT in the development of freight-related policies and projects moving forward. They act as a sounding board, commenting on draft documents. Similar to the input they provided for the Statewide Multimodal Freight Plan, their expertise in freight movements was used in the development of the SRP by reviewing and providing comments on draft SRP documents.

12.3.3 Key Stakeholder Interviews and Surveys

Expanding on information gathered through the development of the 25-Year Plan and Statewide Multimodal Freight Plan, additional outreach efforts were taken for the SRP. A stakeholder package was sent to railroads and transit agencies for identification and verification of their existing infrastructure. The package contained PDFs of a system map and a form to help determine the assets and operations of each railroad. After the packages were returned and evaluated, follow-up

phone calls and e-mails were administered to clarify any discrepancies in the forms.

Another survey was administered to gather a broader audience for stakeholder involvement. This survey, or Request for Information PDF form, helped to identify rail projects, needs, and opportunities. The potential projects could be rail infrastructure improvements for capacity or safety as well as policy changes. The results of this request helped to determine both the proposed freight and passenger rail improvements and investments. As with the railroad stakeholder packages, follow-up phone calls and e-mails were administered to clarify responses in the forms.

12.3.4 Public Review

TDOT's approach for public participation in the SRP was accomplished by compiling comments on rail from recent planning efforts. Piggybacking on the public outreach from TDOT's 25-Year Plan, Statewide Multimodal Freight Plan, and various supporting statewide and local studies, TDOT followed its adopted Public Involvement Plan (PIP) for this effort.

As part of the 25-Year Plan, a Public and Stakeholder Engagement Plan was developed to document outreach tools and techniques, targets for engagement, and resources for engaging traditionally underserved populations and TDOT partners throughout the planning effort. This process yielded over 20,000 community interactions during the development of the 25-Year Plan. Comments received from these interactions came from various engagement activities such as surveys, Book-A-Planner presentations, focus group meetings, and regional summits. Additionally, the public was urged to visit a dedicated website where plan documents could be reviewed. Public comments were submitted using this website and also received through a survey and Wikimaps online application (<http://wikimapping.com/wikimap/TN-Plan.html>).

During the 25-Year Plan outreach, a concerted effort was made to engage those populations that are generally considered to be traditionally underserved by the planning process. While this generally references senior, low-income, and minority populations, this outreach effort was expanded to also include those populations with relatively low levels of vehicle ownership, high levels of disability, and those of Hispanic or Latino descent. TDOT created regional profiles identifying areas with high concentrations of these traditionally underserved groups and sent mailers and translated contact cards encouraging their participation at informal gatherings to discuss the plan.

Prior to the 25-Year Plan update, several studies had been conducted that provided recommendations for freight improvements. TDOT produced three corridor studies, looking at potential solutions for the I-75, I-40/81, and I-24 corridors. These efforts included analysis for freight and passenger movements including rail options for mode shift from the highway. These corridor studies had extensive outreach efforts as well, following TDOT's PIP. Locally, regional freight and transit studies have been conducted by a few of the larger MPOs. These studies also provided extensive outreach according to their local PIPs. Identified needs and projects from these studies have been included in the development of the 25-Year Plan, Statewide Multimodal Freight Plan, and this SRP. For the SRP, draft documents and other materials were posted to TDOT's website and distributed to public libraries. Comments from all efforts were addressed in the development of this plan.

12.3.5 Public Meetings

As a part of the 25-Year Plan outreach, there were several meetings to gather public input. TDOT organized regional summits, Book-A-Planner presentations, and focus group meetings.

TDOT organized eight regional summits across the state. Stopping twice in each TDOT region to ensure participation in both urban and rural communities, members of TDOT's Long Range Planning Division as well as executive leadership had the opportunity to educate elected officials, stakeholders, and TDOT planning partners about the development of the 25-Year Plan. This was done using an interactive presentation that presented current facts and predictions for the future relating to Tennessee's population, employment, and transportation system. Within this presentation, participants were asked questions similar to those asked in the survey where the

questions could be answered anonymously. These responses help TDOT understand the priorities for the State's transportation system, including rail.

The Book-A-Planner series allowed for TDOT Office of Community Transportation (OCT) staff to provide interactive presentations to local and regional elected bodies, planning commissions, chambers of commerce, and other public and private organizations throughout the state. Much like the regional summits, these presentations included an interactive survey to gauge the interests, needs, and priorities of stakeholders. OCT staff hosted nearly 200 separate groups for this effort, interacting with over 4,000 participants.

Fourteen focus group sessions were held across the state with interested citizens and stakeholders. The emphasis of these sessions was on rural engagement. The purpose of these focus groups was to gather a relatively small group of individuals in a work-session atmosphere where participants were able to dig into the details of how TDOT should make investment decisions on a philosophical level. These focus group sessions occurred in the following locations:

- Clarksville – September 8, 2014
- Morristown – September 9, 2014
- Cookeville – September 9, 2014
- Johnson City – September 10, 2014
- Millington – September 10, 2014
- Chattanooga (2) – September 11, 2014
- Mt. Pleasant – September 11, 2104
- Knoxville – September 12, 2014
- Nashville (2) – September 12, 2014
- Jackson – September 25, 2014
- Martin – September 29, 2014
- Memphis – September 29, 2014

12.4 ISSUES IDENTIFIED DURING THE STATEWIDE RAIL PLAN PROCESS

A major issue identified in the creation of this plan is the absence of a National Rail Plan. The lack of a comprehensive national vision prevents Tennessee from fully understanding how the state rail system is expected to fit within the future national railroad system. With several potential intercity passenger rail corridors and six of the seven Class I railroads in Tennessee, a National Rail Plan would help the State understand national priorities. This would allow the state to adjust their priorities to complement improvements that are expected to be made the system. Intercity passenger rail services span local jurisdictions and states. The planning and implementation of intercity passenger rail service requires coordination, cooperation, and federal oversight. Intercity passenger rail services, when decided at the local or state level, may not result in the most comprehensive and efficient system.

12.4.1 Passenger Rail Issues

The public desire for intercity passenger and commuter rail is not reflected in available funding source amounts. Currently, financing in Tennessee for additional passenger rail service is insufficient using traditional FTA funds. Another hurdle to passenger rail, due to smaller funding amounts, is the dependence on freight railroad's track for service. With rail freight volumes expected to significantly

increase, the ability to operate an efficient passenger rail system becomes more difficult.

12.4.2 Freight Rail Issues

The largest issue for freight rail in Tennessee is the uncertainty of the Transportation Equity Fund and its Shortline Program being put on hold. This program was expected to be a steady source of funding for the state's shortline railroads to maintain their lines. Many of the identified short-range projects anticipate the ability to use these funds. Without knowing when they will be available, the RSIP was limited in how shortline capital improvements would be addressed. The lack of this funding source may cause some of the state's shortlines to drastically reduce service or, in some cases, eliminate services due to track and bridge degradation.

Some of Tennessee's shortline railroads are not able to handle the Class I standard 286K loads, a fact that poses several issues. Loads on lines that are not 286K must either reduce the load on the new equipment or transfer the shipment to the older 263K equipment. Both of these options reduce operating efficiencies and lead to higher shipping costs, both of which could potentially result in the loss of customers.

Tennessee has recently experienced several investments in new intermodal facilities and industrial sites. These developments require rail service to be competitive in the global marketplace. Although plans have been conceived on how to provide rail access to these sites, the construction and operation of the new services are not currently feasible for the railroads. This is likely due to the sites not having tenants, which leads to a dilemma. If the site had rail service, they would likely be selected by a new industry as rail served sites in the state are at a premium.

A major issue facing railroads nationwide is the implementation of Positive Train Control (PTC) by the FRA mandated deadline of December 31, 2018. With a lack of public funding and vendors to install the systems needed, PTC is likely not to be fully implemented by the deadline. The result for noncompliant railroads could be additional mitigation costs, substantial fines, or service elimination. This could cause shipping rates to increase and force industries to find alternative modes to move raw materials and finished goods.

12.5 CONSIDERATION OF RECOMMENDATIONS IDENTIFIED DURING THE STATEWIDE RAIL PLAN PROCESS

The public and stakeholder outreach effort for this plan yielded many comments and recommendations. Each of these were carefully analyzed and incorporated into the plan's stated goals, objectives, strategies, policy recommendations, needs, and proposed projects. While not all of the recommendations are currently feasible to implement, they were considered and included as identified needs to be addressed going forward.

12.6 COORDINATION WITH OTHER PLANNING EFFORTS IN TENNESSEE AND ITS URBAN AREAS

Through this plan's outreach process, TDOT has coordinated with appropriate public agencies in urban areas. Each of Tennessee's 11 MPOs and transit agencies with rail services were involved in the SRP development and their comments incorporated. The MPOs' and transit agencies' related plans, programs, and studies were reviewed and recommendations included as either overall needs or specific projects. The MPOs, transit agencies, and all other stakeholders were provided the opportunity to review and comment on the draft SRP.



Tennessee Statewide Rail Plan Appendices

TN TDOT
Department of
Transportation

