Knoxville Regional Freight Movement Study

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The Knoxville Regional Freight Movement Study covers the following counties in East Tennessee: Anderson, Blount, Hamblen, Jefferson, Knox, Loudon, and Sevier. This report was prepared in cooperation with the U.S. Department of Transportation, Federal Highway Administration, and Tennessee Department of Transportation.

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I. INTRODUCTION

The need to integrate freight and goods movement into the long range transportation planning policies of Metropolitan Planning Organizations (MPO's) became increasingly evident with the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991. ISTEA created new federal transportation funding opportunities and established a planning policy to ensure that all modes of transportation are equally represented. The subsequent Transportation Efficiency Act of the 21st Century (TEA-21) in 1998 and Safe, Accountable, Flexible, Efficient Transportation Equity Act- A Legacy for Uses (SAFETEA-LU) in 2005 further enhanced freight planning policies and opportunities. SAFETEA-LU allocated $244 billion over 5-years in transportation funding and established new funding pools for freight planning and projects.

Metropolitan Planning Organization

A Metropolitan Planning Organization (MPO) is a planning agency established by federal law to assure a continuing, cooperative, and comprehensive transportation planning process takes place that results in the development of plans, programs, and projects that consider all transportation modes and supports the goals of the community. Any urbanized area, or contiguous urbanized areas, as defined by the U.S. Census Bureau, containing a population of greater than 50,000 are required to have an MPO. Areas outside but contiguous to an existing MPO boundary that have been designated in non-attainment of National Ambient Air Quality Standards (NAAQS) should be considered as part of that MPO's study area.

The Knoxville Regional Transportation Planning Organization (TPO), established in 1977, is the federally designated Metropolitan Planning Organization for the Knoxville Urban Area, which is the 2000 Census defined urbanized areas of Knox, Blount, Loudon, and Sevier Counties, including the Cities of Knoxville, Alcoa, Maryville, and Lenoir City and the Town of Farragut. The TPO is composed of a 13 member Executive Board made up of principal elected officials and a 19 member Technical Committee comprised of administrative, engineering, and planning staff. Several special interest groups, such as the Urban Transportation Issues Committee, Freight Advisory Committee, Title VI Working Group, Human Services Transportation Planning Committee, and Bicycle Advisory Committee were created to provide feedback to the TPO on transportation related issues.

The Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) was established in 2002 as the MPO for the Morristown Urban Area, which the 2000 Census defined as the urbanized portions of Hamblen and Jefferson Counties, including the cities of Morristown, Jefferson City, and White Pine. The LAMTPO consists of a 6 member Executive Board that includes principal elected officials and a 15 member Transportation Technical Advisory Committee (TTAC) made up of administrative and technical staff.

The TPO and LAMTPO are each federally mandated to develop a Long Range Transportation Plan (LRTP) that identifies needed future improvements to the transportation system and a Transportation Improvement Program (TIP) that documents how federal funds will be expended on these transportation improvements. The TPO adopted its "2005-2030 Knoxville Regional Long Range Transportation Plan Update" in March 2006 and is currently preparing further

updates that will be incorporated in 2007. The TIP for fiscal year 2006-2008 was adopted in July 2005. The LAMTPO adopted its "Long Range Transportation Plan 2005-2030" in March 2006 and its TIP in May 2006.

Knoxville Regional Freight Movement Study

The movement of freight and goods represents a $13 trillion industry in the United States, with over 20 billion tons of freight moved each year, a nearly 30% increase from the early 1990's. Numerous forecasts and projections produced by the Federal Highway Administration (FHWA) show the tonnage of freight moved throughout the country will increase 65% by 2020, placing a strain on the nation's transportation system.

In understanding that a more proactive role must be undertaken locally to include freight and goods movement in their transportation planning activities, the Knoxville Regional Transportation Planning Organization, in coordination with the Lakeway Area Metropolitan Transportation Planning Organization, have undertaken the development of the Knoxville Regional Freight Movement Study.

The Knoxville Regional Freight Movement Study covers Anderson, Blount, Hamblen, Jefferson, Knox, Loudon, and Sevier Counties *(see Map 1)*. This study area was chosen because, a) these counties have representatives on either the TPO or LAMTPO technical committee and thus are included in transportation planning activities of one or both organizations, b) major transportation routes pass through these counties that handle large volumes of freight, c) several facilities that receive, ship, or handle freight are located throughout these counties, and d) freight commodity flow data is represented at the county level data so entire counties rather than urbanized areas were included. Excluded from this plan were Greene, Monroe, and Roane Counties which all border the study area and contain major transportation routes and freight generating facilities but limited data availability and a lack of authority of the MPO's to control transportation planning in these areas made them less attractive to incorporate, however, this plan does recognize their importance on regional freight issues.

The Knoxville Regional Freight Movement Study provides an understanding of existing freight characteristics throughout the Region including freight transportation corridors, major freight generating facilities, freight activity areas, commodity flow, and issues and problem areas that inhibit the movement of freight. The plan also provides an outlook of the future of the freight industry in the Region and establishes strategies and recommendations to improve and enhance the movement of freight.

Data Analysis

The commodity flow data used in the Knoxville Regional Freight Movement Study was derived from Transearch®, which was developed by Reebie Associates in 2002 (Reebie Associates has since been jointly ventured with Global Insight). In 2003, the Tennessee Department of Transportation purchased Transearch® freight commodity flow data for all of Tennessee and provided each of the TPO with a copy. The data provides a comprehensive commodity flow data set, including origin and destination by county, type and volume of commodity, shipment route, and mode of transportation for nationwide freight trips that are moved by truck, rail, water, or air and use segments of the transportation system in Tennessee.

Data from the Freight Analysis Framework (FAF) developed in 1999 by the Federal Highway Administration was also used to identify and map current truck volumes on interstates and major highways throughout the Region. The data also provided low, medium, and high truck volume projections for 2010 and 2020. In cases where FAF data conflicted with the Transearch® data, the Transearch ® data was used since it is more current and comprehensive than the FAF.

Additional sources of data include the Bureau of Transportation Statistics (BTS), the Tennessee Department of Economic and Community Development, and the University of Tennessee Center for Business & Economic Research (CBER), which all provided additional economic and transportation data; the National Highway Traffic Safety Administration (NHTSA) and Federal Motor Carrier Safety Administration (FMCSA), which provided safety related data; the Federal Railroad Administration (FRA), which provided railroad data; the Tennessee Valley Authority (TVA), which supplied certain rail and barge freight data; the Tennessee Department of Transportation (TDOT), which supplied certain traffic count, vehicle miles traveled, railroad, barge, and airport data, and financial data; the Metropolitan Knoxville Airport Authority (MKAA), which supplied air cargo data for McGhee Tyson Airport; the University of Tennessee Center for Transportation Research (CTR), which offered freight economic and transportation related assistance; and the American Trucking Association (ATA) and Tennessee Trucking Association (TTA), which supplied trucking data and statistics and provided assistance by offering member databases and distributing surveys.

Sources of local business, transportation, land use, economic, social, and demographic data came from the East Tennessee Economic Development Agency (ETEDA), East Tennessee Development District (ETDD), the Knoxville Area Chamber Partnership, The Development Corporation of Knox County, Blount County Chamber of Commerce, Anderson County Chamber of Commerce, Anderson County Economic Development Association, Oak Ridge Chamber of Commerce, Loudon County Chamber of Commerce, Loudon County Economic Development Agency, Jefferson County Chamber of Commerce, Sevier County Economic Development Council, and Morristown Area Chamber of Commerce.

Map 1: Knoxville Regional Freight Movement Plan- Study Area

II. Goals and Objectives

The overall goal of the Knoxville Regional Freight Movement Study is to *ensure an ongoing freight planning process that incorporates the interests of the freight community takes place as a part of the overall transportation planning activities of the Knoxville Regional Transportation Planning Organization (TPO) and Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) that results in the development of strategies that improve and enhance the movement of freight to, from, within, and through the Knoxville Region*.

Specific objectives of the Knoxville Region Freight Movement Plan are:

1.) Gain an understanding of the characteristics of freight movement to, from, within, and through the Knoxville Region;

2.) Identify freight stakeholders and develop relationships with the freight community;

3.) Understand the issues surrounding the movement of freight and research ways to improve and enhance the movement of freight;

4.) Identify additional sources of funding for freight related projects and planning;

5.) Incorporate the interests of the freight community into the development of Long Range Transportation Plans;

6.) Develop criteria as part of the Transportation Improvement Program (TIP) project selection process that would evaluate projects based on their ability to improve freight movement;

7.) Develop a Freight Advisory Committee to ensure an ongoing freight planning process occurs; and,

8.) Identify future freight trends and establish strategies to improve and enhance the movement of freight.

III. Existing Freight Plans and Studies

Whereas the Knoxville Regional Freight Movement Study addresses all modes of freight transportation throughout the Knoxville Region, several plans and studies have been undertaken to examine the movement of freight nationwide, statewide, and along certain corridors. The staff of the TPO and LAMTPO have been involved, to some extent, in the development the following studies and plans and have incorporated some of the analysis and findings into this plan.

Freight Analysis Framework
In 2002, the Federal Highway Administration developed the Freight Analysis Framework (FAF) which integrates data from a variety of sources to estimate commodity flows and related freight transportation activity among states, regions, and major international gateways. The FAF provided current truck volumes on interstates and major highways throughout the Region as well as low, medium, and high truck volume projections for the years 2010 and 2020. In 2005, the FAF was updated but Knoxville was not one of the metropolitan areas reevaluated.

Talking Freight Seminar Series
The Federal Highway Administration sponsors the monthly Talking Freight Seminar Series which educates transportation officials on freight planning issues and success stories through professional presentations and dialect over the web. The Series has been in operation since 2003 and, as of March 2007, has offered 40 seminars, all of which are available in archive on the FHWA website. The Talking Freight Seminar Series also includes a freight planning list serve that allows for communication among members of the Seminar Series anytime via e-mail.

I-81 Corridor Study
The Virginia Department of Transportation is studying the I-81 corridor, identifying deficiencies and developing potential solutions to improve the flow of people and freight along the I-81 corridor. The primary solutions that have warranted further study include improvements to certain congested sections of I-81, adding capacity in the form of additional travel lanes or dedicated truck toll lanes, and/or diverting truck traffic to rail. The study has garnered the attention of nearby states, including Tennessee, and study of the entire multi-state I-81 corridor has gained some strength and has been included in the U.S. Department of Transportation Corridors of the Future Program.

Tennessee Long Range Transportation Plan
The Tennessee Department of Transportation recently adopted a Statewide Long Range Transportation Plan, which incorporates a multi-modal planning approach that includes highways, bicycles, pedestrians, rail, public transportation, maritime, and air transportation. The plan consists of three outcomes, 1) a 25-Year Vision, which describes the future of the transportation system and provides policy direction for investments and operating decisions; 2) a 10-Year Strategic Investments Plan, which identifies the programs that should be accelerated to achieve the vision; and, 3) a 3-Year Project Evaluation System, which guides the selection of the 3-Year Program of Projects, offering a broader view of projects under development.

Tennessee Statewide Rail Plan

The Tennessee Statewide Rail Plan, developed by TDOT, evaluates the cost effectiveness of upgrading the railroad system throughout the State to include increased rail freight traffic and potential passenger rail service. The rail corridors studied include Memphis to Nashville, Nashville to Knoxville, Nashville to Chattanooga, Knoxville to Chattanooga, and Knoxville to Tri-Cities. The Nashville to Knoxville corridor is critical in establishing a statewide network and involves reestablishing a rail link through the Cumberland Plateau and upgrading the Nashville and Eastern Railroad (NERR) from Nashville to Monterey in Putnam County. The Knoxville to Chattanooga corridor doesn't serve a large market but has the potential to connect to passenger rail service in Atlanta. The Knoxville to Tri-Cities corridor has the potential to link Tennessee with plans proposed in the I-81 Corridor Study to move truck traffic to rail. This potentially creates a much larger and more feasible network that allows a diversion of freight traffic from truck to rail. The link to the Tri-Cities also provides a connection to the Trans Dominion passenger rail line proposed for Virginia.

Tennessee Airport Systems Plan

The TDOT Airport Systems Plan identifies the economic development opportunities for Tennessee's airports and highlights potential projects that address air cargo activities.

McGhee Tyson Airport Master Plan

Locally, the McGhee Tyson Airport Master Plan, completed in 2006, identifies plans for airport facility improvements and expansion, including improving ground transportation access to air cargo and military facilities, adding capacity to air cargo facilities, constructing a third parallel runway, and the potential development of adjacent land.

Tennessee State Freight Plan

The Tennessee Department of Transportation is in the process of selecting a consultant to perform a statewide freight study and plan and to offer freight planning assistance to MPO's throughout Tennessee. The freight plan is intended to study methods of freight diversion and statewide and corridor specific analysis of truck parking needs and availability as well as develop selection criteria for which transportation projects can be prioritized.

Interstate 40/ Interstate 81 Corridor Feasibility Study

The Tennessee Department of Transportation has secured a consultant to study multi-modal solutions for deficiencies along the 550 mile I-40/I-81 corridor identified in the Statewide Long Range Transportation Plan. The study will look at congestion management, freight diversion, safety, and economic benefits.

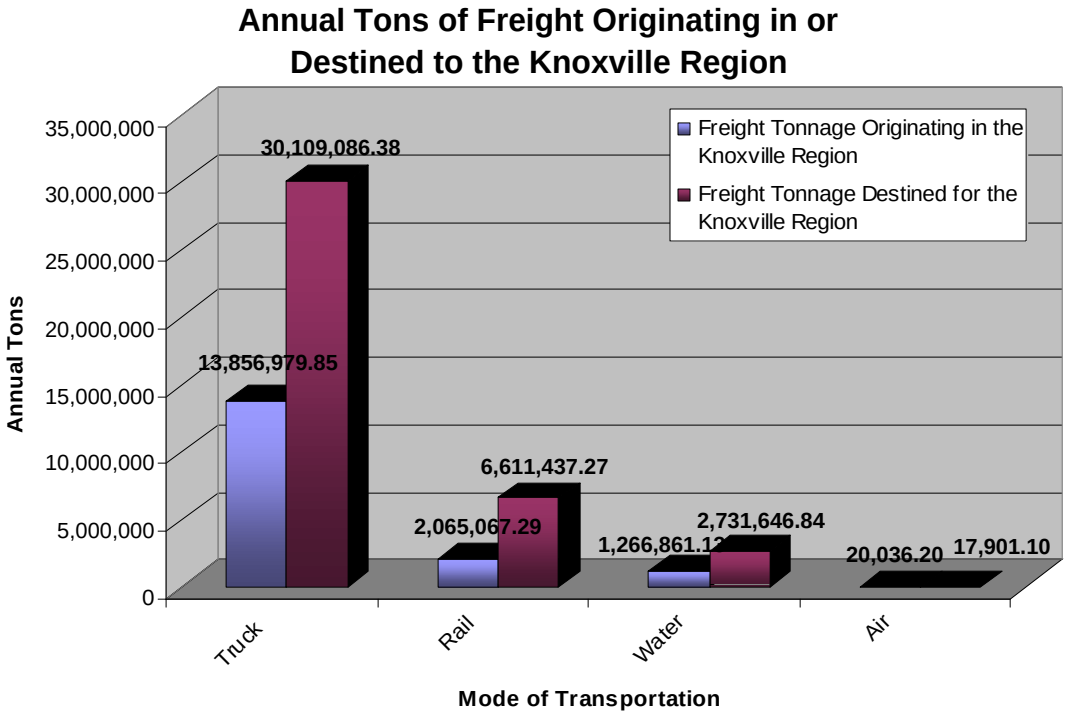
IV. Knoxville Regional Existing Freight Conditions

The economy has always played a key role in determining the growth of the freight industry. As the demand for goods and services increases, the need for transporting these goods and services to customers increases. In addition, as consumer preferences and needs of goods and services change, the freight industry must respond to remain competitive. Today, the continuing trend of companies moving to reduce capital costs by minimizing inventories and providing just in time shipping has changed the dynamics of freight transportation.

Regional Freight Characteristics

Nearly 730 million tons of freight is moved across the transportation network in the Knoxville Region each year, either by truck, rail, barge, or airplane, of which 56.7 million tons, or 7.93%, has either an origin or destination in the Region. Of this freight with a trip end in the Region, trucks handle approximately 44 million tons (77.6%), with rail responsible for 8.7 million tons, (15.3%), barge responsible for 4 million tons (7.1%), and aircraft responsible for 40,000 tons (0.07%).

The following chart (Chart 1) is a breakdown of the annual tons of freight originating in or destined for the Knoxville Region by mode of transportation.



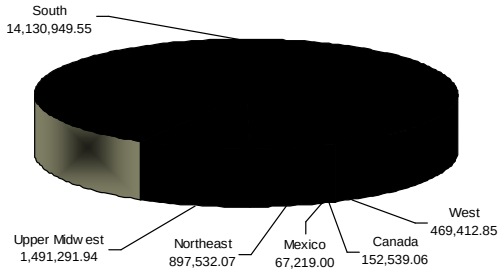
Origin/ Destination

There is almost twice as much freight tonnage destined for the Knoxville Region (39.4 million annual tons) than freight tonnage originating in the Region (17.2 million annual tons), making Knoxville more of a consumer market rather than an exporting market. Appendix A is a table

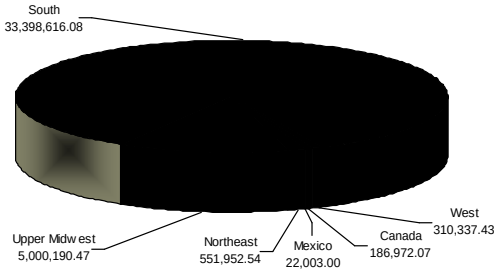
that displays a complete breakdown of the annual tonnage of freight associated with the Knoxville Region by mode of transportation and origin and destination.

The following pie charts (Chart 2 and Chart 3) summarize where freight originating in the Region is destined for and where freight destined for the Region comes from.

Annual Tons of Freight Originating in the Knoxville Region by Destination

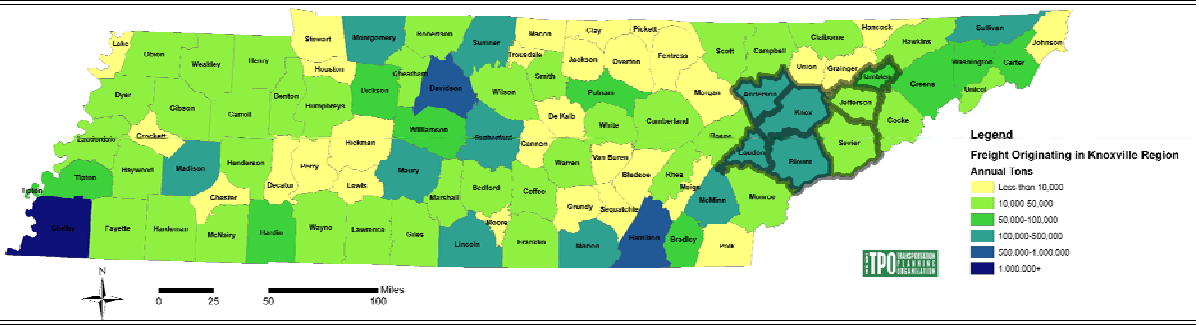


Annual Tons of Freight Destined for the Knoxville Region by Origin



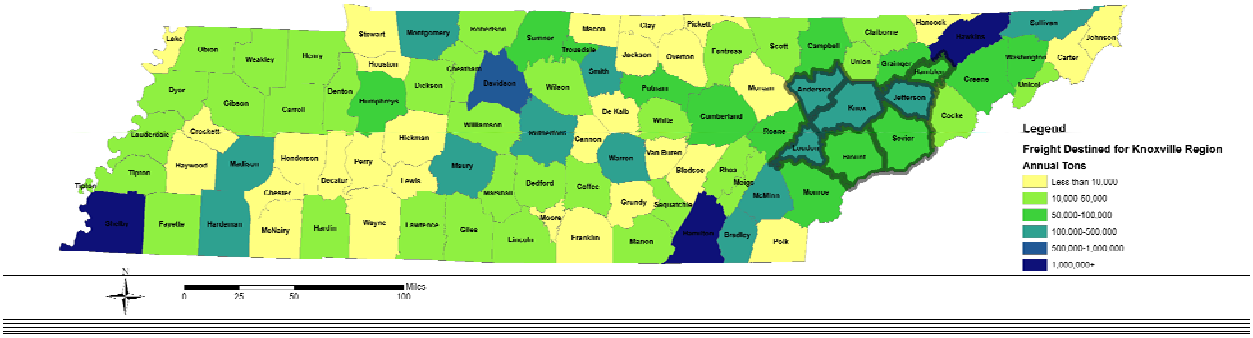
The origin of 74.7% (29.5 million tons) of the annual freight that is destined for the Knoxville Region originates in locations throughout Tennessee and the states that border Tennessee-Alabama, Georgia, Kentucky, Mississippi, North Carolina, and Virginia. Of that inbound freight, 75.2% (22.2 million tons) is coming just from within Tennessee. Map 2 shows the dispersion of the annual tonnage of freight originating in the Knoxville Region destined for other Tennessee Counties.

Map 2: Freight Originating in the Knoxville Region Destined for other Tennessee Counties



The destination of 68.4% (11.8 million tons) of the annual freight that originates in the Knoxville Region is destined for locations throughout Tennessee and the states that border Tennessee-Alabama, Georgia, Kentucky, Mississippi, North Carolina, and Virginia. Of that outbound freight, 72.3% (8.5 million tons) is destined for locations within Tennessee. Map 3 shows the dispersion of the annual tonnage of freight destined for the Knoxville Region that originates in other Tennessee Counties.

Map 3: Freight Destined for the Knoxville Region Originating in other Tennessee Counties



Commodity

The major commodities that originate in the Knoxville Region include aluminum products, concrete and cement, gravel and sand, miscellaneous field crops, metallic ores, motor vehicle parts or accessories, nonmetal minerals, and products from warehouse and distribution centers.

The major commodities that are destined for the Knoxville Region include aluminum ores, coal, concrete and cement, electrometallurgical products, grain, gravel and sand, metallic ores, nonmetal minerals, petroleum refining products, and products from warehouse and distribution centers.

Mode of Transportation

Freight can be transported by truck, rail, barge, airplane, pipeline, or a combination of modes. Trucks have the greatest range of accessibility since they can operate on most roads and are not set to a fixed route. Trucks are also able to transport smaller freight shipments, known as less-than-truckload (LTL), in a time sensitive manner and at feasible costs. Shipping freight by rail or barge becomes feasible if there is a large quantity of the same commodity destined for a common location, the commodity is being shipped over a distance greater than 500 miles, or if the size or weight of the commodity exceeds the limitations of trucking. Shipping freight by air is expensive and is typically only done when the commodity has a high value or requires next day delivery over a long distance such as parcels and mail. Pipelines can continuously transport liquid or gas commodities over a fixed route with little interruption and little man power.

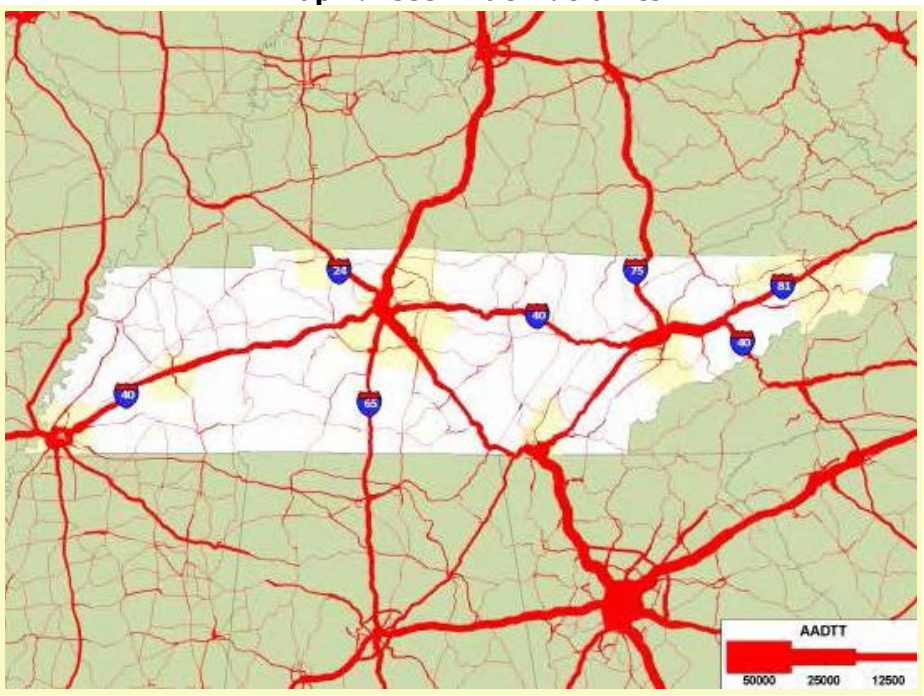
Trucking

The trucking industry is solely responsible for handling 70% of the more than 20 billion tons of freight that is moved across the nation's transportation system annually. An additional 18% of freight is handled by truck at some point during its shipment. The continuing trend of companies moving to reduce capital costs by minimizing inventories and providing just in time shipping has changed the dynamics of freight transportation. Trucks are used as mobile warehouses to supply goods on an as needed basis. This business practice has escalated the increase in truck activity in recent years and will continue to place great demands on the transportation system, particularly the interstates.

Almost 338 million tons of freight is moved across highways in the Knoxville Region each year, resulting in nearly 22 million truck trips. Due to its location along the national transportation

system, a large volume of heavy-duty truck traffic utilizes the Interstate system in Knoxville to transport freight to or from various parts of the country. Only 44 million tons of freight and 4.1 million truck trips have either an origin or destination in the Knoxville Region, meaning 76.8% of the truck tonnage and 67.6% of the trucks that enter the Knoxville Region are passing through, meaning they do not have either an origin or destination in the Region. Map 4 shows truck volumes on interstates and major highways throughout Tennessee in 1999. The map was developed through the FHWA Freight Analysis Framework.

Map 4: 1999 Truck Volumes

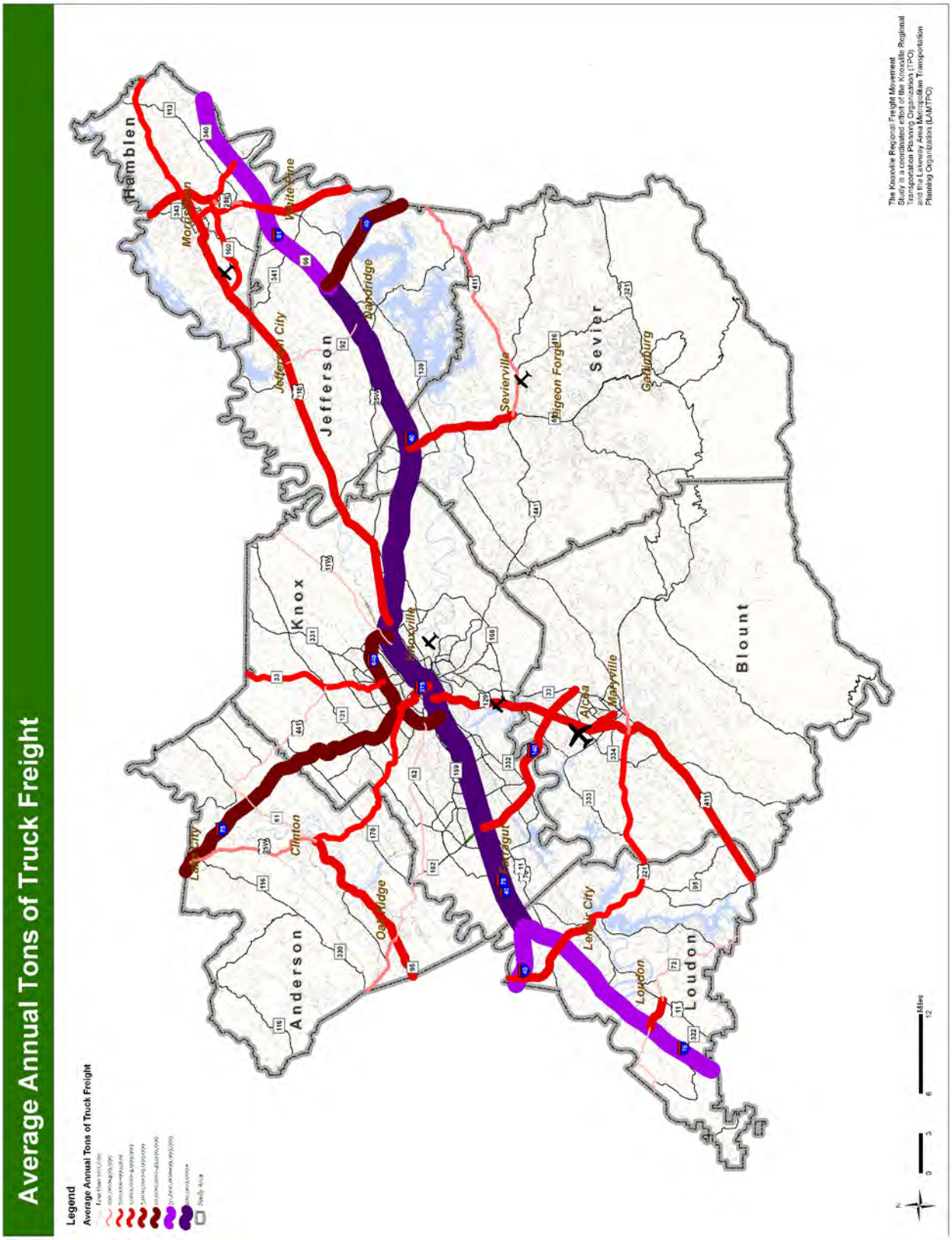


Trucks handle approximately 13.9 million tons, or 80.5% of the annual outbound freight, resulting in an estimated 2.1 million truck trips each year. About 30.1 million tons, or 76.3% of the inbound freight is transported by truck, resulting in nearly 2.0 million truck trips each year. Since Knoxville is a consumer market, generally trucks that deliver goods to the Region maximize their load capacity considerably greater than do trucks that originate in Knoxville or are on backhaul, as indicated by the relatively equal number of inbound and outbound truck trips.

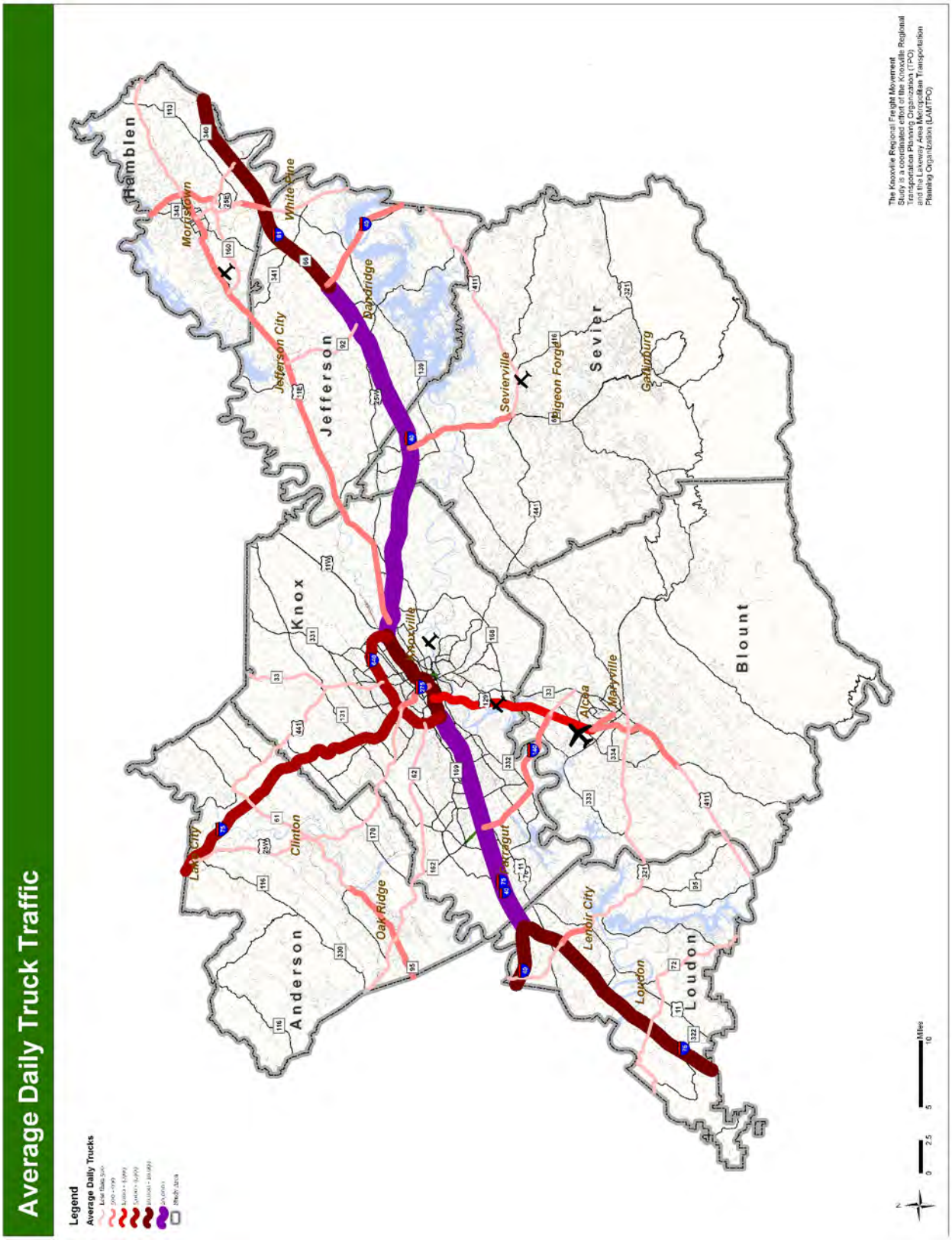
The average trip length of a truck delivering freight is around 500 miles, or about the distance from Washington, D.C. to Knoxville. Due to the proximity, 89.2% of the freight going to or coming from locations throughout Tennessee and the states that border Tennessee- Alabama, Georgia, Kentucky, Mississippi, North Carolina, and Virginia, is transported on truck, resulting in approximately 3.4 million truck trips annually.

The additional truck traffic combined with the growth in commuter travel has worsened congestion, especially in urban areas, and has exacerbated conflicts between freight and passengers. Map 5 displays the annual tonnage of truck freight moved across interstates and major highways throughout the Knoxville Region and Map 6 shows the resulting average daily truck trips.

Map 5: Annual Tons of Truck Freight Transported on Interstates and Major Highways



Map 6: Average Daily Truck Trips on Interstates and Major Highways



The following is some specific data for truck freight in the Region:

- Annually, approximately 44.7 million tons of freight is moved by truck on I-75 in Anderson County resulting in almost 3 million truck trips. This translates into a daily average of 123,000 tons of freight and 8,200 truck trips.
- Approximately 92.6 million tons of freight is moved by truck on I-81 in Hamblen County on a yearly basis resulting in about 5.5 million truck trips. This translates into a daily average of 254,000 tons of freight and 15,000 truck trips.
- Each year, approximately 138.9 million tons of freight is moved by truck on I-40/75 in West Knoxville, resulting in about 8.3 million truck trips. This translates into a daily average of 380,560 tons of freight and 22,740 truck trips.
- I-75 in Loudon County handles approximately 73.2 million tons of freight annually, resulting in 4.5 million truck trips. This translates into a daily average of 201,000 tons of freight and 12,400 truck trips.

Rail

Nearly 370 million tons of freight is moved by railroad throughout the Knoxville Region each year. Only 8.7 million tons of this freight has an origin or destination in the Region, meaning 97.6% of the freight traveling on railroads throughout the Region is passing through. Railroads handle approximately 2.1 million tons, or 12% of the annual outbound freight and about 6.6 million tons, or 16.8% of the inbound freight.

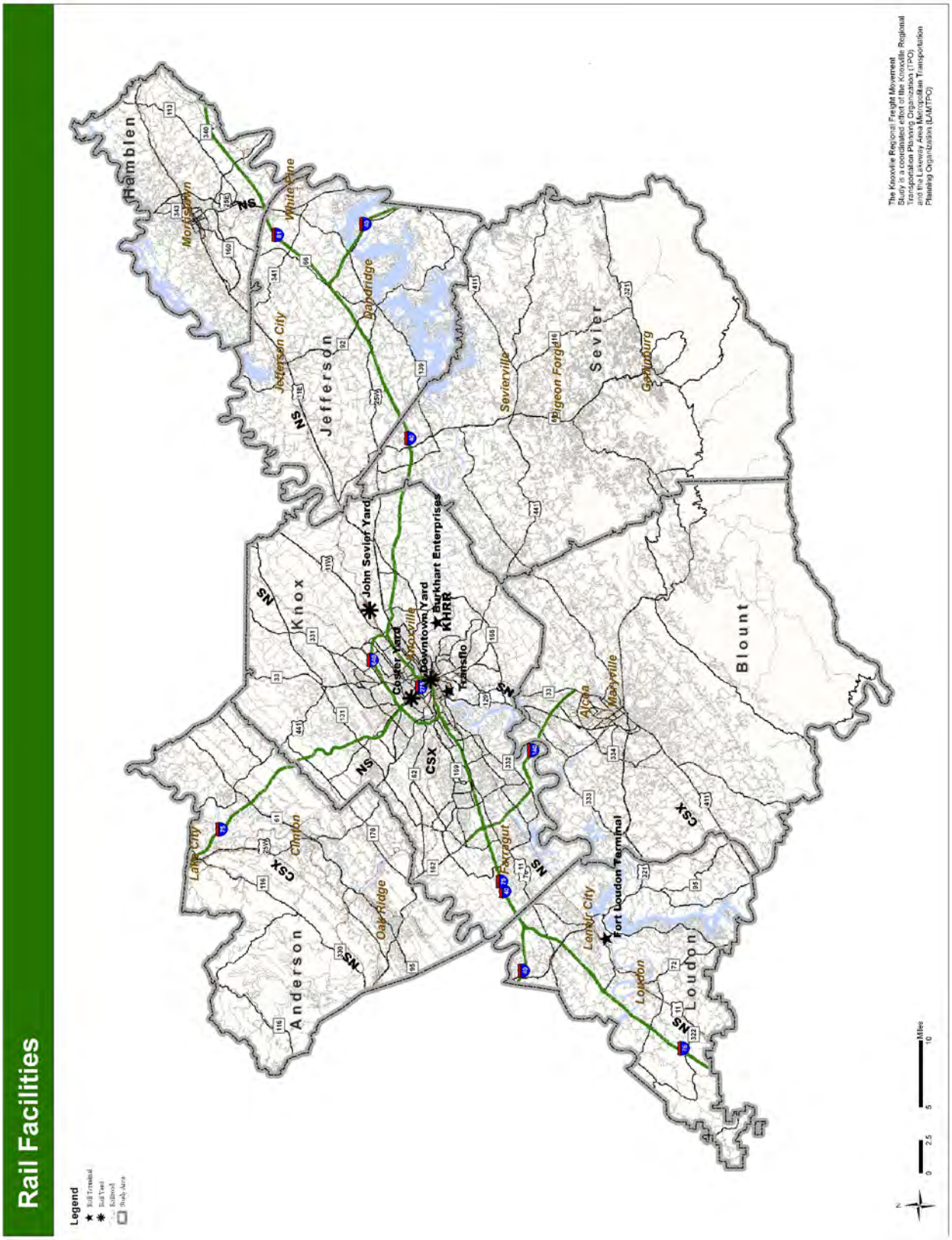
There are approximately 310 miles of railroad track throughout the Knoxville Region that are operated by two major Class I railroads, Norfolk Southern and CSX, and one short line railroad, the Knoxville & Holston River Railroad. Norfolk Southern (NS) controls about 215 miles of railroad track throughout the Region that provide connections to Virginia and North Carolina to the northeast, through Jefferson City and Morristown, Middlesboro, KY and Jellico to the north, Chattanooga to the southwest, through Lenoir City and Loudon, Alcoa to the south, and to the main north-south line between Cincinnati and Chattanooga to the west, through Heiskell and Oliver Springs. The Norfolk Southern railroad network within the Region converges on the John Sevier Yard in East Knox County, which handles the major rail car switching in the Region for Norfolk Southern. There is a rail yard just north of Downtown Knoxville under the I-40/I-275 interchange that is used as a staging area for Norfolk Southern trains.

CSX Transportation controls about 76 miles of railroad track throughout the Region, most of which is part of a major north-south line that provides connections to Cincinnati and Louisville to the north and Chattanooga and Atlanta to the south. The CSX railroad network includes industrial spurs to Bull Run Steam Plant, Oak Ridge National Laboratory, and ALCOA, Inc. Minor switching operations of CSX trains occur at the TransFlo facility located alongside the University of Tennessee.

The Knoxville & Holston River Railroad Company operates 19.2 miles of railroad track that provides rail connections from the Forks of the River Industrial Park to Coster Yard, where rail cars are switched to CSX and Norfolk Southern trains.

Map 7 shows the railroad system and rail facilities throughout the Knoxville Region.

Map 7: Knoxville Region Rail Facilities



Burkhart Enterprises, Inc., Fort Loudoun Terminal Company, and TransFlo operate major rail terminals in the Knoxville Region that provides service to a range of customers. Burkhart, located near Forks of the River Industrial Park along the Tennessee River, handles bulk transloading between truck, rail, and barge. The site is serviced by the Knoxville & Holston River Railroad. The Fort Loudoun Terminal Company is located along the Tennessee River in Lenoir City. The Terminal is serviced by Norfolk Southern and also handles bulk transloading between truck, rail, and barge. TransFlo is located alongside the University of Tennessee and handles bulk transloading between truck and rail. The site is serviced by CSX. Bulk transloading facilities are equipped to handle the transferring of bulk commodities between barge, rail, and trucks and differ from intermodal freight facilities in that commodities are not moved in containers, the actual commodity must be transferred.

The Coster Yard in North Knoxville was once the primary switching yard for all major railroads that accessed the Region. However, with its role diminishing, rail traffic at the Coster Yard decreased to the point that the rail shop was closed in the 1990's. Limited rail switching operations still occur at the Yard, but the majority of the Coster Shop Yard is being redeveloped into an industrial park.

The following is a summary of railroad operations throughout the Region:

- The major north-south rail movements for Norfolk Southern occur on their tracks to the west of the Region through Harriman. The railroad network throughout the Knoxville Region primarily handles major rail movements between this north-south line and the connections to the Northeast and East. All of Norfolk Southern's rail lines are engineered to handle freight train speeds of 50 mph.
- Norfolk Southern's west-northeast line that runs through Oliver Springs, Heiskell, Knoxville, Jefferson City, and Morristown provides connections between the major north-south railroad line in Harriman and Virginia. The number of trains on this line varies from 11-20 in Anderson County, to 21-30 in North Knox County, to as many as 40 per day in East Knox, Jefferson, and Hamblen Counties. The freight handled along this corridor ranges from 10-20 million annual tons.
- A rail line splits off just west of Morristown providing connections to North Carolina through Cocke County. This line handles 6-10 trains per day and 1-10 million tons of freight annually.
- Another rail line splits off this North Carolina line and provides connections into Kingsport, handling 6-10 trains each day and less than 1 million tons annually.
- Norfolk Southern's northeast-southwest line that runs from Knoxville to Chattanooga and Atlanta through Lenoir City and Loudon handles anywhere from 11-20 trains daily and 1-10 million tons of annual freight.
- Norfolk Southern operates two regional rail spurs, one to Jellico and another to Middlesboro, KY, that provide connections to the coal fields. The Jellico spur extends from Clinton north and handles 6-10 trains each day and less than a million annual tons.

- The Middlesboro spur extends through Northeast Knox County and handles 11-20 trains per day and 1-10 million tons each year.
- Norfolk Southern also operates an industrial spur to ALCOA, Inc that serves about 40-60 rail carloads on less than 6 trains per day. Less than 1 million tons of freight is moved along this spur each year.
- The only CSX rail corridor in the Region is the north-south line that runs through Knoxville and provides connections to Cincinnati and Louisville to the north and Chattanooga and Atlanta to the south. This major corridor handles upwards of 30 trains each day and more than 20 million tons of freight each year, most of which are through trips handling coal, automobiles, intermodal containers, and retail merchandise.
- CSX operates industrial spurs to Bull Run Stream Plant and Oak Ridge National Laboratory in Anderson County, the Middlebrook Tank Farm in Knox County, and ALCOA, Inc in Blount County.
- The Knoxville & Holston River Railroad operates two daily round trip trains, transporting approximately 2,100 tons of freight annually between the Forks of the River Industrial Park and the Coster Yard.

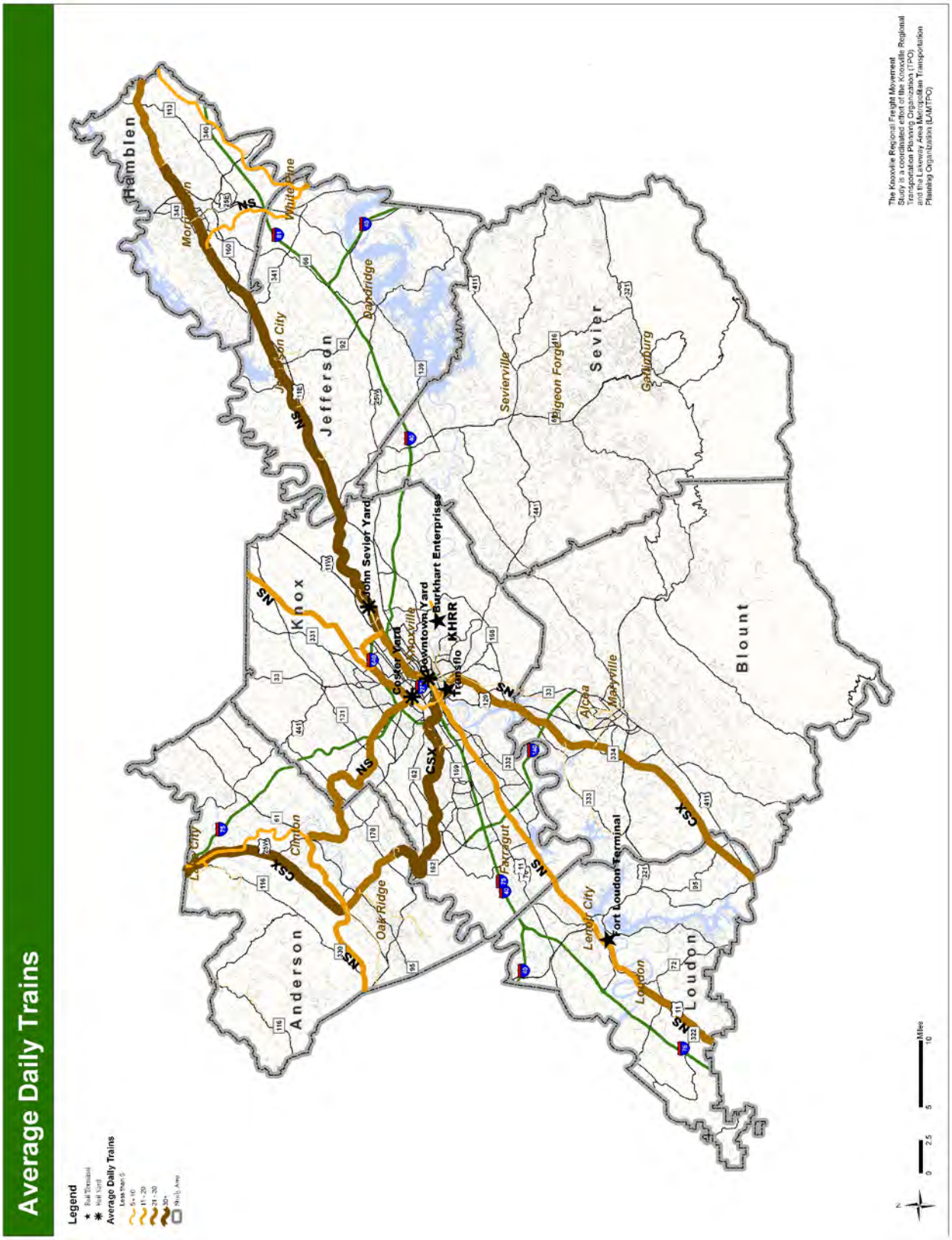
The average number of daily trains for each railroad is displayed on Map 8. Map 9 shows the annual tonnage of rail freight being handled by the railroads throughout the Region.

Intermodal

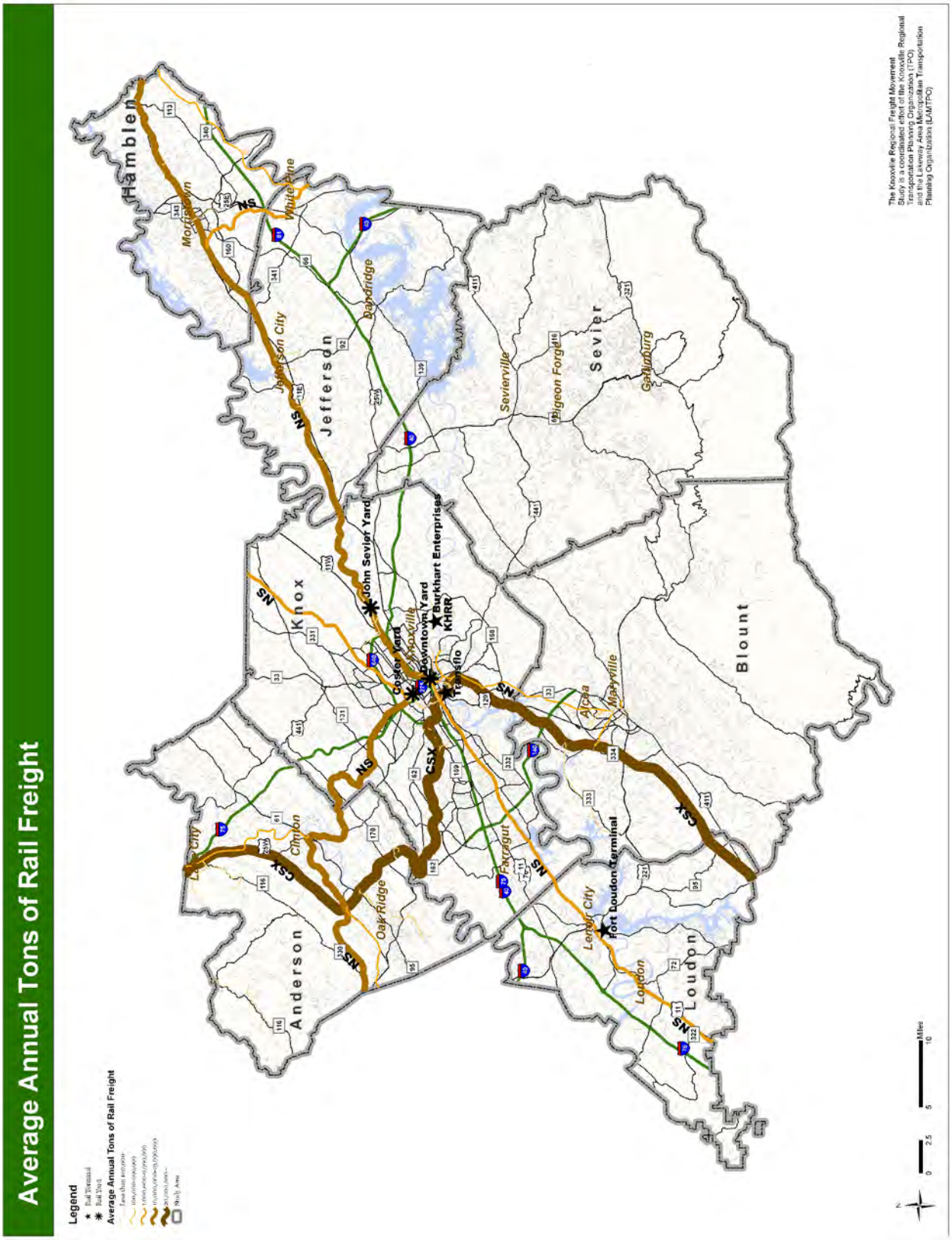
Slightly more than 20 million of the 370 million tons, or 5.4%, of annual rail freight that is handled on the Region's rail network is intermodal freight. Moving freight in intermodal containers allows commodities to be shipped between transportation modes in a single container without having to handle the individual commodity. This allows for the intermodal shipment of containers by barge or rail with the ability to upload from or download to a truck trailer without retrofit and with relative ease. Intermodal containers are classified as either Container on Flat Car (COFC), which are containers that can be stacked on barges and rail flat cars and transferred to a truck trailer chassis, or Trailer on Flat Car (TOFC) in which the entire truck trailer with chassis attached is placed on a barge or rail flat car.

The Surface Transportation Board (STB) defines an intermodal facility as a site consisting of tracks, lifting equipment, paved and/or unpaved areas, and a control point for the transfer of trailers and containers between rail, barge, and truck. Since there are no classified intermodal facilities in the Knoxville Region that handle container freight, none of the intermodal tonnage originates or is destined for the Region. Burkhart Enterprises, Fort Loudoun Terminal Company, and TransFlo are all bulk transfer facilities meaning commodities are moved between modes and not containers. The nearest intermodal facilities are in Nashville, Kingsport, Memphis, Atlanta, Georgetown, KY, or Huntsville, Al.

Map 8: Average Daily Volume of Trains



Map 9: Annual Tonnage of Rail Freight



Barge

Commercial navigation of the Tennessee River System is made possible by the Tennessee Valley Authority's (TVA) system of dams and locks. The dams create a system of reservoirs that control the current and maintain a draft depth of at least nine feet. Locks are located at the dams and allow recreational watercraft and commercial barges to navigate between reservoirs. Each year, 34,000 barges carry 50 million tons of goods up and down the river, about 40% of which is coal being shipped to TVA power plants.

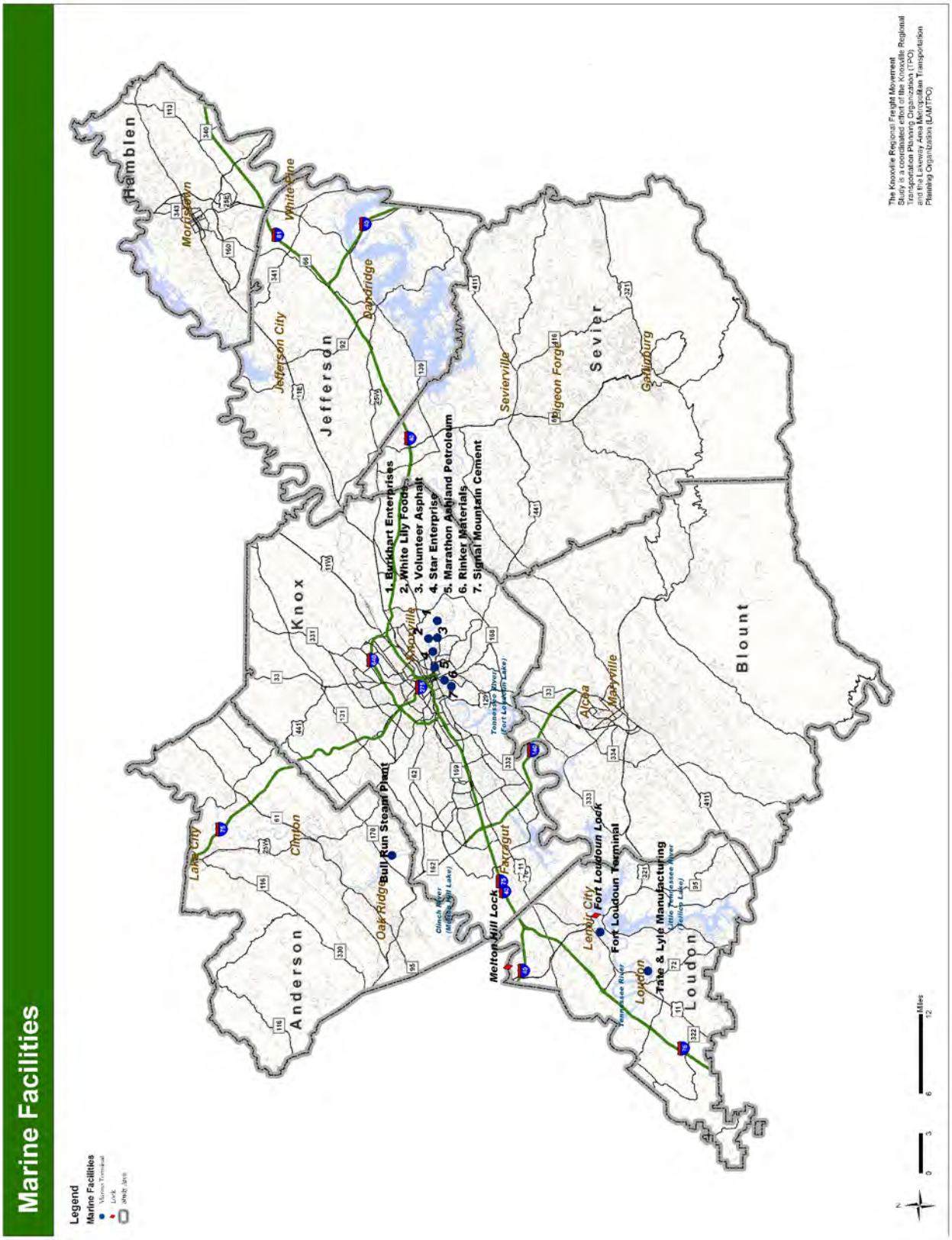
Since commercial navigation of the Tennessee River begins in Knoxville, there are not any pass through barge trips. Approximately 4.0 million tons of annual barge freight has an origin or destination in the Region. Barges handle approximately 1.3 million tons annually of outbound freight and about 2.7 million tons annually of inbound freight.

Fort Loudoun Lock is located in Lenoir City and has a barge capacity of one standard barge (195' by 35'), although the size of the Lock is 360' by 60', and takes approximately 45 minutes to complete an operation. About 550 barges passed through the Lock each year. The Little Tennessee River/ Tellico Lake is connected to the Tennessee River by a canal allowing barge access to two major industrial parks in Monroe County.

Melton Hill Lock is located on the border of Loudon and Roane Counties and allows commercial navigation of the Clinch River through a 400' by 75' lock. Melton Hill Lock handles considerably less barge tonnage, 3,800 tons on 24 barges annually, however, it allows for large pieces of equipment to be shipped to Oak Ridge National Laboratory Y-12 Plant and the Spallation Neutron Source Plant that cannot be shipped by any other mode because of their size. The Lock also allows for coal and other large equipment to be shipped to the Bull Run Steam Plant in Anderson County. Since the Melton Hill Lock is closed to all non-essential traffic and is no longer staffed, the lock operator at Fort Loudoun Lock must operate it upon special request. Prior to the U.S. Corps of Engineers closing the Lock in August of 2003, 91 barges utilized the lock.

There are twelve facilities in the Knoxville Region that contain active port facilities. Burkhart Enterprises, Volunteer Asphalt Company, White Lily Foods Company, Star Enterprise Corporation, Marathon Ashland Petroleum, Rinker Materials (operates two terminals), and Signal Mountain Cement Company all maintain active river terminals in Knox County. Bull Run Steam Plant and Oak Ridge National Laboratory operate terminals in Anderson County. Fort Loudoun Terminal Company and Tate & Lyle Manufacturing (formally A.E. Staley) are located in Loudon County. Map 10 shows the marine facilities used for barge freight in the Knoxville Region.

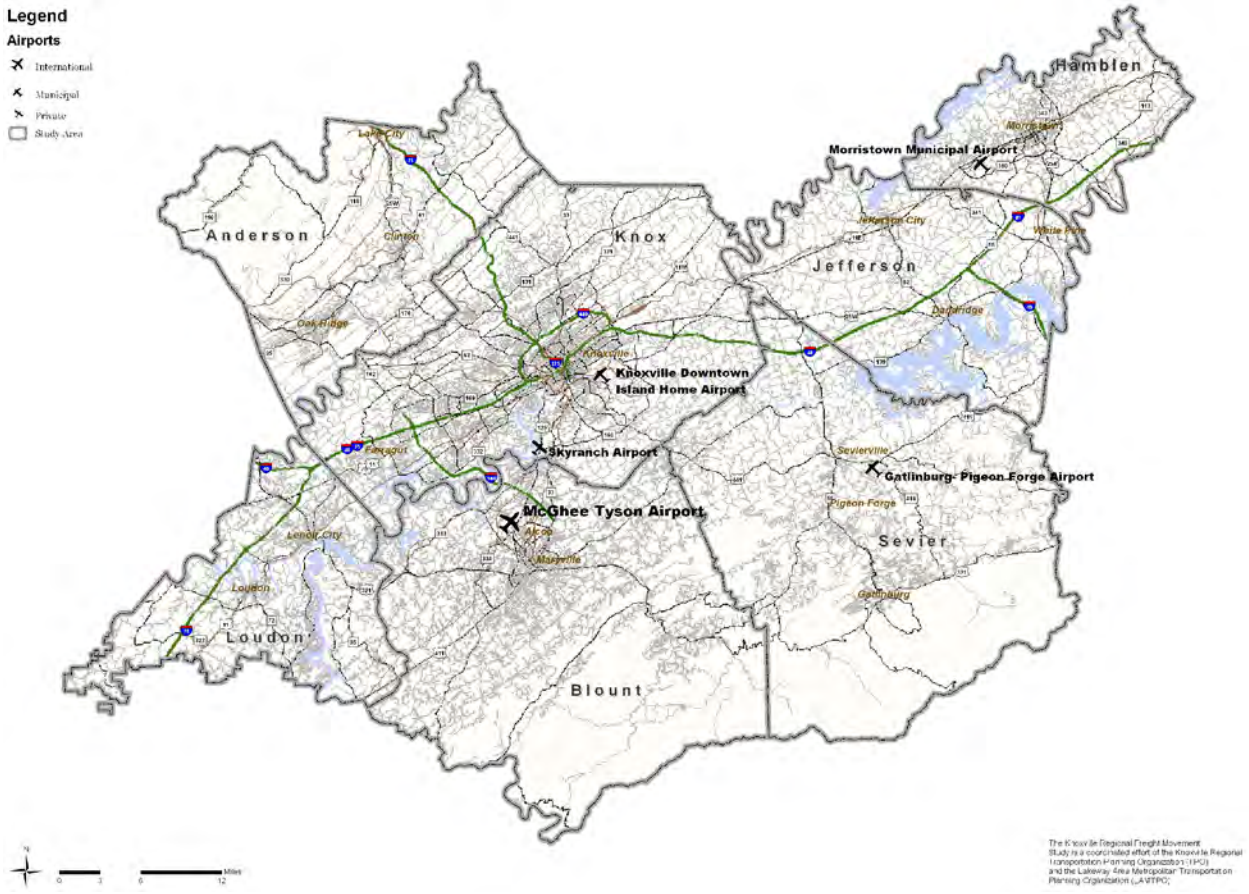
Map 10: Knoxville Region Marine and Barge Facilities



Air

In 2006, approximately 1.7 million passengers arrived or departed through McGhee Tyson Airport passenger terminals, 20% more than in 2003. Air cargo, the combined activities of air freight and air mail, can be shipped either within the cargo hold of commercial passenger aircraft (belly haul) or within aircraft dedicated to air cargo. More than 40,000 tons of air freight is handled at McGhee Tyson Airport, with only 0.1% of that as mail. United Parcel Service (UPS), FedEx, and DHL Express control the majority of the air freight market. In comparison, the Nashville International Airport handled approximately 20,000 tons of air cargo in 2006 and the Memphis International Airport, one of the largest air cargo hubs, handled over 3.5 million tons. Very little freight is handled at Gatlinburg/ Pigeon Forge Airport or Morristown Municipal Airport. Map 11 shows the airports located throughout the Knoxville Region.

Map 11: Knoxville Region Airport Facilities



Pipeline

Two major petroleum pipelines, one operated by Colonial Pipeline Company and one by Plantation Pipeline Company, transport petroleum products from refineries located along the Gulf of Mexico Coast directly to terminals located on Middlebrook Pike between Amherst Road and Ed Shouse Drive in the City of Knoxville. The tanks at the 23 acre Middlebrook Tank Farm are capable of storing more than 100,000 barrels of petroleum. The Tank Farm is a major generator of tanker trucks that deliver fuel to retail fuel stations throughout the Region.

V. Knoxville Regional Freight Movement Survey

In order to gain a better understanding of the characteristics of freight transportation throughout the Knoxville Region, the Knoxville Regional Transportation Planning Organization, in coordination with the Lakeway Area Metropolitan Transportation Planning Organization and Tennessee Trucking Association, developed a survey and distributed it to 256 businesses, ranging from truckload and less-than-truckload carriers to warehouse and distribution centers, local distributors, parcel couriers, and manufactures. A copy of the survey is included as Appendix B.

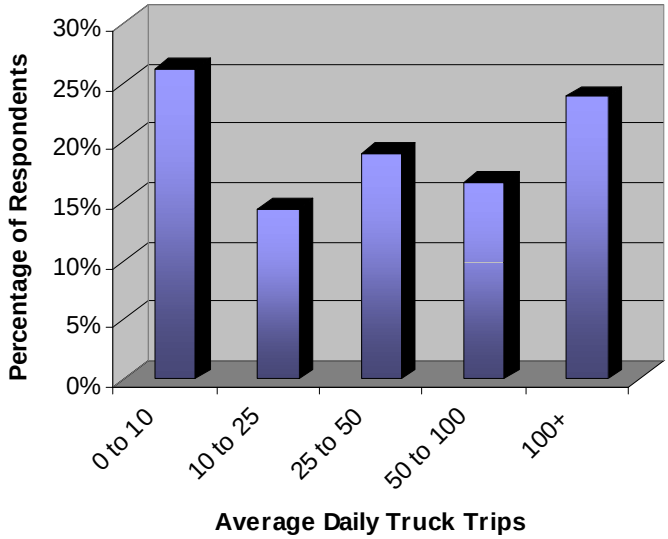
The survey's objective was to obtain information on the number of truck trips to/from a site, peak time for truck activity, general origins and destinations of the truck trips and the routes taken, issues and challenges related to the movement of freight as well as potential solutions, location factors, and future freight movement trends. The survey also asked respondents to serve on the Knoxville Regional Freight Advisory Committee. A total of 47 surveys were returned, making for an 18.36% response rate.

Survey Summary

Average Daily Truck Trips to/ from Facility

Respondents were asked to estimate how many trucks enter or exit their facility in an average day. There was a fairly equal distribution of respondents (Chart 4) that provide varying views from smaller firms, medium sized firms, and larger firms.

Chart 4: Average Daily Truck Trips to/ from Facility

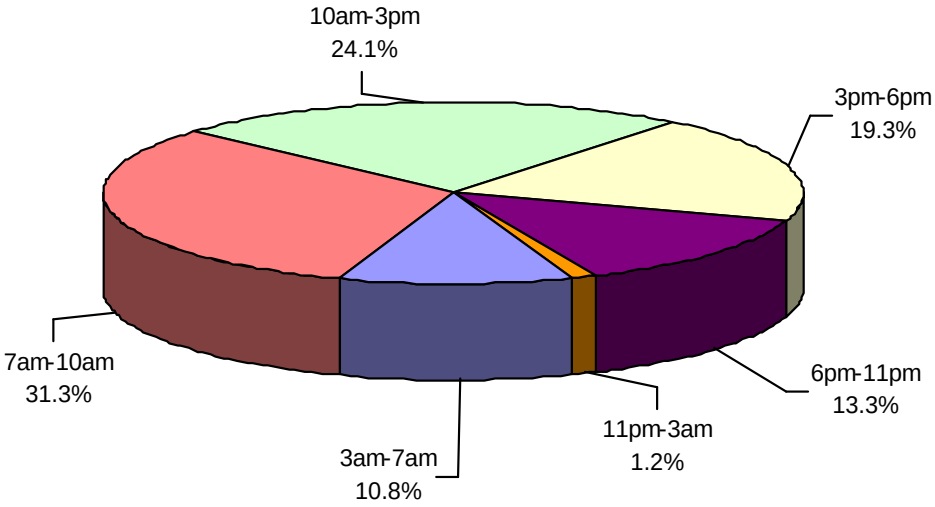


Peak Time for Truck Activity to/ from Facility

Respondents were asked to estimate the times during an average day that peak truck activity to or from their facility takes place. As shown in Chart 5, there isn't a good overall depiction of a peak time for truck activity. Peak truck activity appears to be equally high between the time segments of 7am-10am, 10am-3pm, and 3pm-6pm. Slightly less truck activity occurs during the 3am-7am and 6pm-11pm time segments with very little truck activity occurring during the

11pm-3am time segment. This supports the argument that peak truck activity occurs during times of peak commuting, exacerbating congestion problems and truck-automobile conflicts.

Chart 5: Peak Time for Truck Activity to/ from Facility



Primary Routes Used by Trucks Entering/ Existing a Facility

Respondents were asked to identify the most frequently used routes by trucks traveling between their facility and the origin/ destination or the nearest interstate. The most common routes identified were:

- State Route 61, Anderson County;
- State Route 95, Anderson County;
- Old Knoxville Highway (SR 33), Blount County;
- State Route 160, Hamblen County;
- US 25E, Hamblen County;
- State Route 92, Jefferson County;
- Alcoa Highway (US 129), Knox and Blount County;
- US 11E (Asheville Hwy and Andrew Johnson Hwy), Knox, Jefferson, and Hamblen Counties;
- Ed Shouse Drive, Knox County;
- Governor John Sevier Highway (SR 168), Knox County;
- Lovell Road (SR 131), Knox County;
- Middlebrook Pike (SR 169), Knox County;
- Sutherland Avenue, Knox County;
- Strawberry Plains Pike, Knox County;
- Western Avenue (SR 62), Knox County;
- State Route 72, Loudon County; and,
- Sugarlimb Road, Loudon County.

Primary Issues and Challenges with the Region's Transportation System with Regards to Freight Movement

Respondents were asked to identify issues or problem areas with the transportation system that restrict the movement of freight. The most common issues identified were:

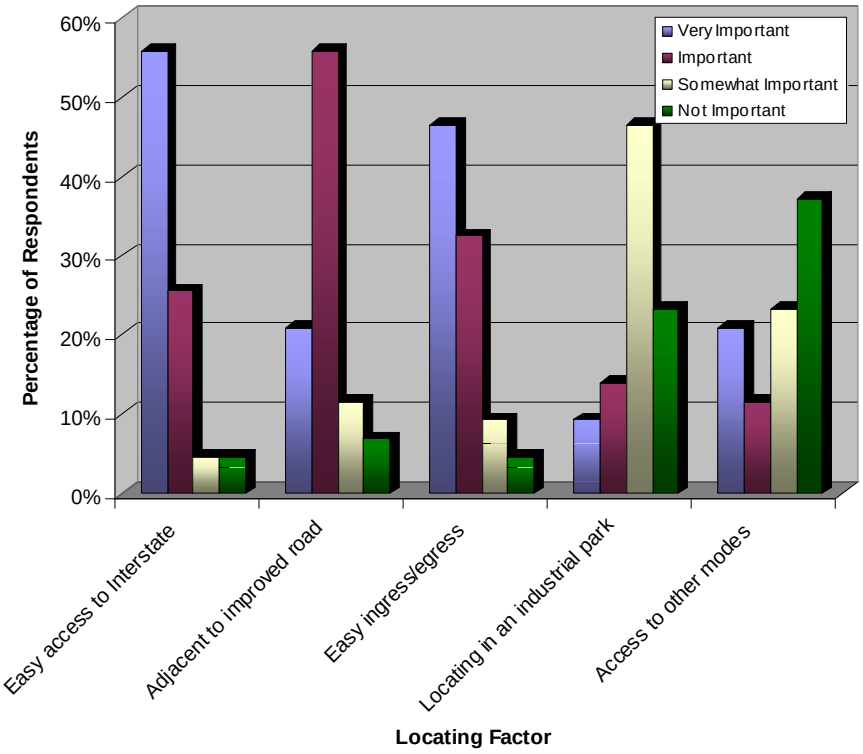
- Restricted access and delivery times in Gatlinburg;
- Traffic congestion;
- Construction and lack of construction related information;
- Lane restrictions for trucks;
- Parking areas that are too close to loading docks;
- Lack of public transit to industrial parks (for worker access);
- Ingress/ egress to major roads from unsignalized intersections;
- Turning radii;
- Lack of truck drivers;
- Narrow roads;
- At-grade railroad crossings;
- Lack of flatbed carriers in Knoxville;
- Interchange at I-640 and Western Avenue;
- I-640 ramp to I-75 north;
- Intersection of Western Avenue and Tennessee Avenue;
- Ramp from Alcoa Highway to I-140 north;
- Access to Alcoa Highway and I-140 from airport;
- Lack of traffic signal at Commerce Boulevard and SR 160;
- I-81/ US 25E interchange;
- Morris Boulevard at US 25E; and,
- Condition of locks between Knoxville and Chattanooga.

Location Factors

Respondents were asked to weigh on a scale of 1 to 4, with 1 being very important and 4 being not important, the factors that went into determining the location of their facility. The majority of respondents said that the proximity or ease of interstate access and easy ingress and egress to their facility were very important criteria that went into determining the location of their facility. Very few respondents mentioned that interstate access was only somewhat important or not important. The majority of respondents identified locating their facility along a recently improved highway as an important factor in determining its location. Locating in a business or industrial park was very important to less than 10% of the respondents but the majority said it was somewhat important in the determination of locating their facility. The majority of

respondents also said that locating near access to other transportation modes (rail, barge, airport, or pipeline) was not important. Chart 6 shows how respondents viewed location factors.

Chart 6: Factors in Determining the Location of the Facility



Intermodal Facility

Respondents were asked to give their opinion on whether or not locating an intermodal freight facility, in which containers can be directly transferred between rail cars and trucks, in the Knoxville Region would be beneficial to their business. A slight majority, 39.5%, said an intermodal facility would not benefit their business, while 37.2% said an intermodal facility would benefit their business, and 11.6% were unsure.

VI. Freight Transportation and Land Use Correlation

There is a strong correlation between land use and transportation, and it is important to include an evaluation of current and proposed land uses when developing a transportation plan, or in this case, a freight movement plan. While all commercial and industrial uses typically generate some degree of truck traffic, certain land uses and clusters of land uses generate higher volumes of truck traffic. Business, commercial, or industrial parks are organized clusters of businesses and industries that are often developed under a public economic development agency. These parks can be geared towards attracting different types of businesses that generate different types and volumes of traffic. There are parks that are focused around attracting offices or service type businesses that do not generate much truck activity. There are parks that promote industrial development, in which a product is manufactured and goods are transported to and from the facility, generating truck activity as a side effect. There are also parks geared towards attracting businesses that rely on the trucking industry such as warehouse/ distribution centers or trucking terminals.

Identifying future land uses is important in anticipating the type and volume of truck activity that can be expected and in analyzing the impact of additional trucks on the existing transportation system. Although predicting future land use is not an exact science, communities develop land use master plans that lay out community goals and identify areas where certain land use types should be permitted and areas they should not. Communities can enforce their land use plans through zoning, which legally binds a property to specified land uses. Zoning gives a clearer picture of what types of land uses can be expected in the future, but zoning can be adjusted, especially as conditions change. Currently, all the counties in the study area participate in zoning.

Land Use Analysis

The overwhelming trend throughout the Knoxville Region over the last 20-30 years has been a general decentralization of business and industry as facilities located in older urban areas become obsolete. Business and industry were typically located in urban areas to be close to labor and markets and to be at the center of the transportation system. As the labor pool became more decentralized and market areas expanded, the need to locate in the urban area was no longer necessary.

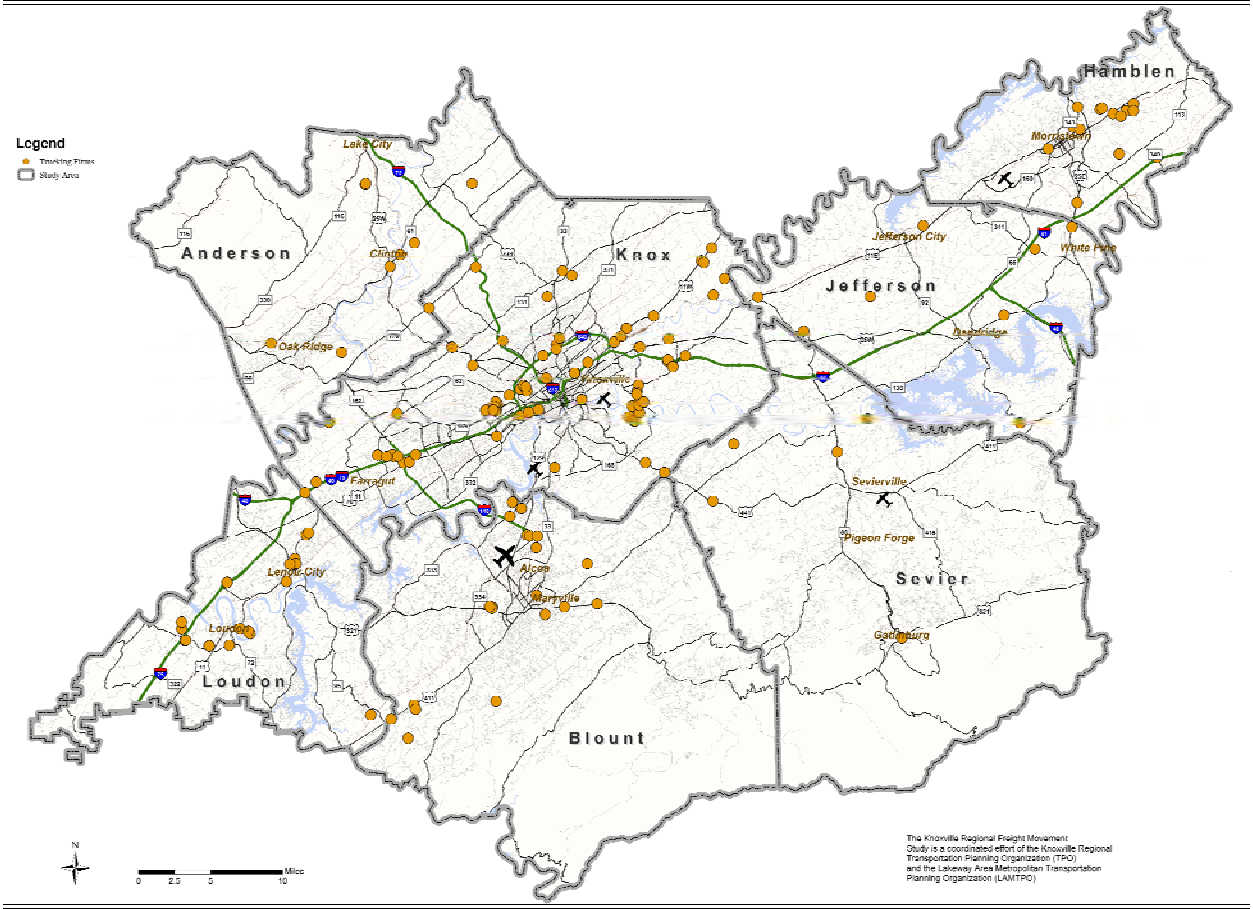
Improvements to the transportation system coupled with the onslaught of less-than-truckload carriers pushed the trend of businesses and industries throughout the Knoxville Region to decentralize from traditional older urban areas and locate in suburban or rural areas, especially near interstate interchanges, where land was cheap, there was room to expand, and access to and from the site for both workers and freight was simplified. The just-in-time inventory push of retailers led to the development of a hub and spoke distribution system. This system set up a number of main distribution centers across the country from which products from manufacturers and suppliers could be shipped to and temporarily stored. Trucks make daily trips from the warehouse to retail markets to deliver only the goods needed to stock the shelves, thus reducing inventory costs. The locations of these distribution centers are typically on the outskirts of a metropolitan area near an interstate interchange so many markets can be reached within a day's

drive. To respond to the just-in-time inventory practices of many retailers and to offer improved and expanded services to a larger market, trucking terminals began locating near interstate interchanges as well.

Trucking Terminals

There are over 100 trucking terminals located throughout the Knoxville Region. These trucking terminals vary in size, offer both truckload and less-than-truckload (LTL) services, provide short haul and long haul transportation, handle various types of freight, and pick up and deliver to locations throughout the region as well as nationwide. Some trucking terminals, especially LTL carriers, provide cross docking space, where freight is moved within a dock directly between trailer trucks without being warehoused. Some offer warehouse space if the needs of their customers require freight to be stored. Others are just offices that dispatch trucks and possibly store trailers, but no freight is brought onsite. Map 12 identifies the locations of trucking firms and terminals throughout the Knoxville Region.

Map 12: Locations of Trucking Firms and Terminals



After mapping and analyzing all the trucking firms and terminals in the Knoxville Region, it was found that there are several clusters of trucking terminals that generate significant daily truck traffic. These locations are:

- Within the East Tennessee Valley Industrial District in Hamblen County;

- Near the interchange of SR 341 and I-81 in Jefferson County;
- Near the I-40/75- Lovell Road interchange in Knox County;
- Along Middlebrook between Weisgarber Road and Ed Shouse Drive in Knox County;
- Near the intersection of Texas Avenue and Western Avenue in Knox County;
- Within the Forks of the River Industrial Park and along Gov. John Sevier Highway in Knox County; and,
- Near the I-75/ SR 72 interchange in Loudon County.

Warehouse/ Distribution Centers

Several major warehouse/ distribution centers, parcel carriers, pipeline terminals, and local distributors are located throughout the Knoxville Region. The service areas for distribution centers vary. There are distribution centers that service a national market, distribution centers that service a regional multi-state market, and local distributors that service the Knoxville Region or East Tennessee. Examples of larger distribution centers located in the Knoxville Region that service a national or multi-state market are:

- Food Lion LLC Distribution Center in Clinton;
- IJ Company Food Service Distributors in Blount County;
- US Foodservice in Alcoa;
- Interstate Bakeries in Knoxville;
- Berkline Furniture in Morristown;
- Wallace Hardware in Morristown;
- Performance Food Group (PFG- Hale) in Morristown;
- Koch Foods in Morristown;
- John Deere Distribution Center in Jefferson City;
- Goody's Family Clothing in Knoxville;
- CVS Distribution Centers in Loudon and Knoxville; and,
- American Honda Distribution in Loudon.

Located just outside the study area are three major distribution centers that generate significant truck activity throughout the Knoxville Region- the Wal-Mart Distribution Center in Greene County, H.T. Hackney Food Distribution Center in Roane County, and Lowe's Distribution Center in Monroe County.

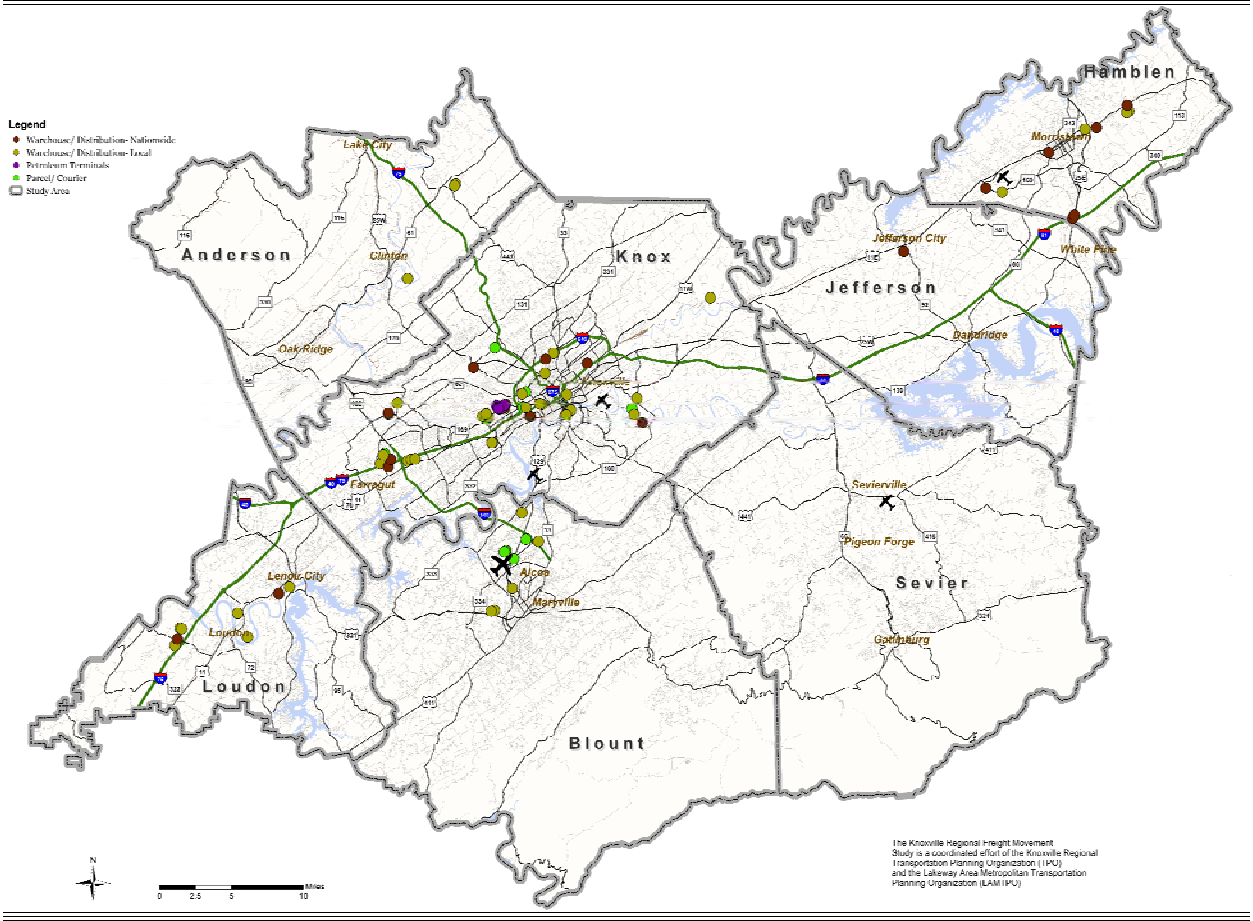
Local distributors deliver products such as beverages, snacks, dairy, and baked goods directly to local markets throughout the Knoxville Region rather than utilizing the retailer's warehouse and distribution system. Examples of local distributors located throughout the Knoxville Region are:

- Knoxville Coca-Cola and Morristown Coca-Cola;
- Pepsi Bottling Group in Knoxville and Morristown;

- Mayfield Dairy in Knoxville and Morristown;
- Frito Lay in Knoxville;
- Flav-O-Rich in Knoxville;
- B&T Distributing and Cherokee Distributing (beverages) in Knoxville;
- Sara Lee Bakery Group in Knoxville; and,
- Eagle Distributing (beverages) in Lenoir City and Knoxville.

Map 13 identifies the locations of national and regional multi-state distribution centers, local distributors, parcel couriers, and petroleum terminals.

Map 13: Locations of Distribution Centers, Parcel Couriers, and Petroleum Terminals



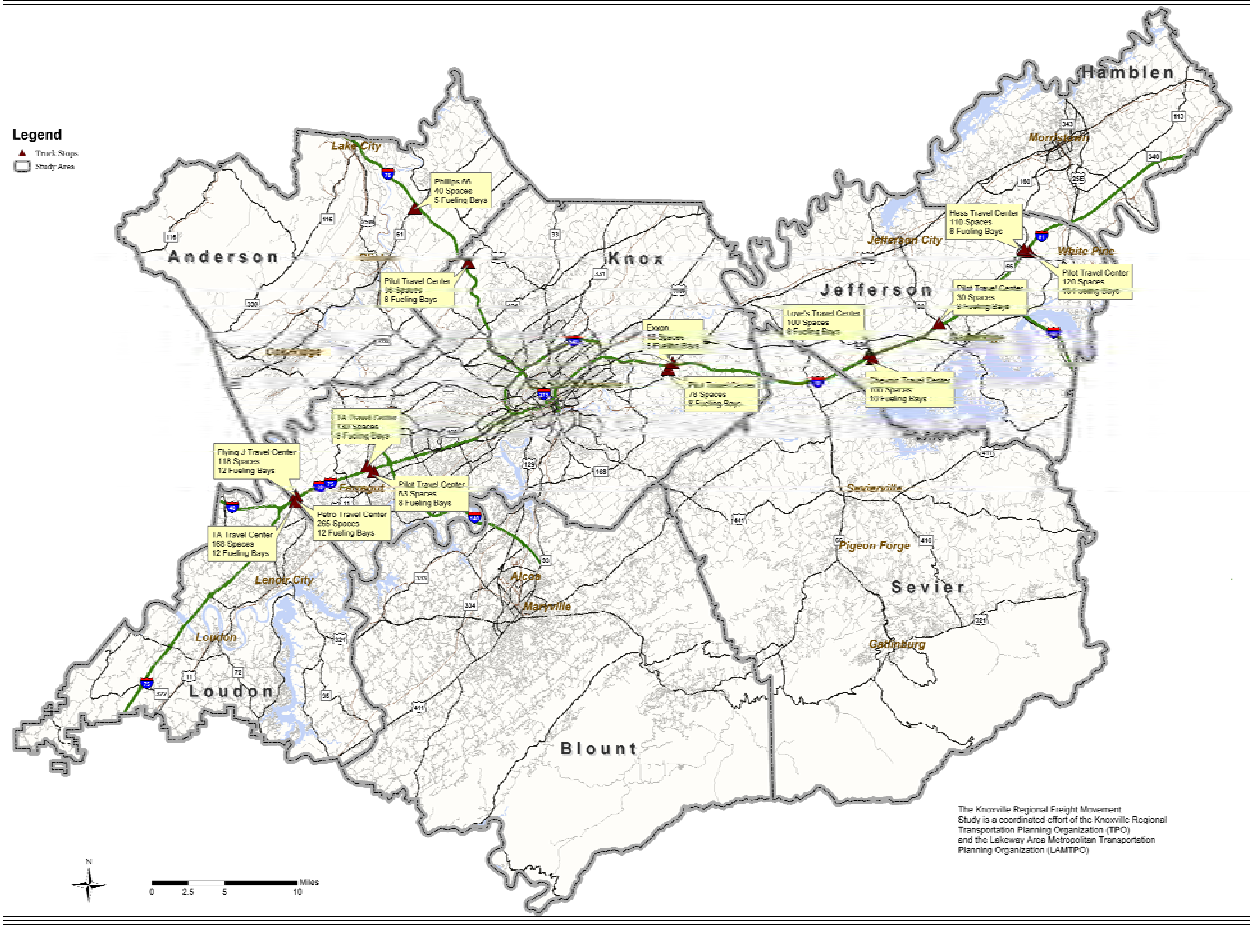
Parcel couriers, such as the U.S. Postal Service, FedEx, UPS, and DHL Express, offer door-to-door delivery of mail and small freight packages, meaning customers can arrange pick up and delivery at their office or residence. These couriers utilize truck, rail, and air transportation to transport freight long distance, and utilize smaller single unit trucks or vans for local delivery. FedEx and UPS also offer less-than-truckload services to businesses and residents.

All of the retail fuel stations throughout the Knoxville Region receive their fuel from one of the petroleum terminals located at the Middlebrook Tank Farm. Several tanker truck carriers offer petroleum distribution between these terminals and the retail fuel station so that customers can fuel their vehicles at local markets. This distribution system is a 24-hour a day, 7-day a week operation. Large volumes of truck traffic along Middlebrook Pike, both west towards Weisgarber Road and Gallaher View Road to access I-40/75 and east to Ed Shouse Drive and Western Avenue to access I-640, are the result of tanker trucks transporting petroleum.

Truck Travel Centers

There are fourteen parking areas designated for overnight truck parking within the Knoxville Region, providing approximately 1,400 parking spaces. These truck stops also combine to provide nearly 125 diesel fueling bays for trucks. Map 14 displays the locations of truck stops in the Knoxville Region along with information on the number of truck parking spaces and diesel fueling bays.

Map 14: Locations of Truck Travel Centers and Parking Areas



Truck travel centers and parking areas are primarily clustered at the following interstate interchanges:

- I-40/ Deep Springs Road in Jefferson County (200 truck parking spaces and 20 diesel fueling bays);

- I-81/ SR 341 in Jefferson County (230 truck parking spaces and 18 diesel fueling bays);
- I-40/75 and Watt Road in Knox County (551 truck parking spaces and 36 diesel fueling bays);
- I-40/75 and Lovell Road in Knox County (193 truck parking spaces and 16 diesel fueling bays); and,
- I-40/ Strawberry Plains Pike in Knox County (96 truck parking spaces and 8 diesel fueling bays).

Truck stop electrification units have been installed by IdleAire Technologies Corporation at several truck travel centers throughout the Region to encourage truck drivers to hook up to the alternative power supply rather than idling the truck. Truck stop electrification units are located at the Petro Travel Center at the interchange of I-40/75 and Watt Road, TA Travel Center at I-40/75 and Lovell Road, and at the Pilot Travel Center at I-81/ SR 341. In total, there are more than 250 IdleAire units in operation throughout the Region.

Industrial Parks

An analysis of the Knoxville Region shows that there are 42 commercial or industrial parks ranging in size from less than 20 acres to as large as 1,800 acres and varying from 100% built out to new parks that are completely unbuilt on. For the purposes of this plan, all parks will be recognized as industrial parks since parks dedicated to office and service businesses were left out due to their lack of truck generating activity. Approximately 12,000 acres of land are dedicated to industrial parks throughout the Region. With nearly 55%, or 5,700 acres still undeveloped, there is sufficient land available for additional development that would lead to increased truck activity.

Anderson County contains over 1,800 acres of industrial park land in 10 industrial parks. Carden Farm and Eagle Bend Industrial Parks in Clinton are 100% developed as is Valley Industrial Park in Oak Ridge. The I-75 Industrial Park in Clinton, Oak Ridge Summit and Melton Lake Industrial Park in Oak Ridge, and David Jones Industrial Park in Anderson County are approximately half developed.

There are over 1,600 acres of industrial park land scattered across 9 industrial parks throughout Blount County. Blount County Industrial Park in Maryville, the largest, and Little Brook Industrial Park in Rockford are 100% built out with Springbrook Corporate Center in Alcoa and Stock Creek Development Center almost at build-out. Partnership Park South has only 10 of its 210 acres developed and Lane Commercial Park has all 20 acres available.

There are three large industrial parks located in Hamblen County. East Tennessee Valley Industrial District and Morristown Airport Industrial District are both over 600 acres in size but are close to build-out. The newly developed 960-acre East Tennessee Progress Center has only 9 acres developed.

Jefferson County is host to three industrial parks that contain a combined 500 acres. Cain-Mullins Industrial Park in Jefferson City is 100% built out. Jefferson City Industrial Park in

Jefferson City has 83 acres developed and Jefferson County Industrial Park in Dandridge has 170 acres developed.

Knox County has over 2,000 acres of industrial park land. One of the largest, Forks of the River Industrial Park, has only 15 of the original 800 acres open for development and Westbridge Business Park is 90% filled. The I-275 Business Park is yet to be developed but has a Sysco Food Distribution Center under contract slated to break ground in 2007. Eastbridge Business Park has approximately 565 acres of development and Pellissippi Corporate Center 58 acres of development.

Industrial land uses are only permitted in industrial parks throughout Loudon County, resulting in the vast amount of industrial park land. Nine industrial parks contain nearly 4,000 acres of industrial land. Several industrial parks are clustered around the I-75/ SR 72 interchange where over 2,700 acres of industrial park land is located, of which only 14% has been developed. Spring Cress Business Park and Lenoir City Industrial Park in Lenoir City and Blair Bend Industrial Park and Sugarlimb Industrial Park in Loudon County are more than 50% developed.

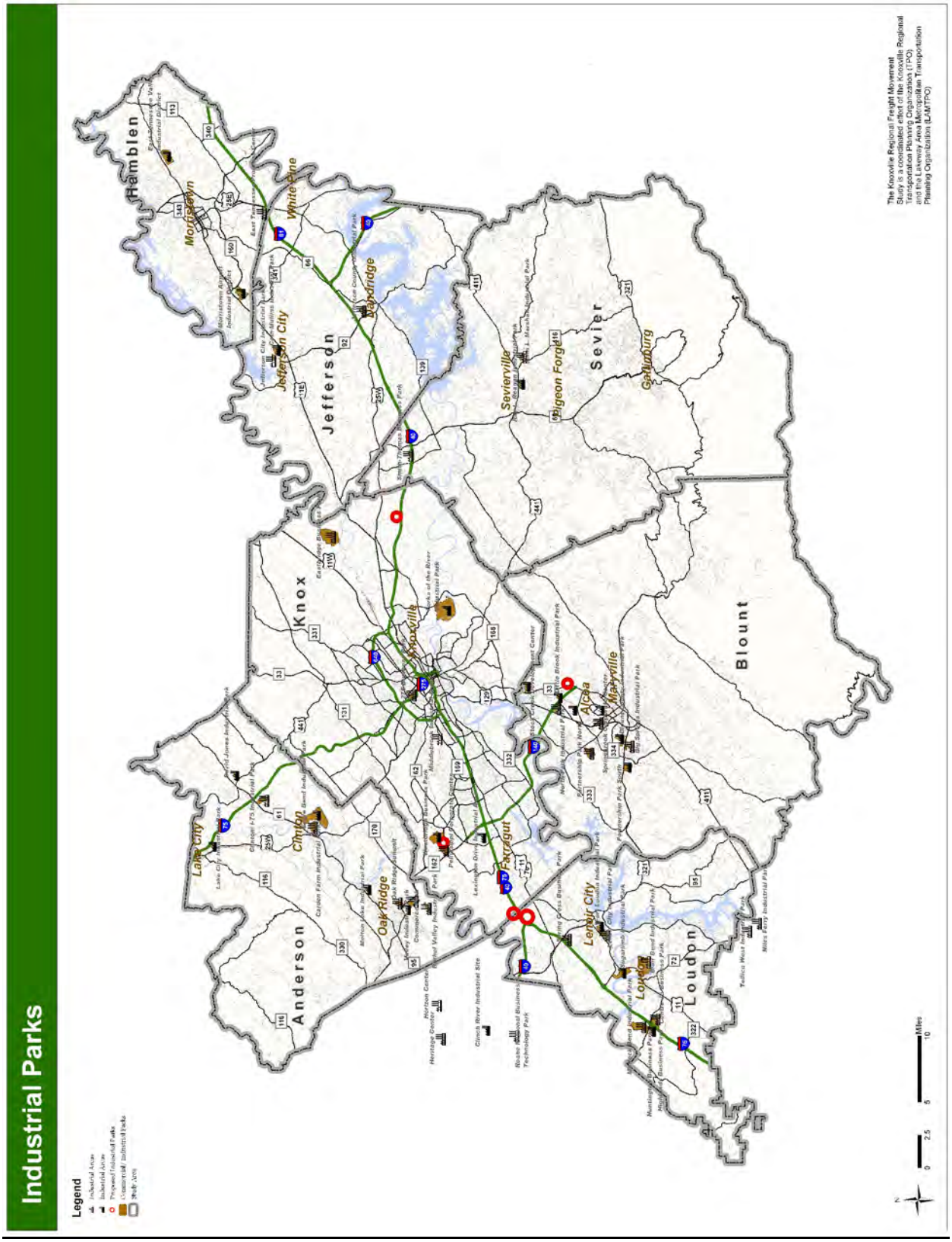
Industrial recruitment is second to tourism in Sevier County as less than 300 acres are dedicated for industrial parks. The 80-acre Ray L. Reagan Industrial Park is 100% developed, but the 141-acre John L. Marshall Industrial Park is only 9% developed. The Smith-Thomas Business Park near the I-40/ SR 66 interchange currently contains only retail type businesses but another 40 acres is under construction that can potentially add greater freight generating businesses.

There are clusters of industries throughout the Region that are not located in industrial parks, but are generally referred to as industrial areas. These areas include the Tennessee Technology Corridor which is a zoning overlay along Pellissippi Parkway north of I-40/75 to promote economic development and high technology businesses. The southern section of the Corridor, bound by Pellissippi Parkway to the east, I-40/75 to the south, Lovell Road to the west, and Dutchtown Road and Murdock Drive to the north, is industrial in nature and contains many manufacturers, trucking terminals, and warehouse/ distribution centers that generate a great deal of truck activity. The area along Middlebrook Pike near the Tank Farm contains numerous warehouse/ distribution centers and trucking terminals in addition to the petroleum terminals, making this area a very active truck activity center. ALCOA, Inc. in Blount County has several facilities that generate significant truck traffic.

Just outside the study area, the Roane Regional Business & Technology Park, with easy access to I-40, is the new home of the H.T. Hackney Food Distribution Center and soon will house a Crete Carrier Corporation trucking terminal. This Park has several acres remaining for additional development. The Tellico West Industrial Park and Niles Ferry Industrial Park located in Monroe County generate truck activity that utilizes SR 72 in Loudon County and US 411 in Blount County.

Map 15 shows the locations of industrial parks or other clusters of land uses that generate truck activity located in the Knoxville Region as well as those industrial parks located just outside the study area. The map also identifies proposed industrial parks.

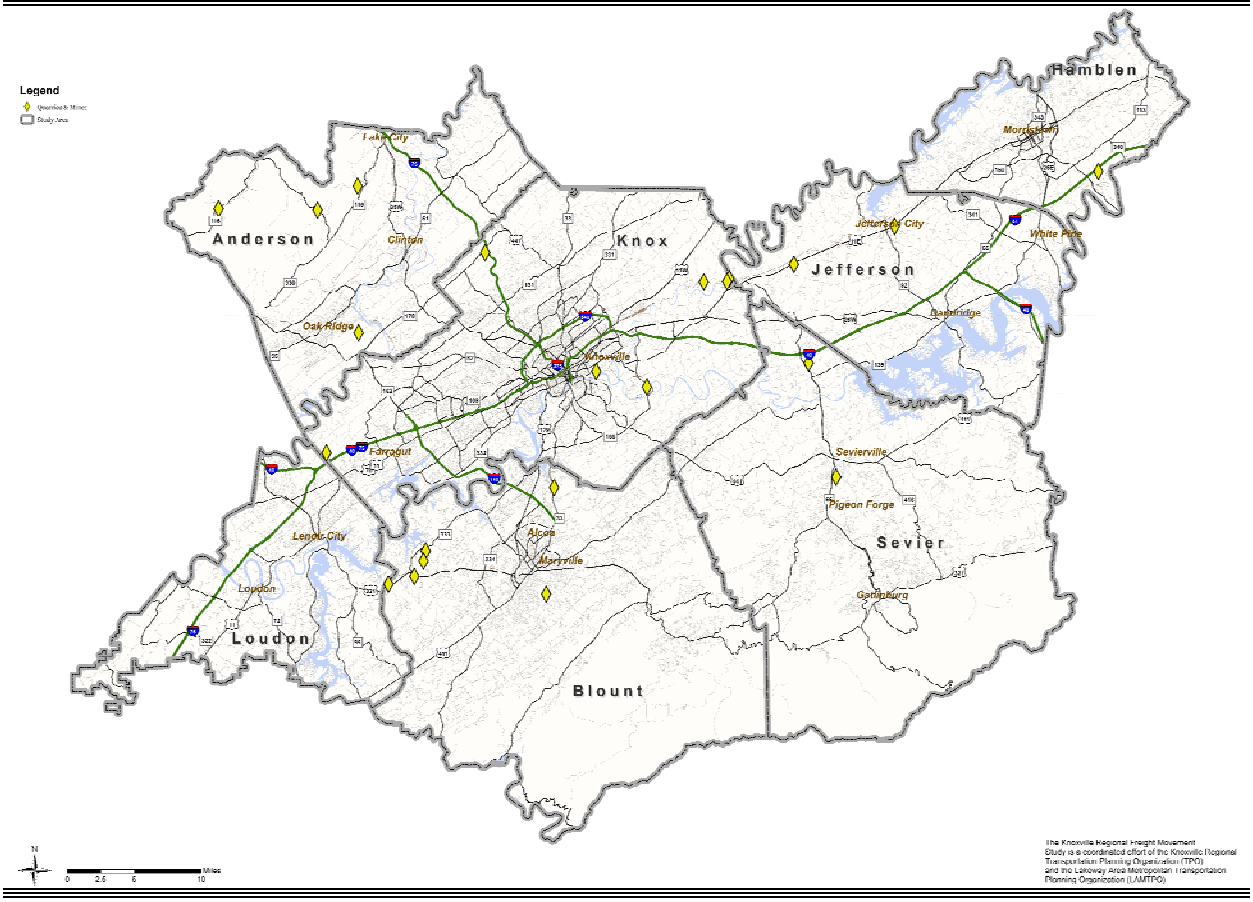
Map 15: Locations of Existing and Proposed Industrial Parks and Clusters of Truck Generating Land Uses



Quarries

The Knoxville Region is situated on land that is rich with natural resources. Several quarries located throughout the Region mine limestone, concrete aggregate, asphalt aggregate, sand, gravel, and coal. Most of these quarries are major generators of truck traffic with contractors continually picking up mined materials for construction or to transport to rail or barge terminals for long distance shipping. Map 16 shows the locations of quarries and mines in the Region.

Map 16: Locations of Quarries and Mines



VII. Evaluation of Freight Activity

After conducting the land use analysis and following discussions with businesses about their logistics operations and evaluating the survey results, a truck activity map and major trucking corridor map were developed, and verified with field checks.

Truck Activity Centers

Recognizing land uses and areas responsible for generating truck traffic is a critical component in identifying truck activity centers within the Region. The intensity of the truck activity is highly depended upon the type and density of truck generating land uses in an area. Since the resources for the development of this plan were limited, daily or peak hour truck volume counts were not used in determining the intensity of truck activity for an area. Truck activity was derived through field inspection, evaluation of land uses and intensity of land uses in an area, through survey respondents indicating the average number of truck trips to or from a facility, and through discussions with businesses about their logistics operations. Truck activity is displayed as very high, high, medium high, or medium. An analysis of land use indicates that truck activity centers are primarily focused around industrial parks and other clusters of industries, clusters of trucking terminals, major manufacturing facilities, warehouse/ distribution centers, and at interstate interchanges with major trucking routes or that contain truck travel centers. The truck activity centers that generate the highest amount of truck traffic are:

- Eagle Bend Industrial Park in Clinton;
- Blount County Industrial Park in Maryville;
- East Tennessee Valley Industrial District in Morristown
- Morristown Airport Industrial District in Morristown;
- SR 431 at the I-81 interchange in Jefferson County;
- SR 66 at the I-81 interchange in Jefferson County;
- Watt Road near the I-40/75 interchange in Knox County;
- Lovell Road near the I-40/75 interchange in the nearby industrial areas contained within Pellissippi Parkway, Lovell Road, and I-40/75 in Knox County;
- Forks of the River Industrial Park in Knox County;
- Middlebrook Tank Farm in Knoxville;
- Cluster of trucking terminals located along Texas Avenue in Knoxville; and,
- Blair Bend Industrial Park in Loudon County.

Major Non-Interstate Trucking Corridors

Once the truck activity centers are located, it is important to determine the primary corridors that connect these activity centers to the Interstate system. In discussions with businesses about their logistics operations and typical routing, and through identifying functionally classified roads of collector or higher that provide the quickest route between truck activity centers and the Interstate system, it was possible to determine which routes are most commonly used by trucks.

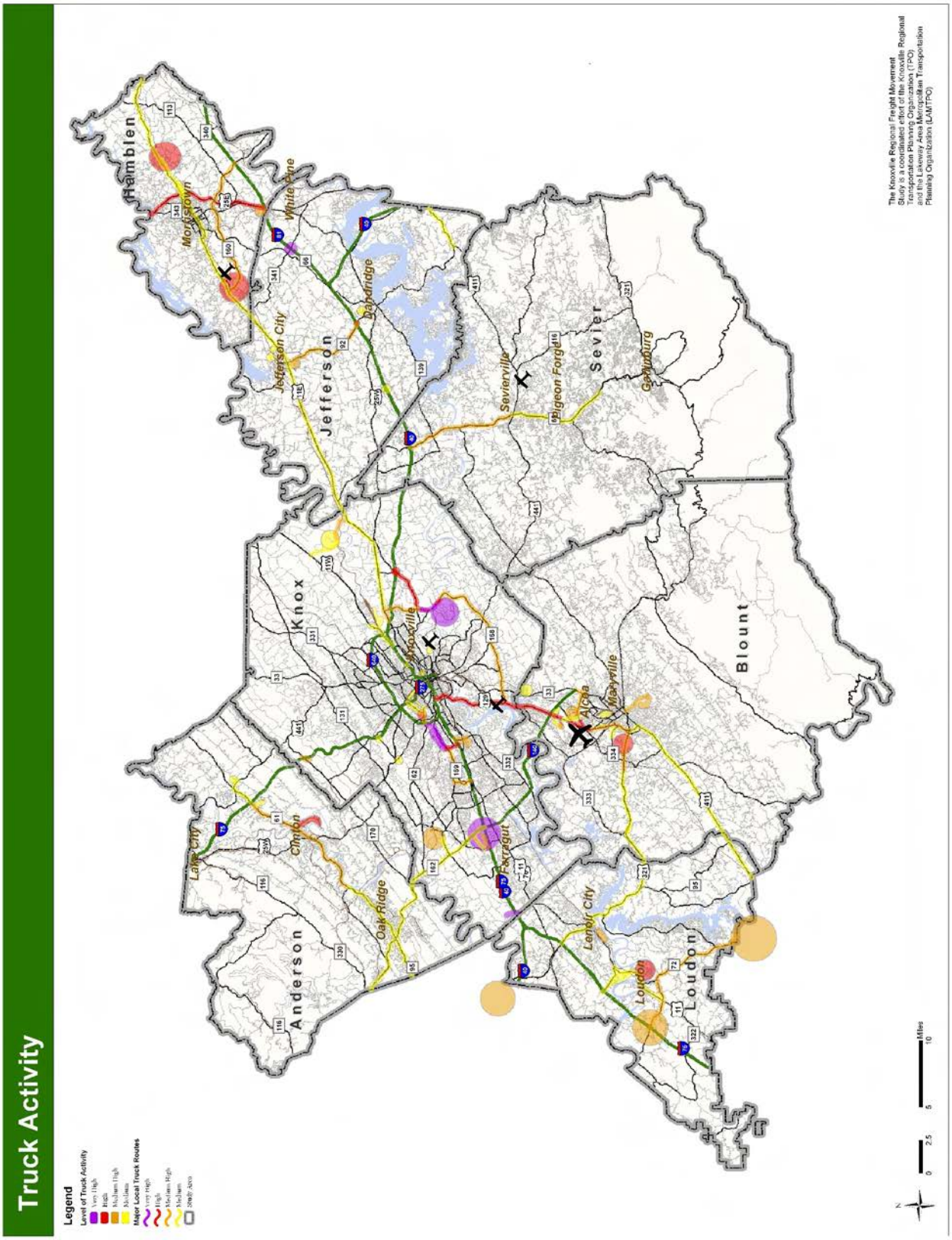
This effort was combined with mapping techniques and field verification to identify major trucking corridors. As with identifying truck activity centers, trucking corridors are displayed as having very high, high, medium high, or medium truck volumes. The corridors most frequently used by trucks must be adequate to handle the existing truck and automobile traffic plus be able to handle any future traffic generated by new development or redevelopment.

The non-interstate routes that handle the greatest volume of truck traffic include:

- SR 62 from Clinton to I-75 in Anderson County;
- SR 33 from ALCOA Inc. to I-140 in Blount County;
- Alcoa Highway from Maryville to Knoxville;
- US 25E north of I-81 in Hamblen County;
- SR 160 from US 11E to I-81 in Hamblen County;
- Middlebrook Pike to Ed Shouse Drive to Western Avenue to I-640 in Knox County;
- Gov. John Sevier Highway to Strawberry Plains Pike to I-40 in Knox County;
- Texas Avenue to Western Avenue to I-640 in Knox County; and
- SR 72 from US 411 to I-75 in Loudon County.

Map 17 identifies truck activity centers and major non-interstate trucking routes throughout the Knoxville Region.

Map 17: Truck Activity Centers and Major Non-Interstate Trucking Routes



VIII. Knoxville Regional Freight Advisory Committee

One of the major components of the Knoxville Regional Freight Movement Study is the creation of the Knoxville Regional Freight Advisory Committee (FAC). The FAC is made up of various stakeholders representing truckload and less-than-truckload carriers, railroads, airport authorities, terminal operators, shippers, receivers, institutions, government agencies, planning and engineering departments, professional organizations, economic development agencies, and chambers of commerce. The objective of the FAC is to improve the TPO's and LAMTPO's relationship with the freight community, gain an understanding of the freight industry in the Region, and ensure that the interests of the freight community are well represented in the transportation planning process. The input from the Freight Advisory Committee will also aid in the development of the Knoxville Regional Freight Movement Study, the Long Range Transportation Plans of the TPO and LAMTPO, and the Transportation Improvement Programs of the TPO and LAMTPO.

The Knoxville Regional Freight Advisory Committee held its initial meeting on Tuesday, July 25, 2006 at the National Transportation Research Center in Knoxville and discussed the current state of freight transportation in the Knoxville Region and identified several issues and challenges that impact the movement of freight. The Committee also brainstormed thoughts on the future of freight transportation in the Knoxville Region and how they could shape the focus of the Knoxville Regional Freight Movement Study. The FAC asked the TPO and LAMTPO to look into the following topics:

a. The rerouting of through truck traffic to I-640.

b. The feasibility of truck only lanes.

c. Expand and enhance the Intelligent Transportation System (ITS).

d. Proactive land use planning, especially at highway interchanges, to avoid the mixing of truck traffic and commuter traffic.

e. How the TPO can be involved in pipeline transportation to increase the supply and availability of diesel fuel, or alternative fuels.

f. Work with Chambers of Commerce, economic development agencies, or labor departments to assist in labor shortages for carriers (truck drivers and warehouse workers, especially at off-peak hours).

g. Approach Norfolk Southern and CSX concerning the feasibility and potential for increased rail capacity to the Knoxville Region.

h. Study feasibility of a public intermodal facility in the Knoxville Region or improvements to existing facilities (TransFlo or Burkhart).

i. Look into funding opportunities for freight related activities and projects (Truck Parking Facilities Program, Freight Building and Capacity Building Program, and Capital Grants for Rail Line Relocation Projects).

j. Increasing the safety of freight transportation (incident management, at-grade highway/ rail crossings, truck/ commuter conflict, and ITS).

k. Work with KUB and City of Knoxville to identify problem areas where, due to low overhead wires or other inhibiting factors, truck delivery is difficult.

l. Look into different options for raising funds for road construction and maintenance of highways in Tennessee.

m. Stay informed on the I-81 Corridor Study, Chickamauga Lock reconstruction, Memphis-Bristol Rail Study, Knoxville Regional Parkway, SmartFix40, James White Parkway extension, Pellissippi Parkway extension and any other projects that would impact freight movement in the Region.

n. Develop ways to forecast freight movement in the Region.

The Freight Advisory Committee will continue to meet regularly to be brought up to date on freight planning activities of the Knoxville Regional Transportation Planning Organization and Lakeway Area Metropolitan Transportation Planning Organization and to discuss freight related topics.

IX. Freight Movement Issues and Challenges

The issues surrounding the movement of freight will continue to escalate over the next decade. Each mode of freight transportation experiences different issues and will face unique challenges but the common theme throughout the freight industry will be added pressure to provide reliable and timely freight transportation for goods at the lowest possible cost.

Many of the challenges faced by the freight industry are associated with the transportation system. As our nation's highways become increasingly congested with passenger and freight traffic, the demands for increased highway capacity are placing great monetary demands on the government. As the volume of freight increases, issues surrounding capacity, congestion, system operations, safety, security, and the environment will also intensify. The freight industry is expected to experience increased operating costs due to higher fuel prices, increasing insurance premiums, and heightened efforts to improve air quality.

The following issues and challenges were submitted with survey responses:

a. Need for updated construction information.
b. Traffic congestion.
c. Need for restricted delivery times in urban areas.
d. Left lane truck restrictions.
e. Parking areas too close to loading docks.
f. Turning radius at Wilbanks Road and Callahan Drive.
g. Traffic light coordination.
h. Congestion on Middlebrook Pike.
i. Bottlenecks on routes leading to interstates.
j. Locks between Knoxville and Chattanooga need reconstruction.
k. Shortage of truck drivers.
l. Lack of flat bed truck carriers.
m. Ramp from Alcoa Highway to I-140 north.
n. Rising diesel fuel prices.

The Freight Advisory Committee, during its first meeting on July 25, 2006, discussed the current state of freight transportation in the Knoxville Region and identified several issues and challenges that impact the movement of freight. They are as follows:

a. The volume of through trucks, especially on I-40 in downtown Knoxville.
b. The result the increased cost of asphalt and its transport may have on developing cost estimates for road projects.

c. Questions about whether pavement can continue to withstand the increased wear and tear resulting from additional truck traffic.

d. Congestion around truck stops in urbanized areas- mix of truck traffic and commuter traffic, especially at I-640/ Western Ave, I-40/75 at Lovell Road, I-40/75 at Watt Road, and I-81 at US 25E.

e. Availability and supply of diesel fuel. Existing pipelines are operating at capacity and may not be able to handle increased growth in East Tennessee.

f. Questions surrounding the new 2007 diesel engine standards.

g. The impact of companies potentially moving towards accepting deliveries at off-peak hours or carriers looking to offer variable pricing based on time of day delivery.

h. Shortage of truck driver labor.

i. There may not be enough rail or intermodal traffic in the Knoxville Region to support a public intermodal facility.

j. If intermodal rail traffic increases, several bridges in the Region would require rebuilding to allow for sufficient clearance of double stacked container rail cars.

k. Questions surrounding the feasibility of Norfolk Southern or CSX to open more rail capacity for Knoxville freight.

l. Truck deliveries to older urban areas can be difficult (loading/ unloading areas, minimal turning radii, and low overhead wires).

m. The decentralization of distribution centers to more rural locations along the interstate and the impact on the rural road system.

n. The majority of truck traffic on Tennessee interstates is through traffic, however, Tennesseans are primarily paying the cost of improvements for out-of-state users.

o. Any rail plan needs to be multi-state. The Memphis-Bristol Rail Plan won't be feasible if rail isn't increased in neighboring states.

p. Industrial parks need to be placed near interstate interchange locations or along roads with good access to the interstate to maximize their attractiveness.

The following issues relate to specific modes of transportation throughout the Knoxville Region and were derived from the FHWA Freight Analysis Framework, the 2005-2030 Knoxville Regional Long Range Transportation Plan comment process, comments from officials of TPO and LAMTPO member jurisdictions, communications and individual visits with freight stakeholders, and through general freight related meetings.

Trucking

Since 1980, the vehicle miles traveled for trucks nationwide has increased 90% while the number of lane miles of public roads has only increased by 4%. Truck vehicle miles traveled are expected to continue to increase by 3% annually through 2020. The additional truck traffic combined with the growth in commuter travel has worsened congestion, especially in urban areas, and has exacerbated conflicts between freight and passengers.

The high volume of truck traffic on area roadways reduces the longevity of the pavement and has increased the maintenance costs of state and local governments. The area around the I-40/75-Watt Road interchange consists of numerous truck travel centers. The high volume of truck movements in the area has lead to deficiencies in the pavement of the on/off ramps and required recent maintenance to upgrade the ramps. The truck stops also generate enough truck traffic that local residents have expressed difficulty in maneuvering passenger vehicles around the trucks.

The geometric design of transportation systems can impact the ability to move freight and limit capacity. A number of the roads that provide access to industrial areas or act as trucking routes are narrow, two lane roads not originally built for heavy truck traffic. Many of these roads also contain horizontal and vertical curves that have limited sight distance.

The local delivery of urban goods is often hindered by a lack of adequate off street loading and unloading facilities. In many instances, delivery trucks must block a travel lane or load and unload from the sidewalk, blocking pedestrian access. Minimum pavement width and turning radii further impede the ability to operate delivery trucks throughout older urban areas.

Rail

Railroads, for the most part, do not experience delay in the form of congestion due to the amount of trains that operate on the track but rather due to capacity constraints. The fact that most of the Norfolk Southern and CSX rail lines in the Region are single track puts a hindrance on the capacity of the railroads. Single tracks can't handle dual directional trains at the same time and trains must clear the track, either by switching track or waiting in a rail yard for oncoming trains or other conflicting trains to complete their route.

The rail freight industry is required by the federal government to allow passenger rail the right-of-way over their tracks. Therefore if a passenger train is scheduled to use a section of track, that track can not be used for freight transport until the passenger train has cleared. Since there is no passenger train service in the Region, this is not a local problem, however, a train may be held up on a local section of track waiting for passenger train service elsewhere.

The majority of the railroad system is dated and was engineered for lower train speeds. Grade and other topographic challenges also impact the speed of trains. Due to the grade constraints, the CSX rail line over the Cumberland Plateau has a capacity of about one train per hour. With about 30 trains operating daily on the CSX line, there is no excess capacity for additional trains.

There is an existing gap in the railroad network between Knoxville and Nashville that drastically limits rail movements to and from the west. During the 1960's, a 31-mile section of railroad between Monterey in Putnam County and Crab Orchard in Cumberland County was removed following the bankruptcy of the Tennessee Central Railroad. This missing link decreases the feasibility to connect passengers and freight by rail to larger economic markets like Memphis and Nashville because of the increased distances and travel times needed to make the connection. Trains traveling between Nashville and Knoxville must either go south through Chattanooga and Northern Alabama or north through Lexington and Louisville, Kentucky.

Intermodal

Often, a business or industry ships freight over a distance that is cost effective for rail use, however, the majority of freight relies on truck transportation for secondary movements to or from a rail facility. The rise of intermodal transportation facilitates this movement of freight between rail and truck. Since there is not an intermodal facility in the Knoxville Region, intermodal freight must be trucked to or from an intermodal facility in a nearby city, making it more feasible and cost effective to use truck transportation for the entire length of the trip. Diverting freight from trucks to rail will be difficult without the existence of an intermodal facility in the Region. If intermodal rail freight traffic were to increase in the Region, a through truss bridge in Del Rio, Cocke County would need modifications to make it compatible for double stacked intermodal container trains.

Barge

The barge industry within the Knoxville Region experiences capacity constraints at Fort Loudoun Lock. The Lock has the capacity to handle one barge and takes about 45 minutes to complete an operation. There has been deposition of sediment along parts of the Tennessee River that has narrowed the channel width and impacted the draft depth.

Shortly after its completion, the Chickamauga Lock, located north of Chattanooga, was discovered to be experiencing structural deficiencies. Temporary repairs were made to the Lock that will allow it to remain in operation through 2010 and partial funding has been approved through a Congressional Earmark to replace the Lock. There had been some discussion about permanently closing the Lock, thus shutting off commercial navigability to the Region from the remainder of the Tennessee River System.

Air

Air cargo capacity at McGhee Tyson Airport is constrained by the limited availability of new air cargo facilities. Currently, existing apron space at the Airport is nearing its capacity during peak operating hours, which for freight often occurs during the nighttime hours. The growth of the air cargo industry does not solely rely on the facilities present at the Airport. The availability and efficiency of the ground transportation network serves just as an important role in distributing air cargo from Airport facilities to their destination, which can be up to 100 miles from McGhee Tyson Airport. The air cargo facilities are directly accessible to Airbase Road, which intersects with Alcoa Highway at an at-grade, unsignalized intersection. Trucks are not permitted to use Wrights Ferry Road to Topside Road to access I-140, however smaller delivery vans are exempt from this prohibition. There are deficiencies with both routes and improvements are needed that would provide safer and more efficient access to the Interstate system.

Pipeline

The petroleum tanks located at the Middlebrook Tank Farm are operating near full capacity. There is demand for additional tanks to store greater volumes of petroleum, however, land is limited and the cost is far greater than the benefit. There is a significant amount of truck traffic generated by the petroleum terminals located at the Tank Farm that adds to the congestion of Middlebrook Pike and the Ed Shouse Drive/Western Ave/ I-640 area.

X. Air Quality and Freight Movement

On April 15, 2004, the U.S. Environmental Protection Agency (EPA) designated the counties of Anderson, Blount, Jefferson, Knox, Loudon, Sevier, and a portion of Cocke within the Great Smoky Mountains National Park in non-attainment of the 8-hour standard for ground level ozone. In addition, on April 5, 2005, EPA designated the counties of Anderson, Blount, Knox, Loudon, and a portion of Roane in non-attainment of the standard for fine particulate matter (PM 2.5). As a result of both designations, the Knoxville Regional Transportation Planning Organization must perform a Transportation Conformity Analysis to demonstrate that the transportation plans and programs identified in the Long Range Transportation Plan do not worsen air quality and to ensure that the air quality is improved to an acceptable level. If air quality improvements are not demonstrated, then an area may lose its ability to obtain federal funding for certain roadway projects.

Ground level ozone is an invisible gas that is created when sunlight, heat and certain pollutants mix in the atmosphere. Ozone causing pollutants Nitrogen Oxide (NOx) and Volatile Organic Compounds (VOC) come from vehicles, factories, burning, and natural sources. High ground level ozone is typically seen in summer months when sunlight is at its greatest intensity and temperatures are warmer.

Fine particulate matter (PM 2.5) is the term used for particles smaller than 2.5 micrometers in diameter found in the air, including dust, dirt, soot, pollen, smoke and liquid droplets. Some particles are directly emitted into the air such as from vehicles, factories, construction, farm fields, quarrying, and burning. Other particles are formed in the air when gases from burning fuels react with sunlight and water vapor.

On-road vehicles, such as automobiles and heavy-duty diesel trucks, are responsible for contributing 50% of the pollution that causes ground level ozone, of which heavy-duty trucks are responsible for 45% of the total on-road vehicle emission contribution. In addition, on-road vehicles are responsible for between 25%-50% of the particulate pollution from tailpipe emissions (depending on the county).

Freight Related Reduction Measures

Since the designations of both the ground level ozone and the particulate matter non-attainment areas, there have been several local and state initiatives undertaken to assist in improving air quality in the Region. Many of these efforts impact freight related businesses to some degree and are aimed at reducing emissions from the everyday transportation of freight.

Congestion Mitigation and Air Quality (CMAQ) funds have been approved by the TPO on three separate occasions and once by the LAMTPO to fund Advanced Travel Center Electrification (ATE) units developed by IdleAire Technologies Corporation. The ATE units are intended to reduce tailpipe emissions by encouraging truck drivers to hook up to the alternative power supply rather than idling their truck. Combined, there are over 250 truck stop electrification units located within the Knoxville Region, dispersed among the Petro Travel Center at I-40/75 and Watt Road and TA Travel Center at I-40/75 and Lovell Road in Knox County and at the

Pilot Travel Center at I-81 and SR 341 in Jefferson County. Each 100 units in operation can be expected to provide the following emissions reductions:

- Particulate matter by 4 kilograms per day;
- Nitrogen Oxide (NOx) by 348 kilograms per day;
- Volatile Organic Compounds (VOC) by 138 kilograms per day;
- Carbon Monoxide (CO) by 303 kilograms per day; and
- Carbon Dioxide (CO2) by 9,490 kilograms per day.

The TPO, in coordination with Anderson, Blount, Jefferson, Knox, Loudon, and Sevier Counties, endorsed a speed limit reduction on interstates and other access controlled highways located within these jurisdictions from 70 mph to 65 mph for automobiles and to 55 mph for heavy-duty trucks. As previously mentioned, heavy-duty diesel trucks are major contributors of particulate matter and emissions that cause ground level ozone. Air quality modeling shows that reducing the speed limit for heavy-duty trucks to 55 mph could result in a reduction of approximately 5 tons of NOx emissions per day.

The use of bio-diesel fuel has increased recently due to air quality problems and the rising costs of petroleum. Bio-diesel fuel uses a blend of petroleum and organically derived oils, such as soybean or rapeseed oils, animal fats, or waste vegetable oils, thereby minimizing the dependency on petroleum and reducing the amount of pollutants emitted into the air. Bio-diesel fuel can be used as a 100% substitute to diesel fuel or can be added to the fuel in lower percentages to create a blend, such as 20% bio-diesel (the bio-diesel blend is indicated with a B followed by the percentage of organically derived oils mixed with the diesel, such as B20, B10, B5, etc). Currently, there are ten refueling stations in the Knoxville Region that sell bio-diesel fuels:

- Mr. Gas Texaco, 312 E. Lincoln Street, Alcoa, offers B20;
- On the Run Exxon, 2028 E. Hunt Road, Maryville, offers B20;
- EZ Stop Mobil, 2102 W. Lamar Alexander Parkway, Maryville, offers B20;
- Calloway Oil, 2128 E. Broadway, Maryville, offers B20;
- Blount-Greenback Farmer's Co-op, 1767 W. Broadway, Maryville, offers B99;
- McNutt Oil's Cardlock, 1817 W. Lamar Alexander Parkway, Maryville, offers B99;
- Regal Fuels, 1206 Proctor Street, Knoxville, offers B20;
- Regal Fuels, 5428 Trebor Lane, Knoxville, offers B20;
- Mr. Gas Texaco, 409 E. Lee Highway, Loudon, offers B20, and;
- Sevier Farmer's Co-op, 321 W. Main Street, Sevierville, offers B5.

The Tennessee Department of Transportation has initiated a program to reduce emissions from locomotive diesel engines called the Pilot Locomotive Diesel Retrofit Partnership Project. Funds from this program can be used for the retrofit of locomotives at switch yards, and short haul railroads and commuter trains operating in non-attainment areas.

In addition to local initiatives, there are several national standards that have recently taken place or will take place over the next year that will have an impact on the freight community. The EPA continues to make efforts to reduce the sulfur content in diesel fuel. Low sulfur diesel fuel was introduced in October 2006 and requires diesel fuel to contain no more than 95 parts per million (ppm) of sulfur. Ultra-low sulfur diesel fuel, with a sulfur content of 15ppm, will be phased in to completely replace all diesel fuel by December 10, 2010.

In addition to new diesel fuel standards, EPA is requiring changes to engines as well to reduce the amount of emissions they generate. All model year 2007 and later diesel engines must reduce emissions to 0.20 grams per brake horsepower-hour (g/bhp-hr) of NOx, 0.14g/bhp-hr of Non-Methane Hydrocarbon (NMHC), and 0.01g/bhp-hr of particulate matter.

A study done by Wendell Cox Consultancy concludes that if by 2025, 25% of the freight shipped through the U.S. were to be shipped by intermodal rail rather than trucks, the average person traveling during peak periods would save 44 hours per year, more than 17 billion gallons of gasoline and diesel fuel would be saved, and mobile emissions (Carbon Monoxide, Volatile Organic Compounds and Nitrogen Oxide) would be reduced by 900,000 tons.

XI. Freight Safety and Security

The SAFETEA-LU legislation requires Metropolitan Planning Organizations to places a high priority on planning for a transportation system that is both safe and secure. With the growing concern of freight equipment, such as tractor trailers, rail and barge containers, airplanes, and pipelines, being used for terrorist attacks, there has been a profound interest in including safety and security planning with freight planning efforts.

Knoxville sits at the crossroads for three major interstates, I-75, I-40, and I-81 and two major Class I railroad lines, Norfolk Southern and CSX. With the high volume of freight passing through the Region, there are bound to be numerous hazardous materials being transported by both truck and rail. An incident involving trucks or trains carrying hazardous materials may result in the closure of a highway or evacuation of nearby neighborhoods, necessitating the need for safety and security objectives to be incorporated into freight planning efforts.

A number of the freight movement issues and challenges identified in Chapter IX relate to safety and security concerns. The existing challenges regarding safety and security planning are evident when reviewing statistics for varying modes of transportation. Although there have been some safety and security enhancements and the rates of fatalities and injuries have declined over the years, there is continued room for improvements.

Trucking

Throughout the United States, 442,000 heavy-duty trucks were involved in crashes in 2005, of which 4,932 were fatal. Nearly one out of every eight traffic related fatalities in 2005 resulted from a crash involving a heavy-duty truck. Within Tennessee, there were 1,752 fatal crashes in 2005, 143 of which involved a heavy-duty truck, placing the state just below the national average of heavy-duty truck related fatal crashes.

The section of I-40 through Downtown Knoxville is an area of safety concern. The highway narrows to two lanes in each direction and numerous mergers, some with limited sight distance, create additional conflicts between trucks and passenger vehicles. There are many other highway on/off ramps along I-275 and I-75 that have limited accel or decel distances, creating safety concerns. The SmartFix40 project currently underway addresses these safety issues and will result in the widening of I-40 through downtown and an improved interchange at James White Parkway. The project has been expanded to improved interchanges along I-275 and to widen I-640 at the I-275/I-75 interchange in anticipation of the temporary closure of I-40 downtown during construction.

Numerous industries located along the stretch of US 25E between I-81 and Morristown in Hamblen County have indicated safety concerns with the egress and degress to their facilities due to limited sight distances, poor median cuts and turning lane placement, and the speed of traffic. The interchange at I-81 also contains ramps with minimal merging distances and tight turning radii, making truck maneuvering difficult. Several businesses along this stretch have already begun making modest safety improvements by combining their access points, however, a more comprehensive strategy for this corridor is needed. The Tennessee Department of

Transportation has plans to reconstruct the I-81/ US 25E interchange and should consider extending the project scope to include looking at safety improvements along US 25E north of the interstate.

Commercial trucks carrying hazardous materials are restricted from using I-40 through downtown Knoxville between exit 385 (I-75/I-640) west of Knoxville and exit 393 (I-640) east of Knoxville. This restriction does not apply to trucks carrying hazardous materials to/from locations within the City of Knoxville or to/from locations along US 129, Alcoa Highway. Although not within the Knoxville Region, the US 25E tunnel through Cumberland Gap restricts certain hazardous materials. This route is used by some trucks traveling between I-81 in Hamblen County and I-75 in Corbin, KY.

The Transportation Security Administration (TSA) administers the Hazmat Threat Assessment Program which obtains background and security checks on drivers of commercial vehicles transporting hazardous materials. In addition, the Federal Motor Carrier Safety Administration (FMCSA) has initiated several programs aimed at protecting against terrorists using commercial trucks as weapons or targets. Their top priority is dealing with trucks that carry hazardous materials.

Rail

One of the main safety issues involving railroads are the numerous at-grade highway/ rail crossings throughout the Region, many of which involve major rail lines crossing major arterials and collectors. At-grade rail crossings also increases maintenance costs for railroad companies. Unlike the street and highway system, the system of railroads is primarily in private ownership, meaning the cost of upgrade and increased capacity relies heavily on the railroad industry. There are 693 at-grade highway/ rail crossings throughout the Knoxville Region, 197 of which are in Anderson County, 51 in Blount County, 97 in Hamblen County, 37 in Jefferson County, 261 in Knox County, and 50 in Loudon County. Thirty-three of these at-grade crossings affect roads that handle more than 10,000 vehicles per day, however, only 7 of those 33 crossings involve railroad tracks that handle more than 10 trains each day. They are as follows:

- E. Morris Boulevard/ Norfolk Southern Railroad in Hamblen County (contains no warning gates, only flashing lights);
- S. Cumberland Street/ Norfolk Southern Railroad in Hamblen County (contains warning gates);
- Liberty Street/ CSX Railroad in Knox County (contains warning gates);
- Cherry Street/ Norfolk Southern Railroad in Knox County (contains warning gates);
- Concord Street/ Norfolk Southern Railroad in Knox County (contains warning gates);
- Cedar Drive/ Norfolk Southern Railroad in Knox County (contains no warning gates); and,
- Emory Road/ Norfolk Southern Railroad in Knox County (contains warning gates).

Of the seven major at-grade crossing identified above, two do not contain a warning gate to stop oncoming traffic on the highway. These two at-grade crossings should be a high priority for the placement of warning gates.

In 2005 there were 18 crashes involving trains and vehicles at at-grade crossings, two of which involved a heavy-duty truck. There were no fatalities in any of these crashes. In addition, there were 6 railroad related crashes in 2005 at locations other than at-grade crossings. The SAFETEA-LU legislation includes rail safety related funding for projects that eliminate at-grade highway/ rail crossings and for projects that relocate a mainline railroad away from an urban area to reduce the number of highway crossings. Some of this funding has been used to upgrade railroad warning signs at at-grade crossings in Knoxville, Lenoir City, and Loudon County.

The TSA has developed a series of voluntary freight rail security action items that should be considered when security plans are developed. The action items address system security, access control, and en-route security. Both CSX and Norfolk Southern routinely monitor railroads for both safety and security purposes. CSX spends $1 billion annually on track maintenance and upgrades.

Barge

The U.S. Army Corps of Engineers in responsible for monitoring all the locks along the Tennessee River and ensuring that they are operating safely and efficiently. The Corps is also responsible for the dredging of the navigation channel and ensuring a draft depth of at least nine feet is maintained. Individual port terminal operators are responsible for the safety and security of their terminals and the loading and unloading of freight to and from barges.

Air

The greatest safety concern identified for the movement of air freight involves moving freight to and from the air cargo facilities. Trucks accessing Airbase Road from Alcoa Highway must maneuver through dangerous turns, merges, and speeding traffic. Currently, heavy-duty trucks are not permitted to use Wrights Ferry Road to access Topside Road and I-140, therefore, the Alcoa Highway access in the most commonly used, and therefore poses the greatest safety concern.

FedEx, UPS, and DHL Express have strict security procedures in place that restrict access to the air cargo facilities and closely monitor the loading of all cargo between the facility and planes. The TSA has new air cargo regulations in place that includes canine teams, site and on-board inspections, and physical screening of cargo as well as security and background checks of pilots, employees, and air cargo carriers. The TSA is also responsible for air passenger security.

Pipeline

Both Plantation Pipeline Company and Colonial Pipeline Company monitor and control pipeline flow through the use of electronic sensors that can identify an incident and shut down the pipeline in the event of an emergency within seconds. Both companies have security cameras in place and pumping stations and terminals and perform routine monthly aerial surveillance of their right-of-way.

Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems (ITS) refer to the use of advanced technologies to enhance the management and operation of transportation facilities, increase safety, security, and mobility, and reduce congestion. The Knoxville Regional Intelligent Transportation System (ITS) cameras allow officials at the Transportation Management Center (TMC), located at Strawberry Plains Pike, to monitor activity along interstates in Knox County. Law enforcement and/or emergency personnel can be dispatched by the TMC if an emergency is spotted.

Dynamic Message Boards located along interstates and major highways throughout Knox County, and at some rural locations outside of the County, are capable of displaying emergency information such as weather or other natural incidents and/or warnings, hazardous spill information, Amber alerts, or evacuation orders.

The TDOT HELP trucks not only provide incident response services along area interstates, but also provide routine surveillance of bridges and overpasses keeping a look out for suspicious activity or disabled vehicles. HELP truck operators are able to contact law enforcement or emergency personnel if needed.

XII. Knoxville Regional Freight Outlook

The previous chapters offer a good understanding of the existing freight conditions throughout the Knoxville Region, however, understanding the trends of freight transportation in the future is important in developing a policy to both enhance the growth of business and industry within the Region and to ensure that future freight growth can be accommodated by the Region's transportation network. Although there have been several freight projections and forecasts developed at the national level by FHWA, there have not been any freight projections or forecasts developed at either the State or Regional level that offer a glimpse at where future freight activity will develop or increase, which routes will see increased truck traffic, and how the growth of national freight will impact the Region's transportation system.

Urban Land Use Allocation Model

The Knoxville Regional Transportation Planning Organization is still approximately 1-2 years away from fully incorporating the Urban Land Use Allocation Model (ULAM). This model will allocate future land use development of the Knoxville Region to the Traffic Analysis Zone (TAZ) level geography based on vacant land, development constraints, market factors, historical trends, and future population and economic projections. The results of ULAM allocate residential population and employment growth for future years to each TAZ so that future traffic generation can be forecasted.

The ULAM results will aid the TPO and LAMTPO in determining where future freight activity is forecast to occur which will aid in supporting proposed transportation improvements. The model will also be of assistance in special studies such as impact analysis, corridor studies, and master plans where different growth scenarios can be tested to determine the impact on the transportation system. It is also anticipated that freight projections and forecasts can be used from the TDOT freight planning efforts and the I-40/ I-81 Corridor Feasibility Study, which are also 1-2 years away from completion.

Freight Forecasting

Until the ULAM model is operational and provides the TPO with a more reliable forecasting tool, the TPO undertook the development of a rather generic forecasting method utilizing the Freight Analysis Framework and the FHWA national freight forecasts combined with Transearch® data to predict future freight tonnage and truck traffic. The TPO also analyzed buildable land within existing or proposed business or industrial parks to determine their potential for increased freight activity.

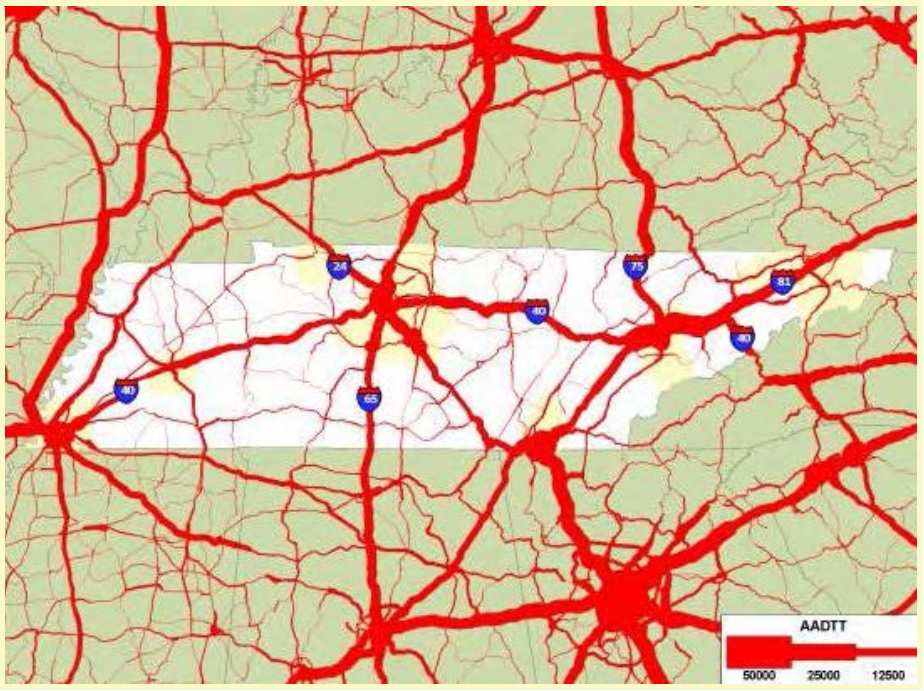
The Federal Highway Administration, as part of its Freight Analysis Framework, developed low, medium, and high truck projections for the highway network in the Region. Utilizing the high truck projection as a worse case scenario, by 2020, several highways throughout the Region will experience significant increases in truck traffic, as follows:

- I-75 in Anderson County is projected to see an increase in daily truck traffic from 8,200 to 12,710, an increase of 55%;

- Daily truck traffic on I-81 in Hamblen County is expected to increase from 15,000 to 20,600, an increase of 37.3%;
- I-40/75 in West Knox County is forecast to see daily truck traffic increase from 22,740 to 32,360, a 42.3% increase; and
- The increase in daily truck traffic on I-75 in Loudon County is expected to jump to 13,175 from 12,400, a 6.3% increase.

The map below, Map 18, represents projected truck traffic volumes throughout Tennessee in the year 2020.

Map 18: 2020 Projected Truck Volumes



The other forecasting method involved the combined use of the FAF data and Transearch® data. As part of the FAF, FHWA projects that freight tonnage throughout the United States will increase 65% by the year 2020. The TPO assumed that this trend could be held equal across the country and applied it to the freight data obtained from Transearch® for the Knoxville Region to determine the volume of freight handled in 2020. The TPO also assumed that the dispersion of freight among transportation modes would be equal to that of today's mode split, and applied the increase to determine freight tonnage by mode in 2020. Using this method, it is projected that by 2020, the Region's transportation network could handle 1.2 billion tons of freight, up from 730 million tons seen today.

- The Region's highways can expect to see an increase in truck freight from 338 million tons to 557.7 million tons;
- The railroads are projected to see an increase in rail freight from 370 million tons to 610.5 million tons;

- Freight traffic on short line railroads in Tennessee is expected to increase 48% from 2002 levels;
- Barge traffic is predicted to see an increase to 6.6 million tons from 4 million tons;
- Air cargo activity at the Gatlinburg/ Pigeon Forge Airport is expected to increase slightly to 92 tons annually; and,
- McGhee Tyson Airport, which developed its own projections, forecasts that by 2020, 70,300 tons of air cargo will be handled at the airport, a 34% increase.

Future Freight Activity

Although many jurisdictions within the Region have zoning and land use plans that direct the location, type, and density of land uses, it is difficult to predict changing conditions, especially when looking as far out as the year 2020. In an attempt to forecast freight activity in the near future, an analysis of the industrial parks and industrial clusters located throughout the Region was conducted to determine which areas could see additional development that could lead to increased truck activity. The areas that are considered to have the greatest potential for adding significant truck activity by 2020 are:

- Areas already zoned for industrial uses or are included in a master plan to eventually become industrial in nature;
- Industrial parks with at least 50 acres of developable land;
- Industrial parks that have recently been completed or are under construction that currently are entirely vacant;
- Industrial parks that are proposed or planned;
- Areas of relatively flat land located near interstate interchanges or along improved corridors that provide access to an interstate and could potentially be developed as industrial type uses; and,
- Areas adjacent to an existing industrial park or cluster.

The land use analysis shows that there are 5,700 acres of industrial park land throughout the Region that are still undeveloped, along with several hundred acres proposed or under construction, meaning there is sufficient land available for additional development leading to increased truck activity. Map 19 shows the acres of developable land within industrial parks.

The Matlock Bend Industrial Park in Loudon County contains over 500 acres of developable land. With an additional 500+ acres available for development within the Huntington Business Park, Highlands Business Park, and Centre 75 Business Park, coupled with continued development of the Tellico West and Niles Ferry Industrial Parks in Monroe County, truck activity around the I-75/ SR 72 interchange is certain to increase over the next decade. Loudon County does not currently have plans to increase industrial park land, as there are over 2,500 acres available for development.

Aggressive economic development efforts in Morristown have yielded an excellent industrial base centered around the Morristown Airport Industrial District and the East Tennessee Valley Industrial District. There is also a large industrial reuse opportunity at the old BASF plant near

the I-81/ SR 160 interchange that the County is eyeing for an intermodal center or other industrial activity. As industrial recruitment continues to add industries, such as the addition of a Colgate plant near the Morristown Airport, and as the 500+ available acres at the East Tennessee Progress Center begins to develop, truck activity around these industrial areas, as well as near the I-81/ US 25E and I-81/ SR 162 interchanges, will increase. The completion of the new SR 474 corridor will provide better access between the Morristown Airport Industrial District and I-81, likely increasing truck activity near the I-81/ SR 341 interchange.

A Sysco Food Distribution Center will occupy the majority of the I-275 Industrial Park in Knoxville and bring additional truck activity to that area. The Eastbridge Business Park in East Knox County contains over 200 acres still available for development, however, land in other industrial parks throughout Knox County is limited. As a result, efforts have focused on locating new sites. The Development Corporation of Knox County is proposing a 360-acre industrial park at the I-40/ Midway Road interchange in East Knox County. This intersection currently experiences very little, if any, truck activity. The addition of this industrial park, combined with additional development at Eastbridge and the introduction of utilities to the interchange area has the potential to bring about significant truck activity, and improvements to this interchange area may be necessary.

The addition of two new industrial parks at the interchange of I-40/75 and Watt Road as well as a new trucking terminal will bring about additional truck activity to the interchange vicinity, worsening the congestion problems existing today.

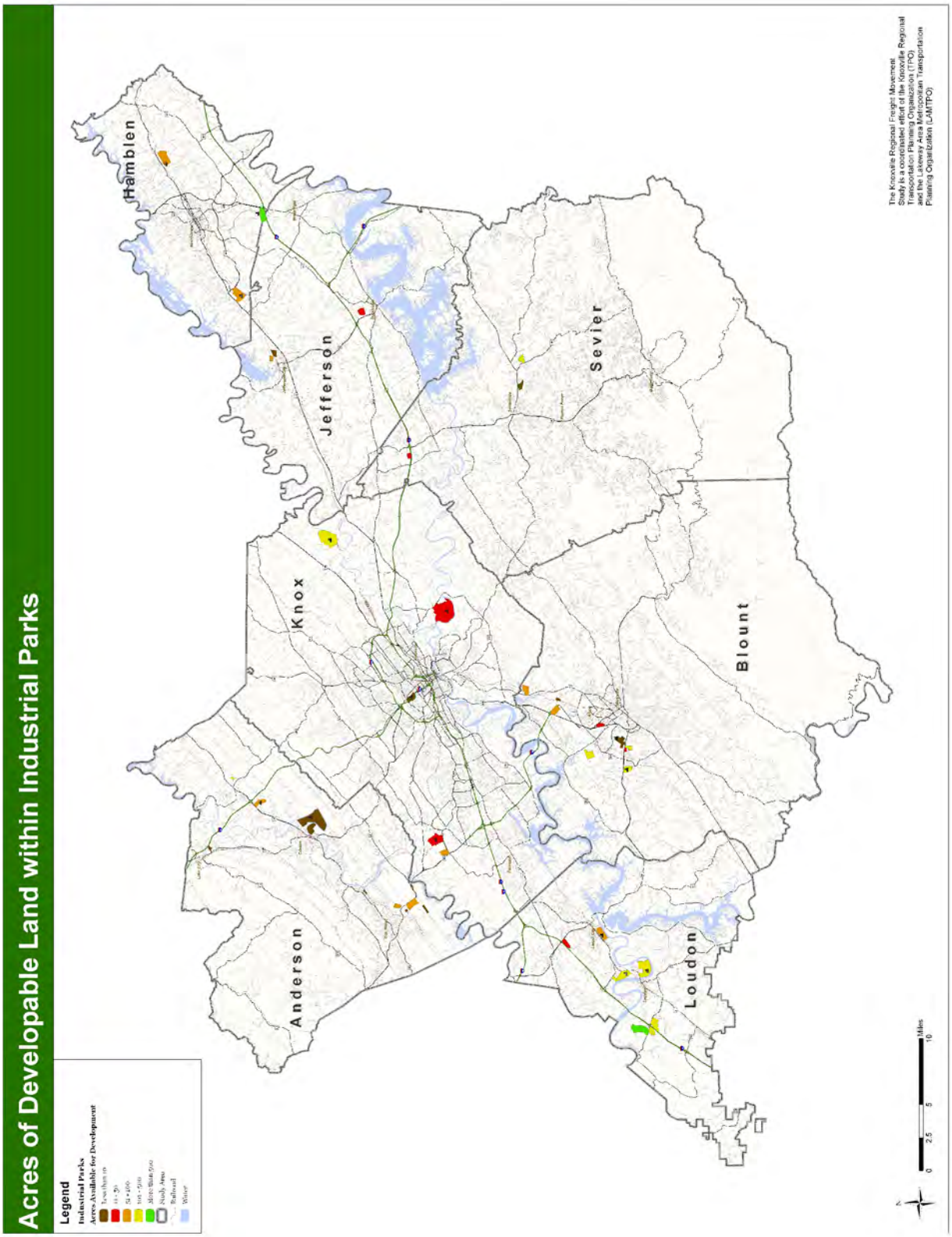
Across Blount County, there are over 750 acres of undeveloped land situated within industrial parks. The 226-acre Partnership Park North is yet to be developed and Partnership Park South and Big Springs Industrial Park, west of Maryville each contain over 100 acres of developable land. The development of these areas could lead to significant increases in truck activity near Maryville and the Airport and increased truck traffic on US 321, US 129, US 411, SR 334, SR 333, and I-140.

The Stock Creek Development Center near the Blount/ Knox County line has over 100 acres of developable land that could bring increased truck activity to SR 33, a road already in need of improvements. A new research and development park is proposed for Blount County along Old Knoxville Highway near I-140, however, this project is currently not intended to be geared towards attracting major freight generating businesses.

The I-75 Industrial Park and David Jones Industrial Park in Anderson County each contain over 100 acres of developable land, leading to the potential that the I-75/ SR 61 interchange area could see an increase in truck activity.

It is known that Jefferson County is interested in expanding the Jefferson County Industrial Park sometime in the future, and with over 50 acres currently available for development, truck activity in this area will likely increase. With multiple interchange locations along I-40 and I-81 providing great interstate access, trucking terminals, warehouse/ distribution centers, and other freight generating businesses are likely to continue to be drawn to Jefferson County.

Map 19: Acres of Developable Land within Industrial Parks



The Clinch River Industrial Site, Heritage Center, and Horizon Center are all business or industrial parks located on Department of Defense land in Oak Ridge that are mostly undeveloped. The Roane Regional Business & Technology Park in Roane County also has abundant developable land. As these sites develop, truck activity can be expected to increase, especially along corridors that lead to interstate interchanges.

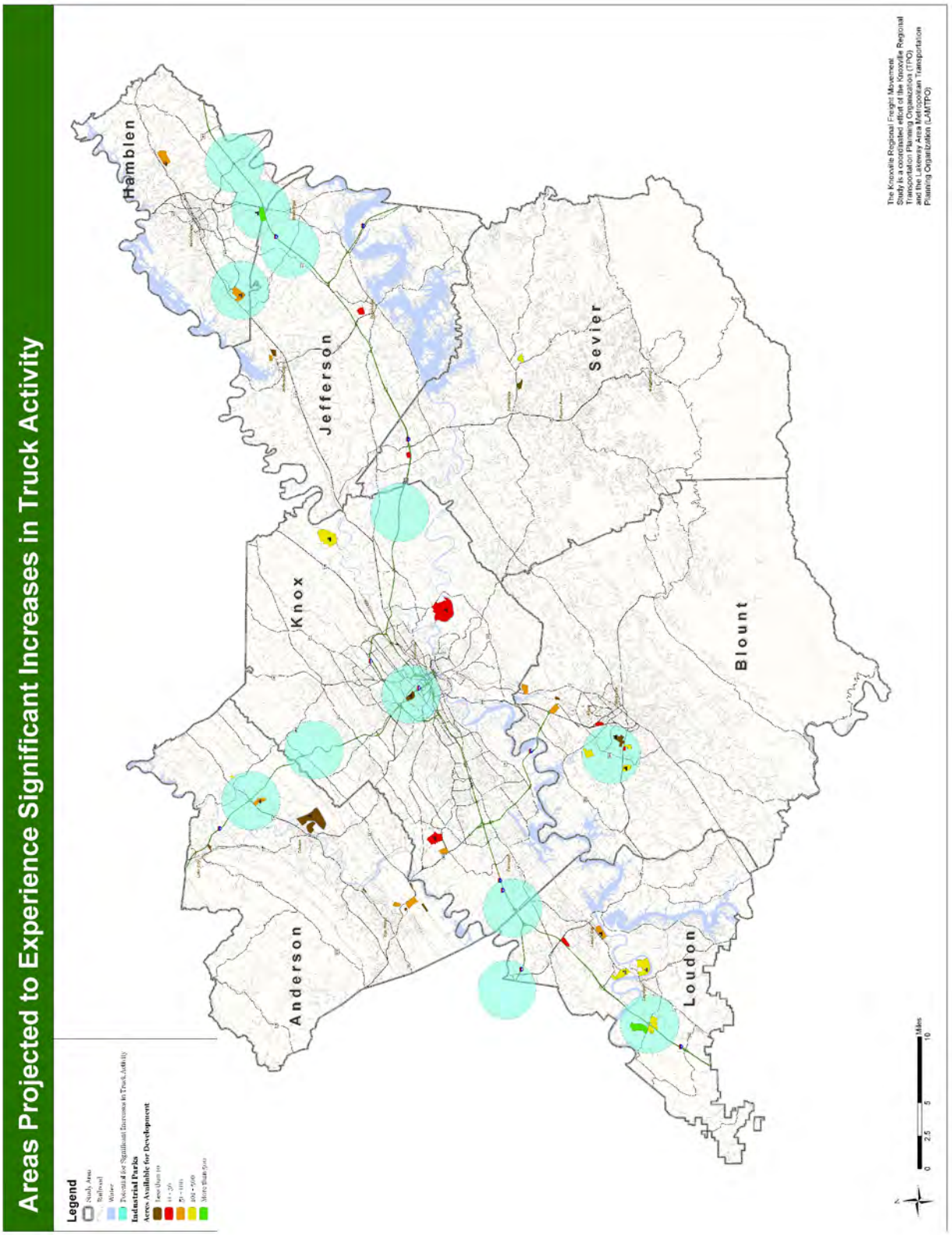
Map 20 identifies the areas that have the greatest potential to experience significant increases in truck activity because of the existence of vacant industrial land or attractive sites for new industrial sites. These areas are:

- The I-75/ SR 62 interchange in Anderson County;
- The area west of Maryville in Blount County;
- The I-81/ US 25E interchange in Hamblen County;
- The I-81/ SR 160 interchange in Hamblen County;
- The Morristown Airport Industrial District in Hamblen County;
- The I-40/ SR 92 interchange in Jefferson County;
- The I-81/ SR 341 interchange in Jefferson County;
- The interchange of I-40/75 and Watt Road in Knox County;
- The I-40/ Midway Road interchange in Knox County;
- The I-275/ Heiskell Ave interchange area in Knox County;
- The I-75/ Raccoon Valley Road interchange in Knox County; and
- The I-75/ SR 72 interchange in Loudon County.

As previously mentioned, the presence of three major interstates makes this Region well situated to attract industry that relies on freight transportation. As the desire to better utilize this asset for continued economic development is discussed, the requests to construct additional interchanges, particularly along I-40 in Loudon and Roane Counties, for economic development purposes will continue to escalate. The Tennessee Department of Transportation, in coordination with local officials, will need to come to an agreement as to how to best provide good interstate access for economic development while maintaining a safe and efficient traffic flow on the interstate.

As the available land located in industrial parks throughout the Region continue to develop, truck activity will increase, freight patterns may shift, and corridors that provide the best access between these areas and the interstate will continue to see increased truck traffic. The result of additional truck activity at these locations will likely exacerbate conflicts with commuter vehicles and increase congestion. Many of the interchanges that would experience additional truck activity have ramps that are not engineered to handle high volumes of truck traffic and consist of poor turning radii, minimal merging distances, limited sight distances, and/or no traffic control devices. In addition, many of the routes that provide access between industrial areas and the interstate are rural, 2-lane highways not constructed to handle high volumes of truck traffic and would need to be improved.

Map 20: Areas with Potential to Experience Significant Increases in Truck Activity



XIII. Projects Under Construction or Planned that Address Freight Transportation

This section identifies the projects that are currently under construction, are committed by having funding obligated, or that are proposed in either the TPO 2005-2030 Knoxville Regional Long Range Transportation Plan or the Lakeway Area MTPO Long Range Transportation Plan 2005-2030.

Projects Under Construction

There are several major projects that are currently underway throughout the Knoxville Region that will improve and enhance the movement of freight.

1. The SmartFix40 project in Downtown Knoxville which will remove the bottleneck on I-40 allowing for six thru lanes and an improved interchange with James White Parkway.
2. Widening I-275 to 6 lanes and improvements to the interchanges with Baxter Avenue, Woodland Avenue, and Heiskell Avenue, as well as modifications to the I-75/ I-640/ I-275 interchange.
3. Improvements to the I-81/ SR 341 interchange in Jefferson County.
4. Construction of a new 5-lane SR 66 alignment from Morristown to SR 160.

Projects Committed

There are also several projects that are in the preliminary planning or engineering stages or that have funding obligated that will enhance the movement of freight throughout the Region.

1. I-140 Pellissippi Parkway extension from SR 33 to US 321 in Blount County.
2. Widen Lovell Road from I-40 to Middlebrook Pike in Knox County to 5 lanes.
3. Widen Western Avenue from Texas Avenue to Keith Avenue in Knoxville to 4 lanes.
4. Widen Middlesettlements Road from Robert C. Jackson Street to US 129 in Blount County to 3 or 4 lanes.
5. Widen SR 33 in Knox County from Emory Road to the Union County Line to 4 lanes.
6. Construction of a new Chickamauga Lock, with a capacity of 110’ x 600’.

Projects Planned

There are numerous projects included in either the TPO 2005-2030 Knoxville Regional Long Range Transportation Plan or the Lakeway Area MTPO Long Range Transportation Plan 2005-2030 that identify transportation improvements that will likely enhance the movement of freight throughout the Knoxville Region.

1. The SR 475 Knoxville Regional Parkway that will link I-75 in Loudon County with I-75 in Anderson County, through West Knox County.
2. Widen I-81 in Jefferson and Hamblen County from 4 lanes to 6 lanes.
3. James White Parkway extension to Gov. John Sevier Highway in Knox County.

4. Construction of a new 4-lane corridor, SR 474, that will enhance connectivity between the Morristown Airport Industrial District and I-81.
5. Widen Oak Ridge Highway in Knox County to 4 lanes.
6. Widen Alcoa Highway in Blount and Knox County to 6 lanes, with the section through the City of Alcoa located on a new alignment.
7. Widen US 25E in Jefferson and Hamblen County to 6 lanes.
8. Improvements to US 441/ Chapman Highway in Knox County
9. Improvements to the Kingston Pike/ Northshore Drive interchange in Knoxville.
10. Widen Strawberry Plains Pike from Gov. John Sevier Highway to I-40 in Knox County to 4 lanes.
11. Construction of a new 2-lane southern bypass around the City of Maryville.

XIV. Knoxville Regional Freight Recommendations

This section outlines the recommendations developed by the Knoxville Regional Transportation Planning Organization and the Lakeway Area Metropolitan Transportation Planning Organization that, in response to issues and challenges identified by the freight community, attempt to improve and enhance the movement of freight throughout the Knoxville Region by:

- Identifying action items that the Knoxville Regional TPO and Lakeway Area MTPO should undertake to address the issues and challenges of freight movement identified by this plan;
- Developing a list of improvements that should be included in the next development of the TPO and LAMTPO Long Range Transportation Plan; and
- Identifying additional funding programs and sources that should be explored for freight related planning and projects.

Action Items

The following action items are either currently being undertaken by the Knoxville Regional TPO and/or the Lakeway Area MTPO or will be in the near future and address the issues and challenges expressed by the freight community.

1. The TPO will continue to provide weekly traffic alert e-mails to all members of the Freight Advisory Committee advising them of construction information and road closures. In addition, a link to the TDOT Smartway cameras to view real time traffic conditions is included.
2. The TPO and LAMTPO will continue to coordinate regular meetings of the Freight Advisory Committee to bring freight stakeholders and officials up to date on freight planning activities and to discuss freight related topics.
3. The TPO will institute the Urban Land Use Allocation Model (ULAM) which will allocate future land use development of the Knoxville Region to a specific geography allowing improved forecasting of freight activity centers.
4. The TPO will research a travel demand forecasting software program that will assist in projecting future year truck activity. This software program will work coherently with our existing Travel Demand Model, which currently provides projections for automobile traffic, to identify areas where truck activity will increase and assign these trucks to the roadway network to identify truck volumes for future years.
5. The TPO and LAMTPO will continue to work with TDOT and county and local highway departments to ensure that all road improvement projects address freight needs, such as including an adequate construction base with the ability to withstand heavy-duty truck traffic, adequate turning radii, sufficient sight distances, and traffic light coordination.
6. The TPO and LAMTPO will continue to work with local land use planning agencies to ensure that land use planning policies and new development include freight

interests, such as adequate transportation access and off-street loading/ unloading facilities.

7. The TPO and LAMTPO will recommend additional routes to be included as part of the National Highway System (NHS) Intermodal Connector System, which are eligible for alternative funding sources.
8. The TPO and LAMTPO will remain involved in the I-81 Corridor Study being commissioned by the Virginia Department of Transportation and the potential for the corridor study to become a multi-state venture that would include Tennessee.
9. The TPO and LAMTPO will become involved in the TDOT I-40/ I-81 Corridor Feasibility Study.
10. The TPO and LAMTPO will communicate with TDOT and their consultants developing the statewide freight plan to ensure coordination with the Knoxville Region Freight Movement Plan, utilize assistance offered to Metropolitan Planning Organizations through the process, and to obtain updated statewide information on truck counts, truck, rail, barge, and air freight forecasts.
11. The TPO and LAMTPO will continue communicating with Norfolk Southern as they study potential sights in East Tennessee for an intermodal terminal.
12. The TPO and LAMTPO will continue to monitor the Memphis-Bristol Rail Study and its implications on the Knoxville Region.
13. The TPO will work with TDOT and elected officials on securing funds for the rebuilding of Chickamauga Lock.

Long Range Transportation Plan Recommendations

The following improvements that address freight are currently identified in either the Knoxville Regional TPO 2005-2030 Knoxville Regional Long Range Transportation Plan or the Lakeway Area MTPO Long Range Transportation Plan 2005-2030, but include completion years that are beyond 15 years. These projects should be given a greater priority and have their anticipated completion years modified to show a more near term need for the project.

1. Widen SR 33 in Blount County to 4 lanes.
2. Construction of a McGhee Tyson Airport access road to I-140 in Blount County.
3. Improvements to the I-81/ US 25E interchange in Hamblen County.
4. Improvements to several intersections and interchanges along US 25E in Hamblen County.
5. Improvements to the I-81/ I-40 interchange in Jefferson County.
6. Improvements to the interchange of I-40/75 and Watt Road in Knox County.
7. Widen I-75 from Emory Road to Raccoon Valley Road in Knox County to 6 lanes.
8. Improvements to the I-75/ Callahan Road interchange in Knox County.
9. Improvements to the I-75/ Raccoon Valley Road Interchange in Knox County.

10. Improvements and access management to Pellissippi Parkway from I-40 to Oak Ridge Highway in Knox County.
11. Widen Gov. John Sevier Highway in Knox County to 4 lanes.
12. Widen SR 72 in Loudon County from I-75 to US 411 to 4 lanes.

New Projects

The following improvements are specific projects that address freight that should be considered as part of Long Range Transportation Plan updates of the TPO and/or LAMTPO as new projects.

1. Construct new access road from McGhee Tyson Air Cargo facilities to Alcoa Highway or I-140, or improve Airbase Road, Wrights Ferry Road, and Topside Road to allow for improved access to Alcoa Highway and I-140.
2. Improvements to the I-40/ Midway Road interchange in Knox County.
3. Widen Midway Road from I-40 to the new industrial park site in Knox County from 2 lanes to 4 lanes.
4. Improvements to Raccoon Valley Road from I-75 to the Bull Run Steam Plant in Knox and Anderson County.
5. Eliminate at-grade highway/ rail crossings at the following high traffic locations:
    a. E. Morris Boulevard/ Norfolk Southern Railroad in Hamblen County;
    b. S. Cumberland Street/ Norfolk Southern Railroad in Hamblen County;
    c. Liberty Street/ CSX Railroad in Knox County;
    d. Cherry Street/ Norfolk Southern Railroad in Knox County;
    e. Concord Street/ Norfolk Southern Railroad in Knox County;
    f. Cedar Drive/ Norfolk Southern Railroad in Knox County; and,
    g. Emory Road/ Norfolk Southern Railroad in Knox County.
6. Relocation of the Norfolk Southern main railroad line from Downtown Morristown to a rail line that runs through southern Hamblen County and connects back into the main line near Bulls Gap. This project would eliminate approximately 40 at-grade highway/ rail crossings in Downtown Morristown.
7. Development of an intermodal terminal in the Knoxville Region along a mainline railroad of either Norfolk Southern or CSX. Norfolk Southern is currently undertaking an economic study to determine the location of an intermodal terminal in East Tennessee.

Additional Funding Programs and Sources

As previously discussed, SAFETEA-LU allocated $244 billion over 5-years in transportation funding and established new funding pools for freight planning and projects. Some of the freight programs that the TPO and LAMTPO should explore for opportunities to fund freight related projects throughout the Knoxville Region are:

- **Freight Intermodal Distribution Pilot Grant Program-** provides funding to states to develop projects that aim to reduce congestion in/out of intermodal ports and inland distribution centers ($30 million over 5 years).
- **Truck Parking Facilities Program-** addresses shortage of truck parking. Includes construction of new facilities and modifying existing facilities ($25 million over 4 years).
- **Freight Planning and Capacity Building Program-** allows for educational opportunities, purchase of data, public-private relationship building, peer-to-peer interviews ($3.5 million over 4 years).
- **Transportation Infrastructure Finance and Innovation Act (TIFIA)-** expanded to freight rail facilities and intermodal facilities that provide a public benefit to highway users ($610 million over 5 years).
- **Capital Grants for Rail Line Relocation Projects-** allows for local rail line relocation and improvement projects resulting in improved vehicular traffic flow and economic development ($1.4 billion over 4 years).
- **National Corridor Infrastructure Improvement Program-** has grants available for projects of national significance to promote economic development and trade. Can be used to connect existing highway system segments, serve increasing freight volume, and reduce congestion and travel time ($1.948 billion over 5 years).
- **Pilot Locomotive Diesel Retrofit Partnership Project-** a TDOT initiative that allocates $800,000 to reduce mobile source emissions from switchyard locomotives, short haul, locomotives, and commuter locomotives operating in air quality non-attainment and/or maintenance areas.

Appendix A

Tonnage Originating in Knoxville Region by Destination	Truck	Rail	Water	Air	TOTAL	Truck Loads
Census Region 1	130,829.07	15,765.00	0.00	383.62	146,977.69	8,473.27
Census Region 2	691,046.47	58,642.00	0.00	865.91	750,554.38	59,500.68
Census Region 3	739,751.79	222,443.40	170,974.12	2,983.64	1,136,152.95	77,533.18
Census Region 4	264,799.55	3,680.00	85,775.37	884.07	355,138.99	20,768.44
Census Region 5	2,632,834.04	1,126,135.29	29,277.19	6,133.63	3,794,380.15	451,992.90
Georgia	641,778.49	321,570.30	0.00	5,362.39	968,711.18	165,351.16
North Carolina	613,637.42	567,209.79	0.00	615.16	1,181,462.37	112,100.73
Virginia	277,174.62	24,522.00	0.00	15.22	301,711.84	42,406.98
Census Region 6	8,255,126.29	311,969.60	748,193.18	4,853.14	9,320,142.21	1,393,512.07
Alabama	144,016.14	27,159.80	82,107.53	67.80	253,351.27	47,776.53
Kentucky	308,487.61	40,438.00	15,646.52	4,851.46	369,423.59	115,601.30
Mississippi	141,886.75	9,646.00	14,716.71	12.60	166,262.06	15,162.00
Tennessee	7,660,735.79	234,725.80	635,722.42	1.68	8,531,185.69	1,214,972.24
Census Region 7	719,817.29	62,732.00	232,620.27	1,257.63	1,016,427.19	66,048.50
Arkansas	116,136.25	0.00	15,692.33	2.60	131,831.18	9,569.00
Census Region 8	114,943.77	93,490.00	0.00	88.17	208,521.94	4,813.42
Census Region 9	152,120.58	108,628.00	0.00	142.33	260,890.91	10,616.98
DOMESTIC TOTAL	**13,701,268.85**	**2,003,485.29**	**1,266,840.13**	**17,592.14**	**16,989,186.41**	**2,093,259.44**
Canada	114,319.00	35,755.00	21.00	2,444.06	152,539.06	
Mexico	41,392.00	25,827.00	0.00	0.00	67,219.00	
TOTAL	**13,856,979.85**	**2,065,067.29**	**1,266,861.13**	**20,036.20**	**17,208,944.47**	**2,093,259.44**
Tonnage Destined for Knoxville Region by Origin	**Truck**	**Rail**	**Water**	**Air**	**TOTAL**	**Truck Loads**
Census Region 1	59,270.88	5,612.00	0.00	505.63	65,388.51	3,124.54
Census Region 2	429,382.00	32,442.00	23,929.37	810.66	486,564.03	30,627.27
Census Region 3	1,976,250.29	1,564,622.26	526,713.68	2,002.63	4,069,588.86	129,534.49
Census Region 4	357,298.84	16,814.00	555,605.52	883.25	930,601.61	20,706.55
Census Region 5	2,580,972.33	1,941,944.21	228,483.51	7,258.23	4,758,658.28	265,417.85
Georgia	889,920.39	61,498.60	0.00	2,507.01	953,926.00	79,689.80
North Carolina	821,803.81	57,914.00	0.00	1,208.60	880,926.41	83,203.80
Virginia	240,289.29	1,304,664.80	0.00	212.66	1,545,166.75	34,705.44
Census Region 6	23,343,465.54	2,522,748.20	217,123.38	3,410.26	26,086,747.38	1,493,931.28
Alabama	459,778.61	71,410.00	20,766.40	16.56	551,971.57	31,198.62
Kentucky	406,787.16	2,116,981.20	151,086.04	829.75	2,675,684.15	74,316.50
Mississippi	643,268.10	32,880.00	14,323.38	11.93	690,483.41	33,143.01
Tennessee	21,833,631.67	301,477.00	27,137.56	20.68	22,162,266.91	1,355,273.15
Census Region 7	996,291.89	376,034.60	1,179,790.38	1,093.55	2,553,210.42	47,545.53
Arkansas	351,408.67	9,484.00	635,584.15	2.03	996,478.85	18,093.28
Census Region 8	87,390.75	23,588.00	0.00	447.13	111,425.88	4,085.38
Census Region 9	175,558.86	22,740.00	0.00	612.69	198,911.55	8,986.56
DOMESTIC TOTAL	**30,005,881.38**	**6,506,545.27**	**2,731,645.84**	**17,024.03**	**39,261,096.52**	**2,003,959.45**
Canada	83,164.00	102,930.00	1.00	877.07	186,972.07	
Mexico	20,041.00	1,962.00	0.00	0.00	22,003.00	
TOTAL	**30,109,086.38**	**6,611,437.27**	**2,731,646.84**	**17,901.10**	**39,470,071.59**	**2,003,959.45**
GRAND TOTAL	**43,966,066.23**	**8,676,504.56**	**3,998,507.97**	**37,937.30**	**56,679,016.06**	**4,097,218.89**

Appendix B

Knoxville Regional Freight Movement Study Survey

Company Name:

1. Approximately how many truck trips per day are there to or from this location (check 1 category)?
   - □0-10
   - □ 10-25
   - □ 25-50
   - □ 50-100
   - □ 100+

2. Approximately what percentage of these truck trips are (check 1 category for each a, b, and c):
   a. **Local**- (To or from a location within the Region- Anderson, Blount, Hamblen, Jefferson, Knox, Loudon, or Sevier County)? □ None □ 1%-25% □ 25%-50% □ 50%-75% □ 75%-99% □ All

   b. **Statewide** - (To or from a location within the State of Tennessee, but outside the Region)? □None □ 1%-25% □ 25%-50% □ 50%-75% □ 75%-99% □ All

   c. **Nationwide** - (To or from a location outside of the State of Tennessee)? □ None □ 1%-25% □25%-50% □ 50%-75% □ 75%-99% □ All

3. What are the peak times of day for truck trip activity to or from this site (check all that apply)?
   - □Early morning (3 am-7 am)
   - □ Mid morning (7 am-10 am)
   - □ Mid day (10 am-3 pm)
   - □ Afternoon (3 pm-6 pm)
   - □ Early evening (6 pm-11 pm)
   - □ Overnight (11 pm-3 am)

4. What are the primary routes used by trucks traveling between your facility and the major highway network.

5. Please list specific issues, problems, and/or locations that you feel restrict the movement of trucks or loading/unloading of freight.

Continued on other side

6. In your view, what are some solutions that would improve or enhance the movement of freight in the Knoxville Region?

7. Please rate how much impact you feel the following factors had in determining the location of your facility or will have in locating a future facility.

	Very Important	Important	Somewhat Important	Not Important at all
Easy access to/from an interstate highway	1	2	3	4
Adjacent to newly widened/improved roads	1	2	3	4
Easy ingress and egress your facility (lack of congestion, traffic signal, etc.)	1	2	3	4
Locating in a business/industrial park	1	2	3	4
Access to other transportation modes (rail, barge, airport, pipeline)	1	2	3	4

8. What future transportation-related trends in the trucking industry do you foresee (movement of freight, locating facilities, etc.)?

9. Do you believe an intermodal facility in Knoxville that could handle the loading/unloading of containers between trucks and rail would be beneficial to your business?

□ Yes
□ No
□ Not sure

10. Would you be interested in serving on a Freight Advisory Committee that would meet 2-3 times over the course of 2006 and be involved in the development of the Freight Movement Plan?

□ Yes
□ No

Contact info (if interested in serving on the committee)

Name: _____

Company: _____

Address: _____

Phone: _____

E-mail: _____