long range regional mobility plan 2040

Adopted April 24, 2013

prepared by

KNOXVILLE REGIONAL TPO TRANSPORTATION PLANNING ORGANIZATION

in partnership with

plan ET

TDOT

Federal Highway Administration

KNOXVILLE REGIONAL TPO TRANSPORTATION PLANNING ORGANIZATION

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A Little Background

Chapter 1

Purpose of the 2040 Regional Mobility Plan

In short, the Mobility Plan lays out the vision for transportation in the Knoxville Region for the next 27 years. All transportation projects that receive federal funding or are regional in nature regardless of funding source must first be in this Plan and based on funds we can expect to be available. When people travel from place to place every day, they rarely consider community boundaries. By looking at the region, the Mobility Plan encourages state and local governments to think the same way.

The Mobility Plan is a requirement of the federal legislation that funds transportation projects in the Knoxville Region. Funding is increasingly limited. We need to be sure we spend our time planning for projects we can pay for. Projects that do receive funding need to address the most important needs in the Knoxville Region. The Plan encourages state and local governments to come together and prioritize the needs of the Knoxville Region, not just their jurisdiction, since people move freely across boundaries for work and other activities every day. The Plan looks at all different modes and 20+ years ahead so we can be proactive, and prepare for the Knoxville Region's needs, rather than simply react when problems emerge. Finally, the Plan provides an opportunity for all effected parties to be a part of the process.

"When people travel from place to place every day, they rarely consider community boundaries. By looking at the region, the Mobility Plan simply encourages state and local governments to think the same way."

The TPO must update the Plan every four years to keep up with existing conditions, reevaluate proposals, and ensure that it meets federal air quality rules and regulations (conformity). The TPO adopted the last Mobility Plan on May 27, 2009, which included the 2009 Knoxville Regional Bicycle Plan. On June 1, 2009, the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) in consultation with the Environmental Protection Agency (EPA) found that the Mobility Plan met federal air quality rules and regulations (conformity).

The Regional Mobility Plan looks at all modes of transportation and supports integration among these modes. This includes roadways, transit, bicycles, pedestrians, rail, air, water, and freight. The Plan includes a federally required "Air Quality Conformity Determination." This ensures that federal funds will not be spent on projects that cause or contribute to any new violations of the National Ambient Air Quality Standards (NAAQS); increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone. This Plan also includes a number of strategies that work to make the existing system more efficient. As required by federal legislation, the Plan is "financially constrained." In other words, projects are not included in this Plan unless we expect funding to be available to pay for it.

The Mobility Plan is the long-term vision for the Knoxville Region. The Transportation Improvement Program (TIP) is the short-term (4-year) program that implements these projects. The TPO continuously updates the TIP. To be eligible for federal funding, plans, programs, and projects must first be in the Mobility Plan and then included in the TIP.

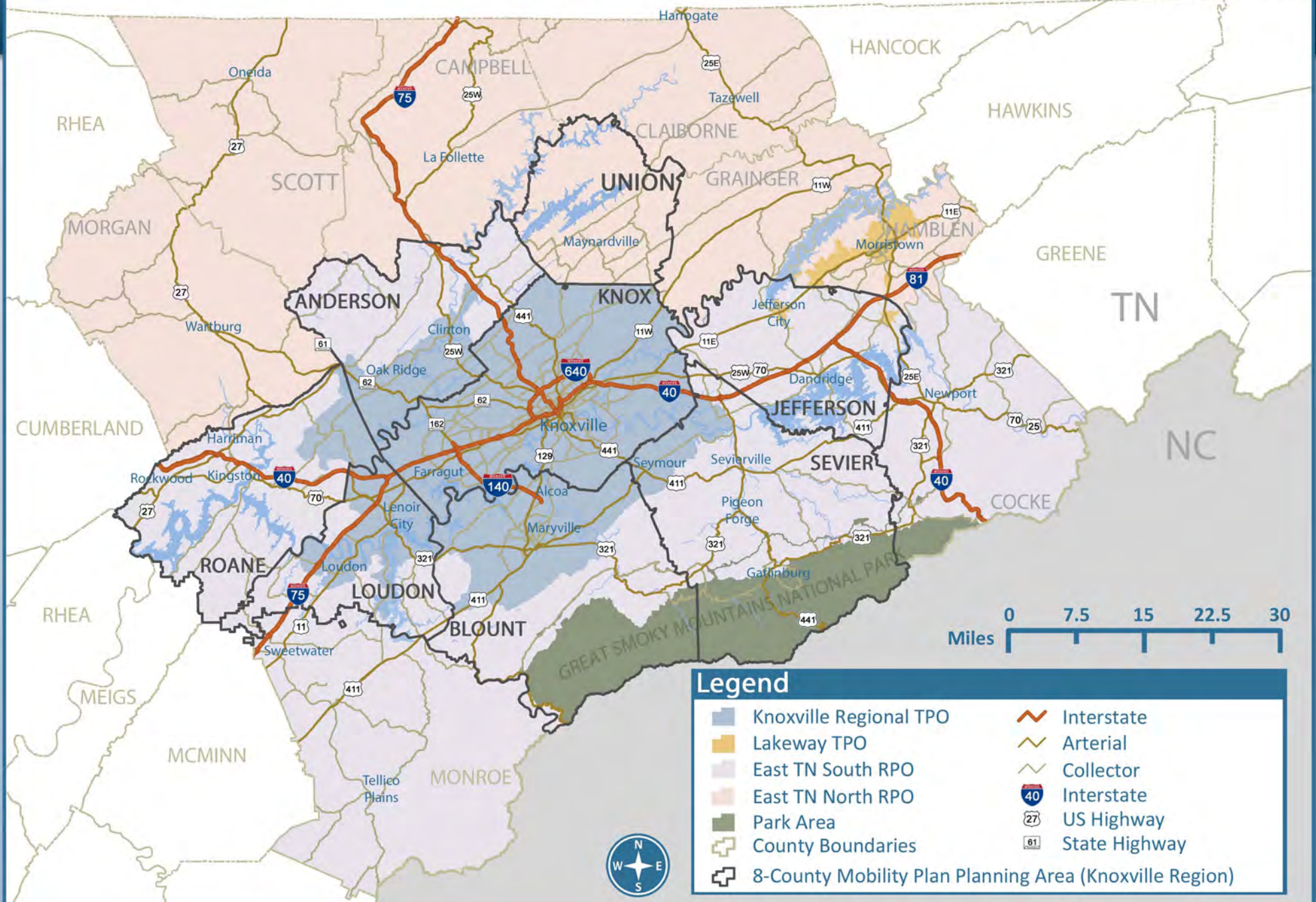
Planning for such a large area with such a diverse mix of cities and towns is challenging. This Plan also works to address a number of even more daunting challenges, including:

- Making a connection between land use and transportation planning,
- Creating a financially and environmentally sustainable transportation system, and
- Promoting equal opportunities and access for all who use it.

It is important to keep these challenges in mind when looking at the Knoxville Region's needs and possible solutions.

Exhibit 1-1

Transportation Planning Areas in East Tennessee



The 8-County Knoxville Region is Made Up of the Following Areas…

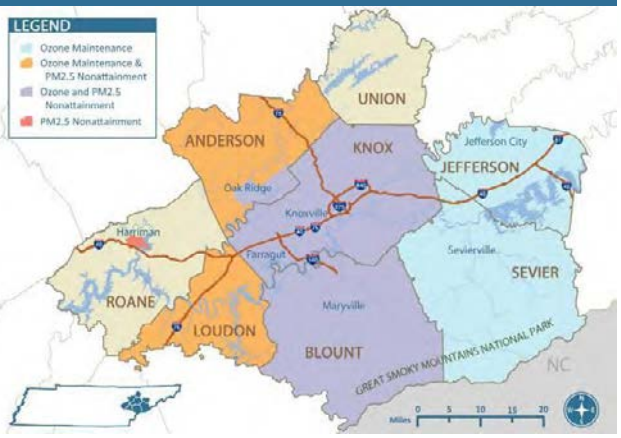
Metropolitan Planning Area (MPA)

Federal regulations base the MPA largely on the census-defined urbanized area. Our MPA includes all of Knox County and portions of Anderson, Blount, Loudon, and Sevier Counties.

PlanET Region – 2003 Metropolitan Statistical Area (MSA)

The Plan East Tennessee project (PlanET) has focused a great deal of TPO effort in the five-county area, which is based on the 2003 Metropolitan Statistical Area (MSA). The Census Bureau defines an MSA based on a number of criteria. The most important is the economic connectivity between counties. They determine this largely by the number of people that commute between counties for work.

Air Quality "Non-Attainment" Area



The Environmental Protection Agency (EPA) sets standards for air quality across the country. "Non-Attainment" refers to areas that do not meet those standards. The Knoxville Region is in one of those areas. Our Non-Attainment area includes Anderson, Blount, Jefferson, Knox, Loudon, Sevier, and small portions of Roane and Cocke Counties.

Why is this area included in the Mobility Plan?

This is the minimum area required to be in the TPO Planning Area. This area must be included in the Plan to be eligible for federal transportation funds. This is to ensure that federal dollars fund projects that serve the best interests of the Knoxville Region.

As commuting patterns are a major factor in determining an MSA, there is a clear mobility connection. It is important that transportation planning include areas with this high level of connectivity. The Mobility Plan includes this area to improve our understanding of regional mobility.

Creating a travel demand model is an important component of transportation planning in a Non-Attainment Area. This helps planners, engineers, and elected officials understand the impact of each project. It also enables them to look for ways to improve or maintain air quality. However, doing this is resource intensive, requiring highly trained staff and costly software. The TPO includes this area in the Knoxville Regional Travel Demand Model to reduce the per capita cost of this process.

What does it mean?

This means that transportation projects must be in this Plan in order to receive federal transportation funds.

The TPO does not plan projects outside of the Metropolitan Planning Area (MPA). That process occurs between local governments, Rural Planning Organizations (RPOs), and the **Tennessee Department of Transportation (TDOT)**. The **East Tennessee South RPO** covers the non-urbanized areas in Anderson, Blount, Cocke, Loudon, Jefferson, Roane, and Sevier Counties. The **East Tennessee North RPO** covers Union County. The **Lakeway Metropolitan Transportation Planning Organization** covers the urbanized portion of Jefferson County.

What is a Transportation Planning Organization (TPO)?

Sometimes referred to as a Metropolitan Planning Organization (MPO), a TPO is a regional transportation policy-making body. Locally elected representatives (Executive Board) advised by transportation experts (Technical Committee) guide TPO activities. The *1962 Federal-Aid Highway Act* required a TPO in all urbanized areas with a population over 50,000. The purpose is to ensure that a continuing, comprehensive, and cooperative (3-C) planning process is the basis for all transportation investments. Federal funding for transportation projects and programs must go through this process. Over the years, Congress has significantly added and revised expectations for the 3-C process. Congress passed our current legislation, *Moving Ahead for Progress in the 21st Century*, or MAP-21, in July 2012. This legislation added requirements such as measuring the performance of our system.

> *"Transportation planning needs to be regional because the transportation system is regional."*

The Five Core Functions of a TPO

1.) **Establish a Setting:** Establish and manage a fair and impartial setting for effective decision-making in the region.

2.) **Evaluate Alternatives:** Evaluate each alternative to ensure it addresses our mobility needs. Alternatives should be realistic and achievable. The size, complexity, and scale of alternatives should be appropriate to our region.

3.) **Maintain a Long Range Regional Mobility Plan:** Develop and update a Mobility Plan for the region that plans at least twenty years into the future. The Mobility Plan should:

- be multimodal and fiscally constrained,
- promote mobility and access for people and goods,
- promote efficient system performance and preservation,
- meet air quality standards, and
- enhance the quality of life in the region.

4.) **Develop a Transportation Improvement Program (TIP):** Develop a short-term list of capital and non-capital improvement projects based on the Mobility Plan. The TIP promotes the area's transportation goals by programming projects that address capacity, congestion, transit service, and air quality.

5.) **Involve the Public:** Involve the public and the affected special interest groups in the four above listed essential functions.

The Knoxville Regional TPO, established in 1977, is the federally designated TPO for the Knoxville Urbanized Area. The U.S. Census Bureau designates Urbanized Areas to reflect urban growth, not jurisdictional boundaries. In our area, growth reaches into five counties surrounding the City of Knoxville. As a result, the

Knoxville Urbanized Area includes a number of jurisdictions, namely the City of Knoxville, Knox County, and parts of Anderson, Blount, Loudon, and Sevier Counties. The Knoxville Regional TPO changed its name, formerly the MPO, to reflect its focus on transportation issues.

This is the reason why TPOs are responsible for transportation planning in urbanized areas. The Federal Government wants to ensure that the planning process is cohesive and functional. It also wants to be sure regions spend federal dollars efficiently and they truly benefit the region, not just a single community. In other words, transportation planning needs to be regional because the transportation system is regional.

The Executive Board is a group of elected representatives that serves as the governing body of the TPO. The Technical Committee is a group of transportation experts that advises the Executive Board. Figure 1-1 shows the structure of this governance and Tables 1–1 and 1-2 show the positions represented in each group.

Figure 1-1: TPO Structure
Source: Knoxville Regional Transportation Planning Organization (TPO)

Table 1-1: Representation on the Executive Board

Executive Board	
Principal elected officials from:	
• City of Alcoa • Town of Farragut • City of Knoxville (two elected officials) • Lenoir City • City of Maryville • City of Oak Ridge • Blount County	• Knox County (two elected officials) • Loudon County • Sevier County • East Tennessee Development District (ETDD) • State of Tennessee • Tennessee Division of the FHWA (non-voting member) • Region 4 of FTA (non-voting member)

Table 1-2: Representation on the Technical Committee

Technical Committee		
Planners and engineers from:		
• City of Alcoa • Town of Farragut • City of Knoxville • Lenoir City • City of Maryville • City of Oak Ridge • Anderson County • Blount County	• Knox County • Loudon County • Sevier County • Knoxville Area Transit (KAT) • Knoxville Commuter Pool • Knox County CAC • Metropolitan Knoxville Airport Authority (MKAA)	• Knoxville-Knox County Metropolitan Planning Commission (MPC) • East Tennessee Human Resource Agency (ETHRA) • Lakeway Area Metropolitan TPO • Tennessee Department of Transportation (TDOT) • East Tennessee Development District (ETDD) • Region 4 of FTA (non-voting member) • Tennessee Division of the FHWA (non-voting member)

The TPO has created topic-specific groups to provide feedback on a number of issues. These groups include the Freight Advisory Committee (FAC), Title VI Working Group, Human Services Transportation Planning Committee, and Bicycle Advisory Committee (BAC). Other projects may require specific Task Forces that will endure for the life of the project.

About the TPO Planning Process

The transportation planning process is not always easy to understand. It has many steps; there are numerous terms, acronyms, and organizations that make it even more confusing; and it produces many dense documents. It is a major goal of the TPO to break that down and make it as easy to understand as possible. The list and diagram below offer a conceptual overview of the TPO transportation planning process.

1.) **Establish a Vision and Principles** – The vision represents the Knoxville Region's collective goals. It is the backbone of the process and this Plan. The vision is very broad so the principles act to make the vision more concrete and guide strategies for implementation.

2.) **Determine Future Needs** – This step is essentially about data collection and analysis. The objective is to understand what improvements our system needs.

3.) **Identify Solutions** – Based on the needs we have found, this step identifies solutions.

> *"It is a major goal of the TPO to break the planning process down and make it as easy to understand as possible."*

4.) **Create a Long Range Mobility Plan** – The first three steps are part of the process to develop the Mobility Plan. The Mobility Plan represents the big picture for the transportation system over the next 20+ years.

5.) **Create a Short Term To-Do List (TIP)** – The Mobility Plan looks at the big picture of the regional transportation system. The TIP is about implementation. It assigns federal transportation dollars to implement specific projects within the next 4 years.

6.) **Implement Solutions:**

a.) **Projects** – There are two types of solutions. The first is projects, which are tangible solutions, like building a roadway, greenway, etc.

b.) **Non-Projects** – The second type of solutions are non-project solutions. These can include a variety of solutions that do not result in construction such as establishing a car-sharing program or carpooling program.

7.) **Monitor and Evaluate the Success of Implemented Solutions** – It is important that the solutions we develop and implement are effective. Thus, we must monitor and evaluate the success of these solutions. This allows us to determine if we need to make improvements, and gives us a better understanding if that solution is a viable option in addressing similar problems in the future.

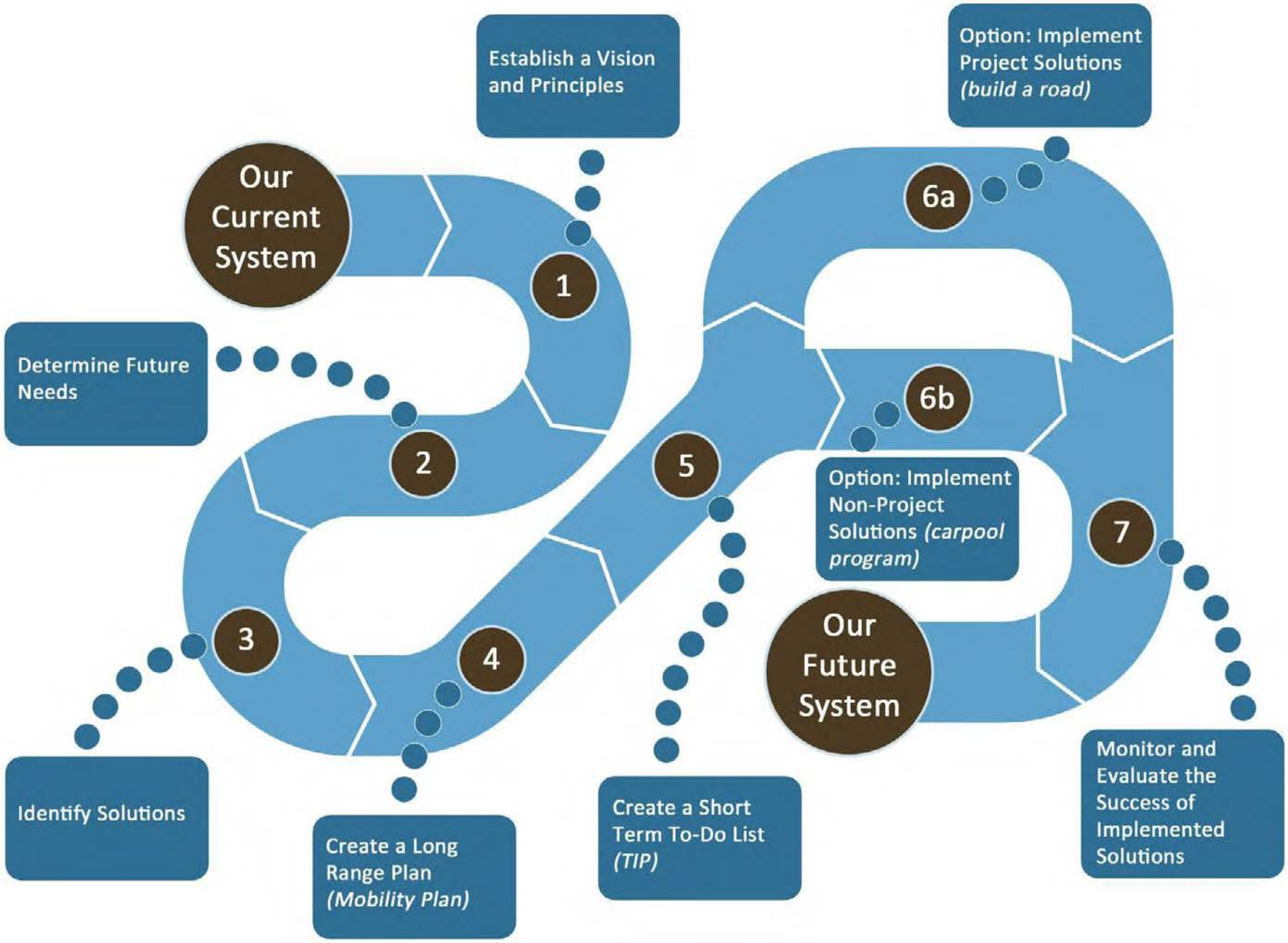


Figure 1-2: Navigating the TPO Planning Process
Source: Knoxville Regional Transportation Planning Organization (TPO)

Challenges and Opportunities – Four Things to Keep in Mind

1 *Our Population is Growing*

In 27 years, we expect the population of the Knoxville Region to increase by 45 percent. That means nearly 1.2 million people will need to get to work, school, and services via the Knoxville Region's transportation system. This growth will create further pressure on our existing transportation system, affecting our economic competitiveness, our environment, and our quality of life. Not only will the Knoxville Region grow, but it will likely grow older as well. Twenty-seven years from now, one in five East Tennesseans will be 65 years or older (Figure 1-3). Older residents and workers have different transportation needs that the system must meet through a variety of choices. For instance, will the elderly drive to medical services, will they use transit service, or will medical services go to them?

> *"Twenty-seven years from now, one in five East Tennesseans will be 65 years or older."*

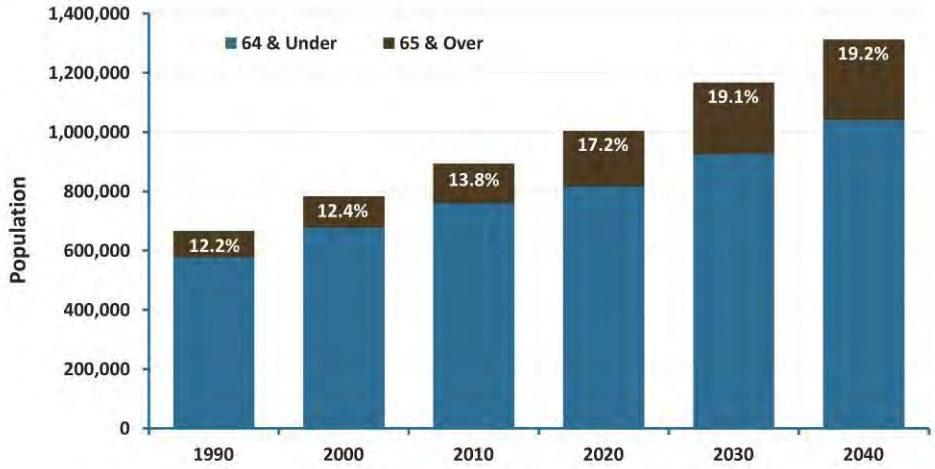


Figure 1-3: Projected Population in the Knoxville Region, 2010-2040
Source: US Census Bureau 1990, 2000, 2010, Knoxville Regional TPO

2 *The Economy is Key*

The Knoxville Region is a hub for commerce and tourism. Three of the nation's most heavily traveled interstates converge in or near Knoxville: I-40, I-75, and I-81, placing us within a day's drive of half the nation's population. As a result, Knoxville is in a strategic position. Knoxville is on an important thoroughfare for the movement of goods to major population centers in the eastern United States. The Knoxville Region is also home to the nation's most visited national park, the **Great Smoky Mountains National Park**. With more than 9.4 million visitors in 2010, the Park is a key economic resource for the Knoxville Region.

The economic health of the Knoxville Region depends on remaining competitive. This includes attracting and keeping well-trained workers, maintaining our low cost of living, and protecting our high quality of life. The transportation system plays an important role in supporting the economic health of the Knoxville Region. Many sectors of our economy depend heavily on the safe and efficient movement of people, goods, and services by car, truck, rail, air, and water.

The costs of building and maintaining large, ever-expanding infrastructure has ballooned and places a heavy burden on federal, state, and local budgets. At the same time, declining investment leaves urban communities abandoned as businesses and families move further out to newer infrastructure. These two facts are directly connected. As our economy continues to struggle and the value of our personal and public dollar continues to decline, it reveals larger problems that we may not have noticed before. Those problems reveal that we have not paid enough attention to the cost of what we are doing. Our development is an important component of this. Though we take this "move to the edge" approach as the norm, the reality is that there are far more financially efficient ways to develop. We rarely have to think about it, as many of the costs are not visible in our daily lives. However, development patterns continue to spread services thinner and the miles of infrastructure increase with fewer people in between to pay to maintain them. In addition to offering more choices for those who want them, looking for alternative ways of developing could present an opportunity to chip away at some of the endless rises in costs.

> *"Though we take this "move to the edge" approach as the norm, the reality is that there are far more financially efficient ways to develop."*

3 *Costs are Rising*

We feel rising costs, broadly as a nation, locally in our community services, and individually in our personal budgets. Higher and more volatile prices for petroleum products – not just fuel – appear to be here to stay. Costs will fluctuate over the months and years, but the reality is we have a limited supply. Dependence on petroleum means greater costs and environmental risk to access what is left. It also means increased exposure to political turmoil in the places it comes from. We need to think about how transportation solutions in the Knoxville Region can reduce our exposure to this costly, volatile energy.

> *"On average, transportation is the second highest household expense after housing. Many lower-income households spend even more of their income on transportation than housing."*

An example of how these resources affect us beyond the pump is in asphalt prices. The price of asphalt more than doubled in Tennessee between January and December 2008, reflected in the spike in Figure 1-4. This increase contributed to a doubling of

roadway project costs in some cases. While the costs have very recently fluctuated and even dropped in some instances, in general, transportation construction costs have risen quickly in the last 10 years. Due to the rising cost of gasoline, vehicle upkeep and insurance, and longer driving distances from place to place, household transportation costs in the Knoxville Region are on the rise. On average, transportation is the second highest household expense after housing. Many lower-income households spend even more of their income on transportation than housing.

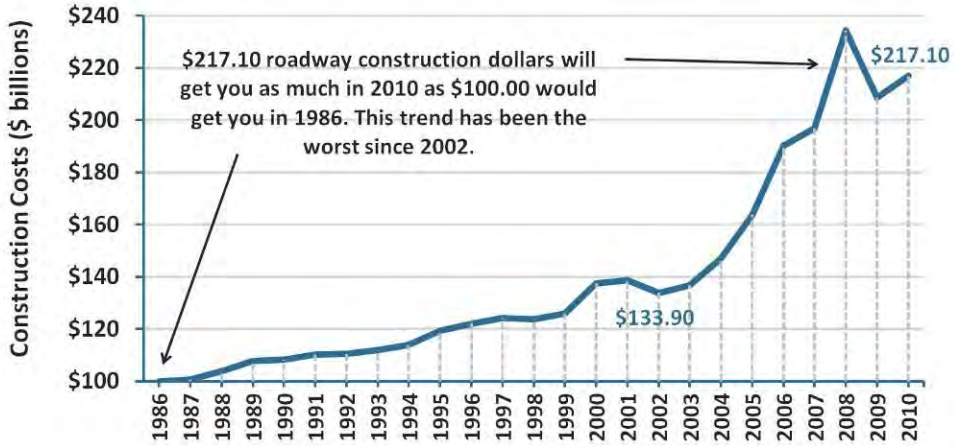


Figure 1-4: National Increase in Transportation Construction Costs, June 1986–2010

Source: U.S. Department of Labor, Bureau of Labor Statistics. Producer Price Index Industry Data, Material and Supply Inputs to Highway and Street Construction. 1986-2010. Data extracted July 13, 2012.

> *"The federal gas tax has not been increased since 1997, and the Tennessee gas tax has not been increased since 1989, effectively a 26 percent tax cut since 1997."*

4 *Funding is Unreliable and not Keeping Up*

Revenues from state and federal transportation sources are not keeping up with growing needs. Each year, to continue to pay for the same services and maintain the same number of roads, revenues (taxes) need to adjust to keep up with inflation. Every year those taxes are not adjusted for inflation amounts to a tax cut – which sounds great, but means tough decisions need to be made and often our infrastructure suffers. This costs us in the end, as crumbling roads can lead to costly wear and tear on our vehicles. The federal gas tax has not been increased since 1997, and the Tennessee gas tax has not been increased since 1989, effectively a 26 percent tax cut since 1997. This means that state and local governments are able to make roughly 26 percent fewer improvements to the system than in 1997. In that time, the condition of our infrastructure has continued to get worse. Attempts to adjust the gas tax have failed, and persistently higher

pump prices for gasoline will continue to thwart any attempts to adjust the state or federal fuel tax. This will increasingly force local governments to find other means to meet their funding needs. The current federal model for transportation funding is unstable and unsustainable. In Fiscal years 2008 through 2014, 19 percent of federal transportation dollars will come from funds other than the Highway Trust Fund (gas tax) (Figure 1-5). Figure 1-6 shows federal transportation funding each year and the support received from outside funding sources. Other sources include the federal government's general fund or the Leaking Underground Storage Tank (LUST) fund. Fiscal years 2013 and 2014 reflect numbers authorized in MAP-21.

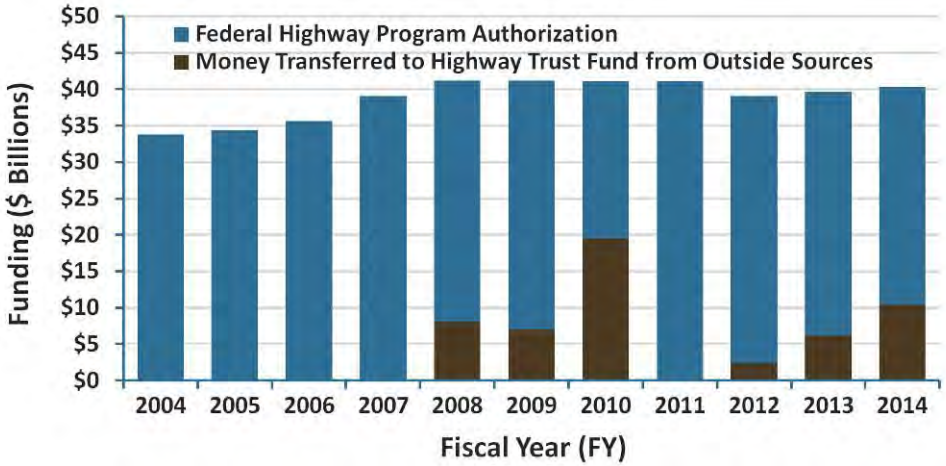


Figure 1-6: Projected Federal Highway Trust Fund Shortfall

Source (Figure 1-5 and 1-6): AASHTO 2007, Congressional Budget Office (CBO) 2012, MAP-21 Funding Authorizations

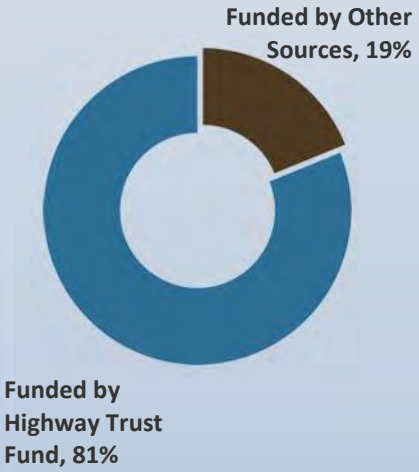


Figure 1-5: Transportation Funding from Highway Trust Fund versus Outside Sources, FY2008-2014

The reduced purchasing power of current revenues leads to increased competition for transportation funds. This means less capability to expand, improve, and maintain our infrastructure. Meanwhile, our infrastructure continues to age, requiring more maintenance. Over the next two decades, the gap will grow between the revenues we have and the investments we need just to keep our roadways and transit services in their current condition.

Vision, Principles, and Strategies

The Knoxville Region has a diverse set of transportation needs. The Plan must work to balance these often-competing needs. People will likely continue to choose the automobile for most trips over the life of the Plan. However, the Knoxville Region needs more options for traveling to everyday destinations, especially for those who are unable to travel safely by automobile. This is increasingly important as the population gets older, but is also critical for disabled and low-income populations. In addition, the occasional use of transit, walking,

bicycling, or sharing a ride can help the Knoxville Region in a number of ways. These travel choices improve air quality, conserve energy, promote active/healthy lifestyles, reduce household transportation costs, alleviate traffic congestion, improve the performance of our transportation system, and help efficiently accommodate our growing population within a compact, sustainable form.

Vision for the Knoxville Region

Every corner of the Knoxville Region is connected by a system of transportation choices that is efficient, reliable, affordable, and environmentally friendly.

The Vision Statement that guides this Plan is the product of many visioning efforts over a number of years. Some of these efforts include Plan East Tennessee (PlanET), Nine Counties One Vision, the Regional Transportation Alternatives Plan, Environmental Health Action Team (Blount County), Regional Senior Summit, the Blount County Growth Strategy, and the Plain Talk on Quality Growth conference. This is the backbone of our Plan. This vision represents the Knoxville Region's collective goal.

Principles and Strategies

The Knoxville Region's vision is very broad. Realizing this vision can come in any number of ways. The four principles listed on the following pages help to make the vision more concrete, and strategies describe even more specifically how we want to achieve the principles and reach the vision. The principles and strategies also support the regional vision while acknowledging the obstacles and challenges.

Principle 1: Preserve and Manage

Preserving and managing the existing system is the highest priority. Capital investments should be directed based on function and need.

Strategies:

- **A.)** Maintain good infrastructure conditions
- **B.)** Plan for a safer and more secure transportation system
- **C.)** Enhance management and operation of the regional transportation system
- **D.)** Enhance demand management
- **E.)** Improve system performance
- **F.)** Manage congestion
- **G.)** Protect our investments
- **H.)** Minimize our costs

Principle 2: Link Transportation and Land Use

Land uses impact the function of the transportation system and vice versa.

Strategies:

- **A.)** Proactively plan vibrant communities
- **B.)** Ensure the environmental impacts of transportation actions are considered
- **C.)** Encourage local land use management
- **D.)** Link transportation investments to land use planning
- **E.)** Promote Transit Oriented Development (TOD) and Context Sensitive Solutions (CSS)

Principle 3: Plan and Build for All Modes

As a region, we need to provide safe and secure mobility choices.

Strategies:

- **A.)** Treat all modes fairly
- **B.)** Support intermodal transportation
- **C.)** Provide reliable, efficient and accessible transit service
- **D.)** Promote Complete Streets roadway design

Principle 4: Develop the Knoxville Region's Potential

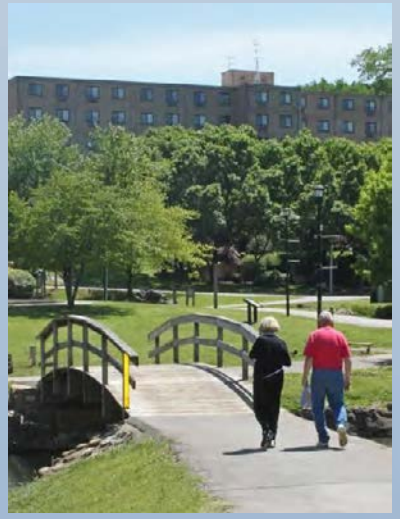
Build on our strengths, and use a variety of transportation investments as an economic development tool.

Strategies:

- **A.)** Explore long-term big ticket/big idea initiatives
- **B.)** Secure adequate funding to fully implement the Plan
- **C.)** Support the advancement of freight movement

Consistency with Federal Guidance

The principles and strategies of the Mobility Plan meet the eight federal planning factors in MAP-21. These factors ensure continuing, coordinated, and comprehensive transportation planning throughout the Knoxville Region. These principles and strategies also meet the six Livability Principles developed as a partnership between the U.S. Department of Housing and Urban Development (HUD), the Environmental Protection Agency (EPA), and the U.S. Department of Transportation (USDOT). This is particularly important due to our region's involvement in Plan East Tennessee (PlanET), a process funded through this partnership.



MAP-21 Planning Factors Addressed in Mobility Plan Principles		Mobility Plan Principles			
		1	2	3	4
M1	Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.		✓	✓	✓
M2	Increase the safety of the transportation system for motorized and non-motorized users.	✓		✓	
M3	Increase the security of the transportation system for motorized and non-motorized users.	✓		✓	
M4	Increase the accessibility and mobility of people and for freight.			✓	
M5	Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.	✓	✓	✓	✓
M6	Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.		✓		
M7	Promote efficient system management and operation.	✓	✓	✓	✓
M8	Emphasize the preservation of the existing transportation system.	✓			

Source: Federal Highway Administration

HUD/EPA/USDOT Livability Principles Addressed in Mobility Plan Principles		Mobility Plan Principles			
		1	2	3	4
L1	Provide more transportation choices.	✓	✓	✓	✓
L2	Promote equitable, affordable housing.		✓		✓
L3	Enhance economic competitiveness.	✓	✓	✓	✓
L4	Support existing communities.	✓	✓	✓	✓
L5	Coordinate policies and leverage investment.	✓	✓		✓
L6	Value communities and neighborhoods.	✓	✓	✓	✓

Source: Partnership for Sustainable Communities

Facts and Trends… Our Changing Region

Chapter 2

Stronger and More Competitive as a Region

The area covered in the Mobility Plan includes eight counties, 32 municipalities, numerous unincorporated communities, and nearly 900,000 people. Each one unique and independent, but with one important thing in common–each is a member of a larger Knoxville Region.

But, are we really a region? What do an engineer in Oak Ridge, a farmer in Loudon County, and a small business owner in Knoxville have in common? The success or failure of the Knoxville Region affects each one of them. When Blount County attracts new jobs, it improves the lives of people in Loudon County, Knoxville, and throughout the Knoxville Region. More people have money to spend and local businesses flourish. More people are able to pay property and sales taxes, so local governments are better able to maintain our infrastructure, and we all benefit. At the same time, if any of our communities loses jobs, we are all affected – from the foreclosed home down the street, to a favorite local business closing due to lost customers, or people paying fewer taxes, leading to tough decisions for our schools and other infrastructure.

It is easy to forget how big the world has become. When we are competing with other states or even other countries for jobs, we cannot look at our neighboring community as our competition. We have to recognize how much we all benefit from a new opportunity in any of our communities. This could include a private

business that brings scores of high-paying jobs or even grant dollars that allow us to do things we never could have afforded to do.

The Mobility Plan covers an eight-county Knoxville Region to reflect the way we are connected, from work to play. Transportation plays a major role in the vitality of our communities, so it is important that transportation planning efforts look at the big picture. This section of the Mobility Plan establishes the setting. What does the Knoxville Region look like? How are its counties similar? How do they differ? What changes are occurring? Perhaps most importantly, what issues are emerging? We need to understand the answers to these questions so we can successfully address the Knoxville Region's needs.

Population and Households

The population of the Knoxville Region has grown steadily over the past few decades (see Table 2-1). Between 1980 and 2010, the population of the Knoxville Region increased by over 42 percent, with Sevier County experiencing the greatest percentage increase, 117 percent. The population of the Knoxville Region has continued to rise since the 2000 census, seeing a 14 percent increase from 2000 to 2010.

Table 2-1: Knoxville Region Historical Population: Trends by County

COUNTY	Total Population				Population Change (%)			
	1980	1990	2000	2010	80-90	90-00	00-10	80-10
Anderson	67,346	68,250	71,330	75,129	1.3	4.5	5.3	11.6
Blount	77,770	85,969	105,823	123,010	10.5	23.1	16.2	58.2
Jefferson	31,284	33,016	44,294	51,407	5.5	34.2	16.1	64.3
Knox	319,694	335,749	382,032	432,226	5.0	13.8	13.1	35.2
Loudon	28,553	31,255	39,086	48,556	9.5	25.1	24.2	70.1
Roane	48,425	47,227	51,910	54,181	-2.5	9.9	4.4	11.9
Sevier	41,418	51,043	71,170	89,889	23.2	39.4	26.3	117.0
Union	11,707	13,694	17,808	19,109	17.0	30.0	7.3	63.2
Knoxville Region	**626,197**	**666,203**	**783,453**	**893,507**	**6.4**	**17.6**	**14.0**	**42.7**

Source: U.S. Census Bureau Total Population, 1980, 1990, 2000, & 2010.

The number of households in the Knoxville Region increased from 262,036 in 1990 to 362,567 in 2010, or 38 percent. This was in response to the gain in population and, as Figure 2-1 shows, to shrinking household sizes. The greatest drop in household size was in Roane County, where the average fell from 2.56 persons in 1990 to 2.39 persons in 2010, a 6.6 percent decline.

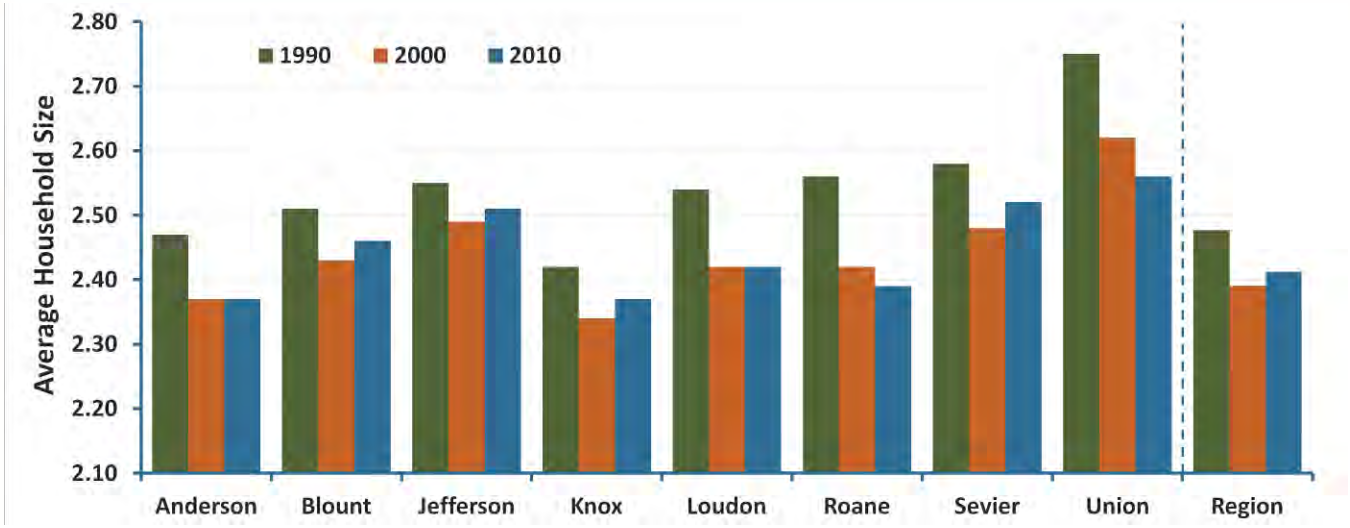


Figure 2-1: Average Household Size in the Knoxville Region, 1990-2010
Source: US Census Bureau, Average Household Size, 1990, 2000, 2010

While the average household size in the Knoxville Region continues to decrease, the number of vehicles per household has increased (see Figure 2-2).

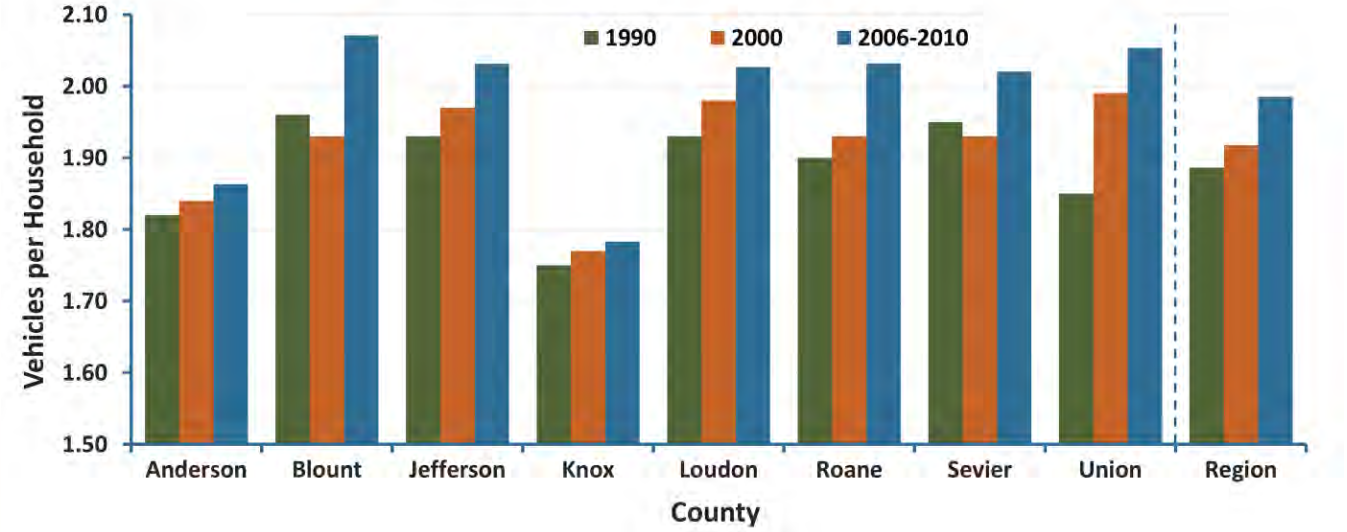


Figure 2-2: Average Vehicles per Household in the Knoxville Region, 1990-2010
Source: US Census Bureau, Vehicles per Household, 1990, 2000, ACS 2006-2010

Spreading Out

The population of the Knoxville Region has grown rapidly for several decades. However, even more significant is how much land area has urbanized in conjunction with that population growth. The U.S. Census Bureau measures urbanized land area every 10 years, showing where contiguous clusters of population have settled. The designation of urbanized area is of particular importance in transportation as it determines the scope of TPO planning areas.

Figure 2-3 shows trends in the growth of the Knoxville Region's urbanized area.

From 1950 to 2010, population grew nearly 380 percent, but the urbanized land area expanded over 1,200 percent. This means population density dropped by two-thirds – we take up over three times more space per person than we did in 1950. This means we have to rely more and more on automobiles for daily travel, including longer commutes for work. There are fewer places close enough to walk to (which also makes it harder to include physical activity in our daily schedules). Fewer neighborhoods can support an efficient transit option, leaving the elderly or anyone who is unable to drive with limited transportation options. Finally, more money is spent on roads spanning across a much larger area.

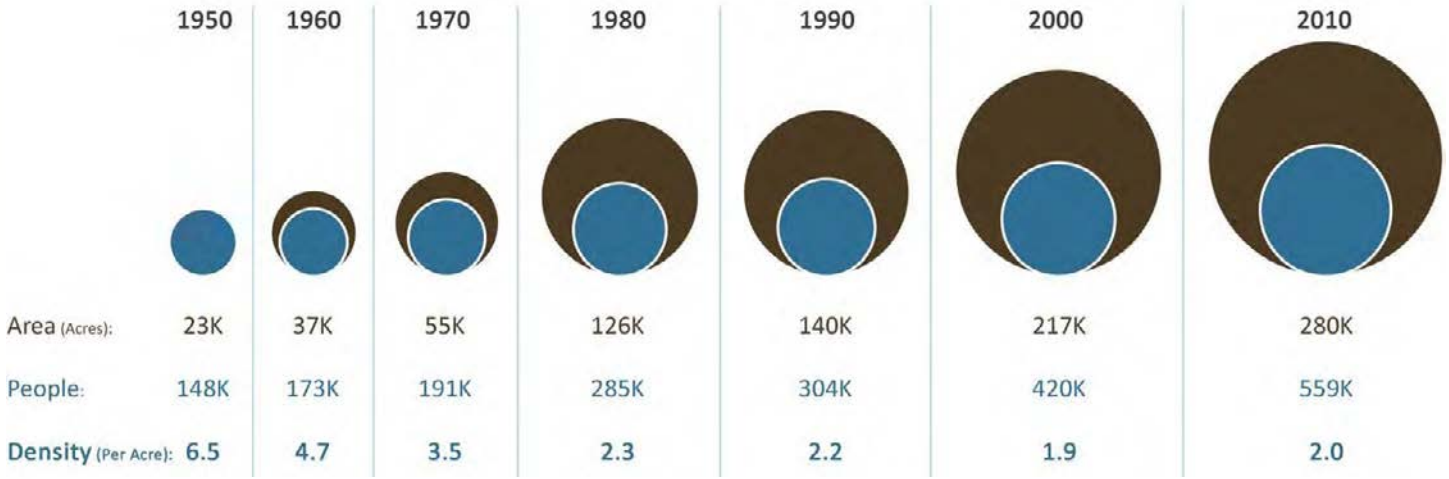


Figure 2-3: Knoxville Urbanized Area Growth, Land Area, People, and Density, 1950-2010

Source: U.S. Census Bureau Urban and Rural Classification, 1950, 1960, 1970, 1980, 1990, 2000, and 2010.

Income and Employment

Most of the counties in the Knoxville Region have between 25 and 30 percent of their households making less than $25,000 annually. Exceptions included Jefferson County, with 33 percent and Union County with 42 percent making less than $25,000. At $49,343, Loudon County had the highest median household income; Union County had the lowest at $30,143. Table 2-2 shows the ranges of income in the Knoxville Region's counties.

Table 2-2: Household Annual Income Levels in the Knoxville Region

County	Less than $15K	$15 - 25K	Over $25K	Median
Anderson	16.8%	12.8%	70.4%	$44,650
Blount	12.7%	11.7%	75.6%	$47,322
Jefferson	18.8%	14.6%	66.6%	$38,239
Knox	14.7%	11.8%	73.5%	$46,759
Loudon	11.6%	13.3%	75.2%	$49,343
Roane	15.5%	13.2%	71.3%	$42,698
Sevier	13.8%	14.2%	72.0%	$41,476
Union	23.2%	18.8%	58.0%	$30,143
Knoxville Region	**14.8%**	**12.6%**	**72.6%**	**$45,224**

Source: 2010 ACS Table B19001

In 2010, there were 576,987 people employed within the Knoxville Region, an increase from 1990 of 37 percent. Sevier, Blount, and Loudon counties have experienced the highest rates of growth in employment since 1990, although Knox County continues to lead the Knoxville Region with 303,682 employees in 2010.

Throughout the Knoxville Region, over the past twenty years, major shifts in employment by industry have occurred (Table 2-3). Manufacturing experienced the sharpest decline from 15.8 percent of total industry employment in 1990, to 6.9 percent in 2010. The largest growth took place in the service and retail sectors. In 1990, these two sectors totaled 38 percent of all industry employment, while increasing to 57 percent in 2010. This reveals a growing shift from a production-based economy to one tied heavily to service and retail industries.

> *"Manufacturing experienced the sharpest decline from 15.8 percent of industrial employment in 1990, to 6.9 percent in 2010."*

Some of the larger employers in the Knoxville Region include the University of Tennessee (10,000 employees) in Knox County, the Department of Energy's Oak Ridge National Laboratory (4,400 employees) in Roane County, Y-12 National Security Complex (4,700 employees) in Anderson County, and Denso Manufacturing (2,700 employees) in Blount County.

Table 2-3: Changes in Employment by Industry, 1990, 2000, and 2010

Knoxville Region	1990	(%) Share	2000	(%) Share	2010	(%) Share
Farm	9,618	2.53	9,344	1.95	6,758	1.30
Agriculture/Forestry/Fishing	2,187	0.58	3,247	0.68	429	0.08
Mining	1,827	0.48	699	0.15	763	0.15
Construction	21,488	5.66	32,148	6.73	29,686	5.73
Manufacturing	60,177	15.85	54,527	11.41	35,583	6.86
Transportation/Public Utilities	15,389	4.05	22,801	4.77	13,592	2.62
Wholesale Trade	18,755	4.94	21,531	4.50	17,605	3.40
Retail Trade	62,911	16.57	92,864	19.43	121,031	23.34
Finance/Insurance/Real Estate	19,491	5.13	31,140	6.51	42,345	8.17
Services	82,668	21.77	145,011	30.34	173,623	33.49
Government	55,913	14.73	62,965	13.17	67,303	12.98
TOTAL full/part time employment	379,660		478,011		518,455	

Source: Tennessee Department of Labor and Workforce Statistics

Commuting to Work

Understanding the travel patterns of people and goods within our transportation system plays an important role in determining future transportation needs.

The automobile is the most common form of transportation within the Knoxville Region, with 84 percent of workers commuting alone in their cars each day. There has been very little change in this travel pattern from 2000 to 2010. Figure 2-4 offers a breakdown of current commuting modes throughout the Knoxville Region.

> *"84 percent of workers commute alone in their cars each day."*

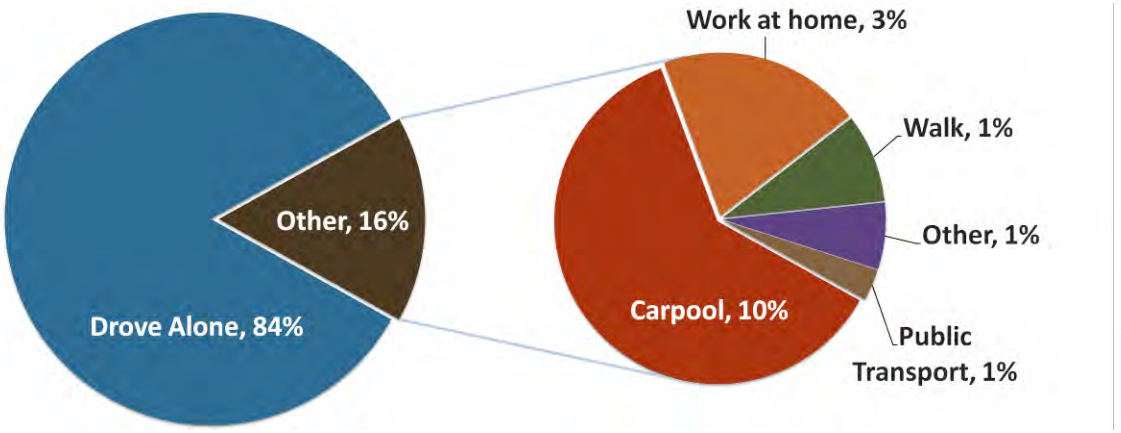


Figure 2-4: Commute to Work by Mode of Transportation in the Knoxville Region

Source: 2006-2010 American Community Survey

Across the Knoxville Region, commuting times are growing longer as people live farther from their jobs and congestion on area roadways increases (see Table 2-4). Workers in Roane County commute an average of 26.1 minutes each way to work, the longest travel time in the Knoxville Region, while workers in Knox County commute an average of 20.9 minutes each way, the shortest time.

Table 2-4: Average Commute Time to Work (Minutes) in the Knoxville Region, 1990-2010

County	1990	2000	2010
Anderson County	20.7	22.9	23.0
Blount County	22.3	24.0	23.4
Jefferson County	22.4	26.4	24.7
Knox County	20.5	22.2	20.9
Loudon County	22.0	24.8	23.2
Roane County	23.2	26.0	26.1
Sevier County	23.5	25.3	24.7
Union County	31.1	31.5	32.4
Knoxville Region	**21.5**	**23.6**	**22.6**
State of Tennessee	**21.5**	**24.5**	**24.0**

Source: U.S. Census Bureau, Journey to Work, 1990, 2000, Selected Economic Characteristics, 2006-2010 American Community Survey 5-Year Estimate, DP03.

Over nine percent of workers commuted more than 45 minutes each way to work in 2010, down slightly since 2000. Residents from one county often commute to another county for work within the Knoxville Region, with Knox County the major attractor for employment. More than 25 percent of the workers in each of Anderson, Blount, Jefferson, Roane, Sevier, and Union counties commute to Knox. The majority of Knox County residents, 79 percent, commute to work within the county. Knox commuters who leave the County for work travel primarily to Anderson and Blount counties (see Exhibit 2-1).

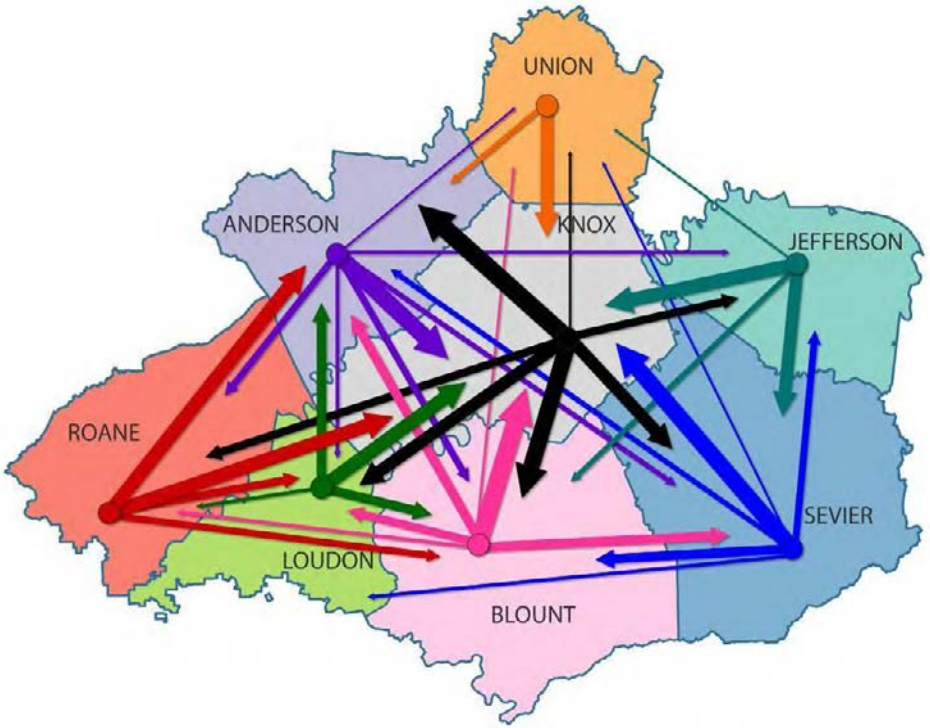


Exhibit 2-1: Commute Flows between Counties
Source: U.S. Census Bureau, Longitudinal Employer-Household Dynamics, 2010.

Increasing Financial Burden

Impacts of the recession that swept the nation in 2009 and 2010 are still being felt. Many local families are struggling financially. It is important to recognize how issues relevant to planning affect families on a personal financial level. In no other area is this clearer than the amount of money families spend on housing and transportation. We look at these two costs as inseparable.

For many people, affordable housing is not always available near their work. If a person moves further from their job for a more affordable home, they often find transportation costs taking a larger share of their income. Families may feel strapped when housing and transportation expenses consume more than 45 percent of their household income. Exhibit 2-2 shows that much of the Knoxville Region exceeds this threshold. Areas below 45 percent are generally concentrated in community centers, both large and small.

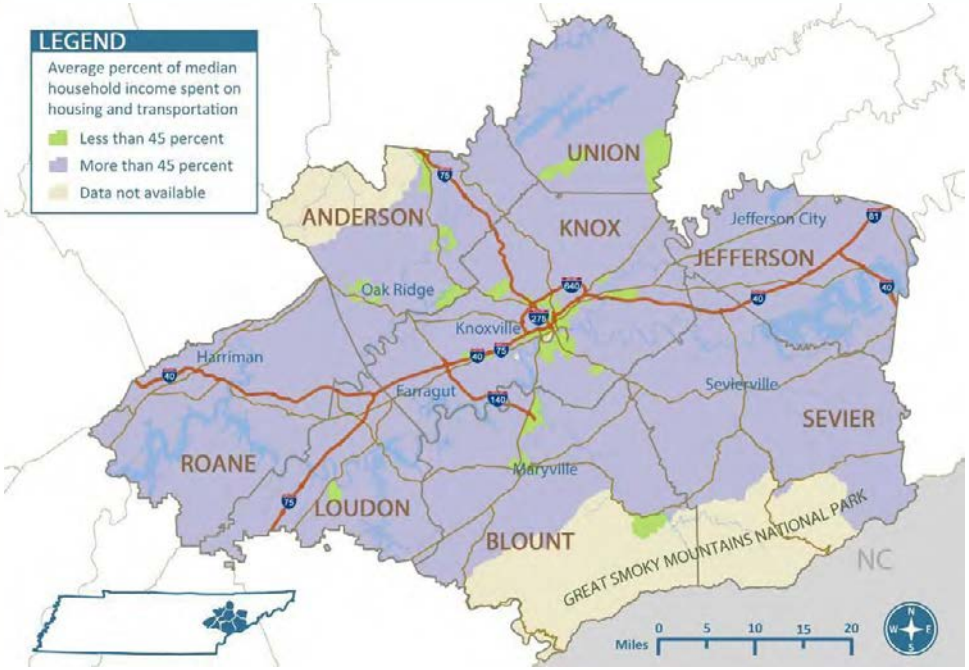


Exhibit 2-2: Share of Income Spent on Housing and Transportation
Source: The Center for Neighborhood Technology, Housing and Transportation Affordability Index.

Any discussion about the cost of transportation must include a look at gas prices. In a region like ours where the vast majority of travel is by personal vehicle, gas prices have a major impact on personal budgets. Figure 2-5 shows just how volatile prices have been over the past five years in our area. This volatility makes planning for transportation costs difficult on households.

> *"Volatile gas prices make planning for transportation costs difficult on households."*

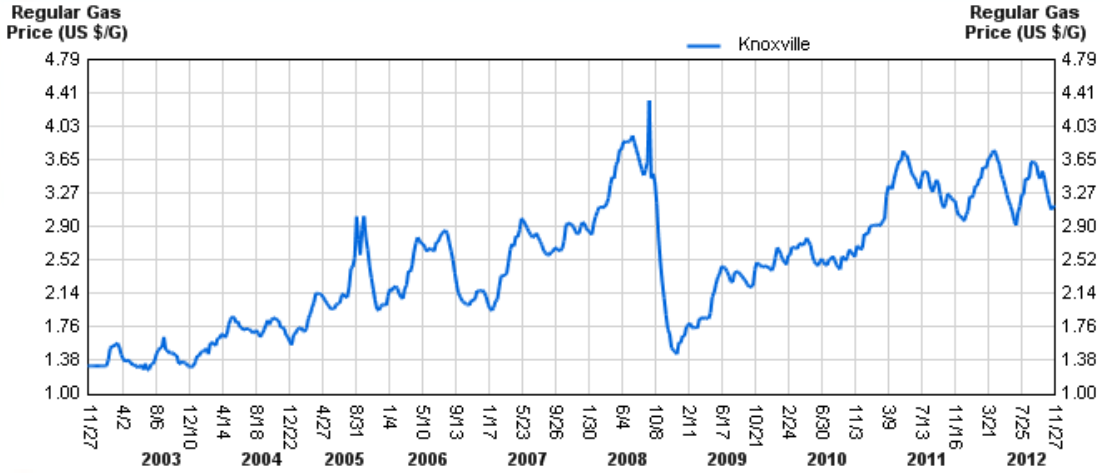


Figure 2-5: Weekly Gasoline Prices in Knoxville, Regular Grade, November 2003 – November 2012
Source: Gas Buddy, December 2012

> *"In East Tennessee, 32 percent of adults are obese."*

Health

Transportation has an impact on our personal health. On the plus side, it can provide access to healthy places and activities. However, lack of transportation options can limit access to physical activity and healthy food choices. In 2012, Tennessee adults ranked second in the nation for physical inactivity, third in incidence of high blood pressure, sixth in diabetes, and 15th in obesity. In East Tennessee, 32 percent of adults are obese, compared with 29 percent statewide.

Table 2-5: Obesity Rates, 2009

County	Percentage of Obese Adults
Anderson	30.8
Blount	33.1
Cocke	36.6
Hamblen	32.6
Jefferson	32.1
Knox	30.6
Loudon	30.6
Roane	34.9
Sevier	30.1
Union	31.9
Knoxville Region	**32.3**

Source: Dept of Health & Human Services, Center for Disease Control & Prevention, County Level Estimates of Obesity, 2009.

There is a growing desire for more opportunities to walk and bicycle in our communities: a national survey found that 47 percent of adults wanted to see their communities made safer for bicycling, and 34 percent wanted to see more facilities for pedestrians.[1] In addition, Centers for Disease Control (CDC) reported that the proportion of adults who walk regularly rose to 62 percent in 2010, compared with 56 percent in 2005.[2]

For these reasons and others, active transportation, such as walking and bicycling, should be a part of all transportation plans and projects.

Transportation also plays a role in access to healthy foods. Neighborhoods with few grocery stores and limited access options to reach those stores or markets elsewhere are known as "food deserts" (Exhibit 2-3). The role of sound transportation planning is especially critical in eliminating local food deserts.

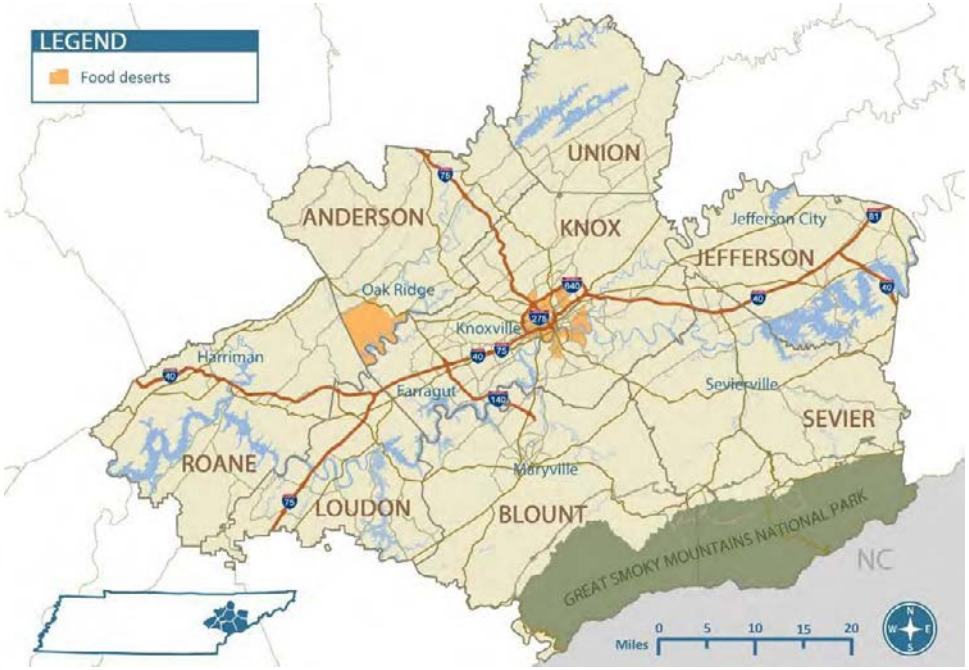


Exhibit 2-3: Food Deserts in the Knoxville Region
Source: USDA Economic Research Service, US Census Bureau 2010

[1] "National Survey of Bicyclist and Pedestrian Attitudes and Behavior," USDOT National Highway Traffic Safety Administration, 2008, **http://www.nhtsa.gov/Driving+Safety/Research+&+Evaluation/National+Survey+of+Bicyclist+and+Pedestrian+Attitudes+and+Behavior**

[2] "More People Walk to Better Health," CDC Vital Signs, **http://www.cdc.gov/vitalSigns/Walking/index.html**

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Getting Around in the Knoxville Region Today

Chapter 3

Roadways

Our roadway network is responsible for the movement of people and goods throughout the Knoxville Region. This includes a mix of passenger, service, and freight vehicles. The convergence of interstates 40, 75, and 81, coupled with several large tourist destinations, generate considerable traffic from within and outside the Knoxville Region. Most notable among attractors are the Great Smoky Mountains National Park, a number of entertainment a recreational opportunities, government facilities, and educational and medical institutions.

Roadway Network Characteristics

There are more than 10,000 miles of public roadways in the eight-county Knoxville Region. Roadways have "Functional Classifications" based on the type of service they provide. Classifications include Arterials (including Interstates & Expressways), Collectors, and Local roadways. This hierarchy of roadways is according to access and mobility, which often compete with one another. The more mobility a roadway offers, the less access to adjoining land uses it typically provides and vice versa. Roughly 75 percent of roadway mileage in the Knoxville Region is made up of Local roadways, which provide the highest level of access to land uses, despite carrying less than 20 percent of total vehicle miles traveled.

> *"There are over 10,000 miles of roadways in the Knoxville Region.."*

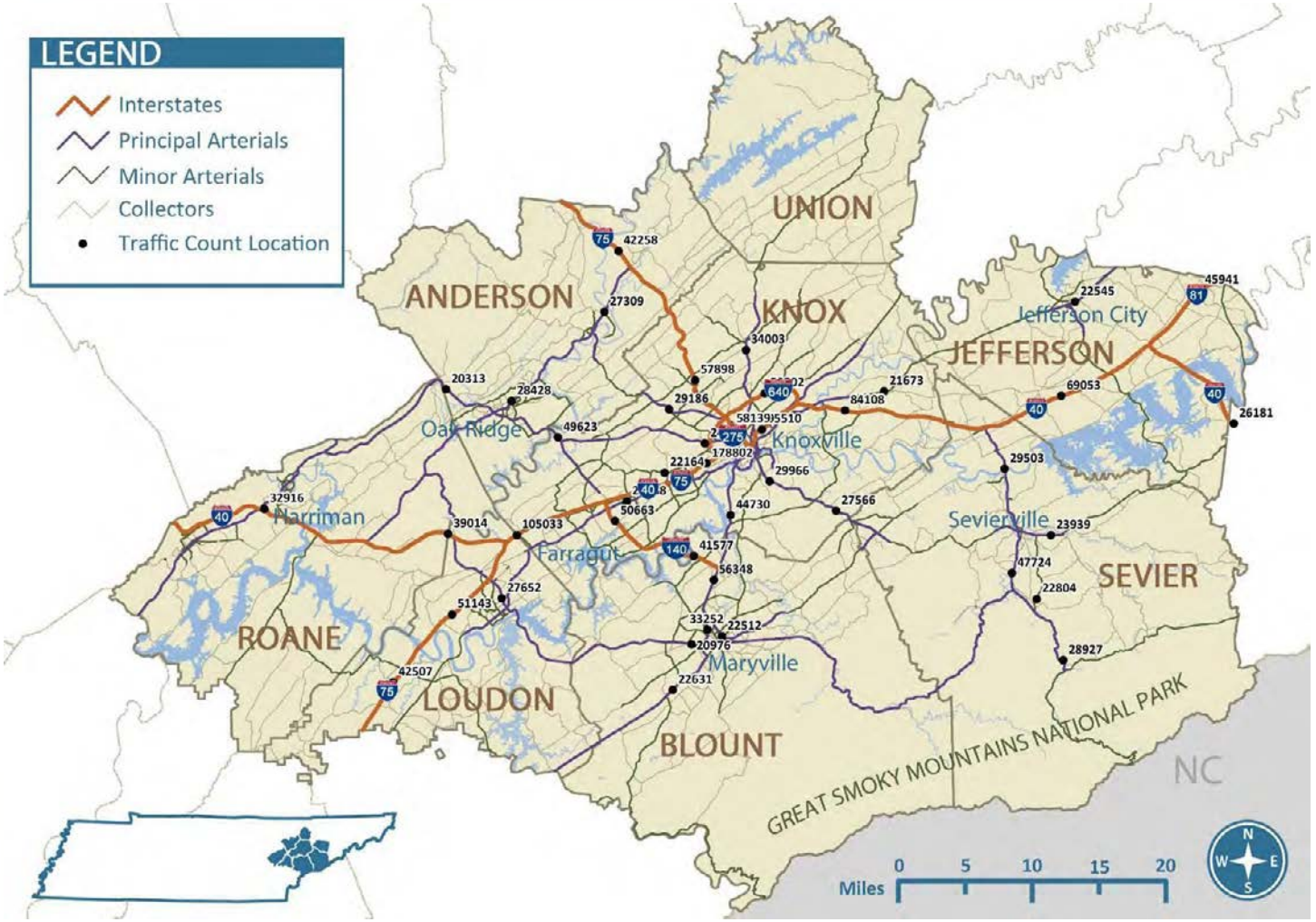


Exhibit 3-1: Functional Classification of Roadways and Select Traffic Counts
Source: Tennessee Department of Transportation (TDOT)

Traffic volume on roadways is measured in terms of Average Annual Daily Traffic (AADT), representing the total number of vehicles traveling daily on a roadway segment. Traffic counts to determine AADT are conducted by Tennessee Department of Transportation and the TPO. The highest traffic volume in the Knoxville Region occurs in the City of Knoxville where Interstates 40 and 75 converge. In 2010, this segment had an AADT of 178,800 vehicles per day.

By regularly collecting traffic count data, it is possible to identify roadways that are experiencing large growth and may begin to exceed their capacity. Table 3-1 lists the top 20 areas for rate of traffic volume growth between 2000 and 2010.

Table 3-1: Highest Traffic Growth Locations 2000 – 2010

RANK	COUNTY	LOCATION	2000 AADT	2010 AADT	% Growth from 2000 to 2010
1	Knox	Lovell Rd (SR 131) south of I-40	16,617	40,200	142%
2	Sevier	Veterans Blvd (SR 449) north of Teaster Ln	10,461	22,804	118%
3	Knox	Callahan Dr west of I-75	10,686	20,629	93%
4	Sevier	Veterans Blvd (SR 449) north of Jayell Rd	9,407	17,662	88%
5	Knox	Schaad Rd east of Oak Ridge Hwy	8,539	14,575	71%
6	Blount	Old Knoxville Hwy (SR 33) north of Hunt Rd	9,423	15,754	67%
7	Knox	Middlebrook Pk (SR 169) east of Lovell Rd	9,757	15,844	62%
8	Knox	James White Pkwy (SR 71) at Tennessee River	10,027	15,846	58%
9	Knox	Lovell Rd (SR 131) north of I-40	9,923	15,575	57%
10	Roane	US 70 west of Pine Ridge Rd	8,343	12,760	53%
11	Knox	Walker Springs Rd north of Kingston Pk	6,849	10,445	53%
12	Blount	US 411 south of Calderwood Hwy	11,335	17,209	52%
13	Sevier	Boyds Creek Hwy (SR 338) east of Chapman Hwy	9,663	13,987	45%
14	Knox	Pellissippi Pkwy (I-140) south of I-40	40,873	58,563	43%
15	Blount	Lamar Alexander Pkwy (US 321) west of Tuckaleechee Tr	13,414	19,046	42%
16	Knox	Hardin Valley Rd west of Pellissippi Pkwy	7,520	10,492	40%
17	Knox	Emory Rd (SR 131) east of I-75	16,893	23,558	39%
18	Knox	I-40 west of Alcoa Hwy	94,341	129,746	38%
19	Knox	Washington Pk north of I-640	12,964	17,806	37%
20	Knox	Pellissippi Pkwy (SR 162) south of Oak Ridge Hwy	33,176	44,969	36%

Source: Tennessee Department of Transportation (TDOT)

Average travel speeds on major roadways within the urbanized portion of the TPO Planning Area are generally collected every three years by TPO staff using GPS-equipped vehicles. Exhibit 3-2 shows the AM and PM peak period average travel speeds collected during the 2009 and 2010 period. The primary purpose for this data collection is to provide information on congestion for the TPO's Congestion Management Process (CMP). The CMP is described in detail in Chapter 7.

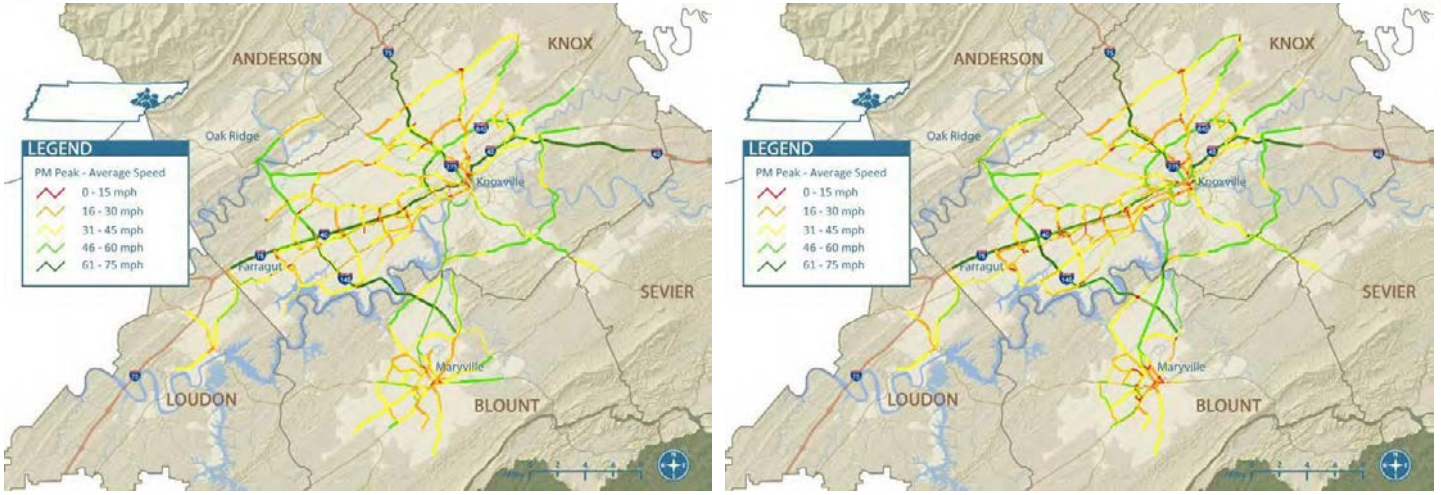


Exhibit 3-2: Average Travel Speed – Morning Peak (left), Evening Peak (right)
Source: Knoxville Regional Travel Demand Model (KRTM)

Roadway Travel Trends

Since 1990, the daily vehicle miles traveled throughout the Knoxville Region grew faster than the population (Figure 3-1). This means people are driving more often and for greater distances. From 1990 to 2000, per capita vehicle miles traveled (VMT) increased in every county in the Knoxville Region except Loudon County. The highest growth occurred in Blount (32 percent) and Sevier (24 percent) counties. However, the trend between 2000 and 2010 in VMT shows a general stabilization and even a decline in some areas. This can likely be attributed to factors such as higher fuel costs and economic recession.

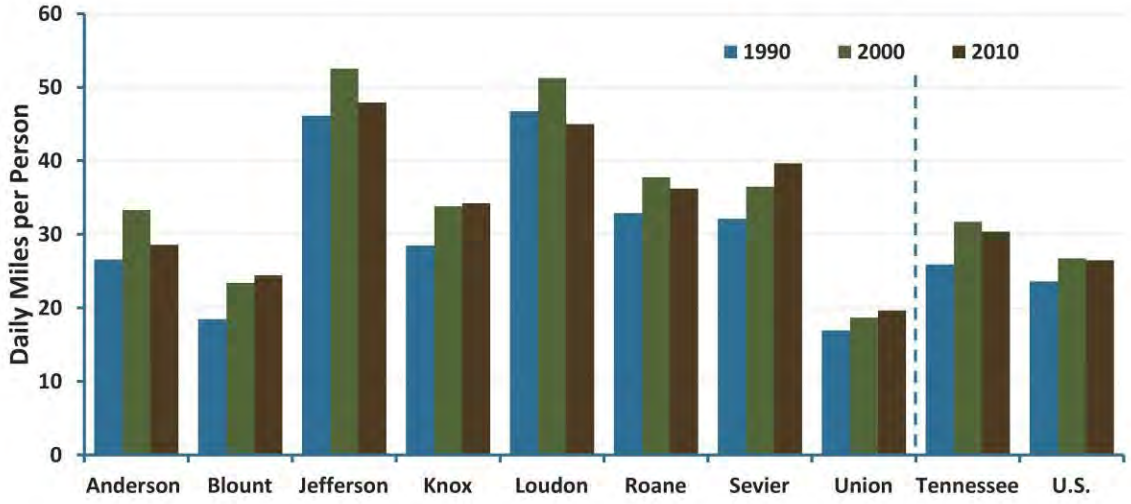


Figure 3-1: Vehicle Miles Traveled (VMT) per Capita in the Knoxville Region, 1990-2010
Source: Tennessee Department of Transportation (TDOT) Highway Performance Monitoring System (HPMS)

Figure 3-2 shows the VMT trend for Knox County from 1990 to 2011. A steady increase in VMT is seen from 1990 to 2005. Since 2005, VMT slowly declined with the exception of 2009.

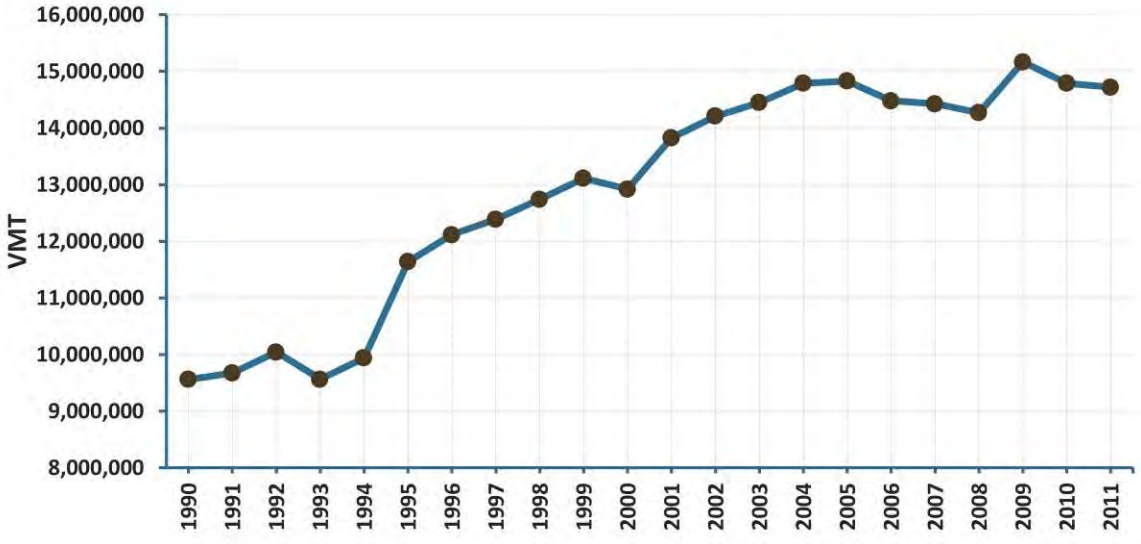


Figure 3-2: Vehicle Miles Traveled (VMT) in Knox County, 1990-2011
Source: Tennessee Department of Transportation (TDOT) Highway Performance Monitoring System (HPMS)

Goods Movement and Freight

Freight is moved from origin to destination by truck, rail, barge, airplane, pipeline, or any combination. Given Knoxville's location along three major interstates, trucking plays a primary role in the movement of goods into, out of, and through the Knoxville Region. The railroad network, waterways, and Knoxville Regional Airport also contribute.

Existing Conditions

Nearly 635 million tons of freight move across the Knoxville Region's transportation network each year by truck, rail, barge, or airplane. About seven percent (42 million tons) has an origin or destination in the Knoxville Region with trucks handling the much of this with approximately 31.8 million tons (75.7 percent). Rail is responsible for 7.1 million tons, (16.7 percent), barge 3.1 million tons (7.3 percent), and aircraft handling 46,000 tons (0.1 percent).

> *"Nearly 635 million tons of freight move across our region's transportation network each year, by truck, rail, barge, or airplane."*

Trucking

The trucking industry is responsible for handling 70 percent of the 16 billion tons of freight moved across the nation's transportation system each year. Trucks also handle an additional 18 percent of freight at some point during its shipment. This includes rail, air, or barge freight that is moved to a truck for a portion of its trip. Truck activity has escalated in recent years and will continue to place great demands on the transportation system, particularly the interstate highways.

A large volume of truck traffic uses the interstate system in Knoxville to transport freight to or from various parts of the country. Almost 530 million tons of freight move across highways in the Knoxville Region each year, resulting in nearly 28 million truck trips in 2007. Of that total, 31.8 million tons of freight and 1.7 million truck trips have either an origin or destination in the Knoxville Region, meaning 94 percent of the truck tonnage and 87 percent of truck traffic that enter the Knoxville Region are passing through. Exhibit 3-3 below shows average daily truck traffic on interstates and major highways throughout the Knoxville Region. The thicker lines indicate higher volumes of truck traffic.

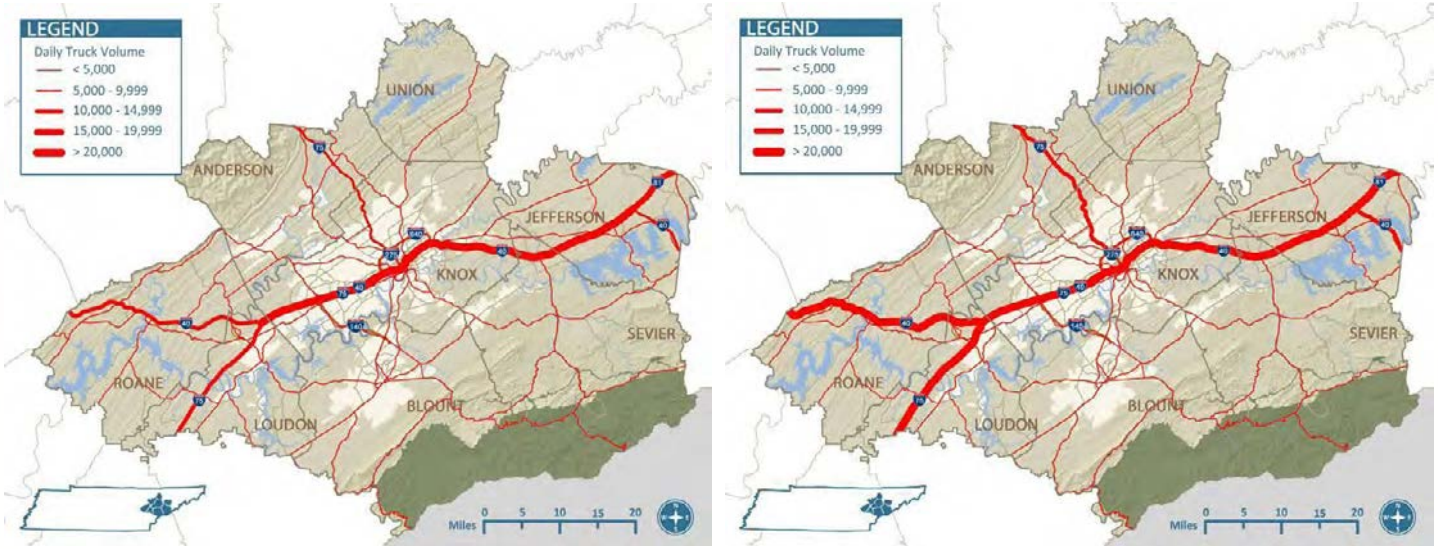


Exhibit 3-3: Knoxville Region Average Daily Truck Traffic in 2007 (left) and 2035 (right)
Source: Tennessee TranSearch Database, 2007

Rail

Nearly 100 million tons of freight move by railroad throughout the Knoxville Region each year. Only seven million tons have an origin or destination in the Knoxville Region, meaning 93 percent is passing through. Approximately 1.2 million tons (12 percent) is annual outbound freight and about 5.9 million tons (16.8 percent) is inbound freight. There are approximately 310 miles of railroad throughout the Knoxville Region operated by two major Class I railroads, Norfolk Southern and CSX, and one short line railroad, the Knoxville & Holston River Railroad. Exhibit 3-4 below shows average daily rail traffic throughout the Knoxville Region. The thicker lines indicate higher volumes of rail traffic.

> *"Nearly 100 million tons of freight move by railroad throughout the Knoxville Region each year."*

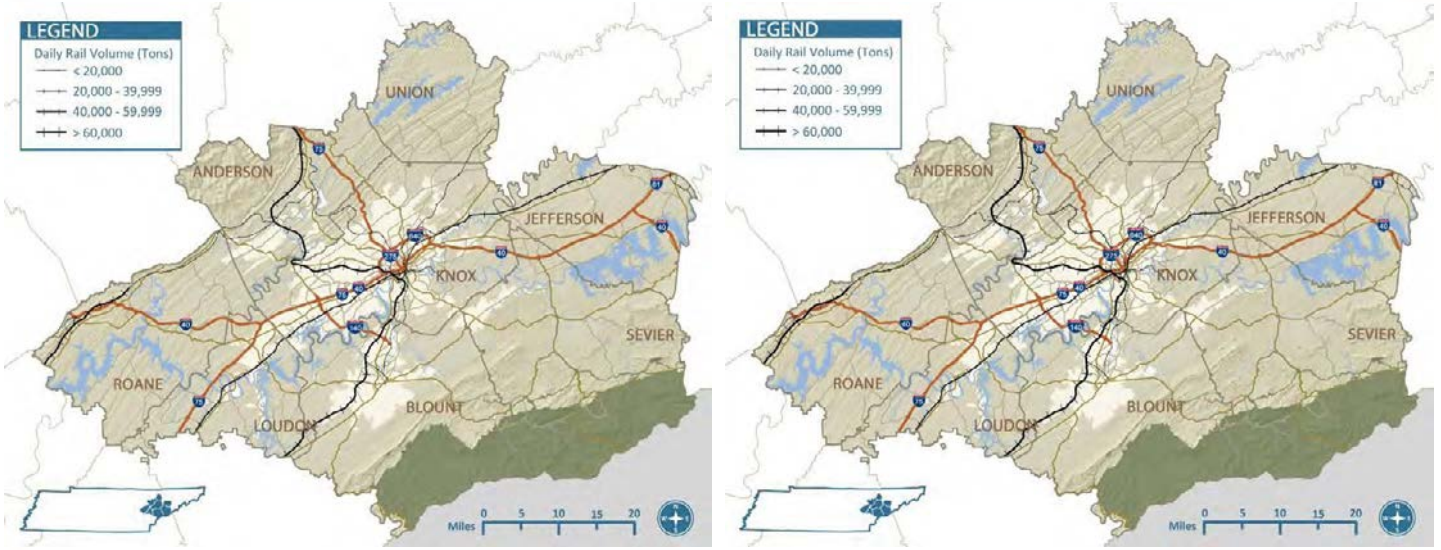


Exhibit 3-4: Knoxville Region Average Daily Rail Traffic - 2007 (left), 2035 (right)
Source: Tennessee TranSearch Database, 2007

Intermodal

Moving freight in intermodal containers allows commodities to ship between transportation modes in a single container. This allows for a shipment of intermodal containers by barge or rail to be loaded to truck trailers without any handling of the freight itself.

A study done by Wendell Cox Consultancy concluded that if by 2025, 25 percent of the freight shipped through the U.S. was moved by intermodal rail rather than by truck, the reduction in truck VMTs on the nation's roadways would allow the average person traveling during peak periods to save 44 hours annually. This also means saving more than 17 billion gallons of gasoline and diesel fuel, while reducing mobile emissions (carbon monoxide, VOCs, and NOx) by 900,000 tons.

Norfolk Southern is in early stages of trying to site an Intermodal Facility in the New Market area of Jefferson County. The number of trips associated with this facility is still preliminary, but it would provide freight transfer from truck to rail within the Knoxville Region.

Maritime

Commercial navigation of the Tennessee River System is possible by the Tennessee Valley Authority's (TVA) system of dams and locks. The dams create reservoirs that control the current and depth of water,

maintaining 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 20 million tons of this is coal shipped to TVA power plants.

Since commercial navigation of the Tennessee River begins in Knoxville, there are no pass through barge trips. Approximately four million tons of annual barge freight has an origin or destination in the Knoxville Region.

Air

Air cargo, the combined activities of air freight and air mail, can be shipped either in the cargo hold of commercial passenger aircraft (belly haul) or on aircraft dedicated to air cargo. Since the 1980s, air cargo experienced dramatic growth within the transportation industry. Locally, there is a 21-acre Air Cargo Complex at McGhee Tyson Airport, built to serve the major air cargo operators servicing the Knoxville Region. Annually, about 4,000 arrivals and departures at the Airport are freight trips.

> *"Nearly 40,000 tons of air freight are handled at McGhee Tyson Airport…"*

Nearly 40,000 tons of air freight are handled at McGhee Tyson Airport, with only 0.1 percent of that mail. Three other air traffic facilities operate in the Knoxville Region. The Knoxville Downtown Island Home Airport handles approximately 18,000 aircraft operations each year, none of which is air cargo. Very little freight is handled at Morristown Municipal Airport. Skyranch Airport in South Knoxville near Alcoa Highway handles less than 5,000 aircraft operations each year.

Pipeline

Two major pipelines operated by Colonial Pipeline and Plantation Pipeline transport petroleum products from refineries along the Gulf Coast directly to terminals located on Middlebrook Pike between Amherst Road and Ed Shouse Drive in 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 truck activity for tanker trucks that deliver fuel to retail fuel stations throughout the region.

Public Transportation

Economic uncertainty, rising gas prices, and environmental concerns have generated a growing interest in regional public transportation. Citizens from a variety of backgrounds and residential locations are seeking alternative transportation solutions. As a result, transit ridership reached levels not seen in over 25 years.

> *"As demand for transit service grows, tax revenues that support transit are shrinking at federal, state, and local levels."*

The same conditions that draw riders to transit also place a burden on transit providers. The increasing costs of fuel, health care, and wages have driven the cost of providing transit service dramatically higher in recent years. Much like roadway-based transportation, user fees (fares) do not fully cover the costs of public transit service. Transit providers must find additional funds to pay for services. This typically involves government grants, and this is true of transit service in Knoxville. As demand for transit service grows, tax revenues that support transit are shrinking at federal, state, and local levels. However, unlike roadway transportation, it is uncommon to fill these gaps with infusions from general funds.

In recent years, additional riders have discovered the services offered by demand-response transit providers, which serve suburban and rural areas. Unfortunately, this has placed additional stresses on an already strained system. Providing expanded service to a comparatively smaller number of riders in less densely settled areas is a challenge for local transit carriers.

> *"The Fuel Paradox: when gas prices are high, riders are drawn to transit, but increased transit operating costs (fuel) threaten to increase fares or reduce services."*

The Fuel Paradox

The fuel paradox says that when gas prices are high, riders are drawn to transit, but increased transit operating costs (fuel) threaten to increase fares or reduce services.

Public transit agencies are going to need new and stable funding sources and increased coordination to meet this increasing demand. Just as with national trends, locally, transit providers have had to increase their fares and reduce services. Fortunately, the service reductions to date in our area have been minimal.

While these challenges may cast a dark cloud over transit's future, there is good news. Transit ridership is at its highest level in at least 25 years. Many of the new riders are making the personal choice to ride. Knoxville Area Transit (KAT) opened a new state-of-the-art transfer center with a number of updated transit routes. KAT has also implemented an Intelligent Transportation System (ITS) project that placed global positioning satellite (GPS) units on its buses.

Innovating to Strengthen Public Transit

Citizens want a variety of transportation options in the Knoxville Region, including more transit service. The Mobility Plan lays out a regional vision for transit. Much of this incorporates and builds upon transit studies and community plans completed over the last 10 years. Key short-term strategies include a focus on efficiency, coordination, technology, marketing, innovation, and amenities. Then, in the long term, transit services will be in a stronger position to expand as new funding partners and dedicated revenue sources become available. Over time, the creation of a seamless, easy-to-use transit system will improve mobility in the Knoxville Region.

Such a system is essential to provide citizens in the Knoxville Region with practical alternatives to driving alone.

Knox County Community Action Committee (CAC) Transit and the East Tennessee Human Resource Agency (ETHRA) continue to provide a valuable service carrying hundreds of citizens to work, medical appointments, and other destinations. Knox County CAC Transit (2010) and ETHRA (2011) have implemented ITS projects to upgrade their ability to track vehicle location and allow for more efficient scheduling of services. The Knoxville-Knox County CAC Office on Aging has launched a new innovative project, called Volunteer Assisted Transportation (VAT), which allows volunteer drivers to escort elderly or disabled passengers to medical appointments, shopping errands, and other activities. This service allows many in the community to remain in their home longer. The VAT program, in its brief three years, recently completed its 10,000th trip.

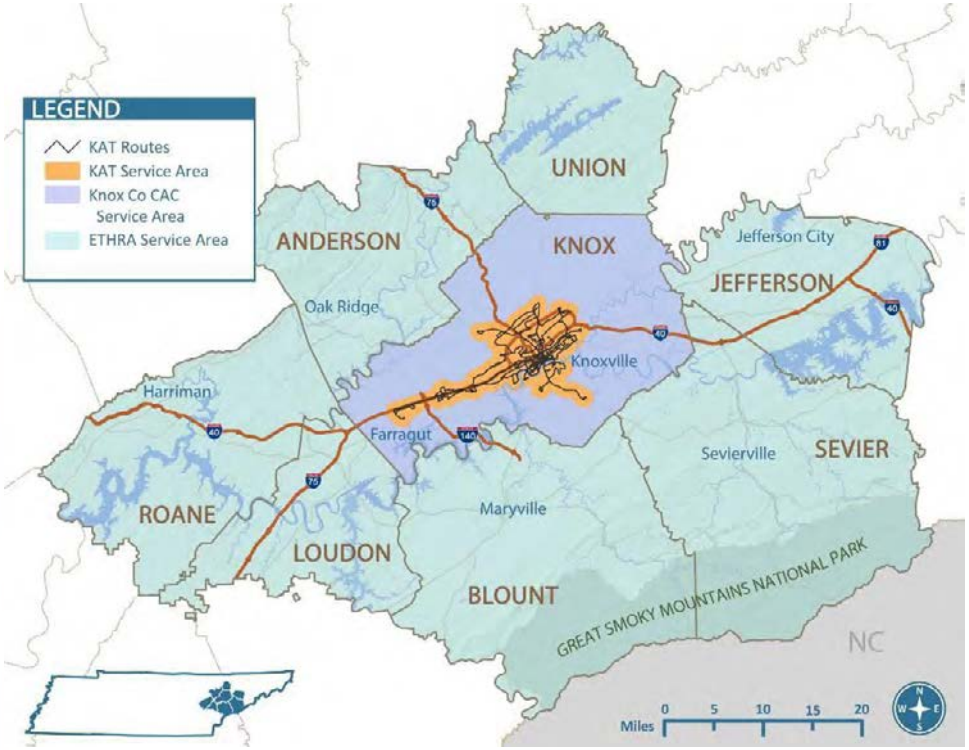


Exhibit 3-5: Transit Service Areas in the Knoxville Region
Source: KAT, ETHRA, and Knox County CAC Transit

> *"In 2012, KAT provided approximately 3.6 million passenger trips."*

Existing Conditions

Knoxville Area Transit (KAT)

KAT is the largest provider of public transit in the Knoxville Region. KAT focuses a majority of its services within the City of Knoxville but does provide some service in Knox County outside city limits (see Exhibit 3-5 above). KAT provides fixed-route bus service, downtown trolley circulators, and door-to-door paratransit service for the disabled. The KAT fixed route bus system consists of 28 routes and over 2,000 stops served by a fleet of 74 buses and 20 demand-response vans. In 2012, KAT provided approximately 3.6 million passenger trips. In June 2013, KAT will be making significant changes to its fixed-route system. Most of the core routes (Kingston Pike, Broadway, and Magnolia Avenue) will be upgraded from every 30 minutes now to every 15 minutes. Some neighborhood routes that currently run hourly will increase to every 30 minutes. In addition, KAT will add two or three new routes and modify some existing routes. For the most up-to-date map, visit **www.katbus.com**.

Knox County Community Action Committee (CAC) Transit

Knox County CAC Transit provides public demand-response transportation for Knox County. A key part of CAC Transit's mission is to increase access to community resources for those with no other means of transportation. CAC Transit uses multiple funding sources to provide services. Some sources allow them to provide service to the public while other services are limited based on funding or pre-determined eligibility requirements. A majority of trips provided are healthcare related. CAC Transit also provides Job-Ride, a demand responsive service for employment and training that operates 24 hours a day, seven days a week. CAC Transit averages 815 one-way trips per day and provides over 200,000 one-way trips a year. In FY 2012, CAC Transit provided 15,009 Job Access trips and 4,441 New Freedom trips. In FY 2012, CAC transit vehicles traveled 1.75 million miles in providing transportation services. The majority of CAC Transit trip origins and destinations are within Knox County however, some do begin or end outside of the county. For FY 2012, 52 percent of CAC Transit's trips were for medical purposes, 30 percent were for employment and training, and 18 percent were other essential errands.

> *"In FY 2012, CAC transit vehicles traveled 1.75 million miles in providing transportation services."*

Volunteer Assisted Transportation Program

The Volunteer Assisted Transportation (VAT) program is part of the Knox County CAC Office on Aging, funded through the FTA New Freedom program and matched by TDOT and CAC. The VAT is a nonprofit, volunteer-driven program that provides accessible and affordable transportation services to Knox County seniors and people with disabilities who require aid and assistance to travel safely. The VAT program also has a mobility navigator who acts as a "transportation counselor" working one-on-one with clients to find them the best

transportation options. Finally, the VAT program has the resources to contract with Knox County CAC Transit for group or coordinated trips. For FY 2012, 43 volunteers provided 4,441 trips, and VAT contracted for another 1,027 rides and provided 815 people with transportation counseling or information.

East Tennessee Human Resource Agency (ETHRA)

ETHRA provides public demand-response transportation to residents of 16 counties in East Tennessee. ETHRA's goal is to provide affordable, safe, quality, dependable transportation. While ETHRA's primary focus is to serve residents who have no other source of transportation. ETHRA operates 115 vehicles and provides 250,000 one-way trips a year. In FY 2012 ETHRA provided the most trips in Knox County (46,016) and the fewest trips in Morgan County (5,213). This also included 35,719 trips in Hamblen, 31,076 in Blount, 4,215 in Grainger, and 3,872 in Union County. In FY 2012 39 percent of ETHRA's trips were for medical purposes, 15 percent were for employment, and the remaining 46 percent divided among a variety of purposes.

> *"ETHRA operates 115 vehicles and provides 250,000 one-way trips a year."*

Oak Ridge Transit System

The Oak Ridge Transit System provides public transit service throughout the City of Oak Ridge. Oak Ridge Transit operates three ADA accessible mini-buses and a van. The system served 6,000 riders in FY 2012. The City of Oak Ridge also has a taxicab voucher program that helps offset the cost of fares for citizens who are elderly or disabled.

Gatlinburg Trolley System

The Gatlinburg Trolley System is the fifth-largest transit system in the state. The system includes 20 trolleys that provide service on six fixed routes throughout the City of Gatlinburg with connections to the Great Smoky Mountains National Park, Dollywood, and the Welcome Center. The system handles 800,000 passenger trips per year.

Pigeon Forge / Sevierville Fun Time Trolley

The Fun Time Trolley provides service throughout the cities of Pigeon Forge and Sevierville with connections to Dollywood and the Gatlinburg Welcome Center. The Fun Time Trolley carries about 650,000 passengers per year and has 39 trolleys in its fleet.

Section 5310 and Other Providers

Section 5310 refers to the FTA program known as *Transportation for Elderly Persons and Persons with Disabilities*. This program, administered by TDOT, provides funding to agencies (typically non-profits) to

purchase vehicles. Occasionally, Knox County CAC Transit, KAT, and ETHRA have received Section 5310-funded vans. A number of other organizations have also received Section 5310-funded vans. These include the Sertoma Center, Cerebral Palsy Center, Douglas Cooperative (Sevierville), and the Lakeway Achievement Center (Morristown – Lakeway TPO area).

Existing Studies, Plans, and Programs

This section gives an overview of recent studies, plans, and programs that are significant to public transportation conditions in the Knoxville Region.

Regional Transportation Alternatives Plan (RTAP)

Though completed in 2002, many of the recommendations and concepts outlined in the RTAP are still valid today. The RTAP identified corridors throughout the Knoxville Region that will support alternative transportation modes. The planning process identified five areas of concern:

1.) People want choices in transportation;
2.) The community has an interest in rail;
3.) Communities still need highways;
4.) No one transportation mode will provide the solution; and
5.) People are concerned about whether mass transit is affordable.

The 2002 proposed transit concept starts with a series of express buses connecting the Knoxville Region (see Exhibit 3-6). These express buses will connect key areas, including Oak Ridge, Maryville and Alcoa, Lenoir City, Knoxville, Sevierville, and Pigeon Forge. Strategically placed transfer centers will allow passengers to connect between express routes and local services. An important element is a proposed bus rapid transit (BRT) connection from Interstate 40 to Sevierville, Pigeon Forge, and Gatlinburg. BRT is similar to light rail, separating transit vehicles from traffic but uses rubber-wheeled vehicles instead. The key to this service is the separation from the rest of the traffic allowing the BRT vehicle to keep moving when congestion occurs.

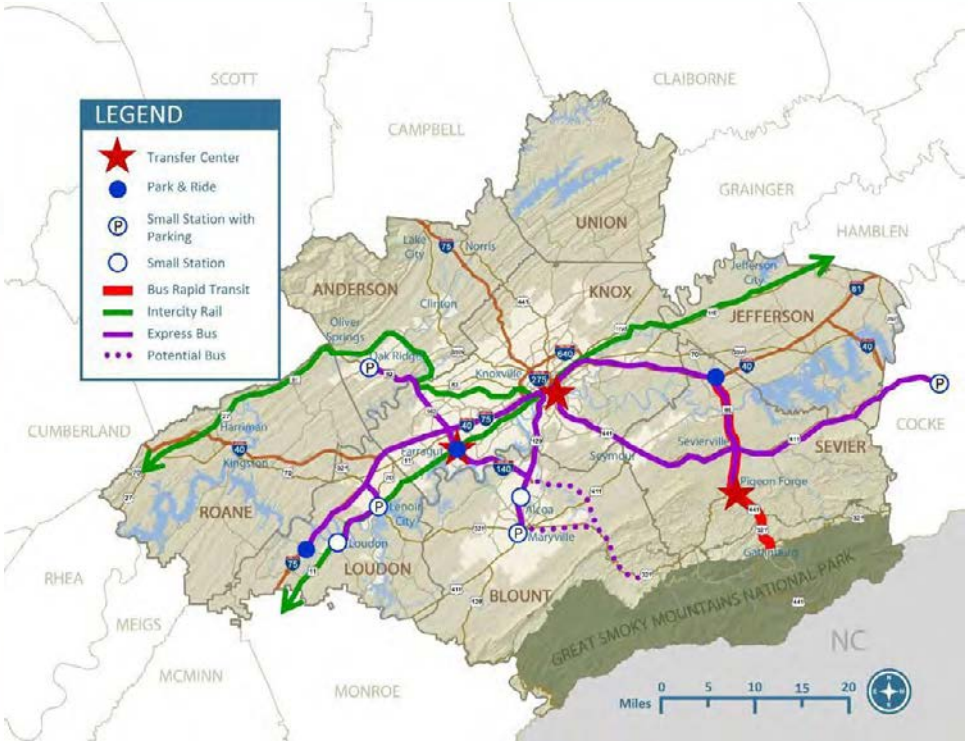


Exhibit 3-6: Regional Transportation Alternatives Plan Map
Source: Regional Transportation Alternatives Plan

Knoxville Human Services Transportation Coordination Plan (HSTCP)

The HSTCP identifies gaps in existing services, proposes strategies to address those gaps, and examines opportunities to coordinate services. It outlines how Job Access and Reverse Commute (JARC), New Freedom, and Section 5310 (Elderly Individuals and Individuals with Disabilities) funds will be distributed in the Knoxville Region. The HSTCP is currently being updated with completion scheduled for May 2013. One key issue the HSTCP will address is how the area will transition programs funded under the last transportation bill (SAFETEA-LU) that are now either being eliminated or merged with other funding programs under the new transportation bill – Moving Ahead for Progress in the 21st Century Act (MAP-21). The urban area still has FY 2012 funds available, which remain under guidance of the SAFETEA-LU regulations so the HSTCP and the Mobility Plan will continue to reference these older programs along with the new ones created under MAP-21.

JARC funds are available to help provide transportation services to get people to work, job training, or education-related activities. New Freedom funds help people who are disabled. Typically, agencies must use these funds to provide new services. Section 5310 funding is also open to non-profits. However, agencies

typically use these funds to buy vans, which must predominately carry elderly and/or disabled individuals. Federal regulations require the HSTCP to help coordinate how the funds are distributed and to make sure they are being used efficiently.

The HSTCP created four broad strategies and ranked them based on a review of other studies, surveys, and public input:

1.) Provide additional, affordable, and accessible service;
2.) Coordinate services and increase efficiency;
3.) Educate citizens about the availability of transit services; and
4.) Create greater access to transit by providing infrastructure and amenities such as sidewalks, shelters, and signs.

The Knoxville Regional Project Action Coalition has been very active in helping to update the HSTCP. The Coalition is an outgrowth of the Knoxville Region being selected by the Easter Seals Project Action organization as one of 10 communities across the United States to participate in the 2011 Accessible Transportation Coalitions Initiative (ATCI). A goal of the Coalition is to foster cooperation between transportation providers and the disability community to increase mobility for people with disabilities. The Knoxville coalition is made up of transit service providers and people who are or who represent people with disabilities and the elderly. The coalition is providing input into the HSTCP and acting as a catalyst to spur local coordination between the transit providers. The Project Action Committee has determined that most of the strategies and projects in the HSTCP are still valid.

After each decennial census, the U.S. Census adjusts the urban area boundaries across the Country. Between 2000 and 2010, the Knoxville urban area recorded the largest increase in population in the State of Tennessee (33 percent). The new transportation law, called Moving Ahead for Progress In the 21st Century Act (MAP-21) went into effect on October 1, 2012. MAP-21 provides the rules and regulations to receive Federal Transit Administration (FTA) funding. MAP-21 eliminated some FTA programs and merged others. Both of these will have a significant impact on transit services and their riders. How these changes will be addressed is currently unresolved but will be a major focus in the months and years to come.

The urban area affects the transit funding that comes to the Knoxville Region. FTA funding is broken down by urban or rural. As the urban area grows, the rural area shrinks. The urban area grew in Knox, Blount, Loudon, Anderson, and Sevier County. The amount of transit urban funding an area receives is determined by Congress each year based on a formula that considers an area's characteristics such as the amount of transit already

being provided and an area's urban population. While the urban area grew significantly, the amount of new FTA funding coming to the Knoxville area is projected to be minimal. KAT currently utilizes this funding to provide services. During 2013, the former rural areas that are now in the urban area will no longer be able to be served with rural funds. To date, a majority of the operating costs in the urban area are paid with local funds. This is not the case for communities being served with rural funding. Transit operations are paid for by a variety of funding sources. As a result, the local communities that are loosing the rural transit service may have to begin to pay for transit services.

One program cut under MAP-21 provided funding to transport low-income persons to work or job training. These funds went to Knox County CAC Transit, which provided 25,000 trips last year. If the community wants to keep this service, FTA recommends funding it through the urban funds. This could put additional demands on those funds. These service and funding issues must quickly resolved. While each transit agency and their respective Boards will be involved, nationwide, the final decision typically rests with the local MPO. How to serve the citizens of the Knoxville Region who now have access to transit services, but no longer will, is a complex issue. Key decisions on how the Knoxville Region allocates the urban and rural funding will be important. Local governments may need to provide funding to match federal grants in order to keep these services. Whatever decisions are made, it should be recognized that there might not be enough funding to address every need. These issues need to be addressed soon to avoid a situation where residents are unable to get to their jobs or doctor appointments. The TPO staff is coordinating meetings, which seek to determine how best to resolve these issues and these decisions will be incorporated into the updated HSTCP.

Opportunities, Needs, and Challenges

Human Services Transportation Coordination – Tennessee State Legislation (2011)

Tennessee Governor Bill Haslam signed into law a bill on May 17, 2011 that supports and promotes human service transportation coordination. The bill created an interagency transportation coordination committee, to include representatives of state departments to coordinate transportation efforts of state and local government. The coordination committee will also have representatives from Tennessee's state departments of transportation, human services, children's services, finance and administration, veterans' affairs, and other departments, as well as one member of the Senate Transportation Committee and one member of the House Transportation Committee. The coordination committee's charge is to:

1.) Improve transportation coordination;
2.) Improve methods of delivery of passenger transportation;
3.) Improve effectiveness of service and improve overall financial efficiency;

4.) Improve universal mobility for Tennessee citizens and visitors; and
5.) Identify opportunities and barriers, and recommend solutions to improve transportation coordination.

Many aspects of this law are in keeping with the requirements and recommendations of the Knoxville Regional Human Services Transportation Coordination Plan (HSTCP).

Regional Transportation Authority (RTA) – Tennessee State Legislature (2009)

The Tennessee state legislature approved a bill on May 20, 2009 that allows for the creation of a RTA by any combination of two or more adjacent local governments with a combined population of at least 200,000. Several transit studies for the Knoxville Region have identified the need to explore the creation of an RTA as a mechanism to coordinate, promote, and possibly fund transit throughout the Knoxville Region. Studies that have examined RTAs across the country have shown a single regional organization can:

1.) Maximize existing resources;
2.) Assist in reducing congestion by providing alternatives to automobile use;
3.) Improve the quality of life for those persons who cannot drive by providing them opportunities to participate in regional activities;
4.) Advocate for a regional land use strategy that supports regional transit and promotes transit use; and
5.) Improve the air quality of the Knoxville Region.

The Mobility Plan does not recommend that a RTA be created at this time or take a position of how the RTA should be organized. However, it is worthy of continued study and discussion.

Passenger Rail Opportunities

RTAP and Regional Transit Corridor Study concluded that passenger rail in the Knoxville Region is unlikely in the near future. However, this does not mean that efforts should not be undertaken to continue to assess potential opportunities. During recent PlanET community meetings, many citizens expressed interest in light rail, commuter rail, and vintage trolley rail. As rail projects are extremely expensive, often running into the hundreds of millions of dollars, most cities fund rail projects by using federal grants. FTA has a very competitive process in which dozens of cities apply for funding yearly but only a few are selected. Attributes like residential and employment density and existing transit ridership are considered when awarding funding. In addition, there has been a renewed interest at the Federal level for passenger rail expansion.

Because of some unique characteristics of the Knoxville Region in regards to tourism, economic development, and poor air quality, the issue of developing rail should continue to be explored. Future opportunities most often cited include linking downtown Knoxville, the University of Tennessee, and the new South Knoxville Waterfront using a vintage rail trolley or light rail. Other options include using light rail or commuter rail to link:

1.) Knoxville to Sevierville, Pigeon Forge, Gatlinburg, and the Great Smoky Mountains National Park;
2.) Downtown Knoxville to Maryville, Alcoa, and McGhee Tyson Airport; or
3.) Downtown Knoxville to west Knoxville.

Further considerations for commuter rail include links from Knoxville to Chattanooga, Knoxville to Nashville, or Knoxville to Johnson City and Bristol, Virginia (as a continuation of possible I-81 corridor improvements in Virginia). The continued study of these possible opportunities would position the Knoxville Region to move more quickly for federal funds if circumstances evolve that justify rail.

Dedicated Funding

In order to expand transit services there is a need to identify a dedicated funding source. Dedicated funding can occur from statewide legislation to local level funding initiatives. Work must begin to build a constituency to support transit objectives. Efforts should commence to recruit transit allies throughout the Knoxville Region including city and county governments, local businesses, non-profits, colleges and universities, and the public.

Services for the Elderly and Persons with Disabilities

Transportation must be accessible to all residents, including those that cannot drive, such as the elderly and persons who are disabled. Outside of KAT's service area, there are transit services that can get people to medical appointments. While getting to the doctor is important, people also want to be able to shop, visit friends, go out to eat, or go to the movies–activities that most people take for granted. Often the elderly may not qualify for ADA Services and are unable to fully use the fixed-route KAT system. Even if a person can afford taxis, very few, if any, are ADA accessible. Demographics show dramatic increases in our elderly population. People are outliving their ability to drive by seven to 10 years. A proactive policy to designing travel options for the elderly and disabled needs to be undertaken.

Inter-City Transportation

A need for inter-city public transportation services was identified in several planning initiatives, including Plan East Tennessee (PlanET). The demand for affordable travel options to other cities throughout the Knoxville Region will continue to grow.

Suburban Rural Transit Service

Much of the suburban and rural area does not have adequate access to public transportation services. While Knox County CAC Transit and ETHRA try to meet some of this demand, a majority of their services are geared towards persons who are disabled, elderly, or need medical services. There is very little transit available for the choice rider.

Downtown Transit Opportunities

Downtown transit opportunities should be enhanced. A "park once and ride transit" concept should be supported. New developments, including parking structures should accommodate transit services, and expansion of the trolley system should occur. An overall parking strategy that includes parking policies, pricing that encourages transit usage should be explored.

Super Stops

Designated stops should be developed where trunk line routes, cross-town routes, and neighborhood and suburban circulators intersect, facilitating a timed transfer network. The stops should include shelters and passenger amenities such as restrooms and ticket booths. Support services such as ATMs, bill paying services, banking, cleaners, and even convenient marts or restaurants should be developed at major activity centers.

Express Services & Park-and-Ride Lots

Express routes should be offered throughout the Knoxville Region. Services should originate from park-and-ride lots and provide limited-stop service via the interstate or major arterials to major attractors. Where practical, reverse commute opportunities, as part of express bus services should be explored. A park-and-ride study that identifies potential lots and strategies to encourage participation by parking lot owners should be prepared.

Technology

Local transit providers should take advantage of emerging technologies to help promote and simplify the use of transit. Transit providers should work in concert such that ITS applications can work regionally. ITS technology can be used to obtain greater efficiencies in transit operations.

Pedestrians and Greenways

Walking is the most basic means of transportation. It is the most accessible, inexpensive, and simple. Those parts of cities and towns that were built while walking and streetcars were the main forms of transportation were constructed to safely accommodate pedestrians. Much of the infrastructure built since then has been designed primarily to serve cars, with the needs of pedestrians and other users secondary, if they were considered at all.

Some places in the Knoxville Region are working to counter this trend. This includes significant investment in planning and constructing greenways and sidewalks and policies requiring sidewalks with new construction and redevelopment. The TPO recently completed a Complete Streets Study that carries on this work. It provides guidance to local governments that are seeking to retrofit auto-oriented corridors into places that accommodate all users. More about Complete Streets can be found in Chapter 5.

The TPO has conducted regular pedestrian counts in select locations within the City of Knoxville for several years. This is to get a better idea of who is walking as a form of transportation. Figure 3-3 shows that the number of pedestrians has generally been increasing at count locations.

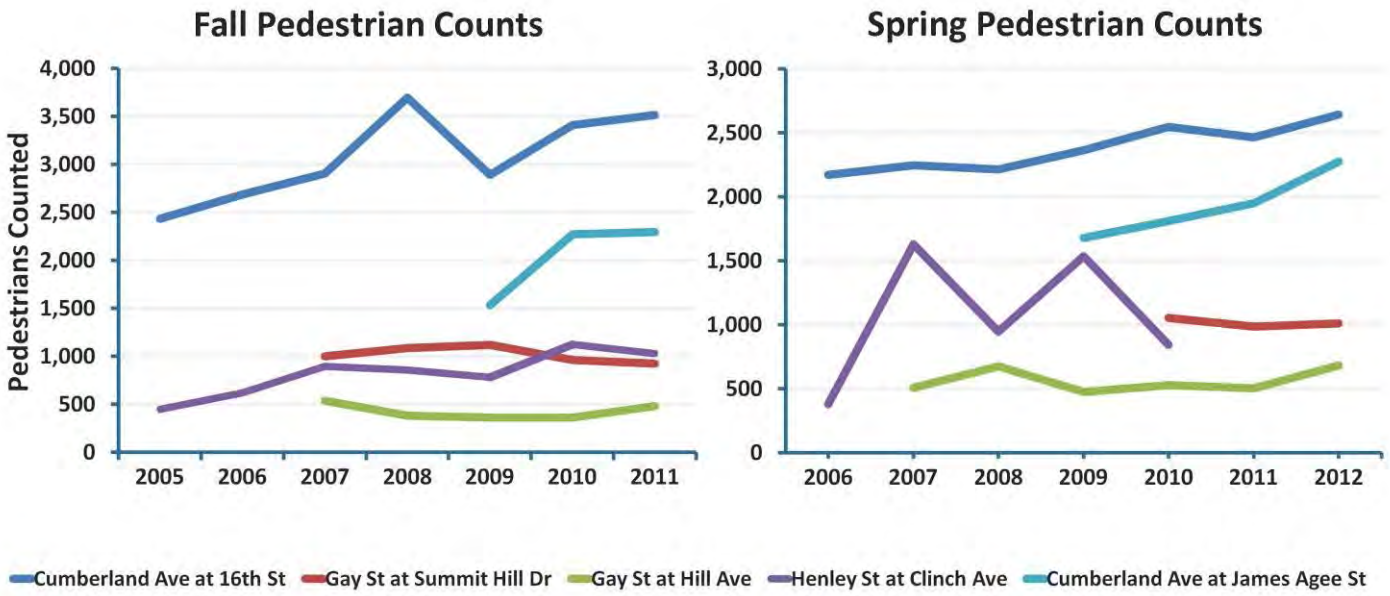


Figure 3-3: City of Knoxville Pedestrian Counts, 2005-2012

Source: Knoxville Regional Transportation Planning Organization (TPO)

Creating a pedestrian-friendly place includes many elements:

- Safe and attractive places to walk, such as sidewalks and greenways.
- Safe and convenient places to cross streets.
- Land use patterns that support walking trips.

Discussion here deals primarily with sidewalks and greenways, as the TPO is involved in the planning and funding of these types of pedestrian facilities. Street crossing design and land use decisions are primarily the responsibility of local governments. Still, the importance of those two elements should not be forgotten in efforts to make places more pedestrian-friendly.

- **Street crossings**: Safe and convenient street crossings are essential. This is to ensure that major roadways do not create barriers within neighborhoods and that transit lines on those roads are accessible to pedestrians. All elements of intersection design should factor in the needs of pedestrians —such as signalization, turning radii, and pavement markings. Design should consider the needs of children, seniors, and people with physical disabilities. The TPO's Complete Street Study and a host of other resources provide information on how to incorporate the needs of pedestrians into intersection designs. These design guidelines also safely accommodate vehicles and meet standard engineering guidelines.
- **Land use:** Day-to-day land use decisions have a significant impact on the walkability of communities. These decisions are typically made by planning commissions, city councils, county commissions, and zoning boards, among other decision-making bodies. Much of that impact can be summed up in the areas of density, diversity, and design. Higher density development, often called compact development, creates more places within walking distance of each other. Diverse, mixed-use development creates stores, offices, and other destinations within walking distance of homes. This pattern accommodates pedestrian travel better than the strict segregation of uses. The design of streets, neighborhoods, buildings, parking areas, and other places can also greatly contribute to or detract from the pedestrian environment.

Sidewalks – Existing Conditions and Policies

This section describes the mileage of sidewalks compared to street mileage throughout the Knoxville Region as of 2012. Some data were not available to the TPO (indicated as N/A). The comparison of sidewalk mileage to street mileage does not give a full picture of the extent of sidewalk coverage. Data do not fully reflect whether streets have sidewalks on one side, both sides, or neither. Still, it provides a general sense of the proportion of sidewalk and street infrastructure in each jurisdiction. Street mileage figures exclude limited-access highways,

which typically would not have sidewalks. Generally, sidewalks are found in older neighborhoods and in downtowns and community centers.

Table 3-2: Sidewalk and Roadway Mileage, by Jurisdiction

Jurisdiction	Streets		Sidewalks	
Knoxville	1,171	miles	319	miles
Knox County	1,993	miles	48	miles
Alcoa	110	miles	25	miles
Clinton	80	miles	35	miles
Dandridge	60	miles	10	miles
Farragut	147	miles	39	miles
Greenback	6	miles	N/A	
Jefferson City	63	miles	15	miles
Kingston	56	miles	9	miles
Lenoir City	106	lane miles	N/A	
Loudon	62	miles	15	miles
Maryville	174	miles	109	miles
Maynardville	22	miles	14	miles
Norris	13	miles	7	miles
Oak Ridge	230	miles	N/A	
Pigeon Forge	91	miles	N/A	
Rockwood	8-10	miles	N/A	
Sevierville	200	miles	N/A	
White Pine	25	miles	2	miles

Source: Reported by individual jurisdictions

Several local jurisdictions have ordinances or regulations that require sidewalks with development and/or redevelopment:

- **Knoxville:** Sidewalks are present throughout downtown Knoxville, the University of Tennessee, and several older neighborhoods. Beyond these areas, sidewalks are sparse and generally lack connectivity. The City of Knoxville does not require sidewalks with new development.
- **Alcoa:** Sidewalks are primarily in Alcoa's downtown and older neighborhoods. A City ordinance requires sidewalks to be constructed with all single-lot development and redevelopment projects wherever site plan review is conducted by the City planning commission. Alcoa's subdivision regulations require sidewalk construction with all new road construction by developers. In some instances, the City asks developers to pay a fee in lieu of sidewalk construction, and the fees collected go into Alcoa's general sidewalk fund.

- **Farragut:** The Town of Farragut, as part of the subdivision process, requires sidewalks to be constructed on the internal spine street of a subdivision, for walking trails to be constructed to all adjacent vacant properties, and for walking trails to be constructed on all adjacent, existing streets. As part of the site plan approval process (non-single-family residential), Farragut requires walking trails/sidewalks to be constructed on all adjacent, existing streets and construction of a pedestrian connection from the internal parking lot to the adjacent pedestrian facility and to adjacent properties.
- **Maryville:** Sidewalks are located mainly in Maryville's downtown and older neighborhoods. Maryville's subdivision regulations require that sidewalks be constructed along both sides of all new streets.

Greenways – Existing Conditions

Greenways are shared-use paths designed for use by pedestrians and bicyclists. They serve both recreational and transportation purposes. As short greenway links and loops are knitted together to create connections within and between cities and towns, greenways increasingly function as active transportation networks and even as tourism destinations. Greenways complement the on-street pedestrian and bicycle network provided by sidewalks and bicycle lanes, and provide important linkages to transit lines and many other destinations. Below is an inventory of significant greenways within the Knoxville Region.

Knoxville *(49.71 miles total)*

Primarily Linear Greenways *(36.8 miles total)*

- Bearden Elementary School to Sequoyah Hills Park and Morningside Park *(16.9 miles total)*
  - Bearden Village Greenway *(Sutherland Ave; 2.1 miles)*
  - Third Creek Greenway *(Forest Park Boulevard to Lake Loudoun; 4.9 miles)*
  - Sequoyah Greenway *(median of Cherokee Boulevard; 2.6 miles)* unpaved
  - Neyland Greenway *(Neyland Drive from Volunteer Landing to University Club; 3 miles)*
  - Lower Second Creek Greenway *(Neyland Greenway to World's Fair Park; 1.2 mile)*
  - James White Greenway *(Neyland Greenway to Morningside Greenway; 1 mile)*
  - Morningside Greenway *(James White Greenway to Haley Heritage Square; 2.1 miles)*
- Cavet Station/Jean Teague/Ten Mile *(5.9 miles total)*
  - Cavet Station Greenway *(I-40 to Middlebrook Pike; 1.2 mile)*
  - Jean Teague Greenway *(2.7 miles)*
  - Ten Mile Greenway *(Cavet Station Greenway to Wynnsong Theater [part of this greenway is in Knox County], 2 miles)*
- First Creek Greenway in First Creek Park *(I-40 to Broadway along First Creek; 0.9 mile)*
- Liberty Street/Middlebrook Pike *(1.2 miles total)*

  - Liberty Street Greenway *(Middlebrook Pike to Division Street; 0.4 mile)*
  - Middlebrook Greenway *(Liberty to Proctor, 0.8 mile)*
- Northwest/Victor Ashe/Pleasant Ridge *(4.4 miles total)*
  - Northwest Middle School Greenway *(Northwest Middle School, 1 mile)*
  - Pleasant Ridge Greenway *(Northwest Middle to I-640, 1.5 miles)*
  - Victor Ashe Greenway *(Victor Ashe Park, 1.9 miles)*
- Papermill Bluff Greenway *(Weisgarber/Lonas to Papermill/Kirby, 0.9 miles)*
- Parkside Greenway *(Campbell Station Road to Lovell Road; 2 miles)*
- Weisgarber Greenway *(Middlebrook Pike to Papermill Road; 1 mile)*
- Will Skelton Greenway *(Ijams Nature Center to Forks of the River Wildlife Management Area; 3.6 miles)*

Smaller and Loop Greenways *(11.91 miles total)*

- Adair and Sue Clancy Greenways *(Adair Park; 1.1 miles)*
- Charter Doyle *(Charter Doyle Park, 0.4-mile loop)*
- Community Unity Greenway *(Montgomery Village Housing Area; 0.6-mile loop)*
- First Creek Greenway in Caswell Park *(0.5 mile)*
- Fountain City Greenway *(Fountain City Park; 0.3-mile loop)*
- Fountain City Skatepark Greenway *(Fountain City Skatepark, 0.2-mile loop)*
- Gary Underwood Greenway *(Gary Underwood Park; 0.8-mile loop)*
- Holston-Chilhowee Greenway *(Holston Chilhowee Ballfields; 1 mile)*
- Holston River Greenway *(Holston River Park; 2.0-mile loop)*
- Lakeshore Greenway *(Lakeshore Park; 2.25-mile loop)*
- Lonsdale Greenway *(Lonsdale Park, 0.3 mile)*
- Loves Creek Greenway *(Holston Middle School; 0.25-mile loop)*
- Malcolm Martin Greenway *(Ed Cothran pool; 0.3-mile loop)*
- Mary Vestal Greenway *(Mary Vestal Park; 0.4 mile)*
- North Hills Greenway *(North Hills Park; 0.4 mile)*
- Sam Duff Greenway *(Sam Duff Field; 0.25-mile loop)*
- Sarah Moore Greene Greenway *(Sarah Moore Greene Elementary, 0.6 mile)*

- Westview Greenway *(Westview Park; 0.26-mile loop)*

Farragut *(11 miles total)*

- Anchor Park *(0.8-mile loop)*
- Campbell Station Park *(1-mile loop)*
- Grigsby Chapel Greenway *(Everett Road to Campbell Station Park; 2.3 miles)*
- Mayor Bob Leonard Park *(1-mile loop)*
- McFee Greenway *(along McFee Road from Boyd Station Road, 1.5 miles, plus a 0.5-mile loop in McFee Park)*
- Parkside Greenway *(Campbell Station Road to Lovell Road; 2 miles)*
- Turkey Creek Greenway *(Audubon Hills to Anchor Park to Brixworth – west along Turkey Creek Road; 1.6 miles with a 0.3-mile spur to Turkey Creek Woods)*

Knox County *(9.6 miles total)*

Primarily Linear Greenways *(6.5 miles total)*

- Halls Greenway *(from Halls Community Park along Beaver Creek to Halls Library and to several neighborhoods; 1 mile)*
- Pellissippi Greenway Trail *(south from Pellissippi State Community College along Pellissippi Parkway; 1 mile)*
- Powell Greenway *(Emory Road from Powell High School to Powell Middle School; 1.7 miles)*
- Sterchi Hills Greenway *(from Knox County/AYSO Soccer Complex to Tommy Schumpert Park; 2.2 miles)*
- Howard Pinkston Greenway *(from French Memorial Park to Bonny Kate Elementary School; 0.6 mile)*

Smaller and Loop Greenways *(3.1 miles total)*

- Beverly Loop *(Beverly Park; 0.6 mile)*
- New Harvest Loop *(New Harvest Park; 0.25 mile)*
- Mascot Park Loop *(0.2 mile)*
- Carl Cowan Loop *(Carl Cowan Park; 0.25 mile)*
- Concord Cove and Parkey Strader Loops *(Concord Park; 0.75 and 0.25 mile)*
- Ball Camp Loop *(Nicholas Ball Park; 0.8 mile)*

Alcoa & Maryville *(16.2 miles total)*

- Alcoa Greenways *(11.8 miles total)*
  - Main spine *(connecting Springbrook Park, Springbrook Road, Springbrook Corporate Center Park, Louisville Road, and the Maryville Greenway; 10 miles)*
  - Clayton Greenway *(from Alcoa Trail to McNutt Avenue, with a spur to Clayton Homes headquarters; 1 mile)*
  - Pellissippi Place Greenway *(along Jackson Hills Drive near entrance to Pellissippi Place; 0.8 miles)*
- Maryville Greenways *(4.4 miles total)*
  - Greenbelt Park loops to Lamar Alexander Parkway *(2.2 miles)*
  - Lamar Alexander Parkway to Foothills Elementary *(2.2 miles)*

Townsend *(9 miles total)*

- Townsend Greenway *(US 321 from Walland Highway bridge to Potleg Hill Road; 9 miles)*

Lenoir City *(1.75 miles total)*

- Town Creek Greenway *(from Broadway along Town Creek to Lenoir City Middle School; 1.75 miles)*

Loudon *(0.14 miles total)*

- City of Loudon Greenway *(along Mulberry Street from near Poplar to the waterfront; 0.14 miles)*

Sevierville *(2.2 miles total)*

- Memorial River Trail Greenway *(from Sevierville City Park to Burchfiel Arboretum; 2.2 miles)*

Pigeon Forge *(2.8 miles total)*

- Riverwalk Trail *(from Patriot Park to north along the West Prong of the Little Pigeon River; 1.5 miles)*
- Veterans Boulevard Greenway *(Sevierville city limit to McCarter Hollow Road/Dollywood; 1.3 miles)*

Oak Ridge *(8.8 miles total)*

- Emory Valley Greenway *(along Emory Valley Road from Briarcliff Road to Melton Lake Drive; 3.3 miles)*
- Melton Lake Greenway *(along Melton Lake Drive and Edgemoor Road from Oak Ridge Turnpike to Haw Ridge Park; 5.6 miles)*

Existing Studies, Plans, and Programs

This section gives an overview of recent studies, plans, and programs that are significant to pedestrian conditions in the Knoxville Region.

Complete Streets Study

Complete streets are designed for safe access by all modes of transportation and all users. TPO's Complete Streets Study, funded by TDOT, analyzed two auto-oriented commercial corridors in the Knoxville Region with the purpose of creating a vision and a set of recommendations that would transform them into complete streets. The study also produced a set of guidelines for retrofitting similar corridors as complete streets. The study is available on the TPO website at **www.knoxtrans.org/plans/complete_streets**.

Safe Routes to School

The goal of Safe Routes to School is to make it safer and easier for more children to walk and bicycle to school. This helps increase fitness in children and reduces traffic congestion and air pollution around schools, among other benefits. It is a comprehensive program aimed at addressing what are known as the "5 E's": engineering, enforcement, education, encouragement, and evaluation.

Safe Routes to School is no longer a stand-alone federal grant program, but that does not mean the effort has stopped. Federal funding is still available for Safe Routes-type projects and activities, and these efforts continue across the country.

In Knox County, the Safe Routes to School Partnership meets regularly to discuss projects and to plan events. Partnership participants include the TPO; Knox County (including staff from the Health Department, Engineering & Public Works, and Parks & Recreation); the City of Knoxville (including staff from Engineering, Parks & Recreation, and the Police Department); Knox County Schools; staff from several University of Tennessee departments; the East Tennessee Clean Fuels Coalition; the Knoxville Area Coalition on Childhood Obesity; the League of Women Voters; the Safe Kids Coalition of the Greater Knox Area; and individual neighborhood and school representatives.

For more information on Safe Routes to School in general, visit the website of the National Center for Safe Routes to School at **www.saferoutesinfo.org**.

Greenway Plans

Several significant greenway plans have been completed recently within the Knoxville Region.

In 2009, the Knoxville-Knox County Metropolitan Planning Commission adopted the **Knoxville, Knox County Comprehensive Park, Recreation, and Greenways Plan**. This plan maps out and prioritizes park and greenway projects for the coming years and decades. The Plan was created in close consultation with the City of Knoxville, Knox County, the TPO, and the public.

The City of Gatlinburg adopted a **Greenways Master Plan** in 2010. The plan identifies greenway opportunities to bolster Gatlinburg's transportation network, recreational opportunities, and economy.

In 2010, Blount County completed a **greenway plan** for the first phase of the Knox/Blount Greenway in Alcoa, Maryville, and Blount County. The Knox/Blount Greenway is a vision for a paved trail connecting Knoxville, Alcoa, Maryville, and Townsend. The greenway is already planned and funded from Knoxville to the Blount County line. This plan looked at preferred routes from the Knox/Blount line to the Alcoa/Maryville greenway system and from Alcoa/Maryville to the Heritage High area of Blount County.

As this plan is being written, the TPO is working with Plan East Tennessee (PlanET) and local governments on a regional greenway conceptual plan. The plan will describe the desired greenway connections within the five-county PlanET area, with a special focus on the four counties currently lacking a countywide greenway plan: Anderson, Blount, Loudon, and Union. Once the conceptual plan is completed, it will be turned over to the local governments for implementation.

Third Creek Greenway in Knoxville

Plans with Pedestrian Impacts

The City of Knoxville is in the process of implementing two recent plans that will mean significant pedestrian improvements within their study areas. The South Waterfront Vision Plan and the Cumberland Avenue Corridor Plan both envision streets designed with pedestrian safety and accessibility at the forefront. Both plans recommend the use of form-based zoning codes to encourage development patterns that support walking and other alternatives to driving.

The Oak Ridge Bicycle and Pedestrian Plan was adopted in 2011. TPO staff created the plan in conjunction with an Advisory Committee made up of City of Oak Ridge staff and volunteers. The plan documents existing facilities and plans and prioritizes corridor and intersection improvements based on public input and analysis of transportation needs.

Knoxville-Knox County General Plan

This **2003 Plan** states that the Knoxville pedestrian system should meet the needs of the average citizen, the elderly, and people with disabilities. Where feasible, walking should be promoted as a viable transportation alternative to driving, especially in light of the non-attainment designation. The Plan outlines goals to promote more non-motorized usage:

- Pedestrian facilities should be incorporated into all aspects of a functional design.
- Road and highway design should encourage bicycling and walking to nearby amenities.
- Neighborhoods should be pedestrian-oriented, containing sidewalks and walking trails.
- Traditional neighborhoods should have sidewalk connections to schools and village centers.
- Streets should be interconnected and have fewer cul-de-sacs.
- New subdivisions should be designed taking into account future developments by providing pedestrian connections as well as street connections.

Statewide Plans

The **Tennessee Trails and Greenways Plan** was updated in 2008. The Plan discusses the many roles of greenways and trails and includes a two-year action plan for the state to expand the network of greenways. **TDOT's 2005 statewide Long-Range Transportation Plan** includes a Bicycle and Pedestrian Plan that aims to improve pedestrian movement and provide for safer pedestrian facilities.

Bicycling

Bicycles are considered vehicles under Tennessee code, and bicycling is an important part of the transportation system. Increasing the safety and convenience of bicycling can produce a number of benefits to communities, including economic, environmental, social, and health improvements. Providing more opportunities to bicycle and increasing awareness about the benefits of bicycling must be an ongoing regional priority. Developing safe, convenient bicycle facilities is a responsibility shared by all jurisdictions in the Knoxville Region, as well as many community organizations. Facility plans must be developed, and each level of government has to commit funding for bicycle projects and programs.

There have been several bicycle plans developed for the Knoxville Region in the past 20 years. Most recently, the 2009 Regional Bicycle Plan was adopted as part of the Regional Mobility Plan. It addressed Capital Investments, Education and Encouragement, Enforcement, Funding, and Monitoring Progress. As with all regional plans of this nature, the Bicycle Plan is subject to the fiscal and policy decisions of each local government.

The TPO has conducted regular bicycle and pedestrian counts at select locations within the City of Knoxville for several years. Figure 3-4 shows that the number of cyclists observed at these locations has generally increased over the past four years.

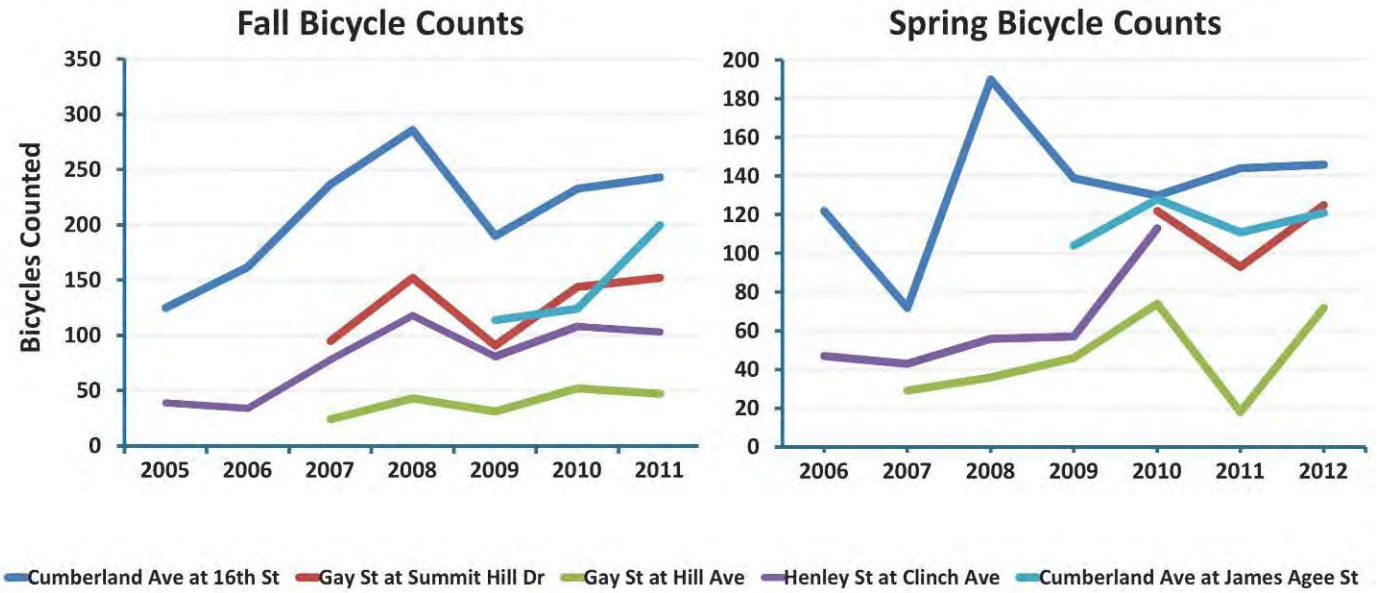


Figure 3-4: City of Knoxville Bike Counts, 2005-2012
Source: Knoxville Regional Transportation Planning Organization (TPO)

Existing Conditions

Bike Lanes

There are only a few miles of bike lanes in the Knoxville Region, primarily in Knoxville and Alcoa (Table 3-3).

Table 3-3: Bike Lanes in the Knoxville Region

Jurisdiction	Corridor	Starting Point	Ending Point	Length (approx)
Alcoa	Lincoln Rd	Aluminum Ave	Harding St	1 mile
Alcoa	Wright Rd	Hunt Rd	Poplar St	1 mile
Alcoa	Wright Rd	Springbrook Rd	Lincoln Rd	0.5 mile
Farragut	Campbell Station Rd	Parkside Dr	school access road	0.75 mile
Knoxville	Central St	Woodland Dr	Emory Pl	0.75 mile
Knoxville	Hall of Fame Dr	Summit Hill Dr	North 6th Ave	1 mile
Knoxville	Hill Ave	State St	east end of the viaduct	less than 0.1 mile
Knoxville	Magnolia Ave	Jessamine St	Prosser Rd	2 miles
Knoxville	Melrose Ave	Volunteer Blvd	Melrose Ave SW	less than 0.25 mile
Knox Co	Lovell Rd	Gilbert Rd	Schaeffer Rd	1.4 miles

Source: Reported by individual jurisdictions

Bike Routes

There are two State bike routes in the Knoxville Region. One runs from Gatlinburg through Sevier and Cocke counties and then east to Washington County. The other is the major east-west route across the entire state and it runs through Knox County. The bike routes use state, county, and local roadways and do not necessarily contain bike lanes or pavement striping. The bike routes are identified by TDOT bike route signs.

Communicating Roadway Conditions to Bicyclists

An important part of making bicycling an option for most users is communicating where people can bike that meets their level of comfort and experience. Some bicyclists would prefer to use only roadways with bike lanes or shoulders, regardless of how fast motorists travel, and some bicyclists prefer to use lower-speed roadways regardless of whether there is a bike lane or shoulder. Exhibits 3-7 and 3-8 show road conditions, including traffic volumes, speeds, and width so that bicyclists can choose routes based on their own tolerance.

Exhibit 3-7

Bicycle Map - Blount County

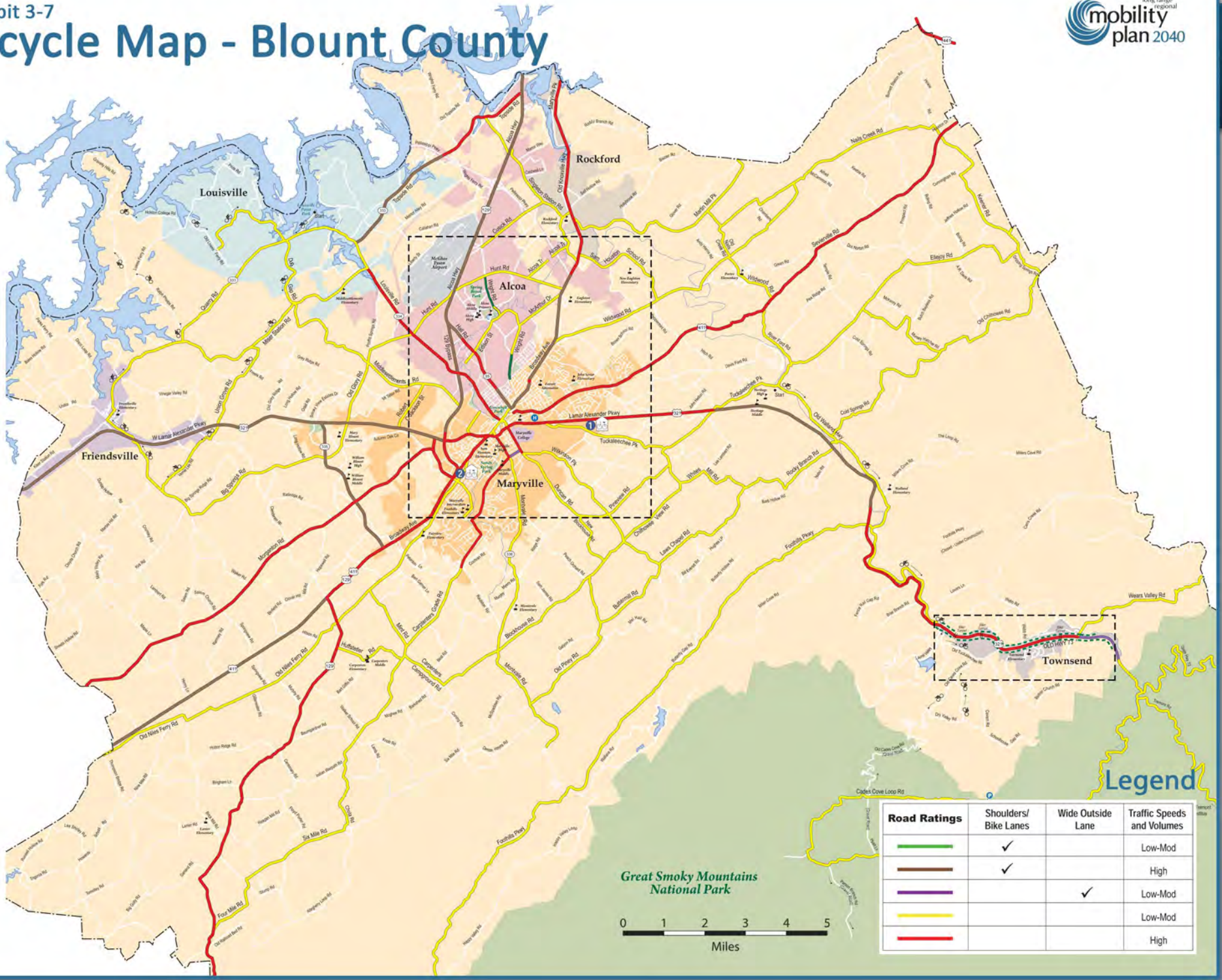


Exhibit 3-8

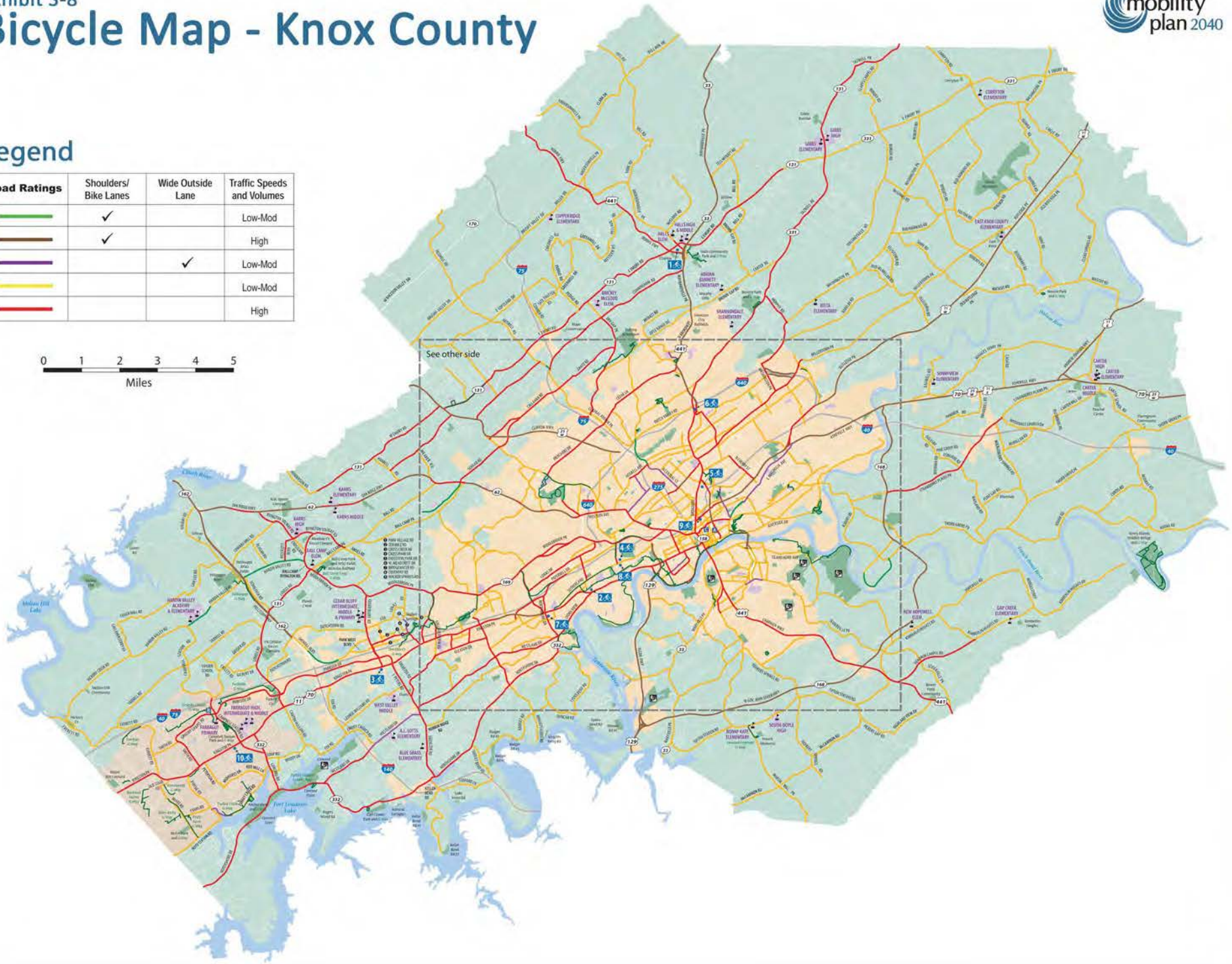
Bicycle Map - Knox County

long range regional mobility plan 2040

Legend

Road Ratings	Shoulders/ Bike Lanes	Wide Outside Lane	Traffic Speeds and Volumes
	✓		Low-Mod
	✓		High
		✓	Low-Mod
			Low-Mod
			High

0 1 2 3 4 5
Miles



Existing or Committed Studies, Plans, Programs, and Projects

The TPO continues to provide staff support to the Regional Bicycle Program. The TPO Bicycle Advisory Committee includes seven to 13 residents from the TPO area. It provides guidance to the TPO Technical Committee and Executive Board on bicycle issues and helps implement the Bicycle Plan.

The TPO Bike Parking Program provides bike racks to businesses and agencies at no cost, through a Congestion Mitigation and Air Quality (CMAQ) grant. To date, more than 520 racks have been installed throughout the Knoxville Region through this grant.

The Knoxville-Knox County Bicycle Map was re-printed in 2011. The Blount County Bicycle Map was printed in June 2008. The maps are distributed for free at bike shops, special events, and other locations. More than 10,000 maps have been given away since the first printing in 2007. The maps are also available on the TPO website, along with all other Bicycle Program handbooks and brochures.

The 2009 Regional Bicycle Plan identified some small but significant gaps in the bicycle network. Some of these gaps have been addressed by City of Knoxville projects, however a number of these gaps remain. The TPO is offering planning funds to member jurisdictions to develop bicycle plans. The City of Knoxville is the first jurisdiction to accept this offer, with that effort to begin in this coming fiscal year. The TPO also allows and encourages bicycle and pedestrian projects to compete for Local STP funds. Many projects are identified in Chapter 8. In addition, TDOT has a policy (see Appendix D) to include bicycle and pedestrian accommodation in roadway projects, which also works to fill in gaps.

TDOT is responsible for developing statewide bike routes and maintaining maps and other information about bicycling in Tennessee. This includes areas not covered by the TPO Bicycle Program (TPO Planning Area). There has been a TPO bicycle accommodation policy since 2002 and a state accommodation policy since 2003 (see full language in Appendix D), so most new road projects include bike lanes or shoulders.

Issues

Bicycle projects and programs share many of the same implementation challenges with other modes in the Knoxville Region. However, the challenges discussed below affect people's ability to comfortably and safely ride. These will likely take more time and effort to overcome.

- Over the past five decades, prevalent land-use patterns have favored auto travel over other modes.
- We have built wider roads, designed for higher speeds and have often neglected to include sidewalks, bike lanes, or shoulders, effectively eliminating the choice to walk or bike in many parts of the Knoxville Region.
- Increasing congestion, gas prices, parking issues, and air quality concerns have led many to take a second look at bicycling as an option. Unfortunately, people are often afraid to bike on many of the roadways in the Knoxville Region because without sidewalks, bike lanes, or shoulders, roadways are not safe from fast moving and increasingly distracted drivers.

You Spoke and We Listened

Chapter 4

We all have busy schedules. It is hard to find the time to get involved, even when it is important, when every segment of life clamors for our attention. We understand this and are working hard to make learning about and getting involved in the Plan development process as convenient as possible.

Engaging the public was a major emphasis for the TPO in 2012. The TPO engaged in a regional partnership, called Plan East Tennessee (PlanET). Major components of that public outreach aligned with this Mobility Plan update. Leading up to the update of this Plan, the TPO reached out to the public via:

- two series of major PlanET regional forums,
- a PlanET region-wide statistically valid survey,
- three series of PlanET working groups,
- two rounds of a new method called Meeting in a Box, which is explained later in this chapter (PlanET),
- two rounds of an online Town Hall, called Mindmixer (PlanET),
- a survey specific to the Mobility Plan, and
- a variety of opportunities to comment on the Plan document and project lists as they have been developed.

Online Mobility Plan Survey

Early in the planning process, the TPO conducted an informal public survey seeking the public's opinion on the existing transportation system. The survey was available online and at all meetings that were open to the public.

The informal survey asked for three key pieces of information. First, respondents were asked to rate the current transportation system. Second, respondents were asked to rate a series of transportation issues based on their perceived importance over the next 25 to 30 years. Finally, respondents were asked their preference on funding transportation projects in the future. In this last question, "How would you spend transportation funds?" participants were asked to distribute $100 among nine different options. Some chose to spend all of their money in one category such as "Build New Roads" or "More Transit" while others divided their money between categories. Results of this funding exercise are shown in Table 4-1 below.

A similar informal survey was used in the 2005 Long Range Transportation Plan and 2009 Mobility Plan updates, and staff compared the results to see if and how public views might be changing. Results from 2005, 2009, and 2012 are shown here. Tables 4-1, 4-2, and 4-3 show how the respondents rated the transportation system. Generally, most rated the various system components as good or fair, though few found any of the elements to be very good. Key elements rated poor were transit services, sidewalks and crosswalks, and bike lanes and wide shoulders. It is important to note that these results may not serve as a statement to the actual condition of any of these facilities in general or in any specific location, but simply reflect the perceptions of these participants.

Table 4-1: Respondents Rate the Transportation System (2012)

Answer Options	Not Available (0 points)	Poor (1 point)	Fair (2 points)	Good (3 points)	Very Good (4 points)	Average Score
Traffic conditions on major roads	0%	13%	44%	37%	6%	**2.36**
Transit services	17%	36%	31%	13%	2%	**1.45**
Sidewalks and crosswalks	13%	43%	31%	12%	2%	**1.49**
Bike lanes and wide shoulders	19%	53%	20%	7%	2%	**1.22**
Greenways and bicycle/pedestrian paths	14%	24%	30%	24%	9%	**1.92**
Traffic safety and control on major roads	1%	18%	41%	35%	5%	**2.25**
Overall rating for transportation system	1%	30%	52%	16%	1%	**1.86**

Source: Informal surveys

Table 4-2: Respondents Rate the Transportation System (2009)

Answer Options	Poor (1 point)	Fair (2 points)	Good (3 points)	Very Good (4 points)	Average Score
Traffic conditions on major roads	13%	45%	34%	8%	**2.37**
Transit services	48%	34%	16%	2%	**1.72**
Sidewalks and crosswalks	54%	32%	12%	2%	**1.62**
Bike lanes and wide shoulders	78%	17%	4%	1%	**1.28**
Greenways and bicycle/pedestrian paths	35%	33%	25%	7%	**2.04**
Traffic safety and control on major roads	20%	43%	33%	4%	**2.21**
Overall rating for transportation system	24%	56%	18%	2%	**1.98**

Source: Informal surveys

Table 4-3: Respondents Rate the Transportation System (2005)

Answer Options	Poor (1 point)	Fair (2 points)	Good (3 points)	Very Good (4 points)	Average Score
Traffic conditions on major roads	26%	43%	26%	4%	**2.06**
Transit services	40%	35%	23%	2%	**1.87**
Sidewalks and crosswalks	57%	31%	12%	1%	**1.59**
Bike lanes and wide shoulders	81%	15%	4%	0%	**1.23**
Greenways and bicycle/pedestrian paths	33%	35%	27%	5%	**2.04**
Traffic safety and control on major roads	21%	46%	32%	1%	**2.13**
Overall rating for transportation system	27%	58%	15%	0%	**1.88**

Source: Informal surveys

Table 4-4 shows how respondents prioritize transportation issues. Key issues identified include respondents wanting to see a transportation system that helps protect neighborhoods, and natural resources, and improves air quality. They want a system that promotes walkability and promotes the use of alternative modes. They want a system that is safe to use. Finally, respondents would like to see a stronger link between land use and the transportation system.

From 2005 to 2009 to 2012, overall priorities remained the same. However, some areas saw more significant changes over the years than others.

Table 4-4: Respondents Rate Transportation Issues for the Next 25 Years

Answer Options	Average of Score from Respondents (1=Least Important, 5=Most Important)	
	2009	2012
Safety for Bicyclists and Pedestrians	4.55	4.48
Walkable Neighborhoods and Commercial Centers	4.37	4.30
Safe Routes to School	4.47	4.29
Improve Air Quality	4.50	4.26
Protect Natural Resources	4.51	4.21
Coordinated Land Use and Transportation System	4.30	4.18
More Sidewalks	4.05	4.03
More Transit Services	3.99	3.97
Safety for Drivers	3.87	3.91
Protect Community Character	4.20	3.87
More Bike Facilities	4.14	3.72
Protect Historic Resources	3.93	3.45
Maintain Existing Transportation System	3.45	3.42
Reduce Travel Time between Places	2.97	3.13
Better Traffic Signal Operations	2.84	2.94
Improve the Movement of Goods and Freight	2.96	2.74
Real Time Traffic Information	2.53	2.62
High Occupancy (HOV) Lanes	2.69	2.41
Build New Roads	1.90	2.22

Source: Informal surveys

Table 4-5: How Respondents Would Distribute Transportation Funds, 2009-2012

Answer Options	2009	2012
Improve traffic signal operation	$4.76	$5.99
Add lanes to existing roadways	$4.95	$3.99
Build new roadways	$2.94	$4.44
Encourage alternative transportation	$16.29	$13.41
Provide real time traffic information	$2.53	$3.16
Maintain pavement in good condition	$12.69	$15.54
Improve road safety	$7.02	$8.60
Provide more transit service	$19.62	$22.71
Provide bicycle and pedestrian facilities	$27.80	$20.95
Other	$1.39	$1.22

Source: Informal surveys

Table 4-5 answers the question, "How would you spend $100 in transportation funds?" Between 2009 and 2012, nearly 1,000 people participated in this exercise.

Participants put more than half of the money towards funding transportation alternatives, like transit and bicycle and pedestrian facilities. While these surveys were not scientific, they were used as an additional piece of public input into how the Mobility Plan's policies, recommendations, and projects were derived. This information cannot be interpreted as a future funding model but rather as a sample of public opinion that indicates a general desire to shift funding priorities.

Freight Survey

The freight advisory committee is a collection of local planners, engineers, and freight providers in the Knoxville Region. The role of the freight advisory committee is to help the TPO to be more inclusive of freight in its day-to-day planning activities. As part of engaging the freight community, the TPO hosted two public meetings and mailed out a survey to all members of the freight advisory committee. The information in this section highlights the results of that survey. Table 4-6 shows the number of truck trips to or from the respondent's location each day.

Table 4-6: Average Daily Truck Usage of Respondents

Trucks Trips Per Day	Number of Respondents
0-10	6
10-25	10
25-50	7
50-100	3
100+	2

Source: Freight survey

Table 4-7 indicates how respondents' answered when asked what percentage of the above truck trips were to or from an area that was local (Anderson, Blount, Hamblen, Jefferson, Knox, Loudon, or Sevier counties), statewide (outside the Knoxville Region but within Tennessee), or Nationwide (outside Tennessee).

Table 4-7: Typical Freight Trip Type (Local, State, Nationwide) of Respondents

Local		Statewide		Nationwide	
0%	6	0%	6	0%	4
1%-25%	10	1%-25%	14	1%-25%	6
26%-50%	8	26%-50%	6	26%-50%	4
51%-75%		51%-75%	2	51%-75%	2
76%-99%	4	76%-99%		76%-99%	8
100%		100%		100%	4

Source: Freight survey

Table 4-8 shows the peak times of the day for truck trips to or from each respondent's location.

Table 4-8: Time of Day of Truck Activity

Time of Day	Number of Respondents
3:00AM – 7:00AM	12
7:00AM – 10:00AM	19
10:00AM – 3:00PM	23
3:00PM – 6:00PM	20
6:00PM – 11:00PM	3
11:00PM – 3:00AM	1

Source: Freight survey

Based on the above survey results it appears that the respondents generally represent mostly small to medium-sized trucking companies and have a wide mix of destinations between local, statewide, and nationwide freight trips. Perhaps the most significant statistic from the survey is that 50% of the respondents reported having their peak time of day truck activity within the timeframes generally associated with the peak roadway traffic congestion hours of the morning (7:00 AM – 10:00 AM) and afternoon (3:00 PM – 6:00 PM). It would be expected that trucking companies would prefer to avoid the most congested parts of the day; however this must also be balanced against the need to make deliveries during normal business hours. As congestion increases in the future one would expect to see a shift in the peak truck activity to less congested times of day such as the mid-day (10:00 AM – 3:00 PM) or overnight hours.

Primary Routes used by members of the freight advisory committee for freight movement include I-40, I-75, I-81, US 25, US 11, SR 160, Northshore Drive, Kingston Pike, SR 66, Western Avenue, and Broadway.

The following are specific issues, problems, or locations that respondents felt restricted the movement of freight in the Knoxville Region:

- Construction Zones and appropriate traffic control and signage
- Limited businesses operating locally
- Traffic Signal coordination
- Unsafe roadway conditions in spot locations
- Visible directional and way-finding signage
- Appropriate signage in appropriate locations
- GPS units not being updates with prolonged roadway closures
- Low train trestles

Respondents provided a number of possible solutions to improve or enhance the movement of freight in the Knoxville Region:

- Finishing long term construction projects along interstate corridors
- Improve the reliability of I-40 through the gorge (North Carolina)
- Improved capacity in high congestion areas
- Truck only lanes in congested areas
- Widen limited capacity freight corridors
- Better dissemination of roadway information to truck drivers
- Limit construction so that not every interchange is under construction
- Intermodal Facility
- Establish a good multi transfer facility (Truck, Barge, Rail)
- Raising train trestles

Respondents were asked if an intermodal facility in Knoxville be beneficial to their business. Their responses are shown below.

- Yes 10
- No 12
- Not Sure 6

Finally, when asked what future transportation related trends respondents saw as relevant to the trucking industry, these were their responses:

- High rail freight costs
- Increased trucking trips
- Alternative fuels
- Moving delivery types to allow drivers to be home at night to help attract and maintain drivers
- More efficient trucks
- Shorter load time for order fulfillment
- Increased use in rail for long distant shipping

Statistically Valid Survey

In partnership with the TPO, Plan East Tennessee (PlanET) performed a statistically valid survey of the five-county PlanET Region. This includes Anderson, Blount, Knox, Loudon, and Union counties. The University of Tennessee performed the survey, which included 2,000 participants, 400 from each county. The results give planners and public officials a great deal of information on the perspectives of the people in the PlanET Region. An overview and highlights of select results are shown below, for the full results, see Appendix E.

Quality of Life

Overall, residents in the PlanET Region feel positive about the quality of life in their community. Three out of four residents in the PlanET Region (78.0 percent), report the quality of life as good or excellent. Figure 4-1 shows how respondents feel about the quality of life in their counties.

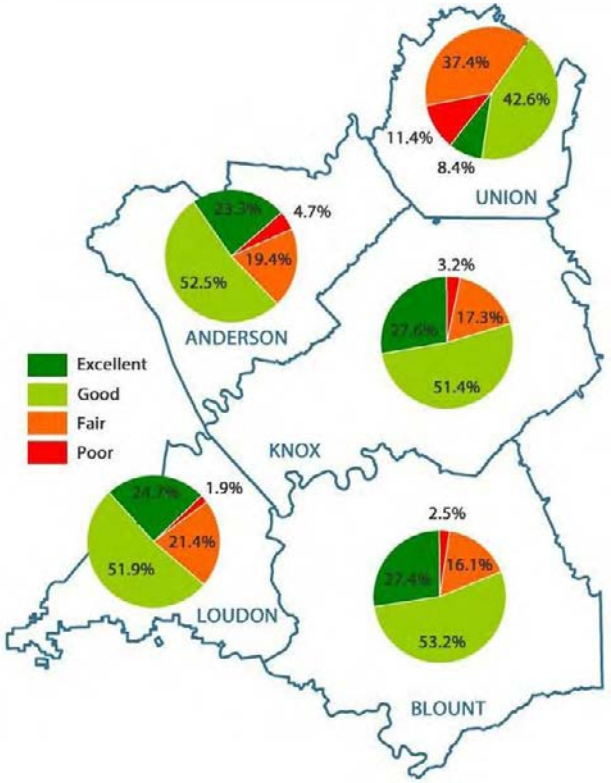


Figure 4-1: How Respondents Rate Quality of Life, by County

Source: PlanET Statistically Valid Survey, Performed by UT Office of Research and Public Services Center for Applied Research and Evaluation

Problems in the PlanET Region

Residents in all five counties indicate the lack of good paying jobs is a major problem in their community. When presented with a list of potential problems, survey respondents consistently chose the lack of good-paying jobs as the most serious problem facing their community. There is considerable variation across counties regarding the presence and severity of other community problems.

Respondents indicated the following were the most important problems in the PlanET Region.

1.)	Lack of Good Paying Jobs	24.9%
2.)	Low Achieving Schools	11.0%
3.)	Pollution in the Rivers and Lakes	7.8%
4.)	Traffic Congestion	6.8%
5.)	Roads and Highways in Need of Repair	6.6%

Priorities in Choosing a Place to Live

Availability of high-quality public schools emerges as the most important factor in choosing a new place to live. Less than one in five survey participants, (14.7 percent), report availability of high-quality schools as not at all important in their decision-making for housing location. Living in a community with a mix of people from different racial or ethnic backgrounds or a mix of different types of housing were the least important factors in choosing a new residence.

Respondents indicated the following were the most important factors in choosing a place to live in the PlanET Region.

1.) High quality public schools
2.) Being within a 30-minute drive to work
3.) Having sidewalks and places to take walks
4.) Easy access to major highways or interstates
5.) Being within an easy walk of other places and things in the community
6.) Living in a community with people at all stages of life
7.) Easy access to public transportation
8.) Living in a community with a mix of people from various racial and ethnic backgrounds
9.) Living in a community with a mix of different types of housing

Spending Priorities

Spending priorities throughout the PlanET Region include attracting high quality jobs and improving the transportation system. Preferences for other areas of governmental spending vary from county to county. Figure 4-2 shows the breakdown by county of how people would like to see dollars spent.

Figure 4-2: Respondent Spending Priorities, by County

Source: PlanET Statistically Valid Survey, Performed by UT Office of Research and Public Services Center for Applied Research and Evaluation

Other Important Priorities

Below are some additional themes that emerged from the statistically valid survey.

- Access to public transportation within an easy walk and sidewalks are two amenities reported to be in short supply by survey respondents. While there is some difference in opinions across counties, a majority of residents indicate they feel sidewalks and public transportation are lacking in the area they live.
- Providing educational programs for new career opportunities is the preferred strategy for creating new jobs in the PlanET Region by approximately one third, (32.6 percent), of the residents. Providing building sites or land to support land growth was the least popular option provided to participants. Manufacturing or science and technology jobs are reported to be the most important type of jobs to attract to the PlanET Region.
- Participating in community forums and posting ideas online are the most popular methods of participation in the process to determine priorities for future growth in the PlanET Region. However, approximately one in three survey participants, (32.4 percent), indicate they never participate in the planning process.

PlanET Regional Forums

PlanET Regional Forum Series One

The items below represent areas of agreement that emerged across all six PlanET Regional Forum Series One meetings (held the week of November 14, 2011). Each theme is followed by selected comments from the meetings that highlight different facets of the theme. The comments are the words of participants (collected by meeting note takers) and have been edited only to correct spelling or grammatical errors. This represents an overview of input from the forum series, for full forum input refer to Appendix E.

Strengths

Figure 4-3: Word Cloud Illustrating Strengths, from Forum Series One
Source: PlanET Forum Series One

Challenges

Figure 4-4: Word Cloud Illustrating Challenges, from Forum Series One

Source: PlanET Forum Series One

Major Themes

Economy and Workforce

- Major regional economic assets: ORNL, UT, and medical centers
- Strategic location for economic development: excellent transportation accessibility
- Mild climate is an asset
- Low cost of living relative to other parts of the country is attractive
- More quality jobs are needed throughout the PlanET Region, not just in Knoxville
- Tourism is important: economic and recreational value of mountains, rivers, and lakes

Environment

- Natural beauty of mountains, rivers, and lakes
- Need to improve air and water quality

Transportation and Infrastructure

- Good highway access within the PlanET Region and to other metro areas
- Need for more transportation options (transit, air, pedestrian facilities, rail)

Housing and Neighborhoods

- Distance between jobs and housing is a problem (lengthy commutes)

Healthy Communities

- Significant community health issues exist: drug use, asthma, obesity, tobacco use

Other Items

- Qualities of people: friendly, hospitable, volunteer ethic
- Importance of Appalachian heritage
- Combination of urban/suburban/rural settings offers something for everyone
- Good regional amenities: Downtown Knoxville, arts/music scene, museums, farmers markets, sports events, greenways
- Resistance to change is strong in the PlanET Region

PlanET Regional Forum Series Two

The items listed below are themes derived from priority items identified at the Forum 2 meetings and the two Youth Forum meetings (April 23-28, 2012). Bulleted items below each theme are actual participant comments and are included to illustrate different facets of a theme. Some of these comments are vision ideas; others are ways in which existing conditions could be improved. This represents an overview of input from the forum series, for full forum input refer to Appendix E.

Economy and Workforce

The following are major themes related to Economy and Workforce that emerged from Forum Series Two.

- High-quality local school facilities and K-12 education programs
- A variety of post-secondary education and job training opportunities
- A fit between the skills of the workforce and the type of businesses the PlanET Region wants to attract
- A diverse regional economy
- Higher-quality jobs
- A more "business friendly" environment

Figure 4-5: Word Cloud Illustrating Major These on Economy and Workforce, from Forum Series Two

Source: PlanET Forum Series Two

Transportation and Infrastructure

The following are major themes related to Transportation and Infrastructure that emerged from Forum Series Two.

- More transportation options and freedom to choose among these options
- Improved connectivity between neighborhoods, community services, and recreation options and to areas outside the PlanET Region
- Lower transportation costs
- Quality infrastructure that serves existing communities and is coordinated with growth

Figure 4-6: Word Cloud Illustrating Major These on Transportation, from Forum Series Two
Source: PlanET Forum Series Two

Housing and Neighborhoods

The following are major themes related to Housing and Neighborhoods that emerged from Forum Series Two.

- More housing options that protect the distinct character of urban, suburban, and rural neighborhoods
- More integrated, walkable communities in which people can choose to live
- More affordable housing

Figure 4-7: Word Cloud Illustrating Major These on Housing and Neighborhoods, from Forum Series Two
Source: PlanET Forum Series Two

Healthy Communities

The following are major themes related to Healthy Communities that emerged from Forum Series Two.

- Good access to health care
- More recreational facilities and opportunities to exercise
- More healthy food options
- Lower rates of drug abuse

Figure 4-8: Word Cloud Illustrating Major These on Healthy Communities, from Forum Series Two
Source: PlanET Forum Series Two

Environment

The following are major themes related to Environment that emerged from Forum Series Two.

- Improved air and water quality as a result of public and private efforts
- Productive farmland
- Resource protection that provides economic, health, and recreational benefits

Figure 4-9: Word Cloud Illustrating Major These on Environment, from Forum Series Two
Source: PlanET Forum Series Two

Differing Opinions

One of the most notable outcomes of the Regional Forum Series 1 and 2 meetings has been the fact that participants generally agree on the PlanET Region's strengths, issues, and challenges. However, a range of different opinions on how to address the PlanET Region's issues has been expressed. Major areas of difference include:

- The role of government and market forces in shaping the PlanET Region's future, including concerns about freedom of choice, regulation, and property rights
- The need for planning, especially on a regional scale
- The need for inter-jurisdictional cooperation

Transportation and Infrastructure Working Group

The Transportation and Infrastructure Working Group is a creation of the PlanET partnership. This working group is comprised of volunteers from around the PlanET Region consisting of technical experts, researchers, and interested citizens. Their charge is to look at the PlanET Region's transportation and infrastructure assets and challenges and to develop priorities and implementation strategies. Their work will help answer the following questions for the PlanET Region:

- How do we provide more transportation choices to increase safety, access, and reliability while reducing public and household transportation costs?
- How do we maintain and increase access to high quality, modern infrastructure, particularly in low-income and rural areas?

Meeting One (February 2012)

Key Findings

Twenty-two key stakeholders and interested parties gathered to address transportation and infrastructure as part of PlanET. Participants included City of Alcoa, Beardsley Farm, Blount County, CAC Office of Aging, Citizens Against the Pellissippi Parkway Extension (CAPPE), Carol R. Johnson Associates (CRJA), Citizens, KAT, Knox County, City of Knoxville, Knoxville TPO, City of Maryville, MPC, City of Oak Ridge, TDOT, and UT Center for Transportation Research. After a general overview and discussion, working group participants divided into three separate breakout groups for a more focused dialogue. The key findings are summarized here.

Existing Conditions Memo Suggestions

Participants discussed important issues and trends that were not included in the regional assessment. Although several were identified, there were five recurring themes:

- Lack of a regional transit presence (both in terms of service and governance).
- Cultural barriers to non-auto transportation.
- Lack of coordination between transportation and land use decision-making.
- Limited connectivity in rural areas.
- Transportation needs of an aging population (choices, access, cost, etc.).

Priorities

Considering all of the issues and trends on the table (both those previously identified by the PlanET team and the new ones issued by the Working Group), participants agreed on the most important priorities for East Tennessee. Three issues/trends emerged as top priorities in at least two, and in some cases all three, of the breakout groups:

- Rising transportation costs.
- Limited transportation options and a lack of regional transit.
- Funding uncertainty.

Meeting Two (June 2012)

Regional Drivers

Participants included Beardsley Farm, Blount County, CAPPE, Citizens, Gresham Smith and Partners, KAT, Knox County, Knox County Health Department, City of Knoxville, Knoxville Regional TPO, Knoxville Utilities Board (KUB), City of Maryville, MPC, City of Oak Ridge, TDOT, and UT. Working group attendees were presented with a summary of the eight broad drivers of regional trends and change as described in the Livability Report Card. Attendees then discussed how various drivers impact transportation and infrastructure across the PlanET Region. There was broad agreement and related discussion that virtually all of the drivers bore some relationship to transportation and infrastructure, although at varying degrees. The group identified two additional drivers for consideration: Lack of a wastewater policy and Zoning (as an offshoot of the Dispersed development patterns driver).

Attendees then rated each driver based on its level of impact on transportation and infrastructure around the PlanET Region, ranging from high (three points) to none (zero points). Cumulative scores for each driver were tabulated. Regional drivers are listed below from most to least important:

1.) Dispersed Development Pattern and Separation of Land Use Types (74)
2.) Few Transportation Options (67)

3.) Location Decisions (50)
4.) Rising Energy Costs (48)
5.) Food, Activity, and Lifestyle (44)
6.) Demographic Shift (35)
7.) Low Educational Attainment, Low Wages, and Limited Job Advancement Opportunity (35)
8.) Loss of Agricultural Land (34)
9.) Wastewater Policy (24)
10.) Zoning and Development Regulations (21)

Vision Themes Summary

A brief overview of the vision themes collected from the Round Two Public Forums in April was given with particular emphasis on themes focused on transportation and infrastructure. Participants were then engaged to identify any additional vision theme ideas for consideration. A number of ideas were identified:

- Quality infrastructure must include water, wastewater, and electric
- Linking infrastructure and economic development
- Funding for infrastructure improvements
- Specifically linking transportation and development patterns
- Redevelopment of old shopping centers to take advantage of existing infrastructure
- Financial impact of redevelopment: Cost analysis of greenfield development vs. brownfield development and greyfield development. (Needed to help inform decision and policy makers)
- Identification of nodes and corridors for more intensive development
- Competitive advantage for regional centers: Centers are the draw for economic development

Meeting Three (August 2012)

Scenario Planning and the Trend Scenario

Participants included the City of Alcoa, Beardsley Farm, Blount County, CAC Office of Aging, CAPPE, Citizens, Foundation for Global Sustainability, Gresham Smith and Partners (GSP), Knox County, Knox County Health Department, City of Knoxville, Knoxville Area Transit, Knoxville Regional TPO, KUB, City of Maryville, MPC, City of Oak Ridge, TDOT, UT Center for Transportation Research, UTK, and Wharf Street Realty. The PlanET Consulting Team began with an introductory presentation on scenario planning. Using a recent scenario planning effort from Austin, TX as an example, scenario planning begins with a trend, or status quo, forecast of

future growth and development and then uses alternative scenarios to show the impacts of changes in policies, infrastructure investments and/or development practices. The presentation demonstrated how indicators are used to describe the differences between scenarios.

The PlanET Consulting Team then presented the trend scenario recently developed for the PlanET scenario. This scenario represents an extrapolation of current policies and development practices to the year 2040, and assumes the PlanET Region will add approximately 300,000 persons and 240,000 jobs during that period. Key findings included the absorption of over 155,000 acres of new greenfield development and 112,000 new homes consuming over 98,000 acres (1.1 dwelling units per acre).

A brief question and answer period followed the presentation. Comments included concern over the impacts of sprawling development patterns on transportation and infrastructure costs and that for transit to be viable, the entire region does not need to meet density thresholds, but rather specific corridors.

Presentation of Draft Regional Vision Statement

The PlanET Consulting Team presented the Draft Regional Vision Statement, noting that this draft is a result of the public input since the project's kickoff in October 2011. These themes were collected through the large community forums, meetings in a box, leadership dialogue, stakeholder interviews, Mindmixer, and the community survey. The regional vision statement is written in the language of someone speaking in 2040. The small groups at this meeting were asked to focus particularly on the connected section of the draft vision statement as it is most closely aligned with the Transportation and Infrastructure focus area.

> Draft Vision Statement as presented to Working Group Three: *Our Vision of East Tennessee in 2040 is one in which our growing region is recognized throughout the nation and the world as a premier community of choice, by virtue of its exceptional livability; scenic natural beauty; strong institutions; highly educated, creative, and motivated workforce; and its robust and diversifying economy.*
>
> *We have retained our East Tennessee identity and small town charm while becoming an international center for research, technology, and innovation. Our region's outstanding quality of life is multifaceted, offering wide freedom of choice in mobility, housing, lifestyle, and community setting, from our vibrant urban core to our highly livable and connected suburbs, and to our scenic and agriculturally productive rural areas.*

Small Group Discussion

Working group participants broke out into small groups and began by critically analyzing the Draft Vision Statement, comparing it to the trend scenario, and identifying potential scenario indicators that are meaningful to transportation and infrastructure. Each group then reported their results back to the whole group.

Each group liked the Draft Vision Statement overall, but presented several ideas on how to clarify it and improve upon it. There was a unanimous sentiment among the group that a stark contrast exists between the trend scenario and the ideas espoused in the Vision. Finally, the groups evaluated and added to an initial list of indicators, which are measures to be used to quantify and evaluate each scenario. The initial list is shown below. Participants added to this list (**shown in bold**).

- Commuters via walking, biking or transit
- Pedestrian environment index
- Daily VMT per capita
- Average commute time to work
- Percentage of jobs accessible by transit
- Occupied units within ¼ mile of KAT fixed route
- Miles of sidewalk and bike lanes
- Total road miles
- **Percent of each household's budget spent on transportation**
- **Accessibility of rural residents to transportation options**
- **# of vehicles per household (avg) – correlated/compared to age of household residents**
- **Air Quality measures**
- **Percent of broadband coverage – finding a measure of quality of broadband coverage**
- **Communications as an infrastructure (broadband, cellular, etc)**
- **Pipelines – units of material moved**
- **Building energy consumption should include residential**
- **Safety component for indicators**

Mindmixer (Online Town Hall)

Mindmixer is an online town hall that allows community members to respond to questions, pose their own and have an online dialogue with other members of their community and staff.

Mindmixer Series One

Economy and Workforce

- Revitalized Downtown Knoxville is a unique asset
- Need local jobs and infrastructure improvements that will attract investment
- Importance of major research institutions that offer good, high-paying jobs
- Regulations throughout the PlanET Region do not adequately protect natural resources that are the basis of tourism
- Low taxes/low cost of living
- Investment and improvements tend to go to more affluent areas
- Improvements to community appearance will encourage more businesses to locate in PlanET Region
- Not all school systems are equal within the PlanET Region; strong systems attract investment

Transportation and Infrastructure

- PlanET Region is too car-oriented; lacks transportation choices
- Many roads are unsafe for cyclists; need bike lanes
- Improve existing rail lines to reduce truck traffic and air pollution
- Need some form of passenger rail to connect Downtown Knoxville, Oak Ridge, McGhee Tyson Airport, and Gatlinburg/Pigeon Forge and connect the PlanET Region to other metropolitan areas (will stimulate economic development)
- Infrastructure maintenance costs
- Communities need sidewalks and greenways

Housing and Neighborhoods

- No comments discussed housing

Healthy Communities

- PlanET Region has safe communities and neighborhoods
- Drug abuse, especially meth and alcohol

Environment

- Natural beauty and recreational opportunities
- Need to protect natural resources
- Trash/litter problems in different areas
- Poor air quality (especially from truck traffic and power plants)
- Improving poor water quality through local and regional partnerships and better regulatory enforcement

Other

- Strong sense of history/culture
- Proximity to natural areas and urban amenities
- Strengthen regulations and enforcement to improve community appearance
- Lack of communication between communities; need to work together to achieve common goals
- Absence of a true planning vision/planning for quality development; too much pressure to allow sprawl/substandard development
- Need to build capacity in community organizations and improve citizen engagement

Mindmixer Series Two

Economy and Workforce

- Collaboration between schools, businesses, and communities to create a culture of high expectations for students
- Equity in school systems across the PlanET Region
- Reuse of vacant properties (e.g., schools, factories) as small business incubators

Transportation and Infrastructure

- More transportation options and freedom to choose among these options
- Improved connectivity between neighborhoods, community services, and recreation options and to areas outside the PlanET Region
- Lower transportation costs
- Quality infrastructure that serves existing communities and is coordinated with growth

Housing and Neighborhoods

- Mixed-use communities that are walkable; contain affordable housing, small parks, and businesses; and have transportation options
- More parks that provide recreation activities for youth within walking distance of homes
- Creative uses for unoccupied properties: small business start-ups, pocket parks, small urban farming projects, community co-ops

Healthy Communities

- Support for a strong local/regional food system
  - Fewer regulations on urban agriculture
  - Incentives for needed components
  - Policies that prioritize locally-grown food
- More recreational activities for children
- Walkable communities that promote exercise
- New technologies that make access to routine care easier (e.g., smartphone apps)

Environment

- More robust environmental regulation that protects water, air, and other amenities that contribute to the character of the PlanET Region
  - Work collaboratively across jurisdictions
  - Protect the PlanET Region's most valuable assets
- Daylighted creeks and improved stormwater management
- Expanded outdoor and aquatic recreational activities
- Control of invasive species

Meeting in a Box

A Meeting in a Box is a companion to the Regional Forum Series events being held throughout the Plan East Tennessee process. Meeting in a Box is designed for community groups, neighborhood associations, or friends to gather at a convenient time and location to share their opinions on the same topics being discussed at the community forums.

Meeting in a Box Series One

Forum Series 1 Meeting in Box focused on the strengths and challenges of the PlanET Region and on the specific community, the participants reside in. Over 200 people from 20 organizations participated in the first round of input gathering via a Meeting in Box.

Economy and Workforce

- UT, ORNL, and TVA and the stability they bring to the regional economy
- Strong economic potential of Innovation Valley, Pellissippi Parkway, and Pellissippi Place
- Not enough vocational training
- Need more emphasis on education; need more funding for public schools
- The PlanET Region should be more business-friendly and attract major employers
- Need a regional economic development/marketing strategy

Transportation and Infrastructure

- Excellent location: proximity to other metropolitan areas; easy drive to the Gulf Coast
- Need to expand public transportation to other areas of the PlanET Region
- Aging/deteriorating infrastructure is a major problem; better maintenance needed throughout PlanET Region

Housing and Neighborhoods

- Housing prices are affordable, especially compared to other metropolitan areas

Healthy Communities

- Drug abuse, especially of meth and prescription painkillers
- The PlanET Region generally has safe neighborhoods, but Knoxville does have crime

- The PlanET Region has good health care overall, but access to hospitals and medical services needs to be improved in some parts of the PlanET Region
- Need more affordable health care, especially for the "working poor" and those who do not have any health insurance

Environment

- The PlanET Region's natural beauty, open spaces, and farms are major assets
- Easy access to nature and outdoor recreation
- Air/water pollution
- Trash/litter problems

Other

- The PlanET Region has a range of communities and amenities
- The PlanET Region has a strong sense of community; people know each other and are willing to help each other
- Pride in cultural heritage/history
- Low citizen engagement/sense of civic responsibility

Meeting in a Box Series Two

Forum Series 2 Meeting in a box was designed to encourage small group conversations about the future residents want to see for the PlanET Region. It then asks participants to prioritize ideas for a regional vision and finally to identify how these future priorities will apply to individual communities.

Economy and Workforce

- Providing more vocational education: in high schools and postsecondary courses; also apprenticeships and on the-job training
- Offering more workforce training
  - Training students to develop skills for jobs available in the PlanET Region
  - Enabling workers to develop transferable skills for jobs that may come in the future
- Improved K-12 schools
- Affordable post-secondary education, with options available in all five counties

- A diverse set of employment opportunities in the PlanET Region (high-tech jobs, manufacturing jobs, etc.)
- Building upon existing economic engines and skill sets/capabilities
- Supporting local businesses/entrepreneurs

Transportation and Infrastructure

- Improved regional connectivity: greenways, bike lanes, sidewalks
- A regional transportation network that includes an array of options, such as private autos, car sharing, carpooling, expanded bus and ETHRA service, and rail services within the PlanET Region and to major cities
- Improvements to existing infrastructure rather than continuing to build new infrastructure
- More energy efficient forms of transportation (including cars)
- New development forms that provide opportunities for walking and include important retail and services to meet daily needs (i.e., "all inclusive" communities)

Housing and Neighborhoods

- Diverse housing options, including different choices for singles, young families, and seniors
    - More green space
    - Within neighborhoods: local parks, trails/greenways, and community gardens
- Preserving open space and farmland throughout the PlanET Region
- Walkable and bikeable communities
- Connectivity between neighborhoods
- Mixed-use/neighborhood centers that are connected to residential areas
    - More sidewalks within neighborhoods; sidewalks connecting to mixed-use and commercial areas
- Neighborhood redevelopment/revitalization

Healthy Communities

- Availability of affordable medical care (physical and mental health)
- Preventative services

- Medical services in all five counties, including community clinics, mobile vans, satellite offices, and physicians and nurses who make house calls
- Finding solutions to the PlanET Region's drug abuse problem
- Availability of health education programs
- Emphasis on active living and healthy lifestyles: walkable communities, regular exercise (including school activities), and affordable health programs
- Healthy eating promoted through the local food system, farmers markets and community farms, affordable healthy foods, and nutrition programs
- More emphasis on the needs of persons with disabilities

Environment

- Improved air and water quality
  - Recognizing the connection between land use activities and water pollution
  - New technologies that will help reduce air pollution
- Protected farmland, which supports local food production
- Greenways and walking trails throughout the PlanET Region
- Preserving natural areas and viewscapes
- Recognizing outdoor recreation and the PlanET Region's natural beauty as key economic assets
- Increased environmental stewardship throughout the PlanET Region
  - By citizens, businesses, nonprofit groups, and leaders

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Looking to the Future – Projections and Priorities

Chapter 5

The Knoxville Region in the Year 2040

In 27 years, we expect the population of the Knoxville Region to increase by nearly 47 percent. That means more than 1.3 million people will need to get to work, school, and other destinations via the region's transportation system. This growth will put more pressure on our existing transportation system, affecting the economic competitiveness of our state and region, our environment, and our quality of life. Figures 5-1 and 5-2 show the projected increases in both population and employment.

> *"In 27 years, more than 1.3 million people will need to get to work, school, and other destinations via the region's transportation system."*

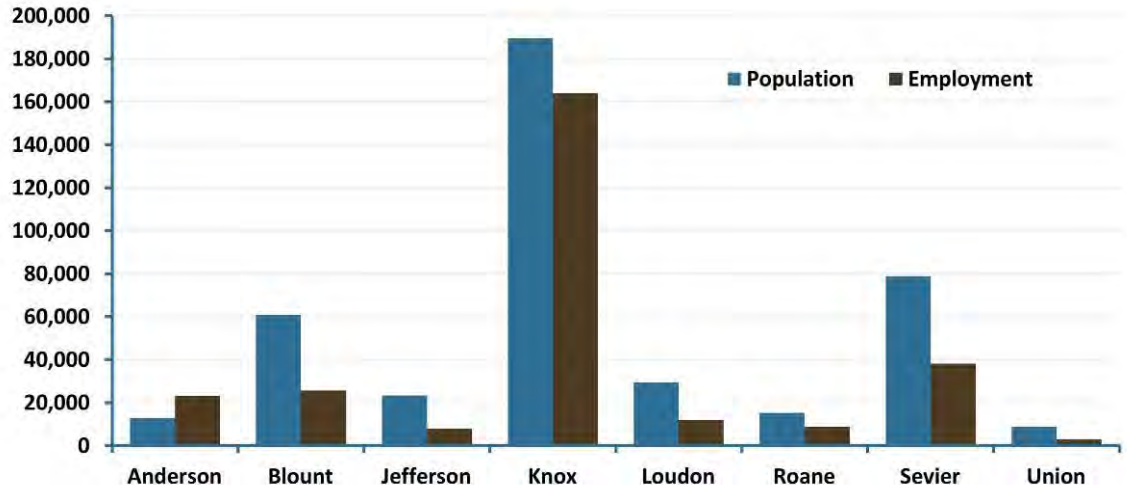

Figure 5-1: Population and Employment, Total Increase in the Knoxville Region, 2010-2040
Source: The University of Tennessee, Center for Business and Economic Research, Population Projections, 2015-2040.

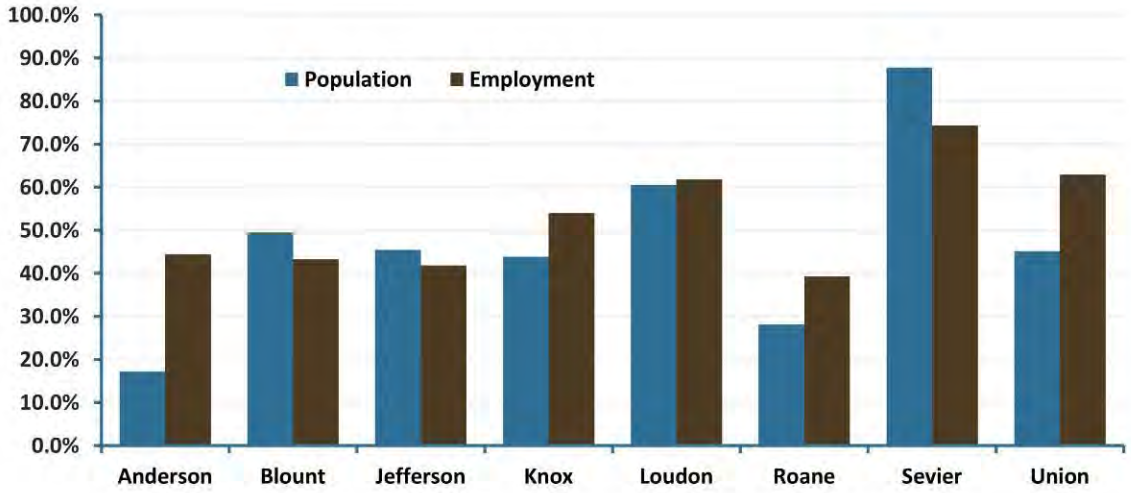

Figure 5-2: Population and Employment, Percent Increase in the Knoxville Region, 2010-2040
Source: The University of Tennessee, Center for Business and Economic Research, Population Projections, 2015-2040.

Not only will the Knoxville Region grow, but it will likely grow older as well. Twenty-seven years from now, one in five East Tennesseans will be 65 years or older (Figure 5-3). Older residents and workers have different

transportation needs that the system must meet through a variety of choices. For instance, will the elderly drive to medical services, will they use transit service, or will the medical service go to them?

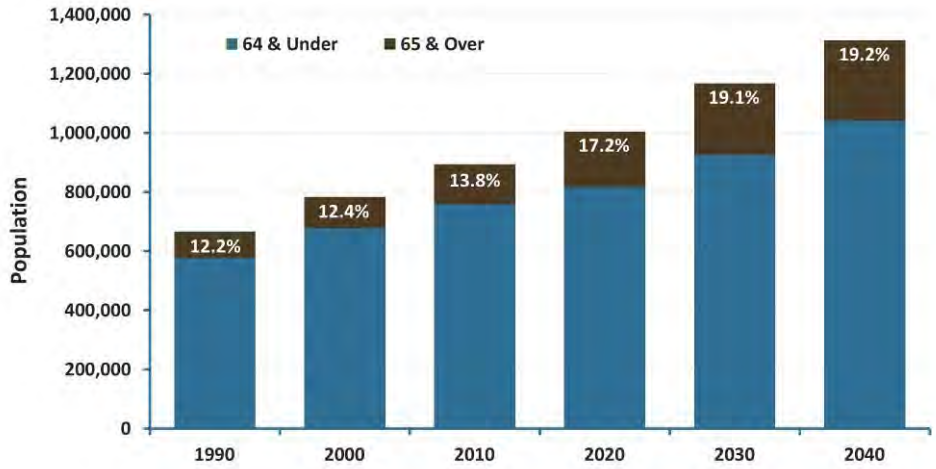

Figure 5-3: Projected Population in the Knoxville Region, 2010-2040

Source: The University of Tennessee, Center for Business and Economic Research, Population Projections, 2015-2040.

> *"Compact development patterns allow for a mix of more affordable mode choices."*

Incorporating Land Use and Transportation[1]

Why Connect Transportation and Land Use?

Transportation and land use are intrinsically linked. Our most pressing problems are regional – air quality, responsible land use, access to transportation, affordable housing, and quality jobs. Although streets and roads are usually viewed solely as a means of transportation, they also exist as a function of land use, just as other transportation facilities such as parking garages, gas stations, and transit stops do. However, development of land in the Knoxville Region has primarily occurred based on the perceived highest and best use of a particular piece of land with little consideration of the impact on the transportation system. The more we understand about the influence of land use on how we travel the better we will become at making decisions regarding land use changes and the Knoxville Region's transportation system.

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[1] Cumberland Region Tomorrow. Quality Growth Toolbox. December 2006.

Littman, Todd and Rowan Steele. Land Use Impacts on Transport: How Land Use Patterns Affect Travel Behavior. Accessed 11/05/08. **http://www.vtpi.org/landtravel.pdf**.

Hume, Christopher. A Planning Headache, 50 Years in the Making. The Toronto Star. 31 May 2008.

Availability of transportation choices is directly related to the types of communities we build. Low-density, segregated land uses require traveling by car, whereas compact development patterns allow for a mix of more affordable mode choices. Shorter trips and convenient connections require compact development with a mix of housing types and appropriate scale commercial and civic uses. On a per capita basis, this is also a cost-effective and efficient kind of transportation system for government to offer.

The Transportation and Land Use Disconnect – Emerging Conflicts

Land use and transportation are clearly linked. Building a shopping center or subdivision on a narrow country road does affect transportation and vice-versa. And funding for necessary improvements is most often sought from local governments. Rarely is this crucial connection acknowledged. As a result, a number of major conflicts are emerging. Here are just a few major conflicts in our growth pattern that may limit the Knoxville Region's success in the coming years.

The Knoxville Region Today: **People are spreading out, with greater distance between themselves and their neighbors, and increasingly have fewer transportation alternatives.**

Potential Conflict:	Potential Result:
The Knoxville Region has seen and will likely continue to see a great deal of population growth.	Just as we need more land to accommodate new population, our development patterns actually make less land available, potentially raising the cost of land to a point of scarcity, and reducing the land available for agricultural and recreational uses.
Gas prices continue to rise.	Our personal economic futures are increasingly unpredictable. We rely on our cars to drive long distances each day and hope we can weather unforeseen turmoil in the Middle East and elsewhere as it affects the price at the pump.
Our population is aging rapidly; many are choosing the Knoxville Region for their retirement years. We anticipate that 1 in 5 people in our region will be over 65 by 2040.	As people age and are no longer able to drive, they may become cut off from their communities, dependent on relatives, or dependent on public transportation, which is often limited and costly to provide in low-density areas.

Potential Conflict:	Potential Result:
People want government to cut costs, especially as our economy struggles, and look for ways to stretch tax dollars and avoid increasing taxes.	As people spread out, we must build longer, wider roads to get people from place to place. Services like police and fire are stretched thinner as more of their time is devoted to driving. Fewer people are able to include physical activity in their daily commute, potentially affecting health and health costs.

Challenges for Land Use and Transportation Coordination

- Policy makers struggling with the vision/reality disconnect – where adopted visions do not seem feasible given the existing community policies.
- The incremental changes needed to realize these visions might be worrisome to some residents. For example, established neighborhoods sometimes object to infill projects that add housing to adjacent lots. While infill improves the delivery of government services – like transit – it can also change the local neighborhood character.
- Growth management policies protect the diversity of urban, suburban, and rural communities, but concern some private property rights advocates.

Opportunities for Land Use and Transportation Coordination in East Tennessee

The TPO believes that in order to meet the goals of the 2040 Mobility Plan and improve quality of life for all residents within the Knoxville Region, transportation and land use decisions must be more closely coordinated. The TPO cannot take on this quality growth challenge alone. Working closely with local governments, the private sector, community-based organizations and members of the public who have not traditionally been engaged in the transportation and land-use discussions is critical to the future of the Knoxville Region. In the end, local governments will make the land-use decisions. The successful coordination of land use and transportation decisions requires the development of closer partnerships between cities, counties, and the Tennessee Department of Transportation (TDOT). The TPO has a role in coordinating land use and transportation, not by making local land use decisions, but by assessing the impact of future land use scenarios on the transportation system, and communicating that to decision makers and the public.

Planning departments around the country are becoming increasingly aware of the need for drastic changes in the way we travel. This awareness is spurring exciting innovations in transportation planning. Nodal and transportation-oriented developments (TOD) provide models for improving multi-modal transportation in communities and the connectivity between them. Advances in vehicle technology might mean that cars will be

cleaner and more efficient but not necessarily cheaper. This movement has tremendous potential to help us coordinate our efforts, supporting networking such as car/ride sharing, vanpools, enhanced traffic operations, and advanced strategies for public transit. In thinking about long-range transportation planning for the Knoxville Region, it is important to emphasize aspects of our current system that support sustainable transportation, sustainable land use, and encourage innovative application of human, material and technological resources.

In both suburban and urban centers, transportation investments can encourage community scale, mixed use development in locations with pedestrian and bicycle access and transit. When residential development occurs far from arterials or when the separation between residential and commercial development is too great, accessibility is limited to the auto only. When development occurs close to arterials with a mix of complementary uses, people have other transportation choices in addition to the automobile. Transportation investments that provide pedestrian and bicyclist enhancements and transit opportunities along urban and suburban corridors improve neighborhood integrity and community livability. If schools and shops are located closer to homes and to one another, walking and bicycling become viable, convenient options. Ultimately, a regional shift toward more compact growth patterns could increase livability, preserve air quality, protect the environment and open space; decrease vehicle miles traveled, and make our investments in transportation more cost-effective.

Enhancing Communities with Transportation Investments

Ours is a region of communities, each with a strong, proud identity. This is one of the things that makes East Tennessee unique – a strong connection to our land, whether that is rural lands, small towns, or urban neighborhoods. In hearing what is important to our citizens, we constantly heard people say they want the character of their communities preserved. Therefore, doing just that must be a top priority.

> *"Transportation investment can destroy a community's character by imposing a generic, improperly scaled infrastructure on it. Or, it can work with the community to ensure it reflects their needs and character."*

Preserving communities can mean different things to different people, but one thing is clear, a "one size fits all" approach will *not* do. Transportation infrastructure is often the largest single-source investment in a community and has the potential to have the most impact. Transportation investment can destroy a community's character by imposing a generic, improperly scaled infrastructure on it. Or, it can work *with* the community to ensure it reflects their needs and character. It can help communities preserve, create, and reestablish their identities. This can mean adjusting the use of roadways by limiting the size and speed, or adding sidewalks, bike lanes, and bus facilities. It can also mean making modest adjustments to aesthetics such as paving, lighting, landscaping, and furniture that reflect the community.

Complete Streets

"Complete Streets are streets for everyone. They are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists, and public transportation users of all ages and abilities are able to safely move along and across a complete street. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. They allow buses to run on time and make it safe for people to walk to and from train stations."[2]

Simply stated, a complete street reflects a new way of thinking about how streets are designed. A complete street may be designed a number of different ways, so long as it serves all potential users. Street designers and transportation agencies have a responsibility to the public health, safety, and welfare to design, operate, and maintain the entire right of way to enable safe access for drivers, transit users and vehicles, pedestrians, and bicyclists, as well as for older people, children, and people with disabilities. More information is available in the 2009 Complete Street Study at **www.knoxtrans.org/plans/complete_streets**.

Strategies that can help achieve complete streets in the Knoxville Region include:

- Road diets
- Lane width reductions
- Sidewalks
- On-street parking
- Bicycle facilities
- Transit
- Mid-block pedestrian crossings
- Crosswalks and pedestrian indicators
- Curb extensions
- Street trees and street furniture
- Intersection design – including roundabouts
- Corner radii
- Number and design of turn lanes
- Traffic signals

[2] Smart Growth America **http://www.smartgrowthamerica.org/complete-streets/complete-streets-fundamentals**

- Lighting
- Pavement treatments
- Special considerations for younger, older, and disabled pedestrians
- Special considerations for emergency access

Safety

The most influential design control, and the design control that provides significant flexibility in urban areas, is speed. Street design should be based on design speed and target speed. Design speed governs certain geometric features of a roadway, primarily horizontal curvature, vertical curvature, super elevation, and sight distance.

Complete street design should start with the selection of a target speed. The design speed (no more than 5 mph over the target speed) should be applied to those geometric design elements where speed is critical to safe vehicular operations, such as horizontal curvature, and intersection sight distance. The target speed is not set arbitrarily, but achieved through a combination of measures that include:

- Setting an appropriate and realistic speed limit;
- Using physical measures such as curb extensions and medians to narrow the traveled way;
- Setting signal timing for moderate progressive speeds between intersections;
- Using narrower travel lanes that cause motorists to naturally slow; and
- Using design elements such as on street parking or street trees to create side friction.

More information is available in the 2009 **Complete Street Study**.

> *"Many communities across the U.S. realize that designing neighborhoods, sub-divisions, business districts, and shopping centers around the automobile has diminished rather than enhanced quality of life."*

Context Sensitive Solutions[3]

A context sensitive solution (CSS) is a collaborative, interdisciplinary approach that includes all stakeholders. The objective is to develop a transportation facility that fits its physical setting. It must preserve scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the context of the setting when pursuing transportation projects.

Many communities across the U.S. realize that designing neighborhoods, sub-

[3] Source: **www.contextsensitivesolutions.org**

divisions, business districts, and shopping centers around the automobile has diminished rather than enhanced quality of life. Some of the basic transportation elements that must be restored to improve community livability include:

- A connected network of sidewalks and bike routes;
- Safe, dependable, and accessible travel options for community members who cannot afford a car or cannot drive;
- Affordable transit that gets people to job centers, retail centers, recreation facilities, and educational and health services; and
- Traffic management in neighborhoods, "main" streets, shopping centers and downtowns, that is compatible with bicycling and walking.

While the personal vehicle offers a high level of accessibility to those who can afford it, people's ability to reach destinations is often constrained by traffic congestion. An important factor in one's decision to use other modes of transportation is how long he or she may be stuck in traffic. Walking and bicycling, on the other hand, offer many people cost effective personal mobility. However, very few places are easily accessible and comfortable to non-motorized modes of travel. Many children can ride a bike in their own neighborhood, but riding a mile or two to school or a friend's house is often difficult or unsafe. This is particularly true if the trip involves crossing a major roadway.

Most people opt not to walk or bike because the route to the store or park is indirect, does not have sidewalks and there are too many fast cars competing for the road space. Taking the bus can be equally frustrating. The bus stop is frequently too far from where we live or work, or the bus service is infrequent or slow, and few amenities are available. These are only a few of the varying and valid transportation needs and objectives of a community that are typically considered in Context Sensitive Street Design (CSSD). CSSD designers and planners must also take into account the role of the entire right-of-way as public space, and the role of the street in shaping the character, function, and livability of adjacent land uses and neighborhoods.

Improving Personal Health in our Communities

Transportation and Our Health

The TPO is not a public health agency, but we recognize that transportation affects health in many ways. These include:

- The health impacts of vehicle emissions.

> *"The Asthma and Allergy Foundation of America regularly ranks the Knoxville Region among the worst places for asthma and allergies."*

- Access, or lack of access, to safe and healthy forms of active transportation, such as walking and bicycling.
- Access, through any means of transportation, to places and activities and promote health, such as social activities, medical care, parks, and healthy food sources.

Bad Air

The Asthma and Allergy Foundation of America regularly ranks the Knoxville Region among the worst places for asthma and allergies. In 2012, the Knoxville Region was ranked the third worst in the country, following Memphis and New Haven, CT. Part of the ranking is based on levels of ozone and particulate matter, which are transportation-related pollutants.

Active Transportation

The automobile-dominated planning of the last 50 years has created widespread barriers to people's ability to incorporate physical activity into their daily routines. In 1996, the Surgeon General released a landmark document entitled "Physical Activity and Health." This report highlighted physical inactivity as a leading factor of death and disability. Reports have attributed 22 to 30 percent of cardiovascular deaths, 30 to 60 percent of cancer deaths, and 30 percent of diabetes deaths to sedentary lifestyles and poor dietary habits. Additionally, physical inactivity has been cited is a primary factor in more than 200,000 deaths each year in the United States.

"Reports have attributed 22 to 30 percent of cardiovascular deaths, 30 to 60 percent of cancer deaths, and 30 percent of diabetes deaths to sedentary lifestyles and poor dietary habits."

Increasing access to walking and bicycling, through the improvements of existing bicycle and pedestrian facilities and the design of walkable towns and neighborhoods, helps combat a range of health problems such as obesity, adult-onset diabetes, heart disease, osteoporosis, cancer, and stroke. Having access to safe pedestrian and bicycle routes means people are more likely to choose walking or biking as modes of transportation. People are also better able to interact with their community and engage in outdoor activities with their families, building valuable social capital.

Through its bicycle and pedestrian programs, and the public health partnerships described below, the TPO is part of the broad effort in the Knoxville Region to improve access to safe places to walk and bicycle.

Access to Health-Promoting Places

Health-promoting transportation might take the form of a walk around the block to clear your head and get some exercise, or it might be a ride to the doctor's office or pharmacy. More and better transportation alternatives help us make these vital trips.

Transportation also plays a role in access to healthy foods. This is especially critical in neighborhoods with little access to grocery stores, places often called "food deserts."[4] Exhibit 5-1, below contains information about the prevalence of food deserts in the Knoxville Region.

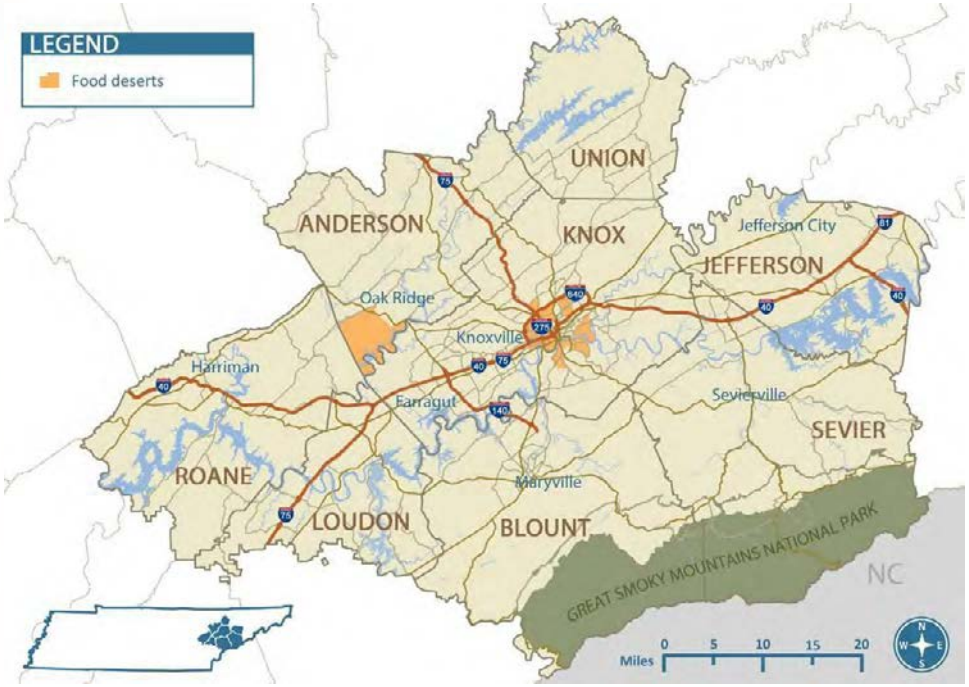

Exhibit 5-1: Food Deserts in the Knoxville Region
Source: USDA Economic Research Service, US Census Bureau 2010

Partnerships for Health

The TPO partners with many other organizations to improve the health of our community. Some of these are described in other sections of this plan. This section of the plan describes our major health-related partnerships.

Safe Routes to School

A recent venture of the Safe Routes Partnership is the Walking School Bus program at Lonsdale Elementary in Knoxville. Health Department staff worked with fifth-graders at the school to design the walking routes.

[4] Food desert designations are based on USDA Economic Research Service definition and 2010 census data.

Community volunteers walk with the students. The City of Knoxville marked additional crosswalks for safety, and the Knoxville Police Department provides regular patrols to enforce speed limits around the school. Kids who were being driven to school now walk with their friends, and the school administration reports that student tardiness is down since the Walking School Bus began.

Healthy Kids, Healthy Communities

The Knox County Health Department received a Healthy Kids, Healthy Communities grant from the Robert Wood Johnson Foundation to work with low-income neighborhoods on policy and environmental changes to address childhood obesity. TPO staff serve on the steering committee for this project and provide assistance with planning projects and events, and with GIS mapping.

Together! Healthy Knox

Together! Healthy Knox (T!HK) is an initiative of the Knox County Health Department to strategically plan steps to improve the health of Knox County residents. TPO staff serve on the teams creating action plans for T!HK.

The TPO also works with Pioneering Healthier Communities, which forms the core group of the Together! Healthy Knox policy team. The local Pioneering Healthier Communities initiative is funded by a grant from the YMCA to focus on policy and systems change for improving community health.

Obesity Efforts

TPO staff work with committees of the Knoxville Area Coalition on Childhood Obesity and the Tennessee Obesity Taskforce to address issues of access to healthy, active forms of transportation for children and adults.

Table 5-1: Obesity Status of Adults, 2009

County	Estimate Total	Estimate (%)
Anderson	17,283	30.8
Blount	30,689	33.1
Cocke	10,004	36.6
Hamblen	15,219	32.6
Jefferson	12,485	32.1
Knox	99,601	30.6
Loudon	11,040	30.6
Roane	14,428	34.9
Sevier	19,606	30.1
Union	4,549	31.9
Knoxville Region	**234,904**	**32.3**

Source: Dept of Health & Human Services, Center for Disease Control & Prevention, County Level Estimates of Obesity, 2009.

Improving Mobility for Aging Populations

Trends

Baby Boomers

Baby boomers are generally defined as persons born between 1946 and 1964. The first baby boomer reached age 65 in 2011 and the last will turn 65 in 2030. Nationally, there are 76 million baby boomers and around 10,000 people turn 65 each day. In Knox County, approximately 13 percent of the residents are currently age 65 or older - that represents approximately 57,000 residents. By the year 2030, that age group will almost double in size to approximately 110,000 residents, which will represent 20 percent of the population. So, in approximately eighteen years one-in-five people in the Knoxville Region will be 65 or over.

Aging in Place

Researchers tell us our population is "aging in place." We are getting older, living longer, and not moving around much. People want to stay in the communities where they have roots. This certainly holds true for the residents of East Tennessee who are passionate about their communities. In 2010, AARP carried out a large-scale survey of adults age 45 and over. More than 85 percent of the respondents strongly or somewhat agreed with the statement, "What I'd really like to do is stay in my current residence for as long as possible." In East Tennessee, this can present a major problem as much of the development is very spread out. While the Knoxville Region has cities and towns, many people choose to live in suburban or rural areas. The same characteristics that draw so many to live in this area – the scenic and rural nature, hilly topography, rivers and lakes, and farm lands – cause problems for many residents as they do not live near the services they may need as they get older.

Disability

As we get older, we begin to have physical limitations. Studies show that most people assume they will remain healthy and mobile, yet the U.S. Census reported in 2010 that approximately one-third of Knox County residents age 65 and over have a disability. More than half of people age 75 and over have a disability. As our society ages, how will it affect people's ability to get around, whether driving, riding transit, or walking? A new report by the National Association of Area Agencies of Aging (n4a) found that meeting the transportation needs for older adults ranked as the second highest concern of local governments, right after financial issues.

Albert Cooper is legally blind. He came to Knoxville four years ago to establish a church, and lives near downtown.

KAT takes him to his volunteer job at the Disability Resources Center and to meetings of Knoxville's Council on Disability Issues, which he serves on.

"I've been doing it for so long, in every city I've been in, I've always learned the bus routes," he says.

CAC provides him with transportation to dialysis three times a week and to other medical appointments.

CAC's Volunteer Assisted Transportation helps him with other trips.

"If I've got more that one trip to make, if I have to make different stops, I use it," he says. "They all work together, so I won't be isolated and stuck at home. I can pretty much go where I need to go."

Margaret Herron is in her 90s and lives in an apartment in West Knoxville. CAC's Volunteer Assisted Transportation program helps her keep her independence.

"I have enjoyed it so much, because it's such a personal thing," she says. "It's like a friend is picking you up, and you're just going shopping together."

She has been using VAT for about three years. She uses the program for doctor appointments too.

Margaret used to use CAC's door-to-door van service, but switched to VAT once she started needing help getting around the grocery store.

"I can't say enough about it," she says. "I keep thinking 'This is too good to be true.' "

Safety

According to a recent study from the Insurance Institute for Highway Safety, the rate of fatal crashes among drivers age 70 and over declined from 1997 to 2008. However, as of 2010, Tennessee was in the top 10 states for most crashes with fatalities where at least one driver was 65 or older. While, nationally, overall fatality rates have decreased, the number of older drivers killed or involved in fatal crashes in Tennessee remains disproportionately high. While, statistically, seniors are safe drivers, the risk of severe injuries and death from an automobile crash grows dramatically with age. The fatality rate for drivers 85 and older is nine times higher than for drivers under the age of 65.

Design

As Americans, we love our cars. Most people have been driving since they were 16 and most want to drive forever. Governments need to reconsider transportation system design to accommodate older drivers. Although studies show that older drivers are safe drivers, how they drive and react to the transportation environment around them is different than younger drivers.

How planners, engineers, and elected officials prepare for senior drivers often requires a departure from current transportation planning trends. Here are some examples:

- **Signage** – Trends show communities are reducing the size of signage. However, older drivers, who on average have poorer eyesight, would likely benefit from larger signage. The Federal Highway Administration (FHWA) has endorsed a new type of font for highway signs that is more visible for drivers. About 30 States have adopted this font so far.
- **Roadway Width** – Some communities are narrowing roadways, but studies show seniors have trouble gauging distances between cars, including on-coming traffic.
- **Parking Width** – Some communities are narrowing the width of parking stalls, but many seniors have visual depth perception issues and struggle to make sharp turns.
- **Improvements** – Detroit, Michigan improved about 140 intersections with larger signs, brighter stoplights, and more left-turn lanes. These improvements resulted in 35 percent fewer crashes among seniors.

New Restrictions

Different States are imposing new restrictions on older drivers. Some States require older drivers pass a vision test, while other States are requiring older drivers take a road test when they renew their license. Some States are considering requiring seniors to renew their license more often. The decision to give up driving may not be a personal choice, the government may have to step in when safety is at risk. Aging drivers can take accident

prevention courses to help reinforce safe driving skills and to keep them up-to-date on traffic laws. Thirty-three States require insurance discounts for drivers who complete an accident prevention course.

Personal Impact on Seniors

The fact is that many seniors will face the hardship of not being able to drive. An AAA article covered a University of Michigan professor that held several focus groups for elderly drivers. The professor discovered a curious thing: "some people said they'd rather die than give up driving." This is a sad reality that some feel the ability to drive is a lifeline to maintaining one's freedom and independence. This shows how important it is going to be to find a solution that allows seniors to maintain vibrant, fulfilling lives without risking their safety when driving is no longer an option. This is especially true, as so many people will face that conflict. More than one in five Americans age 65 and older do not drive[5] and as the number of seniors increases so will the number of elderly non-drivers. Statistics show that the average senior will outlive their ability to drive by 7 to 10 years. One survey shows that 600,000 American drivers hang up their keys each year after hitting age 70. It is imperative that society change the mindset that one's life is over if they cannot drive. One way to do that is to provide good transportation options.

> *"National statistics show on average it costs between $8,000 and $12,000 annually to maintain a car."*

Affordability

Another issue for seniors is that cars are expensive to own and maintain. National statistics show on average it costs between $8,000 and $12,000 annually to maintain a car. The Center for Neighborhood Technology (CNT) estimates that to be affordable, households should not spend more than 15 percent of its income on transportation. However, in 2000 the average Knoxville area household spent 28.7 percent of its income on transportation. These costs grew to 31 percent in 2009. As people retire and have to live on a fixed income, the cost of transportation becomes an even greater burden.

Walkable Communities

The most cost-effective way to ensure mobility for seniors is to reduce the need for long-distance trips by creating affordable, walkable, and livable communities. Communities need to rethink the way they are growing and encourage modern mixed-use town centers where people can shop, work, and recreate in a neighborhood environment. Studies show seniors want quality single-family homes on small lots. However, developers of these kinds of homes often face local opposition or

> *"More seniors need to become involved in local planning processes to ensure their needs are reflected in local plans."*

[5] April 2004 report from the Surface Transportation Policy Project

Marie Taylor is in her 80s and lives in East Knoxville. She stopped driving a year ago.

"I thought I was a menace to society, so I didn't want to get out there and run over somebody or have somebody run over me," she says with a laugh.

She uses CAC's Volunteer Assisted Transportation to go shopping and to doctor appointments.

"They have been lifesavers."

VAT also takes her to the Megabus. She uses the private bus service to visit family in Memphis. If not for VAT, she says, she'd probably have to move to Memphis.

"It helps me stay in Knoxville, where I want to stay, and to stay self-sufficient," Marie says.

conflicts with local zoning or land use plans. More seniors need to become involved in local planning processes to ensure their needs are reflected in local plans.

Public Transportation

Many people in our community choose to use transit for convenience. For seniors, transit services fill a critical need. In the Knoxville Region, there are two types of public transit services available – fixed-route and demand-response. Fixed-route transit typically is service provided by larger buses running a fixed-route on a fixed-schedule. Demand-response transit is typically service provided by vans in which the passenger must call in advance to reserve a trip. The van will then arrive at a passenger's house, take them to their destination, and return to pick them up at a pre-set time. By using vans, demand-response service is more flexible in serving neighborhoods and rural locations. More information about public transportation services in the Knoxville Region is available in Chapter 3.

Not Enough Capacity

Most of the Knoxville Region's demand-response transit services are pushed to capacity just getting people to health care, which is a critical need. Rarely are services available to take people shopping, to the beauty salon, to visit a friend, to go out and eat, or to the movies – activities that drivers often take for granted. One survey shows that one in five persons age 65 and older are still working. Often seniors work non-traditional schedules as some work part time jobs to make extra income. More capacity, longer hours of operation, and more frequent service are key requests in almost every public transit study conducted in the last fifteen years. By having ample transit options available, seniors can maintain their independence.

There is capacity on KAT's fixed-route system, but most of the Knoxville Region's residents do not have access to this service. KAT's fixed-route system can be expanded in certain areas, but region-wide service with large buses is neither practical nor appropriate. If transit was limited to fixed-route services only, passengers would have to walk extended distances to reach the bus or their destination. A lack of sidewalks makes traversing some of the hilly roads in the Knoxville Region almost impossible. A majority of the outlying areas in Knox County and the Knoxville Region are better served by demand-response transit services.

Improving Transit

A local effort to improve transit for seniors and people with disabilities is called the Knoxville Regional Project Action Coalition. The Knoxville Region was selected by the Easter Seals organization for a grant in 2011. The grant brought employees of the national Easter Seals organization to Knoxville to meet with a group of citizens to discuss ways to improve transportation in the Knoxville Region. The Knoxville coalition continues to meet and anyone is welcomed to join. Current projects include:

- improving mobility management,
- establishing a one-stop shop of information on transit services,
- encouraging accessible taxicabs, and
- promoting coordination between transit providers.

Coordination between transit providers cannot be overstated. A recent example of successful coordination is occurring in the Chattanooga Region, where the demand response public transit agencies have launched a project that strengthens their coordination through establishing a joint reservation center. The agencies trade reservations as needed to improve fleet efficiency. While early in their effort, they are hoping to achieve 20 percent more capacity through such coordination. Whether a joint reservation center could be established in Knoxville is unknown at this time. Locally, KAT, Knox County CAC Transit, and ETHRA are working together as part of the Project Action Coalition. The Coalition, still in its infancy, is looking at several coordination projects and strategies with the goal to help provide improved transportation for the elderly and people with disabilities.

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Improving Safety and Efficiency in the Transportation System

The financial realities of transportation have changed, much like everything else. The primary focus on infrastructure can no longer be making it bigger; we need to focus on making it better. The TPO devotes a great deal of energy and resources in doing just that. Two major areas of emphasis are safety and efficiency. Safety is a large, multifaceted undertaking. It focuses on user behavior, which includes education, marketing, organizing events, etc and roadway design, which focuses on identifying and mitigating or eliminating safety issues that present a challenge to users. Efficiency focuses a great deal on a high level of data and ability to process it. However, it also looks at behavior – specifically how to get users thinking about transportation differently. The Congestion Management Process (CMP) is a robust system of strategies and measures to do just that.

> *"The primary focus on infrastructure can no longer be making it bigger; we need to focus on making it better."*

Congestion Management

The focus of congestion management is to first, investigate strategies that improve transportation operations and manage the existing system more efficiently. The second is to reduce travel demand as a way of reducing congestion rather than building or widening roadways. The Knoxville Congestion Management Process (CMP) identifies a number of strategies to evaluate those improvements before looking at roadway expansion.

The TPO has identified the following strategies for managing congestion within the Knoxville Region.

- Transportation Demand Management (TDM)
- System Management & Operations (M&O) Strategies an Intelligent Transportation Systems (ITS)
- Public Transportation Improvements
- Additional System Capacity (Projects)

More information about congestion management and its strategies are detailed in Chapter 7.

Strategic Highway Safety Plan (SHSP)

The Governor of Tennessee, TDOT, Tennessee Department of Safety (TDOS), and the Governor's Highway Safety Office (GHSO) have come together with the Federal Highway Administration (FHWA) and the Federal Motor Carrier Safety Administration (FMCSA) to develop the State of Tennessee's Strategic Highway Safety Plan (SHSP). The SHSP's mission is "Through coordination of education, enforcement, engineering, and emergency response initiatives, to reduce the number of crashes that result in fatalities, injuries, and related economic losses on Tennessee's roadways." The goal of the SHSP is reduce the total number of fatalities on

Tennessee Roadways to 900 total fatalities by 2012. The following education campaigns have been employed to help battle fatalities:

- Booze it & Lose it
- Buckle up in your Truck
- Click it or Ticket
- Child Passenger Safety
- 100 Days of Summer Heat
- Public Service Announcements
- Dynamic Message Board Statistics
- Quick Clearance Laws
- Service Patrols

As part of the SHSP, providing the most efficient and safest highway facilities is of critical importance. The primary "measuring sticks" for safety are reductions in the number of fatalities and serious injuries each year that occur due to motor vehicle crashes in Tennessee. To achieve the goal of the SHSP, data driven emphasis areas and strategies to reduce the number of fatal and serious injury crashes have been identified. Comprehensive, coordinated, and extensive safety initiatives of Engineering, Enforcement, Education, and Emergency Response will be developed and implemented for each emphasis area.

Enhanced Tennessee Emphasis Areas and Lead Agencies:

- Improve Crash Data (TDOT, TDOS, GHSO)
- Reduce Lane Departures (TDOT)
- Improve Intersection Safety (TDOT)
- Improve Work Zone Safety (TDOT, TDOS)
- Improve Motor Carrier Safety (TDOS, FMCSA)
- Improve Driver Behavior (GHSO, TDOS)
- Strengthen Legislation (GHSO,TDOT)
- Enhance Educational and Awareness Programs (GHSO, TDOT, TDOS)

TDOT's purpose in this is to help minimize the impacts of accidents on the roadways, and the congestion and delays associated with accidents. In analyzing the problems of congestion, two numbers stand out:

- **60 percent of all freeway congestion is non-recurring,** i.e. caused by incidents such as wrecks, debris in the road, disabled vehicles, weather conditions, work zones, and not by limited highway capacity.
- **20 percent of all freeway crashes are "secondary,"** occurring because the roadway is blocked by an earlier incident.

As can be seen, if accidents and their duration can be minimized, the congestion that is associated with the accident and the chances for a secondary accident are also reduced. With the installation of the TDOT SmartWay surveillance system (cameras and speed detection) extending further into the region, TDOT Help Patrols are better able to identify and more quickly respond to incidents and aid motorists. The SmartWay system extensions are planned to occur first on I-40/75 west from the current terminus around Lovell Road out into Loudon County at the U.S. 321 exits on both I-40 and I-75. Further extensions are planned over time as shown in the Operations Projects List in Chapter 8.

Driver Education

In addition to these statewide programs, the TPO has developed a Driver's education session. This session is to inform new young drivers on the rules of the road as they pertain to vehicles and bicycles. TPO staff and other trained members of the education team teach Driver's Education classes about Tennessee Laws for motorized vehicles and bicycles.

Safe Routes to School

The TPO began working on Safe Routes to School before the passage of SAFETEA-LU, the federal legislation that included funding for the program. One of our early partners was the Knox County Health Department. Today, the Health Department and TPO coordinate the Knox County Safe Routes to School Partnership, which brings together engineers, advocates, school officials, law enforcement, planners, and others to create projects and programs that make it safer and easier for children to walk and bike to school.

Distracted Driving

Distracted driving includes any activity that diverts a driver's attention away from operating their vehicle. Distractions can include texting, using a cell phone or smartphone, eating or drinking, talking to passengers, grooming, reading, using a navigation system, watching a video, or adjusting a radio. The new phenomenon of distracted driving has begun to create safety concerns. The State of Tennessee has enacted legislation that makes texting and driving illegal. The GHSO and local authorities are working on an education campaign to minimize texting and distracted driving.

Measuring the Performance of Our System

Our transportation system is a large, costly one to build and maintain. Taxpayers entrust us with a great deal of money every year in support of that effort. The current economic conditions make it more important than ever that we invest those precious dollars as wisely and efficiently as possible. The public demands greater accountability and we must deliver. Therefore measuring the effectiveness of these investments has become a major priority from the Federal level to the local level. It is not always easy to find meaningful, balanced ways to quantify the effectiveness of our infrastructure. However, the TPO is committed to making this kind of accountability a top priority. As the 1992 book, *Reinventing Government* stated it:

- If you don't measure results, you can't tell success from failure.
- If you can't see success, you can't reward it.
- If you can't see failure, you can't correct it.

> *"The current economic conditions make it more important than ever that we invest those precious dollars as wisely and efficiently as possible."*

The Process of Identifying Meaningful Measures

In July 2012, after several years of extensions to the previous legislation, congress passed a two-year bipartisan transportation bill, called *Moving Ahead for Progress in the 21st Century*, or MAP-21 for short. MAP-21 recognized the importance of accountability and made measuring performance a priority.

The U.S. Department of Transportation (USDOT) will establish performance measures through the federal rulemaking process, providing public and private transportation stakeholders (including TDOT and TPO) with opportunities to review and comment on the proposed measures. TDOT will set performance targets for the USDOT performance measures in consultation with the TPOs and public transportation operators. The TPO will then establish metropolitan performance targets for the USDOT performance measures after the State sets statewide performance targets.

According to the 2001 TRB report, *Performance Measures to Improve Transportation Systems and Agency Operations*, in selecting measures, an array of questions must be addressed:

- Do the measures get to the heart of the key issues?
- Are the measures readily understood by all affected parties?
- Will measures be interpreted with consistency?
- Are the measures too complex, at the expense of being comprehensible?

- Are the costs to collect, validate, and update the underlying data within reason, particularly when weighed against the value of the results?
- Can easier, less costly measures satisfy the purpose, perhaps not as elegantly, but in a way that does the job?
- Are the measures too simplistic at the expense of offering useful insights?
- Do the measures assess outcomes that reveal key results, or do they assess outputs that measure level of effort, which may not be the best indicator of results?

Sample of Current State (TDOT) Measures

Table 5-2: Select TDOT Performance Measures

Measure	Standard
Annual percent increase in total statewide transit passenger trips.	Increase total statewide transit passenger trips by 1.5 percent annually to reduce urban congestion and increase air quality and accessibility.
Percent of usage of seat belts in Tennessee.	Increase seat belt usage in Tennessee.
Percent of bridge deck area on all bridges maintained by TDOT that is not structurally deficient.	The sum of the deck area for those bridges on the state system not classified as structurally deficient will be 94 percent or greater of the total deck area for all bridges.
Percent of reduction in fatality rate on Tennessee roadways.	Reduce the fatality rate by 2 percent annually on Tennessee roadways by expanding traffic safety information systems and other engineering efforts.
Number of publicly accessible biofuels (B20 and/or E85) refueling pumps in Tennessee's Biofuel Green Island Corridor System.	To increase the number of publicly accessible biofuels (B20 and /or E85) refueling pumps in Tennessee through funding, education, and marketing efforts of the state refueling infrastructure development program.
Percent of interstate mileage with an International Roughness Index (IRI) pavement rating of good or very good.	International Roughness Index (IRI) rating on interstate pavement will be good or very good on 93 percent of pavement.

Measure	Standard
Percent of highway lane blockage incidents in urban HELP service areas cleared within 90 minutes.	The average clearance time for all highway lane blockage incidents in urban HELP service areas should be within 90 minutes for 97 percent of the HELP operator responses. Lanes closed for construction or maintenance activities are not included.
The condition level for the combination of interstate and state maintained roads.	TDOT's Maintenance Rating Index (MRI) related to maintaining roadways will be equal to or greater than 90.

Source: Tennessee Department of Finance and Administration

Current TPO Measures

The TPO can be proactive in identifying measures prior to TDOT guidance as long as it also conforms to TDOT requirements when those are announced. The TPO has already identified a number of measures as a part of other efforts.

Congestion Management

The TPO already uses performance measurement in its Congestion Management Process (CMP) to evaluate levels of congestion on roadway in the Knoxville Region. Measures include:

- Travel Time, which measures the time to travel from one location to another
- Level-of-Service (LOS)
- Volume-to-Capacity (V/C) Ratio

Table 5-3: Definition of Level of Service (LOS)

LOS	Congestion Level	Stop Delay (seconds)	Peak TT / Free Flow TT	V/C Ratio
A - C	Not Congested	less than 25	less than 1.33	less than 0.65
D	Marginal	between 25 and 40	between 1.33 and 1.5	between 0.65 and 0.85
E	Moderate	between 40 and 60	between 1.5 and 2	between 0.85 and 1.00
F	Serious	greater than 60	greater than 2	greater than 1.00

Source: 1994 Highway Capacity Manual (Transportation Research Board), Knoxville Regional Transportation Planning Organization (TPO)

Public Transportation

Transit services in the Knoxville Region collect a variety of performance data that they use to evaluate the effectiveness of the services they provide. Federal regulations, such as the ADA and Title VI require that the transit agencies consider more than just raw data when they evaluate their services, but performance factors are important.

Performance factors that look at cost, such as cost per passenger, cost per mile, and cost per hour are important, but are complicated and must be evaluated carefully. Turbulent fuel prices can make transit costs jump dramatically in just a few weeks or months, making factors that consider costs fluctuate wildly. In addition, recent grants allow seniors or disabled passengers to ride KAT for free or for a reduced fare. Therefore, a route that serves a large number of these riders may look less productive due to lower revenue. In the end, performance measures are important but it is important not to rely solely on them when making decisions about these services.

KAT collects data for all of their services that can generate a number of commonly used transit performance factors:

- revenue per mile
- revenue per vehicle hour
- passengers per mile
- passengers per hour
- preventable accidents
- mechanical road calls
- accidents per 100,000 miles of service
- number of miles per bus failure on the road

With the implementation of the Automatic Vehicle Locators (AVL's) KAT will be able to do system wide reliability analysis of routes/drivers. As more implementation of the AVL system takes hold, more data for planning purposes and performance measures will be developed.

KAT staff review performance factors in detail and present them to the Knoxville Transportation Authority each month. KAT shares these data and performance factors with the TPO staff.

Knox County CAC Transit and the East Tennessee Human Resource Agency (ETHRA) collect similar data for their demand response transit service:

- passengers
- revenue
- service hours
- miles traveled
- passengers per service hour
- cost per trip
- miles per trip
- passengers per mile
- cost per mile
- date on vehicle breakdowns in service

In addition, as demand response transit service requires a reservation, both agencies are often able to collect data on trip purpose (i.e. medical, job, essential errand, etc.). Though not always easy to ascertain, both agencies try to determine the number of unique individuals that use the service. This can help them understand whether a few people are taking many trips or many people are taking a few trips. Knox County CAC Transit and ETHRA staff review performance factors in detail and present them to their respective boards or advisory committees. They both share these data and performance factors with the TPO staff.

All three systems have recently implemented GPS and automatic vehicle locator (AVL) systems. This technology will allow transit providers a higher level of data and analysis that will improve services. In addition, all three systems conduct passenger surveys. Though costly and time consuming, passenger surveys provide more detailed information that is important in service delivery (customer satisfaction, demographic, origin-and-destination, etc.). These passenger surveys are important and will continue to be done when financially feasible.

2009 Bicycle Plan

The 2009 Bicycle Plan established a number of measures to gauge the performance of the Bicycling Program as well as the overall state of bicycling in the Knoxville Region:

- Number of bicyclists observed at count locations in TPO area
- Number of bicycle racks installed through the TPO grant program

- Number of local engineers attending training on bicycle issues
- Number of page views on Bicycle Program website
- Number of fans on facebook
- Number of people on TPO Bicycle Program email list
- Number of Smart Trips participants logging bicycle commutes
- Number of attendees at Bike to Work Day event
- Number of bicyclists in Neighborhood Bike Ride and Tour de Lights
- Percentage of arterial and major/urban collector roads with bike lanes or shoulders
- Number of miles of signed, official bike routes
- Number of miles of linear greenways
- Number of bike shops
- Number of bike clubs
- Number of bicycles parked at racks
- Number of rides offered by local shops and clubs

Ridesharing (Smart Trips)

Smart Trips is a program housed within the TPO, which seeks to improve air quality in the Knoxville Region by reducing the number of people driving to work alone. Smart Trips educates commuters about transportation options, helps them find carpool partners or get started bicycling or taking the bus to work. Active participants can earn rewards for their efforts. Smart Trips also helps businesses promote the program and develop their own incentives such as free transit passes, parking cash-out (where employees can choose a parking space or get the value of that parking space each month), or preferential carpool parking.

Smart Trips records a great deal of data to evaluate its effectiveness. Some of these data include:

- Smart Trips Active Participants (logged at least one clean commute in past 3 months)
- Smart Trips Reward Qualifiers (Highly Active Participants)
- VMT Reduced
- NOx Saved
- VOC Saved
- PM Saved

- CO2 Emission Reduced
- Fuel and Maintenance Cost Savings

Safety

The Governor of Tennessee, TDOT, Tennessee Department of Safety, and the Governor's Highway Safety Office have come together with the FHWA and FMCSA to develop the state of Tennessee's Strategic Highway Safety Plan (SHSP). Through implementation of the SHSP, the state of Tennessee has been able to lower our total fatalities on the roads of Tennessee from 1,043 in 2008 to 938 in 2011 or 11 percent.

Objectives and Proposed Actions

Goods Movement and Freight

The following are objectives and actions recommended by the Mobility Plan Goods Movement and Freight element:

- The TPO will continue to coordinate meetings of the Knoxville Freight Advisory Committee and follow the recommendations in the Knoxville Regional Freight Movement Plan. The TPO will continue to be involved in the I-81 Coalition.
- The TPO will research funding opportunities for freight-related projects and apply for grants as applicable. In addition, 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 the 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.
- The TPO will also work with TDOT on implementing the Tennessee State Rail Plan and work with the Knoxville Metropolitan Airport Authority as needed on implementing the McGhee Tyson Airport Master Plan.
- The TPO will study the feasibility of developing an intermodal facility in the Knoxville Region and identify available funding resources.
- In March of 2005, the TPO Executive Board adopted a resolution requesting TDOT and Commissioner Nicely to fully support the phased construction of the Memphis to Bristol Railroad Connection by securing the cooperative efforts of the railroads involved, the cooperative efforts of the State of Virginia, and by including appropriate projects in the next 3-Year Program of Projects and in the 10-

Year Investment Plan which will be prepared as part of the Statewide Long-Range Multi-Modal Transportation Plan.

Public Transportation

The following are objectives and actions recommended by the Mobility Plan Public Transportation element. These proposed actions and objectives will help shape the future of public transportation in the Knoxville Region and draw upon many of the recommendations of the recent transit planning studies that have been completed:

- Improve coordination and communication between transit providers to gain greater efficiencies in providing services. The TPO should study the need to establish a Regional Transit Authority.
- Provide transit training that will assist people in learning how to use transit.
- Identify target markets for the development and promotion of additional services, which should include, but not be limited to, students, elderly, disabled persons, commuters, and shoppers.
- Improve local fixed-route services where population densities or traffic generators justify service. Trunk lines or core routes should have very frequent service (up to fifteen-minute headways). Higher capacity systems, like Bus Rapid Transit should be explored.
- Support Neighborhood Circulators and community based transit services where appropriate.
- Suburban circulators should be designed to facilitate movement within particular suburban centers.
- Downtown transit opportunities should be enhanced. The park once and ride transit concept should be fully supported. New developments, including parking structures, should accommodate transit services. Expansion of the trolley system should occur.
- Transit providers should use a variety of sized vehicles.
- Marketing needs to be made an integral component of all transit programs.
- Designated stops should be developed where trunk line routes, cross-town routes, neighborhood, and suburban circulators intersect, facilitating a timed transfer network. The stops should be clearly identified and include shelters and passenger amenities.
- Satellite centers or super stops should be at locations where several trunk route, cross-town, and circulator routes converge. Transit centers could also include restrooms, restaurants, shelters, small shops, and ticket booths.
- Commuter-oriented services should be provided throughout the TPO Area. Ridesharing alternatives should be promoted.

- A series of express routes should be offered throughout the TPO Area. Services should originate from park-and-ride lots and provide limited-stop service via the interstate or major arterials to major attractors. Where practical, reverse commute opportunities, as part of express bus services should be explored. Outlying transfer centers could be established where several routes converge.
- Transit providers should continue to work toward meeting the ADA regulations by providing comparable paratransit service and accessible fixed-route services to persons who have a disability.
- An overall parking strategy that includes parking policies, pricing that encourages transit usage, and coordination between zoning, planning and public works on actions that include parking and transit use should be established, especially in downtown areas. In other words, a strategy that encourages interdepartmental coordination on parking policies and policies that incentivize the use of transit.
- Transit agencies should promote use of both alternative fuels and alternative fuel vehicles.
- Transit centers, superstops, and transit stops should connect with biking and pedestrian facilities. Bike lockers and/or bike repair stations should be located at key transit stops.
- Local transit providers should take advantage of the new emerging technologies to help promote and simplify the use of transit. Transit providers should work in concert so ITS applications cannot only work within a system but regionally also. ITS technology should also be used to obtain greater efficiencies in transit operations.

Pedestrians and Greenways

The following are objectives and actions recommended by the Mobility Plan Pedestrians and Greenways element:

- **Roadway Design:** Continue to provide safe and convenient bicycle and pedestrian access in all new and improved transportation projects, unless exceptional circumstances exist (as recommended by the US DOT Policy Statement, **Accommodating Bicycle and Pedestrian Travel: A Recommended Approach**).
- **Barriers and Missing Links:** Achieve greater system continuity for pedestrian travel by removing deterrents and barriers, creating better pedestrians links to public transit and filling gaps in regional and local networks.
- **Education and Encouragement:** Educate the general public and public officials about the economic, environmental, health and social benefits of walking as transportation, and develop improved programs to encourage increased levels of walking.
- **Regional Cooperation and Communication:** Use the Great Smoky Mountains Regional Greenway Council to develop and refine the regional greenway network so that all parties understand, incorporate, and proceed to implement their respective components of the Plan. Additionally the

group identifies, prioritizes, and seeks funding for needed greenway links in addition to collaborating on grant applications and map production.

- **Comprehensive and Transportation Plan Development:** Foster pedestrian-oriented development patterns and plan for appropriate greenway facilities through the development and refinement of local comprehensive plan transportation elements, sub-area plans, and state transportation plans.

Bicycling

The following are objectives and actions recommended by the Mobility Plan Bicycling element:

- **Provide safe and convenient bicycle accommodation in all transportation projects.**
  - Continue to follow the TPO Bicycle Accommodation Policy adopted in 2002 and the TDOT Policy updated in 2010.
  - Review and update local roadway design standards for appropriate bicycle accommodation.
- **Maintain bicycle facilities for function and safety.**
  - Develop facility management plans to assure proper maintenance of bicycle facilities.
  - Keep bicycle facilities well maintained and free of hazards.
  - Develop local policies requiring paved aprons on gravel driveways or roads to prevent gravel from being carried out onto the shoulders.
- **Achieve greater system continuity for bicycle travel.**
  - Add bicycle crossings over waterways, highways, major arterials, and other obstacles where such crossings are inadequate.
  - Give high priority to bicycle projects that link existing facilities into a continuous network.
  - Address regional bicycle “missing links” identified in plans and studies.
- **Build all bicycle projects according to accepted design standards.**
  - Plan, design, and build facilities in accordance with the AASHTO Guide for the Development of Bicycle Facilities and other accepted documents.
  - Educate transportation planners and engineers on how to safely and efficiently accommodate bicyclists.
- **Educate the general public and public officials about the benefits of biking and develop/improve programs to encourage increased levels of biking.**
  - Increase the use of media to educate the public.
  - Integrate bicycle safety laws and regulations into driver’s education classes and driver’s license testing.
  - Produce materials on bicyclist safety laws and distribute in a wide variety of venues.

  - Develop and administer bicycle safety programs for bicyclists of all ages.
  - Produce, regularly update, and distribute bicycle maps.
  - Increase participation and quality of special events and programs that encourage bicycling.

- **Increase enforcement of traffic laws equally among bicyclists and motorists to increase safety and build mutual respect among all system users.**
  - Consistently enforce laws among motorists and bicyclists.
  - Continue to educate and train law enforcement personnel in bicycle enforcement.

- **Develop and refine the regional bicycle network so that all jurisdictions understand, incorporate, and implement their respective components of the regional system.**
  - Develop guidelines for jurisdictions to use when developing the bicycle components of their local plans.
  - Collaborate to ensure that all plans are in agreement.

- **Support greater investment in bicycle projects.**
  - Support increased funding to implement and maintain transportation plans, including bicycle components.
  - As new transportation funding sources are identified, assure that a share be provided for bicycle projects.

- **Monitor the progress of the implementation of the Bicycle Plan, and assess the effects of project and program investments.**
  - Conduct counts to measure changes in bicycle travel over time
  - Conduct “before and after” studies to evaluate the impact of improved and expanded facilities
  - Develop tools to measure the effects of safety, education, and encouragement programs
  - Periodically inventory bicycle facilities in the Knoxville Region.

Intelligent Transportation Systems (ITS)

The following are objectives and actions recommended by the Mobility Plan ITS element:

- Promote the expansion of traffic management system (TMS) deployment throughout the Knoxville Region, including placing closed-circuit television (CCTV) traffic cameras and dynamic message signs in Anderson, Blount, Cocke, Jefferson, Loudon, and Sevier Counties;
- Develop a strategic plan for ITS expansion in the City of Knoxville by identifying additional opportunities, a timeframe for deployment, and potential funding sources; and

- Support the installation of additional CCTV traffic cameras and dynamic message signs along arterials and collectors and at congested intersections, especially throughout the TPO Planning Area.

The following objectives relate to incident management:

- Support expanded Incident Management through HELP truck coverage along the interstate and expressway system in Anderson, Blount, Cocke, Jefferson, Loudon, and Sevier Counties.

Transportation Demand Management (TDM)

The following are objectives and actions recommended by the Mobility Plan TDM element:

- Reduce traffic congestion and improve air quality by decreasing the use of the single occupant vehicles (SOV) at peak hours.
- The TPO shall work with local governments and TDOT to develop vehicle miles traveled (VMT) reduction goals.
- The TPO shall continue the Smart Trips program, promoting alternatives to SOV travel, including carpool, vanpool, transit, walking, bicycling, telecommuting, and variable work schedules.
- The TPO shall encourage local governments and businesses to participate in events and other activities that support and facilitate the use of alternatives to driving alone by commuters and other travelers.
- The TPO shall work with transportation-related agencies and local governments to encourage, promote, and support employers in offering tax-deductible public transportation fringe benefits to their employees.
- The TPO shall encourage and participate in public-private partnerships and develop incentives to encourage employers, developers, and other organizations to participate in meeting the mobility needs of the Knoxville Region's residents, visitors, and businesses.
- The TPO shall work with local governments, employers, and developers to encourage and implement effective parking management strategies, including preferential parking for carpools and vanpools, shared use parking, and variable parking pricing.
- The TPO will work with local governments to develop TDM-supportive policies and ordinances for all new and redevelopment projects.

Best practices for TDM include:

- Make TDM programs comprehensive, including as many transportation improvements and incentives as appropriate for a particular situation;

- Include both positive and negative incentives. Programs tend to be most effective when they improve consumers' travel choices and provide incentives to use alternatives to driving when possible;
- Integrate transportation and land use planning as part of a comprehensive program; and
- Involve stakeholders in planning and implementation, including transportation and land use planning agencies, transit providers, businesses, residents, and employees.

Common barriers to TDM programs include overcoming existing planning and funding practices that favor increasing capacity over implementing demand management strategies (even when they are more cost effective and beneficial overall), institutional or political opposition to change, and resistance from special interest groups that benefit from existing inefficiencies.

Safety

The following are objectives and actions recommended by the Mobility Plan Safety element:

- Develop and implement short term strategies that enhance the safety for all users of the transportation system;
- Create policies and design practices that are consistent with an efficient and safe Intermodal Transportation Network;
- Develop an information system for crash data compiling, consolidating, analyzing, and accessing;
- Encourage TPO involvement in the development of regional incident management plans, coordination, and training; and
- Develop tools that allow stakeholders to examine safety data and establish priorities, apply for relevant funding, publicize the benefits of safety, and educate decision-makers and the public.

Security

The following are objectives and actions recommended by the Mobility Plan Security element:

- Ensure cooperation and coordination among all agencies in incident management and emergency situations.
- Engage emergency and law enforcement personnel in transportation planning.
- Ensure that the transportation system is capable of handling a response to an emergency.
- The TPO will continue to coordinate the Knoxville Incident Management Committee, which includes members of TDOT, TEMA, THP, local governmental officials, law enforcement, emergency personnel, and wrecker services. An objective of the TPO is to ensure cooperation and coordination among all

agencies in incident management and emergency situations. In the event of a major hazard, the TPO supports all measures that need to be taken to ensure the area is safe and secure but also would like to see highways or lanes closed as a result opened as soon as possible. In some events, the evacuation of nearby neighborhoods may be necessary.

- The TPO will continue to engage emergency and law enforcement personnel in transportation planning activities. Another objective of the TPO is to ensure that the transportation system is capable of handling a response to an emergency. This can be achieved by providing multiple alternative routes through road network connectivity in the case of highway closures, ensuring sufficient emergency personnel and equipment access along the transportation system throughout the Knoxville Region, and utilizing ITS and other measures to effectively handle an evacuation.

Evaluating the System

Chapter 6

Travel Demand Model

Background

In order to project future conditions of the roadway system the TPO uses a computer-modeling tool known as a travel demand forecasting model. The Knoxville Regional Travel Demand Model (KRTM) is calibrated to closely replicate existing traffic patterns in the Knoxville Region in order to provide a means of forecasting future traffic volumes and conditions. The model covers the primary roadway network in a 10-county area that includes Anderson, Blount, Grainger, Hamblen, Jefferson, Knox, Loudon, Roane, Sevier, and Union Counties. To develop the model, mathematical relationships between travel activity and household socio-economic characteristics were derived from extensive travel behavior surveys that were conducted in the years 2000 and 2008. In these surveys, approximately 3,000 households in the Knoxville Region were asked to record their travels in a one-day period including:

- the purpose of the trip,
- the origin and destination of each trip,
- the mode of transportation used, and
- the time of day the trip was made.

The model was then developed based on the assumption that households with similar socio-economic characteristics such as household income, number of school-age children, and vehicle ownership would demonstrate similar travel activity. These household characteristics are available from the U.S. Census and are input into the model based on their distribution across smaller geographic areas in the Knoxville Region known as Traffic Analysis Zones (TAZ).

In addition to the socio-economic inputs at the TAZ-level, the model also includes a mathematical representation of the roadway network as a system of links and nodes. Each link in the model represents a segment of roadway that is described by several attributes, including:

- functional classification,
- speed limit,
- number of lanes,
- pavement width,
- level of access control, and
- whether it is divided by a median.

The nodes represent intersections, locations of traffic signals, and places where roadway characteristics might change in the middle of a segment (such as where a road narrows). The roadway attributes are used to determine the vehicular capacity and travel time along each link in the model network. The model can therefore be used to test alternative improvement strategies by changing appropriate attributes such as increasing the number of lanes or by coding in a new link to represent construction of a new roadway.

Please contact the TPO with any technical questions regarding the model and its analysis.

General Overview

Travel demand modeling has been in national practice for over 50 years since the development of original "4-step" models in the 1950s and 60s. Recently there has been a shift from the standard 4-step process towards a more detailed approach known as "Activity-based Modeling," which has been implemented in a few larger cities in the nation. For more information about travel demand modeling, see the FHWA Travel Model Improvement Program, at **www.fhwa.dot.gov/planning/tmip**. The Knoxville Regional TPO recently updated the overall structure of the model from the standard 4-Step process to introduce some elements from Activity-based travel demand modeling. Complete travel demand model documentation can be found in Appendix H.

This "hybrid" design allows for greater policy sensitivity and a more realistic representation of travel than a 4-step model produces. One of the key distinctions between the 4-step model and the new KRTM is in the KRTM's modeling of daily "tours" instead of individual trips. A tour is a daily set of travel that begins and ends at home and incorporates trip-chaining effects such as stopping at a grocery store on the way home from work.

The KRTM is really made up of several sub-models. These sub-models are tied together and run in a sequential manner such that the output from one sub-model is an input into the next sub-model. Figure 6-1 displays the KRTM modeling process, and below is a summary of each component. Please refer to the separate "Knoxville Model Technical Documentation Report" included in Appendix H for more detail about the model components.

- **Population Synthesis** – Determines the characteristics of individual households in the Knoxville Region based on the aggregate characteristics at the TAZ-level.
- **Vehicle Ownership Choice** – A significant factor in the number of motor vehicle trips made and the choice of mode (driving, carpooling, riding transit, walking, etc.) is the availability and number of vehicles at the household level. This sub-model estimates vehicle ownership based on the household characteristics such as income and number of workers.
- **Tour Generation** – This step is similar to "Trip Generation" in the standard 4-step model. The model predicts the number and types of tours that will be made by each household based on a number of factors. The model includes five different types of tours – Work, U.T., School, Non-Work, and Visitor (for tourist areas in Sevier County).
- **Tour Mode Choice** – Determines the predominant mode of travel for each tour. The KRTM includes four separate modes of private automobile, school bus, public bus, and walking/biking. Additionally the private automobile mode is disaggregated to number of occupants to account for carpooling.
- **Stop Location/Stop Sequence Choice** – This step is similar to "Trip Distribution" in the standard 4-step model. The model predicts the locations of trip ends for each tour. Stops are determined such that daily patterns of travel that begin and end at home are formed. Individual trips within the overall tour can use a different mode of travel than the predominant mode, e.g. a person that drives to work but can walk somewhere for lunch during the day.
- **Departure Time Choice** – This step determines when trips are made throughout the day.

- **Assignment** – The final step in the process is to assign the trips to the roadway network. The model computes the effects on travel time based on congestion and feeds this information back to the earlier sub-models, which affect travel behavior.

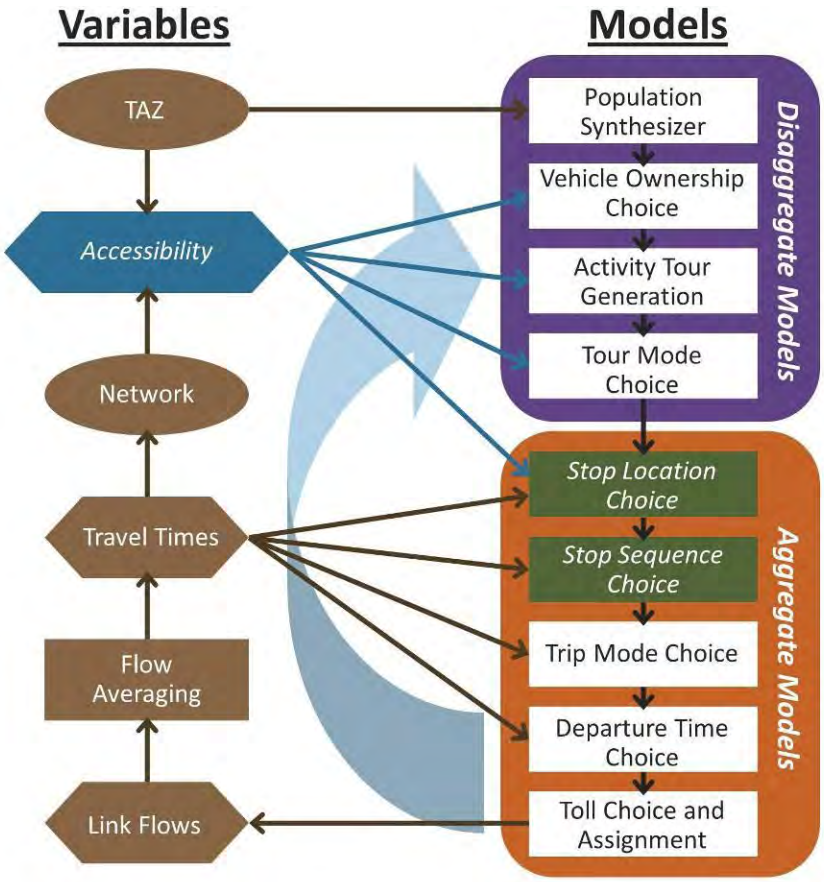


Figure 6-1: Overview of Knoxville Regional Travel Demand Model (KRTM)
Source: Knoxville Regional Travel Demand Model (KRTM)

The model results estimate statistics such as average speeds, delay and volume-to-capacity (V/C) ratios, and use them to determine performance and congestion on the regional roadway network under various land use and transportation network scenarios.

Model Calibration and Validation

As the travel demand model is developed, each sub-model is calibrated until results are acceptable. The process of determining acceptable results is known as "Model Validation." The ultimate validation of a travel demand model is in comparing the daily traffic volumes computed by the model for each roadway against actual traffic counts taken in the validation year. The KRTM was calibrated and validated to the base year of 2010. There was a wealth of information available from the 2010 Decennial Census.

Validation Criteria

Criteria for acceptable errors between observed and estimated traffic volumes vary by facility type, according to the magnitude of traffic volume. For example, higher volume roadways have stricter calibration guidelines than those with lower volumes. Acceptable error standards have been established as guidelines for use in Tennessee through the Tennessee Model Users Group (TNMUG) and the Tennessee Department of Transportation (TDOT). These standards follow the guidelines developed by the Federal Highway Administration (FHWA) for travel demand models. Tables 6–1 and 6–2 show that the Knoxville model meets or exceeds the standards set by TNMUG for model validation for the main categories of volume to count ratios by functional class and volume group. Additional validation categories are documented in the Knoxville Model Technical Documentation Report in Appendix H.

Table 6-1: Knoxville Travel Demand Model Performance by Functional Classification

	Area	Number of Observations	Mean Count	Mean Load	% Error	TNMUG Standard	
						Acceptable	Preferable
Freeways	Urban	114	71,397	71,335	**-0.1%**	**+/- 7%**	**+/- 6%**
	Rural	83	42,156	44,386	**5.3%**		
Principal Arterials	Urban	200	24,379	24,094	**-1.2%**	**+/- 15%**	**+/- 10%**
	Rural	40	11,756	12,378	**5.3%**		
Minor Arterials	Urban	237	10,057	9,256	**-8.0%**	**+/- 15%**	**+/- 10%**
	Rural	80	7,733	8,014	**3.6%**		
Collectors	Urban	226	4,471	3,941	**-11.9%**	**+/- 25%**	**+/- 20%**
	Rural Major	148	3,089	3,551	**14.9%**		
	Rural Minor	144	1,518	1,456	**-4.1%**		
Locals	Urban	61	3,151	2,897	-8.1%	none	none
	Rural	22	1,576	826	-47.6%		
All	Urban	838	19,811	19,346	-2.3%	none	none
	Rural	517	10,248	10,781	5.2%		
	All	**1,615**	**14,388**	**14,389**	**0.0%**		

Source: Knoxville Regional Travel Demand Model (KRTM)

Table 6-2: Knoxville Travel Demand Model Performance by Volume Group

AADT	Number of Observations	Mean Count	Mean Load	% Error	TNMUG Standard	
					Acceptable	Preferable
0 – 1,000	159	613	864	**41.0%**	**+/- 200%**	**+/- 60%**
1,001 - 2,500	283	1,687	1,903	**12.8%**	**+/- 100%**	**+/- 47%**
2,501 - 5,000	297	3,714	3,740	**0.7%**	**+/- 50%**	**+/- 36%**
5,001 - 10,000	305	7,244	7,185	**-0.8%**	**+/- 29%**	**+/- 25%**
10,001 - 25,000	317	15,355	14,667	**-4.5%**	**+/- 25%**	**+/- 20%**
25,001 - 50,000	145	36,039	37,443	**3.9%**	**+/- 22%**	**+/- 15%**
> 50,000	111	83,422	82,744	**-0.8%**	**+/- 21%**	**+/- 10%**

Source: Knoxville Regional Travel Demand Model (KRTM)

It is important to note that the travel demand model is only one tool that helps identify deficient roadways. The results must be carefully scrutinized to determine whether a particular roadway is indeed an area of concern. One drawback of the model is that it can only measure effects of major improvement projects. These include additional lanes or new roadways. Smaller capacity improvements such as intersection improvements, additional turn lanes, and other congestion management strategies will not typically show much effect in the model. The Congestion Management Process section in Chapter 7 highlights some of these strategies.

Land Use Model Background

Predicting where future growth in population and employment will occur is critical in determining future travel demand. A land use allocation model was developed to do just that. A summary of the process is described in this section with additional information provided in Appendix H.

The Knoxville Regional TPO, Metropolitan Planning Commission (MPC), and other regional agencies have partnered together in an effort called Plan East Tennessee (PlanET). PlanET is a planning and visioning effort that covers a five-county region that includes, Anderson, Blount, Knox, Loudon, and Union Counties. PlanET includes a scenario-planning component, which shows hypothetical transportation and land use scenarios that represent distinct alternatives for how the PlanET Region could develop by the year 2040.

There is a high degree of overlap and need for consistency between the PlanET scenario planning process and the Regional Mobility Plan. Thus, it was determined that the results of the PlanET scenario planning process would be used to satisfy the socioeconomic data forecasts required by the travel demand model as part of the Mobility Plan.

Trend Scenario

Scenario planning often begins with a "trend" or "business as usual" scenario that projects development based on current policies and practices. The PlanET Trend scenario will form the basis for socioeconomic data forecasts as part of the Mobility Plan. While PlanET is focused on a five-county region, the Trend scenario will include the larger ten-county region to satisfy the requirements of the travel demand model. The ten-county region includes the five PlanET counties plus Grainger, Hamblen, Jefferson, Roane, and Sevier Counties.

Allocation Tool

The Mobility Plan requires a "top-down" approach for socioeconomic data allocation, in which land use is allocated until prescribed control totals are met. Specifically, the Mobility Plan includes control totals for four attributes (population, commercial employment, service employment, and industrial employment), four forecast years (2014, 2024, 2034, and 2040), and each of the ten counties. All told, there are 80 control totals as part of the allocation.

Overview of Allocation Process

The process used to allocate socioeconomic data for the Mobility Plan is a spreadsheet-based method that allocates control totals for each attribute, county, and forecast year. It relies on three basic inputs:

- **"Supply"** – Inventories of vacant and re-developable land based on existing conditions.
- **"Demand"** – A spatial measure of demand; where growth is most likely to happen.
- **"Rates"** – The rates of consumption (dwelling units per acre, employees per acre, etc.).

Land use is allocated to polygons formed by a grid of 40-acre cells that cover all ten counties. All polygons are "nested" within a traffic analysis zone (TAZ) so that polygon data can be aggregated to the TAZ level. In cases where a TAZ is smaller than a 40-acre grid cell (such as in many downtowns), the TAZ structure is the polygon. In sum, there are 60,896 polygons in the allocation model.

TAZ Aggregation

Once the allocation is complete, data is aggregated from polygons to TAZs for use in the travel demand model. Aggregate-level data is provided for population and commercial, office, industrial, and basic employment. Exhibit 6-1 below shows dot-density maps that represent growth in both population (left) and employment (right) by TAZ through the year 2040.

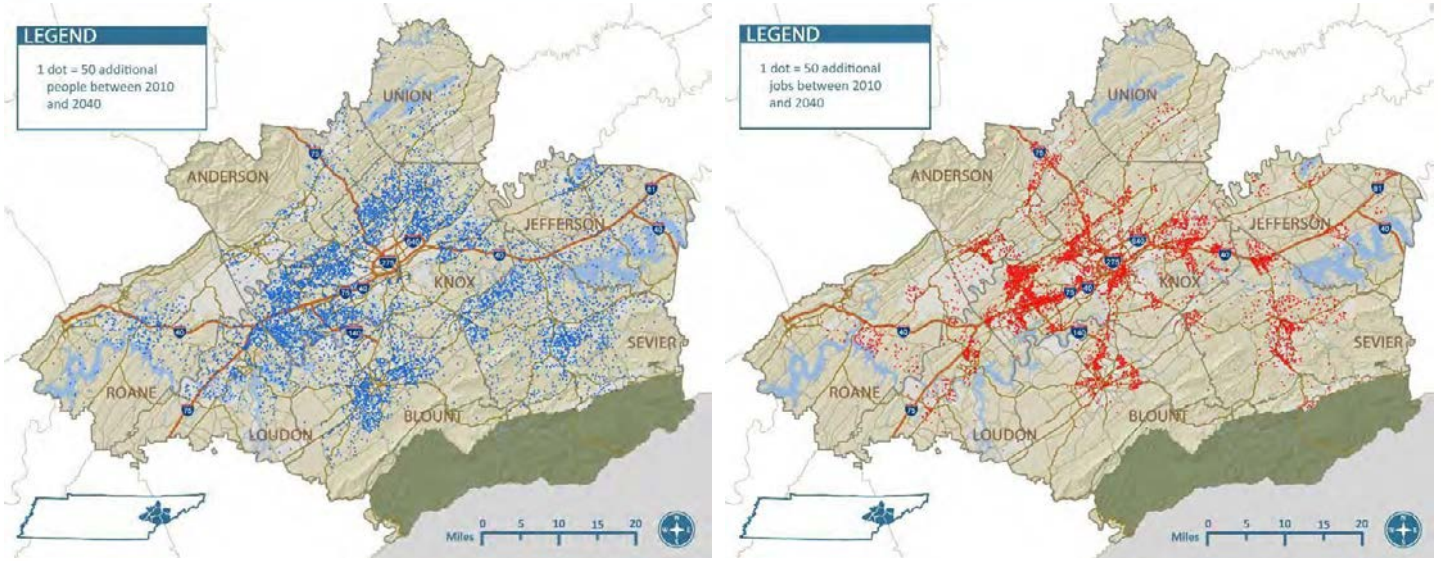


Exhibit 6-1: Dot Density Maps of Growth between 2010 and 2040, Population (left), Jobs (right)
Source: Knoxville Regional Travel Demand Model (KRTM)

Model Congestion and Deficiency Analysis Results

The future scenarios developed from the land use allocation model were input to the travel demand model to test the potential impacts on roadway system performance and congestion assuming that no improvements are made. This analysis essentially enables us to see what might happen in terms of the level of congestion on the roadway network if all expected future population and employment growth out to year 2040 suddenly appeared tomorrow.

The analyzed roadway network is known as the "Existing plus Committed", or E+C, network. The E+C network represents the roadway characteristics in place in the year 2010 and adds any improvements that have been completed since that time such as the widening of Campbell Station Road in Farragut as well as improvements that are considered to be committed – in other words fully funded for construction. A listing of all the E+C projects throughout the region can be found in Table 8-7 of Chapter 8. By analyzing this network in the travel demand model, the TPO staff is able to determine which roadways are currently congested, or are likely to become congested in the future if no other improvements are made beyond those that have already been committed.

The roadway system performance can be described using different measures. The most commonly used measure is the "Level of Service" (LOS), which is documented in the Highway Capacity Manual by the

Transportation Research Board. LOS is a qualitative measure that describes operational conditions within a traffic stream and their perception by motorists. It is based on a grade-letter system similar to a student's report card with "A" representing a free-flow roadway and "F" representing heavy traffic and forced flow conditions. For the purposes of the Mobility Plan, a planning-level LOS analysis is most appropriate, which bases the LOS on the peak hour volume-to-capacity (V/C) ratio of the roadway. The V/C ratio describes the amount of traffic volume that can be effectively accommodated based on the carrying capacity of the roadway.

Exhibit 6-2 illustrates the LOS results for 2010 conditions (left) and the future year 2040 land use on the 2010 E+C roadway network (right). The roadway links are color-coded based on their LOS and corresponding congestion level as follows:

- LOS D links (Marginal Congestion) are yellow,
- LOS E links (Moderate Congestion) are orange and
- LOS F links (Severe Congestion) are red.

It is apparent that roadway congestion increases considerably if no improvements are made. Further information regarding the roadway deficiency analysis is provided in the Congestion Management Process (CMP) section of the Mobility Plan (Chapter 7).

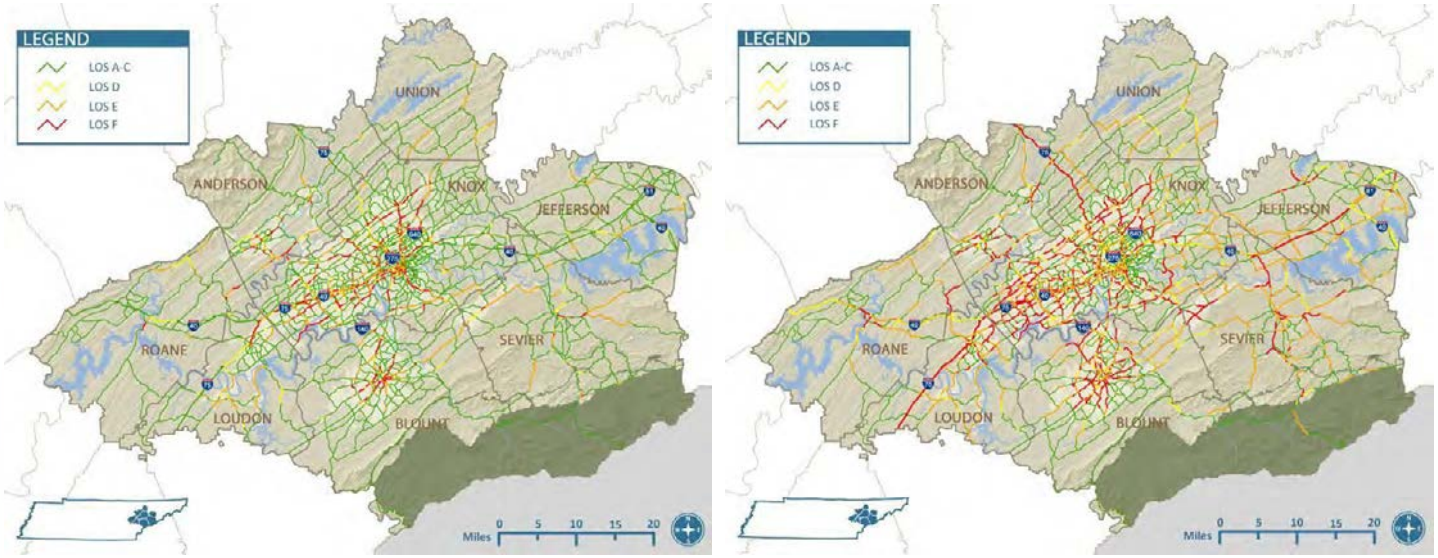


Exhibit 6-2: Roadway Level of Service in the Knoxville Region, 2010 (left), 2040 (right)
Source: Knoxville Regional Travel Demand Model (KRTM)

Regional Transit Corridor Study

The Study examined major corridors in the TPO planning area to determine if any could support higher capacity transit services. A goal of the study was to select projects that could be implemented within the next 10 years with Federal Transit Administration funds. Capital-intensive projects can take 6 to 10 years to implement the entire process, from planning to start-up , depending on the complexity of the project.

The study identified twelve corridors that warranted analysis. While most of the corridors were in the City of Knoxville, they also included Alcoa Highway, Pellissippi Parkway, Alcoa-Norfolk Southern (NS) Rail Line, Alcoa CSX Rail Line, and the NS "A" Rail Line. The corridors were screened through a two-tier process. The Tier 1 analysis served as an initial screening for fatal flaws, while the Tier 2 analysis contained a more detailed screening using a refined set of criterion. The corridors with the lowest rankings in the Tier 1 analysis did not advance for Tier 2 analysis. The Tier 2 analysis identified three corridors as deserving further study for a Bus Rapid Transit (BRT) system. The corridors are Cumberland Avenue/Kingston Pike, Magnolia Avenue, and North Broadway. BRT service is most commonly defined as very frequent service, using rubber wheel vehicles, on a dedicated travel lane, with enhanced passenger stations. If a dedicated lane is not possible, BRT vehicles can serve in regular traffic but this causes the service to lose its appeal. Other features, such as signal prioritization or queue jumper lanes, can be provided to improve those services.

Highest Priority Corridors

For each corridor, capital costs were developed using a high/low scenario.

- **The high scenario** assumes major upgrades to the roadway and traffic signals and installing Intelligent Transportation Systems (ITS) technology. Stations built along the corridor would have enhanced features (pay stations, ITS, and variable message systems). BRT vehicles are purchased and a new maintenance facility is included because the existing KAT maintenance facility is over-capacity.
- **The low scenario** includes minor improvements along the corridors and only half of the stations would be constructed with enhanced features. A new maintenance facility is included, but it would be built to a minimal design.

This high/low scenario is consistent for each corridor except for the number of stations built and the number of BRT vehicles needed for service.

North Broadway Corridor

The existing mix of commercial, residential, light office, and industrial land uses make this a viable corridor for implementing a sustainable transit system. This corridor would utilize in-street BRT, operating in mixed-traffic.

At the existing signalized intersections, signal prioritization or queue jumper lanes would be implemented. The curb lane would operate as a BRT and general-purpose travel lane in order to continue to provide access to various entrances and roadways off Broadway. It is recommended that 12 stations be built along the corridor and eight BRT vehicles would be needed for service. The estimated cost of the high scenario is $86.9 million and the estimated cost of the low scenario is $73.4 million.

Cumberland Avenue/Kingston Pike Corridor

Lined with commercial and residential areas, the east end of the corridor passes directly through the center of the University of Tennessee's campus. The west end of the corridor passes through a major retail area at West Town Mall. This corridor would utilize both BRT operations in mixed-traffic and in dedicated travel lanes. At the existing signalized intersections, signal prioritization and queue jumper lanes would be implemented. Within the in-street operations (downtown Knoxville to Lyons View Pike), BRT would operate within the curb lane with general purpose vehicles. Within the dedicated BRT lanes (Old Kingston Pike to West Town Mall), the service would operate in the median, prohibiting general-purpose vehicles from utilizing the BRT lanes. Stations would be constructed within the median at intersections, with pedestrian access to the stations provided at signalized intersections. The Study recommended 20 stations and 12 BRT vehicles to serve this corridor. The estimated cost of the high scenario is $184 million and the estimated cost of the low scenario is $124 million.

Magnolia Avenue Corridor

This corridor contains a mix of residential and commercial uses and a wide roadway cross section. This corridor is extended beyond Magnolia Avenue along Hall of Fame Drive to connect to Knoxville Station. This corridor would utilize both in-street service (Hall of Fame Drive) and a dedicated BRT lane within the median (Magnolia Avenue). At the existing signalized intersections, signal prioritization or queue jumper lanes would be implemented. Ten stations and eight BRT vehicles are identified as needed for this corridor. The estimated cost of the high scenario is $112 million and the estimated cost of the low scenario is $93.2 million.

General recommendations for immediate, short-term, and long-term improvements are provided in the Study. These recommendations are broad enough that they can be applied to various corridors with similar characteristics.

Immediate Recommendations (1-2 years)

- Advance corridors into the newly adopted federal MAP-21 Systems Planning process.
- Evaluate the signal timing on each corridor. Optimizing signal timing can add 10 to 20 percent more vehicle capacity and decrease travel time for buses.

- Allow buses the ability to queue jump in front of automobiles at intersection. Queue jump lanes have proven to be an effective way to achieve time savings for buses.
- Allow buses to have signal priority. Signal priority improves travel times, increases appeal for riding transit, keeps buses on schedule, and decreases lost revenue.
- Evaluate corridors to see if dedicated or designated lanes are appropriate. Dedicated lanes would be for bus use only while designated lanes would be for mixed traffic.
- Provide Real Time Traveler Information. Providing the most up to date schedule information and the next bus arrival time helps attract ridership.
- Increase the frequency of bus service on the corridors, which often increases ridership.

Short-Term Recommendations (1-5 years)

- Implement a Regional Transit Authority (RTA) to help facilitate inter-county transit service. In 2009, Tennessee signed into law the ability to form RTAs. Note: the implementation of an RTA is a recommendation of the Regional Transit Corridor Study. This Mobility Plan recommends that the TPO study the RTA issue further so an informed decision can be made.
- Implement express bus service within the Knoxville Region, especially along Pellissippi Parkway and Alcoa Highway. These corridors have pockets of growth that could support a limited stop bus service. Both of these corridors could benefit from designated bus lanes with transit-oriented development around station areas.
- Implement urban circulator routes that connect destinations such the South Waterfront to downtown Knoxville.

Long-Term Recommendations (5-10 years)

- Create a Transit Alliance to help educate the public about the benefits of transit.
- Create Transit Overlay Districts along corridors to enhance the need for transit and encourage transit supportive land uses. These districts help focus sustainable growth in areas that could benefit from transit and transit type enhancements.
- Apply to the FTA for Very Small Starts, Small Starts, or New Starts funding, starting with the top most viable corridors.

Safety

Incorporating safety in transportation planning helps identify, analyze, and develop solutions to transportation hazards. Safety conscious planning addresses highway, transit, pedestrian, bicycle, and freight safety. It is necessary for many agencies and the public to communicate consistently with one another and build partnerships. Some of these agencies include TPO, TDOT, local governments, public safety personnel, emergency services personnel, and trucking companies. Promoting transportation safety is primarily focused on reducing injuries and loss of life. However, improving safety can also decrease economic losses and significant transportation system disruptions that result from crashes.

Great efforts have been made in Tennessee to increase roadway safety including development of a State of Tennessee Strategic Highway Safety Plan, which is described in more detail in a subsequent section. Safety must be addressed through the coordination of education, enforcement, engineering and emergency response initiatives. Some notable behavioral strategies such as new Traffic Safety Laws have made Tennessee's roadways safer. These include the Seatbelt Law, Child Restraint Law, DUI Law, and the Graduated License Law, among others. The intersection and roadway departure action plans developed by TDOT have resulted in the implementation of a variety of engineering strategies to improve roadway safety in the Knoxville Region such as the installation of rumble strips on the edge lines of several roads to alert drivers before they leave the roadway. Other strategies to improve safety involve technology, like the Intelligent Transportation System (ITS). Statistics at the national, State, and regional levels (below) provide a realistic view of the safety challenges facing a variety of modes. Although in recent years national fatality and injury rates have declined, there are still obviously needed improvements.

Statistics

Nationally the number of motor vehicle fatalities decreased in 2007 for the first time in several years. Between 1997 and 2010, the fatality rate per 100 million Vehicle Miles Traveled decreased each year (1.64 in 1997 and 1.11 in 2010). That reduced rate along with reduced VMT on the roads each year since 2007 has resulted in fewer fatalities on the nation's roads.

Table 6-3: Crash Statistics at the National (top), State (middle), and Local (bottom) Levels

2010 National Crash Statistics			
	Fatalities	**Injuries**	**Property Damage Only**
Motorists	34,698	2,243,000	
Pedestrians	4280	70,000	
Bicyclists	618	51,000	

2010 Tennessee Crash Statistics			
All	958	46,608	115,335

Source: National Highway Traffic Safety Administration

Knoxville Region Crash Statistics			
Year	**Crashes with Fatalities***	**Crashes with Injuries***	**Total Crashes***
2008	127	6,626	24,653
2009	121	6,411	23,809
2010	130	6,375	22,670
2011	212	6,340	24,221
2012	134	6,333	24,462

*Source: Tennessee Department of Safety

In Tennessee, many steps have been taken to improve safety in the transportation system. In June 2006, the Knoxville Urban Area Incident Management Taskforce was established. Comprised of several stakeholders – TDOT, KPD, EMS-911, Tennessee Highway Patrol, and the Knoxville Regional TPO – the taskforce explores new initiatives and seeks to increase efficiency in Incident Management. Incident Management encompasses a variety of activities undertaken to:

- assist involved motorists,
- protect public health and safety,
- conduct necessary investigations,
- minimize travel disruptions and delays,
- remove the damaged vehicles or cargo, and
- restore the roadway to normal conditions.

Tennessee Strategic Highway Safety Plan

In November 2004, the State of Tennessee was the first state to complete a Strategic Highway Safety Plan (SHSP). It was updated and signed by the Governor in 2007, with the stated goal of reducing the fatality rate by 10 percent by the end of 2008. Additionally, the Plan has been revised in 2009 and 2011. The Plan details eight areas of emphasis:

1.) Improve crash data
2.) Reduce lane departures
3.) Improve intersection safety

4.) Improve work zone safety
5.) Improve motor carrier safety
6.) Improve driver behavior, which specifically includes:
    a.) Alcohol,
    b.) Aggressive driving,
    c.) Occupant protection,
    d.) Young drivers, and
    e.) Older drivers
7.) Strengthen legislation
8.) Enhance educational awareness programs

The development of this Plan is a combined effort of TDOT, the Governor's Highway Safety Office, Tennessee Department of Safety, Federal Highway Administration, and Federal Motor Carrier Safety Administration.

Regional High Crash Locations

TDOT compiles information of identified high crash locations across the state of Tennessee. From this list of locations, TDOT determines which projects to prioritize and move forward each year. Table 6-4 highlights the locations that have been part of TDOT's Hazard Elimination Safety Program (HESP), High Risk Rural Roads (HRRR), Spot Safety Program, and Ramp Queue Program (Queue) since the 2009 Mobility Plan.

Table 6-4: Knoxville Region Safety Projects (2012)

High Risk Rural Roads			
County	**HRRR Roadway**	**Beginning Cross Street**	**Ending Cross Street**
Anderson	Norris Park Rd	Nig Longmire Rd	Nig Longmire Rd
Knox	Strawberry Plains Pk	Brakebill Rd	Asheville Hwy
Knox	Washington Pk	Maloneyville Rd	Corryton Rd
Knox	Old Rutledge Pk	Circle Rd	Rutledge Pk
Sevier	Jones Cove Rd (SR 339)	Bogard Rd	Bethany Baptist Church
Sevier	Glades Rd	SR 73	Bird Creek Rd
Sevier	Old Newport Hwy (SR 339)	Jones Cover Rd	Wilhite Rd
Sevier	New Era Rd	Lewelling Rd Intersection	
Sevier	SR 338	Douglas Dam Rd	Sevierville City Limits

Hazard Elimination Safety Program			
County	**HESP Roadway**	**Beginning Cross Street**	**Ending Cross Street**
Blount	Broadway (SR 33)	Lamar Alexander Pkwy (SR 73)	
Blount	Sevierville Rd (SR 35)	Cherokee St	
Blount	Louisville Rd (SR 334)	Miser Station Rd	
Knox	Lovell Rd (SR 131)	Ramp to Pellissippi Pkwy	
Knox	Kingston Pk	Gore Rd	
Knox	Northshore Dr (SR 332)	I-140 WB Ramp	
Knox	Callahan Dr	I-75 NB Ramp	
Loudon	Harrison Rd	Norwood St	Browder Hollow Rd

Spot Safety Program		
County	**Spot Safety Roadway**	**Cross Street**
Anderson	Oliver Springs Hwy (SR 61)	Illinois Ave (SR 62)
Blount	Alcoa Hwy (SR 115)	Topside Rd (SR 333)
Blount	William Blount Dr (SR 335)	Morganton Rd
Blount	Lamar Alexander Pkwy (SR 73)	Academy Dr
Blount	Alcoa Hwy (SR 115)	(Cable guardrail installation)
Blount	Old Knoxville Hwy (SR 33)	William Mill Rd
Blount	Sevierville Rd (SR 35)	High St
Blount	Alcoa Hwy Bypass (SR 115)	Louisville Rd
Blount	Broadway Ave (SR 33)	Defoe Cir
Knox	I-140 Ramps	Westland Dr
Knox	I-40	(Cable guardrail installation)
Knox	I-40	I-640
Knox	I-140 NB Ramp	Kingston Pk (SR 1)
Knox	Alcoa Hwy (SR 115)	Montlake Rd
Knox	Alcoa Hwy (SR 115)	Maloney Rd
Loudon	I-75 NB Ramp	US 321 (SR 73)
Loudon	Sugarlimb Rd (SR 324)	US 11 (SR 2)
Loudon	US 11 (SR 2)	SR 72
Loudon	US 11 (SR 2)	Ward Ave
Sevier	Chapman Hwy (SR 35)	White School Rd

Ramp Queue		
County	**Interstate**	**Street Exit**
Knox	I-40	Campbell Station Rd
Knox	I-140	Westland Dr

Hazard Elimination Safety Program (HESP) roadways are roads that have experienced seven fatal and/or incapacitating injury crashes during a 3-year period. An additional criterion evaluates the type of crash that is prevalent in a location and compares a crash rate for the roadway to the critical crash rate based off crash types.

High Risk Rural Roads (HRRR) are roadways in which the crash rate for fatal or incapacitating injury crashes exceeds the statewide average for the qualifying functional class roadway. The qualifying functional classes are major collector, minor collector, and local roadways outside of urbanized areas.

Spot Safety Program projects are roadways and intersections that require minor improvements to prevent fatalities, injuries, and other crashes. Initiated by the Regional TDOT Traffic Office, this program is state and federally funded.

The excessive ramp queuing list is a list of high crash locations at interstate off-ramps that are the by-product of excessive queuing from the off-ramp.

Public Transit Safety

Local transit agencies have always placed an emphasis on providing a safe, secure, and reliable service for its passengers and employees. These efforts are on going and are an integral part of providing transit service.

While transit must be concerned about safety as it relates to the provision of service, transit itself can be a valuable resource to a community in providing rescue or evacuation services. Local transit providers participate as part of the larger community emergency preparedness efforts.

Basic goals of transit agencies in regards to safety include:

- Participate in training and subscribe to information distributions related to workforce safety training to reduce the incidence and duration of Workers' Compensation Claims.
- Continue efforts in the maintenance areas to maintain a well-lit and secure work environment for all employees.
- Attend OSHA training and monitor compliance with related regulations.
- Being able to appropriately support the needs of emergency management and public safety agencies.
- Continue to be part of FTA's "See Something, Say Something" safety program where drivers alert local law enforcement and emergency services of potential incidents.

- Continue to be part of the Child and Family Services "SafePlace" location program. The Knoxville Station and KAT's Magnolia Offices are a SafePlace location.

Incident Management

Incident Management is gaining national attention as a means to improve highway congestion and safety. An incident such as a crash, an overturned truck, an abandoned vehicle on the shoulder, or debris can cause major congestion problems on a highway. This can eventually spill over to the nearby transportation network. Even more important than the impact on efficiency are the increased safety risks for other drivers. Often these events lead to secondary crashes. Reportedly, approximately 20 percent of all freeway crashes are secondary.

TDOT launched its incident response unit trucks, known as HELP, in July 1999. The trucks operate daily along I-40 from Farragut to Strawberry Plains Pike, along I-75 from I-640 to Emory Road, and on all of I-640 and I-275. HELP trucks are equipped to respond to crashes and other incidents along these roadways or adjoining ramps to restore normal traffic flow as quickly as possible. They not only provide a service to vehicles involved but also reduce nonrecurring congestion caused by incidents.

Since the HELP program began in 1999, their trucks have responded to 295,400 incidents in the Knoxville Region. In 2011, HELP trucks made 18,339 stops – assisting primarily with disabled or abandoned vehicles, crashes, and debris on the road. The trucks were on the scene of the incident in less than 15 minutes approximately 87 percent of the time. Of the vehicles assisted, 89 percent were passenger vehicles and nearly 11 percent were tractor-trailers or other heavy-duty trucks.

System Maintenance

Included in the objectives of System Maintenance are items such as maximizing the useful life of existing elements of the transportation system, using management systems to identify and implement optimal maintenance strategies, and maintaining transit vehicles. While maintaining the existing infrastructure, operational equipment like traffic, pedestrian, and railroad crossing signals, and transit vehicles extends the life of these elements. Maintenance and/or reconstruction can also enhance the safety of bridges, roadways, sidewalks, intersections, and railroad crossings. Included in the objectives of System Efficiency are items such as maximizing the street network efficiency by using technology and travel demand management strategies and increasing vehicle occupancy rates.

Safety Conscious Planning

Safety-conscious planning (SCP) is proactive safety planning for preventing crashes and unsafe conditions. Often safety improvements are reactive, spearheading strategies such as "hot spot" improvements and

educational and behavioral programs. In essence, SCP involves a shift of focus from driver behavior initiatives to strategies that make it more difficult for the driver to have a crash. One way to look at integrating SCP into long range planning is considering that crashes are a function of exposure. In long-range transportation planning, the TPO has the capability of minimizing exposure (via an efficient intermodal network), minimizing risk (via functional network), and minimizing consequences (via efficient emergency management system). A balance must be achieved between these techniques – reducing, modifying, restricting exposure – so that changes to one component will not cause safety concerns in another.

To be most effective, SCP must extend across all planning activities. The Institute for Transportation Engineers (ITE) identified several levels of planning processes and decisions which safety conscious planning must effectively address, namely:

- **Regional** – growth strategies, major network strategies, etc.;
- **City/County** – community plans, zoning and subdivision regulations, transportation plans, etc.;
- **Small Area Plans** – sector/neighborhood plans, area transportation strategies, corridor and access management strategies, development of pedestrian and bicycle facilities, etc.; and
- **Site** – site plan review, site impact studies, etc.

SCP is needed in land use planning decisions and processes to influence policies that shape the direction of land uses to the specifics of urban form, mix, and density of use. Safety conscious planning is also an integral part of transportation planning for all modes of travel in order to shape the amount of travel as well as the mix of transportation modes.

One example of how the TPO demonstrates SCP is through the staff review of major roadway project preliminary design plans and planning studies to evaluate potential safety concerns for all modes of transportation. For example, potential pedestrian safety issues may be more readily identified by a person with specific pedestrian planning knowledge when reviewing roadway design plans. There is often a balance that must be achieved between safety of one mode versus another such as with the case of designing intersection radii where a larger curb return radius may make motor vehicle operations safer but decrease the safety for pedestrians, which must cross a wider distance.

Security

Security has been added as a separate goal to address new standards identified in MAP-21. All projects listed in this Plan have been reviewed to determine their potential to improve the security of the transportation system.

The TPO is not involved in specific security or emergency planning. However, it does communicate with a number of agencies on major transportation plans and projects with the intention of developing a transportation system that is as secure as possible. These groups include:

- Tennessee Department of Transportation (TDOT),
- Tennessee Department of Safety (TDOS),
- Tennessee Emergency Management Agency (TEMA),
- Tennessee Highway Patrol (THP),
- Knoxville-Knox County Emergency Management Agency,
- local law enforcement,
- local engineering officials, and
- emergency personnel.

The TPO has attended meetings of the East Tennessee Safety and Maintenance Committee (ETSMC), the Tennessee Trucking Association, and includes members of the State Governor's Highway Office and ETSMC on its Freight Advisory Committee.

Existing Conditions

The selection criteria for projects in the Mobility Plan and the Transportation Improvement Program include security. The TPO requires that all parties pursuing federal funding for projects show how the project meets the goals and objectives of this Plan, including security.

The specific question related to safety and security in the Regional Mobility Plan application is: "How does the project improve or promote safety and security for the users?" The specific questions or related information pertaining to safety and security in the TIP application are: Identification of the crash rate; and "Does the project address or improve the safety/security of the transportation system? If yes, explain."

Evacuation Routes

The only designated evacuation routes in the Knoxville Region are provided for the emergency evacuation of the Department of Defense facilities in Oak Ridge. In Anderson County, evacuation routes include:

- SR 95,
- SR 62,
- SR 170,
- Union Valley Road,
- Emory Valley Road,
- Melton Lake Drive, and
- Lafayette Drive.

In Knox County, evacuation routes include:

- Pellissippi Parkway and
- Hardin Valley Road.

In the event of other emergency evacuations, such as for hazardous spills or natural disasters, local law enforcement will determine the best routes.

Intelligent Transportation Systems (ITS)

The Knoxville Regional ITS cameras allow officials at the Transportation Management Center (TMC) 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 are capable of displaying emergency information such as weather or other natural incidents 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, while keeping an eye out for suspicious activity or disabled vehicles. HELP truck operators are able to contact law enforcement or emergency personnel if needed.

Public Transportation

Since the terrorist attacks of September 11, 2001, efforts concerning safety and security have reached a new level of importance. The Federal Transit Administration (FTA) has undertaken a series of major steps to help local transit providers prepare against a variety of threats. It is critical to integrate security throughout every aspect of transit programs. This commitment must be demonstrated by the continual emphasis on security when purchasing new systems and equipment, hiring and training employees, managing the agency, and providing service. The security function must be supported by an effective emergency response capability, both to support resolution of those incidents that occur on transit property and those events that affect the surrounding community serviced by the agency.

Although local transit providers have made great strides to strengthen security and emergency preparedness, there is still more to do. Local transit providers are a critical, high risk, and high consequence asset. Everyday, transit provides mobility to thousands of our Knoxville Region's citizens. An appealing aspect of transit is its open and easy access. This aspect also makes it vulnerable.

At the basic level, local transit agencies are assessing their vulnerability, developing security and emergency response plans, training drivers and supervisors, coordinating with local emergency management services, and, if possible, accelerating technology development. Security is being considered proactively in all plans or projects being developed rather than added as an afterthought.

Basic goals of transit agencies in regards to security include:

- Being prepared for and protected against attacks;
- Being able to respond rapidly and effectively to natural and man-made threats and disasters;
- Being able to appropriately support the needs of emergency management and public safety agencies;
- Being able to be quickly and efficiently restored to full capability.
- KAT General Manager, Chief Operating Officer, Chief Maintenance Officer, and Safety Manger to receive certification of successful completion of Level 300 and Level 400 National Incident Management System (NIMS) training courses.
- Attend, assist with organizing and otherwise provide support to local agencies with desktop and live public safety emergency drills.

Trucking

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.

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 locations along US 129/Alcoa Highway.

Rail

The Transportation Security Administration (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.

Air

The Transportation Security Administration (TSA) has new air cargo regulations in place that include 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.

Barge

The U.S. Army Corps of Engineers is responsible for monitoring all of the locks along the Tennessee River and ensuring that they are operating safely and efficiently. The Port Security Training Exercise Program (PortSTEP) was established by TSA to provide port and barge security services.

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.

Recent Progress

The Strategic Plan for Highway Incident Management in Tennessee was adopted in August 2003 and "establishes the framework for a systematic, statewide, multi-agency effort to improve the management of highway incidents – crashes, disabled and abandoned vehicles, debris in the roadway, work zones, adverse weather, and other events and emergencies that impact the transportation system."

Knoxville Area Transit has recently instituted an onboard camera system that provides closed loop security monitoring of their buses. In addition to on board cameras, KAT and Knox County Community Action Committee (CAC) have installed automatic vehicle location (AVL) devices on their vehicles.

Issues

Some industries in the Knoxville Region use, produce, store, or distribute hazardous materials. The Department of Defense facilities at Oak Ridge and the Middlebrook Tank Farm are two of the larger facilities that handle hazardous materials.

Since Knoxville is at a crossroads for three major interstates – I-75, I-40, and I-81 – and for two major Class I railroads – Norfolk Southern and CSX – hazardous materials are often transported through the Knoxville Region. Occasionally, incidents involving trucks or trains carrying hazardous materials results in the closure of a highway or evacuation of nearby neighborhoods.

The Tennessee Emergency Management Agency (TEMA) identifies the following as major hazards in East Tennessee:

1.) Sequoyah and Watts Bar Nuclear Plants, which are both located outside the Knoxville Region;
2.) U.S. Department of Energy (DOE) facility at Oak Ridge;
3.) Wild fire or forest fire;
4.) Flooding;
5.) Hazardous materials;
6.) Severe weather; and
7.) Earthquakes.

Managing the System

Chapter 7

About the Congestion Management Process (CMP)

The ability to reach one's destination in a timely manner is a critical component of the quality of life for residents and visitors in the Knoxville Region. Traffic congestion detracts from quality of life, especially if it is not managed and is allowed to increase over time. The Knoxville Congestion Management System (CMS) Plan was adopted on February 26, 2003. It was established as a mechanism to identify congestion in the TPO Planning Area and to propose appropriate solutions to deal with it. With the passage of SAFETEA-LU in 2005, the Congestion Management System requirement was changed to a Congestion Management "Process" (CMP). The intent of the name change was to ensure that congestion management would be treated as an integral part of an ongoing planning process. As a result, the TPO staff prepares updates to the CMP in conjunction with each major Long Range Plan update.

This section of the Mobility Plan provides an overview of the Congestion Management Process—how it is conducted and implemented in the TPO planning area. (Detailed description of congested locations and mitigation strategies that have been identified are included in Appendix I.)

What is a CMP?

A CMP is a systematic and regionally accepted approach for managing congestion. It includes a mechanism for measuring transportation system performance and assessment of alternative strategies to mitigate congestion to an acceptable level within the appropriate context. It is recognized that different levels of congestion can be considered acceptable based on the particular circumstances and land use context. For example, people generally tend to expect a certain level of roadway congestion within dense urban areas, and the amount of capacity devoted to motor vehicles must be balanced against providing adequate accommodations for other modes of travel such as walking, biking, and taking public transportation. Furthermore, eliminating congestion altogether may not be desired if it comes at the expense of economic vitality, community livability, or bicycle/pedestrian access.

Required Elements of a CMP

A CMP is made up of several elements that are performed in a continuous and ongoing process (Figure 7-1). The process begins with the identification of broad regional objectives that relate to transportation system performance and congestion. The Knoxville Regional Mobility Plan has identified four overarching principles:

- Preserve and Manage;
- Link Transportation and Land Use;
- Plan and Build for All Modes; and
- Develop the Knoxville Region's Potential.

Each involves some aspect of limiting congestion and ties back to the MAP-21 Planning Factor, "Promote efficient system management and operation." The next steps of the process can be summarized as:

- Developing methods to identify congested locations;
- Analyzing the congestion problems to identify appropriate mitigation strategies; and
- Programming and implementing projects and programs that will reduce congestion.

The process then repeats itself as the transportation system is continuously monitored and regional objectives are reassessed, which typically occurs concurrent with the four-year major update cycle of the Regional Mobility Plan.

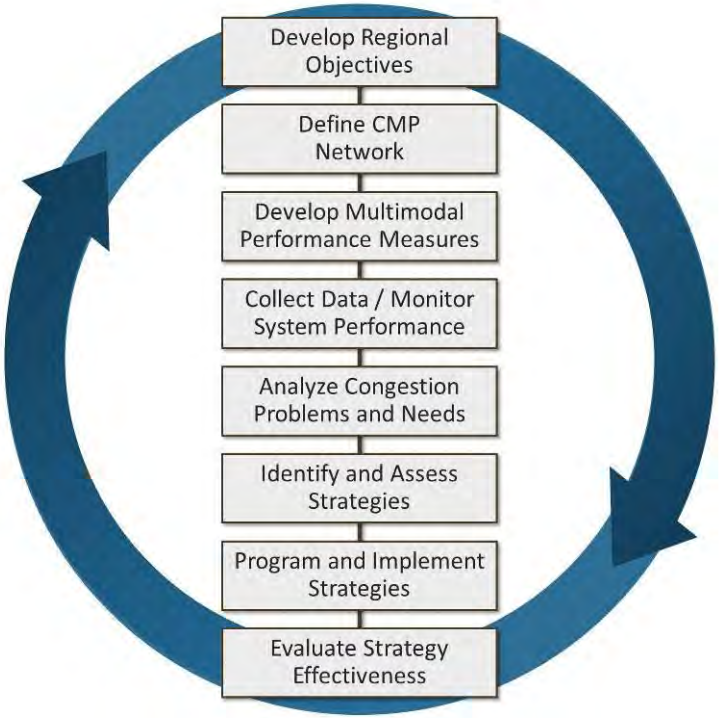


Figure 7-1: Elements of a CMP
Source: The Congestion Management Process: A Guidebook, FHWA

Identifying Congestion

Identification of congestion involves a series of steps:

- Identify the system that is to be monitored for congestion;
- Identify performance measures to determine what is considered congested; and
- Identify a data collection mechanism to monitor the performance measures that were selected.

A CMP is required in urbanized areas with a population of greater than 200,000—known as Transportation Management Areas (TMA). As a result, the Knoxville Regional TPO concentrates much of its data collection efforts within the urbanized area. However, since the travel demand forecasting model includes the entire nonattainment area, it is possible to include some measures of congestion for the entire Knoxville Region, as described below.

1.) Identify Methods to Monitor and Evaluate the Performance of the Multimodal Transportation System.

Since the personal automobile is the predominant mode of transportation in the Knoxville Region, and the street and highway system affects the mobility of other modes such as freight and public transit, it was determined that the CMP should include all roadways that carry an average daily traffic volume of 10,000 vehicles or more. Congestion is also monitored for all facilities that are included in the TPO's travel demand forecasting model.

2.) Identify the Mechanism to Select Appropriate Performance Measures.

This element involves the definition of parameters used to measure the extent of congestion based on locally determined thresholds for system performance. There are two categories of performance measures that were selected to determine congestion in the Knoxville Region: Volume-to-Capacity ratio (V/C ratio) and Travel Time for average speed and stopped delay (see Table 7-1).

The V/C ratio compares traffic volume of a roadway in the peak hour to theoretical capacity of the roadway to determine whether traffic flow is effectively accommodated. One main reason that the V/C ratio was chosen as a performance measure is its ability to use the TPO's travel demand forecasting model to determine possible future congestion in both the urban and regional areas. Outputs from the travel demand model showing congestion in base year 2010 and future year 2040 (assuming no improvements have been made) were included in Chapter 6.

The Travel Time performance measure allows the TPO to document roadway congestion in terms that are easier to understand by the public. These measures are based on actual speed data collected using GPS units attached to vehicles that travel on roadways in times of peak hour congestion. Due to the extensive amount of data collection required for this measure the GPS travel time data is collected only within the TPO urbanized area.

Average speeds from morning and afternoon peak periods are compared to an "ideal" free flow speed for the facility, which is based on facility type and posted speed limit. A locally derived definition of level-of-service (LOS) based on degradation of travel speed compared to free flow speed is used to determine whether a roadway is congested. Additionally, stopped time at each intersection, measured in terms of seconds of delay, is compared against LOS thresholds to determine congestion. Exhibit 7-1 shows congested segments and intersections during the AM (left) and PM (right) peak periods based on the travel time data collected in 2009 and 2010.

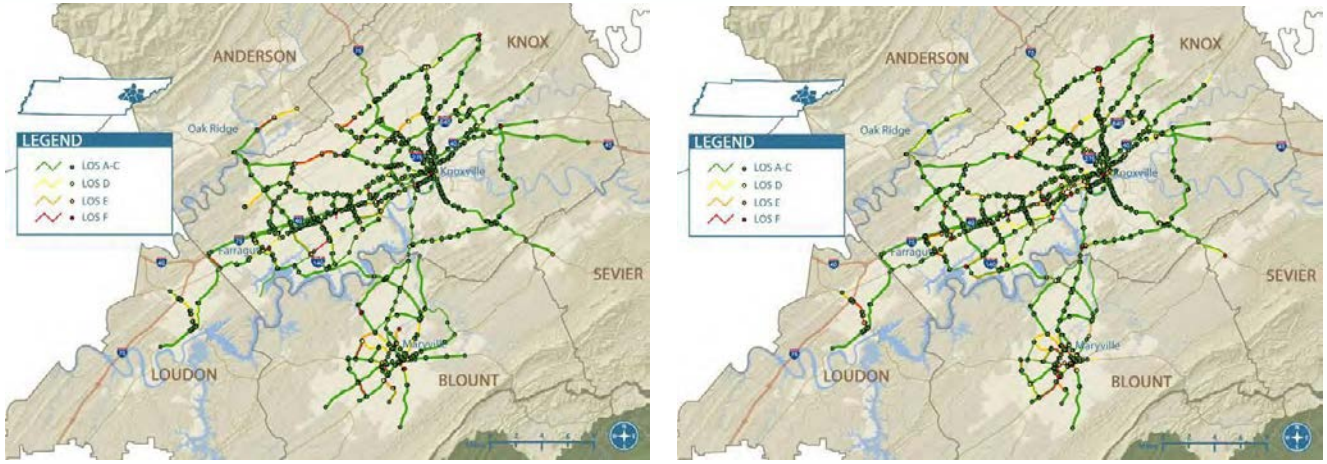


Exhibit 7-1: Level of Service During AM (left) and PM (right) Peak Periods
Source: Knoxville Regional Travel Demand Model (KRTM)

Table 7-1: Volume/Capacity (V/C) and Travel Time (TT) Performance Measures

LOS	Congestion Level	Stop Delay (seconds)	Peak Travel Time (TT) / Free Flow TT	Volume / Capacity (V/C) Ratio
A - C	Not Congested	less than 25	less than 1.33	less than 0.65
D	Marginal	between 25 and 40	between 1.33 and 1.5	between 0.65 and 0.85
E	Moderate	between 40 and 60	between 1.5 and 2	between 0.85 and 1.00
F	Serious	greater than 60	greater than 2	greater than 1.00

Source: 1994 Highway Capacity Manual (Transportation Research Board), Knoxville Regional TPO

3.) Establish a Program for Data Collection and System Monitoring.

This component includes development of a data collection program that provides for adequate system monitoring to identify causes of congestion. As previously mentioned, the TPO collects travel time data on the system's roadways and has found that GPS units provide the most efficient and accurate means of collection. Other transportation data, such as hourly traffic volume counts, feed into the CMP and are provided by various agencies in the area. Using the collected data and performing technical analyses based on the performance measures identified above, roadway corridors and segments that qualify as being congested can be identified.

Congested Locations

Based upon the performance measures and system monitoring information described above, the TPO identifies congestion on two separate levels: "Congested Corridors" and "Congestion Hot Spots." Congested Corridors are defined as several contiguous segments of roadway with similar characteristics and roadway capacity that qualify as congested under the V/C performance measure criteria (see Table 7-1). Priority levels were established for the corridors based on the horizon year in which the roadway is congested, so, for example, a roadway that is already congested receives a higher priority than one that is projected to be congested in a future year, such as 2024, 2034, or 2040 (see **Error! Reference source not found.**). Congested Corridors are listed in Appendix I.

Congestion Hot Spots were identified using travel time data to determine specific locations where stopped delay was excessive (Exhibit 7-1). Congested intersections are listed by priority (based on the amount of delay and number of congested approaches) in Appendix I.

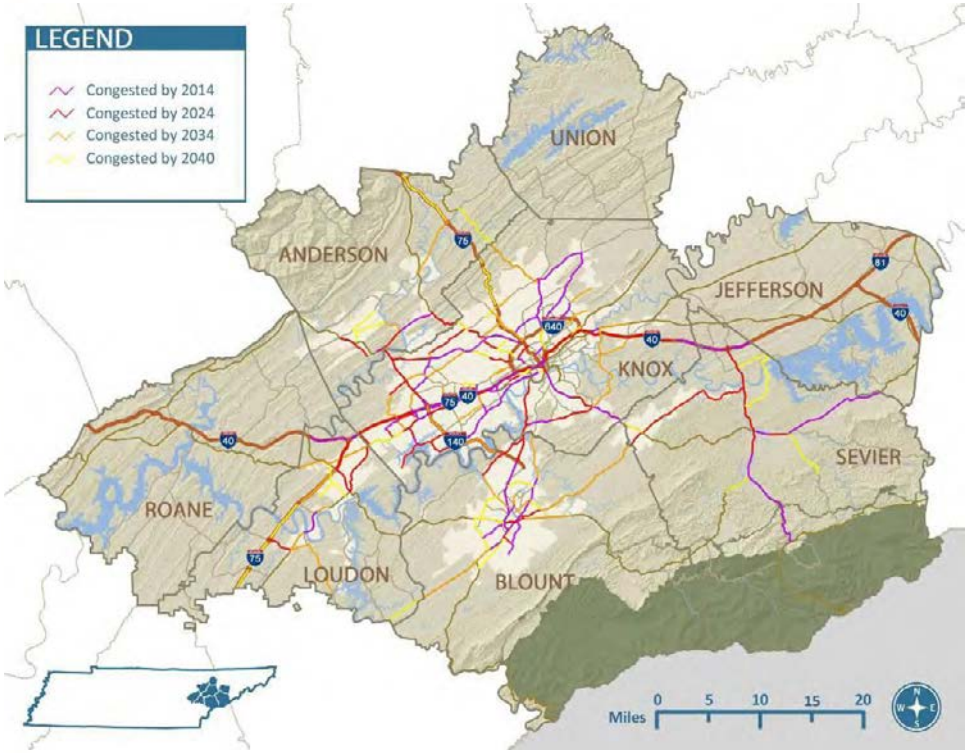


Exhibit 7-2: Congested Corridors
Source: Knoxville Regional Travel Demand Model (KRTM)

Strategies of Congestion Management

The intent of CMP regulations is, first, to investigate mitigation strategies that focus on improving transportation operations and managing the existing system more efficiently; and, second, to reduce travel demand as a means to reduce congestion before resorting to new roadway construction or widening projects that serve single occupant vehicles (SOV).

The Knoxville CMP identifies a menu of congestion mitigation strategies (Appendix I) that provide for a stepwise method of evaluating operational and travel demand-reducing improvements, prior to determining that additional SOV capacity is warranted:

- Transportation Demand Management (TDM);
- System Management & Operations (M&O) Strategies;
- Intelligent Transportation Systems (ITS);
- Public Transportation Improvements; and
- Additional System Capacity (Projects).

Subsequent sections of this chapter provide more detail and descriptions of each of the first three strategies above. Additional system capacity is used as a "last resort." However, it is sometimes necessary given the realities of increasing population growth and economic activity, which can over-burden roadways that were not designed to handle the amounts of traffic they are experiencing both now and in the future.

TPO staff organized a group of stakeholders and operations partners from each jurisdiction and agency represented on the Technical Committee to identify which strategies were appropriate for each congested corridor. Appendix I provides a cross-reference of the projects in the Plan that address the congested corridors.

CMP regulations require that areas such as the Knoxville Region, which are designated in nonattainment of the Ozone standard, include complementary mitigation strategies that increase effectiveness and preserve capacity of a project that significantly increases capacity for single occupant vehicles (SOV). Appendix I identifies all of the projects within the Knoxville TMA that significantly increase capacity for SOV and the complementary strategies that are included with such projects. For example, all road-widening projects in the TPO area are recommended to include non-traditional mode incentives, such as sidewalks and bicycle lanes at a minimum and provisions for transit vehicles where appropriate.

Additional TDM, Operations/ITS, and Public Transportation strategies are continuously being implemented to mitigate congestion as described in subsequent sections of this chapter and are not specifically noted in Appendix I.

Summary of CMP Interaction with the Overall Planning Process

The CMP is not intended to supersede other elements of the transportation planning process, nor is it intended to prioritize all transportation projects. The primary purpose of the CMP is to provide for a more informed decision-making process that can be used to make the most effective use of limited resources to address congestion problems.

The project selection criteria for the Regional Mobility Plan, TIP, and CMAQ program have been modified to address results from the CMP. The scoring system used in the above criteria provides a direct mechanism for the CMP to be considered in the project selection process, which ultimately determines the projects that are to be implemented.

Currently, the Regional Mobility Plan project scoring system accommodates the CMP primarily under the categories of Congestion Management and System Preservation, which together are assigned 25 out of a total 100 possible points. The TIP project selection system assigns a weight to CMP considerations of 20 out of 100 total possible points, and the CMAQ selection system assigns 10 out of a possible 70 points to projects or strategies identified by the CMP.

CMP Procedural Considerations

It is important to stress that the CMP is an ongoing effort. It is a continuous element of the transportation planning process. The following schedule illustrates the preferred mechanism for maintaining the CMP as an ongoing process to provide timely information for the development and selection of projects for both the Regional Mobility Plan and the TIP. It should be noted that TPO staff is in the early stages of identifying a new "Planning for Operations," as described in a subsequent section that will likely modify the overall CMP itself as it further develops.

Table 7-2: CMP Procedural Considerations

Task	Year			
	1	2	3	4
1. Collect Data	✓	✓		
2. Evaluate Completed Projects	✓	✓	✓	
3. Select Appropriate Strategies			✓	
4. Prepare Summary Report			✓	
5. Select Projects for Mobility Plan Inclusion				✓

The above schedule assumes that Year 1 begins immediately upon adoption of a new, fully updated Regional Mobility Plan.

- **Task 1 – Collect Data:** Refers most specifically to the collection of GPS travel time data, which are the most important data collected with respect to the CMP; however, there are other types of transportation system data that are collected continuously, such as traffic counts and land use information, which also feed into CMP development. Prior to beginning this task, a review of CMP performance measures will ensure that appropriate data are collected and will identify additional types of data needed.
- **Task 2 – Evaluate Completed Projects**: Done on an ongoing basis as projects are completed. It is highly dependent on the type of project evaluated, i.e., some project types have a definitive conclusion, while others, such as the Smart Trips program, are ongoing and should be evaluated on a recurring basis as to their congestion reduction performance.
- **Task 3 – Select Appropriate Strategies**: Involves coordination with the aforementioned operations partners and other stakeholders to determine appropriate congestion reduction strategies for each of the corridors identified as congested, based on most recent data and performance analysis.
- **Task 4 – Prepare Summary Report**: Intended to be a single document that summarizes the CMP process. It includes a current listing of congested locations, identifies strategies for each location, and analyses implemented strategies.
- **Task 5 – Select Projects for Regional Mobility Plan Inclusion:** This is the culmination of the cycle such that the appropriate information on congestion is been made available to the decision-making process for selecting and prioritizing the projects to go into the Regional Mobility Plan.

Conclusion

Congestion is a way of life in many metropolitan areas. However, it can be kept at a tolerable level by employing operational and travel demand reduction strategies, along with capacity additions where necessary. An effective CMP is an important tool that provides objective data on the performance of the transportation system, identifying congested areas, selecting appropriate mitigation strategies, and, finally, prioritizing projects and actions to mitigate congestion.

Transportation Demand Management (TDM)

Transportation demand management (TDM) programs reduce traffic congestion and pollution by encouraging changes in travel behavior rather than increasing capacity through widening roads. TDM strategies encourage commuters to get to work by alternatives to driving alone, such as taking the bus, carpooling, vanpooling, bicycling, walking, working from home (telecommuting), or shifting their commute to off-peak hours. These strategies are typically voluntary in nature and often rely on incentives to increase participation.

Strategies:

- **Ridesharing Programs:** These include carpooling and vanpooling.
- **Alternative Work Arrangements:** These include working from home or at a site near the person's home, with staggered or offset shifts so that not all commuting happens during rush hour.
- **Incentives:** Economic or other incentives are offered to commuters for choosing alternatives to driving alone: free or discounted transit fares or free, discounted, or preferential parking for those who carpool.
- **Parking Management:** This includes removing subsidies to align parking costs to market rates, reducing the oversupply of parking, and providing information to help users locate available parking.
- **Emergency Ride Home Programs:** These programs guarantee a way home should a participant need to work late or an emergency arises during the day.
- **Car Sharing Programs:** This is a modified rental car program, where users are charged an hourly or daily rate to use a program vehicle. This allows people to opt out of owning a vehicle and take transit, walk, or bike for most trips, but still have access to a vehicle when needed. This program reduces vehicle ownership, so discretionary trips are more likely made by transit or non-motorized modes.

Smart Trips

Smart Trips is a program housed within the TPO whose goal is to improve air quality in the Knoxville Region by reducing the number of people driving to work alone. Smart Trips helps commuters access alternative commuting options. It also gets businesses involved in promoting participation and providing incentives to their employees. Some examples of incentives include:

- Free transit passes;
- Parking cash-out (where employees can choose a parking space or get the value of that parking space each month); and
- Preferential carpool parking.

The Smart Trips website provides information on carpooling, transit, bicycling, walking, telecommuting, and reduced workweek. Registered commuters gain access to a free online ride-matching service. Participants can also use the website to log qualifying commutes, which can make them eligible for incentives. The TPO uses commuter log data to quantify program progress and track commuting habits.

When participants log their commutes online, they qualify for an incentives program called "Commuter Rewards." These come in the form of $5 and $10 gift cards to local merchants. Smart Trips also recognizes outstanding participants through a "Commuter Close Up" program. Additionally, Smart Trips holds a Commuter Challenge each year, with the most recent Challenge running in June and July 2012. During the Challenge, additional prizes are offered and the threshold for winning is lowered to get more people to try alternative transportation choices.

As of June 2012, Smart Trips has more than 600 active participants and continues to add more (Figure 7-2). The main reasons given for joining Smart Trips are the high cost of commuting and the desire to do something good for the environment. Commuters are becoming better educated about the impact driving has on regional air quality. Smart Trips produces a quarterly Progress Report that describes participation, events, and reports a number of measured statistics about the impact of Smart Trips. These reports are available at **http://smarttrips.knoxtrans.org/reports.htm**.

Smart Trips also is used as a resource to learn how to ride the bus, identify available routes, find a carpool partner, locate safe routes for biking and walking, and get employers to participate.

There are more than 55 participating employers in the program and Smart Trips recently hired an additional staff person to work with employers on increasing their level of participation. Carpooling, taking transit, biking, walking, telecommuting, and compressed work weeks help make commuting more affordable and complement employee wellness programs.

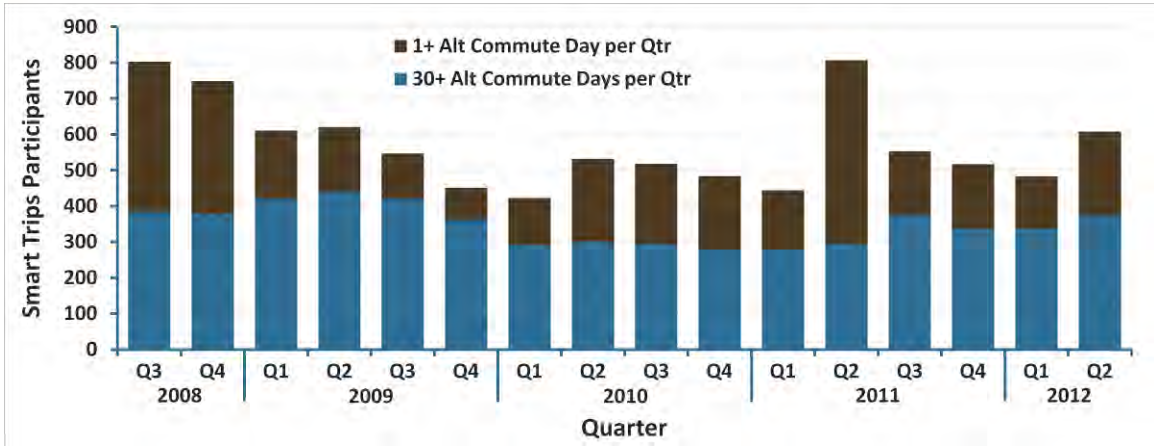


Figure 7-2: Smart Trips Participation, July 2008 – June 2012
Source: Smart Trips

University of Tennessee Knoxville Commuter Pool (KCP) and Tennessee Vans

The Knoxville Commuter Pool (KCP) and Tennessee Vans are regional services designed to encourage commuters to carpool, vanpool, or ride public transportation. KCP works very closely with KAT and Smart Trips. Tennessee Vans is a statewide service that provides passenger vehicles and support services to commuters and community organizations. The program works to broaden economic opportunities throughout the region by alleviating transportation barriers to employment and by improving mobility options for area workers. KCP and Tennessee Vans have instituted several innovative programs. These include car and van leasing programs and establishing park and ride lots. Tennessee Vans has placed 198 vans with 119 different organizations throughout the region.

Issues

Many studies have compared mobility and air quality strategies and concluded that TDM programs are among the most cost-effective because they can reduce a trip, mile of travel, or ton of emissions for a relatively small amount of money. A seminal report commissioned by the Federal Highway Administration (FHWA) in 1993[1]

[1] Overview of Travel Demand Management Measures: Final Report, January 1994, **http://ntl.bts.gov/DOCS/273.html**

quantified the cost to society of a daily commute driven in a single occupancy vehicle as $6.75. Employer-hosted TDM programs can eliminate that same trip for only $1.33.

When TDM programs receive comprehensive support from the regions they serve, they can significantly reduce vehicle trips. According to the FHWA Office of Transportation Management, with the correct incentives and disincentives to encourage use of alternate travel modes, TDM strategies can reduce vehicle trips and vehicle miles traveled by 10 to 20 percent. In the absence of these comprehensive strategies that include parking pricing, incentives, and more, most TDM programs are only able to reduce travel by 0 to 5 percent. It is important to recognize, however, that the goals for TDM programs often extend beyond reducing vehicle miles traveled to include mobility, accessibility, environmental, and other outcomes.

System Management and Operations (M&O)

Overview

National congestion statistics show that 60 percent of traffic congestion is caused by factors other than lack of roadway capacity. These include weather, incidents, poor signal timing, and work zones. The purpose of System Management and Operations (M&O) is to maximize the efficiency of the system to ensure that transportation services are delivered in a safe, reliable, and secure manner. The TPO does not own, maintain, or operate any transportation infrastructure or services. However, it has a role to provide for regional collaboration among system operations stakeholders through a "Planning for Operations" process.

The Planning for Operations process is used to develop operations objectives. Those objectives assist in considering operational performance during the planning process. They also incorporate operations solutions into investment decisions that support the operations objectives. The result is a mix of both operations and capital projects that optimize transportation system performance.

Federal Requirements

MAP-21 and its predecessor SAFETEA-LU specifically require that M&O be considered in the metropolitan transportation planning process:

- **Promote Efficient System Management and Operations:** Section 6001(a) of SAFETEA-LU amends United States Code Title 23, Section 134(h) to require consideration of M&O in the metropolitan transportation planning process – "Promote efficient system management and operation" is specifically identified as one of eight planning factors.

- **Include Management and Operations Strategies:** Section 6001(a) of SAFETEA-LU amends United States Code Title 23, Section 134(i) to state that the [Mobility Plan] shall include "operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods."

TPO Planning for Operations Process

The TPO is in the early stages of building an ongoing Planning for Operations process that will become an integral part of the development of future Mobility Plans and Transportation Improvement Programs. All operations stakeholders in the Knoxville Region will be engaged through regular committee meetings to develop specific operations projects and strategies that will improve the efficiency of the transportation system.

The TPO has already established two separate committees related to Planning for Operations:

- **Incident Management Taskforce** has been in existence for several years and has been a joint effort of TDOT Region 1 and the TPO for organizing and initiating meetings. Lately, TDOT Region 1 has taken the leadership role since focus has been on managing incidents on the urban freeway system. TDOT has jurisdiction, housing the regional Traffic Management Center and operating HELP Truck services. The TPO recognizes that it can play a significant role in facilitating additional discussions on policy issues involved in incident management, such as legislation related to towing performance standards. The TPO plans to engage this committee to a greater extent in the future.
    - **Membership** – The Incident Management Taskforce is comprised of governmental staff including representatives from TDOT, FHWA, and the TPO along with major emergency services providers in the region such as Tennessee Highway Patrol, police, fire and EMS staff. Participation has been encouraged from major towing operators however it has been a challenge to get consistent participation from these types of private stakeholders.
- **Traffic/Transit Management Taskforce** is relatively new, although similar committees have been used on an infrequent basis as updates to the TPO's Congestion Management Process were made. The first meeting of this committee was held on September 5, 2012. The purpose was to introduce stakeholders to the Planning for Operations concept and to review operations projects for the Mobility Plan that were identified in the recently completed Regional ITS Architecture Deployment Plan.
    - **Membership** – The Traffic/Transit Management Taskforce is comprised of the TPO Technical Committee members plus additional staff from the jurisdictions that have day-to-day operations responsibilities such as traffic signal engineers. The stakeholder list that was identified for the update to the Regional ITS Architecture formed the basis of this committee

since it involves the same concepts in terms of identification of traffic and transit operations strategies.

Relationship of M&O and Intelligent Transportation Systems (ITS)

The TPO recently completed a major update to the Knoxville Regional ITS Architecture with the assistance of a broad range of regional operations stakeholders. M&O and ITS are directly linked. Most, if not all, of the strategies used to better manage transportation systems involve solutions that are covered under the ITS umbrella of "User Services." Specific ITS projects and strategies to be deployed in the Knoxville Region were identified, along with prioritization of short-, medium-, and long-term deployment efforts. ITS projects have been included in an "Operations" project list for this Plan.

More information about the Regional ITS Architecture update is provided in a subsequent section of this chapter.

Operations Objectives and Performance Measures

As noted previously, a key component of M&O and Planning for Operations is to develop specific operations objectives, which guide the Knoxville Region towards achieving its overall goals for system performance. The operations objectives should be specific, measurable statements of performance of the transportation system.

The TPO is already collecting data and information about transportation system performance as described in the Congestion Management Process section. However, the intent of M&O is to become more targeted in developing "SMART" objectives that are Specific, Measurable, Agreed, Realistic, and Time-Bound. Performance measures are developed based on data availability to specifically track the Knoxville Region's progress in meeting its objectives.

The TPO is currently in the initial stages of developing specific objectives as previously noted, although it is expected that objectives will be developed in the very short term through the Planning for Operations committees. At the time that this Plan was prepared, new requirements under MAP-21 for Performance Measures were still under development, and the TPO will respond as necessary to outcomes from that process. Further information regarding the performance management aspects of MAP-21 as of the development of this Plan are in the following section.

MAP-21 Performance Management Goals

A key feature of MAP-21 is the establishment of a performance- and outcome-based program. The objective of this program is to maximize the benefits that are achieved from the finite funding resources that are

available. MAP-21 specifically states "performance management will transform the Federal-aid highway program and provide a means to the most efficient investment of Federal transportation funds by refocusing on national transportation goals, increasing the accountability and transparency of the Federal-aid highway program, and improving project decision-making" [section 1203; 23 USC 150(a)].

MAP-21 has established National Performance Goals for the Federal-aid highway program in the following seven areas:

- Safety
- Infrastructure Condition
- Congestion Reduction
- System Reliability
- Freight Movement and Economic Vitality
- Environmental Sustainability
- Reduced Project Delivery Delays

Specific Performance Measures must be developed within 18 months of enactment of MAP-21 in the following areas through consultation between US DOT, the States and MPOs in order to track progress towards meeting the National Performance Goals:

- Pavement condition on the Interstate System and on remainder of the National Highway System (NHS)
- Performance of the Interstate System and the remainder of the NHS
- Bridge condition on the NHS
- Fatalities and serious injuries – both number and rate per vehicle mile traveled
- Traffic congestion
- On-road mobile source emissions
- Freight movement on the Interstate System

Subsequent to the Performance Measures being developed, there will be a process of coordination between the Knoxville Regional TPO, TDOT and other system/transit operators to establish the actual performance targets that will desired to achieve. An example of this could be to set a target to reduce traffic fatalities by X% within five years. Data collection needs will have to be identified to track progress and a mechanism for reporting the progress toward achieving each target will be required as well.

Baseline Operations Information

The M&O and Planning for Operations initiative is currently a work in progress; however, there is some baseline information that is currently available and documented in this Plan to provide a foundation for development of future goals and objectives for M&O. Three key aspects of the transportation system have been initially identified for targeting strategies to improve M&O and reduce congestion: Traffic Incident Management (TIM), Freeway System Travel Time Reliability, and Traffic Signal Operations & Maintenance.

Traffic Incident Management (TIM)

Effective Traffic Incident Management (TIM) is a critical component to ensuring the transportation system is operating efficiently. Quick clearance of crashes and other obstructions to travel lanes has several benefits, including reducing congestion as well as improved safety by lessening the potential for secondary crashes that can result at the back of queues.

Two initial areas of potential M&O objectives have been identified – TIM Program/Policy Development and Incident Clearance Times.

- **TIM Program/Policy Development**: TIM involves a broad range of interdisciplinary stakeholders that must work in close coordination with one another and have a good understanding of roles and responsibilities at incident scenes. In order to improve coordination and communication among stakeholders, a TIM Taskforce has been meeting on a regular basis in the Knoxville Region, as described earlier. A "TIM Self Assessment" is conducted on an annual basis, identifying areas that need improvement in the TIM Program and Taskforce. The 2012 assessment issued a score of 82 for the Knoxville Region, which is good but means that there are areas for improvement. In terms of policy development, there are policies that have been initiated to promote quicker incident clearance, such as state laws regarding moving crashed vehicles from travel lanes, but additional guidance is needed, especially related to performance of towing services.
- **Incident Clearance Times**: ITS surveillance and detection technologies allow system operators to track the amount of time it takes to get from initial detection of an incident to clearance from the roadway. Objectives can be developed to set a realistic expectation of how long it should take for incident clearance, and performance can be measured to track how well objectives are met. The TDOT Region 1 Traffic Management Center (TMC) "SmartWay" system is already collecting data on incidents and clearance time, and a quarterly summary is provided on the TDOT website.

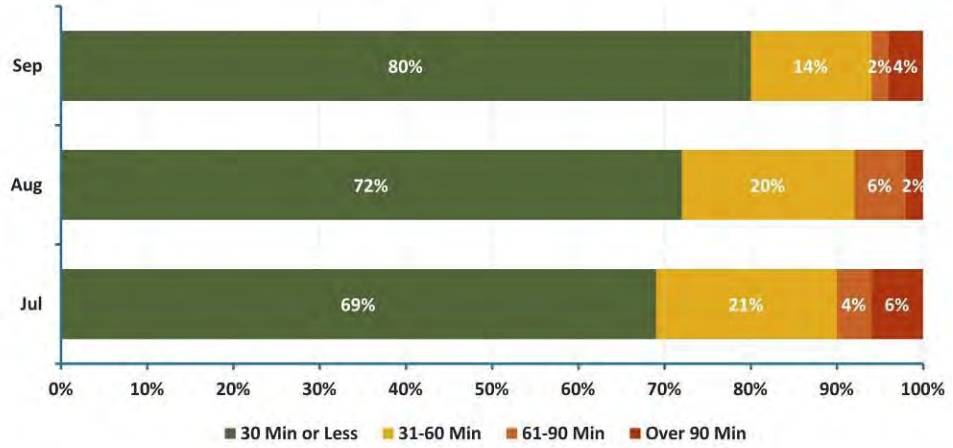


Figure 7-3: TDOT Region 1 SmartWay Incident Clearance Times – Third Quarter, 2012
Source: TDOT SmartWay

Freeway System Travel Time Reliability

Users of a transportation system prefer to experience a consistent and predictable trip time, which is particularly true on the freeway system. Travel time reliability of freeway trips can be measured using a "Travel Time Index" and "Planning Time Index". The Travel Time Index is measured from data collected on a continuous basis from TDOT SmartWay ITS units and it represents the additional time required to make a trip during the congested peak period rather than during the non-congested off-peak periods. The ITS units are continuously collecting data and can therefore track variability in travel time on a day-to-day basis. "Planning Time" can be described as the additional amount of time that must be added to a trip to ensure on-time arrival 95 percent of the time. The more variability in travel time that occurs on the freeway system, the higher the Planning Time Index will be.

Baseline data on travel time reliability were collected for the Knoxville Region as part of a case study performed by Cambridge Systematics Inc. (CSI) under the Strategic Highway Research Program 2 (SHRP 2) of USDOT. CSI developed freeway performance measures based on travel time data obtained from the ITS archived data system maintained by TDOT on urban freeways in Knoxville. Specifically, travel time indices were developed for the AM and PM peak hours and for the peak hour shoulders from March 1, 2011 to December 31, 2011.

Table 7-3 presents the most problematic segments of the Knoxville Region's urban freeway system based on a calculated Planning Time Index. Values equal to or greater than 1.5 indicate how much more the 95th

percentile travel time is compared to free flow travel time. If the ratio is 1.5, for example, the 95th percentile time is 50 percent longer than the free flow time.

Table 7-3: Problem Urban Freeways Segments Based on Planning Time Index

Freeway Segment	Planning Time Index
I-75 SB in AM Peak: I-640 to Murray Dr	1.83
I-40 WB in PM Peak: I-640 W to I-275	1.80
I-640 WB in AM Peak: I-40 W to Western Ave	1.79
I-640 EB in PM Peak: I-40 W to Western Ave	1.77
I-40 WB in PM Peak: Lovell Rd to Cedar Bluff Rd	1.76
I-140 WB in AM Peak: George William Rd to Kingston Pk	1.54
I-40 EB in PM Peak: Cedar Bluff Rd to West Hills	1.50

Source: Knoxville Regional Travel Demand Model (KRTM)

A continuous system of acquiring archived ITS data from TDOT Region 1 will be established to track the Planning Time Index over time and create objectives and performance measures to ensure system reliability meets acceptable standards.

Traffic Signal Operations & Maintenance

Traffic signals play a significant role in the day-to-day operations of the roadway system in the Knoxville Region and can be a major source of unnecessary delay to motorists when improperly timed or malfunctioning. It is challenging for traffic engineering departments in the region to re-time signals on frequent enough basis due to staff constraints. Departments must also keep up with the common malfunction of broken detector loops in the pavement, causing signals to revert to fixed time patterns, which reduces their efficiency.

The TPO staff believes that improvement of traffic signal operations is one of the lowest hanging fruits in terms of improving efficiency and reducing congestion on arterial roadways in the Knoxville Region. A survey is in development to assess traffic signal management and operations practices of each major jurisdiction in the Knoxville Region. The results of the survey will assist in developing objectives and performance measures for improving traffic signals, including identification of hardware needs that may be fulfilled by ITS solutions or additional funding for special timing studies. This process is anticipated to be complete within the next year.

Public Transportation Improvements

A key component in addressing congestion is to find ways to improve the efficiency of the existing system rather than simply adding more capacity. Public transportation offers a great opportunity to do just that. For example, one 60-person KAT bus can take 53 cars off the road during a typical work commute (based on the regional average of 1.13 persons per vehicle). The figures below illustrate how much roadway capacity is gained when 200 people ride a bus rather than drive.

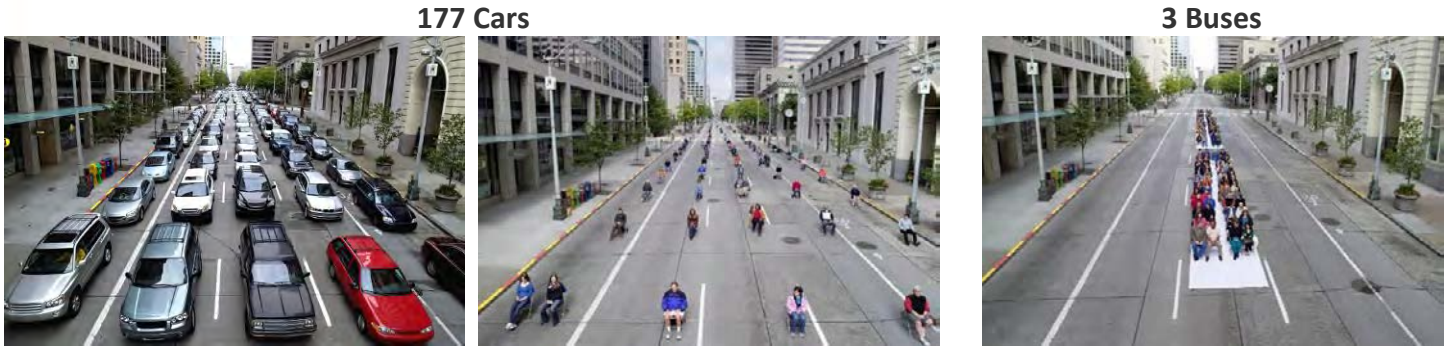


Figure 7-4: Roadway Capacity Saved When 200 People Commute by Bus Rather than Driving
Source: International Sustainability Institute

An important step in expanding opportunities to access public transportation is conducting transit studies. These studies look at the feasibility of transit and look for best options to implement successful transit improvements. One recent study, the Knoxville Regional Transit Corridor Analysis, examined major transportation corridors in the TPO planning area to determine if any could support higher capacity transit services. The study focused on opportunities in the next 10 years to implement transit options that benefitted congestion mitigation and were eligible for Federal Transit Administration funds. More information on this study is available in Chapter 6.

Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems (ITS) refers to the use of advanced technologies to enhance the management and operation of transportation facilities, increase safety, security, and mobility, and reduce congestion. ITS elements take many forms:

- Vehicle detection devices that report traffic counts, speed, and travel time;
- Video surveillance equipment that monitors roadways for congestion and incidents;
- Roadway sensors that monitor weather and road conditions;

- Communication services and facilities that transmit information;
- Traffic control centers that serve as a central location for traffic management, communication, and collection and coordination of information;
- Variable message signs that display traffic information to motorists; and,
- Roadway service patrols that respond to incidents in a timely manner.

Existing Conditions

During the 1990s, the Tennessee Department of Transportation recognized the need for a statewide Intelligent Transportation System (named SmartWay in 2003). A component of the TDOT SmartWay Strategic Plan was to focus ITS efforts in the four major urban areas of Tennessee – Nashville, Knoxville, Chattanooga, and Memphis.

Knoxville Intelligent Transportation Systems Plan

In 1998, the Knoxville ITS Strategic Assessment was completed, incorporating input from the Tennessee Department of Transportation, Federal Highway Administration, state, county, and local highway officials, planning agencies, local emergency services, and transit and airport authorities to identify what an Intelligent Transportation System in the Knoxville Region should consist of and what it should accomplish.

In October 2000, the Knoxville Regional Intelligent Transportation Systems Plan was completed, which included a Communications Master Plan and Regional Architecture. The Plan identified the project limits of the ITS, consisting of more than 41 miles of roadways within Knox County and including all or portions of I-40, I-75, I-640, I-275, Pellissippi Parkway, and Alcoa Highway. The ITS Architecture Plan was updated in 2012, identifying additional ITS needs for TDOT and local communities. As part of the 2012 ITS Architecture Plan, there is a strategic deployment plan for each community which gives projects and probable costs for ITS needs.

The Communications Master Plan identifies how information will be transmitted among ITS components, jurisdictions, and agencies responsible for management, operations, and emergency response, the media, and the public. The deployment of the Knoxville ITS system involves the use of wireless communications for audio information to the public and fiber optic landlines for the transmission of video digital information. To ensure redundancy in the system, two Public-Private Partnership agreements are used for covering shared usage of fiber optics.

The Regional Architecture ensures that ITS projects funded by federal transportation dollars are in compliance with the National ITS Architecture so that separate ITS components will be compatible and integrated with one another. It identifies which ITS user services will be provided for the Knoxville Region along with the roles and responsibilities of stakeholders involved in its deployment. The ITS user services identified for the Knoxville ITS Plan are travel and traffic management, public transportation management, electronic payment, emergency management, and information management.

Highway Advisory Radio System (HARS)

The Highway Advisory Radio System sponsored by TDOT provides information to motorists through an AM radio band. In Knoxville, AM 1620 is dedicated to broadcasting highway advisories.

Progress since the 2009 Regional Mobility Plan

Since the last Regional Mobility Plan, several ITS activities throughout the Knoxville Region have been initiated.

Knoxville Area ITS Architecture Update

The update of the Regional ITS Architecture and Deployment Plan for the Knoxville Region relied heavily on stakeholder input to ensure that architecture reflected local needs. A series of four stakeholder workshops were held between October 2011 and July 2012, and draft documents were made available to stakeholders for review and comment.

ITS Architecture Workshop and ITS Architecture Development

The purpose of the Regional ITS Architecture Workshop was to review system inventory with stakeholders and update the Knoxville Regional ITS Architecture. Training on the National ITS Architecture was integrated into the workshop so that key elements of the architecture, such as service packages, could be explained prior to selection and editing of these elements. Stakeholders reviewed the service packages that are currently available in the National ITS Architecture as well as those that were included in the 2003 Knoxville Regional ITS Architecture.

The result of the Workshop was an ITS architecture for the Knoxville Region that included a system inventory, interconnect diagram, customized service packages, functional requirements, and relevant ITS standards. The TPO is responsible for maintaining the Knoxville ITS Regional Architecture.

ITS Deployment Plan Workshop and ITS Deployment Plan Development

A draft project listing for the Knoxville Region was presented to stakeholders at the Regional ITS Deployment Plan Workshop. Stakeholders were asked to provide input on recommended projects, responsible agencies,

associated costs, and deployment timeframe. A Regional ITS Deployment Plan document was prepared from stakeholders' input. The above-mentioned documents and plans are available online via **TDOT**.

Knoxville Regional Transportation Management System (TMS)

The first large scale deployment of the Knoxville ITS Plan, known as the Knoxville Regional Transportation Management System (TMS) has been completed by TDOT to address operations and management of the Interstate system. The Knoxville TMS includes 85 closed circuit television (CCTV) cameras along portions of the interstate, expressway, and arterial system to monitor traffic flow and roadway conditions and to identify incidents. Sixteen Dynamic Message Signs (DMS) were placed at overhead locations along the interstates and expressways displaying traveler information. There are now several Dynamic Message Signs strategically located at critical points on the rural interstate system in the Knoxville Region.

The Traffic Management Center (TMC) is in operation at TDOT Region 1 Headquarters on Strawberry Plains Pike. The TMC acts as a central point for the Knoxville TMS. It collects and coordinates all transportation-related information. The TMC also controls the direction of traffic cameras, incident detection, verification, and coordination and HELP truck deployment. The TMC also issues traveler information and displays travel times on the dynamic message signs. Travelers can also check traffic conditions and view real time traffic cameras on the **TDOT SmartWays website**.

Tennessee 511

The Tennessee 511 system utilizes an automated voice response system to provide travelers with information on road and travel conditions, incidents, transit options, and construction. Tennessee 511 is available 24 hours a day, seven days a week and can also be accessed through online at **www.tn511.com**.

ITS and Public Transportation

Intelligent Transportation Systems can be used by public transportation agencies to track transit vehicles, provide route information, aid in fare collection and management, and provide transit information to passengers. In 2005, Knoxville Area Transit (KAT) had an ITS Assessment undertaken which laid out a prioritization plan. This assessment was updated in the 2009 KAT Transit Development Plan and then again as part of the 2012 Regional ITS Architecture and Deployment Plan.

ITS as applied to transit represents a comprehensive approach to improve customer service and reduce system capital and operating costs. One of the most requested improvements by passengers is the ability to access real time information through smartphones and mobile devices. Transit, in general, is persistently challenged to lure choice riders away from their automobiles. Meeting customer wishes with technology

updates like real time information delivery, for example, can help level the playing field, making transit more customer-friendly, efficient, and reliable.

Some of the key ITS technologies recommended for KAT include:

1.) Automatic vehicle location (AVL);
2.) Upgrade in communications;
3.) Automatic passenger counters;
4.) Operational software and computer aided dispatching;
5.) Advanced traveler information systems;
6.) Electronic fare payment;
7.) Traffic signal priority; and,
8.) Vehicle diagnostics.

KAT, Knox County CAC Transit, and ETHRA, like most bus-only, mid-size city systems, are inching along in implementing ITS because of the costs and variability of the technologies. Nevertheless, with the rapid increase of technological capabilities in all areas (smartphones, voice actuation, etc.), it is important that transit systems take advantage of these capabilities when possible. With increasing fuel costs, efficiency in operating a fleet of vehicles continues to grow in importance, especially for demand response systems. Computerized scheduling and dispatching and knowing where vehicles are in real time can greatly increase efficiency, which means overall operating costs are held down and more passengers can be scheduled for trips.

Several recent events helped KAT, CAC, and ETHRA advance the implementation of ITS. For KAT, the construction of a new, state-of-the-art transit center allowed the opportunity to include the cost of implementing several technologies in the overall building cost. This included allowing the transit center to be appropriately designed and constructed to accommodate any future ITS improvements. As part of the overall capital grant, KAT was able to implement AVL on its buses, which allows real time information to be displayed at various locations in the center, including at each bus bay.

Federal stimulus funding in August of 2009 allowed CAC to finish placing AVL on all of its vehicles, upgrade its computerized dispatching, and add several innovative communication improvements. Using real time information, Knox County CAC Transit can call passengers a few minutes in advance to let them know their van will be there shortly.

The State of Tennessee funded a statewide ITS grant which allowed ETHRA to implement AVL, real time information, and computerized dispatching.

One of the next priorities that KAT, Knox County CAC, and ETHRA are pursuing is the opportunity to better coordinate with each other. If the three systems can communicate with each other, a seamless transportation system can be offered to the citizens of this Knoxville Region, which will allow for more choices and a greater service area.

Great Smoky Mountains National Park

The National Park Service (NPS) recently completed a study that identified potential ITS projects for the Park and major access points. TPO, TDOT, and NPS should work together to ensure that the ITS architecture is compatible and that ITS projects are coordinated.

Adding System Capacity (Projects)

The roadway improvement projects identified in the following chapter (Chapter 8) generally address at least one of three major needs – safety, capacity, or system connectivity/economic development. Many roadways in the Knoxville Region were originally constructed long ago and do not possess modern design features to accommodate motor vehicles, pedestrians and bicycles in a safe and efficient manner.

The Congestion Management Process was utilized to determine if roadway congestion could first be mitigated using operational strategies or reducing travel demand. In certain cases, however, additional system capacity through widening of existing roadways to add general-purpose lanes was deemed necessary to effectively meet either existing or forecasted travel demand. In other cases, additional system capacity through construction of roadways on new alignment was determined to be necessary to improve roadway network connectivity and/or provide access to areas of planned residential or commercial development, such as the Alcoa West Plant redevelopment area in the City of Alcoa.

The TPO Travel Demand Model was utilized to analyze various statistics to determine overall impacts of constructing the roadway projects recommended by this Plan. Table 7-4 below shows the daily vehicle miles of travel (VMT), daily vehicle hours of travel (VHT), system-wide average speed, and projected daily hours of delay for motor vehicles that result for three different roadway network scenarios. The three scenarios include base year conditions of 2010 with existing and committed projects in place, future year 2040 conditions with existing plus committed (E+C) projects, i.e. the “No-Build” scenario, and finally, future year 2040 with implementation of recommended roadway projects.

Table 7-4: Network Analysis Based on Three Network Scenarios

Network Analyzed	Daily VMT (miles/day)	Daily VHT (hours/day)	Average System Speed (mph)	Total Hours of Delay (hours/day)
2010 E+C	25,153,956	588,667	42.7	97,654
2014 E+C	26,506,049	629,265	42.1	111,457
2014 Projects	26,354,197	625,859	42.1	110,488
2024 E+C	30,706,259	772,839	39.7	172,050
2024 Projects	31,013,264	760,930	40.8	157,492
2034 E+C	35,281,265	946,443	37.3	254,690
2034 Projects	36,043,802	922,596	39.1	222,537
2040 E+C	38,987,220	1,099,636	35.5	336,381
2040 Projects	40,302,079	1,078,223	37.4	299,378

Source: Knoxville Regional Travel Demand Model (KRTM)

While it is obvious that the projects identified by this Plan significantly improve future operations versus the No-Build scenario, there are still projected to be several remaining roadway sections with excessive congestion. It is widely recognized that it is impossible to build your way out of congestion. Instead, the full list of operational and travel demand management strategies should be considered for the remaining deficient roadways given the fact that major capacity improvements are very costly and can be very disruptive to residences, businesses, and the environment.

Projects

Chapter 8

Overview of Project Selection

Funding estimates show expected revenues would exceed the expected expenditures for the projects in some categories, such as the National Highway Performance Program (NHPP) funds. However, the costs of projects eligible for LOCAL or L-STP funds exceed anticipated revenues. This is largely because NHPP funds may only be used for a narrowly defined set of roadway projects. LOCAL and L-STP funds have broad criteria, thus a much larger list of projects compete for these funds despite their limited size. Capital projects have been scored and prioritized based on a list of criteria, which include:

- Congestion management
- Multimodal choices
- Freight and goods movement
- Safety and security
- System preservation
- Quality growth
- Economic prosperity
- Health and environment

- Local support and consistency with plans
- Bonus given based on output from the Travel Demand Model assessment of congestion

Projects that scored lower based on these criteria moved to later horizon years and some moved to a non-constrained "Wish List." These wish list projects identify projects that local jurisdictions have identified as beneficial to the Knoxville Region, and though funding does not exist at this time for these projects, jurisdictions would like to keep these projects available to pursue if other funding becomes available or if other projects are able to be implemented with lower than anticipated costs.

Roadway Projects

Financially Constrained Project List

The Roadway section of Chapter 3 discussed how the roadway projects were selected and evaluated for inclusion in the Mobility Plan. The roadway project list is financially constrained, and the projects that increase the capacity of the roadway network undergo air quality conformity, the results of which will be shown in last section of this chapter.

Many of these highway projects fall under TDOT's Accommodation Policy (see Appendix D to view the full text of policy) and will therefore include sidewalks and/or bike lanes as appropriate. In the past, intersection improvements were already prescribed in the Plan as adding a center turn lane or adding a right-hand turn lane. In this Plan update, the appropriate design to fulfill the project's needs will be determined during the Design phase.

The Mobility Plan number (RMP #) corresponds with the project listing to the project location in the maps, which displays regional roadway projects, color coded by anticipated completion horizon year. Seven completion horizon years were used to coincide with five air quality conformity determination years (2014, 2015, 2024, 2034, and 2040) and two additional years to subdivide ten-year periods into more manageable periods (2019 and 2029).

Project Description Definitions

Further explanation of some of the descriptions included in the following table of roadway projects are as follows:

1.) **Construct New Roadway (any number of lanes)** – Entails constructing a roadway on new location. Roadways that are envisioned to include full access control are denoted as a "freeway." The final

design will determine the median configuration in terms of either a continuous center turn lane or non-traversable raised median and the accommodation of bicyclists and pedestrians.

2.) **Widen Roadway (from x lanes to y lanes)** – Entails addition of motor vehicle capacity through construction of additional through travel lanes on an existing roadway. Multilane facilities will generally include either a non-traversable median or a center turn lane. The final design will determine the median configuration and accommodation of bicyclists and pedestrians through sidewalks and/or bike lanes.

3.) **Reconstruct 2-lane road** – Entails the improvement of an existing 2-lane roadway to bring it up to modern standards in terms of lane and shoulder widths and geometric design chiefly to enhance the safety of the roadway. This may also involve the construction of turn lanes at major intersections necessary for safety to remove stopped vehicles from the travel lanes. The final design will determine the median configuration and accommodation of bicyclists and pedestrians through sidewalks and/or bike lanes.

4.) **Add Center Turn Lane** – Entails addition of a continuous two-way left turn lane on an existing undivided roadway of two or more lanes, also usually involves reconstructing the roadway to modern design standards for lane and shoulder width and geometric design. The final design will determine the median configuration and accommodation of bicyclists and pedestrians through sidewalks and/or bike lanes.

5.) **Replace Bridge** – Entails the replacement of an existing bridge that has been determined to be structurally deficient. The new bridge may include safety enhancements such as wider lanes and shoulders, but will not have more through lanes than the previous structure had unless otherwise noted.

6.) **Intersection Improvements** – Entails the modification of a single intersection to improve safety and operations including the possible addition of separate turn lanes, realignment of approaches or traffic signal.

Project Development Process

Figure 8-1 below shows a broad overview of the TDOT Project Development Process.

Figure 8-1: TDOT Project Development Process

Source: TDOT Transportation Process Alternatives for Tennessee Final Report, August 2012

Exhibit 8-1

Roadway Projects - Anderson County

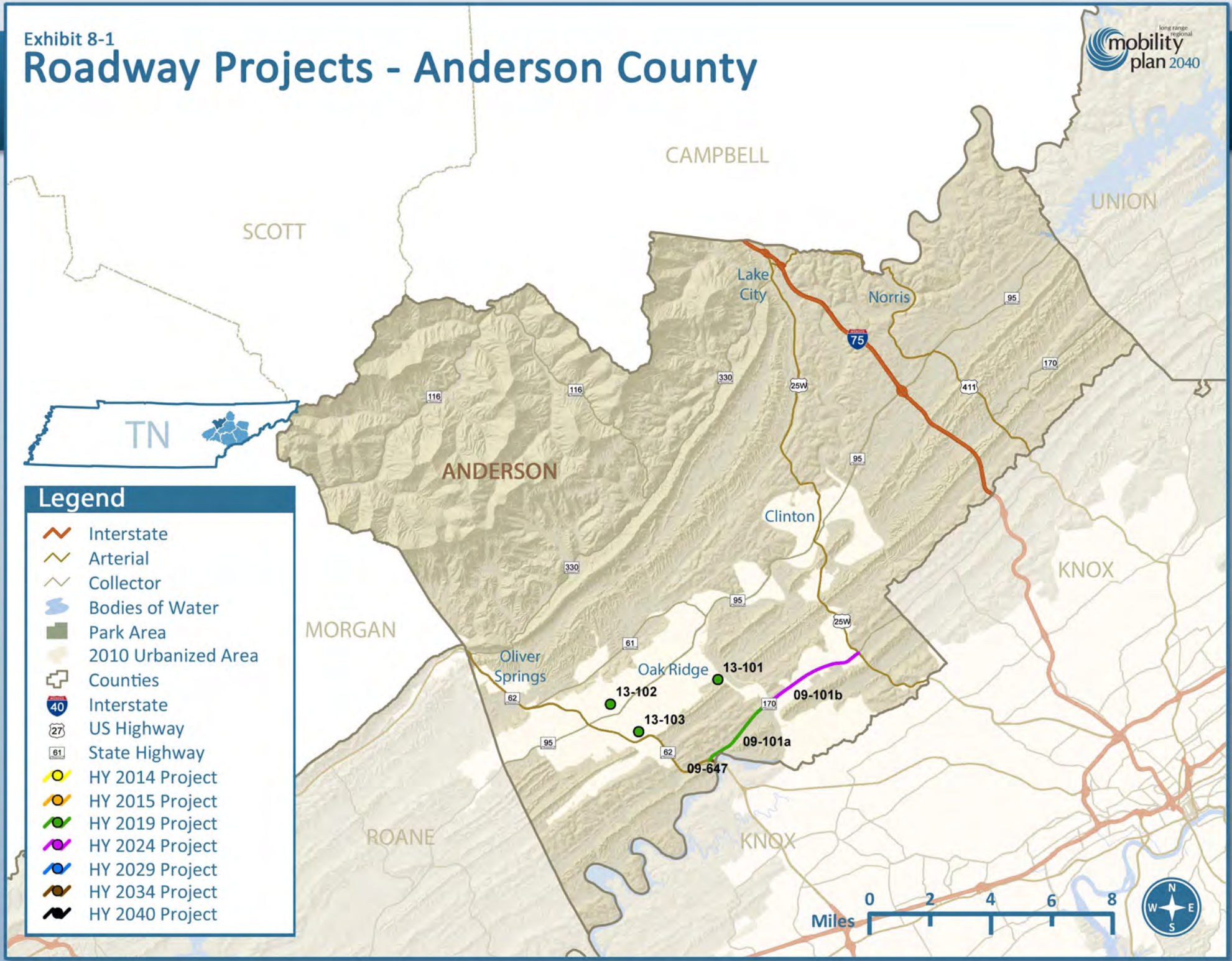
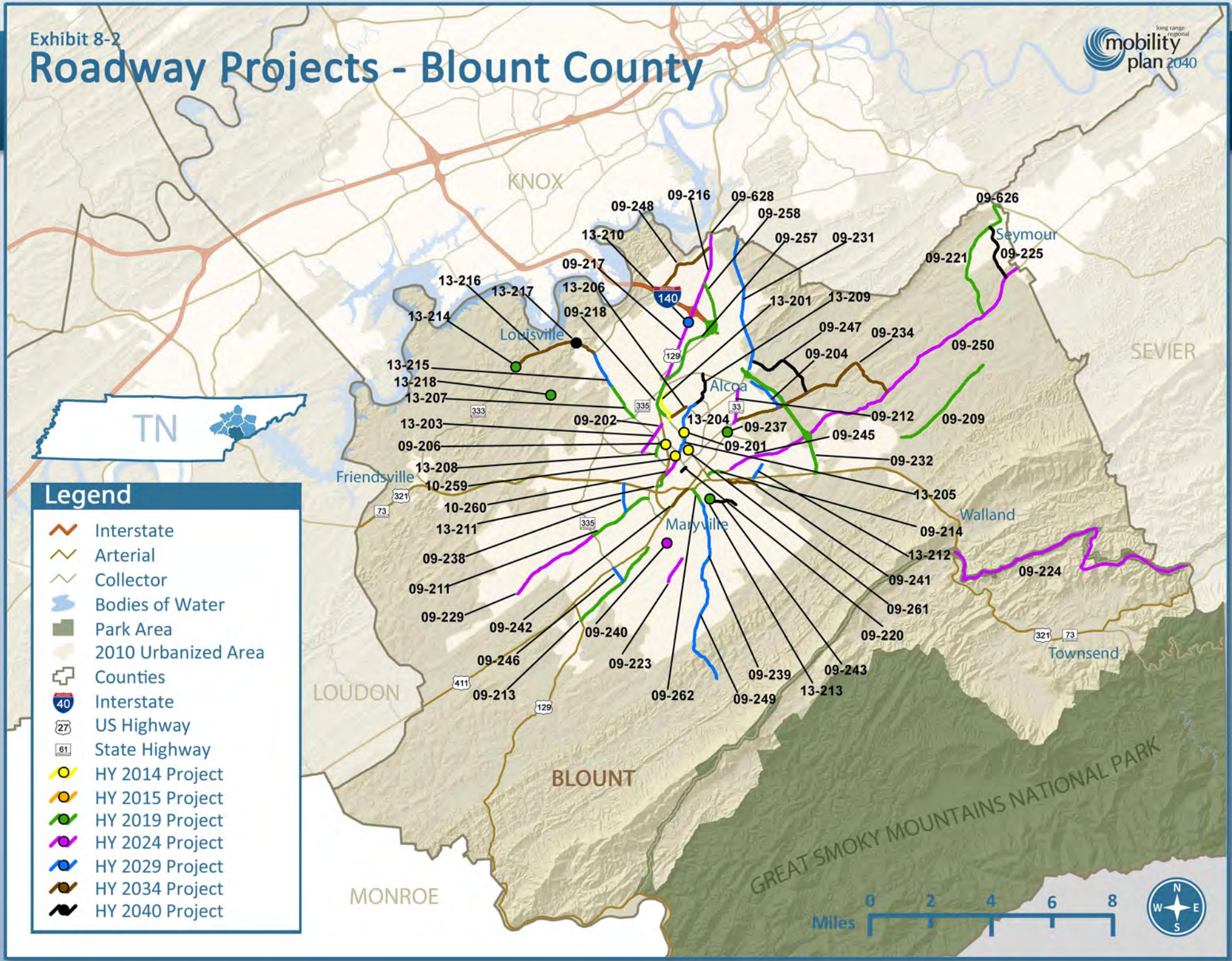


Exhibit 8-2

Roadway Projects - Blount County



Legend

- Interstate
- Arterial
- Collector
- Bodies of Water
- Park Area
- 2010 Urbanized Area
- Counties
- Interstate
- US Highway
- State Highway
- HY 2014 Project
- HY 2015 Project
- HY 2019 Project
- HY 2024 Project
- HY 2029 Project
- HY 2034 Project
- HY 2040 Project

Exhibit 8-3

Roadway Projects - Knox County

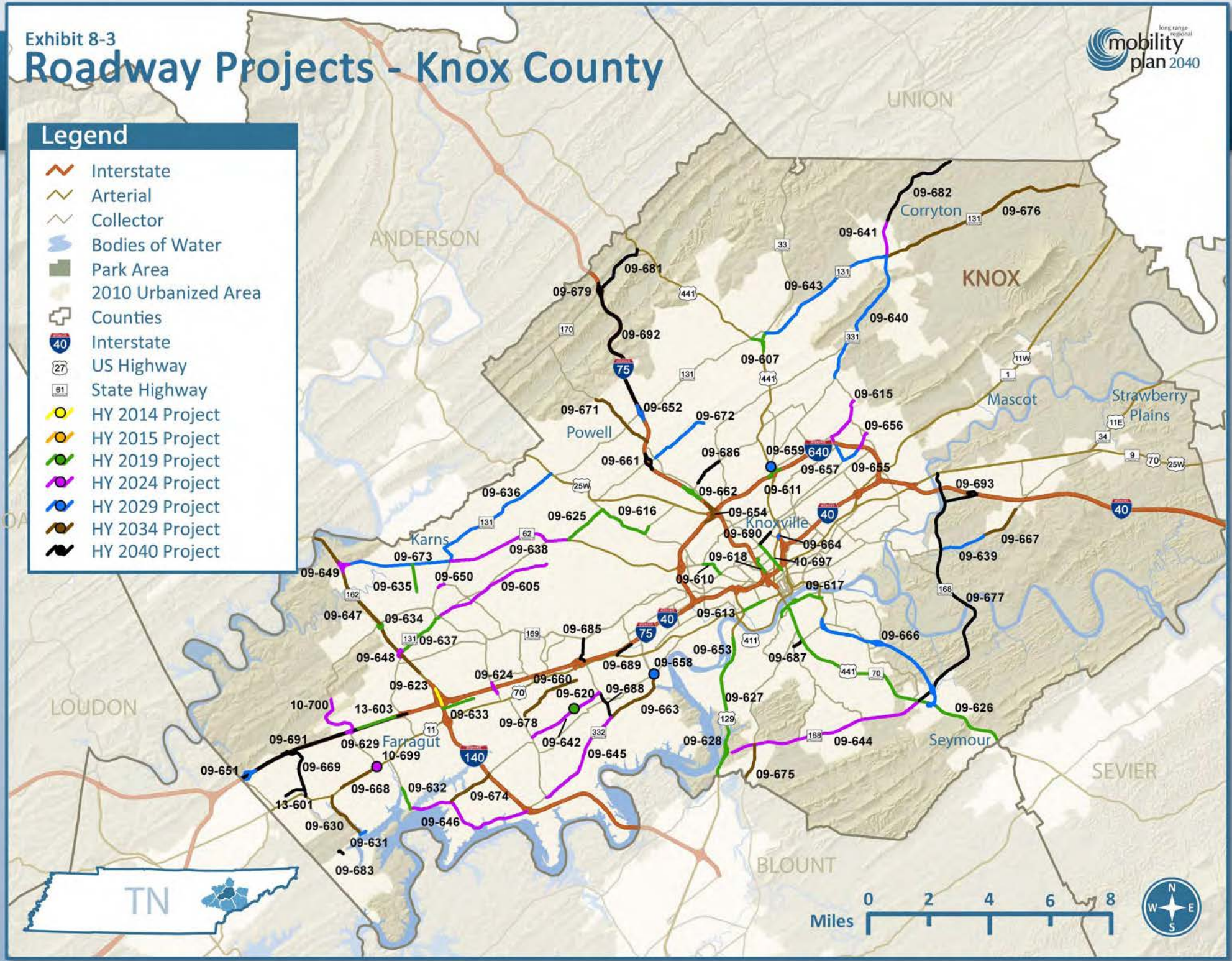


Exhibit 8-4

Roadway Projects - Loudon County

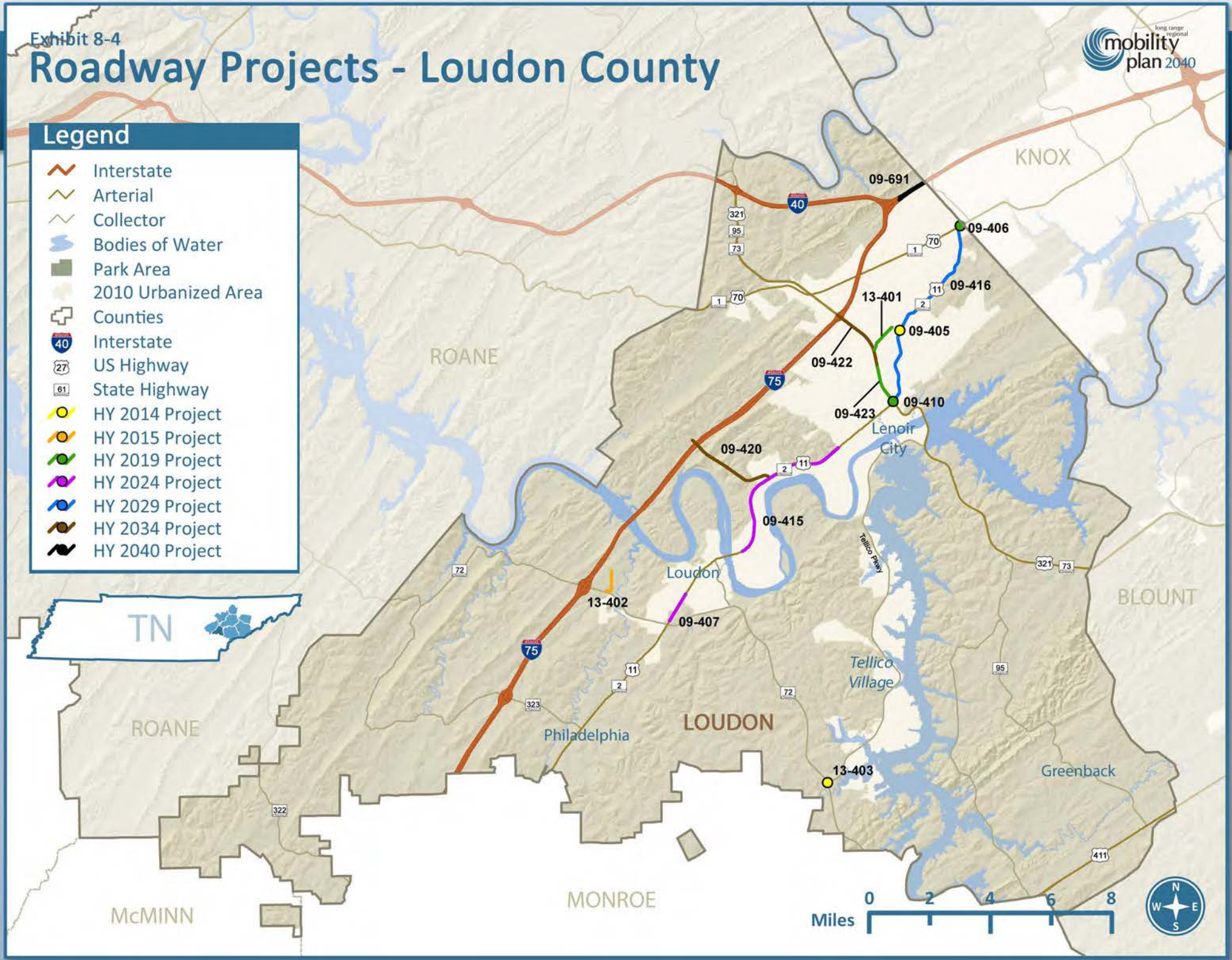


Table 8-1: Constrained Roadway Projects

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
Horizon Year 2013 – 2014												
10-259	Maryville	McCammon Ave at W Bessemer St Relocation and Reconstruction	From W Bessemer St to 720' south of W Bessemer St	0.1	Relocation and reconstruction of McCammon Ave from its existing intersection with W Bessemer St to tie in to the traffic signal at Hunters Crossing Dr. Includes 11' lanes, curb and gutter, and sidewalk along one side.	4	2014	$615,094	L-STP	0%	0%	100%
13-201	Alcoa	W Plant Redevelopment Local Interstate Connector New Road Construction	Hall Rd (SR 35) / Associates Blvd to Mill St (Future Hunt Rd Interchange)	1.4	Construct 4-lane road with center median		2014	$4,935,517	Local	0%	0%	100%
09-613a	Knoxville	Cumberland Ave Road Diet and Streetscaping, Phase 1	Alcoa Hwy to 22nd St	0.2	Operational and Pedestrian improvements including intersection realignment, turn lanes, and wider sidewalks	1	2014	$3,075,469	L-STP	80%	20%	0%
10-696	Knoxville	Downtown Knoxville Wayfinding Project	Downtown Knoxville	0.0	Create a consistent signage system to include gateway signs, pedestrian directionals, trolley signs, etc…	1	2014	$1,230,188	L-STP	80%	0%	20%
13-403	Loudon Co	Tellico Pkwy / SR 72 Intersection Lighting	Intersection with Tellico Pkwy	0.0	Install street lighting		2014	$77,194	TA	80%	20%	0%
Total for Horizon Year 2013 – 2014:								**$9,933,462**				
Horizon Year 2015												
09-401	Lenoir City	Lenoir City Railroad Crossing Improvements	South C St in Lenoir City	0.0	Improve at-grade RR crossings		2015	$111,374	HPP	80%	0%	20%
13-402	Loudon	Queener Rd Reconstruction	SR 72 to River Rd	0.7	Widen from 15.8' to 26', drainage, reduce curves	4	2015	$1,037,971	L-STP	50%	50%	0%
09-623	Knoxville	Pellissippi Pkwy (I-140) Restriping	I-40 to Dutchtown Rd	0.4	Restripe to add one lane on northbound I-140	1	2015	$103,797	NHPP	80%	0%	20%
Total for Horizon Year 2015:								**$1,253,142**				
Horizon Year 2016 – 2019												
09-101a	Oak Ridge / Anderson Co	Edgemoor Rd (SR 170) Widening, Phase 1	Oak Ridge Hwy (SR 62) to Melton Lake Dr	2.6	Widen 2-lane to 5-lane with bike lanes	3	2019	$42,669,694	STP	80%	20%	0%
13-101	Oak Ridge	Emory Valley Rd at Melton Lake Dr Roundabout Construction	Intersection at Melton Lake Dr	0.0	Construct roundabout	3	2019	$478,837	HSIP	80%	0%	20%
13-102	Oak Ridge	Tulane Ave at Pennsylvania Ave Roundabout Construction	Intersection at Pennsylvania Ave	0.0	Construct roundabout	3	2019	$478,837	HSIP	80%	0%	20%

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
13-103	Oak Ridge	New Signalized Intersection at Lafayette Dr	Half way between Midway Rd and Midland Rd	0.0	Construction would include right-of-way acquisition of private property from Midway across the CSX railroad to Lafayette.	5	2019	$372,429	Local	0%	0%	100%
09-208	Maryville	Maryville Streetscaping	Various locations	0.0	Street-scaping and "Complete Street" types of projects throughout Maryville	4	2019	$319,225	TA	80%	0%	20%
09-209	Blount Co	Ellejoy Rd Reconstruction	River Ford Rd to Jeffries Hollow Rd	3.7	Reconstruct 2-lane section with shoulders	4	2019	$12,894,015	HSIP	80%	0%	20%
09-211	Blount Co	Morganton Rd Reconstruction, Phase 1	Foothills Mall Dr to William Blount Dr (SR 335)	2.2	Reconstruct 2-lane section with shoulders	1	2019	$10,095,479	HSIP	80%	0%	20%
09-213	Blount Co	Old Niles Ferry Rd Reconstruction	Maryville City Limit (Willis Rd) to Calderwood Hwy (US 129 / SR 115)	3.3	Reconstruct 2-lane section with shoulders	4	2019	$15,143,219	HSIP	80%	0%	20%
09-214	Maryville	Sevierville Rd (US 411 / SR 35) Widening and Bridge Replacement	Washington St (SR 35) to Walnut St	0.4	Widen 2-lane to 3-lane with curb and gutters, sidewalks, new bridge over Browns Creek, 2 business relocations, and new entrance for Blount Memorial Hospital	1	2019	$6,070,589	NHPP	80%	20%	0%
09-216	Blount Co / Alcoa	Alcoa Hwy (US 129 / SR 115) Widening	Pellissippi Pkwy (SR 162) to Knox / Blount Co Line	2.4	Widen 4-lane to 6-lane with 2 auxiliary lanes between Singleton Station Rd and Topside Rd (SR 333)	2	2019	$50,650,311	NHPP	80%	20%	0%
09-218	Alcoa	Alcoa Hwy Parkway (US 129 / SR 115) New Road Construction	From south of Airport Rd to proposed Interchange serving McGhee Tyson Airport	1.3	Construct new 8-lane highway	3	2019	$53,204,108	NHPP	80%	20%	0%
09-221	Blount Co	Burnett Station Rd Reconstruction	Sevierville Rd (US 411 / SR 35) to Chapman Hwy (US 441 / SR 71)	4.4	Reconstruct 2-lane section with shoulders	4	2019	$15,333,424	HSIP	80%	0%	20%
09-232	Blount Co	Pellissippi Pkwy (SR 162) Extension / New Road Construction	Old Knoxville Hwy (SR 33) to Lamar Alexander Pkwy (US 321 / SR 73)	4.4	Construct new 4-lane freeway	2	2019	$52,608,434	NHPP	80%	20%	0%
09-237	Maryville	E Broadway Ave (SR 33) / Eagleton Rd / Brown School Rd Intersection Improvements	From south of Brown School Rd to north of Eagleton Rd		Re-align Eagleton Rd with Brown School Rd to remove offset and create 4-leg, signalized intersection. Widening to include left-turn lanes at all approaches with curb & gutter and sidewalk.	1	2019	$2,427,171	STP	80%	20%	0%
09-257	Alcoa	Alcoa Hwy Parkway (US 129 / SR 115) New Road Construction	From Proposed Interchange serving McGhee Tyson Airport to Pellissippi Pkwy (SR 162)	2.4	Construct new 8-lane highway	2	2019	$53,736,149	NHPP	80%	20%	0%
09-258	Alcoa	Alcoa Hwy Parkway (US 129 / SR 115) New Road Construction	From Pellissippi Pkwy (SR 162) to Existing Alcoa Hwy near Singleton Station Rd	1.4	Construct new 8-lane highway	2	2019	$53,204,108	NHPP	80%	20%	0%
09-262	Maryville	Montvale Rd (SR 336) Widening	Montvale Station Rd to Lamar Alexander Pkwy (SR 73 / US 321)	0.6	Widen from 2-lane to 3-lane	1	2019	$13,620,252	STP	80%	20%	0%
13-207	Alcoa	Louisville Rd (SR 334) Reconstruction	W Hunt Rd to Alcoa city limits (Liberty St)	1.3	Reconstruct existing 2-lane facility with shoulders	3	2019	$6,149,065	STP	80%	20%	0%

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
13-208	Alcoa	Harvest Ln Extension / New Road Construction	Harvest Ln (cul-de-sac) to Louisville Rd	0.2	Extend existing 2-lane road to connect to Louisville Rd	4	2019	$2,508,209	Local	0%	0%	100%
13-211	Maryville	Foothills Mall Dr Extension / New Road Construction	US 129 Bypass (SR 115) to Foch St	0.5	Extend Foothills Mall Dr across US 129 Bypass on new alignment to Foch St Modification of existing traffic signal to accommodate fourth leg and additional left and right turn lanes.	2	2019	$4,127,575	L-STP	80%	20%	0%
13-213	Maryville	Court St at Boardman Ave Intersection Improvements	Intersection at Boardman Ave	0.0	Widen Court St to accommodate left-turn lane onto Boardman Ave and install signal	5	2019	$2,050,486	L-STP	80%	0%	20%
13-214	Louisville	Old Lowes Ferry Rd at Louisville Rd (SR 333) Intersection Improvements	Intersection at Louisville Rd (SR 333)	0.0	Realignment of intersection	4	2019	$1,330,103	HSIP	80%	20%	0%
13-218	Blount Co	Middlesettlements Rd at Miser Station Rd Intersection Improvements	Intersection at Mider Station Rd	0.0	Re-alignment of intersection	5	2019	$236,653	STP	80%	20%	0%
09-607	Knox Co	Halls Connector Corridor and Intersection Improvements	Norris Fwy (US 441 / SR 71) to Emory Rd (SR 131) and Maynardville Hwy (SR 33)	0.4	Reconfigure intersections and add SB thru lane on Norris Fwy from Emory Rd to Maynardville Hwy	1	2019	$10,832,356	NHPP	80%	20%	0%
09-610	Knoxville	Western Ave (SR 62) Widening and Bridge Reconstruction	Texas Ave to Major Ave	0.8	Reconstruction: bridge over CSX railroad, 4-lane roadway, curbs and gutters, 12' lanes, 4' shoulders, 7' sidewalks, 20' raised median, shoulders eliminated between Keith Ave and Major Ave	2	2019	$20,856,010	STP	80%	20%	0%
09-611	Knoxville	I-640 at N Broadway Interchange Improvements	Interchange at N Broadway (US 441 / SR 33)	0.0	Modify interchange	1	2019	$9,044,698	NHPP	80%	20%	0%
09-613b	Knoxville	Cumberland Ave Road Diet and Streetscaping, Phase 2	22nd St to 16th St	0.6	Pedestrian Improvements and Reduce from 4 lanes to 2 lanes with center turn lane	1	2019	$12,832,831	L-STP	80%	0%	20%
09-616	Knoxville	Pleasant Ridge Rd / Merchant Dr Widening, Phase 2	Knoxville City Limits (Country Brook Ln) to Merchant Dr / Pleasant Ridge Rd to Wilkerson Rd	1.6	Add center turn lane	3	2019	$20,536,786	L-STP	80%	0%	20%
09-617	Knoxville	South Knoxville Waterfront Roadway Improvements	From Scottish Pk to James White Pkwy (SR 71)	1.9	Add turn lanes where needed and pedestrian and bicycle accomodations where feasible	2	2019	$6,384,493	HPP	80%	0%	20%
09-618	Knoxville	I-275 Industrial Park Access Improvements	Blackstock Ave: extend from Fifth Ave to Bernard Ave; Marion St: realign; University Ave: intersections with W Fifth Ave and Bernard Ave	0.5	Blackstock Ave: extend from Fifth Ave to Bernard Ave; Marion St: realign; University Ave: intersections with W Fifth Ave and Bernard Ave		2019	$5,958,860	HPP	80%	0%	20%
09-619	Knoxville	Various Railroad Crossing Improvements		0.0	Improve circuitry on vehicle protection devices of at-grade RR crossings throughout Knoxville		2019	$235,907	HPP	80%	0%	20%

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
09-620	Knoxville	Cessna Rd Railroad Crossing Improvements	Cessna Rd Railroad crossing	0.0	Improve the at-grade RR crossing at Cessna Rd		2019	$91,511	HPP	80%	0%	20%
09-625	Knoxville / Knox Co	Schaad Rd Widening	Oak Ridge Hwy (SR 62) to Pleasant Ridge Rd	1.5	Widen 2-lane to 4-lane	1	2019	$12,507,222	Local	0%	0%	100%
09-626a	Knoxville / Knox Co	Chapman Hwy (US 441 / SR 71) Safety Improvements, Phase 1	Blount Ave to Gov John Sevier Hwy	5.9	Operational and Safety Improvements including center-turn lanes at various locations	1	2019	$9,257,515	NHPP	80%	20%	0%
09-626b	Knoxville / Knox Co	Chapman Hwy (US 441 / SR 71) Safety Improvements, Phase 2	Evans Rd to Burnett Ln	0.9	Operational and Safety Improvements including center-turn lanes at various locations	1	2019	$1,915,348	HSIP	90%	10%	0%
09-626c	Knoxville / Knox Co	Chapman Hwy (US 441 / SR 71) Safety Improvements, Phase 3	Gov John Sevier Hwy to Macon Ln	4.4	Operational and Safety Improvements including center-turn lanes at various locations	1	2019	$5,746,044	NHPP	80%	20%	0%
09-627	Knoxville	Alcoa Hwy (US 129 / SR 115) Widening	North of Maloney Rd to Woodson Dr	1.4	Widen 4-lane to 6-lane	1	2019	$28,410,994	NHPP	80%	20%	0%
09-628	Knoxville	Alcoa Hwy (US 129 / SR 115) Widening	Maloney Rd to Blount/Knox Co Line	2.3	Widen 4-lane to 6-lane, including bike/ped facilities	2	2019	$41,499,204	NHPP	80%	20%	0%
09-632	Farragut / Knox Co	Concord Rd (SR 332) Widening	Turkey Creek Rd to Northshore Dr (SR 332)	1.5	Widen 2-lane to 4-lane with median, bike lanes, sidewalk	2	2019	$12,028,385	STP	80%	20%	0%
09-633	Knox Co	Parkside Dr Widening	Mabry Hood Rd to Hayfield Rd	1.1	Widen 2-lane to 4-lane with continuous center turn lane	2	2019	$8,693,126	L-STP	80%	0%	20%
09-634	Knox Co	Pellissippi Pkwy (SR 162) / Hardin Valley Rd Interchange Improvements	Interchange at Hardin Valley Rd	0.0	Reconfigure existing interchange to improve safety and operations	1	2019	$26,602,054	NHPP	80%	20%	0%
09-635	Knox Co	Karns Connector New Road Construction	Westcott Blvd to Oak Ridge Hwy (SR 62)	0.8	Construct New 2-lane road with center turn lane	2	2019	$6,266,167	Local	0%	0%	100%
09-637	Knox Co	Lovell Rd (SR 131) Widening	Cedardale Ln to Middlebrook Pk (SR 169)	1.7	Widen 2-lane to 4-lane with median, bike lanes, sidewalk	2	2019	$14,174,851	STP	80%	20%	0%
09-653	Knoxville	Alcoa Hwy (US 129 / SR 115) Widening	Woodson Dr to north of Cherokee Trail	1.3	Widen 4-lane to 6-lane	1	2019	$35,646,752	NHPP	80%	20%	0%
09-662	Knoxville	I-75 at Merchant Dr Interchange Improvements	Interchange at Merchant Dr	0.0	Reconfigure existing interchange to improve safety and operations	1	2019	$21,281,643	NHPP	80%	20%	0%
10-697	Knoxville	Central St Road Diet and Streetscaping	Woodland Ave to Depot St	1.2	Road Diet and Streetscape Project, reduce from 4 lanes to 2 lanes with center turn lane	3	2019	$2,660,205	L-STP	80%	0%	20%
13-603	TDOT	I-40/I-75 Westbound Auxiliary Lane	Lovell Road to Campbell Station Road	1.8	Add full westbound auxiliary lane		2019	$2,873,022	HSIP	80%	20%	0%
09-403	Greenback	Greenback Streetscaping	Various locations in Greenback	0.0	Improve streetscapes and repair pavement		2019	$236,652	HPP	80%	0%	20%
09-406	Loudon Co	Dixie Lee Junction Intersection Improvements	Intersection at US 70 (SR 1)	0.2	Improve intersection capacity, operations, geometrics, safety, and facilities for alternative modes.	3	2019	$3,192,246	NHPP	80%	20%	0%
09-410	Lenoir City	US 321 (SR 73) at US 11 (SR 2) Intersection Improvements	Intersection at US 11 (SR 2)	0.0	Intersection Improvements	1	2019	$6,643,280	STP	80%	20%	0%
09-423	Lenoir City	US 321 (SR 73) Widening to 7-lanes	Simpson Rd to US 11 (SR 2)	1.4	Remove median and install turn lanes	4	2019	$10,428,005	STP	80%	20%	0%

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
13-401	Loudon Co / Lenoir City	Simpson Rd Reconstruction	US 321 to Shaw Ferry Rd	0.7	Widen from 18' to 26', sidewalks, and left turn lanes at select locations	4	2019	$611,847	HSIP	80%	0%	20%
09-508	Sevier Co / Seymour	Chapman Hwy (US 441 / SR 71) Widening	Boyds Creek Hwy (US 411 / SR 35/338) to Macon Ln	1.2	Widen 4-lane to 5-lane, 12' lanes, 6' shoulders, curb and gutters, and 5' sidewalks	2	2019	$8,193,433	NHPP	80%	20%	0%
Total for Horizon Year 2016 – 2019:								**$745,349,817**				
Horizon Year 2020 – 2024												
09-101b	Oak Ridge / Anderson Co	Edgemoor Rd (SR 170) Widening, Phase 2	Melton Lake Dr to Clinton Hwy (US 25W / SR 9)	3.6	Widen 2-lane to 5-lane with bike lanes and a bridge	2	2024	$50,923,507	STP	80%	20%	0%
09-202	Alcoa	Robert C. Jackson Dr Extension / New Roadway Construction, Phase 1	Middlesettlements Rd to Louisville Rd (SR 334)	0.7	New 4-lane road w/ center turn lane and/or median	2	2024	$13,969,042	STP	80%	20%	0%
09-212	Blount Co	Old Knoxville Hwy (SR 33) Reconstruction	Wildwood Rd to McArthur Rd	1.2	Reconstruct 2-lane section with shoulders	2	2024	$11,429,216	STP	80%	20%	0%
09-217	Alcoa	Alcoa Hwy (SR 115 / US 129) Intersection Improvements	Singleton Station Rd to Hunt Rd (SR 335)	3.6	Improve intersections including signals, turn lanes, pedestrian infrastructure upon completion of Alcoa Pkwy	2	2024	$2,259,315	HSIP	80%	20%	0%
09-223	Maryville	Carpenters Grade Rd Reconstruction and Intersection Improvements	Raulston Rd to Kirkland Estates Blvd	0.7	Widen 2-lane to 2- 12' lanes with curb and gutter, sidewalk, and auxiliary turn lanes where needed. Reconstruct intersection with Peterson Ln, Cochran Rd, and Raulston Rd to roundabout.	3	2024	$4,129,757	Local	0%	0%	100%
09-229	Blount Co	Morganton Rd Reconstruction, Phase 2	Willam Blount Dr (SR 335) to Walker Rd	3.3	Reconstruct 2-lane section with shoulders	4	2024	$13,724,584	HSIP	80%	0%	20%
09-240	Maryville	Sandy Springs Rd at Montgomery Ln Intersection Improvements	Intersection at Montgomery Ln	0.0	Sandy Springs Rd: Add left turn lane and NB righ turn lane; Montgomery Ln: add left turn and right turn approaches. Install new traffic signal.	4	2024	$1,308,010	CMAQ	80%	0%	20%
09-245	Maryville / Blount Co	Sevierville Rd (US 411 / SR 35) Widening	Everett High Rd to Swaneed Dr (Maryville City Limits)	2.0	Widen 2-lane to 3-lane with curb and gutter, and sidewalks to the section recently widened by the City of Maryville	1	2024	$24,889,023	NHPP	80%	20%	0%
09-250	Blount Co	Sevierville Rd (US 411 / SR 35) Reconstruction	Swanee Dr (Maryville City Limits) to Chapman Hwy (US 441 / SR 71)	11.9	Reconstruct 2-lane section with shoulders	3	2024	$49,491,681	NHPP	80%	20%	0%
10-260	Maryville	McCammon Ave Extension / New Road Construction	Foch St to existing McCammon Ave	0.7	Construction of 2-3 lanes of new roadway on new alignment. This roadway would complete a new corridor parallel to the US 129 Bypass and support new commercial development along the City of Maryville's high intensity retail zone.	2	2024	$4,980,598	Local	0%	0%	100%

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
13-203	Alcoa	Robert C. Jackson Extension / New Road Construction, Phase 2	Louisville Rd to US 129 Bypass	0.5	Extension of Robert C. Jackson, Phase 1. Construct new 4-lane section and grade separated interchange connecting US 129 and Associates Blvd	2	2024	$42,161,108	STP	80%	20%	0%
09-605	Knox Co	Schaad Rd Extension / New Road Construction	Middlebrook Pk (SR 169) to west of Oak Ridge Hwy (SR 62)	4.6	Construct new 4-lane road with median, 6' sidewalks, 2 grade separated rail crossings	3	2024	$44,292,662	Local	0%	0%	100%
09-615	Knoxville	Washington Pk Widening	I-640 to Murphy Rd	1.6	Widen 2-lane to 4-lane	2	2024	$21,398,032	NHPP	80%	20%	0%
09-624	Knoxville	Cedar Bluff Rd Intersection Improvements	Cross Park Dr to Peters Rd	0.4	Intersection and Operational Improvements	2	2024	$1,269,913	CMAQ	80%	0%	20%
09-629	Farragut	I-40/75 at Campbell Station Rd Interchange Improvements	Interchange at Campbell Station Rd	0.0	Reconfigure existing interchange to improve capacity, safety, and operations	1	2024	$48,567,819	NHPP	80%	20%	0%
09-638	Knox Co	Oak Ridge Hwy (SR 62) Widening	Schaad Rd to Byington-Beaver Ridge Rd (SR 131)	4.2	Widen 2-lane to 4-lane with TWLTL most likely as well as bike lanes and sidewalks	1	2024	$41,794,358	NHPP	80%	20%	0%
09-641	Knox Co	Tazewell Pk (SR 331) Widening	Emory Rd (SR 131) to Barker Rd	1.2	Widen 2-lane to 4-lane	3	2024	$11,941,245	STP	80%	20%	0%
09-642	Knox Co	Westland Dr Reconstruction	Morrell Rd to Ebenezer Rd	2.7	Reconstruct 2-lane section	3	2024	$17,766,488	HSIP	80%	0%	20%
09-644	Knox Co	Gov John Sevier Hwy (SR 168) Widening	Alcoa Hwy (US 129 / SR 115) to Chapman Hwy (US 441 / SR 71)	6.5	Widen 2-lane to 4-lane	2	2024	$64,681,744	STP	80%	0%	20%
09-645	Knox Co	Northshore Dr (SR 332) Reconstruction	Morrell Rd to Ebenezer Rd	3.5	Reconstruct 2-lane section	4	2024	$21,010,709	HSIP	80%	20%	0%
09-646	Knox Co	Northshore Dr (SR 332) Reconstruction	Pellissippi Pkwy (I-140) to Concord Rd (SR 332)	4.5	Reconstruct 2-lane section	2	2024	$26,744,366	STP	80%	20%	0%
09-648	Knox Co	Pellissippi Pwy (SR 162) at Lovell Rd (SR 131) Interchange Improvements	Interchange at Lovell Rd (SR 131)	0.0	Reconfigure existing interchange to improve safety and operations	1	2024	$22,858,432	NHPP	80%	20%	0%
09-649	Knox Co	Pellissippi Pwy (SR 162) at Oak Ridge Hwy (SR 62) Interchange Improvements	Interchange at Oak Ridge Hwy (SR 62)	0.0	Reconfigure existing interchange to improve safety and operations	2	2024	$38,097,387	NHPP	80%	20%	0%
09-650	Knox Co	Byington-Beaver Ridge Rd (SR 131) Railroad Underpass	At One-Lane Railroad Underpass	0.2	Widen railroad underpass	2	2024	$3,076,396	NHPP	80%	20%	0%
09-656	Knoxville	Millertown Pk Widening	I-640 to Mill Rd	0.6	Widen 2-lane and 4-lane sections to 4-lane and 6-lane sections	1	2024	$8,254,434	L-STP	80%	0%	20%
10-699	Farragut	Kingston Pk (US 11/70 / SR 1) at Campbell Station Rd Intersection Improvements	Intersection w/ Campbell Station Rd	0.4	Construct additional eastbound and northbound left turn lanes	3	2024	$6,730,538	CMAQ	80%	20%	0%
10-700	Farragut / Knox Co	Campbell Station Rd Widening	Snyder Rd to Yarnell Rd	1.8	Widening to include addition of center turn lane, bike/ped facilities	2	2024	$19,048,694	STP	80%	20%	0%

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
09-407	Loudon Co	US 11 at Loudon High School Intersection Improvements	From south of Loudon High School to north of Loudon High School	0.5	Improve alignment of roadway at School	3	2024	$761,948	CMAQ	80%	0%	20%
09-414	Lenoir City	Broadway (US 11 / SR 2) Downtown Streetscaping	D St to Hill Ave	0.8	Streetscape improvements and reduction of travel lanes in downtown area to improve pedestrian use, will require off-street parking facilities.	3	2024	$6,984,521	NHPP	80%	20%	0%
09-415	Loudon Co	US 11 (SR 2) Widening	East of Tennessee River west to Lenoir City corporate limits (Browder Hollow Rd)	3.8	Widen 2-lane to 4-lane and improve horizontal and vertical curves.	2	2024	$58,415,994	NHPP	80%	20%	0%
Total for Horizon Year 2020 – 2024:								**$682,961,521**				
Horizon Year 2025 – 2029												
09-204	Alcoa	Pellissippi Place Access Rd Extension / New Road Construction	Pellissippi Place existing termini to Wildwood Rd	1.2	Extend 2-lane and 4-lane road w/ center median lane	4	2029	$26,701,636	Local	0%	0%	100%
09-231	Rockford	Old Knoxville Hwy (SR 33) Reconstruction and Bridge Replacement	Pellissippi Pkwy (SR 162) to Knox Co Line (Co Op Rd)	4.6	Reconstruct 2-lane section with shoulders, including 2 bridges	4	2029	$34,762,366	STP	80%	20%	0%
09-238	Maryville	Robert C. Jackson Dr Extension / New Roadway Construction	Lamar Alexander Pkwy (US 321 / SR 73) to Morganton Rd	1.2	Construct new 2-lane road	2	2029	$12,150,233	STP	80%	20%	0%
09-239	Maryville	Montvale Rd (SR 336) Widening	Montvale Station Rd to Maryville South City Limits (south of Southview Dr)	2.4	Add center turn lane	4	2029	$39,096,712	STP	80%	20%	0%
09-246	Maryville / Blount Co	William Blount Dr (SR 335) Extension / New Road Construction	US 411 (SR 33) to Old Niles Ferry Rd	0.6	Construct new 2-lane road with auxiliary turn lanes where needed	3	2029	$8,555,328	STP	80%	20%	0%
09-249	Blount Co	Montvale Rd (SR 336) Reconstruction	Maryville City Limits (Southview Drive) to Six Mile Rd	2.7	Reconstruct 2-lane section with shoulders	5	2029	$13,401,326	STP	80%	20%	0%
13-204	Alcoa	Bessemer Blvd Widening, Phase 1	Hall Rd (SR 35) to N Wright Rd	1.4	Widen 2-lane to 4-lane with raised median	3	2029	$31,826,729	L-STP	80%	0%	20%
13-205	Alcoa	Bessemer Blvd Widening, Phase 2	Hamilton Crossing Dr / McCammon Ave to Hall Rd (SR 35)	0.5	Widen 2-lane to 4-lane with raised median or center turn lane	4	2029	$11,366,689	HSIP	80%	0%	20%
13-210	Alcoa	N Park Blvd at Airbase Rd Intersection Improvements	Intersection at Airbase Rd	0.3	Realign N Park Blvd to Airbase Rd	5	2029	$14,994,415	HSIP	80%	0%	20%
13-212	Maryville	Merritt Rd Reconstruction	E Lamar Alexander Pkwy (US 321) to Fielding Dr	0.5	Widening existing 2-lane to 2 - 12ft lanes with curb and gutter, sidewalk, and auxiliary turn lanes where needed	3	2029	$4,228,408	HSIP	80%	0%	20%
13-215	Louisville	Louisville Rd (SR 334) Reconstruction, Phase 1	Alcoa city limits (Liberty St) to Topside Rd (SR 333)	1.2	Reconstruction of 2-lane with shoulders	4	2029	$7,973,732	STP	80%	20%	0%

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
09-631	Farragut	Turkey Creek Rd New Road and Bridge Construction	Brixworth Blvd to Boyd Station Rd	0.4	Construct new 2-lane bridge and approaches to connect Turkey Creek Rd with intersection of Boyd Station Rd and Virtue Rd	5	2029	$12,882,248	L-STP	80%	0%	20%
09-636	Knox Co	Emory Rd (SR 131) Widening	Oak Ridge Hwy (SR 62) to Clinton Hwy (US 25W / SR 9)	5.0	Add center turn lane	4	2029	$35,464,070	STP	80%	20%	0%
09-639	Knox Co	Strawberry Plains Pk Widening	Gov. John Sevier Hwy (SR 168) to Moshina Rd	1.6	Widen 2-lane to 4-lane with turn lanes as needed and bike lanes and sidewalks	4	2029	$19,001,467	L-STP	80%	0%	20%
09-640	Knox Co	Tazewell Pk (SR 331) Widening	Murphy Rd to Emory Rd (SR 131)	4.7	Widen 2-lane to 4-lane with turn lanes as needed and bike lanes and sidewalks	3	2029	$55,816,808	STP	80%	0%	20%
09-643	Knox Co	Emory Rd (SR 131) Widening	Maynardville Hwy (SR 33) to Tazewell Pk (SR 331)	4.9	Widen 2-lane to 4-lane	3	2029	$58,191,992	STP	80%	0%	20%
09-651	Knox Co	I-40/75 at Watt Rd Interchange Improvements	Interchange at Watt Rd	0.0	Reconfigure existing interchange to improve safety and operations	5	2029	$30,311,171	NHPP	80%	20%	0%
09-652	Knoxville	I-75 at Emory Rd (SR 131) Interchange Improvements	Interchange at Emory Rd (SR 131)	0.0	Reconfigure existing interchange to improve safety and operations	3	2029	$30,311,171	NHPP	80%	20%	0%
09-655	Knoxville	Millertown Pk Reconstruction	Washington Pk to I-640	0.6	Reconstruct 2-lane section	4	2029	$7,880,904	L-STP	80%	0%	20%
09-657	Knoxville	Washington Pk Widening	Millertown Pk to I-640	0.6	Add center turn lane	4	2029	$11,215,133	HSIP	80%	0%	20%
09-658	Knoxville	Northshore Dr (SR 332) at Kingston Pk (US 11/70 / SR 1) Intersection Improvements	Intersection at Kingston Pk (US 11/70 / SR 1)	0.0	Intersection improvement	1	2029	$15,155,585	STP	80%	0%	20%
09-659	Knoxville	Tazewell Pk (SR 331) Intersection Improvements	Intersection w/ Old Broadway & Greenway Dr	0.0	Intersection improvement	2	2029	$6,365,346	STP	80%	0%	20%
09-664	Knoxville	Broadway (US 441 / SR 33) at Hall of Fame Dr Intersection Improvements	Intersection at Hall of Fame Dr	0.0	Intersection improvement	4	2029	$3,372,118	NHPP	80%	20%	0%
09-666	Knoxville / Knox Co	James White Pkwy (SR 71) Extension / New Road Construction	Chapman Hwy (US 441 / SR 71) (southeast of E Governor John Sevier Hwy) to Moody Ave	5.2	Construct / extend new 4-lane road	5	2029	$106,392,209	NHPP	80%	20%	0%
09-672	Knox Co	Dante Rd Reconstruction	Central Ave Pk to Dry Gap Pk	2.1	Reconstruct 2-lane section	4	2029	$14,894,909	HSIP	80%	0%	20%
09-673	Knox Co	Oak Ridge Hwy (SR 62) Widening	Byington-Beaver Ridge Rd (SR 131) to Pellissippi Pkwy (SR 162)	4.2	Widen 2-lane to 4-lane	4	2029	$49,878,850	NHPP	80%	20%	0%
09-416	Loudon Co / Lenoir City	US 11 (SR 2) Widening	Lenoir City corporate limits (Hall St) to US 70 (Dixie Lee Junction)	5.1	Widen 2-lane to 4-lane with left turn lanes	3	2029	$86,386,836	NHPP	80%	20%	0%
Total for Horizon Year 2025 – 2029:								**$748,578,390**				

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
Horizon Year 2030 – 2034												
09-215	Alcoa	I-140 Interchange Ramps at McGhee Tyson Airport	Airport Terminus to Pellissippi Pkwy (I-140) (SR 162)	0.0	Add new interchange ramps for direct access to future terminal and cargo area	5	2034	$37,983,133	NHPP	80%	20%	0%
09-234	Blount Co	Wildwood Rd Reconstruction and Bridge Replacement	Maryville City Limit (Brown School Road) to Sevierville Rd (US 411 / SR 35)	6.1	Reconstruct 2-lane section with shoulders, reconstruct Wildwood Bridge over the Little River	4	2034	$63,264,526	L-STP	80%	0%	20%
09-241	Maryville	Tuckaleechee Pk Reconstruction	Lamar Alexander Pkwy (US 321 / SR 73) to Grandview Dr	1.1	Reconstruct 2-lane to 2- 12' lanes with curb and gutter, sidewalks, and auxiliary turn lanes where needed.	5	2034	$14,151,430	HSIP	80%	0%	20%
09-242	Maryville	W Broadway Ave (US 411 / SR 33) Widening	Old Niles Ferry Rd to Lamar Alexander Pkwy (US 321 / SR 73)	0.8	Widen 2-lane to 3-lane with curb and gutter, auxiliary turn lanes where needed, modify signal at Magnolia Ave.	2	2034	$17,528,312	NHPP	80%	20%	0%
09-248	Alcoa	Topside Road (SR 333) Widening	Alcoa Hwy (US 129 / SR 115) to Wrights Ferry Rd	1.2	Reconstruct 2-lane to 5-lane	4	2034	$66,070,083	STP	80%	20%	0%
13-206	Alcoa	Associates Blvd Extension / New Road Construction	Associates LIC Project to Springbrook Rd	0.8	4-lane section with median	4	2034	$18,548,430	State LIC/Local	0%	50%	50%
13-216	Louisville	Louisville Rd (SR 334) Reconstruction, Phase 2	Topside Rd (SR 333) to Old Lowes Ferry Rd	2.9	Reconstruction of 2-lane with shoulders	5	2034	$22,776,314	HSIP	80%	20%	0%
09-630	Farragut	Virtue Rd Reconstruction	Boyd Station Rd to Kingston Pk (US 11/70 / SR 1)	1.4	Reconstruct 2-lane roadway to 2- 12' lanes with 4' bike lanes, curb and gutter, and sidewalk/ greenway	4	2034	$17,001,974	L-STP	80%	0%	20%
09-647	Knox Co	Pellissippi Pkwy (SR 162) Widening	Edgemoor Rd (SR 170) to Dutchtown Rd	6.0	Widen from 4-lane to 6-lane	4	2034	$120,670,786	NHPP	80%	20%	0%
09-654	Knoxville	I-640 at I-75/275 Interchange Improvements	Interchange at I-75/275	1.6	Interchange improvements to include additional through lanes on I-75 north and southbound ramps	1	2034	$144,697,650	NHPP	80%	20%	0%
09-660	Knoxville	Gleason Dr Reconstruction	Montvue Rd to Gallaher View Rd	1.0	Reconstruct 2-lane section	5	2034	$9,947,963	HSIP	80%	0%	20%
09-663	Knoxville	Northshore Dr (SR 332) Reconstruction	Lyons View Pk to Morrell Rd	2.2	Reconstruct 2-lane section	3	2034	$25,322,089	STP	80%	20%	0%
09-667	Knoxville / Knox Co	Strawberry Plains Pk Widening	Moshina Rd to south of I-40	2.3	Widen 2-lane to 4-lane	4	2034	$19,842,389	L-STP	80%	0%	20%
09-668	Farragut	Kingston Pk (US 11/70 / SR 1) Widening	Smith Rd to Campbell Station Rd	1.4	Widen 5-lane to 7-lane	4	2034	$33,642,204	NHPP	80%	20%	0%
09-671	Knox Co	Central Ave Pk Reconstruction	Beaver Creek Dr to Emory Rd (SR 131)	2.3	Reconstruct 2-lane section	2	2034	$19,469,069	HSIP	80%	0%	20%
09-674	Knox Co	Westland Dr Reconstruction	Northshore Dr (SR 332) to Pellissippi Pkwy (I-140)	1.7	Reconstruct 2-lane section	2	2034	$14,390,181	CMAQ	80%	0%	20%
09-675	Knox Co	Maryville Pk (SR 33) Reconstruction	Gov. John Sevier Hwy (SR 168) to Blount Co Line (Co Op Rd)	1.2	Reconstruct 2-lane section	4	2034	$10,157,775	STP	80%	20%	0%
09-676	Knox Co	Emory Rd (SR 331) Reconstruction	Tazewell Pk (SR 131) to Grainger Co Line (Mountain Rd)	7.8	Reconstruct 2-lane section	4	2034	$144,273,031	STP	80%	0%	20%
09-678	Knox Co	Gleason Dr Widening	Gallaher View Rd to Ebenezer Rd	1.1	Add center turn lane	4	2034	$9,311,294	HSIP	80%	0%	20%
09-420	Loudon Co	Sugar Limb Rd Widening	US 11 (SR 2) to I-75	2.3	Widen 2-lane to 4-lane	4	2034	$37,802,261	CMAQ	80%	0%	20%

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
09-422	Lenoir City	US 321 (SR 73) Widening	I-75 to Simpson Rd	1.6	Widen 4-lane to 6-lane	4	2034	$23,694,240	NHPP	80%	20%	0%
Total for Horizon Year 2030 – 2034:								**$870,545,133**				
Horizon Year 2035 – 2040												
09-220	Alcoa / Maryville	Home Ave Extension / New Road Construction	McCammon Ave to Calderwood St	0.2	Extend 3-lane Home Ave through existing shopping center to line up with Lindsay St at Calderwood St. Replace bridge crossing at Pistol Creek.	4	2040	$14,424,134	Local	0%	0%	100%
09-225	Blount Co	Hinkle Rd Reconstruction	Sevierville Rd (SR 35 / US 411) to Burnett Station Rd	1.9	Reconstruct 2-lane section with shoulders	4	2040	$13,915,375	L-STP	80%	0%	20%
09-243	Maryville	Wilkinson Pk Widening	Court St to Maryville City Limits (Old Whites Mill Rd)	0.9	Widen 2-lane to 3-lane with curb and gutter, auxiliary turn lanes where needed	5	2040	$14,182,613	L-STP	80%	0%	20%
09-247	Alcoa / Blount Co	Sam Houston School Rd Widening	Old Knoxville Hwy (SR 33) to Wildwood Rd	2.7	Add center turn lane, bike lane, and shoulder	5	2040	$61,706,542	HSIP	80%	0%	20%
13-209	Alcoa	Bessemer Blvd Widening, Phase 3	N Wright Rd to E Hunt Rd (SR 335)	1.1	Widen 2-lane to 4-lane with raised median or center turn lane (0.22 mi), Extension with raised median or center turn lane (0.87 mi)	4	2040	$55,907,495	L-STP	80%	0%	20%
13-217	Louisville	Louisville Rd (SR 333) Lackey Creek Bridge Replacement	Lackey Creet Bridge	0.0	Reconstruction of Lackey Creek Bridge	5	2040	$16,773,367	NHPP	80%	20%	0%
09-661	Knoxville	I-75 / Callahan Rd Interchange Reconfiguration	Interchange at Callahan Rd	0.0	Reconfigure existing interchange to improve safety and operations	2	2040	$78,270,493	NHPP	80%	20%	0%
09-669	Farragut	Everett Rd Reconstruction	Synder Rd Extension to Kingston Pk (US 11/70 / SR 1)	2.1	Reconstruct 2-lane section	4	2040	$44,278,736	L-STP	80%	0%	20%
09-677	Knox Co	Gov John Sevier Hwy (SR 168) Widening	Chapman Hwy (US 441 / SR 71) to Asheville Hwy	9.2	Widen 2-lane to 4-lane	4	2040	$352,672,360	STP	80%	0%	20%
09-679	Knox Co	I-75 at Raccoon Valley Rd Interchange Improvements	Interchange at Raccoon Valley Rd	0.0	Reconfigure existing interchange to improve safety and operations	5	2040	$24,599,298	NHPP	80%	20%	0%
09-681	Knox Co	Raccoon Valley Rd (SR 170) Reconstruction	Norris Frwy (US 441 / SR 71) to I-75	2.0	Reconstruct 2-lane section	5	2040	$20,931,766	STP	80%	20%	0%
09-682	Knox Co	Tazewell Pike (SR 131) Reconstruction	Barker Rd to Union Co Line (Jim Wolfe Rd)	3.1	Reconstruct 2-lane section	5	2040	$32,444,237	STP	80%	20%	0%
09-683	Knox Co / Farragut	McFee Rd / Harvey Rd Railroad Underpass Improvements	McFee Rd to Harvey Rd over railroad	0.1	Construct new road or widen railroad underpass	4	2040	$12,806,171	NHPP	80%	20%	0%
09-685	Knoxville	Vanosdale Rd Widening	Buckingham Rd to Middlebrook Pk (SR 169)	0.9	Add center turn lane	4	2040	$11,740,574	CMAQ	80%	0%	20%
09-686	Knoxville	Cedar Ln Widening	East of Central Ave Pk to Inskip Rd	1.0	Add center turn lane	4	2040	$18,114,028	HSIP	80%	0%	20%
09-687	Knoxville	Moody Ave New Road Construction	Chapman Hwy (US 441 / SR 71) to Maryville Pk (SR 33)	0.4	Construct new 2-lane road w/ center turn lane	4	2040	$4,193,062	L-STP	80%	0%	20%
09-688	Knoxville	Morrell Rd Widening	Westland Dr to Northshore Dr (SR 332)	0.9	Add center turn lane	3	2040	$13,417,799	CMAQ	80%	0%	20%

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
09-689	Knoxville	Papermill Rd Widening	Kingston Pk (US 11/70 / SR 1) to Weisgarber Rd	0.6	Add center turn lane	4	2040	$8,553,847	CMAQ	80%	0%	20%
09-690	Knoxville	Woodland Ave Widening	Central St to Huron St	0.6	Add center turn lane	4	2040	$8,050,679	HSIP	80%	0%	20%
09-691	Knoxville / Farragut / Knox Co	I-40/75 Widening	I-40 / I-75 Interchange to Lovell Rd (SR 131) Interchange	6.7	Widen 6-lane to 8-lane	4	2040	$223,795,689	NHPP	80%	20%	0%
09-692	Knoxville / Knox Co	I-75 Widening	Emory Rd (SR 131) to Raccoon Valley Rd (SR 170) Interchange	4.8	Widen 4-lane to 6-lane	2	2040	$191,469,752	NHPP	80%	20%	0%
09-693	Knox Co	I-40 at Governor John Sevier Hwy (SR 168) New Interchange Construction	Interchange at Governor John Sevier Hwy (SR 168)	0.0	New interchange	4	2040	$44,725,996	NHPP	80%	20%	0%
13-601	Farragut	Union Rd Reconstruction	Saddle Bridge Rd to Brochardt Blvd	0.7	Reconstruct existing 2-lane facility	4	2040	$13,865,059	Local	0%	0%	100%
Total for Horizon Year 2035 – 2040:								**$1,280,839,070**				
TOTAL of Roadway Projects for All Horizon Years 2013 – 2040								**$4,339,460,535**				

Roadway Project "Wish List"

Based on the project selection process described at the beginning of this chapter, projects were evaluated and scored. Those scores were used to prioritize which projects would utilize limited funding streams and which projects moved either to a later horizon year where money was available, or to a non-constrained "Wish List." These wish list projects identify projects that local jurisdiction have identified as beneficial to the Knoxville Region, and though funding does not exist at this time for these projects, jurisdictions would like to keep these projects available to pursue if other funding becomes available of if other projects are able to be implemented with lower than anticipated costs.

Table 8-2: Roadway "Wish List" (Non-Constrained)

RMP#	Jurisdiction	Project Name	Termini	Length (mi.)	Project Description	Priority	Requested Horizon Year	Requested Horizon Year Cost
BLOUNT COUNTY								
09-207	Alcoa	Wrights Ferry Rd Widening	Topside Rd (SR 333) to Airbase Rd (SR 429)	1.4	Add center turn lane and shoulders	5	2024	**$13,338,943**
09-210	Blount Co	Jeffries Hollow Rd Reconstruction	Ellejoy Rd to Sevier Co Line	2.7	Reconstruct 2-lane section with shoulders	5	2024	**$11,229,205**
09-222	Blount Co	Carpenters Grade Rd Reconstruction	Raulston Rd to Mint Rd	2.3	Reconstruct 2-lane section with shoulders	4	2024	**$9,565,619**
09-227	Blount Co	Mentor Rd Reconstruction	Louisville Rd (SR 334) to Wrights Ferry Rd	3.2	Reconstruct 2-lane section with shoulders	4	2024	**$13,308,687**
09-244	Blount Co	Peppermint Rd Reconstruction	Wildwood Rd to Sevierville Rd (US 411 / SR 35)	1.1	Reconstruct 2-lane section with shoulders	5	2024	**$4,574,861**
09-236	Maryville	Brown School Rd Reconstruction	E Broadway Ave (SR 33) to Sevierville Rd (US 411 / SR 35)	1.5	Reconstruct 2-lane to 2- 12' lanes with curb and gutter, sidewalk, and auxiliary turn lanes where needed	5	2034	**$16,974,843**
KNOX COUNTY								
09-665	Knoxville / Knox Co	Murphy Rd Extension / New Road Construction	Washington Pk to Millertown Pk	1.3	Construct new 4-lane road	5	2024	**$12,936,349**
09-680	Knox Co	Northshore Dr Reconstruction	Concord Rd (SR 332) to Choto Rd	2.8	Reconstruct 2-lane section	3	2034	**$23,701,475**
09-670	Farragut	Snyder Rd Extension / New Road Construction	Western terminus of Snyder Rd to Everett Rd	2.5	Construct new 2-lane road	5	2040	**$47,633,186**
LOUDON COUNTY								
09-412	Lenoir City	Old Highway 95 Widening and Intersection Improvements	Harrison Rd north to US 321 (SR 73)	1.8	Reconstruct and widen 2-lane section and improve intersection with US 321	5	2034	**$21,704,647**

Non-Financially Constrained Project List

The Financially Constrained list in an earlier section of this chapter shows projects utilizing federal funding that are located within the TPO planning area. Projects listed in this section include those outside the TPO planning area. Projects outside the TPO planning area, but within the Knoxville Region's non-attainment area must be listed, but they are not required to be financially constrained by the TPO. TPO staff coordinated with The Tennessee Department of Transportation (TDOT) and the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) to collect projects in these areas. These projects are fiscally constrained within the LAMPTO Long Range Plan and TDOT's State Transportation Improvement Program (STIP).

Table 8-3: Non-Constrained Roadway Project List

RMP ID #	Jurisdiction	Project (Route)	Termini	Length (miles)	Type of Improvement	Horizon Year
Jefferson County Projects						
09-302	Jefferson City	E. Main St/N. Chucky Pk	Intersections at Old AJ Hwy	0.0	Realign Intersection	2024
09-303	Jefferson City	Municipal Dr	Intersection at Old AJ Hwy	0.0	Add left and right turn lanes	2024
09-304	Jefferson City	Old AJ Highway	Intersection at Chucky Pk	0.0	Add left and right turn lanes	2024
09-307	Jefferson City	Old AJ Highway	Mossy Creek E. of Branner Ave	0.0	Replace bridge	2024
09-309	Jefferson City	Old AJ Hwy and SR 92 w/Montcastle St	Intersection at Mountcastle St	0.0	Realign, Add turn lanes and Signalize Intersection	2014
09-314	Dandridge	SR 92	Bridge in Dandridge	0.6	Replace Bridge	2024
09-317	Jefferson City	US 11E (SR 34)	Intersection w/ George Ave	0.0	Intersection improvements	2014
09-318	Jefferson City	US 11E (SR 34)	Intersection w/ Russell Ave	0.0	Intersection improvements	2014
09-321	Jefferson City	US 11E (SR 34)	SR 92S to Hicks Rd	1.7	Install Pedestrian Signals and Pushbutton Activation	2024
09-323	Jefferson City	US 11E (SR 34)	Intersection at Pearl Ave and at Harrington St	0.0	Intersection improvement- add left turn lanes	2024
13-301	Jefferson Co	LAMTPO Area	All Classified Roadways	various	Road Resurfacing	ALL
13-302	Jefferson Co	LAMTPO Area	Various	various	Safety Projects	ALL
13-303	Jefferson City	US 11E at E. Old AJ Hwy	Intersection at E. Old AJ Hwy	0	Signalize Intersection	2024
13-304	Jefferson City	Overlook Ave Extension	Universal St to US 11E	0.1	Extension of Overlook Ave to US 11E	2024
13-305	Jefferson City	Jefferson City Pedestrian	Various	various	Pedestrian Improvements	2024
13-306	Jefferson Co	ITS w/Railroad Intersections	Various	0	ITS w/railroad intersections	2024
13-307	White Pine	SR 341	Intersection with SR 113	0	Signalize Intersection	2024
13-308	White Pine	Signal Pre-emption	Various	0	Emergency Vehicle Signal Pre-emption	2034
Roane County Projects						
13-R01	Roane Co / Morgan Co	US 27 (SR 29)	SR 61 (Harriman) to north of SR 328	4.4		2014
13-R02	Roane Co	I-40	Truck Climbing Lane MP 341 (WBL)	1.2		2014
13-R03	Roane Co	US 70 (SR 1)	Kingston Ave to SR 382	2.1		2024
13-R04	Roane Co	US 70 (SR 1)	From SR 382 to Midtown	3.5		2024
13-R05	Roane Co	US 70 (SR 1)	SR 61 in Rockwood to Kingston Ave	1.1		2014
13-R06	Roane Co	SR 95	SR 58 to near Westover Dr	2.8		2014
Sevier County Projects						
09-502	Sevierville	Dolly Parton Pkwy (US 411 / SR 35)	Intersection w/ Veterans Blvd (SR 449)	0.0	Improve Intersection	2024
09-503	Sevierville	Old Knoxville Highway	Boyds Creek Hwy (SR 338) to US 411/441 (SR 71)	4.2	Widen 2-lane to various 3 and 4 lane divided cross sections	2024
09-504	Sevierville	Veterans Blvd (SR 449) Extension	US 411 (SR 35) to SR 66	3.5	Construct new 4-lane road	2024

RMP ID #	Jurisdiction	Project (Route)	Termini	Length (miles)	Type of Improvement	Horizon Year
09-508	Sevier Co/ Seymour	Chapman Hwy (SR 71) (US 441)	Boyds Creek Hwy (SR 338) to Macon Ln	1.2	Add center turn lane	2024
09-509	Pigeon Forge	Thomas Road Connector	Teaster Lane to Veterans Blvd (SR 449) at McCarter Hollow Rd	1.6	Construct new 4-lane road	2024
09-510	Sevier Co	US 411 (SR 35)	Sims Rd to Grapevine Hollow Rd	6.2	Widen 2-lane to 4-lane	2024
09-511	Sevier Co	Foothills Parkway	Blount County Line to US 321 (SR 73) in Wears Valley	2.5	Construct new 2-lane road	2024
09-512	Sevierville	I-40/ SR 66 Interchange	Interchange at SR 66	0.3	Modify Interchange to a Diverging Diamond	2024
09-513	Sevier Co	US 321 (SR 73)	Buckhorn Rd (SR 454) to east of Pittman Center Rd (SR 416)	1.4	Widen 2-lane to 4-lane	2024
09-515	Sevierville/ TDOT	SR 139	SR 66 to Bryan Rd	0.2	Widen 2-lane to 4-lane	2024
09-516	Sevierville/ Sevier Co	Bryan Road	E. Dumplin Valley Rd. to SR 139	2.1	Widen 2-lanes to 4-lanes	2024
09-517	Sevierville/ Sevier Co	I-40 (mile 408)	New Interchange Proposed near Mile Marker 408	N/A	Construct new interchange	2024
13-501	Sevierville	Dumplin Creek Pkwy	SR 66 to Bryan Rd	1.5	Construct new 4-lane road	2015
Union County Projects						
13-R07	Union Co	SR 33	Knox Co Line to south of SR 144 left	5.2		2024
13-R08	Union Co	SR 33	South of SR 144 left to SR 61 in Maynardville	4.6		2014

Exhibit 8-5

Roadway Projects - Jefferson County

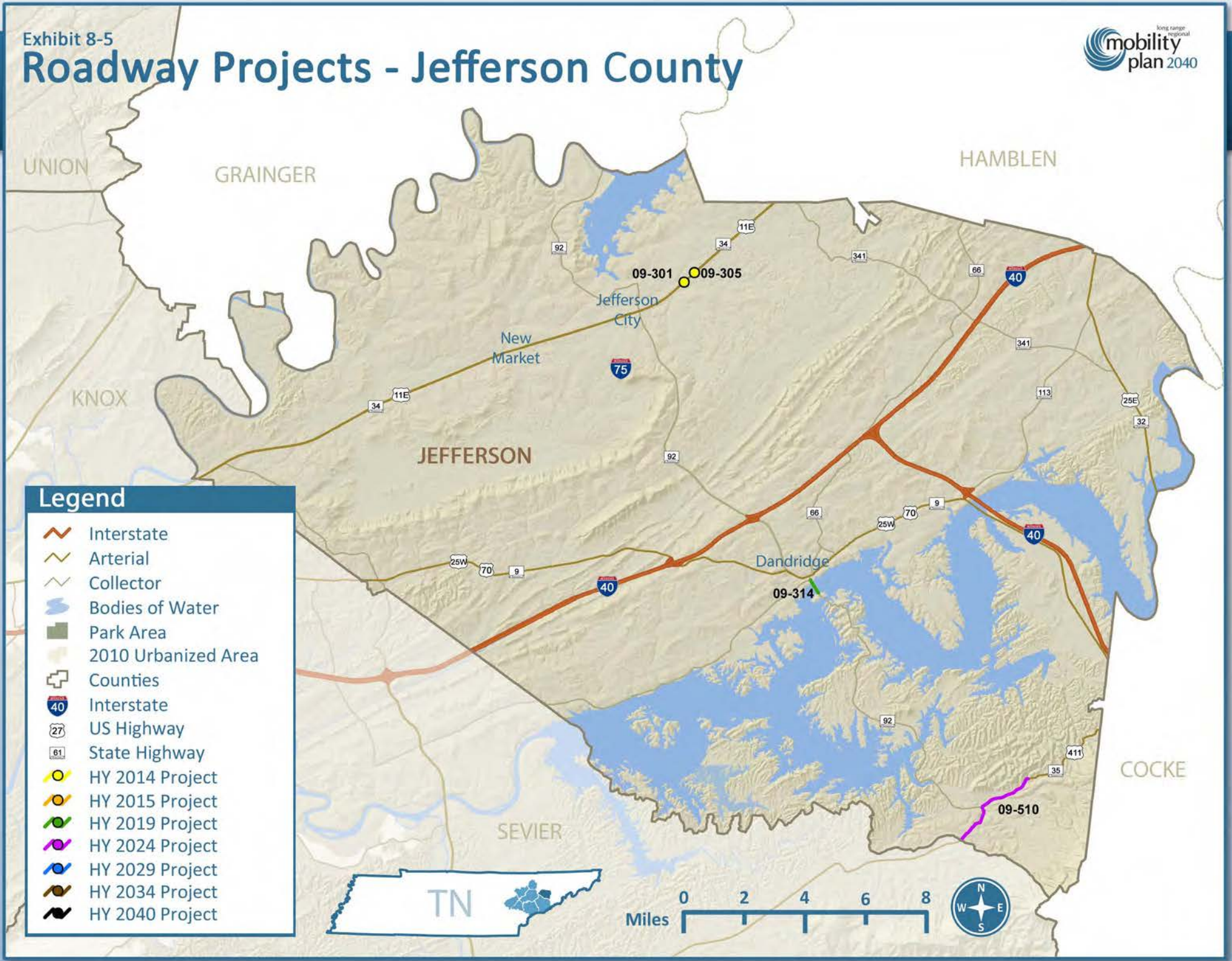


Exhibit 8-6

Roadway Projects - Roane County

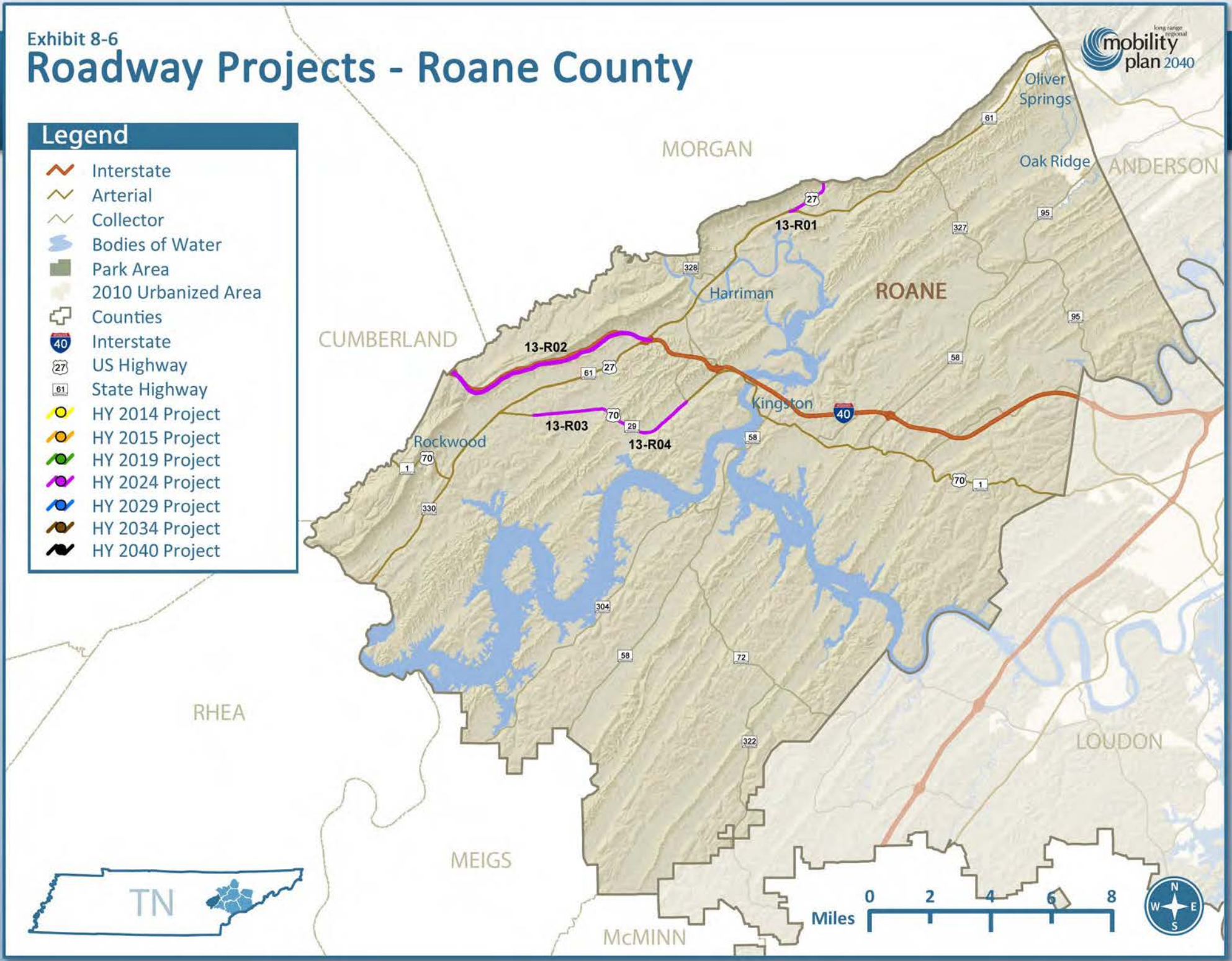


Exhibit 8-7

Roadway Projects - Sevier County

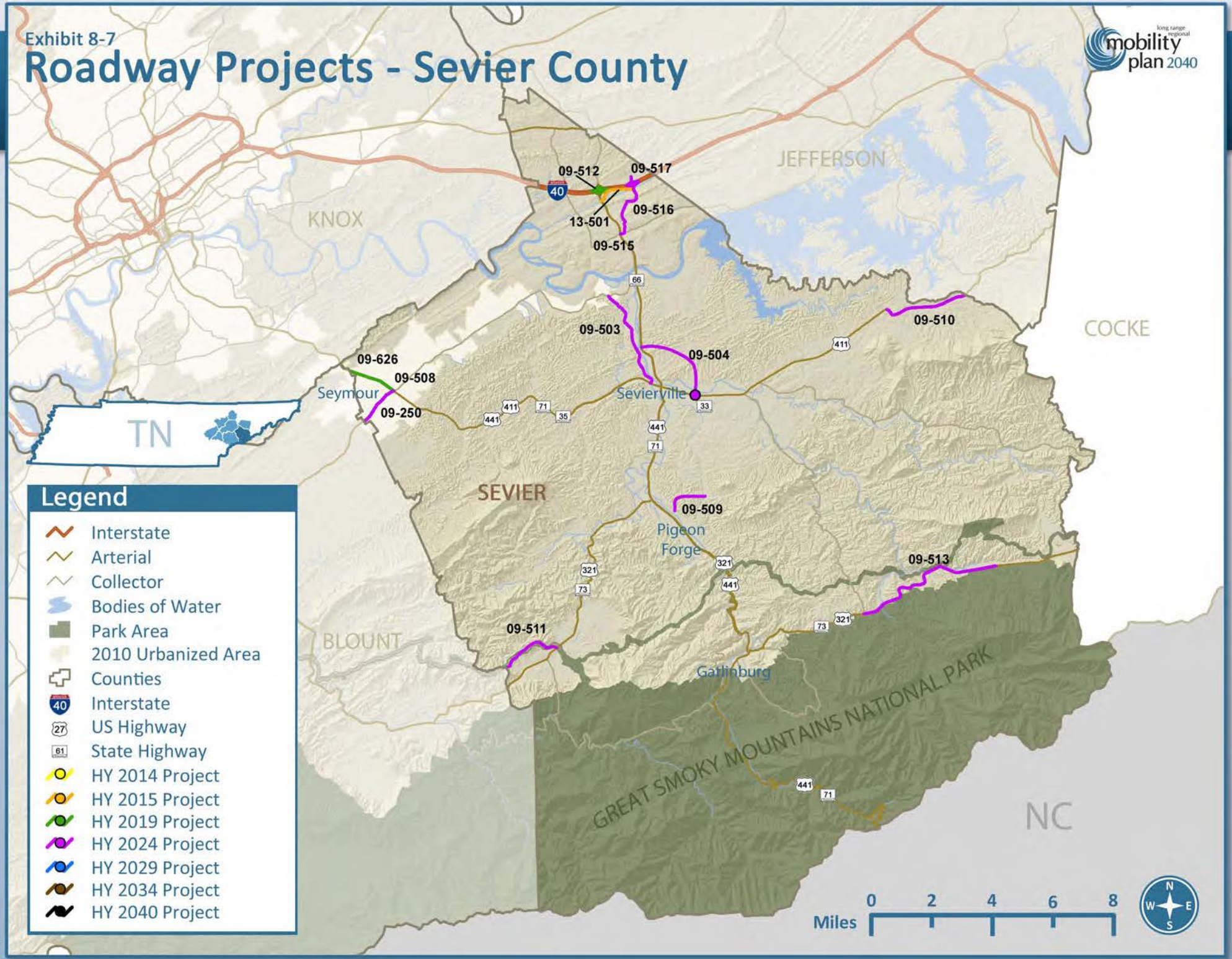
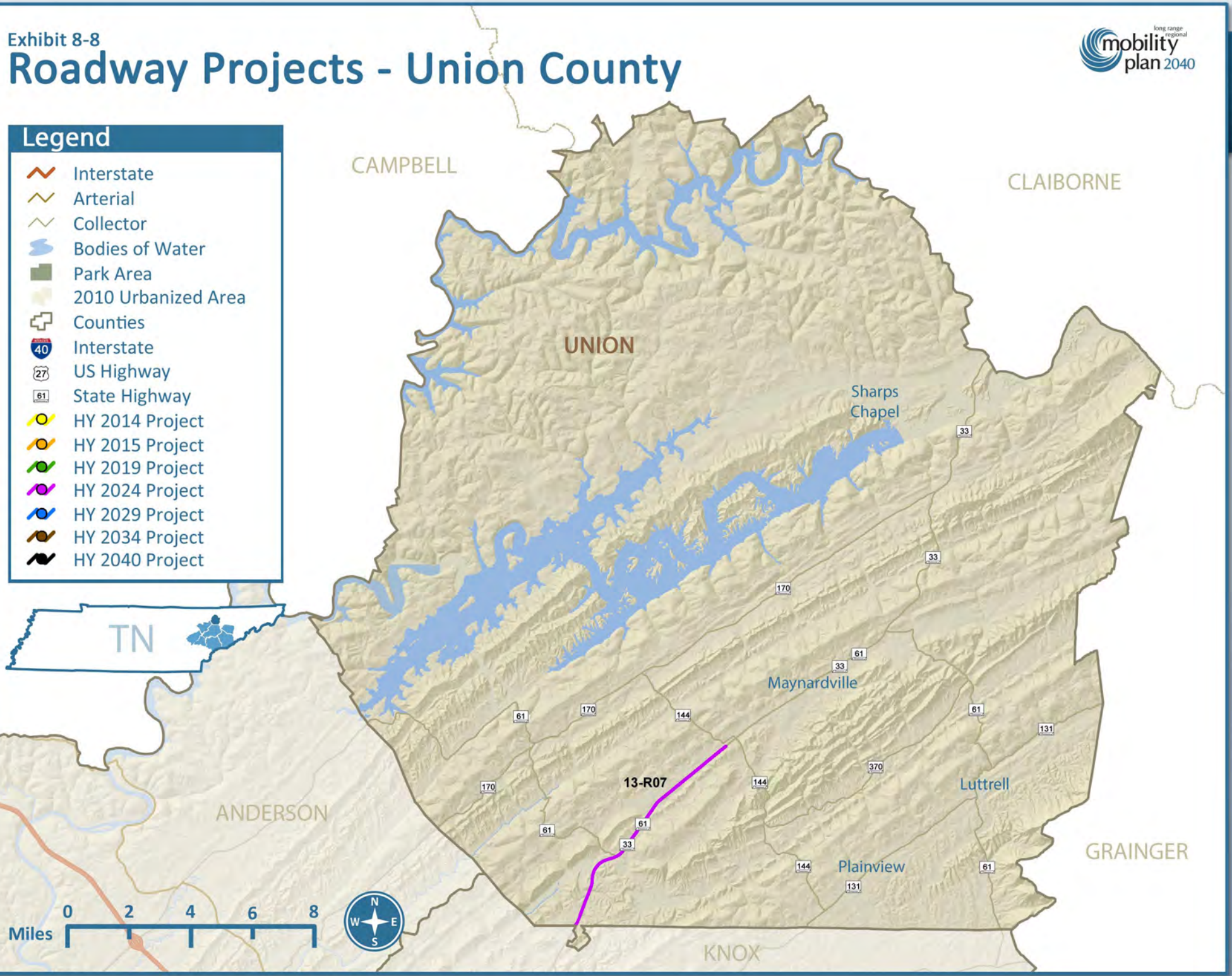


Exhibit 8-8

Roadway Projects - Union County



Public Transportation Projects

Transit projects were determined by TPO staff soliciting project applications and working in consultation with the local transit agencies. Two lists are presented. The Financially Constrained list shows projects or services utilizing federal funding that are located within the TPO planning area. The Other Projects list shows projects that are located outside the TPO planning area or are not utilizing federal funds. Projects outside the TPO planning area, but within the Knoxville Region's non-attainment area must be listed, but they are not required to be financially constrained by the TPO. TPO staff coordinated with The Tennessee Department of Transportation (TDOT) and the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) to collect projects in these areas. These projects are fiscally constrained within the LAMPTO Long Range Plan and TDOT's State Transportation Improvement Program (STIP). Projects are broken down into seven completion horizon years to coincide with five air quality conformity determination years (2014, 2015, 2024, 2034, and 2040) and two additional years to subdivide ten-year periods into more manageable periods (2019 and 2029).

TPO staff worked with each transit agency to prepare a vehicle replacement list based on the Federal Transit Administration (FTA) life expectancy of a bus, trolley, or van. A trend-line analysis of the Knoxville Region's last five years of purchases was used to determine an annual inflation rate for vehicles (2.1 percent for buses and trolleys and 1.0 percent for vans and sedans). In most cases, vehicles are purchased under a bid for a specific vehicle design and/or features. Therefore, the base cost of vehicles can vary greatly depending on each agency's preferences or needs.

To determine fiscal constraint, costs were compared to projected grant funding. Some FTA grants are awarded annually, while other grants are awarded on a competitive basis. An examination of the area agencies' past success in obtaining grant funding was undertaken. And, based on projected funding and the past success in obtaining grants, it was determined the list is financially constrained. However, because a new transportation act (MAP-21) went into effect on October 1, 2012, and the intricacies of obtaining grant funding is unknown at this time, the success in obtaining capital funding will need to be carefully monitored.

Table 8-4: Constrained Public Transportation Projects

RMP#	Project Name	Jurisdiction	Project Description	Horizon Year	Unit Price	# of Units	Horizon Year Cost	Funding Source
KAT								
13-852a	Buses	Knoxville	Purchase of Fixed Route Buses for Fleet Replacement or Expansion	2014	$382,875	10	$3,828,750	FTA
13-852b	Buses	Knoxville		2015	$390,915	5	$1,954,577	FTA
13-852c	Buses	Knoxville		2019	$423,752	20	$8,475,045	FTA
13-852d	Buses	Knoxville		2024	$468,246	25	$11,706,156	FTA
13-852e	Buses	Knoxville		2029	$517,412	25	$12,935,303	FTA
13-852f	Buses	Knoxville		2034	$571,740	25	$14,293,510	FTA
13-852g	Buses	Knoxville		2040	$643,780	30	$19,313,390	FTA
				Total		**140**	**$72,506,731**	

RMP#	Project Name	Jurisdiction	Project Description	Horizon Year	Unit Price	# of Units	Horizon Year Cost	Funding Source
13-855a	Trolleys	Knoxville	Purchase of Fixed Route Trolley Buses for Fleet Replacement or Expansion	2014	$459,450	3	$1,378,350	FTA
13-855b	Trolleys	Knoxville		2015	$469,098	0	$0	FTA
13-855c	Trolleys	Knoxville		2019	$508,503	0	$0	FTA
13-855d	Trolleys	Knoxville		2024	$561,896	7	$3,933,269	FTA
13-855e	Trolleys	Knoxville		2029	$620,895	3	$1,862,684	FTA
13-855f	Trolleys	Knoxville		2034	$686,088	4	$2,744,354	FTA
13-855g	Trolleys	Knoxville		2040	$772,536	6	$4,635,214	FTA
				Total		**23**	**$14,553,870**	
13-854a	ADA Vans/ Neighborhood Vans	Knoxville	Purchase of ADA/ Neighborhood Service Vehicles for Fleet Replacement or Expansion	2014	$70,700	10	$707,000	FTA
13-854b	ADA Vans/ Neighborhood Vans	Knoxville		2015	$71,407	5	$357,035	FTA
13-854c	ADA Vans/ Neighborhood Vans	Knoxville		2019	$74,263	20	$1,485,266	FTA
13-854d	ADA Vans/ Neighborhood Vans	Knoxville		2024	$77,976	25	$1,949,411	FTA
13-854e	ADA Vans/ Neighborhood Vans	Knoxville		2029	$81,875	25	$2,046,882	FTA
13-854f	ADA Vans/ Neighborhood Vans	Knoxville		2034	$85,969	25	$2,149,226	FTA
13-854g	ADA Vans/ Neighborhood Vans	Knoxville		2040	$91,127	30	$2,733,815	FTA
				Total		**140**	**$11,428,634**	
13-860a	Section 5307 Formula Transit Funds	Knoxville	Annual Formula FTA funding for planning, operations, maintenance, fleet, facilities, ITS, and other improvements	2014	$5,528,609	2 years	$11,057,218	FTA
13-860b	Section 5307 Formula Transit Funds	Knoxville		2015	$5,694,467	1 Year	$5,694,467	FTA
13-860c	Section 5307 Formula Transit Funds	Knoxville		2019	$6,377,803	4 Years	$25,511,213	FTA
13-860d	Section 5307 Formula Transit Funds	Knoxville		2024	$7,334,474	5 Years	$36,672,369	FTA
13-860e	Section 5307 Formula Transit Funds	Knoxville		2029	$8,434,645	5 Years	$42,173,225	FTA
13-860f	Section 5307 Formula Transit Funds	Knoxville		2034	$9,699,842	5 Years	$48,499,208	FTA
13-860g	Section 5307 Formula Transit Funds	Knoxville		2040	$11,445,813	6 Years	$68,674,879	FTA
				Total			**$238,282,580**	
Knox Co CAC Transit								
13-861a	Vans	Knox Co	Replacement Vehicles For Knox County CAC Transit	2014	$70,700	16	$1,131,200	FTA
13-861b	Vans	Knox Co		2015	$71,407	8	$571,256	FTA
13-861c	Vans	Knox Co		2019	$74,263	24	$1,782,319	FTA
13-861d	Vans	Knox Co		2024	$77,976	30	$2,339,293	FTA
13-861e	Vans	Knox Co		2029	$81,875	30	$2,456,258	FTA
13-861f	Vans	Knox Co		2034	$85,969	30	$2,579,071	FTA
13-861g	Vans	Knox Co		2040	$91,127	48	$4,374,104	FTA
				Total		**186**	**$15,233,501**	
13-862a	Minivans	Knox Co	Purchase of Wheelchair Accessible Minivans for Volunteer Assisted Transportation Program	2014	$35,735	2	$71,470	FTA
13-862b	Minivans	Knox Co		2015	$36,485	1	$36,485	FTA
13-862c	Minivans	Knox Co		2019	$39,550	4	$158,201	FTA
13-862d	Minivans	Knox Co		2024	$43,703	5	$218,515	FTA

RMP#	Project Name	Jurisdiction	Project Description	Horizon Year	Unit Price	# of Units	Horizon Year Cost	Funding Source
13-862e	Minivans	Knox Co		2029	$48,292	5	$241,459	FTA
13-862f	Minivans	Knox Co		2034	$53,362	5	$266,812	FTA
13-862g	Minivans	Knox Co		2040	$60,086	6	$360,517	FTA
				Total		**28**	**$1,353,459**	
13-863a	Hybrid Sedans	Knox Co	Purchase of hybrid sedans for Volunteer Assisted Transportation Program	2014	$25,525	4	$102,100	FTA
13-863b	Hybrid Sedans	Knox Co		2015	$26,061	2	$52,122	FTA
13-863c	Hybrid Sedans	Knox Co		2019	$28,250	8	$226,001	FTA
13-863d	Hybrid Sedans	Knox Co		2024	$31,216	10	$312,164	FTA
13-863e	Hybrid Sedans	Knox Co		2029	$34,494	10	$344,941	FTA
13-863f	Hybrid Sedans	Knox Co		2034	$38,116	10	$381,160	FTA
13-863g	Hybrid Sedans	Knox Co		2040	$42,919	12	$515,024	FTA
				Total		**56**	**$1,933,513**	
ETHRA								
13-850a	Vans	TPO Urban Area	Replacement and Expansion Vans for service In Urban Area (Note: ETHRA provides service in 16 Counties. Rural funding and projects are not included in this project list).	2014	$70,700	12	$848,400	FTA
13-850b	Vans	TPO Urban Area		2015	$71,407	6	$428,442	FTA
13-850c	Vans	TPO Urban Area		2019	$74,263	24	$1,782,319	FTA
13-850d	Vans	TPO Urban Area		2024	$77,976	30	$2,339,293	FTA
13-850e	Vans	TPO Urban Area		2029	$81,875	30	$2,456,258	FTA
13-850f	Vans	TPO Urban Area		2034	$85,969	30	$2,579,071	FTA
13-850g	Vans	TPO Urban Area		2040	$91,127	36	$3,280,578	FTA
				Total		**168**	**$13,714,361**	
City of Oak Ridge								
13-864a	Vans	Oak Ridge	Replacement Vans	2014	$70,700	2	$141,400	FTA
13-864b	Vans	Oak Ridge		2015	$71,407	1	$71,407	FTA
13-864c	Vans	Oak Ridge		2019	$74,263	2	$148,527	FTA
13-864d	Vans	Oak Ridge		2024	$77,976	3	$233,929	FTA
13-864e	Vans	Oak Ridge		2029	$81,875	3	$245,626	FTA
13-864f	Vans	Oak Ridge		2034	$85,969	3	$257,907	FTA
13-864g	Vans	Oak Ridge		2040	$91,127	4	$364,509	FTA
				Total		**18**	**$1,463,304**	
Alcoa								
13-872	Alcoa Multimodal Transportation Facility	Alcoa	Multimodal transportation facility located on or near the Old South Plant site	2040			$20,000,000	FTA/Other

RMP#	Project Name	Jurisdiction	Project Description	Horizon Year	Unit Price	# of Units	Horizon Year Cost	Funding Source
Urban Area								
13-860h	Section 5307 Formula Transit Funds	Urban Area	FTA funding for planning, operations, maintenance, fleet, facilities, ITS, and other improvements	2040			TBD	FTA
13-867	Job Access & Reverse Commute Projects	Urban Area	Section 5316 JARC funding from SAFETEA-LU (FY 2012)	2014			$300,000	FTA
13-868	New Freedom Projects	Urban Area	Section 5317 New Freedom funding from SAFETEA-LU (FY 2012)	2014			$200,000	FTA
13-869a	Elderly & Disabled Projects	Urban Area	Section 5310 Elderly & Disabled funding. Eligible projects, include but not limited to New Freedom projects and vehicles for non-profits	2014	$429,257	2 years	$858,514	FTA
13-869b	Elderly & Disabled Projects	Urban Area		2015	$442,135	1 Year	$442,135	FTA
13-869c	Elderly & Disabled Projects	Urban Area		2019	$480,768	4 Years	$1,923,071	FTA
13-869d	Elderly & Disabled Projects	Urban Area		2024	$552,883	5 Years	$2,764,415	FTA
13-869e	Elderly & Disabled Projects	Urban Area		2029	$552,883	5 Years	$2,764,415	FTA
13-869f	Elderly & Disabled Projects	Urban Area		2034	$635,815	5 Years	$3,179,077	FTA
13-869g	Elderly & Disabled Projects	Urban Area		2040	$750,262	6 Years	$4,501,574	FTA
				Total			**$16,433,201**	
13-871a	Formula Transit Funds	Urban Area	Section 5339 Annual Formula funding for capital items to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities	2014	$594,889	2 years	$1,189,778	FTA
13-871b	Formula Transit Funds	Urban Area		2015	$612,736	1 Year	$612,736	FTA
13-871c	Formula Transit Funds	Urban Area		2019	$686,264	4 Years	$2,745,056	FTA
13-871d	Formula Transit Funds	Urban Area		2024	$789,204	5 Years	$3,946,018	FTA
13-871e	Formula Transit Funds	Urban Area		2029	$907,584	5 Years	$4,537,920	FTA
13-871f	Formula Transit Funds	Urban Area		2034	$1,043,722	5 Years	$5,218,608	FTA
13-871g	Formula Transit Funds	Urban Area		2040	$1,231,592	6 Years	$7,389,550	FTA
				Total			**$25,639,666**	

Table 8-5: Non-Constrained Public Transportation Projects

RMP#	Project Name	Jurisdiction	Project Description	Horizon Year	Unit Price	# of Units	Horizon Year Cost	Funding Source
Gatlinburg								
13-874	Storage Shelter	Gatlinburg	Build a New Storage Area for Trolley Fleet	2014			$2,000,000	FTA
13-851a	Trolleys	Gatlinburg	Replacement Trolleys	2014	$197,980	4	$791,920	FTA
13-851b	Trolleys	Gatlinburg		2015	$202,138	2	$404,275	FTA
13-851c	Trolleys	Gatlinburg		2019	$219,117	8	$1,752,937	FTA
13-851d	Trolleys	Gatlinburg		2024	$242,124	10	$2,421,244	FTA
13-851e	Trolleys	Gatlinburg		2029	$267,548	10	$2,675,475	FTA
13-851f	Trolleys	Gatlinburg		2034	$295,640	10	$2,956,400	FTA

RMP#	Project Name	Jurisdiction	Project Description	Horizon Year	Unit Price	# of Units	Horizon Year Cost	Funding Source
13-851g	Trolleys	Gatlinburg		2040	$332,891	12	$3,994,688	FTA
				Total		**56**	**$14,996,939**	
Pigeon Forge								
13-873	Pigeon Forge Transit Center	Pigeon Forge	Build a New Transit Center/ Administrative Building	2014			$7,200,000	FTA
13-865a	Trolleys	Pigeon Forge	Replacement Trolleys	2014	$224,030	6	$1,344,180	FTA
13-865b	Trolleys	Pigeon Forge		2015	$228,735	3	$686,204	FTA
13-865c	Trolleys	Pigeon Forge		2019	$247,948	12	$2,975,380	FTA
13-865d	Trolleys	Pigeon Forge		2024	$273,983	15	$4,109,744	FTA
13-865e	Trolleys	Pigeon Forge		2029	$302,751	15	$4,541,267	FTA
13-865f	Trolleys	Pigeon Forge		2034	$334,540	15	$5,018,100	FTA
13-865g	Trolleys	Pigeon Forge		2040	$376,692	18	$6,780,456	FTA
				Total		**84**	**$25,455,331**	
Sevierville								
13-866a	Trolleys	Sevierville	Replacement Trolleys	2014	$224,030	4	$896,120	FTA
13-866b	Trolleys	Sevierville		2015	$228,735	2	$457,469	FTA
13-866c	Trolleys	Sevierville		2019	$247,948	8	$1,983,587	FTA
13-866d	Trolleys	Sevierville		2024	$273,983	10	$2,739,829	FTA
13-866e	Trolleys	Sevierville		2029	$302,751	10	$3,027,511	FTA
13-866f	Trolleys	Sevierville		2034	$334,540	10	$3,345,400	FTA
13-866g	Trolleys	Sevierville		2040	$376,692	12	$4,520,304	FTA
				Total		**56**	**$16,970,221**	
Tennessee Vans								
13-870a	Tennessee Vans	Tennessee Vans	Vans for Commuter Program	2014	$25,500	20	$510,000	FTA/Other
13-870b	Tennessee Vans	Tennessee Vans		2015	$25,755	10	$257,550	FTA/Other
13-870c	Tennessee Vans	Tennessee Vans		2019	$26,785	40	$1,071,408	FTA/Other
13-870d	Tennessee Vans	Tennessee Vans		2024	$28,124	50	$1,406,223	FTA/Other
13-870e	Tennessee Vans	Tennessee Vans		2029	$29,531	50	$1,476,534	FTA/Other
13-870f	Tennessee Vans	Tennessee Vans		2034	$31,007	50	$1,550,361	FTA/Other
13-870g	Tennessee Vans	Tennessee Vans		2040	$32,868	60	$1,972,059	FTA/Other
				Total		**280**	**$8,244,135**	

Process of Prioritizing Greenways and Sidewalks

Most sidewalks and greenways in the Knoxville Region are constructed in one of two ways: some are built by local governments or TDOT using public funds and others are constructed as part of private-sector development projects. Plans and/or policies requiring sidewalk or greenway construction as part of development are often helpful in increasing the amount the private sector contributes to pedestrian infrastructure. Plans also help local governments prioritize public investment in sidewalks and greenways.

In the absence of a full-fledged sidewalk or greenway plan, local governments can still systematically prioritize their construction of those facilities. This can be done using GIS or another mapping software or, more simply, by drawing circles on a map.

The first step in identifying sidewalk or greenway priorities is mapping the existing network to identify missing links. Again, this can be accomplished with GIS or by drawing lines on a paper map. The paper map requires less upfront effort and cost, but a GIS map is easier to keep up to date and can contain much more data.

Once missing links are identified, the next step is to determine the factors that will go into prioritizing new construction. Prioritization factors should be determined in consultation with relevant stakeholders within and outside of local government. Some prioritization factors to consider are:

- Location and density of residential development
- Location and density of commercial development
- Location and density of employment
- Schools
- Transit corridors
- Parks and other greenways
- Libraries and other civic buildings
- Hospitals and major medical offices
- Public and senior housing
- The average daily traffic (ADT) and classification of a given road
- Evidence of pedestrian demand, such as paths worn in the grass
- Whether right-of-way is available for a sidewalk or greenway

- Length of sidewalk or greenway segment needed to fill in a gap

These factors and others can be mapped in GIS or by drawing them on a map, with a circle of reasonable walking distance (one-quarter or one-half mile) around origins and destinations. The missing sidewalk and greenway links within locations where the most circles overlap would be the highest priorities. Greater weight can be given to some factors over others, or based on the relative density of development. In smaller cities and towns, the missing links could simply be listed, with points assigned based on the various relevant factors. The projects with the most points would be the highest-priority projects.

Projects in the Mobility Plan

Funding for active transportation projects such as greenways and sidewalks will primarily be funded from the Federal TA (Transportation Alternatives) program. The TPO anticipates receiving approximately $725,000 in TA funds in FY 2013.

Non-roadway projects do not add capacity to the regional roadway network and therefore do not impact the area's air quality. Because of that, they do not undergo air quality conformity analysis. Many of the projects in the active transportation project list came from earlier planning processes such as the 2009 Regional Mobility Plan; the Regional Transportation Alternatives Plan; Nine Counties, One Vision, Plan East Tennessee, and the Knoxville-Knox County Comprehensive Parks, Recreation, and Greenways Plan. Other projects were generated by public interest and demand.

Exhibit 8-9

Active Transportation Projects - Knox County

long range regional mobility plan 2040

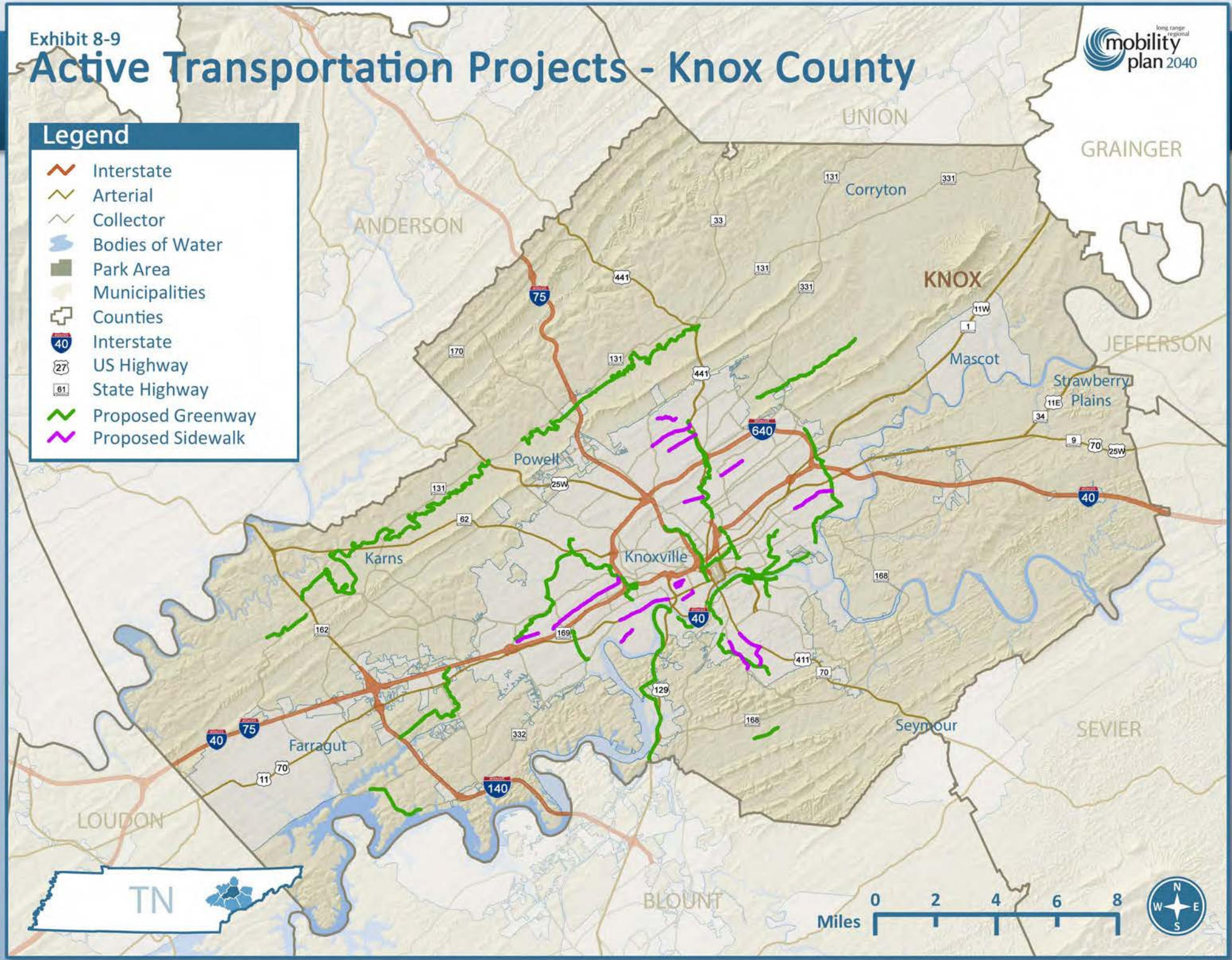


Table 8-6: Active Transportation Project List

RMP#	Project Type	Jurisdiction	Project Name	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
Horizon Year 2013 – 2014												
13-834	Greenways	Farragut	Kingston Pk Greenway/Sidewalk Improvements		Construct greenway and sidewalk along the southern side of Kingston Pk between Old Stage Rd and Virtue Rd	1	2014	$1,127,672	L-STP	80%	0%	20%
13-837	Greenways	Knoxville	Knox/Blount Greenway - Phase 1		Construct greenway trail from Buck Karnes Bridge to Marine Park	3	2014	$2,972,953	L-STP	80%	0%	20%
13-838	Greenways	Knoxville	First Creek Greenway - Caswell Park to Glenwood Ave		Construct greenway trail from Caswell Park and Greenway to First Creek Park and Greenway	1	2014	$205,031	Local	0%	0%	100%
13-839	Greenways	Knoxville	First Creek Greenway - Fulton HS to Edgewood Park		Construct greenway trail from Fulton High School to Edgewood Park	1	2014	$941,093	L-STP	80%	0%	20%
13-840	Greenways	Knoxville	Loves Creek Greenway - Phase 1		Construct greenway trail from Spring Place Park to Knoxville Center Mall/ Millertown Pk; multiple phases	1	2014	$820,125	Local	0%	0%	100%
13-862	Greenways	Knox Co	Stock Creek Greenway		Construct greenway from South Doyle High School to Howard Pinkston Library Branch	3	2014	$433,971	Local	0%	0%	100%
13-880	Sidewalks	Knoxville	Atlantic Ave Sidewalks	0.6	Construct 3,000 linear feet of sidewalks on Atlantic Ave between Pershing St and Broadway	1	2014	$1,076,414	TA	80%	0%	20%
13-894	Sidewalks	Knoxville	Fort Sanders Sidewalks	1.1	Construct sidewalk on Grand Av between 19th St and 23rd St; on Forest Av between 21st St and 23rd St; and on 21st, 22nd and 23rd St between Grand Av and Highland Av	1	2014	$1,260,942	CMAQ	80%	0%	20%
Total for Horizon Year 2013 – 2014:								**$8,838,202**				
Horizon Year 2015												
13-841	Greenways	Knoxville	Downtown Greenway Connection - Phase 1		Connect Second Creek Greenway trail from World's Fair Park to the Old City with connection to Jackson Ave	1	2015	$1,556,956	TA	80%	0%	20%
13-842	Greenways	Knoxville	Downtown Greenway Connection - Phase 2		Extend Downtown Greenway trail from the Old City to First Creek Greenway trail	1	2015	$518,985	Local	0%	0%	100%
13-843	Greenways	Knoxville	James White Greenway - Extension		Construction greenway trail connections from James White/ Neyland/ Morningside Greenways, to Will Skelton Greenway & Island Home Park, via James White Pkwy White Bridge	1	2015	$1,037,971	L-STP	80%	0%	20%
13-863	Greenways	Knox Co	Knox/Blount Greenway - Phase 2		Construct greenway from Marine Park to Knox/Blount county line	3	2015	$7,523,718	L-STP	80%	0%	20%
13-881	Sidewalks	Knoxville	Cedar Ln Sidewalks	1.5	Construct 8,000 linear feet of sidewalks on Cedar Ln between Inskip Rd and Broadway [needs clarification]	1	2015	$2,906,318	L-STP	80%	0%	20%
Total for Horizon Year 2015:								**$13,543,948**				

RMP#	Project Type	Jurisdiction	Project Name	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
Horizon Year 2016 – 2019												
13-830	Greenways	Oak Ridge	Oak Ridge Rails to Trails		Construct greenway trail along old rail line from intersection of Elza Gate at Oak Ridge Tpk, runs parallel to Fairbanks Ave, and ends at the Department of Energy (DOE) Y-12 National Security Complex	1	2019	$1,316,802	L-STP	80%	0%	20%
13-831	Greenways	Alcoa	Alcoa High School Greenway Extension		Construct 10 foot asphalt mixed trail along old ALCOA railroad bed	1	2019	$692,002	L-STP	80%	0%	20%
13-832	Greenways	Alcoa	N. Wright Rd Greenway Extension		Construct greenway generally paralleling N Wright Rd	1	2019	$317,749	L-STP	80%	0%	20%
13-833	Greenways	Maryville	Maryville Citywide Greenways		Construction of new trails, extension of existing trails, and/or improvements to existing trails within the Maryville/ Alcoa Greenway Trail System.	3	2019	$212,816	L-STP	80%	0%	20%
13-844	Greenways	Knoxville	First Creek Greenway - Morningside to Caswell		Construct greenway trail from Morningside Park and Greenway to Caswell Park	1	2019	$1,276,899	TA	80%	0%	20%
13-845	Greenways	Knoxville	First Creek Greenway - Old Broadway Section		Construct greenway trail within the Old Broadway corridor	1	2019	$1,808,940	STP	80%	20%	0%
13-846	Greenways	Knoxville	Fourth Creek Greenway - Phase 1		Construct greenway trail from Weisgarber Greenway and Papermill Bluff Greenway to Bearden Greenway, and Lakeshore Park and Greenway	1	2019	$2,660,205	L-STP	80%	0%	20%
13-847	Greenways	Knoxville	Fourth Creek Greenway - Phase 2		Construct greenway trail from Weisgarber Greenway to Jean Teague Greenway	1	2019	$1,276,899	Local	0%	0%	100%
13-848	Greenways	Knoxville	Goose Creek Greenway		Construct greenway trail from Mary Vestal Park to Fort Dickerson Park and the south waterfront	1	2019	$2,128,164	L-STP	80%	0%	20%
13-849	Greenways	Knoxville	Second Creek Greenway - North Extension		Construct greenway trail from World's Fair Park to Baxter Ave (first phase) & Sysco property (second phase)	1	2019	$3,192,246	L-STP	80%	0%	20%
13-850	Greenways	Knoxville	South Waterfront Greenway - Phase 1		Construct greenway trail from Island Home Park to Scottish Pike Park, River Bluff, and Suttree Park	1	2019	$2,128,164	HPP	80%	0%	20%
13-864	Greenways	Knox Co	Northshore Dr Greenway		Construct Greenway along Northshore through Concord Park and Carl Cowan Park	1	2019	$261,551	TA	80%	0%	20%
13-882	Sidewalks	Knoxville	Sheffield Dr Sidewalks	0.8	Construct 4,300 linear feet of sidewalks on Sheffield Dr between Wesley Rd and existing sidewalks near Portsmouth Rd	1	2019	$1,372,666	TA	80%	0%	20%
13-883	Sidewalks	Knoxville	Kingston Pk Sidewalks	1.8	Construct 9,500 linear feet of sidewalks on Kingston Pk between Neyland Dr and Towanda Tr	1	2019	$3,032,634	L-STP	80%	0%	20%
Total for Horizon Year 2016 – 2019:								**$21,677,738**				
Horizon Year 2020 – 2024												
13-835	Greenways	Knoxville / Knox Co	Ten Mile Creek Greenway, Phase 3		Construct greenway trail from I-40/75 to West Valley Middle School	3	2024	$1,523,895	L-STP	80%	0%	20%
13-851	Greenways	Knoxville	West Knoxville Greenway		Construct greenway trail from Weisgarber Greenway to Victor Ashe Park and Greenway	1	2024	$2,793,808	TA	80%	0%	20%
13-852	Greenways	Knoxville	Tennessee River Pedestrian Bridge and Path		Connect the south waterfront to University of Tennessee & the north waterfront trails	1	2024	$19,048,694	L-STP	80%	0%	20%

RMP#	Project Type	Jurisdiction	Project Name	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
13-853	Greenways	Knoxville	Williams Creek Greenway		Construct greenway trail from the Knoxville Botanical Gardens, to Williams Creek Golf Course, and to north waterfront trails, and to First Creek Greenway; multiple phases	1	2024	$7,619,477	L-STP	80%	0%	20%
13-854	Greenways	Knoxville	Baker Creek Greenway		Construct greenway trail from Mary James Park to the south waterfront	1	2024	$634,956	Local	0%	0%	100%
13-855	Greenways	Knoxville	First Creek Greenway - North Sections		Construct greenway trail from First Creek Park and Greenway to Fulton High School, and from Edgewood Park to Old Broadway corridor, and farther to Fountain City Park	1	2024	$5,333,634	L-STP	80%	0%	20%
13-856	Greenways	Knoxville	Old Smoky Mountain Railroad Greenway		Construct greenway trail from Mary Vestal Park to Charter E. Doyle Park and Gary Underwood Park	1	2024	$4,444,695	L-STP	80%	0%	20%
13-857	Greenways	Knoxville	Tennessee/Holston River Greenway - Phase 1		Construct greenway trail from James White Greenway to Holston River Park	3	2024	$6,349,565	L-STP	80%	0%	20%
13-858	Greenways	Knoxville	Third Creek Greenway - North Extension		Construct greenway trail from Sutherland Ave./ Third Creek Greenway to Victor Ashe Park	1	2024	$6,349,565	L-STP	80%	0%	20%
13-859	Greenways	Knoxville	South Waterfront Greenway - Phase 2		Construct greenway trail from Scottish Pike Park to UT Hospital	1	2024	$1,904,869	TA	80%	0%	20%
13-865	Greenways	Knox Co	Beaver Creek Greenway, Phase 1		Construct greenway linking Halls Community Park to schools, Powell Greenway to Powell Library, and Northwest Sports Park to Westbridge Business Park	1	2024	$5,140,814	L-STP	80%	0%	20%
13-866	Greenways	Knox Co	Ten Mile Creek Greenway, Phase 2		Construct greenway from West Valley Middle School to Pellissippi Parkway	3	2024	$1,004,260	TA	80%	0%	20%
13-884	Sidewalks	Knoxville	Chapman Hwy Sidewalks	0.9	Construct 4,600 linear feet of sidewalks on Chapman Hwy between Young High Pike and Stone Road	1	2024	$2,044,560	L-STP	80%	0%	20%
13-885	Sidewalks	Knoxville	Lonas Dr Sidewalks	2.8	Construct 15,000 linear feet of sidewalks on Lonas Dr between Middlebrook Pk and Gate Ln	1	2024	$6,667,043	L-STP	80%	0%	20%
Total for Horizon Year 2020 – 2024:								**$70,859,835**				
Horizon Year 2025 – 2029												
13-836	Greenways	Knoxville / Knox Co	Murphy Creek/White Creek Greenway		Construct greenway trail from First Creek Greenway to Washington Pike or Greenway Drive to Harvest Park and Loves Creek Greenway	1	2029	$10,608,910	L-STP	80%	0%	20%
13-861	Greenways	Knoxville	Tennessee/Holston River Greenway - Phase 2		Construct greenway trail from Holston River Park to Loves Creek Greenway	3	2029	$7,577,793	L-STP	80%	0%	20%
13-887	Sidewalks	Knoxville	Scenic Dr Sidewalks	0.6	Construct 3,000 linear feet of sidewalks on Scenic Dr between Southgate Rd and Cherokee Blvd	1	2029	$1,591,336	TA	80%	0%	20%
13-888	Sidewalks	Knoxville	Fairmont Blvd Sidewalks	0.9	Construct 4,500 linear feet of sidewalks on Fairmont Blvd between Whittle Springs Rd and Fairway Rd	1	2029	$2,387,005	TA	80%	0%	20%
Total for Horizon Year 2025 – 2029:								**$22,165,044**				
Horizon Year 2030 – 2034												
13-860	Greenways	Knoxville	Loves Creek Greenway - Phase 2		Construct greenway trail from Spring Place Park to Holston Middle School, Holston Hills	1	2034	$3,617,441	TA	80%	0%	20%

RMP#	Project Type	Jurisdiction	Project Name	Length (mi.)	Project Description	Priority	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
13-886	Sidewalks	Knoxville	Caledonia Ave Sidewalks	0.5	Construct 2,500 linear feet of sidewalks on Caledonia Ave between Volunteer Blvd and Lake Ave	1	2034	$1,808,721	TA	80%	0%	20%
13-889	Sidewalks	Knoxville	Martin Mill Pk Sidewalks	1.2	Construct 6,100 linear feet of sidewalks on Martin Mill Pk between Avenue A and Mooreland Heights Elementary School	1	2034	$5,516,598	L-STP	80%	0%	20%
13-890	Sidewalks	Knoxville	Stone Rd Sidewalks	0.7	Construct 3,800 linear feet of sidewalks on Stone Rd between Chapman Hwy and Magazine Rd	1	2034	$2,405,598	TA	80%	0%	20%
Total for Horizon Year 2030 – 2034:								**$13,348,358**				
Horizon Year 2035 – 2040												
13-867	Greenways	Knox Co	Conner Creek Greenway		Construct greenway from Pellissippi State to Hardin Valley schools	3	2040	$458,069	TA	80%	0%	20%
13-868	Greenways	Knox Co	Beaver Creek Greenway, Phase 3		Construct greenway from Brickey-McCloud Elementary to Powell Library, Powell Middle School to Karns Elementary, and Westbridge Business Park to Pellissippi Parkway	1	2040	$7,028,566	TA	80%	0%	20%
13-891	Sidewalks	Knoxville	Ridgecrest Dr Sidewalks	0.7	Construct 3,900 linear feet of sidewalks on Ridgecrest Dr between Martha Berry Rd and Medlin Heights Rd	1	2040	$3,052,549	TA	80%	0%	20%
13-892	Sidewalks	Knoxville	Highland Dr Sidewalks	1.0	Construct 5,400 linear feet of sidewalks on Highland Dr between Jenkins Rd and Broadway	1	2040	$4,226,607	L-STP	80%	0%	20%
13-893	Sidewalks	Knoxville	Skyline Dr Sidewalks	1.4	Construct 7,500 linear feet of sidewalks between Fern St and Chilhowee Dr	1	2040	$5,870,287	L-STP	80%	0%	20%
Total for Horizon Year 2035 – 2040:								**$20,636,078**				
TOTAL of Active Projects for All Horizon Years 2013 – 2040								**$171,069,203**				

Existing Plus Committed (E+C) Projects

Table 8-7 lists highway projects that are considered as part of the "Existing plus Committed" (E+C) roadway network. The criteria for a project to be considered an E+C project is that it has either been completed, construction has already begun or funding for the construction phase has been totally committed since the year 2010. This list reflects the projects that have been added to the TPO's "Existing plus Committed" (E+C) network in the travel demand model. This is necessary because the model was only calibrated to reflect the travel patterns in the year 2010 on the highway network that was in place at that time. The E+C network is used as the base case in the travel demand model, which is then used to determine operational deficiencies in the future assuming that no other improvements are made to the roadway network. E+C Projects are shown in county roadway project maps 8-1 to 8-8 on pages 8-4 to 8-7 and 8-22 to 8-25. They are labeled by project number (RMP#).

The E+C network is also necessary to reflect the fact that the projects that have not been closed out and are still receiving funding for construction are indeed still a subset of the current Mobility Plan for the Knoxville Region.

Table 8-7: Existing Plus Committed (E+C) Projects

RMP#	Jurisdiction	Project Name (Route)	Termini	Length (miles)	Project Description	Horizon Year	Cost (Current $)
BLOUNT COUNTY							
09-201	Alcoa	East Bessemer Street	Intersection w/ E Watt St	0.0	Realign intersection	2014	$30,000
09-203	Alcoa	Old Knoxville Hwy (SR 33)	Hunt Rd (SR 335) to Pellissippi Pkwy (SR 162)	0.5	Widen 2-lane to 4-lane w/center turn lane	2014	$3,000,000
09-206	Alcoa	US 129 Bypass (SR 115)	Intersection with Louisville Rd (SR 334)	0.0	Intersection improvements	2014	$800,000
09-261	Alcoa	Hall Road (SR 35)	Intersection with Alcoa South Plant Entrance	0.0	Add southbound left turn lane	2014	$90,000
JEFFERSON COUNTY							
09-301	Jefferson City	Chucky Pike	Intersection at US 11E (SR 34)	0.0	Intersection improvement- add turn lanes and modify signal	2014	$140,000
09-305	Jefferson City	Odyssey Rd	Intersection at US 11E (SR 34)	0.0	Add left and right turn lanes	2014	$60,000
09-306	Jefferson City	Odyssey Rd	US 11E (SR 34) to Old AJ Hwy Bridge over RR	0.9	Add center turn lane, Provide a 3-lane section	2014	$240,000
09-315	Jefferson City	SR 92	US 11E to Hinchey Hollow Rd	2.3	Install street lighting	2014	$30,000
09-319	Jefferson City	US 11E (SR 34)	SR 92 to Morristown City Limit	4.8	Install street lighting	2014	$45,000
09-320	Jefferson City	US 11E (SR 34)	All signalized intersections	0.0	LED signal head replacements	2014	$110,000
09-322	Jefferson City	US 11E (SR 34)	SR 92S to Odyssey Rd	0.5	Signal Coordination	2014	$115,000
09-326	Jefferson City	Old AJ Highway	Railroad Crossing	0.0	Bridge replacement	2014	$435,000
09-324	Jefferson Co	US 411/ US 25W (SR 35)	Grapevine Hollow Rd to 4-lane section of SR 9	5.6	Widen 2-lane to 4-lane	2014	$33,400,000
09-325	Jefferson Co	I-40/ I-81 Interchange	I-40/ I-81 Interchange	0.1	Safety Improvements to increase length of acceleration ramps	2014	$8,100,000
09-313	Jefferson Co	SR 66 Relocation	North of I-81 at SR 341 to SR 160	3.1	Construct new 4-lane road	2015	$55,000,000
KNOX COUNTY							
09-600	Farragut	Old Stage Road/Watt Road Extension	Old Stage Rd. from Johnson's Corner Rd. to Town Limits, Watt Road from Old Stage Rd. to Kingston Pk (SR 1) (US 11/70)	0.8	Improve Old Stage Rd to 2-lane with sidewalk from Johnson's Corner Rd to western Town limits and Extend Watt Road from Old Stage to SR-1 with three lanes, sidewalk, curb & gutter	2014	$3,936,800

RMP#	Jurisdiction	Project Name (Route)	Termini	Length (miles)	Project Description	Horizon Year	Cost (Current $)
09-601	Farragut	Campbell Station Road	Jamestown Blvd to Parkside Dr/ Grigsby Chapel Rd	0.9	Widen 2-lane to 4-lane w/center turn lane	2014	$9,000,000
09-698	Farragut	Kingston Pike (SR-1)(US 11/70)	Intersection w/Everett Rd	0.3	Intersection Improvements to include center turn lane and traffic signal	2014	$1,800,000
09-602	Farragut/ Knox Co	Outlet Drive	Lovell Rd (SR 131) to Campbell Station Rd	0.5	Construct new 2-lane road w/center turn lane along existing and new alignment	2014	$3,000,000
09-603	Knox Co	Emory Road (SR 131)	Clinton Hwy (SR 9) (US 25W) to Gill Rd	2.9	Widen 2-lane to 4-lane w/center turn lane	2014	$25,626,620
09-604	Knox Co	Maynardville Hwy (SR 33)	Temple Acres Dr to Union County Line	5.9	Widen 2-lane to 4-lane	2014	$32,062,500
09-608	Knox Co	Lovell Road (SR 131)	Pellissippi Pkwy (SR 162) SB Ramps to Schaeffer Rd	0.2	Widen 2-lane to 4-lane w/center turn lane	2014	$3,100,000
09-609	Knox Co	Emory Rd (SR 131)	Intersection w/Tazewell Pk (SR 331)	0.0	Intersection improvement	2014	$4,000,000
09-695	Knox Co	Dutchtown Road	Murdock Rd to E of Pellissippi Pkwy southbound ramps	0.3	Widen to 4-lanes with center turn lane, add eastbound decel lane at Pellissippi ramps	2014	$585,000
09-612	Knoxville	Western Avenue (SR 62)	Schaad Rd to I-640	3.7	Widen 2-lane to 4-lane w/center turn lane	2014	$22,500,000
09-614	Knoxville	Henley Street Bridge (SR 33/71) (US 441)	Bridge over Tennessee River	0.4	Rehabilitate bridge & add bike lanes	2014	$34,000,000
09-621	Knoxville	I-40/75	From I-140 to Lovell Rd (SR 131) Interchange Westbound Direction	1.0	Add full auxiliary lane westbound between interchanges (approx 2,700 ft)	2014	$1,800,000
09-622	Knoxville	I-40/75 at Weigh Station	Eastbound and Westbound Truck Weigh Stations	0.1	Extend on and off ramps at weigh stations	2014	$1,300,000
09-694	Knoxville	I-140 (Pellissippi Pkwy)/Northshore Dr (SR 332) Interchange	I-140 EB Off Ramp to Northshore Dr (SR 332)	0.2	Construct new slip ramp from existing off ramp to serve the Northshore Town Center Development	2014	Developer Funded
LOUDON COUNTY							
09-400	Lenoir City	Harrison Road	From Kingston St toGlenfield Dr (approx. 2,000 ft.)	1.3 0.4	Intersection improvements and reconstruct 2-lane section	2014	$7,525,000
09-408	Lenoir City	US 321 (SR 73)	I-75 Interchange to Simpson Rd	1.6	Intersection Improvements from Corridor Study	2014	$1,000,000
N/A	Lenoir City	Town Creek Pkwy	U.S. 321 to Kingston St	1.3	New 4-lane median divided roadway	2014	
09-411	Loudon	Veteran's Memorial Bridge	Veteran's Memorial Bridge	N/A	Install lighting	2014	$200,000
09-402	Loudon Co	Improve Streetscapes and Pavement	Various locations in Loudon County	N/A	Improve streetscapes and repair pavement	2014	$278,308
09-404	Loudon Co	Unitia Rd	Unitia Rd Bridge	0.0	Replace Bridge	2014	$920,000
09-405	Loudon Co	US 11 (SR 2)	Intersection w/ Shaw Ferry Rd	0.0	Intersection improvements	2014	$1,013,112
09-409	Loudon Co	US 321 (SR 73)	US 11 (SR 2) to east of Little Tennessee River	1.7	Construct 4-lane road on existing and new alignment	2015	$35,145,000
ROANE COUNTY							
09-102	Harriman/Roane Co	SR 29	Pine Ridge Rd to SR 61	0.8	Widen 2-lane to 4-lane	2014	$16,500,000
SEVIER COUNTY							
09-505	Sevier Co	Birds Creek Road (SR 454)	Glade Rd to SR 416	4.6	Reconstruct 2-lane section	2014	$10,800,000
09-506	Sevierville/ Sevier Co	SR 66	North of Nichols St to Boyds Creek Hwy (SR 338)	4.2	Widen 4-lane to 6-lane	2014	$28,300,000
09-507	Sevierville/ Sevier Co	SR 66	Douglas Dam Rd (SR 139) to I-40	2.0	Widen 4-lane to 6-lane	2014	$18,000,000
09-514	Sevierville/ Sevier Co	SR 66	Boyds Creek Hwy (SR 338) to Douglas Dam Rd (SR 139)	2.1	Widen 4-lane to 6-lane	2014	$18,100,000

Equity of Projects (Title VI)

The TPO strives to ensure that funding, projects, and services are not distributed in a discriminatory way. It is important to the TPO that the Knoxville Region continues to grow and providing transportation infrastructure and services are essential to that effort. However, community investments must be done in an equitable manner so all areas have an opportunity to prosper. The TPO wants to be sure that all citizens have a voice in the transportation decision-making process. Historically, minority and low-income communities have been under-represented in this process. Having a "voice" is a fundamental right of everyone. The TPO understands that transportation has a tremendous social impact and can greatly affect communities and neighborhoods.

Federal Legislation

Title VI is part of the Civil Rights Act of 1964 that ensures, "no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied benefits, or be subjected to discrimination under a program of activity receiving federal financial assistance."

On Feb 11, 1994, President Bill Clinton signed Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Its goal was to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities.

Assessing the Equity of Projects

The primary tools used to assess the potential Title VI and Environmental Justice impacts of transportation projects from a long range planning perspective are demographic studies and overlay maps. Staff attempts to ensure that programs and projects incorporated into the Mobility Plan are not discriminatory either by geographical location, by distribution of financial resources, or by a person's ability to provide public input. Due to the large number of projects in the Mobility Plan and because the exact size, location, and design of projects is not completely known, the Title VI assessment of a project's impact cannot be specific. Generalizations can be drawn and attention can be given to project selection and funding distribution.

As projects move from the Mobility Plan into the Transportation Improvement Plan (TIP), a greater level of study will occur. Here projects are typically within three-to-five years to implementation. A project's placement into the TIP does not always mean that engineering studies, planning reports, or even exact alignments have been determined. Even at the TIP level, many questions concerning a project's impact cannot be fully understood until final construction alignments are determined and detailed reports are completed. While the TPO may not oversee many of the projects in the TIP, the staff does try to stay involved about the projects. Staff reviews documents, engineering plans, and Transportation Planning Reports and makes

recommendations on how to improve projects or how to mitigate potential impacts. The TPO feels it has an important role to remind agencies undertaking a transportation project that there could be Title VI impacts.

Equity in the 2013 Mobility Plan

Title VI areas are defined as a census tract where the percent of minority persons exceed the average percent of minority persons in the TPO Planning Area. There are a total of 157 census tracts in the planning area. The total population of the TPO Planning Area is 637,336. The total minority population is 78,658, or 12.3 percent. Of those census tracts, 56 qualify as Title VI census tracts due to their total minority population at or above 12.34 percent. Minority population was calculated using race only. It included Black, American Indian, or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, Some other race, and two or more races.

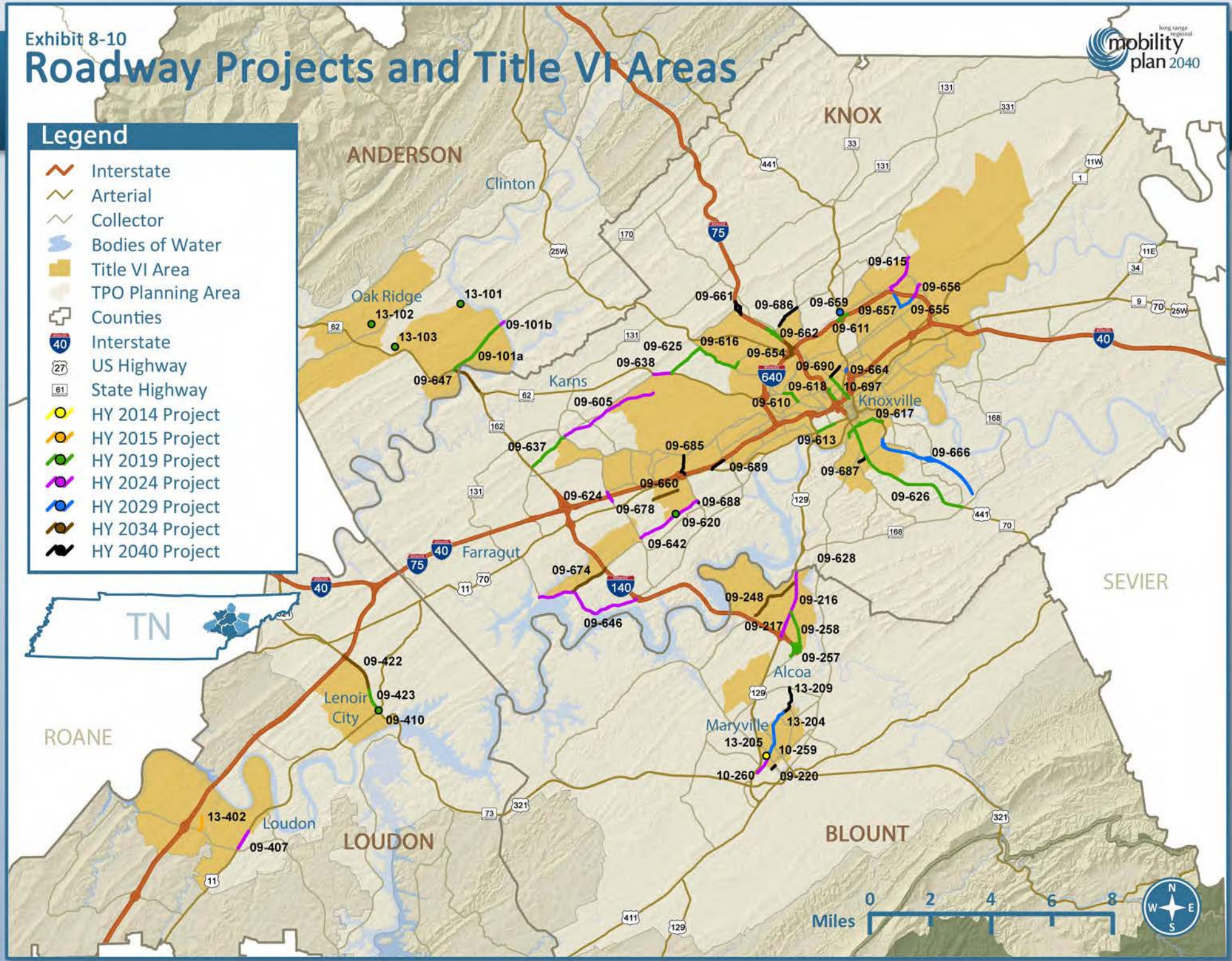
There are a total of 160 projects in the Knoxville Regional Mobility Plan with a total cost of $4.4 billion. Of that total, 59 projects are located within or directly connect to Title VI tracts for a total cost of $1.5 billion or 34.27 percent. As a percentage, this is clearly higher that the 12.3 percent minority or 11.8 percent low-income populations in the TPO Planning Area. Exhibit 8-9 shows those minority census tracts and identifies the Mobility Plan roadway projects.

In addition, the TPO also looks at low income, Hispanic, and Limited English Proficient (LEP) populations. The TPO's FTA Title VI Report (2010) reported that low-income persons represent 11.8 percent of the Planning Area's population. The 2010 Census reported that 3.4 percent of persons in the planning area are Hispanic. The FTA Title VI Report (2010) has a Limited English Proficiency (LEP) plan and notes persons who speak Spanish are by far the most prevalent of those persons who spoke a foreign language in the TPO Planning Area. Of the total population (5 years and older), it was reported that 1.68 percent spoke Spanish as the primary language. Of those persons, less than one percent (0.59 percent) reported that they spoke English poorly.

Exhibit 8-10

Roadway Projects and Title VI Areas

long range regional mobility plan 2040



Operations Projects

Table 8-8: Constrained Operations Projects

RMP#	Jurisdiction	Project Name	Horizon Year	Total Horizon Year Cost	Funding Source	Federal Share (%)	State Share (%)	Local Share (%)
Horizon Year 2013 – 2014:								
13-801	Oak Ridge	Advance Traffic Management System (ATMS) Communications Master Plan/ Synchronized Signal Progression Study	2014	$205,031	CMAQ	80%	0%	20%
13-809	Maryville / Alcoa	Joint Traffic Operations Center	2014	$153,773	CMAQ	80%	0%	20%
13-810	Maryville / Alcoa	CCTV Camera Deployment	2014	$307,547	CMAQ	80%	0%	20%
13-816	Knox Co	Traffic Signal and Communication System Upgrades	2014	$2,255,344	CMAQ	80%	0%	20%
13-817	Knox Co	Traffic Operations Center	2014	$25,629	CMAQ	80%	0%	20%
Total for Horizon Year 2013 – 2014:				**$2,947,324**				
Horizon Year 2015:								
13-802	Oak Ridge	Traffic Signal and Communication System Upgrades	2015	$1,785,310	CMAQ	80%	0%	20%
13-803	Oak Ridge	Traffic Operations Center	2015	$25,949	CMAQ	80%	0%	20%
13-804	Oak Ridge	Emergency Vehicle Traffic Signal Preemption	2015	$155,696	CMAQ	80%	0%	20%
13-808	Maryville / Alcoa	Traffic Signal System Upgrade	2015	$259,493	CMAQ	80%	0%	20%
13-811	Maryville / Alcoa	Emergency Vehicle Traffic Signal Preemption	2015	$77,848	CMAQ	80%	0%	20%
13-814	Farragut	Emergency Vehicle Traffic Signal Preemption	2015	$62,278	CMAQ	80%	0%	20%
13-822	Knoxville	Emergency Vehicle Traffic Signal Preemption	2015	$243,923	CMAQ	80%	0%	20%
13-812	Lenoir City	Traffic Signal and Communication System Upgrades	2015	$643,542	CMAQ	80%	0%	20%
Total for Horizon Year 2015:				**$3,254,038**				
Horizon Year 2016 – 2019:								
13-805	Oak Ridge	CCTV Camera and DMS Deployment	2019	$319,225	CMAQ	80%	0%	20%
13-602	Knoxville	City of Knoxville ATMS	2019	$14,897,150	CMAQ	80%	0%	20%
13-820	Knoxville	Traffic Operations Center	2019	$53,204	CMAQ	80%	0%	20%
Total for Horizon Year 2016 – 2019:				**$15,269,579**				
Horizon Year 2020 – 2024:								
13-806	Knox Co / Blount Co	TDOT Region 1 SmartWay Geographic Expansion: US 129 / SR 115	2024	$6,984,521	STP	80%	0%	20%
13-807	Knox Co / Blount Co	TDOT Region 1 SmartWay Geographic Expansion: I-140 South of Knoxville	2024	$4,571,686	STP	80%	20%	0%
13-813	Farragut	Traffic Signal and Communication System Upgrades	2024	$761,948	CMAQ	80%	0%	20%
13-815	Knox Co	TDOT Region 1 SmartWay Geographic Expansion: I-75 North of Knoxville	2024	$1,650,887	STP	80%	20%	0%
13-818	Knox Co	CCTV Camera Deployment	2024	$380,974	CMAQ	80%	0%	20%
13-819	Knox Co	Speed Monitoring System	2024	$25,398	CMAQ	80%	0%	20%
13-821	Knoxville	CCTV Camera and DMS Deployment	2024	$857,191	CMAQ	80%	0%	20%
Total for Horizon Year 2020 – 2024:				**$15,232,605**				
TOTAL of Operations Projects for All Horizon Years 2013 – 2040				**$36,703,547**				

Environmental Mitigation

The federal transportation legislation, MAP-21, requires that the TPO consult with Federal, State, and Tribal land management, wildlife, and regulatory agencies to develop a general discussion on possible environmental mitigation activities that should be incorporated into transportation projects identified in this Plan.

As part of this requirement, TDOT established a consultation process with state and federal agencies responsible for environmental protection, land use management, and natural resource and historic preservation. Through this process, the TPO was able to seek comment and compare available plans and maps with planned transportation improvements.

MAP-21 streamlined the environmental review process for transportation projects compared with previous funding bills. The Federal Highway Administration is still determining how those changes will be implemented.

Since the transportation planning activities of the TPO are regional in scope, this environmental mitigation discussion does not focus on each individual project within the Regional Mobility Plan but rather offers a summary of the environmentally sensitive areas to be aware of regionwide, the projects that most likely will have an impact on these environmentally sensitive areas, and mitigation strategies that should be considered to reduce the impact of projects.

This environmental mitigation discussion was developed through a three-step process. First, the TPO developed a list of environmentally sensitive areas that should be identified. Geographic Information Systems (GIS) was then used to map these areas. Second, the highway projects from the Regional Mobility Plan were overlaid. A query was performed to determine which projects would have an impact on an environmentally sensitive area. Finally, a discussion of general mitigation efforts that should be utilized is included to minimize the potential impacts any project in this Plan has on an environmentally sensitive area.

While some sort of mitigation effort should be included in every project that has an impact on an environmentally sensitive area, it is recognized that not every project will have the same level of impact and thus different levels and types of mitigation should be utilized. Some projects involve major construction with considerable earth disturbance, such as new roadways and roadway widening projects. Other projects involve minor construction and minimal, if any, earth disturbance, such as traffic signals, street lighting, and resurfacing projects. The mitigation efforts used for a project depends on how severe the impact on environmentally sensitive areas is expected to be. In determining which mitigation strategies to use, each project identified as having an impact on an environmentally sensitive area should follow the three-step mitigation planning process prior to construction:

1.) Identify all environmentally sensitive areas throughout the project study area;
2.) Determine how and to what extent the project will affect these environmentally sensitive areas; and
3.) Develop appropriate mitigation strategies to lessen the impact these projects have on the environmentally sensitive areas.

All projects shall minimize off-site disturbance in sensitive areas and develop strategies to preserve air and water quality, limit tree removal, minimize grading and other earth disturbance, provide erosion and sediment control, and limit noise and vibration. Where feasible, alternative designs or alignments should be developed that would lessen the project's impact on environmentally sensitive areas. The three-step mitigation planning process should solicit public input and offer alternative designs or alignments and mitigation strategies for comment by the TPO and local government.

For major construction projects, such as new roadways, or for projects that may have a regionwide environmental impact, a context sensitive solutions process should be used in which considerable public participation and alternative design solutions are used to lessen the impact of the project.

Environmentally Sensitive Areas

There are numerous environmentally sensitive areas found throughout the Knoxville Region. Many areas are too small or too numerous to map at a regional level and can only be clearly identified through a project level analysis. Some areas are yet to be identified and will only become known once a project level analysis is completed, such as caves, sinkholes, and wetlands. When a project is ready to move from the Regional Mobility Plan into construction phases, a complete analysis should be completed to determine the type and location of environmentally sensitive areas within the project study area. The following environmentally sensitive areas are included in that analysis:

1.) Lakes/rivers/streams;
2.) Flood plains and floodways;
3.) Wetlands;
4.) Sinkholes;
5.) Caves and other karst topography;
6.) Steep slopes;
7.) Preserved forest/game lands;
8.) National/state/local parks;
9.) Historic sites/ neighborhoods;

10.) Cemeteries; and
11.) Scenic highways/parkways.

Transportation Projects Potentially Impacting Environmentally Sensitive Areas

For the initial purposes of determining whether a transportation project may have an impact on an environmentally sensitive area, any project that intersects or comes within one-eighth of a mile (660 feet) of an environmentally sensitive area identified from the list above is considered to have an impact and thus should incorporate mitigation strategies. Due to the hilly terrain, presence of karst topography, and numerous government preserved lands in the area, the majority of the projects in this Plan may require some type of mitigation effort. Exhibit 8-10 illustrates the prevalence of slope. More specific examinations are conducted after a project's scope has been defined. For instance, TDOT's area of potential effect corridors typically runs from 500 feet wide to 2,000 feet wide depending on the scope of the proposed project.

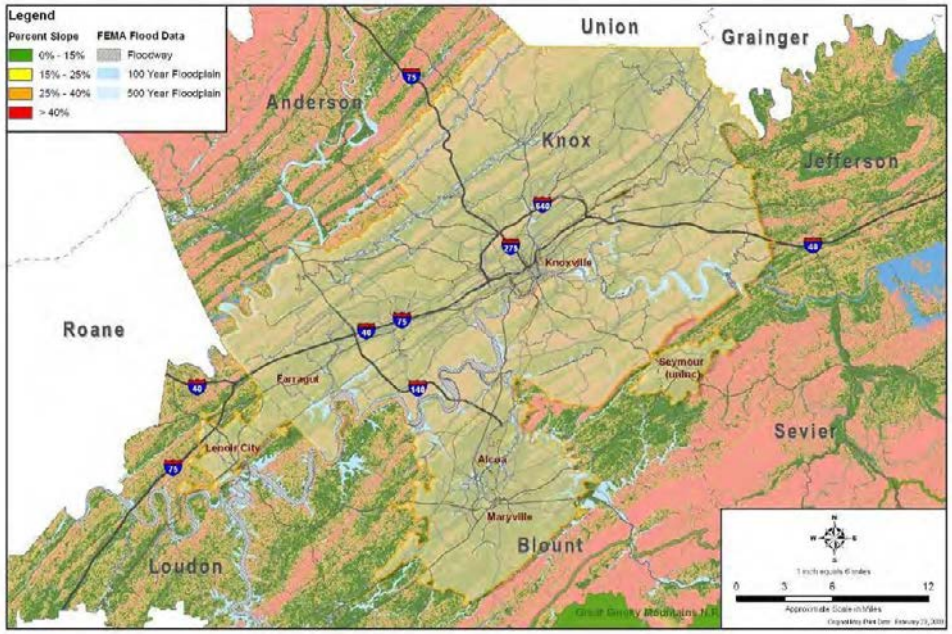


Exhibit 8-10: Slope, Floodways, and Floodplains – An Example of Mapping Environmental Constraints

Climate Change

Overview

Climate change is an issue that has generated increasing interest and discussion across the country and around the world. It has potentially limitless impacts locally and worldwide, but has generated a great deal of controversy and debate. It is generally accepted that the global climate is changing. Where opinions differ is what is causing this. A large number of scientists and environmental advocates point to human factors, such as increased greenhouse gas emissions from automobiles, factories, and the like. These individuals often see enacting policies to reduce these emissions as a moral imperative. However, many also suggest that changes may be part of a natural cycle of climate changes that began long before human development. These individuals often see enacting new policies as overly burdensome on economic development with little or no benefit for the money.

This disagreement exists in many parts of society – from the scientific community, to the business community, among elected representatives, and numerous others. These disagreements have resulted in an absence of a coherent direction in public policy. Federal, state, and local governments are often in conflict, leaving many unsure of what direction to take.

The TPO Role

The TPO does not intend to enter the national debate over the cause of climate change. Those decisions rest with scientists that study the data and elected officials who make the policies. At such a time as coherent policy exists, the TPO will tailor its activities to ensure compliance with any policies that apply to TPO activities.

Surveys at the national and local levels indicate strong public support for expanding multimodal choice – from increased transit availability to more greenways, bikeways, and sidewalks. The TPO puts a great deal of emphasis on planning for a multimodal transportation system. The state of Tennessee has indicated an interest in promoting a multimodal system as well, as evidenced in its Bicycle and Pedestrian Policy (see Appendix D). In addition to promoting personal choice, healthier lifestyles, significant personal cost savings, independence for a growing aging population, reduced congestion, and the costs associated with congestion, multimodal choices also reduce the kinds of greenhouse gas emissions that many point to as a cause of climate change. Therefore, until the debate over climate change is settled with a coherent policy direction, the TPO and its partners, through supporting a multimodal approach hope to act in a way that does no harm as pertains to possible causes of climate change.

Therefore, by promoting the kinds of transportation choices that people are asking for, the TPO is prepared for either outcome in this important debate. If the national debate concludes with a clear policy direction that climate change is a result of human activity, the TPO will not have created new damage to correct. If policy direction points to climate change as a natural phenomenon, the actions and costs associated with TPO activities will have advanced other goals of the Knoxville Region in promoting a multimodal system.

Air Quality Conformity

As an Air Quality Nonattainment Area, the Knoxville Regional Transportation Planning Organization must demonstrate that its transportation plans and programs will meet air quality conformity requirements – a process known as "Transportation Conformity." The reason that Transportation Conformity is required is that it ensures that federal funds will not be spent on projects that cause or contribute to any new violations of the National Ambient Air Quality Standards (NAAQS); increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone.

Transportation Conformity is demonstrated through a technical process using the TPO Travel Demand Forecasting Model and an EPA emissions factor model known as MOBILE6.2. The Travel Demand Model provides estimates of future vehicle miles of travel (VMT) based on forecasted changes in demographics and implementation of roadway projects while MOBILE6.2 provides emission rates in terms of grams per mile of each pollutant based on local characteristics such as meteorology and operating speeds on the roadway system. The total estimated emissions for future analysis years are compared against allowable limits from the applicable State Implementation Plans (SIP).

This section presents a summary of the conformity requirements and analyses used demonstrate that the Regional Mobility Plan meets Transportation Conformity requirements under federal regulations found in the Clean Air Act Amendments of 1990 and MAP-21. More detailed information can be found in the full Conformity Determination Report included in Appendix K.

Most of the Knoxville Region has recently been, or is currently in non-attainment for two criteria pollutants (ground-level ozone and fine particulate matter) under federal NAAQS as Exhibit 8-11 shows.

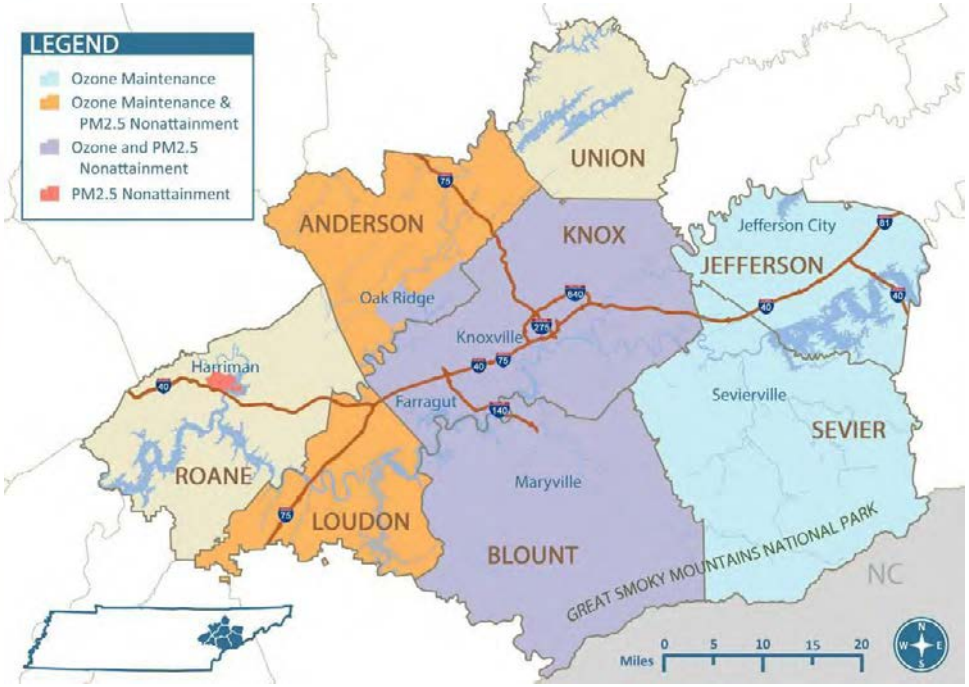


Exhibit 8-11: Knoxville Regional Air Quality Areas (Ozone and PM2.5)
Source: Environmental Protection Agency (EPA)

What does this mean for the Knoxville Region? For one, it means that this Plan and its associated projects must undergo an analysis to determine if they will negatively affect the Knoxville Region's air quality. Second, it means that the Knoxville Region is eligible for federal funding through the Congestion Mitigation and Air Quality (CMAQ) program, for projects that can help improve air quality, such as installing technologically advanced filters on municipal diesel vehicles. Third, it means that if air quality continues to worsen and our best efforts to improve air quality do not work, federal highway funding could be restricted for certain types of projects such as adding lanes to a roadway. While this last implication is not likely at present, it is a consequence we have to keep in mind as we develop the project list and choose where investments go.

History of Air Quality in Knoxville

Ozone

The Knoxville Region's first nonattainment designation for ground-level ozone became effective in January 1992 under the "1-Hour Ozone Standard" and included only Knox County. The area was able to demonstrate attainment with that standard effective in October 1993 and was then considered a "Maintenance Area".

EPA promulgated a more stringent ozone standard in 1997 known as the "1997 8-Hour Ozone Standard" which was set at 80 parts per billion (ppb). The 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 1997 8-hour standard for ground level ozone. This nonattainment designation became effective on June 15, 2004. The area demonstrated attainment with this standard effective in March 2011.

A large portion of the 8-Hour Ozone Non-Attainment Area was outside of the currently designated TPO Planning Area and also overlapped with an adjoining Metropolitan Planning Organization – the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO). In response to this issue, meetings were held among the County Mayors of the non-attainment counties, TPO Executive Board, Tennessee Department of Transportation (TDOT), and Tennessee Department of Environment and Conservation (TDEC) to discuss ways to address air quality and transportation planning for the entire Ozone Non-Attainment Area. After alternatives were presented, the consensus was to request the TPO prepare the Regional Long Range Transportation Plan and corresponding air quality conformity analysis for the entire Non-Attainment Area. A Memorandum of Agreement (MOA) was entered into between the TPO, TDOT and LAMTPO, which formalized the responsibilities of each agency to ensure all Transportation Conformity requirements would be addressed.

EPA again strengthened the ozone standard in 2008 based on an updated review of scientific and medical data to ensure that air quality standards are set at an appropriate level to protect the environment and human health. This standard is known as the "2008 8-hour Ozone Standard" and it was set at 75 ppb. A formal designation of nonattainment areas for this standard became effective on July 20, 2012 and included the counties of Blount and Knox plus a small portion of Anderson County surrounding the TVA Bull Run Fossil Plant in the Knoxville Region. Attainment with this standard is required to be demonstrated by July 2015.

PM2.5

The EPA first promulgated air quality standards for fine particulate matter less than 2.5 microns in diameter (PM2.5) in 1997 due to evidence that these fine particles pose a significant health risk because of their ability to lodge deeply within the lungs. Figure 8-2 shows the relative size of these particles compared with human

hair and Table 8-10 lists the major sources of fine particulate matter. The EPA set standards on both a daily (65 micrograms/cubic meter) and an annual (15 micrograms/cubic meter) basis for levels of PM2.5.

On April 5, 2005, the U.S. EPA formally designated the counties of Anderson, Blount, Knox, Loudon, and a portion of Roane in non-attainment for the 1997 Annual PM2.5 Standard. As a result of the PM2.5 designation, the TPO updated the Mobility Plan in 2006, expanding the Knoxville Region to include that portion of Roane County not included in the original Plan and prepared an updated conformity determination.

EPA strengthened the PM2.5 standard in 2006 by reducing the permissible daily levels of PM2.5 from 65 to 35 micrograms per cubic meter. The same counties that were designated under the 1997 Annual PM2.5 Standard were formally designated nonattainment for the 2006 Daily PM2.5 Standard effective December 2009.

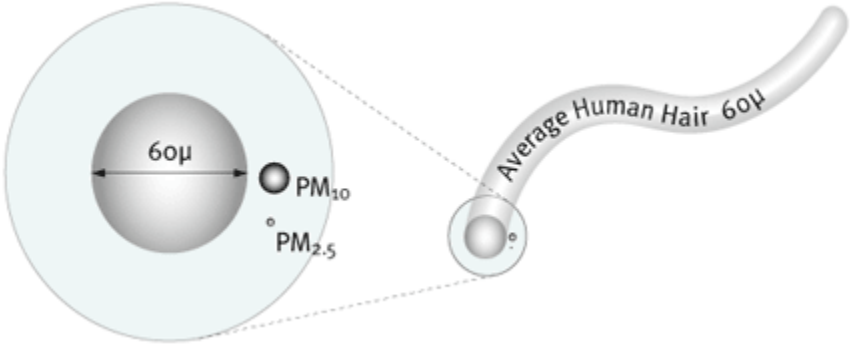


Figure 8-2: Relative Size of Fine Particulate Matter
Source: Environmental Protection Agency, Queensland, Australia, 2007

Table 8-9: Sources of Fine Particulate Matter

Natural Sources:	Primary Man-made Sources:	Secondary Man-made Sources:
• Wildfire (elemental carbon and organic carbons) • Organic carbons from biogenic VOCs • Nitrates from natural NOx	• Fossil fuel combustion (industrial, residential, autos) (elemental carbon and organic carbons) • Residential wood combustion (elemental carbon and organic carbons)	• Organic carbons from anthropogenic sources of VOCs (autos, industrial processes, solvents) • Sulphates and nitrates from anthropogenic sources of SOx and NOx (autos, power plants, etc.)

Source: Environmental Protection Agency

Conformity Statement for 8-Hour Ozone

Ozone is not directly emitted into the atmosphere, rather it is formed through complex chemical reactions of Oxides of Nitrogen (NOx) and Volatile Organic Compounds (VOC) in the presence of sunlight. Both NOx and VOC are emitted from motor vehicles, primarily through the internal combustion process and evaporation of fuels. Transportation conformity is demonstrated by determining the amount of these emissions that will result from project implementation and comparing those amounts to a level of emissions that has been determined to allow the area to attain the standard. The allowable levels of emissions are established in a "State Implementation Plan" (SIP) and are known as a "Motor Vehicle Emissions Budget" (MVEB). In some cases conformity is required prior to a SIP being established in which case the future expected emissions are compared against a Baseline Year level of emissions.

Tables 8–2 and 8–3 summarize the results of the emissions analyses used to demonstrate conformity of the Mobility Plan to the 1997 and 2008 8-Hour Ozone Standards respectively:

Table 8-10: 1997 8-hour Ozone Standard Emissions Analyses (tons/day)

Volatile Organic Compounds (VOC)	Analysis Years				
	2015[1]	2015[2]	2024	2034	2040
Emissions Budget	22.12	25.11	25.19	25.19	25.19
Projected Emissions	13.34	13.86	19.92	22.20	25.12

Oxides of Nitrogen (NOx)		Analysis Years			
	2015[1]	2015[2]	2024	2034	2040
Emissions Budget	22.49	57.94	36.32	36.32	36.32
Projected Emissions	18.52	20.56	22.65	20.30	22.50

Note 1: 2015 Horizon Year Test for Knox County only against the 2014 1-Hour Ozone MVEB
Note 2: 2015 Horizon Year Test of Less than Baseline Year 2002 Emissions for counties outside Knox County
Source: Knoxville Regional Transportation Planning Organization (TPO)

Table 8-11: 2008 8-hour Ozone Standard Emissions Analyses (tons/ day)

Volatile Organic Compounds (VOC)	Analysis Years			
	2015	2024	2034	2040
Emissions Budget	22.12	25.19	25.19	25.19
Projected Emissions	17.30	19.92	22.20	25.12

Oxides of Nitrogen (NOx)	Analysis Years			
	2015	2024	2034	2040
Emissions Budget	22.49	36.32	36.32	36.32
Projected Emissions	21.97	22.65	20.30	22.50

Source: Knoxville Regional Transportation Planning Organization (TPO)

The projected emissions of VOC and NOx that are expected to result from the build-out of the roadway projects included in this Plan are in all cases lower than either the established emissions budgets and/or baseline emissions. Therefore, Transportation Conformity under the 8-Hour Ozone Standard has been demonstrated for the 2040 Knoxville Regional Mobility Plan.

Conformity Statement for PM2.5

The emissions of concern from on-road mobile sources that contribute directly to PM2.5 pollution (known as "Direct PM2.5" emissions) are from small particles in the vehicle exhaust as well as from brake and tire wear. In addition to Direct PM2.5, it is believed that Oxides of Nitrogen (NOx) are also a precursor to PM2.5 formation.

Table 8-12 summarizes the results of the emissions analysis used to demonstrate conformity of the 2040 Knoxville Regional Mobility Plan to the 1997 Annual PM2.5 and 2006 Daily PM2.5 standards. Note that the emissions budget is currently identical for both standards since a SIP has not yet been established for the Daily PM2.5 Standard and until such time as there is one then the MVEB established for the Annual PM2.5 Standard is required to be used.

Table 8-12: 1997 Annual and 2006 Daily PM2.5 Standard Emissions Analyses (tons/year)

Direct PM2.5	Analysis Years			
	2014	2024	2034	2040
Emissions Budget	283.63	283.63	283.63	283.63
Projected Emissions	167.94	150.94	168.58	187.29

Oxides of Nitrogen (NOx)	Analysis Years			
	2014	2024	2034	2040
Emissions Budget	18,024.9	18,024.9	18,024.9	18,024.9
Projected Emissions	10,678.38	6,094.95	5,712.70	6,307.94

Source: Knoxville Regional Transportation Planning Organization (TPO)

The projected emissions of Direct PM2.5 and NOx that are expected to result from the build-out of the roadway projects included in this Plan are in all cases lower than the 2002 emissions. Therefore, Transportation Conformity under the PM2.5 standard has been demonstrated for the 2040 Knoxville Regional Mobility Plan.

Interagency Consultation (IAC) Summary

The conformity determination was coordinated with stakeholder and regulatory agencies through an Interagency Consultation (IAC) process to formally deliberate any issues. The Interagency Consultation Group included participants from the US Environmental Protection Agency (EPA), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Tennessee Department of Transportation (TDOT), Tennessee Department of Environment and Conservation (TDEC), the National Park Service, Knox County Air Quality Management Department, and representatives from affected local jurisdictions. Meetings were held in order to explain the assumptions and procedures that were used to perform the conformity analysis and modeling. Full documentation of the IAC process is included in the separate full conformity determination report.

What is Next?

An Interagency Consultation (IAC) process continues. The TPO works closely with the EPA, Tennessee Department of Environment and Conservation, TDOT, LAMTPO, Knox County Air Quality Management, FTA, FHWA, and the National Park Service to increase communication and to keep the process transparent.

The fleet of vehicles on the road is continuing to turn over. Older, more-polluting vehicles are being replaced by newer, more efficient, and cleaner-burning vehicles. This helps combat the non-point source emitters, but at the same time, the EPA continues to tighten air quality standards effectively setting the bar higher. There are several “local” initiatives that can be taken to improve the region’s air quality rather than relying only upon national measures. Some of the major initiatives that have been demonstrated to have air quality benefits include active transportation projects, operations projects that improve efficiency of the transportation system such as ITS solutions, and increased efforts to better coordinate land use and transportation planning to minimize the necessity of motor vehicle usage for all trips. Generally speaking, If more investments are directed to non-highway projects including public transportation, this will further reduce the amount of pollutants in our air.

Financial Plan

Chapter 9

Financial Constraint – The New Norm

Federal legislation (MAP-21) requires the Mobility Plan to be financially constrained, in other words it only spends what it can expect to receive. Transportation projects are funded through many different sources including federal, state, and local funds. Most regionally significant projects, as identified in this Plan, are funded with some combination of federal, state, and local funds. The greatest funding source for major roadway projects is from the federal government, which accounts for over 80 percent of the funding granted to the TPO Area. A number of these funding sources (STP, HSIP, and NHPP) have strict guidelines about the types of projects and types of roadways they fund. The local jurisdictions and the TPO have greater discretion on spending the remaining funding sources (L-STP, CMAQ, and Local).

As we put together the lists of projects for the Plan, we cannot plan to spend more money that we can reasonably expect to have available. It is important that when we project the cost of projects and the revenue that we can expect to pay for them, that those projections be realistic. Based on what we know today, we must prepare for project costs to rise faster than the revenues we receive to pay for them.

Roadways

The following section details the methodology for financially constraining the 2040 Knoxville Regional Mobility Plan. Specifically, the projected expenditures for all the projects in the Plan are compared to the projected revenues anticipated to be available for each network year through 2040. This section supports the Plan's financial constraint because the costs of the projects do not exceed the projected revenues.

Roadway Capital Projects

Projected Revenues

The projected revenues were derived from the jurisdictions year 2008 through year 2012 actual funding amounts for roadway construction and rehabilitation and evaluated based on changes in MAP-21 and Tennessee's apportionment for 2013 and 2014. These figures were projected forward to year 2040 using a 1 percent inflation rate during the first five years to reflect the continued austerity of the 2008 recession followed by a 3 percent inflation rate to reflect a business as usual model during the remainder of the Plan.

Projected Expenditures

Each roadway project cost was projected from a 2012 cost and inflated to its horizon year with an inflation rate of 1.25 percent during the first five years to reflect the modest inflation since the 2008 recession began, followed by a 3.6 percent rate to reflect a business as usual model during the remainder of the Plan. The year of expenditure cost was projected to the midpoint of the horizon year period. It is assumed that half of the projects will be funded before the middle of the horizon year range and half will be funded after. For instance, projects within the 2015 to 2019 horizon year were projected to year 2017, the midpoint for that period.

Financial Constraint

Funding estimates show expected revenues will exceed the expected expenditures for the projects in a number of categories, such as STATE and National Highway Performance Program (NHPP) funds. However, the costs of projects eligible for LOCAL or L-STP funds exceed anticipated revenues. This is largely due to the fact that STATE and NHPP funds may only be used for a narrowly-defined set of roadways. LOCAL and L-STP funds have broad criteria, thus a much larger list of projects compete for these funds despite their limited size. Each project has been scored and prioritized based on a list of criteria, which include:

- Congestion management
- Multimodal choices
- Freight and goods movement
- Safety and security

- System preservation
- Quality growth
- Economic prosperity
- Health and environment
- Local support and consistency with plans
- Bonus given based on output from the Travel Demand Model assessment of congestion

Projects that scored lower based on these criteria moved to later horizon years and some moved to a non-constrained wish list. These wish list projects identify projects that local jurisdictions have identified as beneficial to the Knoxville Region, and though funding does not exist at this time for these projects, jurisdictions would like to keep these projects available to pursue if other funding becomes available of if other projects are implemented with lower than anticipated costs.

Tables 9–1 through 9–8 display all the projected revenues and expenditures by funding source. The tables show that the Plan is financially constrained for construction and rehabilitation of roadways as well as active transportation and operational improvements. Expenditures tie directly to costs shown in the Roadway (page 8-8), Active Transportation (page 8-33), and Operations (page 8-42) project lists.

Table 9-1: Roadway, Active, and Operations Cost vs. Revenue, Total for all Horizon Years 2013 – 2040

Total Over All Horizon Years, 2013 – 2040							
Funding Category	**Fed %**	**State/ Local %**	**Carry Over**	**New Revenue**	**Total Revenue**	**Expenditures**	**Balance (Carry Over)**
CMAQ	80	20	$0	$99,711,810	$99,711,810	$96,585,972	$3,125,837
HPP	80	20	$15,000,000	$0	$15,000,000	$12,117,569	$2,882,431
LOCAL (includes match)	0	100	$0	$478,616,687	$478,616,687	$476,784,136	$1,832,551
STATE (includes match)	0	100	$0	$757,809,755	$757,809,755	$559,211,882	$198,597,873
STP	80	20	$0	$1,076,887,547	$1,076,887,547	$1,059,162,529	$17,725,018
L-STP	80	20	$34,000,000	$378,904,878	$412,904,878	$397,337,462	$15,567,416
NHPP	80	20	$0	$2,113,890,370	$2,113,890,370	$1,649,734,015	$464,156,355
HSIP	90	10	$0	$279,193,068	$279,193,068	$269,105,216	$10,087,852
Subtotal			**$49,000,000**	**$5,185,014,114**	**$5,234,014,114**	**$4,520,038,781**	**$713,975,333**
Plus Other Funding:							
TA (active projects only)	80	20	$0	$28,931,860	$28,931,860	$27,194,503	$1,737,358
TOTAL			**$49,000,000**	**$5,213,945,975**	**$5,262,945,975**	**$4,547,233,283**	**$715,712,691**

Note: LOCAL and L-STP expenditures include active transportation projects in some horizon years when TA revenues did not cover costs

Table 9-2: Roadway, Active, and Operations Cost vs. Revenue, Horizon Years 2013 – 2014

Horizon Years 2013 – 2014							
Funding Category	**Fed %**	**State/ Local %**	**Carry Over**	**New Revenue**	**Total Revenue**	**Expenditures**	**Balance (Carry Over)**
CMAQ	80	20	$0	$5,025,000	$5,025,000	$3,366,613	$1,658,387
HPP	80	20	$15,000,000	$0	$15,000,000	$0	$15,000,000
LOCAL (includes match)	0	100	$0	$24,120,000	$24,120,000	$9,321,056	$14,798,944
STATE (includes match)	0	100	$0	$38,190,000	$38,190,000	$630,533	$37,559,467
STP	80	20	$0	$54,270,000	$54,270,000	$0	$54,270,000
L-STP	80	20	$34,000,000	$19,095,000	$53,095,000	$7,477,900	$45,617,100
NHPP	80	20	$0	$106,530,000	$106,530,000	$0	$106,530,000
HSIP	90	10	$0	$14,070,000	$14,070,000	$0	$14,070,000
Subtotal			**$49,000,000**	**$261,300,000**	**$310,300,000**	**$20,796,102**	**$289,503,898**
Plus Other Funding:							
TA (active projects only)	80	20	$0	$1,458,028	$1,458,028	$922,887	$535,141
TOTAL			**$49,000,000**	**$262,758,028**	**$311,758,028**	**$21,718,988**	**$290,039,040**

Note: L-STP expenditures include active transportation projects in some horizon years when TA revenues did not cover costs

Table 9-3: Roadway, Active, and Operations Cost vs. Revenue, Horizon Year 2015

Horizon Year 2015							
Funding Category	**Fed %**	**State/ Local %**	**Carry Over**	**New Revenue**	**Total Revenue**	**Expenditures**	**Balance (Carry Over)**
CMAQ	80	20	$1,658,387	$2,550,250	$4,208,637	$2,603,231	$1,605,406
HPP	80	20	$15,000,000	$0	$15,000,000	$89,099	$14,910,901
LOCAL (includes match)	0	100	$14,798,944	$12,241,200	$27,040,144	$3,817,820	$23,222,324
STATE (includes match)	0	100	$37,559,467	$19,381,900	$56,941,367	$518,985	$56,422,382
STP	80	20	$54,270,000	$27,542,700	$81,812,700	$0	$81,812,700
L-STP	80	20	$45,617,100	$9,690,950	$55,308,050	$9,693,391	$45,614,659
NHPP	80	20	$106,530,000	$54,065,300	$160,595,300	$83,038	$160,512,262
HSIP	90	10	$14,070,000	$7,140,700	$21,210,700	$0	$21,210,700
Subtotal			**$289,503,898**	**$132,613,000**	**$422,116,898**	**$16,805,564**	**$405,311,335**
Plus Other Funding:							
TA (active projects only)	80	20	$535,141	$739,967	$1,275,108	$1,245,565	$29,544
TOTAL			**$290,039,040**	**$133,352,967**	**$423,392,007**	**$18,051,129**	**$405,340,878**

Note: L-STP expenditures include active transportation projects in some horizon years when TA revenues did not cover costs

Table 9-4: Roadway, Active, and Operations Cost vs. Revenue, Horizon Years 2016-2019

Horizon Years 2016 – 2019							
Funding Category	**Fed %**	**State/ Local %**	**Carry Over**	**New Revenue**	**Total Revenue**	**Expenditures**	**Balance (Carry Over)**
CMAQ	80	20	$1,605,406	$10,616,760	$12,222,166	$12,215,663	$6,503
HPP	80	20	$14,910,901	$0	$14,910,901	$12,028,470	$2,882,431
LOCAL (includes match)	0	100	$23,222,324	$50,960,447	$74,182,771	$52,710,368	$21,472,403
STATE (includes match)	0	100	$56,422,382	$80,687,375	$137,109,757	$121,902,263	$15,207,494
STP	80	20	$81,812,700	$114,661,006	$196,473,706	$104,833,845	$91,639,862
L-STP	80	20	$45,614,659	$40,343,687	$85,958,347	$51,562,902	$34,395,444
NHPP	80	20	$160,512,262	$225,075,309	$385,587,571	$375,344,509	$10,243,062
HSIP	90	10	$21,210,700	$29,726,928	$50,937,628	$49,114,840	$1,822,788
Subtotal			**$405,311,335**	**$552,071,511**	**$957,382,846**	**$779,712,860**	**$177,669,986**
Plus Other Funding:							
TA (active projects only)	80	20	$29,544	$3,080,504	$3,110,047	$2,584,272	$525,775
TOTAL			**$405,340,878**	**$555,152,015**	**$960,492,894**	**$782,297,133**	**$178,195,761**

Note: L-STP expenditures include active transportation projects in some horizon years when TA revenues did not cover costs

Table 9-5: Roadway, Active, and Operations Cost vs. Revenue, Horizon Years 2020-2024

Horizon Years 2020 – 2024							
Funding Category	**Fed %**	**State/ Local %**	**Carry Over**	**New Revenue**	**Total Revenue**	**Expenditures**	**Balance (Carry Over)**
CMAQ	80	20	$6,503	$15,092,494	$15,098,997	$9,676,736	$5,422,261
HPP	80	20	$2,882,431	$0	$2,882,431	$0	$2,882,431
LOCAL (includes match)	0	100	$21,472,403	$72,443,971	$93,916,374	$91,438,380	$2,477,994
STATE (includes match)	0	100	$15,207,494	$114,702,955	$129,910,448	$105,602,791	$24,307,657
STP	80	20	$91,639,862	$162,998,936	$254,638,797	$203,284,813	$51,353,984
L-STP	80	20	$34,395,444	$57,351,477	$91,746,922	$58,221,100	$33,525,822
NHPP	80	20	$10,243,062	$319,960,874	$330,203,935	$252,458,914	$77,745,021
HSIP	90	10	$1,822,788	$42,258,983	$44,081,771	$43,808,876	$272,895
Subtotal			**$177,669,986**	**$784,809,690**	**$962,479,676**	**$764,491,611**	**$197,988,064**
Plus Other Funding:							
TA (active projects only)	80	20	$525,775	$4,379,160	$4,904,935	$4,562,350	$342,584
TOTAL			**$178,195,761**	**$789,188,849**	**$967,384,610**	**$769,053,961**	**$198,330,649**

Note: L-STP expenditures include active transportation projects in some horizon years when TA revenues did not cover costs

Table 9-6: Roadway, Active, and Operations Cost vs. Revenue, Horizon Years 2025-2029

Horizon Years 2025 – 2029							
Funding Category	**Fed %**	**State/ Local %**	**Carry Over**	**New Revenue**	**Total Revenue**	**Expenditures**	**Balance (Carry Over)**
CMAQ	80	20	$5,422,261	$17,496,337	$22,918,598	$0	$22,918,598
HPP	80	20	$2,882,431	$0	$2,882,431	$0	$2,882,431
LOCAL (includes match)	0	100	$2,477,994	$83,982,418	$86,460,412	$83,898,771	$2,561,640
STATE (includes match)	0	100	$24,307,657	$132,972,162	$157,279,819	$91,611,224	$65,668,595
STP	80	20	$51,353,984	$188,960,440	$240,314,424	$229,546,798	$10,767,626
L-STP	80	20	$33,525,822	$66,486,081	$100,011,902	$71,822,440	$28,189,462
NHPP	80	20	$77,745,021	$370,922,345	$448,667,367	$245,321,883	$203,345,483
HSIP	90	10	$272,895	$48,989,744	$49,262,638	$45,359,644	$3,902,995
Subtotal			**$197,988,064**	**$909,809,527**	**$1,107,797,591**	**$767,560,761**	**$340,236,830**
Plus Other Funding:							
TA (active projects only)	80	20	$342,584	$5,076,646	$5,419,231	$3,182,673	$2,236,558
TOTAL			**$198,330,649**	**$914,886,173**	**$1,113,216,821**	**$770,743,434**	**$342,473,388**

Note: L-STP expenditures include active transportation projects in some horizon years when TA revenues did not cover costs

Table 9-7: Roadway, Active, and Operations Cost vs. Revenue, Horizon Years 2030-2034

Horizon Years 2030 – 2034							
Funding Category	**Fed %**	**State/ Local %**	**Carry Over**	**New Revenue**	**Total Revenue**	**Expenditures**	**Balance (Carry Over)**
CMAQ	80	20	$22,918,598	$20,283,050	$43,201,648	$41,753,954	$1,447,694
HPP	80	20	$2,882,431	$0	$2,882,431	$0	$2,882,431
LOCAL (includes match)	0	100	$2,561,640	$97,358,640	$99,920,280	$81,834,710	$18,085,570
STATE (includes match)	0	100	$65,668,595	$154,151,180	$219,819,774	$109,782,732	$110,037,042
STP	80	20	$10,767,626	$219,056,939	$229,824,565	$196,658,382	$33,166,183
L-STP	80	20	$28,189,462	$77,075,590	$105,265,052	$84,500,389	$20,764,663
NHPP	80	20	$203,345,483	$430,000,659	$633,346,142	$302,573,059	$330,773,083
HSIP	90	10	$3,902,995	$56,792,540	$60,695,535	$60,524,856	$170,678
Subtotal			**$340,236,830**	**$1,054,718,597**	**$1,394,955,427**	**$877,628,083**	**$517,327,344**
Plus Other Funding:							
TA (active projects only)	80	20	$2,236,558	$5,885,224	$8,121,782	$6,265,408	$1,856,374
TOTAL			**$342,473,388**	**$1,060,603,821**	**$1,403,077,209**	**$883,893,491**	**$519,183,718**

Note: LOCAL expenditures include active transportation projects in some horizon years when TA revenues did not cover costs

Table 9-8: Roadway, Active, and Operations Cost vs. Revenue, Horizon Years 2035-2040

Horizon Years 2035 – 2040							
Funding Category	**Fed %**	**State/ Local %**	**Carry Over**	**New Revenue**	**Total Revenue**	**Expenditures**	**Balance (Carry Over)**
CMAQ	80	20	$1,447,694	$28,647,919	$30,095,613	$26,969,775	$3,125,837
HPP	80	20	$2,882,431	$0	$2,882,431	$0	$2,882,431
LOCAL (includes match)	0	100	$18,085,570	$137,510,011	$155,595,581	$153,763,030	$1,832,551
STATE (includes match)	0	100	$110,037,042	$217,724,185	$327,761,227	$129,163,353	$198,597,873
STP	80	20	$33,166,183	$309,397,526	$342,563,709	$324,838,691	$17,725,018
L-STP	80	20	$20,764,663	$108,862,092	$129,626,756	$114,059,340	$15,567,416
NHPP	80	20	$330,773,083	$607,335,884	$938,108,966	$473,952,611	$464,156,355
HSIP	90	10	$170,678	$80,214,173	$80,384,851	$70,297,000	$10,087,852
Subtotal			**$517,327,344**	**$1,489,691,790**	**$2,007,019,134**	**$1,293,043,800**	**$713,975,333**
Plus Other Funding:							
TA (active projects only)	80	20	$1,856,374	$8,312,331	$10,168,705	$8,431,347	$1,737,358
TOTAL			**$519,183,718**	**$1,498,004,121**	**$2,017,187,839**	**$1,301,475,148**	**$715,712,691**

Note: LOCAL expenditures include active transportation projects in some horizon years when TA revenues did not cover costs

Roadway Operation and Maintenance (O&M)

Operating and maintaining the transportation system is an important aspect in ensuring that investments to improve, widen, or expand the transportation system are maintained. If the new improvements or existing roadways are not maintained properly, then the transportation system is not functioning at its capacity and the new investments are not fully realized. Local governments are cutting programs and projects in order to meet other budgetary needs and that includes not expanding or building new highways or placing greater emphasis on maintaining existing roadways since it is often less expensive than building new roadways. Therefore, jurisdictions are ensuring that they budget enough money in order to maintain and preserve their current transportation system. This section details the street and highway operations and maintenance costs associated with sustaining the existing system and the new improvements proposed in this Plan.

Local and State Operations and Maintenance Revenues

Operating budgets for each jurisdiction for the period of fiscal year 2010/2011 were reviewed to determine the current revenues used on street and highway operations and maintenance (O&M) activities. The O&M activities include sidewalk/greenway/street and signal maintenance, resurfacing, street striping, street lighting and other expenses related to operating and maintaining the jurisdictions' facilities.

Each jurisdiction identifies O&M activities differently within their individual operating budgets and some jurisdictions incur significantly higher costs than others such as those which maintain street lights versus those that do not provide much if any street lighting. Table 9-9 identifies the estimated costs for O&M activities for the major jurisdictions with the TPO Planning Area for which FY 2010/2011 operating budget information was available. This table also identifies the amount of lane miles of major roadways within the TPO Planning Area for each jurisdiction. A major roadway is defined as one that is included on the Federal-aid functional classification system.

Cost per Network Year to Maintain Transportation System

Costs associated with operating and maintaining the transportation system were derived from calculating a cost per lane mile and applying this cost to the number of lane miles built in each network year. It is assumed that the same level of operation and maintenance currently applied to the transportation system will be available in the future out years. Table 9-9 displays the urban areas current cost per lane mile.

Table 9-9: TPO Planning Area Current Operation and Maintenance Cost, per Lane Mile

Jurisdiction	O&M Costs	2010 Major Roadway Lane Miles
City of Knoxville	$11,292,000	995
Town of Farragut	$437,000	94
Knox County	$9,713,000	834
City of Maryville	$720,000	142
City of Alcoa	$651,000	144
Blount County	$1,170,000	406
Seymour/Sevier County	N/A	96
Lenoir City	$195,000	82
Loudon County	$854,000	293
City of Oak Ridge	$827,000	215
Anderson County	$1,757,000	231
Total TPO Planning Area	**$27,616,000**	**3,532**

Source: Individual jurisdictions

In order to determine financial constraint for O&M activities it is assumed that the total revenues and costs would increase by 3 percent since it is assumed that the same level of O&M currently applied to the transportation system will be available in the future out years. Table 9-10 displays the total expected costs and revenues for the life of the KRMP grouped by major horizon year.

Table 9-10: O&M Costs vs. Revenues, by Horizon Year (Adjusted for Inflation)

Jurisdiction	2011 – 2014			2015 – 2024			2025 – 2034		
	Costs	Revenues	Balance	Costs	Revenues	Balance	Costs	Revenues	Balance
Knoxville	47,241,516	47,241,516	-	145,697,256	145,697,256	-	195,804,929	195,804,929	-
Farragut	1,828,245	1,828,245	-	5,638,479	5,638,479	-	7,577,644	7,577,644	-
Knox Co	40,635,569	40,635,569	-	125,323,898	125,323,898	-	168,424,839	168,424,839	-
Maryville	3,012,211	3,012,211	-	9,289,942	9,289,942	-	12,484,905	12,484,905	-
Alcoa	2,723,541	2,723,541	-	8,399,656	8,399,656	-	11,288,435	11,288,435	-
Blount Co	4,894,844	4,894,844	-	15,096,156	15,096,156	-	20,287,971	20,287,971	-
Lenoir City	815,807	815,807	-	2,516,026	2,516,026	-	3,381,328	3,381,328	-
Loudon Co	3,572,817	3,572,817	-	11,018,903	11,018,903	-	14,808,485	14,808,485	-
Oak Ridge	3,459,860	3,459,860	-	10,670,531	10,670,531	-	14,340,301	14,340,301	-
Anderson Co	7,350,633	7,350,633	-	22,670,039	22,670,039	-	30,466,637	30,466,637	-
TOTAL	**115,535,043**	**115,535,043**	-	**356,320,885**	**356,320,885**	-	**478,865,473**	**478,865,473**	-

Source: Individual jurisdictions

Jurisdiction	2035 – 2040			2011 – 2040 Summary		
	Costs	Revenues	Balance	Costs	Revenues	Balance
Knoxville	148,477,892	148,477,892	-	537,221,594	537,221,594	-
Farragut	5,746,089	5,746,089	-	20,790,457	20,790,457	-
Knox Co	127,715,708	127,715,708	-	462,100,013	462,100,013	-
Maryville	9,467,241	9,467,241	-	34,254,299	34,254,299	-
Alcoa	8,559,964	8,559,964	-	30,971,596	30,971,596	-
Blount Co	15,384,266	15,384,266	-	55,663,236	55,663,236	-
Lenoir City	2,564,044	2,564,044	-	9,277,206	9,277,206	-
Loudon Co	11,229,199	11,229,199	-	40,629,405	40,629,405	-
Oak Ridge	10,874,178	10,874,178	-	39,344,869	39,344,869	-
Anderson Co	23,102,697	23,102,697	-	83,590,005	83,590,005	-
TOTAL	**363,121,279**	**363,121,279**	-	**1,313,842,680**	**1,313,842,680**	-

Source: Individual jurisdictions

Financial Constraint

Street and highway operation and maintenance expenses are financially constrained for the life of this Plan as demonstrated in Table 9-10. A review was made of the increase in lane miles of major roadways based on the projects identified in the KRMP as a reasonableness check for O&M financial constraint. Table 9-11 shows the increase in lane miles that will need to additionally be maintained due to the implementation of the projects in the KRMP. The overall growth of 289 lane miles represents a growth amount of 8.2 percent for the entire life of the KRMP, which translates to an annual average increase in lane miles of less than 0.3 percent. It is believed that this small percentage increase should be manageable in terms of jurisdictional O&M budgeting.

Table 9-11: Total Lane Miles of Major Roadways by Horizon Year

	2010	2014	2024	2034	2040
TPO Planning Area	3,532	3,539	3,662	3,770	3,821

Source: Knoxville Regional Travel Demand Model (KRTM)

Roadway Funding Sources

Federal Funding

The greatest funding source for roadway projects is from the federal government. The Federal-Aid Highway Act and the Highway Revenue Act in 1956 established the Highway Trust Fund in order to create a financing mechanism for the Interstate Highway System. This is the source of funding for most of the programs in the Act. The funds come from a motor fuels tax and are administered by the Federal Highway Administration (FHWA). MAP-21 drastically simplified the funding categories, which for roadway include the following.

National Highway Performance Program (NHPP)

Roadways eligible for this funding include rural and urban roads serving major population centers, other rural and urban principal arterials, the Interstate system, international border crossings, intermodal transportation facilities, and major travel destinations. The NHPP provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS. Other areas of eligible funding are publicly owned bus terminals, infrastructure-based intelligent transportation system capital improvements, and natural habitat mitigation. These funds are distributed based on a formula that includes each state's lane miles of principal arterials (excluding interstates), vehicle miles traveled on those arterials, diesel fuel used on state highways, and per capita principal arterial lane miles. For FY2013, the State of Tennessee receives approximately $494 million under this program.

Highway Safety Improvement Program (HSIP)

The purpose of this program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal land. MAP-21 significantly increased HSIP funding from previous years in an effort to emphasize a focus on safety. For FY 2013, the State of Tennessee receives approximately $50 million under this program.

Surface Transportation Program (STP)
Projects eligible for funding under this program include construction, reconstruction, and rehabilitation (major resurfacing) of any Federal Aid Highway, including the NHS, rural minor collectors, bridge projects on any public road, transit capital projects, enhancement projects, and public bus terminals and facilities. Additionally the program funds advanced truck stop electrification systems, projects relating to intersections, which are on a Federal-aid highway that have high accident rates and high congestion, and environmental restoration and pollution abatement. Funds are distributed based on each state's lane miles of Federal Aid Highways, total vehicle-miles traveled on those highways, and estimated contributions to the Highway Account of the Highway Trust Fund.

In general, STP projects may not be on local or rural minor collectors. However, there are a number of exceptions to this requirement. A State may use up to 15percent of its rural suballocation on minor collectors. Special rule allows States to use up to 15 percent of funds suballocated for areas with a population of 5,000 or less on rural minor collectors. Other exceptions include: ADHS local access roads, bridge and tunnel replacement and rehabilitation (not new construction), bridge and tunnel inspection, carpool projects, fringe/corridor parking facilities, bike/pedestrian walkways, safety infrastructure, Transportation Alternatives, recreational trails, port terminal modifications, and minor collectors in NHS corridors. For FY 2013, the State of Tennessee receives approximately $227 million per year. The TPO receives approximately $9.5 million in STP funds for FY 2013.

Congestion Mitigation and Air Quality (CMAQ)
The CMAQ program was designed to assist non-attainment and maintenance areas in attaining the National Ambient Air Quality Standards for ozone, carbon monoxide (CO), and particulate matter by funding transportation projects and programs that will improve air quality by reducing transportation related emissions. There is a balance of approximately $15 million for designated projects in the TPO area.

High Priority Projects (HPP)
MAP-21 ended the tradition of past highway bills by no longer providing designated funding for specific projects identified by Congress. The TPO still holds a balance in this category from previous years under SAFETEA-LU. It anticipates approximately $3 million for the first five years of the Plan.

State Funding (STATE)

In addition to the Highway Trust Fund allocations, the State of Tennessee has two types of funds to finance street and highway projects.

1986 Roads Program
In 1986, the Tennessee State Legislature passed an aggressive pay-as-you-go Transportation Improvement Program. Identified in legislation were a number of transportation projects that were funded via a special tax of 4 cents per gallon of gasoline and 3 cents for motor fuel.

Fuel Taxes
This source of funding is utilized by TDOT to support transportation improvements throughout the entire State. The current gasoline tax amount is 21.4 cents per gallon. Part of the money that is maintained by TDOT is used for ongoing maintenance and operations, resurfacing, bridges, major reconstruction, new construction, right-of-way purchases and to match federal funds.

Local Funding (LOCAL)

Local towns, cities, and counties use their respective General Fund as the primary source of funding for operations and maintenance. Some counties have instituted a local wheel tax in addition to the State motor vehicle registration fee to build the general fund. Local jurisdictions also provide funding in full or to match federal or state funds for local transportation projects. Money for capital investments in streets and highways may also come from the sale of bonds.

Locally, the jurisdictions in the TPO Area have alternative sources of funding authorized by the state enabling legislation to finance transportation projects. These sources of funding can include rail authorities, local gasoline tax, local motor vehicle taxes, and road improvement districts. These sources can help to generate a steady flow of funding for transportation improvements. The following describes these options as well as other local funding tools available to local jurisdictions:

Special Assessment Districts
Special Assessment Districts are designated areas within which commercial and residential property is assessed a charge sufficient to defray the costs of capital improvements that benefit the property within the district. Transportation Development Districts (TDDs) are one example of these districts used to finance transportation improvements. The TDD has the power to issue bonds to pay for construction that can benefit the area instead of waiting for the local jurisdiction to fund the project. These districts work best in small, fast growing suburban areas where the tax base is low and the tax rate is high.

Impact and Utility Fees
This one-time fee is imposed by local governments on new developments to help pay for the capital facilities, mainly extending utilities and putting in traffic enhancements and transit facilities that serve it. A fee is

typically assessed on the square footage of the planned development and in some cases, the granting of a building permit is made contingent on payment of the fee. To implement this impact fee, it must be demonstrated that

1.) Improvements are necessary and are caused by the new development,
2.) Each developer is charged a fair share of the cost of the improvements, and
3.) Funds collected are to be used in close proximity to the new development and for the intended purposes only.

These fees are enacted by the local ordinance and are usually favorable because the new development is creating these development needs and without these fees, the burden to pay for these expenses falls on taxpayers. The upper limit on impact fees is around 3 percent of project value, however, enforcing and administrating this fee is burdensome to the local government.

Bond Financing
Bond financing helps local government pay for projects by establishing a type of payment plan that allows capital costs to be spread out over a number of years.

Property Taxes
This is the chief source of local revenue. The funds are distributed to a General Fund and then appropriated for transportation purposes. These taxes are dependent on local economic conditions. Typically, they remain a steady and reliable source of revenue, however in recent years, due to a decline in home values, local governments across the country have seen these revenues decline significantly. A separate tax for transit operations and capital can be administered by voter approval.

Local Gasoline Taxes
Counties, municipalities, and metropolitan governments are authorized under Section 67-3-101 to 67-3-1013 of the Tennessee Code Annotated to impose a local gasoline tax to support local public transportation services. Imposition of the tax requires a majority vote in public referendum. The tax revenue depends on tax rate, driver sensitivity to price, administrative costs, population, and real travel patterns.

Sales Taxes
This is one of the most commonly used and the second largest source of local revenue for state and local jurisdictions in the country. This tax is placed on the sale of consumer goods and services, and purchases by business firms of items for business use. The tax is a function of the tax rate, use of funds and of redistribution formulas. A sales tax is generally more acceptable to citizens than other taxes since the tax is collected in small

amounts that are not highly visible to consumers. The State applies a sales tax of 5.25 percent on food items and 7.00 percent on all other items. Local option sales taxes within the TPO Area counties range from a low of 2.00 percent in Loudon County to a high of 2.75 percent in Anderson, Jefferson, and Sevier Counties.

Wheel Taxes

Counties are authorized under Section 5-8-102 of the Tennessee Code Annotated to impose a local motor vehicle tax to provide revenue for county purposes. Imposition of the tax requires a majority vote in public referendum of a two-thirds vote from the county legislators at two consecutive meetings. Revenue potential of the local motor vehicle tax depends on the tax rate, driver sensitivity to price, administrative costs, and the number of registered vehicles. The high tax rate may encourage some motorists to register their vehicle in a county that does not have local motor vehicle tax. Administrative costs are likely to be low because local motor vehicle departments are already organized to collect state taxes and fees. A disadvantage of this tax is that the tax revenues do not have to be earmarked for transportation.

Other Taxes

Other taxes that can be used to generate revenue include payroll tax, income tax, severance tax, driver's license fees, and a parking tax. The payroll, income, and parking tax are used in relatively few states but can offer small additional revenue sources. The severance tax can be imposed on resources extracting industries such as oil, gas, coal, or other natural products. This tax is used to help pay for the cost of providing roads to these industries. The driver's license fee has limited revenue potential but it does offer a stable source of money.

Public Transportation

The Federal Transit Administration (FTA) administers funds to state and local governments for operating and capital assistance for public transportation activities. The new transportation act Moving Ahead for Progress in the 21st Century Act (MAP-21) made significant changes to the FTA grant programs. FTA eliminated some grant programs, merged others, and created a few new programs. As MAP-21 became effective October 1, 2012 there is very little historical data to base future funding projections. In addition, MAP-21 is only a two-year transportation act so understanding the long-term financial implications is difficult. The TPO and KAT staff used a combination of historical trends, industry forecasts, local knowledge, and FTA information to project future expenses, revenues, and capital needs.

In the past, FTA Section 5307 funds could only be used for capital items or maintenance, but under MAP-21, for transit systems of Knoxville size, some of the funding can be used for operations. Typically, FTA provides 80 percent funding for capital projects and 50 percent funding for operations. Most of FTA's grant programs use

complicated formulas that consider urban area population, the numbers of transit trips provided, and the number of transit miles driven to determine how much funding comes to an area each year. The Tennessee Department of Transportation (TDOT) provides funds for capital and operating assistance to local transit operators. TDOT also provides matching funds, typically up to 50 percent of the non-federal share, for FTA grants.

Financial Analysis

In order to project revenues a trend analysis of KAT's past budgets was undertaken. Fifteen years of data (1999 to 2013) were examined and the average annual percent growth is shown in Table 9-12, below. In reviewing the annual growth rates, TPO and KAT felt some of the percentages needed adjustment. The staff looked not only at the trend line data, but also past studies including, the KAT Transit Development Plan (2009) and the Knoxville Regional Corridor Study (2012). Also taken into consideration were the rates used in the last Mobility Plan (2009).

The trend-line data were examined in detail to be sure no anomalies were causing the percentages to be abnormally low or high. One thing that stood out was 2003 when KAT implemented the University of Tennessee transit service. While the University of Tennessee pays, in part, for the service, it did cause the expenses and revenues for that year to jump significantly. So, it was determined to remove 2003 from the trend analysis. Over the 15 years, KAT also has had other major expansions. Examples include, when KAT began to provide Job Access & Reverse Commute (JARC) services and more recently the opening of Knoxville Center. Originally paid for by a federal grant, the JARC service was eventually absorbed by KAT when the grant ended.

KAT has also increased its operating budget to pay for the operations of the new Knoxville Center. So, the average annual increase of 5.75 percent for operating expenses was determined to be artificially high. Therefore, the annual average percentage increase for operating expense was reduced to 4.5 percent, the same percentage used in the 2009 Mobility Plan. In projecting expenses and revenues, the goal was to remain as conservative as possible. Table 9-12, below shows the results of the consultation and the recommended adjustments. KAT is a non-profit organization overseen by the City of Knoxville. As a non-profit, all fiscal year budgets end with a zero balance. Any shortfalls are covered by the City's contribution and conversely any overage is returned to the City's general fund.

Table 9-12: KAT Financial Spreadsheet Assumptions

Source	Trend Analysis Result (1999-2013)*	2034 Mobility Plan (2009)	Revised Forecast For 2040 Mobility Plan (2013)
City of Knoxville (Revenue)	5.29%	3.87%	4.75%
State of Tennessee (Revenue)	4.93%	2.41%	2.50%
Federal, Other State Sources (Revenue)	4.61%	5.00%	4.00%
Fares (Revenue)	6.72%	5.00%	4.87%
Other funding (Revenue)	NA	2.50%	0.00%
Operating Expense	5.75%	4.50%	4.50%

*The average annual percent increase from 2002-2003, when KAT begin the University of Tennessee data was not counted
Source: Knoxville Area Transit (KAT)

Public Transportation Capital Expenses

Maintaining an up-to-date fleet of vehicles is necessary in providing effective transit service. Vehicles are the most visible component of KAT traveling millions of miles throughout the City every year. Many passengers will determine satisfaction with their trip based on cleanliness, comfort, and the internal climate of the bus. Paramount to transit's ultimate success is the ability of buses to stay on time. Any mechanical failure causing a bus to break down leaving passengers stranded is a serious issue. It is impossible to eliminate all mechanical failures but by maintaining an up-to-date fleet, incidents will be dramatically reduced. Therefore, an equal component in planning is to calculate KAT's capital needs.

KAT essentially uses three vehicle types.

- Buses are used for regular fixed route services.
- Trolleys are used on the downtown circulator.
- Lift equipped vans are used on neighborhood fixed routes and in providing ADA paratransit services.

Table 9-13, below shows the estimated cost of buses, trolleys, and lift vans (neighborhood service vans) over the period of the Plan. The cost of buses and heavy-duty trolleys has increased at an average of 2.1 percent per year over the last five years. Therefore, this rate was used to inflate the cost of buses and trolleys annually over the life of the plan. For the Lift and Service vans, a rate of 1.0 percent per year was used. The lift and service vans have not seen the same rate of increase over the last five years. The costs are broken down by the horizon years of the Mobility Plan.

Table 9-13: KAT Vehicle Unit Cost

Years	Bus	Trolley	Lift Van/Service Van
2013-2014	$382,875	$459,450	$70,700
2015	$390,915	$469,098	$71,407
2016-2019	$423,752	$508,503	$74,263
2020-2024	$468,246	$561,896	$77,976
2025-2029	$517,412	$620,895	$81,875
2030-2034	$571,740	$686,088	$85,969
2035-2040	$643,780	$772,536	$91,127

Source: Knoxville Area Transit (KAT)

Table 9-14, below shows the number of vehicles needed to maintain the current level of service over the next 28 years. This is essentially a replacement plan for the existing KAT fleet. To keep the table manageable, the number of vehicles needed are totaled and shown by the horizon years of the plan.

Table 9-14: KAT Vehicle Needs

Horizon Years	Buses	Trolleys	Lift Vans/Service Vans
2013-2014	10	3	10
2015	5	0	5
2016-2019	20	0	20
2020-2024	25	7	25
2025-2029	25	3	25
2030-2034	25	4	25
2035-2040	30	6	30
Total Units	**140**	**23**	**140**

Source: Knoxville Area Transit (KAT)

Over the course of the Mobility Plan KAT would need to purchase approximately 140 buses, 140 lift vans (neighborhood service vans), and 23 trolleys. Using the estimated vehicle costs and the capital needs, the amount of funding needed is shown in Table 9-15, below. To keep the table manageable the funding is totaled for the horizon years of the Plan.

Table 9-15: KAT Vehicle Needs, 2013-2040

Years	Buses	Trolleys	Lift Vans / Service Vans	Total
Expenses				
2013-2014	$3,828,750	$1,378,350	$707,000	$5,914,100
2015	$1,954,577	$0	$357,035	$2,311,612
2016-2019	$8,475,045	$0	$1,485,266	$9,960,311
2020-2024	$11,706,156	$3,933,269	$1,949,411	$17,588,836
2025-2029	$12,935,303	$1,862,684	$2,046,882	$16,844,868
2030-2034	$14,293,510	$2,744,354	$2,149,226	$19,187,089
2035-2040	$19,313,390	$4,635,214	$2,733,815	$26,682,419
Total Expenses	**$72,506,731**	**$14,553,870**	**$11,428,634**	**$98,489,235**
Revenues				
Federal	$58,005,385	$11,643,096	$9,142,907	$78,791,388
State	$7,250,673	$1,455,387	$1,142,863	$9,848,923
Local	$7,250,673	$1,455,387	$1,142,863	$9,848,923
Average Annual Need	**$2,589,526**	**$519,781**	**$408,166**	**$3,517,473**

Source: Knoxville Area Transit (KAT)

Public Transportation Funding Sources

City of Knoxville

Between 1999 and 2013, the City of Knoxville increased its contribution on average by 5.29 percent. The City has increased its contribution to KAT every year for the last fifteen years. As mentioned, part of the City's funding increases include, absorbing the JARC service and paying for the operations of Knoxville Center. It was felt that it was not reasonable to expect the City to continue to increase their contribution by a percentage of 5 percent or greater until 2040. It was felt the amount the City would contribute would eventually level off. Staff agreed to that an adjustment to 4.75 percent a year would be appropriate for the Mobility Plan.

State of Tennessee

The State of Tennessee has increased its contribution nine of the last fifteen years. Between 1999 and 2013, the State increased their contribution by 4.93 percent. For the last five years, the State has slowed their increases. The State of Tennessee, like other states, is going through difficult economic times and tax revenues are unpredictable. To remain conservative, staff decided that an annual percentage rate of 2.5 percent per year would be reasonable for the analysis.

Other Federal and State Sources

This category includes several Federal grants and State revenue sources. This funding category has seen an average annual increase of 4.61 percent from 1999 to 2013. For the 2009 Mobility Plan a 5 percent annual increase was used. With some uncertainty of funding at the federal level, it was decided to remain slightly more conservative and to reduce the annual increase to 4 percent.

Fares

From 1999 to 2013, the annual average increase in fare revenue was 6.72 percent a year. While revenues from fares continue to increase, over the last few years the annual average increase has lessened. KAT over the last few years has continued to see strong ridership increases. However, an increase of 6.72 percent a year is too high. Therefore, staff determined an adjusted annual increase of 4.87 percent would be appropriate.

Other Revenues

This category reflects revenue collected through other programs and grants. Some of this is the subcontracting of special services. From 1999 to 2008, the other revenues category increased by an annual rate of 10.5 percent bringing in almost $500,000 a year. Recent changes in the Federal requirements associated with subcontracting makes predicting revenue under this category difficult. Therefore, to be conservative this funding source was removed from the analysis. However, KAT is dedicated to pursuing other revenues and funding opportunities and expects some revenue in this category.

Public Transportation Financial Constraint

KAT's expenses and revenue sources are forecasted to the year 2040. For the year 2013, KAT's adopted budget is used. From 2013 to 2040, annual calculations were made using the percentages agreed upon by TPO and KAT staff. The Table below shows a snapshot of the forecasts by showing years 2013, 2018, 2028, and 2040. It is projected that KAT's budget would increase from $20.2 million in 2013 to $25.2 million in 2018. By 2028, KAT's budget is projected to be $39.1 million. Finally, in 2040, the last year of the Plan, KAT's budget is projected to be $66.4 million. The percent difference from KAT's projected expenses and revenues are calculated. For this analysis, it was felt that if the difference was not greater than 3 percent over or under, the analysis was acceptable. Forecasting millions of dollars over nearly three decades is not an exact science and it is unreasonable to assume that an analysis of this nature can match expenses and revenues exactly. Based on this analysis, KAT will be able to meet its future expenses.

Table 9-16: KAT Projected Budget and Revenues

Category	2013 (Budgeted)	2018 (Projected)	2028 (Projected)	2040 (Projected)
Revenues				
City	$10,717,240	$13,516,153	$21,497,771	$37,518,184
State	$2,050,750	$2,320,235	$2,970,097	$3,994,451
Federal and Other State Funding	$3,348,960	$4,074,522	$6,031,288	$9,656,286
Fares	$4,121,040	$5,227,128	$8,409,610	$14,879,593
Other Funding Sources	$0	$0	$0	$0
Total Revenue	**$20,237,990**	**$25,138,039**	**$38,908,766**	**$66,048,515**
Total Expenses	**$20,241,090**	**$25,224,080**	**$39,172,226**	**$66,431,450**
Percent Difference Expenses/Revenue	**Less than 1%**	**Less than 1%**	**Less Than 1%**	**Less Than 1%**

Source: Knoxville Area Transit (KAT)

This analysis assumes a no growth scenario. KAT is committed to continue to grow and improve. There have been several studies over the last ten years: the Regional Transportation Alternatives Plan, the KAT Action Plan 2010, and the Knoxville Regional Transit Corridor Study, which call for improved and expanded transit services. The City of Knoxville has been supportive of KAT. If new services are proposed that will result in tangible increases in transit ridership the City will consider providing funding. However, if increases in transit service are going to be made outside the City limits other funding will be required. Transit operators require a predictable and consistent funding source in order to plan and make commitments. Funding needs to be adequate to meet projected level of services and grow as needed to reflect inflation. Many transit agencies across the country have a dedicated funding source, typically set by government via a dedicated tax or fee. This does not exist for KAT at this time.

FTA has a variety of grants that fund capital equipment purchases, including vehicles. Each year, the City of Knoxville (KAT) receives a Section 5307 grant that can be used to purchase capital items. In addition, under MAP-21 Section 5310 and Section 5339 can be used for vehicle purchases. On occasion, KAT will receive a STP funding from the TPO for vehicles. Typically, the State of Tennessee provides half of the local match for FTA grants. While the capital forecasts are for a no-growth scenario, diligence is needed to secure consistent funding. It is estimated that KAT will need to secure approximately $3,517,473 in funding a year to meet the capital needs. Based on federal capital funding secured over the last few years KAT should be able to meet this need, at least, in the short term. However, MAP-21 is only a two-year transportation act so it is hard to predict funding sources too far in the future.

Active Transportation

Overview

A new federal transportation bill, MAP-21, was approved in 2012. The law consolidates many funding programs, including those that fund active transportation projects and programs. The remaining funding programs still have a great deal of flexibility, meaning there are many options for funding pedestrian projects. The Surface Transportation Policy Project has an excellent publication describing the flexibility of those programs available at their website (**www.transact.org**) called From the Margins to the Mainstream: A Guide to Transportation Opportunities in Your Community.

Active transportation projects, which include bicycle, pedestrian, and greenway improvements, do not have as many funding sources as do roadway projects. The TA (Transportation Alternatives) fund is the only fund designated exclusively for active modes in MAP-21, and it has very limited funding levels. The majority of the roadway projects listed in Chapter 8 include bicycle and/or pedestrian accommodations, however calculating the portion of a project devoted to active modes is virtually impossible. In addition to TA funds, the TPO and local jurisdictions are free to use LOCAL and L-STP (Local STP) funds on active transportation projects. Those projects are listed in the Active Transportation section of Chapter 8 and are constrained within the LOCAL and L-STP categories in the Roadways constraint section of this chapter.

Funding estimates show that costs of projects eligible for TA funds exceed anticipated revenues. This means that remaining projects are eligible to compete with roadway projects for LOCAL and L-STP funds. To better determine which projects receive these limited funds, each project has been scored and prioritized based on a list of criteria, which include:

- Congestion management
- Multimodal choices
- Freight and goods movement
- Safety and security
- System preservation
- Quality growth
- Economic prosperity
- Health and environment
- Local support and consistency with plans

- Bonus given based on output from the Travel Demand Model assessment of congestion

Project that scored lower based on these criteria moved to later horizon years and some moved to a non-constrained wish list. None of the active transportation projects moved to the wish list during process.

Table 9-17: Transportation Alternative (TA) Funds

Horizon Years	Fed %	State/ Local %	Carry Over	New Revenues	Total Revenue	Expenditures	Balance (Carry Over)
Horizon Year 2013-2014	80	20	$0	$1,458,028	$1,458,028	$922,887	$535,141
Horizon Year 2015	80	20	$535,141	$739,967	$1,275,108	$1,245,565	$29,544
Horizon Year 2016-2019	80	20	$29,544	$3,080,504	$3,110,047	$2,584,272	$525,775
Horizon Year 2020-2024	80	20	$525,775	$4,379,160	$4,904,935	$4,562,350	$342,584
Horizon Year 2025-2029	80	20	$342,584	$5,076,646	$5,419,231	$3,182,673	$2,236,558
Horizon Year 2030-2034	80	20	$2,236,558	$5,885,224	$8,121,782	$6,265,408	$1,856,374
Horizon Year 2035-2040	80	20	$1,856,374	$8,312,331	$10,168,705	$8,431,347	$1,737,358
			$0	**$28,931,860**	**$28,931,860**	**$27,194,503**	**$1,737,358**

Transportation Alternatives (TA)

The Transportation Alternatives (TA) program is a major source of funding for bicycle and pedestrian projects. Bicycle, Pedestrian, and Greenway projects also competed with roadway projects for a small amount of money within Local STP (L-STP) funding. There are six categories of programs and projects eligible for TA funds:

1.) **On-road and off-road trail facilities** — Construction, planning, and design of bike/ped infrastructure

2.) **Safe routes for non drivers** — Also bike/ped infrastructure, specifically mentioning children, older adults, and individuals with disabilities

3.) **Abandoned railroad corridors for trails** — Conversion of rail corridors for pedestrians and bicyclists, or other non-motorized transportation users

4.) **Turnouts, overlooks, and viewing areas** — Apparently roadside facilities previously included in the scenic byways program

5.) **Community improvement activities** — Rights-of-way improvements: billboards, historic and archeological preservation, and vegetation management and erosion control (analogous to Landscaping in TE)

6.) **Environmental mitigation** — Stormwater management, wildlife mortality, and "connectivity among terrestrial or aquatic habitats"

State Funding

TDOT's main role in enhancing roadways for pedestrian use is to incorporate sidewalks, additional lanes, and increased shoulder widths into the design of new roadways and roadway enhancements. Having these designs in place minimizes the cost of having to implement these into existing roads. TDOT also matches funds for bicycle and pedestrian facilities.

Local Funding

Local governments provide funding for sidewalks and greenways as part of construction projects. They can also apply to TDOT to receive funding under the Transportation Enhancement Program.

Looking for New Funding Sources

Funding is Unreliable and not Keeping Up with Rising Costs

While the costs have very recently fluctuated and even dropped in some instances, in general, transportation construction costs have risen quickly in the last 10 years. A major factor is oil prices. An example of how these resources affect us besides at the pump is in asphalt prices. The price of asphalt more than doubled in Tennessee from January 2008 to December 2008, reflected in the spike in Figure 9-1.

Figure 9-1: National Increase in Transportation Construction Costs, June 1986–2010

Source: U.S. Department of Labor, Bureau of Labor Statistics. Producer Price Index Industry Data, Material and Supply Inputs to Highway and Street Construction. 1986-2010. Data extracted July 13, 2012.

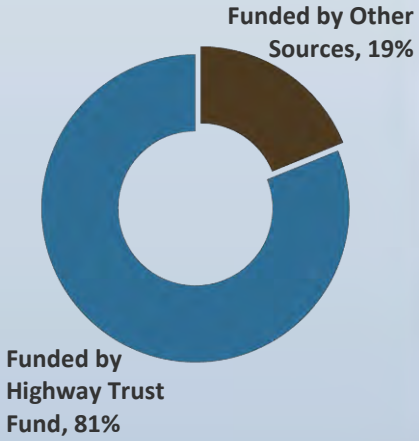


Figure 9-2: Transportation Funding from Highway Trust Fund versus Outside Sources, FY2008-2014

Revenues from state and federal transportation sources are not keeping up with growing needs. Each year, to continue to pay for the same services and maintain the same number of roads, revenues (taxes) need to adjust to keep up with inflation. Every year those taxes are not increased by the rate of inflation amounts to a tax cut – which sounds great, but means tough decisions need to be made and often our infrastructure suffers. This costs us in the end, as crumbling roads can lead to costly wear and tear on our vehicles. The federal gas tax has not been increased since 1997, and the Tennessee gas tax has not been increased since 1989, effectively a 26 percent tax cut since 1997. This means that state and local governments are able to make roughly 26 percent fewer improvements to the system than in 1997. In that time, the condition of our infrastructure has continued to get worse. Attempts to adjust the gas tax have failed, and persistently higher pump prices for gasoline will continue to thwart any attempts to adjust the state or federal fuel tax. This will increasingly force local governments to find other means to meet their funding needs. The current federal model for transportation funding is unstable and unsustainable. In Fiscal years 2008 through 2014, 19 percent of federal transportation dollars will come from funds other than the Highway Trust Fund (gas tax) (Figure 9-3). Figure 9-3 shows federal transportation funding each year and the support received from outside funding sources. Other sources include the federal government's general fund or the Leaking Underground Storage Tank (LUST) fund. Fiscal years 2013 and 2014 reflect numbers authorized in MAP-21.

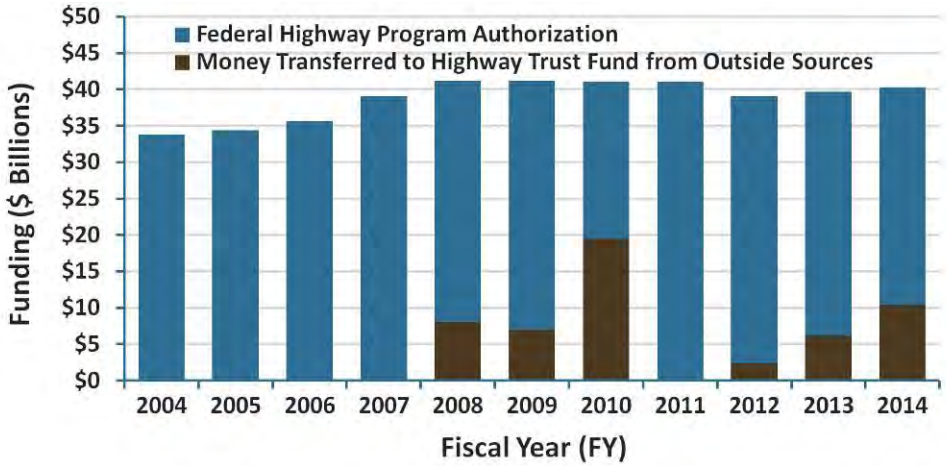


Figure 9-3: Projected Federal Highway Trust Fund Shortfall

Source: (Figure 9-2 and 9-3): AASHTO 2007, Congressional Budget Office (CBO) 2012, MAP-21 Funding Authorizations

The reduced purchasing power of current revenues leads to increased competition for transportation funds. This means less capability to expand, improve, and maintain our infrastructure. Meanwhile, our infrastructure continues to age, requiring more maintenance. Over the next two decades, the gap will grow between the

revenues we have and the investments we need just to keep our roadways and transit services in their current condition.

How Could We Fund Transportation in the Future?

Traditional funding options for our nation's aging infrastructure, including federal, state, and local gas taxes and vehicle taxes and fees, generate less than the amount required to maintain our transportation system. MAP-21 provides some additional funding from general funds to balance the Highway Trust Fund budget, but this is a temporary solution. The costs of projects needed to maintain the system far exceed the revenue generated. There are only four avenues to pursue moving forward:

- Revenue sources will need to increase to meet system needs,
- New revenue sources will need to be identified,
- General funds will continue to supplement the Highway Trust Fund, or
- Transportation investments will need to be cut drastically, threatening the quality of the system.

Raising revenues, either from increasing existing revenue sources or creating new ones, has been very politically unpopular, however the alternatives have presented consequences few people are willing to accept, such as crumbling infrastructure or limiting expansion. The solution may very well include two components. First, identify inexpensive solutions to maximize the efficiency of the system, minimizing the need for physical expansions. This includes travel demand management programs, developing ITS programs that get drivers better information, and making much more targeted physical improvements, such as improving interchanges rather than widen a highway. This is often referred to "Right-Sizing" projects, which simply means finding a less costly solution that delivers the best return on your investment. The second component may include looking at reasonable ways to generate revenue. This is ultimately a decision that will be made by elected officials at the federal, state, and local levels, however a public survey (not statistically valid) that the TPO conducted in October and November of 2012 identified a number of priorities in answering that question of revenues. Those responses are shown below.

you spoke, we listened...

For more information, see complete survey results in Chapter 4

How do you think future transportation projects should be funded?

Use tolls to fund new projects	19.8%
Increase the fuel tax (gas/diesel)	41.6%
Leave taxes at the level they are now	20.8%
Charge new development for transportation improvements	59.4%
Increase sales tax to fund projects	10.1%
Increase property tax to fund projects	21.5%
Other	14.8%

Appendix A: Adoption Letters

Adopting Resolution by Knoxville Regional TPO Executive Board for 2040 Long Range Regional Mobility Plan

**A RESOLUTION BY THE EXECUTIVE BOARD
OF THE KNOXVILLE REGIONAL
TRANSPORTATION PLANNING ORGANIZATION (TPO)
ADOPTING THE 2040 LONG RANGE REGIONAL MOBILITY PLAN**

WHEREAS, the Moving Ahead for Progress in the 21st Century Act (MAP-21) requires that each MPO have a current metropolitan transportation plan; and

WHEREAS, the guidance for the development of the metropolitan transportation plan, as found in the Final Rule for Metropolitan Transportation Planning and Programming in the Federal Register, February 14, 2007 under section 450.322, was followed; and,

WHEREAS, the metropolitan transportation plan must address all modes of transportation in an urban area, have a planning horizon of at least 20 years, and be financially constrained; and,

WHEREAS, the 2040 Long Range Regional Mobility Plan includes the planned improvements to the transportation network for the entire Knoxville Ozone and PM2.5 Maintenance/Nonattainment Areas; and,

WHEREAS, the 2040 Long Range Regional Mobility Plan meets the requirements of transportation conformity found in the Clean Air Act Amendments of 1990; and,

WHEREAS, the TPO's public outreach and Interagency Consultation procedures were adhered to with the 2040 Long Range Regional Mobility Plan and Air Quality Conformity Determination being circulated for public review, presented at more than two open public meetings and coordinated with stakeholder and regulatory agencies through the Interagency Consultation process; and,

WHEREAS, the TPO Technical Committee has recommended the adoption of the 2040 Long Range Regional Mobility Plan; and,

NOW, THEREFORE, BE IT RESOLVED BY THE KNOXVILLE REGIONAL TRANSPORTATION PLANNING ORGANIZATION EXECUTIVE BOARD:

That the 2040 Long Range Regional Mobility Plan be adopted as the basis for transportation planning decisions in the Knoxville air quality non-attainment area including the TPO planning area.

April 24, 2013
Date

Mayor Ralph McGill
Town of Farragut
TPO Executive Board Chair

Jeffrey A. Welch
TPO Director

Adopting Resolution by Knoxville Regional TPO Executive Board for Air Quality Conformity Determination

A RESOLUTION BY THE EXECUTIVE BOARD OF THE KNOXVILLE REGIONAL TRANSPORTATION PLANNING ORGANIZATION (TPO) FINDING THE LONG RANGE REGIONAL MOBIITY PLAN 2040 AND 2011-2014 TRANSPORTATION IMPROVEMENT PROGRAM MEET AIR QUALITY CONFORMITY REQUIREMENTS

WHEREAS, the Clean Air Act Amendments of 1990 (CAAA) and the Moving Ahead for Progress in the 21st Century Act (MAP-21) require that transportation plans and programs conform to air quality goals established by the State Implementation Plan (SIP) for regions in nonattainment of an air pollution standard; and,

WHEREAS, the Knoxville Region is currently designated as a Maintenance Area for the 1997 8-Hour Ozone Standard and a Nonattainment Area for the 2008 8-Hour Ozone Standard, 1997 Annual PM2.5 Standard and 2006 Daily PM2.5 Standard by the United States Environmental Protection Agency (EPA); and,

WHEREAS, the conformity determination used the latest emissions model approved by the EPA; and,

WHEREAS, conformity was demonstrated using the required emissions tests; and,

WHEREAS, the conformity determination addresses the planned transportation improvements included in the Long Range Regional Mobility Plan 2040 and covers the entire Knoxville Ozone and PM2.5 Maintenance/Nonattainment Areas; and,

WHEREAS, the Knoxville Regional TPO FY 2011-2014 Transportation Improvement Program is a subset of the Long Range Regional Mobility Plan 2040; and,

WHEREAS, the TPO's public involvement and Interagency Consultation procedures were adhered to with the Long Range Regional Mobility Plan 2040 and Air Quality Conformity Determination being circulated for public review, presented at more than two open public meetings and coordinated with stakeholder and regulatory agencies through the Interagency Consultation process; and,

WHEREAS, the TPO Technical Committee has recommended approval of the Conformity Determination; and,

WHEREAS, the Air Quality Conformity Determination Report will be sent to EPA for comment and to U.S. DOT (Federal Highway Administration and Federal Transit Administration) for approval;

NOW, THEREFORE, BE IT RESOLVED BY THE KNOXVILLE REGIONAL TRANSPORTATION PLANNING ORGANIZATION EXECUTIVE BOARD:

That the Long Range Regional Mobility Plan 2040 and 2011-2014 Transportation Improvement Program have been found to conform to air quality requirements of the Tennessee SIP in accordance with the Clean Air Act as Amended.

April 24, 2013
Date

Mayor Ralph McGill
Town of Farragut
TPO Executive Board Chair

Jeffrey A. Welch
TPO Director

Adopting Resolution by East Tennessee South RPO for the 2013-2040 Knoxville Regional Mobility Plan Amendments and Air Quality Conformity Determination

**A RESOLUTION BY THE EAST TENNESSEE SOUTH RURAL PLANNING ORGANIZATION (RPO)
ENDORSING THE 2040 KNOXVILLE LONG RANGE REGIONAL MOBILITY PLAN AND AIR QUALITY CONFORMITY DETERMINATION FOR THE KNOXVILLE OZONE AND PARTICULATE MATTER 2.5 NON-ATTAINMENT AREAS**

WHEREAS, the East Tennessee South RPO, developed by the Tennessee Department of Transportation (TDOT), is responsible for ensuring that areas not included in a Metropolitan Planning Organization are involved in the state's transportation planning process; and,

WHEREAS, the 2040 Knoxville Long Range Regional Mobility Plan meets the requirements of transportation conformity found in the Clean Air Act Amendments of 1990; and,

WHEREAS, the Knoxville TPO has prepared a single Air Quality Conformity Determination Report for the entire Ozone and PM2.5 Non-attainment Area, including a portion of the East Tennessee South RPO planning area, which has determined that all proposed transportation projects meet the air quality conformity requirements; and,

WHEREAS, the TPO's public involvement and Interagency Consultation procedures were adhered to with the 2040 Knoxville Long Range Regional Mobility Plan and Air Quality Conformity Determination being circulated for public review, presented at two public hearings and coordinated with stakeholder and regulatory agencies through the Interagency Consultation process; and,

WHEREAS, the Air Quality Conformity Determination Report will be sent to EPA for comment and to U.S. DOT (Federal Highway Administration and Federal Transit Administration) for approval;

NOW, THEREFORE, BE IT RESOLVED BY THE EAST TENNESSEE SOUTH RURAL PLANNING ORGANIZATION EXECUTIVE BOARD:

That the 2040 Knoxville Long Range Regional Mobility Plan and Air Quality Conformity Determination be endorsed for transportation planning decisions in the Knoxville air quality non-attainment area including a portion of the East Tennessee South RPO planning area.

4-12, 2013
Date

Mayor Tim Yates
Monroe County
East Tennessee South RPO Chair

Terry Bobrowski
Director, East Tennessee Development District

Adopting Resolution by Lakeway Area MTPO Executive Board for 2040 Long Range Regional Mobility Plan

Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO)
Morristown, TN – Jefferson City, TN – White Pine, TN – Hamblen County, TN – Jefferson County, TN

Resolution Number: 2013-007

A RESOLUTION BY THE LAKEWAY AREA METROPOLITAN TRANSPORTATION ORGANIZATION (LAMTPO) ADOPTING THE 2040 LONG RANGE TRANSPORTATION PLAN (LRTP)

WHEREAS, in accordance with the Federal requirements of the US Dept. of Transportation, the elements of the transportation planning process are to receive final approval from the Executive Board of the local Metropolitan Transportation Planning Organization, and

WHEREAS, this is the second Long Range Transportation Plan (LRTP) for the Lakeway Area Metropolitan Transportation Planning Organization; and

WHEREAS, the LRTP must be updated at least every four years in non-attainment (or maintenance) areas; and

WHEREAS, no local highway and transit projects are eligible for Federal funds until they are programmed in the LRTP; and

WHEREAS, the 2040 LRTP has been prepared by the local planning staff and the Technical Advisory Committee subcommittee, with an endorsement from the LAMTPO Technical Advisory Committee;

NOW, THEREFORE BE IT RESOLVED, the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) Executive Board hereby approves and adopts the 2040 Long Range Transportation Plan on Wednesday, April 24, 2013.

Chair Bill Brittain
LAMTPO Executive Board

April 24, 2013
Date

Adopting Resolution by Lakeway Area MTPO Executive Board for Air Quality Conformity Determination

Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO)
Morristown, TN – Jefferson City, TN – White Pine, TN – Hamblen County, TN – Jefferson County, TN

Resolution Number: 2013-008

A RESOLUTION APPROVING THE AMENDED AIR QUALITY CONFORMITY DETERMINATION REPORT AS PREPARED BY THE KNOXVILLE TPO

WHEREAS, a comprehensive, cooperative, and continuing transportation planning process is to be carried out in the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) study area; and

WHEREAS, The Executive Board of the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) serves as a forum for cooperative decision making on transportation issues in the Urbanized Area; and

WHEREAS, the Lakeway Area Metropolitan Transportation Planning Organization promotes the safety, protection, and enhancement of transportation corridors within its jurisdictional boundaries, and

WHEREAS, the Lakeway Area Metropolitan Transportation Planning Organization and the Knoxville TPO are within the same nonattainment area for the 8-Hour Ozone Standard and have a Memorandum of Agreement to cooperatively address transportation conformity requirements for ozone, and

WHEREAS, the Knoxville TPO has prepared a single Air Quality Conformity Determination Report for the entire Ozone Non-attainment Area, including the LAMTPO planning area within Jefferson County, which has determined that all proposed transportation projects from the LAMTPO 2040 Long Range Transportation Plan and the LAMTPO 20011-2014 Transportation Improvement Program; and

WHEREAS, the Clean Air Act Amendments of 1990 (CAAA) and the Moving Ahead for Progress in the 21st Century (MAP-21) require that transportation plans and programs conform to air quality goals established by the State Implementation Plan (SIP) for regions in nonattainment of an air pollution standard; and,

WHEREAS, the Knoxville Region is currently designated as a Maintenance Area for the 1997 8-Hour Ozone Standard and a Nonattainment Area for the 2008 8-Hour Ozone Standard, 1997 Annual PM2.5 Standard and 2006 Daily PM2.5 Standard by the United States Environmental Protection Agency (EPA); and,

WHEREAS, the conformity determination used the latest emissions model approved by the EPA; and,

WHEREAS, conformity was demonstrated using the required emissions tests; and,

WHEREAS, the conformity determination addresses the planned transportation improvements included in the 2040 Long Range Transportation Plan, and the Knoxville Regional Mobility Plan 2040 and covers the entire Knoxville Ozone and PM2.5 Maintenance/Nonattainment Areas; and,

WHEREAS, the LAMTPO FY 2011-2014 Transportation Improvement Program is a subset of the 2040 Long Range Transportation Plan; and,

WHEREAS, the Air Quality Conformity Determination Report will be sent to EPA for comment and to U.S. DOT (Federal Highway Administration and Federal Transit Administration) for approval;

NOW, THEREFORE, BE IT RESOLVED BY THE LAKEWAY AREA METROPOLITAN TRANSPORTATION PLANNING ORGANIZATION (LAMTPO) EXECUTIVE BOARD:

That the 2040 Long Range Transportation Plan and 2011-2014 Transportation Improvement Program have been found to conform to air quality requirements of the Tennessee SIP in accordance with the Clean Air Act as Amended.

This Resolution shall be effective upon its passage and approval.

ATTEST:

Bill Brittain, Chairman
LAMTPO Executive Board

April 24, 2013
Date

Conformity Approval Letter from USDOT

U.S. Department of Transportation
Federal Highway Administration

Tennessee Division

May 31, 2013

404 BNA Drive, Suite 508
Nashville, Tennessee 37217
Phone (615) 781-5770

In Reply Refer To:
HDA-TN

Ms. Tanisha Hall
Director, Long Range Planning Division
Tennessee Department of Transportation
James K. Polk Building, Suite 900
Nashville, TN 37243

Subject: Air Quality Conformity Determination for the Knoxville Region

Dear Ms. Hall:

The Tennessee Division of the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) Region IV, in coordination with the Environmental Protection Agency (EPA) Region IV, have reviewed the Air Quality Conformity Determination adopted by the Executive Boards for the Knoxville Regional Transportation Planning Organization (TPO) and the Lakeway Area Metropolitan Transportation Planning Organization (MTPO) on April 24, 2013.

The Air Quality Conformity Determination covers the entire Knoxville 8-hour ozone and fine particulate matter ($PM_{2.5}$) maintenance/nonattainment areas and addresses the planned transportation improvements from the Knoxville Regional TPO's Long Range Regional Mobility Plan 2040 and Fiscal Year (FY) 2011-2014 Transportation Improvement Program (TIP) and the Lakeway Area MTPO's 2040 Long Range Transportation Plan and FY 2011-2014 TIP.

Based on our review, we find the documents conform to the National Ambient Air Quality Standards (NAAQS) for the 8-hour ozone and $PM_{2.5}$ standards.

If you have any questions regarding this determination, please contact Corbin Davis at (615) 781-5767.

Sincerely,

Pamela M. Kordenbrock
Division Administrator

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Appendix B: Commonly Used Acronyms

The following is a list of commonly used acronyms in planning and in the Mobility Plan.

A

AADT	Average Annual Daily Traffic
AASHTO	American Association of State and Highway Transportation Officials
ADA	Americans with Disabilities Act of 1990 (legislation)
ADT	Average Daily Traffic
AICP	American Institute of Certified Planners
APA	American Planning Association
APTA	American Public Transportation Association
AUA	Adjusted Urbanized Area
AVL	Automatic Vehicle Location

B

BAC	Bicycle Advisory Committee
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BMS	Bridge Management System
BRR	Bridge Replacement and Rehabilitation funds
BRT	Bus Rapid Transit
BTS	Bureau of Transportation Statistics

C

CAA	Clean Air Act (legislation)
CAAA	Clean Air Act Amendment of 1990 (legislation)
CAC	Knoxville-Knox County Community Action Committee
CAFE	Corporate Average Fuel Economy Standards
CBD	Central Business District
CDR	Conformity Determination Report
CFR	Code of Federal Regulations
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CMP	Congestion Management Process
CMS	Congestion Management System
CON	Construction
CSA	Combined Statistical Area
CO2	Carbon Dioxide (air quality)
CPI	Consumer Price Index
CSD	Context Sensitive Design

D

DMS	Dynamic Message Sign
DOE	Department of Energy

E

EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
ETQG	East Tennessee Quality Growth
ETDD	East Tennessee Development District
ETHRA	East Tennessee Human Resources Agency

F

FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FFP	Financially Feasible Plan
FHWA	Federal Highway Administration
FLHP	Federal Lands Highway Program
FMCSA	Federal Motor Carrier Safety Administration
FOIA	Freedom of Information Act (legislation)
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FY	Fiscal Year

G

GHG	Greenhouse Gases (air quality)
GHSO	Governor's Highway Safety Office
GIS	Geographic Information Systems
GSMNP	Great Smoky Mountains National Park

H

HBRRP	Highway Bridge Replacement and Rehabilitation Program
HHS	Department of Health and Human Services
HOV	High Occupancy Vehicle
HOT	High Occupancy Toll
HPMS	Highway Performance Monitoring System
HPP	High-Priority Project (funding)
HSTCC	Human Services Transportation Coordination Committee
HTF	Highway Trust Fund (funding)
HUD	United States Department of Housing and Urban Development

I

IAC	Inter-Agency Consultation (air quality)
IHS	Interstate Highway System
IM	Interstate Maintenance funds (funding)
IRI	International Roughness Index (pavement)
IT	Information Technology
ITS	Intelligent Transportation Systems

J

JARC	Job Access and Reverse Commute

K

KAT	Knoxville Area Transit
KCP	Knoxville Commuter Pool
KRTPO	Knoxville Regional Transportation Planning Organization
KTA	Knoxville Transportation Authority

L

LAMTPO	Lakeway Area Metropolitan Transportation Planning Organization
LEED	Leadership in Energy and Environmental Design
LIC	Local Interstate Connector Program (funding)
LOS	Level of Service
LRMP	Long Range Mobility Plan (see also RMP)
LRT	Light Rail Transit

M

MAP-21	Moving Ahead for Progress in the 21st Century Act (legislation)
MCSA	Micropolitan Statistical Area
MKAA	Metropolitan Knoxville Airport Authority
MOA	Memorandum of Agreement
MOVES	Motor Vehicle Emission Simulator (modeling)

MPC	Knoxville-Knox County Metropolitan Planning Commission
MPA	Metropolitan Planning Area
MPG	Miles Per Gallon
MPO	Metropolitan Planning Organization (see also TPO)
M&O	Management & Operations
MSA	Metropolitan Statistical Area
MTP	Metropolitan Transportation Plan (see also RMP)
MVEB	Motor Vehicle Emission Budgets (air quality)

N

NAA	Nonattainment Area (air quality)
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act (legislation)
NHS	National Highway System (funding)
NHTSA	National Highway Traffic Safety Administration
NOx	Nitrogen Oxides (air quality)
NPS	National Park Service
NSBP	National Scenic Byways Program

O

O&M	Operating and Maintenance (funding)

P

PE	Preliminary Engineering
PL	Planning Funds (funding)
PlanET	Plan East Tennessee
PM2.5	Fine Particulate Matter (2.5 microns) (air quality)
POV	Privately Owned Vehicle
PPI	Producer Price Index
ppm	parts per million (air quality)
PUD	Planned Unit Development

R

RMP	Regional Mobility Plan
ROW	Right of Way
RPO	Rural Planning Organization
RTP	Recreational Trails Program
RTPC	Regional Transportation Planning Council

S

SHSP	Strategic Highway Safety Plan
SIA	State Industrial Access Program
SIP	State Implementation Plan
SOGR	"State of Good Repair"
SOV	Single Occupancy Vehicle
SPR	State Planning and Research Funds (funding)
SR	State Route
SRTS	Safe Routes to School
STIP	Statewide Transportation Improvement Program
STP	Surface Transportation Program (funding)

T

TAZ	Traffic Analysis Zone (modeling)
TCM	Transportation Control Measure
TDEC	Tennessee Department of Environment and Conservation
TDH	Tennessee Department of Health
TDM	Travel Demand Management
TDOS	Tennessee Department of Safety
TDOT	Tennessee Department of Transportation
TDR	Transfer of Development Rights
TE	Transportation Enhancements (funding)
TIP	Transportation Improvement Program
TMA	Transportation Management Area
TMC	Traffic Management Center
TND	Traditional Neighborhood Development

TNSHPO	Tennessee State Historic Preservation Office
TOD	Transit-Oriented Development
TPO	Transportation Planning Organization
TPR	Transportation Planning Report
TPWP	Transportation Planning Work Program
TRB	Transportation Research Board
TSM	Transportation System Management
TTF	Transportation Trust Fund
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
TYS	McGhee Tyson Airport

U

UC	Urban Cluster (as defined by the Census Bureau)
ULAM	Urban Land Allocation Model
UPWP	Unified Planning Work Program (see also TPWP)
USDOT	United States Department of Transportation
USGS	United States Geological Survey
UTK	University of Tennessee at Knoxville
UA	Urbanized Area (as defined by the Census Bureau)

V

V/C	Volume to Capacity
VHT	Vehicle Hours Traveled
VMS	Variable Message Sign
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds (air quality)

Appendix C: Commonly Used Terms

The following is a list of commonly used terms in planning and in the Mobility Plan.

#

1-Hour Ozone Standard – A national ambient air quality standard set for ozone based on the peak 1-hour concentration of ozone measured at a monitoring site. The maximum level of ozone allowed under the standard is 124 parts per billion of ozone. The EPA implemented a revised 8-Hour Ozone Standard effective on June 15, 2004, with the 1-Hour Standard being replaced by the 8-Hour Standard one year later on June 15, 2005.

8-Hour Ozone Standard – Similar to 1-Hour Standard, but changes measurement to a maximum level of exposure over an 8-hour average timeframe. The 1997 Ozone Standard effective on June 15, 2004 set the maximum level at 84 ppb and the 2006 Ozone Standard effective on July 20, 2012 set the maximum level at 75 ppb.

A

Access Management – A set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways for the purpose of improving the safety and efficiency of roadways.

Adaptive Reuse – Rehabilitation or renovation of existing buildings or structures for uses other than the current ones.

Affordable Housing – Housing that a low- or moderate-income household can occupy without spending more than 30% of household income. Also incorporates the idea of quality (safe and decent dwelling), choice of location, and an adequate supply.

Americans with Disability Act (ADA) – Federal legislation outlining specific rights of persons with disabilities, and providing that publicly funded mass transit agencies must provide complementary paratransit service within the fixed-route service area to those persons unable to use fixed-route service because of a disability.

Arterial Roadway – A major roadway facility with the primary function of traffic movement that connects activity centers in the region.

Auto Occupancy – The number of persons per automobile, including the driver.

Average Annual Daily Traffic (AADT) – The total volume of traffic on a highway segment for one year, divided by the number of days in the year.

B

Bicycle Advisory Committee (BAC) – An appointed committee composed of representatives of various government agencies, law enforcement officials, and private citizens interested in bicycle issues. The BAC advises the TPO in the process of planning and developing bicycle facilities and promoting bicycle use in the TPO area.

Bicycle Facilities – A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically designated for bicycle use.

Bike Lane – A portion of a roadway, sharing the same right-of-way with motorized vehicles, but designated for the preferential or exclusive use of bicyclists.

Bikeway – A generic term for any road, street or path that is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

Brownfield – Industrial or commercial property that is abandoned or underused and environmentally contaminated, especially one considered as a potential site for redevelopment.

Bus Rapid Transit (BRT) – A flexible high-performance form of rapid transit that combines features of rail systems with those of over-the-road vehicles, and is characterized by being able to operate in special-purpose lanes or on city streets.

Busway –Two-lane facility, one lane per direction, on exclusive right-of-way dedicated for buses only. Grade separation at high-volume cross streets and gate crossing arms at low-volume crossings are assumed.

C

Capital Improvement Program (CIP) – An itemized program for a multi-year prospective period, and any amendments thereto, subject to at least biennial review, setting forth the schedule, timing, and details of specific contemplated capital improvements by year, together with their estimated cost, the need for each improvement, financial sources, and the financial impact that the improvements will have on the local governmental unit or school district.

Carpool – Transportation by auto, on a scheduled or unscheduled basis, with at least two occupants.

Circulator System – Means of movement provided within a major activity center (such as a regional business concentration or community) for going from place to place within the center; such a system may be entirely pedestrian or may use transit.

Clean Air Act (CAA) – The U.S. Clean Air Act, referring to the Air Pollution Control Act of 1955, as amended.

Collector Roadway – A minor roadway facility primarily serving to provide access to and from local streets and adjacent land uses.

Commuter Rail – Public transportation mode using passenger trains operating on railroad right-of-way. Generally, commuter rail systems are integrated with other regional transit providers to permit transfers throughout a region.

Comprehensive Plan – Plan for the development of an area, which recognizes the physical, economic, social, political, aesthetic, and related factors of the community involved. (Compare with local comprehensive plan.)

Conformity – An analysis which demonstrates that a transportation plan, program, or project conforms with the State Implementation Plan purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards; and that such activities will not cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

Congestion – Overloading of roadway with vehicles (see Level of Service).

Congestion Management Process (CMP) – A systematic process designed to emphasize effective management of existing transportation facilities through the use of travel demand and operational strategies.

Congestion Mitigation and Air Quality (CMAQ) – A program under MAP-21 that provides funding for projects that contribute to the attainment of the National Ambient Air Quality Standards (NAAQS). Eligible projects include intersection projects, transit projects, and Transportation Management Organizations/Initiatives.

Congestion Pricing – The use of fees that are charged to manage traffic and avoid congestion, also called “value pricing.”

Conservation – Natural resources management to prevent waste, destruction, or degradation.

Context Sensitive Design – Inclusive design approach that integrates and balances community, aesthetic, and environmental values with traditional transportation safety and performance goals. Includes roadway standards and development practices that are flexible and sensitive to community values, balancing economic, social, aesthetic and environmental objectives.

Coordinated Public Transit Human Services Transportation Plan – A unified, comprehensive strategy for public transportation services delivery that identifies the transportation needs of individuals with disabilities, older adults, and individuals with limited incomes, lays out strategies for meeting these needs, and prioritizes services.

Corridor Studies – Typically, corridor studies focus on a segment of a particular travel corridor or travel shed. A corridor study may look at land use, access issues, capacity, level of service, geometrics, multiple modes of travel, and safety concerns, analyzes alternatives, and makes recommendations.

Cost-Sharing – Contractual arrangement whereby a local unit of government or other governmental body enters into an agreement to pay for part of a physical facility or a service; includes subscription transit service.

D

Degradation – A decline to a lower condition, quality, or level.

Demand Management – A set of strategies that promote increased efficiency of the transportation system by reducing the incidence of single occupant vehicle travel.

Demand-Response – Any type of public transportation involving flexibly scheduled service that is deployed upon a person's request for a trip.

Density – Number of dwelling units per net residential acre of land.

Design hour volume – Traffic volume used to determine the appropriate design features of a roadway.

Developable Land – Land that is suitable as a location for structures and that can be developed free of hazards to, and without disruption of, or significant impact on, natural resource areas including surface waters, wetlands, floodplains, parks, steep slopes.

Disadvantaged Business Enterprise (DBE) Program – A U.S. Department of Transportation program that helps small businesses owned and controlled by socially and economically disadvantaged individuals, including minorities and women, to participate in contracting opportunities for federally funded capital improvement projects.

E

Environmental Justice (EJ) – 1994 executive order requiring analysis of the effects of federally funded programs, plans and actions on racial minority populations and low-income populations.

Exempt Project – Projects that are determined to be exempt from the requirement to determine air quality conformity such as safety, maintenance, certain transit and other projects as determined through Interagency Consultation. These projects may proceed toward implementation even in absence of a conforming transportation plan and TIP.

F

Federal Highway Administration (FHWA) Metropolitan Planning (PL) Funds – Source of planning funds allocated in UPWP in accordance with 23 U.S.C., Section 134.

Federal Transit Administration (FTA) Section 5303 – Source of transit planning funds allocated in the TPWP in accordance with SAFETEA-LU and 49 U.S.C., Chapter 53.

Financial Constraint – The requirement that the proposed projects in the transportation plans for an area must not have costs that exceed the reasonably expected revenues.

Fixed-Route Transit – Service that follows a specified route of travel with identified stops for passengers and an established schedule; regular-route transit.

Food Desert – The U.S. Department of Agriculture's Economic Research Service defines food desert as a low-income census tract where either a substantial number or share of residents has low access to a supermarket or large grocery store.

Forecast – A calculation of growth, for example in population, households, and jobs based on data about current conditions (e.g., the 2010 Census) that is extrapolated into the future.

Freeway – A divided highway with two or more lanes for the exclusive use of traffic in each direction, and with full control of access and egress.

Functional Classification – Classification of roadways according to their primary function— mobility for through trips or access to adjacent lands. A four-class system is used to designate roads (principal arterials, minor arterials, collectors, and local streets).

G

General Aviation – All aviation activity other than that of the scheduled air carriers and the military. General aviation includes single- and twin-engine aircraft with gross weights ranging from 2,000 to 60,000 pounds.

Grade Separation – Intersection of traffic by provision of crossing structures, underpasses or overpasses; interchanges.

H

Headway – The amount of time between successive arrivals of a bus on a fixed bus route.

High-Occupancy Toll (HOT) Lanes – Combines HOV and pricing strategies by allowing single occupancy vehicles to gain access to HOV lanes by paying a toll.

High-Occupancy Vehicle (HOV) Lanes – Highway lanes reserved for vehicles carrying more than one person. The specific number of people in the vehicle or class of vehicles who can use this facility is established locally. These lanes are officially denoted with a diamond marking and are sometimes called "diamond lanes."

Highway Beautification Act – Federal legislation passed in 1965 providing for the cleanup and beautification of federal highways.

Highway Performance Monitoring System (HPMS) –Summary information obtained from a sample of the arterial and collector functional systems to assess highway condition, performance, air quality trends, and future investment requirements.

Household – Group of all the people who occupy a housing unit.

Housing Stock – An inventory or description of a community's existing residences by age, condition, structure type, number of bedrooms, rental cost, or value.

I

Impact Fees – Charges to individuals or groups intended to supplement existing funding and to account for the increased use of public facilities or services.

Incident Management System – An Intelligent Transportation System monitoring process that provides traffic operators with the tools to allow quick and efficient response to accidents, hazardous spills, and other emergencies. Redundant communications systems are used to link data collection points, transportation operations centers, and travel information portals.

Infill – Development or redevelopment of land that has been bypassed, remained vacant, and/or is underused.

Infrastructure – Fixed facilities, such as sewer lines and roadways that serve existing and new development and redevelopment.

Intelligent Transportation System (ITS) – Development or application of technology (electronics, communications, or information processing) to improve the efficiency and safety of surface transportation systems. ITS is divided into five categories that reflect the major emphasis of application: Advanced Traffic Management Systems, Advance Traveler Information Systems, Advanced Public Transportation Systems, Automatic Vehicle Control Systems, and Commercial Vehicle Operations

Intensity of Development – Relative measure of development as defined by characteristics such as the number of dwelling units per acre, number of employees, amount of traffic generated, and amount of site covered.

Interagency Consultation (IAC) – The formal process used to involve stakeholder agencies into the air quality conformity determination development.

Intermodal – Denotes the seamless movement of people or cargo between transport modes (e.g., rail to heavy truck).

Intermodal Facilities – Transportation facilities that provide for linkages between travel modes, such as rail or bus stations at airports.

J

Job Access Reverse Commute (JARC) – An FTA grant program to improve access to transportation services to employment and employment-related activities for welfare recipients and eligible low-income individuals.

L

Land use categories – Standardized system for classifying and designating the appropriate use of properties.

Level of Service (LOS) – As related to highways, the different operating conditions that occur on a lane or roadway when accommodating various traffic volumes. It is a qualitative measure of the effect of traffic flow factors, such as speed and travel time, interruption, freedom to maneuver, driver comfort and convenience, and indirectly, safety and operating costs. It is expressed as levels of service "A" through "F." Level "A" is a condition of free traffic flow where there is little or no restriction in speed or maneuverability caused by presence of other vehicles. Level "F" is forced-flow operation at low speed with many stoppages, with the highway acting as a storage area.

Life-Cycle Maintenance – Concept of keeping a facility useable at least through its design life by conducting scheduled maintenance.

Light Rail Transit (LRT) – Electrically propelled vehicle operated singly or in trains on predominantly reserved, but not necessarily grade-separated, rights-of-way.

Limited English Proficiency (LEP) Plan – A strategy developed by the MPO to help recognize and assist a person who does not speak, read, write or understand English very well.

Local Government – Municipal units of government such as counties, cities, and towns.

Local Roadway – A road, usually with low traffic volume, designed to serve adjacent development rather than through traffic.

Long Range Transportation Plan (LRTP) – *See Regional Mobility Plan (RMP)*

Low Impact Development (LID) – Simple management and preservation technique used to restore aquatic, terrestrial, and biologic natural resources.

Low Income – Household income that is 80% or less of the area median income, as defined by the U.S. Department of Housing and Urban Development.

M

Maintenance Area – A classification of an area, which was in nonattainment of an air quality standard at one point in time and is required to demonstrate the ability to maintain the standard.

Major Construction – Roadway projects that increase the operational characteristics of a highway facility, including decreasing congestion, increasing operating speed, and reducing accidents.

Median Income – Income measure used by the U.S. Department of Housing and Urban Development. The median income of a population is the level at which half the population has a higher income and half has a lower income.

Metropolitan Transportation Plan (MTP) – *See Regional Mobility Plan (RMP)*

Mixed Use – Single building containing more than one type of land use or a single development of more than one building and use, where the different land uses are in close proximity, planned as a unified,

complementary whole, and functionally integrated with transit, pedestrian access and parking areas.

Mobility – The ability to travel from one place to another.

Moderate Income – Household income that is 80% of the area's median income.

Motor Vehicle Emissions Budget (MVEB) – Established by the SIP, it sets out the maximum levels of emissions from on-road mobile sources for an area.

MOVES – MOtor Vehicle Emissions Simulator, a model approved by EPA for estimating emissions from mobile sources and is required for use in air quality conformity determinations started after March 2, 2013.

Moving Ahead for Progress in the 21st Century Act (MAP-21) – The federal transportation bill passed in 2012. It restructures many transportation funding programs and provides two years of funding.

Multifamily Housing – Residential structure with two or more separate dwelling units.

Multi-modal – Utilizing more than one means of transportation.

Multimodal Link – The connection between two or more passenger transportation methods (such as bicycle, walking, automobile and transit).

N

National Ambient Air Quality Standards (NAAQS) – Minimum air quality standards established by the Clean Air Act Amendments of 1990.

National Highway System (NHS) – Transportation system consisting of approximately 155,000 miles of highway in order to provide an interconnected system of principal arterial routes serving major population centers, major transportation facilities, major travel destinations, interstate and interregional travel and meeting national defense requirements.

New Freedom – An FTA formula grant program to provide additional tools to overcome existing barriers facing Americans with disabilities seeking integration into the workforce and full participation in society.

Noise Abatement – The attempt to reduce the amount and level of noise on and around airports, especially during takeoffs and landings, partly through special operational restrictions and proper land use planning for areas affected by aircraft noise.

Nonattainment Area – An area designated by the U.S. Environmental Protection Agency as not being in attainment of the national standard for a specified pollutant.

Nonpoint Source Pollution – Sources of pollution that are less definable and usually cover broad areas of land such as agricultural land with fertilizers or automobile pollution that are carried away by runoff. Discharge of waste cannot be located to a specific source.

O

Observed Peak-Hour Flow – Highest flow rate over one hour duration during a 24-hour period that has been measured and reported.

Off-Peak Period – Time of day outside the peak period (see peak period).

Operational Improvement – Capital improvement consisting of installation of traffic surveillance and control equipment, computerized signal systems, motorist information systems, integrated traffic control systems, incident management programs, and transportation demand and system management facilities, strategies and programs.

Ordinance – Law or regulation set forth and adopted by a governmental authority, usually a city or county.

Oxides of Nitrogen (NOx) – An emission resulting from the process of fuel combustion.

Ozone – A secondary pollutant formed by the combination of VOCs and NOx in the presence of sunlight.

P

Paratransit Services – Transit service that provides generally more flexible and personalized service regular-route transit, using a variety of vehicles, such as large and small buses, vans, cars and taxis. Paratransit can serve a particular population, such as people with disabilities, or can be assigned

to serve the general population. Paratransit is frequently provided in less densely populated areas, and used at times and in areas where trip demands are less concentrated, such as during weekends and evenings in urban settings.

Park and Ride – Travel arrangement where people drive to a transit center, transfer station or terminal, park in the designated place, and use a transit vehicle for their ultimate destinations.

Peak Hour – Hour during the peak period when travel demand is highest.

Peak Period – The time on a weekday when traffic is usually heavy.

Person Trip – One-way journey between two points by one person in a vehicle.

PM2.5 – PM2.5 particles are air pollutants with a diameter of 2.5 micrometers or less, small enough to invade even the smallest airways. These particles generally come from activities that burn fossil fuels, such as traffic, smelting, and metal processing.

Point Source Pollution – A discrete source from which pollution is generated before it enters receiving waters, such as a sewer outfall, smokestack, or industrial waste pipe.

Preservation – Preservation activities are directed toward the elimination of deficiencies and major cost replacement of existing transportation facilities. Preservation is not meant to include work that will increase the level of service by the addition of traffic lanes.

Principal Arterials – High-capacity highways that make up the metropolitan highway system.

Project – Group of tasks or methods designed to accomplish a specific purpose.

Q

Qualified Transportation Fringe Benefits – Employers may provide employees with transportation benefits, the value of which is exempt from federal taxes up to specified annual limits. Qualified transportation benefits include transit passes, rides in a commuter highway vehicle, or reimbursement for commuting by bicycle.

R

Ramp Metering – Electronically regulated flow of vehicles to increase capacity of through lanes and improve safety.

Ramps – Connections to and from freeway facilities to the arterial and collector roadway system.

Redevelopment – Process by which an existing building, structure, or developed area is adaptively reused, rehabilitated, restored, renovated and/or expanded.

Regional Mobility Plan (RMP) – Requirement for the metropolitan transportation planning process under MAP-21, must have a minimum of 20-year horizon and be updated every four years in metro areas with greater than 200,000 population.

Regionally Significant Project – A project that is on a facility that serves a regional transportation need and would normally be included in the modeling of an area's transportation network. These projects must be accounted for specifically in the regional air quality analysis.

Regular-Route Transit Service – Operates on a predetermined, fixed route and schedule. The types of vehicle used in regular-route service are generally large buses or small buses. Regular route service can include local service, express service, or various levels of service in between.

Rehabilitation – Roadway improvements intended to correct conditions identified as deficient without major changes to the cross section. These projects should consist of removal and replacement of base and pavement, shouldering and widening and drainage correction as needed.

Reinvestment – Investment in redevelopment, infill, or adaptive reuse.

Ridership – The total number of riders on a vehicle, trip, route or system over an identified period of time.

Ridesharing – A service with two or more persons in the vehicle consisting usually a prearranged carpool, vanpool or subscription bus. Car and vanpooling intended primarily to serve the work trip.

Route Deviation – A service operating on a fixed route from which vehicles may deviate to pick up or drop off passengers. Requests for route

deviation may come by phone via radio contact with the driver or may be requested by a passenger upon boarding. Deviation from the route may include a premium charge for the extra service. Generally, this strategy utilizes a small vehicle.

Routine Maintenance – Roadway maintenance consisting of snow and ice control, mowing, sweeping, periodic applications of bituminous overlays, seal treatments, milling, crack routing and filling and base repair. These treatments are intended to help ensure the roadway can be used to the end of its design life. These projects are ineligible for federal funding.

S

Signal Preemption – Technology that triggers the green go-ahead on meters or traffic lights to allow transit vehicles to more quickly move through freeway ramp entrances or intersections.

Smart Growth – Pro-growth approach to guiding development into more convenient patterns and into areas where infrastructure allows growth to be sustained over the long term. It envisions developments of complementary land uses, including affordable and lifecycle housing, retail and offices, on interconnected streets amenable to walking, bicycling, or using transit or car to reach destinations.

Special Transportation Services – Transit services provided on a regular basis to elderly and disabled persons who are unable to use regular means of transportation. Rides are provided through a variety of public and private entities, including social services and transit agencies, using lift-equipped vans, taxis, buses and volunteer drivers.

Staging – A plan that documents the planned timing of development and growth in an area so that the development and growth are coordinated with needed public infrastructure in accordance with the adopted policies and plans.

State Implementation Plan (SIP) – A federally approved State Plan that documents emission control strategies for criteria pollutants (such as carbon monoxide, nitrogen dioxide, ozone, lead, particulate matter, and sulfur dioxide), which are applicable in air quality nonattainment and attainment/ maintenance areas to protect the air quality in the air shed. State Implementation Plans can be extensive, containing state regulations or other enforceable documents and supporting information such as emission inventories, monitoring networks, and modeling demonstrations.

Stormwater – Surplus surface water generated by rainfall and snowmelt that does not seep into the earth but flows overland to rivers, lakes, or streams.

Surface Transportation Program (STP) – One of the five core federal highway funding programs. Flexible funding that may be used by states and localities for projects to preserve or improve conditions and performance on any Federal-aid highway, bridge projects on any public road, facilities for non-motorized transportation, transit capital projects and public bus terminals and facilities.

Sustainable Development – Development that maintains or enhances economic opportunity and community well-being while protecting and/or restoring the natural environment upon which people and economies depend. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.

T

Telecommuting – Eliminating or reducing commuter trips by routinely working part or full-time at home or at a satellite work station closer to home.

Throughput – Amount of vehicles that can pass a point on a roadway or pass through an intersection over a specified period of time. Can be equated to capacity if considering vehicles alone.

Tolls – Fee collected for the use of a road.

Traffic Analysis Zone (TAZ) – A small geographic area for which socioeconomic data is estimated in the TPO travel demand model.

Traffic Calming – Techniques such as speed bumps, narrow lanes and traffic circles used to slow traffic in primarily residential neighborhoods.

Traffic Signal Control Systems – Degree of traffic management of an arterial is grouped and defined as follows:

- **Fixed time** – Traffic signals on an arterial are controlled locally through a time clock system. In general, the progression of a through band (the amount of green time available along an arterial at a given speed) along the arterial in the peak direction is determined by past experience and is not a function of immediate traffic demand.
- **Semi-actuated** – Traffic signals along the arterial are designed to maximize the green time on the major route in the major direction. Timing and through band are based upon historical records. Use of green time on the minor leg depends on real-time demand and maximized based upon total intersection delay.
- **Interconnection** – A traffic signal system in which data collected at individual signals is shared with a central processor or controller. Adjustments in traffic signal control can be made based upon incoming data as opposed to historical data.
- **Optimization** – The process in which a traffic signal or system is modified to maximize the amount of vehicles passing through the intersection for all approaches or on the major road in the peak direction.
- **Real-time adaptive control** – An advanced traffic control system that incorporates current technologies in communications, data analysis, and traffic monitoring to provide real-time traffic control of arterials, corridors or roadway networks.

Transit Advantages – Facility improvements that offer travel-time benefits and connections to multi-occupant vehicle services such as bus lanes, ramp meter bypasses, HOV lanes, transit stations, and major park-and-ride lots.

Transit Centers – Locations where timed-transfer connections between transit modes is facilitated. Transit centers are usually at shopping centers or other high-pedestrian locations.

Transit Dependence – Reliance on transit for travel needs because of age-related or economic limitations and/or physical or mental disability.

Transit Facility – The property, structures and other improvements used to provide mass transportation for passengers including park and ride stations, transfer stations, and parking lots.

Transit Market Area – The geographic area that draws riders of the transit system.

Transit Route – An existing or planned route for public transit service in the plan of the relevant transit service provider.

Transit Stations – Stops along rail lines and busways.

Transit Trip – Person trip as a passenger of a transit vehicle.

Transportation Control Measure (TCM) – Any measure that is specifically identified and committed to in the applicable implementation plan that is either one of the types listed in Section 108 of the Clean Air Act Amendments, or any other measure for the purpose of reducing emissions or concentrations of air pollutants from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions. Examples of TCM include programs for improved transit service, employer-based transportation management plans, trip-reduction ordinances, traffic flow improvement programs, programs and facilities for telecommuting, and other programs and ordinances to facilitate non-automobile travel, such as the use of bicycles.

Transportation Corridor – A defined area through which people move from one major center to another or from a major center to a dispersal area. A transportation corridor may contain several transit routes and highways.

Transportation Demand Management (TDM) – Programs and methods to reduce effective demand. In the broadest sense, any activity or facility that reduces vehicle trips would fall within this classification. The highest priority in the region is given to reducing single-occupant vehicle trips in the peak periods. Techniques that might be utilized are carpooling, vanpooling, transit, alternative work hours, transportation management associations, and land development or ordinances that discourage vehicle trips and encourage walking, biking, ridesharing and transit trips.

Transportation Disadvantaged (TD) – Those persons who, because of physical or mental disability, income status, or age are unable to transport themselves or to purchase transportation and are, therefore, dependent on others to obtain access to health care, employment, education, shopping, social activities, or other life-sustaining activities.

Transportation Enhancement (TE) Program – A federal funding program under SAFETEA-LU Sections 1113, 1122 and 6003 that apportions a 10% set-aside of the Surface Transportation Funding Program to transportation enhancements such as provision of bicycle and pedestrian facilities, provision of safety and educational activities for pedestrian and bicyclists, acquisition of scenic easements and scenic or historic sites, scenic or historic highway programs, land rehabilitation and operation of historic transportation buildings, preservation of abandoned railway corridors, control and removal of outdoor advertisement, archeological planning and research, environmental mitigation, and environmental museums. MAP-21, passed in 2012, replaced this program with Transportation Alternatives, which encompasses most activities previously funded under Transportation Enhancement, plus some additional activities.

Transportation Impact Fee – An assessment levied by local governments against land development activity to help mitigate its impact to the existing transportation infrastructure by funding transportation improvements required to provide for public services and facilities needed to service the proposed new growth in land development.

Transportation Improvement Program (TIP) – A biennial document listing a three- to five-year program of projects with some phase of work to be implemented such as design, right-of-way or construction.

Transportation Management Area (TMA) – Areas subject to special requirements under the federal transportation bill that benefit from preferential treatment with regard to air quality needs and local authority to select transportation projects. Any urban area over 200,000 in population is automatically a TMA, which subjects it to additional planning requirements but also entitles it to funds earmarked for large urbanized areas under the Surface Transportation Program.

Transportation Planning Organization (TPO) – Each urbanized area in the U.S. with greater than 50,000 population must have an MPO (Metropolitan Planning Organization) in order to coordinate transportation planning. In the Knoxville Urbanized Area, the name TPO was chosen to better represent the activities that are performed.

Travel Demand Forecasting Model – A computer software tool developed to estimate the travel activity of a region based on the correlation between household-level characteristics and travel behavior.

Trip Attraction Variables – Based on employment conditions, trip attraction variables are used by the Regional Transportation Analysis traffic demand model to simulate the attraction of vehicle trips to various destination points.

Trip Production Variables – Based on land use conditions and population statistics, trip production variables are used by the traffic demand model to simulate the generation of vehicle trips from various points of origin.

U

User Cost – Total dollar cost of a trip to a user for a particular mode of transportation. Includes out-of-pocket costs such as transit fares, gas, oil, insurance, and parking for autos plus a valuation of implicit cost, such as waiting and travel times.

V

Vanpool – Paratransit service by van on a scheduled or unscheduled basis with at least five persons as occupants.

Vehicle Miles of Travel (VMT) – Is calculated from the average daily traffic volume multiplied by the length of roadway.

Vehicle Trip – One-way journey made by an auto, truck or bus to convey people or goods.

Volatile Organic Compounds (VOC) – VOCs are emitted in the storage and use of fuel, solvents, and many industrial and consumer chemicals, as well as from vegetation.

Z

Zoning – The classification of land by types of uses permitted and prohibited and by densities and intensities permitted and prohibited. Regulations govern lot size, building placement, and other development standards.

Appendix D:
TDOT Bicycle and Pedestrian Policy

To view TDOT's adopted policy, see
www.tdot.state.tn.us/bikeped/pdfs/policy.pdf

Policy No: 530-01 **Effective Date:** December 1, 2010

Responsible Office
The Multimodal Transportation Resources Division

Authority
TCA 4-3-23-3, if any portion of this policy conflicts with applicable state or federal laws or regulations, that portion shall be considered void. The remainder of this policy shall not be affected thereby and shall remain in full force and effect.

Purpose
It is the intent of the Department of Transportation to promote and facilitate the increased use of non-motorized modes of transportation, including developing facilities for use by pedestrians and bicyclists and promoting public education and safety programs for using such facilities.

Application
The policy applies to Department of Transportation employees involved in the planning, design and construction of projects, consultants and contractors, and local governments managing transportation projects with federal funding.

Definitions
- **Highway –** Includes roads, streets, and all their appurtenances (i.e. right-of-way, bridge, railroad-highway crossing, tunnel, drainage structure, sign, guardrail, and protective structure in connection with a highway (23 U.S.C. 101).
- **Reasonableness –** Cost not exceeding twenty percent of the total project cost as defined in the Federal Highway Administration's "Bicycle and Pedestrian Design Guidance".
- **Reconstruction –** Major changes to an existing highway within the general right-of-way, such as adding lanes and modifying horizontal and vertical alignments.
- **Roadway –** The portion of a highway intended for vehicular use.

Policy
The policy of the Department of Transportation is to routinely integrate bicycling and walking facilities into the transportation system as a means to improve mobility, access and safety of non- motorized traffic. The intent of this policy is to promote the inclusion of bicycle and pedestrian accommodations in the transportation planning and project development activities at local, regional and statewide levels. TDOT will coordinate through established transportation planning processes with local government agencies and regional planning agencies to assure that bicycle and pedestrian accommodations are addressed on a multimodal planning level through the Long Range Planning Process and within the project development planning process.

The department is committed to the development of a transportation system that improves conditions for bicycling and walking through the following actions:

1.) Provisions for bicycles and pedestrians shall be integrated into new construction and reconstruction of roadway projects through design features appropriate for the context and function of the transportation facility.

2.) The design and construction of new facilities shall anticipate likely future demand for bicycling and pedestrian facilities and not preclude the provision of future improvements.

3.) The design of facilities for bicyclists and pedestrians shall follow standard drawings designed by the Department and approved by

FHWA, in accordance with the American Association of State Highway and Transportation Officials (AASHTO) "Guide for the Development of Bicycle Facilities," and the department's "Bicycle and Pedestrian Plan."

4.) Bicycle and Pedestrian access along corridors served by new or reconstructed roadways shall not be made more difficult or impossible by roadway improvements. If all feasible roadway alternatives have been explored and suitable bicycle or pedestrian facilities cannot be provided within the existing or proposed right of way due to economical or environmental restraints, an alternate bicycle/pedestrian route that provides continuity and enhances the safety and convenience of bicycle/pedestrian travel shall be considered.

5.) Addressing the need for bicyclists and pedestrians to cross corridors as well as travel along them, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible and convenient.

6.) For all Federal-aid highway bridge replacement and rehabilitation projects on routes that are not the Interstate or have full access control, bicycle and pedestrian traffic accommodations, such as minimum shoulders, shall be provided when the cost is reasonable.

7.) For all Federal-aid highway bridge replacement and rehabilitation projects that fall on a route identified in an adopted local government plan as a bicycle or pedestrian facility, bicycle and/or pedestrian traffic accommodations in addition to minimum shoulders shall be considered. Because these additional accommodations can change the layout and design of the structure, the route must be identified before the preparation of the preliminary bridge plans.

8.) Bicycle and pedestrian facilities shall be integrated into the study, planning, design, and implementation of federal and state funded transportation projects involving air, rail, marine, and public transportation, including public parking facilities, and included in the Statewide Transportation Improvement Program when Federal Funds are being used.

9.) While it is not the intent of system preservation projects to expand existing facilities, opportunities to provide or enhance bicycle facilities identified in an adopted local government plan shall be considered during the program development stage of paving projects.

10.) Pedestrian facilities shall be designed to accommodate persons with disabilities in accordance with the access standards required by the Americans with Disabilities Act (ADA). Sidewalks, shared use paths, street crossings (including over- and under- crossings) and other infrastructure shall be constructed so that all pedestrians, including people with disabilities, can travel independently.

Exceptions

There are conditions where it is generally inappropriate to provide bicycle and pedestrian facilities. These conditions include:

1.) Facilities where bicyclists and pedestrians are prohibited by law, such as the Interstate, from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the same transportation corridor.

2.) The cost of providing bicycle and pedestrian facilities would be excessively disproportionate to the need and probable use. In accordance with the "Bicycle and Pedestrian Design Guidance" provided by FHWA, excessively disproportionate is defined as exceeding twenty percent (20%) of the cost of the project. The 20 percent figure should be used in an advisory rather than an absolute sense, especially in instances where the cost may be difficult to quantify.

3.) Bridge projects that are fully funded with state maintenance funds, although consideration will be given to providing bicycle and pedestrian accommodations if (a) the bridge is part of a route identified in an adopted local government plan as a bicycle or pedestrian route and (b) the cost of providing bicycle and pedestrian accommodations is less than 20% of the project cost as described in number 2 above.

4.) Other factors where there is a demonstrated absence of need or prudence, or as requested by the Commissioner of the Department of Transportation.

Exceptions for not accommodating bicyclists and pedestrians in accordance with this policy will be documented describing the basis for the exception. For exceptions on Federal-aid highway projects, concurrence from the Federal Highway Administration must be obtained.

Design Guidance

Pedestrian, Bicycle, and Shared Use Path design standards have been developed by the Tennessee Department of Transportation and approved by FHWA. These design standards should be followed by local, regional and state agencies when considering including bicycle and pedestrian features on an existing facility or new construction.

Appendix E: Full Outreach Data

Outreach Plan and Supporting Documents

This Regional Mobility Plan update development and review followed the guidelines adopted in the TPO Outreach Plan. Most of the discussion on the methods used to involve the public and seek participation have been discussed in Chapter 4, with full data in this appendix. The consultation process is outlined here.

Consultation with Interested Parties

The TPO will provide notice of upcoming public review meetings or review periods being held on the draft and final Mobility Plan and the draft and final TIP. Notice will be provided to known interested parties:

- Public transportation employees
- Freight shippers
- Providers of freight transportation services
- Private providers of transportation
- Users of public transportation
- Users of pedestrian walkways and bicycle facilities
- Disabled
- Elderly
- Low-income
- Limited English-speaking populations
- Providers of non-emergency transportation services receiving financial assistance from a source other than title 49, U.S.C., Chapter 53.

Amendments to the Mobility Plan or TIP that require an air quality conformity analysis (e.g., addition of a regionally significant project) shall also require consultation with interested parties and other appropriate public review activities.

Consultation with Federal, State, and Local Agencies

When the TPO develops the Mobility Plan and TIP, it will consult, as appropriate, with local and regional agencies and officials responsible for other planning activities within the Knoxville area. This consultation shall include, as appropriate, contacts with regional, local, and private agencies responsible for planned growth, economic development, environmental protection, airport operations, freight movements, land use management, natural resources, conservation, and historic preservation.

An increased emphasis is placed on consultation with resource agencies responsible for natural resource management and historic preservation. The Tennessee Department of Transportation (TDOT) took the lead in establishing consultation procedures, and the TPO will contact federal and state agencies using the agreed upon process. Formal coordination with these agencies will help to identify effective mitigation strategies for potential impacts of projects included in the TPO's Regional Mobility Plan.

The TPO will compare proposed transportation improvements in the area to the agencies' plans, maps, inventories, etc. to assess potential environmental impacts. The assessments will be included in the draft Mobility Plan document to be circulated to the public and to the environmental agencies for at least 30 days prior to adoption.

The Mobility Plan and TIP shall be developed with due consideration of other related planning activities within the Knoxville area, including the design and delivery of transportation services within the area that are provided by:

- Recipients of assistance under title 49, U.S.C., Chapter 53;
- Governmental agencies and nonprofit organizations (including representatives of the agencies and organizations) that receive federal assistance from a source other than the U.S. Department of Transportation to provide non-emergency transportation service; and
- Recipients of assistance under 23 U.S.C. 204.

Interagency agreements will be maintained between the TPO and other local and regional agencies such as the Lakeway MPO, East Tennessee North Rural Planning Organization (RPO), East Tennessee South RPO, and the East Tennessee Development District (ETDD). The agreements will describe the TPO's role and responsibility in relation to the other agencies' work.

Getting the Word Out

The process to hear from the public in developing this Plan has been guided by and is consistent with the rules and processes laid out in the TPO Outreach Plan and all relevant federal legislation. Highlighted below are some major elements from the Outreach Plan that have been relevant in the development of this Plan.

Accessibility

TPO meetings and public review meetings shall be held at locations and times that are convenient and accessible. When there are a series of public meetings being held throughout the region on a certain plan or program, a special effort will be made to offer a portion of these meetings at times and locations that are accessible by public transportation.

Public Notice

Public notices and/or advertisements will be placed in newspapers that target specific minority and ethnic groups, in addition to major regional newspapers deemed appropriate for the project.

List of regional newspapers:

- Knoxville News Sentinel
- Clinton Courier
- The Enlightener
- Fountain City Focus
- Loudon County News-Herald
- Mundo Hispano
- Citizen Tribune (Jefferson County)
- The Daily Times (Maryville)
- Farragut Press
- Halls Shopper
- Mountain Press (Sevierville)
- Oak Ridger

Public service announcements and meeting advertisements will be sent to popular minority and ethnic radio stations, in addition to local public radio and regional mainstream/commercial stations. Whenever possible and appropriate, public service announcements and meeting advertisements will be sent to the public access cable television station, in addition to regional network stations.

List of regional television media:

- WATE-TV (ABC 6)
- WVLT-TV (CBS 8)
- ACTV 95 (Anderson County)
- CTV (Knoxville)
- WBIR-TV (NBC 10)
- WTNZ-TV (Fox 43)
- WKOP-TV (East Tennessee PBS)

Transparent, User-Friendly Products and Processes

Understandable and Interesting Language / No Jargon

Meeting notices and materials will use appropriate, understandable language. Acronyms and other technical jargon will be avoided to the extent that is possible to the subject matter. Efforts will be made to tailor advertising, project campaigns, and slogans to generate the most interest possible. The TPO will make reasonable efforts to address identified language barriers in order to provide meaningful access to information on its plans and programs. The TPO will utilize tools such as the Flesch Reading Ease Score and the Flesch-Kincaid Grade Level Score to evaluate the readability of products and especially information on the TPO website. Every effort will be made to improve readability using these tools.

Use of Shorter Documents or Executive Summaries

Planners are known for writing plans that contain valuable content, but are lengthy, dense, and often perceived as "coffee table books" that few people read. This reduces transparency and drastically diminishes the effectiveness of the planning process. An effective process results in a plan that is easy to read, highlights what is important, and explains how the planning process affects people's daily lives. Not all planning products can be succinct and remain complete. When this is the case, executive summaries should be used to communicate the central concepts to the public and refer them to the main document for further detail. In addition, the TPO will be aggressive in ensuring that these products are easy to understand, based on the above-mentioned Flesch Reading Ease Score and Flesch-Kincaid Grade Level Score.

Use of Visualization Techniques

Visualization techniques are used to make it easier to understand complex technical materials and ideas. Diagrams, maps and other visual tools can simplify confusing information. Easy-to-understand publications and presentations effectively mix color, white space, and graphics.

Elements Specific to the Long Range Regional Mobility Plan

The Regional Mobility Plan is a long-range (20+ year) multimodal strategy and capital improvement program. It is developed to guide the effective investment of public funds in transportation facilities. The Mobility Plan is updated every four years and may be amended as a result of changes in projected Federal, State, and local funding; major investment studies; congestion management systems plans; interstate interchange justification studies; and environmental impact studies. The current Mobility Plan is available for viewing online as well as at the TPO office.

Table 4-1: Summary of Mobility Plan Outreach Activities and Techniques, from Outreach Plan

Activity	Technique(s)
Draft Document:	Available online (www.knoxtrans.org) and at the TPO office.
Comment Opportunities:	Many opportunities to be heard: • At public meetings • Via electronic formats (e-mail, online comment cards, fax, etc.) • In person or by mail to the TPO office • During standing meetings (Technical Committee, Executive Board, or public meetings held specifically for Mobility Plan updates). • Through mail- or web-based questionnaires (may be used to gather information about specific projects in some cases).
Comment Period:	• **Minimum of 30 days**, prior to adoption for updates and amendments[1]. • The public comment period begins with public notice.
Public Meeting(s):	• Public meeting(s) are to be held during the public comment period. • There will be separate meetings for the draft plan and the final Mobility Plan.
Public Meeting Notice:	• Ten (10) to fourteen (14) days prior to the public meeting, a press release, web announcements, announcement posters, and/or announcement letters will be distributed. • Two (2) to three (3) weeks prior to the public meeting, paid media advertisement (newspaper) or a public service announcement (radio) will run, and/or a public notice will be published in various regional, local, and minority newspapers.
Amendment Notice:	Amendment notices will be sent through web announcements, public notice in regional, local, and minority newspapers and regularly scheduled meetings.
Summary of Comments Received:	• A public comment summary memo will be made available prior to the Executive Board meeting for the Mobility Plan update. • Written and verbal comments are summarized and incorporated into the final Mobility Plan.[2]

[1] If there are significant changes to the final draft Mobility Plan or TIP from the one made available for public comment, an additional opportunity will be provided for public comment on the revised changes. The TPO director shall determine when changes are significant and warrant additional opportunity for public comments.

Activity	Technique(s)
Final, Adopted Document:	• Available at the TPO website (www.knoxtrans.org) and TPO office. • Upon adoption of final document, all TPO participants as well as all county libraries will be notified by e-mail that the document is available on the TPO website.
Evaluation Technique(s):	• The Mobility Plan will be evaluated at least every four years in consultation with interested parties. • All comments and suggestions made by the public will be recorded and taken into consideration when improvement strategies are discussed. • The number of meeting participants, number of electronic comments and responses, number of "hits" on website, and the number of non-electronic written and oral comments will be tracked and recorded by TPO staff and a summary will be reported on the TPO website.

Evaluating Our Performance

The Outreach Plan does not intend to be a prescriptive document that dictates what public outreach will look like until the Plan is next updated. The Plan establishes a set of meaningful minimum requirements, based on federal guidance and sound logic. It then sets the tone for a professional culture that continuously seeks out new best practices. This philosophy is new and reflects the need for "living" planning processes that respond to the public rather than playing catch-up years later.

Ongoing Public Surveys

In years past, outreach has been evaluated using surveys administered every four years at the onset of the Plan update. In the future, the TPO will look to incorporate an evaluation of its outreach process in all of its activities. This will give a current data point that directly relates to a real activity in the outreach process rather than an academic exercise that asks broad questions long after the events have occurred. The TPO will use a standardized questionnaire card where appropriate, but may often use questions tailored to specific outreach activities.

[2] When significant written and oral comments are received on the draft Mobility Plan or draft TIP as a result of the public involvement process or the interagency consultation process required under the U.S. Environmental Protection Agency's conformity regulations, a summary, analysis, and report on the disposition of comments shall be made part of the final Mobility Plan or TIP.

Laboratory for Best Practices

The best way to evaluate our performance is a real-world approach. The TPO and its programs will continue to look to other organizations as well as internal ideas to identify and test new practices in addition to fulfilling a set of meaningful minimum requirements. This will allow the TPO to evaluate performance by testing the effectiveness of a method. How many people did the method reach? Do they have a better understanding of our process as a result? Did this method reach people new to our process? These and other questions determine the effectiveness of a method and its potential value moving forward.

Reliable Outside Sources

The TPO will look to outside sources that are able to evaluate outreach methodology, especially those that are able to do so in a statistically significant way. This can be a meaningful source of information in evaluating those methods and practices, which may warrant further consideration and those, which may warrant less emphasis. A statewide survey revealed that the most effective communication tools for public outreach are e-mail and websites as well as newspaper and direct mailings, while the least effective communication tools are legal documents at libraries and telephone and direct mail surveys.

Readability of TPO Products

The TPO will utilize tools such as the Flesch Reading Ease Score and the Flesch-Kincaid Grade Level Score to evaluate the readability of products and especially information on the TPO website. These scores will be used to evaluate TPO performance and identify where complex materials need to be supplemented with summary materials that are in more digestible language. The TPO will be aggressive in ensuring that the TPO website and summaries are easy to understand by these measures.

Statistically Valid Survey (Partnered with Plan East Tennessee)

In partnership with Plan East Tennessee (PlanET), the TPO performed a statistically valid survey of the five-county Metropolitan Statistical Area (MSA). This includes Anderson, Blount, Knox, Loudon, and Union counties. The University of Tennessee performed the survey, which included 2,000 participants, 400 from each county. The results, shown in detail in this section, give a great deal of information for planners and public officials on the perspectives of the people of our region and form the most significant backdrop for this and other planning efforts.

*Overall how would you rate the quality of life in your community?**

Table E-2: Rating of Overall Quality of Life

	Region (N=2,000)	Anderson (N=400)	Blount (N=400)	Knox (N=400)	Loudon (N=400)	Union (N=400)
Poor	3.40%	4.70%	2.50%	3.20%	1.90%	11.40%
Fair	18.10%	19.40%	16.10%	17.30%	21.40%	37.40%
Good	51.60%	52.50%	53.20%	51.40%	51.90%	42.60%
Excellent	26.40%	23.30%	27.40%	27.60%	24.70%	8.40%
Overall Quality of Life	**3.00**	**2.94**	**3.04**	**3.02**	**2.99**	**2.48**

*(Higher number indicates higher quality of life - 4=Excellent, 3=Good, 2=Fair, 1=Poor)

Please tell me if you think .... is a major problem, a minor problem, or not a problem at all in your community?

Table E-3: Severity of Problems in the Region

	Region (N=2,000)	Anderson (N=400)	Blount (N=400)	Knox (N=400)	Loudon (N=400)	Union (N=400)
Lack of Good Paying Jobs	**2.41**	**2.42**	**2.48**	**2.34**	**2.56**	**2.85**
Pollution in the Rivers and Lakes	2.17	1.97	2.10	2.25	2.14	1.84
Roads and Highways in Need of Repair	2.12	1.87	2.06	2.18	1.99	2.48
Lack of Public Transportation	2.09	2.36	2.23	1.95	2.40	2.38
Empty Commercial Buildings	2.01	2.13	1.99	2.02	1.92	1.76
Loss of Agricultural Land	2.00	1.90	2.04	2.01	1.99	1.74
Traffic Congestion	1.99	1.62	2.14	2.06	1.76	1.46
Low Achieving Schools	1.97	1.64	1.77	2.07	2.00	2.23
Air Pollution	1.94	1.62	1.86	2.03	2.04	1.47
Lack of Affordable Housing	1.87	1.85	1.95	1.85	1.84	1.93
Lack of Places to Walk or Ride Bikes	1.86	1.77	1.57	1.96	1.79	2.10
Overdevelopment of Land	1.82	1.58	1.94	1.86	1.67	1.50
Lack of Quality Healthcare	1.81	1.82	1.79	1.80	1.79	2.19
Rapid Population Growth	1.77	1.58	2.01	1.73	1.88	1.67
Loss of Community Identity and Character	1.69	1.70	1.63	1.71	1.60	1.71
Water and Sewer Systems in Need of Repair	1.58	1.59	1.46	1.60	1.59	1.94
Poor Water Quality	1.54	1.45	1.44	1.58	1.50	1.80

*(Higher number indicates more severe problem - 3=Major Problem, 2=Minor Problem, 1=Not a Problem)

Which one of these problems do you think is the most serious problem facing your community?

Table E-4: Most Serious Problem Facing the Region

	Region (N=2,000)	Anderson (N=400)	Blount (N=400)	Knox (N=400)	Loudon (N=400)	Union (N=400)
Lack of Good Paying Jobs	24.90%	34.30%	28.10%	21.30%	30.40%	35.70%
Low Achieving Schools	11.00%	5.30%	6.80%	12.40%	14.90%	20.20%
Pollution in the Rivers and Lakes	7.80%	6.80%	8.00%	8.10%	7.30%	2.60%
Traffic Congestion	6.80%	2.70%	7.30%	8.10%	1.90%	1.00%
Roads and Highways in Need of Repair	6.60%	1.80%	6.70%	7.60%	3.30%	11.20%
Air Pollution	5.30%	1.40%	5.30%	5.60%	10.40%	0.50%
Lack of Quality Healthcare	4.80%	4.40%	4.30%	5.10%	4.00%	4.70%
Lack of Places to Walk or Ride Bikes	4.50%	1.40%	1.70%	6.40%	0.50%	0.90%
Lack of Affordable Housing	4.10%	5.10%	4.20%	4.20%	1.90%	1.70%
Empty Commercial Buildings	3.50%	10.30%	1.00%	3.40%	1.70%	1.30%
Loss of Agricultural Land	3.30%	1.00%	5.30%	3.20%	3.10%	1.40%
Lack of Public Transportation	3.10%	3.30%	3.60%	2.80%	4.30%	1.90%
Overdevelopment of Land	2.40%	4.30%	3.70%	1.90%	1.70%	1.40%
Rapid Population Growth	2.30%	1.90%	4.90%	1.60%	2.70%	1.30%
Poor Water Quality	2.00%	2.60%	1.40%	2.00%	2.30%	2.80%
Loss of Community Identity and Character	1.10%	2.10%	1.40%	1.00%	0.30%	0.80%
Water and Sewer Systems in Need of Repair	1.00%	1.80%	1.50%	0.60%	1.00%	2.70%

For every additional dollar received, how much would you spend on each of the following five areas?

Table E-5: Spending Priorities (in Cents)

	Region (N=2,000)	Anderson (N=400)	Blount (N=400)	Knox (N=400)	Loudon (N=400)	Union (N=400)
Attracting high quality jobs	29.38	34.13	28.44	28.40	33.28	28.70
Improving air or water quality	15.23	12.63	13.39	16.47	14.51	11.27
Improving the transportation system including roads and highways	22.18	17.94	24.02	22.16	21.55	29.44
Increasing housing choices at affordable prices	13.96	15.64	14.23	13.80	12.53	12.74
Reducing healthcare costs	19.95	20.40	20.20	20.17	17.55	17.58

If you were going to move from your present home, how important would the following be to you in choosing a new place to live?

Table E-6: Importance of Factors in Choice of Housing

	Region* (N=2,000)	Anderson* (N=400)	Blount* (N=400)	Knox* (N=400)	Loudon* (N=400)	Union* (N=400)
High quality public schools	2.54	2.58	2.55	2.53	2.51	2.48
Easy access to major highways or interstates	2.30	2.12	2.07	2.39	2.38	2.10
Being within a 30-minute drive to work	2.45	2.40	2.34	2.51	2.32	2.31
Having sidewalks and places to take walks	2.41	2.33	2.22	2.50	2.30	2.17
Living in a community with people at all stages of life	1.97	1.96	1.92	2.00	1.92	1.84
Easy access to public transportation	1.89	1.92	1.72	1.93	1.90	1.84
Being within an easy walk of other places and things in the community	2.04	2.03	1.95	2.10	1.85	1.85
Living in a community with a mix of people from various racial and ethnic backgrounds	1.76	1.73	1.73	1.80	1.68	1.46
Living in a community with a mix of different types of housing	1.70	1.68	1.65	1.73	1.59	1.55

*(Higher number indicates higher level of importance - 3=Major Importance, 2=Minor Importance, 1=Not Important)

Please tell me if you think there is too much, too little, or the right amount of each of the following in the area close to where you live.

Table E-7: Availability of Amenities

	Region (N=2,000)	Anderson (N=400)	Blount (N=400)	Knox (N=400)	Loudon (N=400)	Union (N=400)
Housing for People with Moderate or Low Incomes						
Too Much	7.20%	10.20%	5.80%	7.30%	4.50%	10.20%
Right Amount	41.40%	39.40%	43.30%	40.50%	52.70%	31.60%
Too Little	42.30%	42.10%	44.00%	42.00%	37.10%	52.70%
Large Discount or Warehouse Stores						
Too Much	7.20%	6.00%	7.50%	7.50%	6.50%	1.50%
Right Amount	56.30%	42.10%	54.50%	62.10%	45.10%	22.40%
Too Little	35.70%	50.10%	36.30%	29.90%	47.90%	74.90%
New Houses and Apartments Being Built						
Too Much	18.50%	13.00%	21.70%	19.10%	18.10%	7.00%
Right Amount	51.60%	46.80%	52.40%	52.10%	55.80%	41.40%
Too Little	27.00%	37.30%	23.20%	25.70%	24.10%	49.40%
New Stores and Offices Being Built						
Too Much	16.00%	13.20%	15.80%	17.80%	10.00%	3.00%
Right Amount	45.10%	30.40%	49.00%	47.50%	45.50%	22.60%
Too Little	36.70%	54.40%	32.80%	32.40%	43.00%	72.50%
Parks and Playgrounds						
Too Much	0.70%	1.50%	0.80%	0.80%	0.50%	0.20%
Right Amount	58.80%	62.60%	64.90%	57.00%	57.00%	45.80%
Too Little	39.50%	34.40%	34.30%	41.00%	41.80%	54.00%
Places to Bike						
Too Much	2.20%	1.00%	4.30%	1.50%	4.70%	2.20%
Right Amount	46.80%	53.90%	60.40%	42.50%	44.30%	37.30%
Too Little	49.70%	43.40%	34.80%	54.80%	49.80%	59.00%
Places to Walk or Exercise for Fun						
Too Much	1.20%	1.80%	2.00%	0.50%	4.00%	2.50%
Right Amount	58.70%	64.30%	68.10%	55.90%	57.60%	46.30%
Too Little	39.80%	34.00%	29.90%	43.30%	38.20%	50.00%
Public Transportation Within an Easy Walk						
Too Much	1.10%	2.50%	1.30%	1.00%	0.20%	0.00%
Right Amount	28.90%	14.50%	22.00%	36.10%	11.40%	12.70%
Too Little	64.50%	79.80%	72.00%	56.40%	83.10%	84.10%
Sidewalks						
Too Much	0.60%	0.70%	1.80%	0.30%	0.20%	0.70%
Right Amount	32.50%	41.60%	42.00%	27.90%	33.50%	35.20%
Too Little	66.10%	57.10%	55.50%	70.90%	65.30%	63.60%
Shops or Restaurants Within an Easy Walk of Your House						
Too Much	2.90%	2.00%	2.70%	3.50%	1.00%	0.70%
Right Amount	37.70%	32.40%	42.90%	39.20%	26.60%	20.60%
Too Little	58.10%	64.30%	53.10%	56.00%	70.40%	77.40%

When it comes to participating in a process to share your ideas about future growth, what ways of participating would be most attractive to you?

Table E-8: Methods of Participation

	Region (N=2,000)	Anderson (N=400)	Blount (N=400)	Knox (N=400)	Loudon (N=400)	Union (N=400)
Being part of a local organization that is directly involved in the process with decision makers	17.50%	18.90%	15.70%	18.30%	13.20%	16.10%
Participating in-person in a community forum or meeting	21.20%	23.70%	21.00%	20.50%	25.30%	17.20%
Posting my ideas somewhere online	24.70%	26.20%	25.40%	23.70%	28.50%	24.80%
Talking about and sharing my ideas directly with my own local community leaders	4.80%	3.80%	5.10%	4.60%	7.00%	6.10%
Some other way	8.30%	8.60%	8.70%	8.20%	8.50%	7.60%
I never participate	32.40%	29.00%	29.00%	34.90%	27.20%	26.40%

Where do you get most of your information about what is going on in your area?

Table E-9: Source of Local News

	Region (N=2,000)	Anderson (N=400)	Blount (N=400)	Knox (N=400)	Loudon (N=400)	Union (N=400)
Local newspaper	45.70%	43.40%	49.60%	43.20%	56.50%	61.70%
Local TV stations	55.30%	57.30%	55.40%	55.30%	57.00%	43.70%
Local radio stations	20.20%	15.40%	20.50%	21.80%	15.00%	14.60%
Online	27.10%	26.40%	19.90%	30.00%	25.60%	11.30%

How far and how long do you travel to your school or place of employment?

Table E-10: Travel Time and Distance to Place of Employment

	Region (N=2,000)	Anderson (N=400)	Blount (N=400)	Knox (N=400)	Loudon (N=400)	Union (N=400)
Distance (miles)	12.3	15.4	12.1	11.4	13.8	20.2
Time (minutes)	20.5	23.8	21.7	19.2	19.7	32.7

*Respondent Characteristics***

Table E-11: Respondent Characteristics

	Region (N=2,000)	Anderson (N=400)	Blount (N=400)	Knox (N=400)	Loudon (N=400)	Union (N=400)
Gender						
Male	41.10%	41.40%	38.50%	37.40%	47.00%	41.30%
Female	58.90%	58.60%	61.50%	62.60%	53.00%	58.70%
Age						
18 - 39	13.10%	10.80%	17.60%	16.30%	7.80%	13.30%
40 - 64	47.10%	45.00%	45.70%	48.10%	42.10%	54.80%
65+	39.70%	44.20%	36.70%	35.60%	50.10%	31.90%
Years of Residence						
1 - 9 years	19.60%	18.00%	21.80%	19.40%	23.90%	15.00%
10 - 19 years	17.80%	12.20%	19.30%	15.60%	24.20%	17.80%
20 years or more	62.60%	69.80%	58.90%	65.00%	51.90%	67.30%
Area of Residence						
Rural area	47.70%	37.50%	48.80%	25.20%	51.00%	75.60%
Next to a city or town	21.70%	14.30%	24.00%	32.20%	27.80%	10.40%
In a city or town	30.60%	48.30%	27.30%	42.60%	21.30%	13.90%
Type of Residence						
House	83.30%	82.80%	83.30%	82.20%	89.10%	79.40%
Apartment or condo	6.80%	7.00%	6.50%	13.60%	4.50%	2.50%
Duplex	0.60%	1.50%	0.80%	0.50%	0.20%	0%
Mobile home	9.00%	8.20%	9.30%	3.50%	6.00%	18.20%
Employment Status						
Employed full-time	30.30%	29.20%	30.80%	35.90%	22.90%	32.60%
Employed part-time	9.10%	8.00%	10.30%	11.60%	8.70%	7.00%
Unemployed	8.60%	9.70%	8.30%	7.50%	6.00%	11.70%
Retired	44.90%	48.40%	43.30%	37.20%	56.70%	39.10%
Full-time homemaker	5.30%	2.50%	6.30%	5.80%	4.20%	8.00%
Student	1.60%	2.00%	1.00%	2.00%	1.50%	1.70%
Highest Level of Education						
Less than high school	7.60%	6.50%	6.50%	5.30%	4.50%	15.40%
High school or equivalent	28.90%	24.40%	32.00%	20.90%	24.60%	42.50%
Some college or Associate degree	30.70%	34.70%	33.00%	28.90%	29.60%	27.40%
Bachelor degree	17.50%	16.50%	17.50%	22.60%	21.90%	9.00%
Graduate work or degree	15.10%	17.70%	10.50%	22.10%	19.40%	5.70%
Racial Category						
African American or Black	2.10%	1.50%	2.30%	6.50%	0.20%	0%
Asian or Pacific Islander	0.60%	1.20%	0.30%	1.00%	0.20%	0.20%
Hispanic	0.30%	0.20%	0.30%	1.00%	0%	0%
Native American	1.20%	1.50%	1.30%	0.30%	1.70%	1.20%
White	94.70%	93.80%	95.30%	89.20%	97.50%	97.50%
Some other race	0.70%	0.70%	0.50%	1.50%	0%	0.70%

	Region (N=2,000)	Anderson (N=400)	Blount (N=400)	Knox (N=400)	Loudon (N=400)	Union (N=400)
Household Income						
Under $25,000	23.00%	24.00%	17.80%	20.40%	16.30%	36.00%
$25,000 - $49,000	27.30%	25.60%	33.20%	23.60%	22.90%	30.80%
$50,000 - $74,000	21.40%	20.00%	23.10%	20.90%	26.20%	17.20%
$75,000 - $99,000	12.10%	12.30%	11.70%	12.20%	15.70%	8.90%
$100,000- $149,000	8.80%	10.10%	9.30%	10.10%	10.70%	4.20%
$150,000	5.00%	5.30%	3.40%	10.10%	5.80%	0.80%
Not sure	2.30%	2.70%	1.60%	2.70%	2.50%	2.10%

**All frequencies are unweighted

Online Mobility Plan Survey

The TPO released a survey to the public on October 16, 2012 and closed it on November 9, 2012. Information was shared via email from the TPO, Smart Trips, the Bicycle Program, and PlanET. Information was shared via Facebook and Twitter by each of the above groups. Among the people and groups directly contacted by the TPO were local jurisdictions and transportation-related agencies. Many shared the survey with their email lists, via their newsletters, and via social media. Based on that broad effort, it is difficult to pinpoint how many people were directly informed. The TPO received 378 responses to the survey.

Question 2: Please rate each of the following aspects of the transportation system in your community today, on a scale of 1 to 4 with 1 being "Poor" and 4 being "Very Good" or select 0 if it is "Not Available" in your community.

Table E-12: Rating of Transportation System

Answer Options	0 (N/A)	1 (Poor)	2 (Fair)	3 (Good)	4 (Very Good)
Traffic conditions on major roads	0.0%	13.0%	43.9%	37.2%	5.9%
Transit services	17.2%	36.4%	30.8%	13.3%	2.3%
Sidewalks and crosswalks	13.2%	42.6%	30.8%	11.5%	2.0%
Bike lanes and wide shoulders	19.3%	52.5%	19.8%	6.7%	1.7%
Greenways and bicycle/pedestrian paths	13.6%	23.9%	30.4%	23.6%	8.5%
Traffic safety and control on major roads	1.4%	17.9%	40.8%	34.9%	5.0%
Overall rating for transportation system	1.1%	29.7%	52.4%	16.0%	0.8%
				answered question	**358**
				skipped question	**20**

Question 3: Please look at the issues below and tell us which are most important to consider for your community over the next 25-30 years. Rate each issue on a scale of 1 to 5, with 1 being the least important and 5 being the most important.

Table E-13: Importance of Issues

Answer Options	1 (Least Important)	2	3	4	5 (Most Important)
Better traffic signal operation	14.8%	24.6%	25.9%	21.2%	13.5%
Real-time traffic info (i.e. signage, web)	21.4%	26.1%	28.5%	17.3%	6.8%
More transit service	4.0%	5.7%	20.7%	28.4%	41.1%
More sidewalks	2.7%	7.0%	18.0%	29.0%	43.3%
Maintain existing transportation system	8.2%	10.2%	31.4%	32.1%	18.1%
More bike facilities	9.3%	10.3%	17.0%	25.3%	38.0%
Build new roads	33.1%	32.1%	20.5%	8.9%	5.5%
High occupancy vehicle (HOV) lanes	30.7%	27.7%	20.0%	13.7%	8.0%
Improve the movement of goods and freight	12.5%	34.0%	28.6%	16.5%	8.4%
Protect historic resources	7.4%	16.7%	24.4%	26.1%	25.4%
Walkable neighborhoods/commercial centers	1.7%	4.7%	13.7%	22.3%	57.7%
Protect community character	4.3%	8.0%	22.3%	26.7%	38.7%
Safe routes to school (bike/walk)	4.0%	2.4%	11.1%	25.9%	56.6%
Reduce travel times between places	8.0%	20.7%	34.7%	23.7%	13.0%
Improve air quality	2.3%	4.0%	12.8%	27.5%	53.4%
Protect natural resources	2.0%	5.4%	12.7%	29.4%	50.5%
Safety for drivers	1.7%	7.1%	24.9%	31.6%	34.7%
Safety for bicyclists and pedestrians	1.3%	2.3%	9.3%	20.9%	66.2%
Coordinated land use and transportation planning	0.7%	3.0%	18.9%	32.4%	44.9%
				answered question	**303**
				skipped question	**75**

Question4: If you were given $100 to spend on transportation in our region, how would you distribute it among these types of projects? (Please put a number in every category, even if it is $0)

Table E-14: How Respondents would Spend $100

Answer Options	Response Average
Improve traffic signal operation	$5.99
Add lanes to existing roadways	$3.99
Build new roadways	$4.46
Encourage alternative transportation	$13.41
Provide real time traffic information	$3.16
Maintain pavement in good condition	$15.54
Improve road safety	$8.63
Provide more transit service	$22.71
Provide bicycle and pedestrian facilities	$20.95
Other	$1.22
answered question	**301**
skipped question	**77**

Question 5: How do you think future transportation projects should be funded?

Table E-15: How Transportation Should be Funded

Answer Options	Response Percent
Use tolls to fund new projects	19.8%
Increase the fuel tax (gas/diesel)	41.6%
Leave taxes at the level they are now	20.8%
Charge new development for transportation improvements	59.4%
Increase sales tax to fund projects	10.1%
Increase property tax to fund projects	21.5%
Other (some specified below)	14.8%
answered question	**297**
skipped question	**81**

- It makes sense to piggyback off of vehicle registration revenues for increase funding of transportation projects. Every vehicle that is registered is another that is contributing to the congestion we are plagued with. The answer is not expansion or more roads but better management and incentives to use alternative transit. When a society would like less of something through history, the taxation of that tangible asset (vehicles and their use on area roads) has provided a good disincentive. This of course must be precluded by the presence of an effective public transit system that services a larger area including areas of higher residential dwellings. *(Nov 9, 2012 9:44 PM)*
- I would favor tolls for major developments, such as theme parks and Turkey-Creek-sized shopping parks. Such developments create massive transportation issues for established neighborhoods, which should not be penalized financially, as they are already paying a price with heavy traffic and pollution issues. *(Nov 8, 2012 5:51 PM)*
- Property Tax Increase *(Nov 7, 2012 3:08 PM)*
- Reallocate present funds *(Nov 7, 2012 1:29 PM)*
- Increase fuel tax but provide alternatives to driving. Very important that both are done together. *(Nov 6, 2012 7:47 PM)*
- All of these things go hand in hand. You don't have to increase a budget to spend it wisely. A dollar spent on a bike lane is not a dollar taken away from road safety. *(Nov 6, 2012 6:49 PM)*
- TN needs an income tax. The tax structure in TN is highly regressive and the tax revenue in the state needs to be more diverse. Also, reworking property taxes structures and zoning laws that encourage smarter development would be a boon to urban planning. At the same time, preventing the bad reworking of laws like the state assembly tried to do with the solar installations would also be beneficial. Please lobby for good legislation in TN. *(Nov 6, 2012 5:26 PM)*
- Public park and rides to give people options. *(Nov 5, 2012 3:31 PM)*
- With the taxes already being collected. *(Nov 5, 2012 1:34 PM)*
- Can you obtain additional revenue from vehicle registration? *(Nov 4, 2012 2:05 AM)*
- Establish HOV lanes and impose fees for single occupancy vehicles to use those lanes. Use tolls on busy roads to encourage use of mass transit, bikes, sidewalks." *(Nov 3, 2012 10:47 PM)*
- Partner with Scenic Knoxville, Knox Heritage, Legacy Parks, community organizations, and other nonprofits to raise money through grants and other means. Major focus needs to be build roundabouts, sidewalks, and planted medians on collectors and minor arterials and building more greenways to connect neighborhoods with parks and schools. *(Nov 3, 2012 7:28 PM)*
- Divert funding from programs that are not essential to cover funding for programs that are (such as transportation). Also, the city should stop

giving money to developers to encourage that they develop. If Walmart and Public cannot afford to build at the bellows site, then it means they should not build. We should not be diverting millions of dollars from our budget to "help them out". Especially not when they build developments and then abandon them in other parts of the city. *(Nov 3, 2012 2:04 PM)*

- Work at improving efficiency because times are getting tough for us all. *(Nov 2, 2012 12:07 PM)*
- Some type of consumption tax that allows me to determine how much I pay and when I pay *(Nov 2, 2012 2:49 AM)*
- Decrease mega projects and improve / maintain local roads. *(Nov 2, 2012 2:15 AM)*
- Cut waste elsewhere!!! *(Nov 1, 2012 6:12 PM)*
- Make sure modern transit systems are included in every new project - like bus lanes, light rail or subway. Fares will help mitigate costs. *(Nov 1, 2012 2:35 PM)*
- REDUCE SPENDING ON JUSTICE SYSTEM *(Oct 31, 2012 5:54 PM)*
- Local taxes and federal grants. *(Oct 31, 2012 12:22 PM)*
- Additional Fees for Gas Guzzlers *(Oct 30, 2012 10:23 PM)*
- Part of traffic violation charges should go toward transportation projects *(Oct 30, 2012 9:34 PM)*
- Use fees *(Oct 30, 2012 6:09 PM)*
- All counties reflected in ridership should be given opportunity to support and participate in transportation projects. Add new transportation projects by expansion to surrounding counties. *(Oct 30, 2012 5:51 PM)*
- Increase vehicle registration fees to fund projects *(Oct 30, 2012 5:44 PM)*
- charge for city wheel tax by size of vehicle *(Oct 30, 2012 5:31 PM)*
- increase tickets amount for road and safety violations, for they are too low *(Oct 30, 2012 5:06 PM)*
- Consider a state income tax - the above resources are either tapped out or not viable (tolls - there are not enough miles of interstate to make it worth it) *(Oct 30, 2012 1:18 PM)*
- Wheel tax *(Oct 29, 2012 5:45 PM)*
- New development that requires new roads should pay for the roads as well as other infrastructure, like sewer. *(Oct 28, 2012 4:00 PM)*
- Just add traffic light on Alcoa hwy. we're neighborhood locked in commercial is leaving because of hwy access need traffic slower *(Oct 28, 2012 5:00 AM)*
- Income tax *(Oct 26, 2012 4:45 PM)*
- Redistribute current funds, prioritizing according to the peoples' desires. *(Oct 26, 2012 4:41 PM)*
- We need to encourage people who can pay taxes to see the benefits of taxation. Taxes maintain infrastructure. If people understood the importance of taxes, they'd balk less at having to pay them. I cannot say I'm the biggest fan of taxes, but I understand they're necessary. *(Oct 26, 2012 2:51 PM)*
- Wheel tax *(Oct 25, 2012 3:37 PM)*
- Increase wheel tax; tax based on gas mileage of vehicle; luxury auto tax *(Oct 25, 2012 3:37 PM)*
- Find better ways to distribute Taxpayer money to better serve those with the greatest need. *(Oct 25, 2012 2:24 PM)*
- Decrease the "fat" in others programs where money is being misused and wasted. *(Oct 25, 2012 1:35 PM)*
- Increase the wheel tax. Charge new development that increases sprawl (and longer transportation times) and encourage reusing space already on bike and bus routes. *(Oct 25, 2012 6:11 AM)*
- State income tax *(Oct 25, 2012 12:22 AM)*
- No tax increase! But use a combination of toll road and charging developers for enhancement. *(Oct 24, 2012 11:55 PM)*
- Larger proportion of state and federal taxes *(Oct 24, 2012 5:45 PM)*
- Not sure *(Oct 23, 2012 6:32 PM)*
- Patch the cracks in the current budgets and appropriate the funds to make improvements. *(Oct 23, 2012 6:13 PM)*
- Wheel tax or add tax to vehicle tags. Could also introduce vehicle inspections, which are needed. *(Oct 23, 2012 6:12 PM)*
- Increase auto registration fees. Levy surcharge on low gas mileage vehicles. Increase parking fees. *(Oct 23, 2012 6:08 PM)*
- Charge a clean air fee on vehicle registration. Many regions have done this. *(Oct 23, 2012 5:59 PM)*
- Maybe less back room deals and use the money that's already there/allocated in a more efficient manner. The necessary money is available; it's tied up in corruption and bullshit! *(Oct 23, 2012 5:54 PM)*
- Need to have a percentage of development cost bond for real estate developers. They build buildings, take the profit, then leave the taxpayers with the bill for infrastructure. It's very unfair for

transportation, schools, fire and police protection *(Oct 23, 2012 5:09 PM)*

- Reorganize statewide funds - It's a fact when schools, are under budget they waste funds just so they can get more the following year. This needs to change drastically. Schools is only an example all State funded organizations do this. A plan needs to be in place to reward all money saved. Not to reward all money spent with a larger budget for the following year. *(Oct 23, 2012 4:55 PM)*
- Tax incentives based on savings & environmental impact (reduced travel time, lessened congestion, decreased pollution, non-renewal resource usage, better utilization of existing roadways, remote work for decreased commuting etc). *(Oct 23, 2012 4:50 PM)*
- I think that some school dollars should be allocated for making it safe for the children to get to school. If you live in a "walk" zone, make it SAFE for the kids to actually walk or ride their bikes to school. It makes no sense for 100's of kids to be DRIVEN to EACH school that live within a mile of the school, because there is not a sidewalk or anywhere for them to safely walk or ride their bikes. *(Oct 22, 2012 3:56 AM)*
- Increase wheel tax *(Oct 20, 2012 4:46 PM)*
- Tax vehicles based on their weight *(Oct 18, 2012 7:06 AM)*
- Switch from fuel to mile use tax *(Oct 18, 2012 12:44 AM)*
- Increase sales tax on auto (fossil fueled) specific purchases. Decrease tax on alternative specific purchases, i.e. bicycles, electric/hybrid vehicles. *(Oct 17, 2012 6:15 PM)*
- An income tax is a much more logical approach towards funding, though I recognize the difficulties in passing one and potential flight issues. *(Oct 17, 2012 3:49 PM)*
- Income Tax *(Oct 17, 2012 2:37 PM)*
- Don't raise taxes and don't do anything if you can't afford to do it with funds you have now. There is nothing wrong with waiting which is the responsible thing. *(Oct 17, 2012 2:26 PM)*
- Grants, redistribute existing funds, get creative, referendum on specific enhancement projects *(Oct 16, 2012 10:33 PM)*
- Use and convenience fees in addition to gas taxes. *(Oct 16, 2012 9:35 PM)*
- Better use of existing resources. *(Oct 16, 2012 8:09 PM)*
- Bond (create debt) for major projects to best match who benefits and who pays for such projects *(Oct 16, 2012 7:45 PM)*
- The gas tax should stay in the hands of local government. It now goes to DC and returns with too many string attached. *(Oct 16, 2012 7:36 PM)*
- Apply for grant money *(Oct 29, 2012)*

Question 6: Please comment on other issues you think are important concerning the Regional Mobility Plan or any other transportation issues.

- We must service a larger percentage of the regions populations to encourage public support of the system that is in fact available to them. The technology improvements that were instituted with tracking on the busses was in my opinion a waste of funds that might have been better allocated to expand routes served by KAT transit. *(Nov 9, 2012 9:44 PM)*
- I am very frustrated by the presence of bicycles on roads that have no shoulder, bike lane, or sidewalk. A recent bicycling tour actually came down Delrose Drive and Boyd's Bridge Pike. Why? *(Nov 8, 2012 5:51 PM)*
- Increase Bus transportation, Repair Sidewalks, Maintain and build bike lanes, return free bus rides to the elderly *(Nov 7, 2012 3:08 PM)*
- Most of my time/gas is spent sitting at traffic lights. Alternate routes/bypasses through these areas would help. *(Nov 7, 2012 1:29 PM)*
- Bike safety is a huge concern and Henley has been closed for WAY too long!!! It should not take so long to build a bridge. *(Nov 6, 2012 9:58 PM)*
- Railway needs to be considerably expanded. Both for people and freight *(Nov 6, 2012 8:33 PM)*
- Public transit to "The largest Department of Energy facility" and Y-12, which together employ close to 10,000 people should be a priority. Linking those who want to live in the beautiful city of Knoxville to these work options is a win-win for both the city of Knoxville (i.e. will allow people more options than living in W. Knox county- e.g., the sprawl areas of Turkey Creek) and the traffic issues associated with these employment centers. Buses or other HOVs should be provided on a regular and frequent schedule to/from downtown with stops in North Knox (1 line) and West Knox (another line) at inception. Other lines coming from East Knox, South Knox, far North Knox (Clinton, Norris?), etc. should be added as funding permits. *(Nov 6, 2012 7:47 PM)*
- Public transport needs to be the leader in green energy. By focusing public money on green investment, TN could help break our dependency on dirty and exploitative industries such as coal and help to halt the gas industry's advances in TN. By helping make green technology cheaper (since no one is willing to make fossil fuels more expensive) investing

public money in green and sustainably initiatives is the only way to fight the cost battle. Also, education programs such as apprenticeships and retraining will be necessary to ensure that people in TN are able to grow with the economy as well as to keep the public informed and willing to buy into these new options that we need in our near future. *(Nov 6, 2012 5:26 PM)*

- Somehow, incentives have to be offered for using public transportation and biking, greenways HAVE to be expanded, and the buses absolutely have to run more often and build shelters at the stops. KAT needs signage at every stop saying when that route picks up. Every single one. That would make it a lot more user-friendly. People won't use the buses en masse until it's easy & convenient. *(Nov 6, 2012 4:02 PM)*
- Buses should cover more areas and with more frequency. Park and Ride facilities for heavy commuter areas like UT and ORNL. *(Nov 6, 2012 3:02 PM)*
- 10,000 people at ORNL and Y12 - not one bus from Knoxville to ORNL or Y12. Such a shame! *(Nov 6, 2012 2:47 PM)*
- PARK AND RIDE *(Nov 6, 2012 2:46 PM)*
- Too much emphasis is placed on carpooling. I have car/van/bus-pooled in the past & was not particularly satisfied. Most people have lives that cannot be dictated by such inflexible schedules. *(Nov 5, 2012 6:18 PM)*
- Increasing access from surrounding counties into Knox County. Better signage, less business clutter would make a big difference. Better mass transit!!!! *(Nov 5, 2012 4:33 PM)*
- Need park and rides for public transit. Need more public transit to congested areas for employees to park and ride. KAT has done a terrible job 'getting rid' of routes for downtown employees who live 25 miles or further to have to now drive. We now have one Express route to downtown and riders have to pay more to ride this route. Charging more only causes lower ridership. *(Nov 5, 2012 3:31 PM)*
- Please connect greenways and bikeways so they are a viable option for getting from place to place. *(Nov 5, 2012 3:20 PM)*
- KAT = "Knoxville **AREA** Transit", right? But they do not serve the people who live outside the city, but work INSIDE the city. It's time to re-think the structure: The bus system needs to have some governing body other than the City of Knoxville. We had a thriving, growing ridership of Halls residents riding into the city every day to work, until the city pulled the plug BECAUSE OF GAS PRICES. This needs to be addressed. People in Halls, Seymour, East Knox, West Knox, Norris, Clinton, etc. who work in Knoxville should be encouraged to ride buses to work. *(Nov 5, 2012 2:58 PM)*
- Transit assets are focused on Knoxville and Knoxville to suburban areas. Some consideration should be given to other commuting possibilities, such as Knoxville/Knoxville suburbs to Oak Ridge or other places of concentrated employment. *(Nov 5, 2012 2:51 PM)*
- Better access to our revenue-generating towns like Sevierville, Gatlinburg, and Pigeon Forge *(Nov 5, 2012 1:34 PM)*
- When KAT changed schedules and routes, they made bus routes from N Knox get downtown after 8 instead of just before. Apparently, they don't know that some of us still work 8-5. What was a 45-minute walk to bus stop and then ride became over an hour! I'm thinking THEY can use their Prius fleet while the rest of us struggle! *(Nov 5, 2012 1:25 PM)*
- Something needs to be done about rush hour traffic on Pellissippi Parkway and on the 75/40 in West Knoxville. *(Nov 5, 2012 1:06 PM)*
- Bicycles need to have safe routes to go places not just scenic routes; connect business areas with suburbs *(Nov 5, 2012 12:29 PM)*
- Bus rapid transit implementation *(Nov 4, 2012 10:36 PM)*
- Connect greenways, add bike lanes - this is something that is seriously lacking in Knoxville and would encourage alternative transportation, reduce carbon emission, etc. Also, timing of many lights in town does make sense and seem to promote idling. *(Nov 4, 2012 2:05 AM)*
- Our aging population will need alternative transportation so we aging folks don't have to drive--it's not safe!! *(Nov 3, 2012 10:47 PM)*
- Knox County is horribly unprepared for the aging of our population. There are virtually no apartments that have safe sidewalks to shopping, and few apartments are on a bus line. I know--I just tried to help my elderly mother find a place to live and was appalled. There are two apartment complexes--out of about 60--in West Knox County that have sidewalks between the apartments and the mailboxes and between the apartments and the public sidewalks. One is The Grove at Deane Hill and the other is Heritage Lake on Westland. Both are $750+ for a very small one-bedroom apartment. *(Nov 3, 2012 7:28 PM)*
- Should have better coordination with the community and with long range planning of local sector plans *(Nov 3, 2012 2:52 PM)*
- I believe that one of the reasons people do not use the sidewalks and green ways in my area is due to the homeless population and drug addicts using the walking areas as bathrooms, living rooms, places of business...etc. If this was addressed then more people would have

access to walking areas and green ways. It is difficult to control when the city insists on building all social services and rescue missions in the same area. You can't even drive down Central Avenue anymore without hoards of KARM patrons in the middle of the street. I live in a house off of Broadway, and I can say that it seems as though the City cares more about those people than they do about the residents of the area. And that is very frustrating. I would love to ride my bike down the sidewalks (where there are sidewalks) without being asked for money, offered drugs, offered the services of a prostitute...etc. To be honest, I don't even feel safe enough to attempt that. *(Nov 3, 2012 2:04 PM)*

- Transportation out of Knoxville airport is expensive. Would love to have a train service to other cites since we have existing rail lines through the city. *(Nov 2, 2012 4:32 PM)*
- If we started designing new developments around the thought of green spaces and allowing people to access basic needs (groceries, social interaction, etc.) without having to use cars, wouldn't that cut down on this whole issue? If we could make the major work areas safer to access by bicycle, people may stop driving to work as much. Less people driving would take care of a lot of these problems. Safe bike lanes, bike share programs, etc. *(Nov 2, 2012 3:37 PM)*
- Chapman Hwy has bus service on Sunday, and until I could afford to get another car then it would be really nice to have bus service on Clinton Highway where I live so I could get over to Chapman Hwy on Sundays. *(Nov 2, 2012 12:07 PM)*
- Total vehicle miles traveled in Blount county have not increased (and even decreased on some major roadways) over the last 10 years. The trend is more efficient trips and lower ADT counts. In the areas that do have congestion, focus on signals, overpass /underpass construction, and improving existing roads. *(Nov 2, 2012 2:15 AM)*
- New developments are being added without apparent consideration for access to roads already present. Example area near John Sevier and Alcoa. Construction that will increase traffic onto these roads that are already heavily traveled with speeding vehicles. There is no space for a bike. *(Nov 2, 2012 1:11 AM)*
- Enforce laws already on the books. If people refuse to obey safety rules, encourage police to help fund their department through more tickets. Insulate good law enforcement from redneck politics. *(Nov 1, 2012 8:47 PM)*
- We need more sidewalks, speed limit enforcement, and bike lanes. *(Nov 1, 2012 7:44 PM)*
- Promote bicycle and pedestrian infrastructure *(Nov 1, 2012 6:49 PM)*
- I think that express bus lines (such as the Farragut to downtown Knoxville line) are a good idea- maybe they could be implemented for other parts of Knox County? I would also appreciate more bike lanes downtown and in the surrounding neighborhoods- Central St. is a good start, maybe Broadway or even Gay St. could get lanes. *(Nov 1, 2012 6:44 PM)*
- Need bike lanes and driver education. We have mass transit. Buses travel around virtually empty. Do NOT add more - it is a waste here. We have good roadways, just make them safer. *(Nov 1, 2012 6:12 PM)*
- More concern needs to be paid to older transit users, which are going to increase exponentially soon. The majority of riders in this country are over 55. Lifts MUST work properly; transit stops must be closer together & safer. Some of the bus stops on Merchants Drive & Cedar Lane are very dangerous, especially if there's snow or ice on the ground! More stops should have benches & enclosures. Sidewalks would help, too. *(Nov 1, 2012 2:35 PM)*
- Beginning planning to connect regional growth centers (oak ridge, Maryville) to Knoxville with rail service, commuter or light. Be visionary, and challenge our communities to envision a better transportation future. Transit oriented development on gray filed sites near existing Putnam centers *(Nov 1, 2012 2:16 AM)*
- Outside of downtown Knoxville, and the major shopping areas, there is a surprising lack of sidewalks. This makes walking around the city almost impossible. *(Nov 1, 2012 1:29 AM)*
- Better mass transit - train/bus. *(Oct 31, 2012 12:22 PM)*
- For KAT, why aren't there smaller buses with more routes or routes that run more often? *(Oct 30, 2012 10:23 PM)*
- More sidewalks and crosswalks. *(Oct 30, 2012 6:13 PM)*
- Better ways for pedestrians to cross Kingston Pike *(Oct 30, 2012 5:46 PM)*
- Regional transit is critically important for the healthy growth of our region. It will require some sort of regional transit authority in addition to regional consensus and cooperation (like the Nashville region). *(Oct 30, 2012 5:44 PM)*
- I would like to see more greenways and bike paths connected so there could be routes around town without using high traffic roads *(Oct 30, 2012 5:31 PM)*

- True regional bus transportation is key. Now the 102-X Farragut Express bus is the only bus running outside Knoxville City limits. Dedicated bus rider parking is needed. The lack of it almost killed the Farragut Express bus. *(Oct 30, 2012 5:22 PM)*
- Please continue to support the use of the City of Knoxville Transit Center as a station for Megabus to use in Knoxville. This provides a good connection for both local residents and visitors to connect from our transit system and Megabus. *(Oct 30, 2012 5:20 PM)*
- The bus I ride to and from work everyday gets more crowded each week. Standing room only today. This seems to be a trend of the future. *(Oct 30, 2012 5:12 PM)*
- KAT needs to get these people to work and appointments. They need to start going out to Turkey Creek and some kind of busy system to Sevier County. So many unemployed people so little bus service. Busses need to run every half hour instead of every hour in some cases. Busses need to do a better job in coordinating the busses so it isn't so long to wait between busses. Busses should run up until 12:15 a.m. Busses stop at 10:30 at the mall it should stop at 12:00 so people can go to a movie and get home. *(Oct 30, 2012 5:08 PM)*
- More needs to be done to extend public transportation beyond the city limits. *(Oct 30, 2012 5:03 PM)*
- I think cross-town routes like 90 should run more often during peak times. Particularly since they connect to so many of the "major" routes. *(Oct 30, 2012 4:51 PM)*
- The mobility plan should encourage future developers to develop in a manner to sustain small pockets of communities (i.e. Northshore Town Centre, Market Square/Gay Street, etc.) *(Oct 30, 2012 1:18 PM)*
- Maintaining good connection to Knoxville of utmost importance. Improving connection to Oak Ridge and Lenoir City important. *(Oct 29, 2012 5:45 PM)*
- Need light rail transportation between towns and cities in the East Tennessee region. *(Oct 29, 2012 2:33 PM)*
- Increased planning between adjacent communities and coordinated joint projects (ie greenway expansion) *(Oct 29, 2012 1:36 PM)*
- Educating the public on how to use the public transportation systems in place is crucial. Not many people think it can fit into their lifestyle. Easy to understand schedules and facts about using the system could help. Until it is a viable option for people to commute to work then it is a very expensive system for few. A lot of people may not want to drive but may not feel there is a viable alternative for where they live. Park and ride lots? *(Oct 29, 2012 12:34 PM)*
- We really need some commuter lots to encourage carpooling. I carpool to work but have been chased from businesses' parking lots who do not want cars parked there all day. Yet we have no other place to go. *(Oct 29, 2012 12:17 PM)*
- Complete extension of Pellissippi Parkway to eastern termination *(Oct 28, 2012 12:13 PM)*
- Studies take too log we're 30 yrs and nothing ever happens *(Oct 28, 2012 5:00 AM)*
- Sidewalks to shopping and SCHOOLS. *(Oct 28, 2012 12:20 AM)*
- Why don't we have Amtrak? It goes right through our city. *(Oct 27, 2012 8:46 PM)*
- Creative incentives *(Oct 27, 2012 8:41 PM)*
- I love the form-based zoning that has been implemented. The more mixed-use, compact, pedestrian friendly development the better. *(Oct 27, 2012 8:39 PM)*
- Public transportation needs to be cheap and timely. It takes me twice as long to take the bus to UT than it does to drive, I have to drive halfway to school to get to a bus stop, and the bus doesn't save me a penny. I could take the Express from Farragut to save time, but the cost is ridiculous for a <20 mile ride. And I can't ride my bike to the bus stop because there are not consistent bike lanes - they just end randomly and the road becomes unsafe for bikers. Step it up, Knoxville. *(Oct 26, 2012 4:45 PM)*
- We need our greenways to be more connected. When you look at the greenway map there are numerous paths that are less than two miles, but none of them connect to anything. If we had an actual greenway system, perhaps along abandoned tracks, I think it would be easier to promote a more cycling/pedestrian focused community. If there were a safe, more direct route to bike from North Knoxville to West Hills, I'd do it every day! As someone who has studied transportation geography and GIS, I think looking into how Memphis and Atlanta have improved their greenways would be influential! *(Oct 26, 2012 3:48 PM)*
- Encourage sustainable neighborhood development with commercial hubs. Work hard to improve residents commuting options. *(Oct 26, 2012 3:45 PM)*
- If a road has sidewalks down each side, there needs to be a way to cross the street, especially at bus stops. People who want to ride the bus

sometimes have to cross busy Kingston Pike to get to the stop they need to be at, and there is no safe way to do it. *(Oct 26, 2012 2:51 PM)*

- Better public transportation for seniors and those with disabilities *(Oct 26, 2012 1:45 AM)*
- I would like to see more focus placed on the esthetic design quality of our regions bridges and other construction elements associated with transportation improvements. I certainly understand that the addition of such features adds additional cost to the overall project budget and cost to the community; however, the rubber stamp approach taken throughout our region and the U.S. as a whole has contributed to the loss of community identity and economic competitiveness. I am fortunate to live in one of the most beautiful places in this country and preserving its character is important for the continued enjoyment for those that live, work, play or visit. *(Oct 25, 2012 8:14 PM)*
- Traffic lights need to be in sync. They're HORRIBLE now *(Oct 25, 2012 8:11 PM)*
- Shelters with seats at all bus stops. Cross-town transfers instead of just downtown *(Oct 25, 2012 4:43 PM)*
- We need light rail and mixed use development centered around rail stops (e.g. live/ work/ shopping/ entertainment all within walking distance) *(Oct 25, 2012 3:37 PM)*
- People who don't drive are sorely limited in transportation options-the mass transit has limited hours and routes. People with disabilities are the most effected when trying to get to work... *(Oct 25, 2012 2:22 PM)*
- Connecting communities through public transportation *(Oct 25, 2012 1:49 PM)*
- People need ways to get places without the use of personal vehicles. Need more SIDEWALKS and BIKE PATHS. *(Oct 25, 2012 1:35 PM)*
- I would like to see passenger rail in Knoxville *(Oct 25, 2012 1:29 PM)*
- Completion of Pellissippi Parkway to 321 very important for economic development and tourism industry *(Oct 25, 2012 1:19 PM)*
- Promote carpooling to businesses. *(Oct 25, 2012 12:52 PM)*
- Improvement of access for people using wheelchairs/scooters *(Oct 25, 2012 12:32 PM)*
- My main concerns are for people with disabilities. My neighbor with cerebral palsy was struck by a car because there were no sidewalks and he had to ride in the street. He still does this, nonetheless. *(Oct 25, 2012 12:07 PM)*
- Need a viable regional transit system. KAT is basically a Knoxville system. A public option for transportation to airport, at least from downtown, would be nice. *(Oct 25, 2012 11:52 AM)*
- Encourage the development of walkable/bikeable communities. Children within walkable distance of schools should have safe places to walk (sidewalks) not roads, ditches, or through lawns; safety patrols could be used to help younger kids cross streets (like they did when I was young). Encourage development in the downtown and east side of Knoxville to spread out the traffic flow. Add some emissions control regulations to help clean up the air in our area. Make use of all the train tracks in this area to transport people (and possibly their cars) to other urban areas (DC, Atlanta, Nashville, Asheville, Chattanooga, etc.) and for train tourism/vacations. *(Oct 25, 2012 6:11 AM)*
- What about light rail? *(Oct 25, 2012 4:45 AM)*
- I suggest expanding transit service on Alcoa Hwy to Alcoa/Maryville corridor (especially the airport-we are among the few cities with no transit to the airport. And, expand to Oak Ridge. Hourly service for both. *(Oct 24, 2012 11:55 PM)*
- Expand focus of public transportation beyond low income riders, and outside the current Knoxville city-center focus of to-and-from for work commuters. Provide public transportation for leisure users and for transportation between Knoxville-Oak Ridge, Knoxville-Sevier County. Better integrate with other services like MegaBus (and any future comparable services). *(Oct 24, 2012 3:29 PM)*
- Increase coverage of KnoxTrans & provide more frequency *(Oct 24, 2012 2:11 PM)*
- Provide more appropriate options for public transportation. *(Oct 24, 2012 12:48 PM)*
- "Oh please, please add bike lanes and crosswalks/signals - especially on new roads. Also - sweep the edges of roads. There is so much junk there - not just for bikes but for cars and pedestrians as well." *(Oct 24, 2012 3:40 AM)*
- Increased greenway connectivity *(Oct 24, 2012 2:22 AM)*
- More sidewalks on major roads, pedestrian signals at traffic signals, park and ride to and Knoxville and Oak Ridge. *(Oct 24, 2012 1:13 AM)*
- Building new roads or widening existing ones doesn't solve congestion. In my opinion, new construction attracts traffic. Management of existing traffic conditions combined with providing transportation alternatives including bicycle and pedestrian facilities, which are very inexpensive,

are the long term solution to transportation management. *(Oct 24, 2012 12:44 AM)*

- More effectively managing the adverse ecological effects of automobile activity in Knoxville (air quality, noise pollution, roadway pollution) *(Oct 23, 2012 11:06 PM)*
- Out West in our area, mobility plans that are important are more pedestrian related. Sidewalks to connect neighborhoods and bike paths and greenways to connect people to other areas such as shopping, libraries, schools etc. *(Oct 23, 2012 8:49 PM)*
- More sensible use of rumble strips, so bicycle traffic is considered *(Oct 23, 2012 7:42 PM)*
- Alcoa Highway must be made safer. *(Oct 23, 2012 7:31 PM)*
- Transit Stops *(Oct 23, 2012 6:42 PM)*
- Building and maintaining good sidewalks are very important to neighborhoods in that they provide access, exercise options, and a better feeling of community. Bikes are becoming more popular and bike lanes would be a much safer option for those who bike. Traffic light timing is horrible. In my short (10-12 min) commute sitting at lights can increase my commute as much as 50%. It is no wonder so many people run red lights. It is very frustrating to sit through light after light after light...well you get the picture. :) *(Oct 23, 2012 6:31 PM)*
- West Knoxville has many residential areas that are severed from major roadways and commercial centers. The roads are burdened with excessive cut through traffic and there is no resource for safe passage of pedestrians. One becomes acutely aware of this during fowl weather and icy roads. Dense residential projects are engulfed by surround residential tracts and all access is choked off mainly for automobiles. Every driver is a pedestrian at some point. *(Oct 23, 2012 6:13 PM)*
- Traffic lights always seem out of sync, signaling for no traffic, etc. Slowdowns at commuter peak hours seem to stem from poorly planned lane alignments/not enough lanes. Always feel reasonably safe on my bike, but I'm usually on country roads. Development seems poorly integrated with roads despite MPC's efforts. Just think of what a nightmare Lovell Rd is going to be. *(Oct 23, 2012 6:11 PM)*
- CONNECTIVITY of sidewalks, greenways and other pedestrian areas are a must; along with well-maintained sidewalks with curb cuts *(Oct 23, 2012 6:08 PM)*
- This region desperately needs transit and intercity rail. Transit and rail will spur economic activity, improve air quality, reduce traffic fatalities, improve health, and generally make us more productive because we will not be spending hours in the car. *(Oct 23, 2012 6:08 PM)*
- Transportation is a HUGE contributor to air pollution, and a relatively small fraction of the vehicles are the worst polluters. PLEASE require emissions testing for ALL vehicles or at least for those older than say 5 years. *(Oct 23, 2012 5:59 PM)*
- Traffic lights are terribly timed -- very wasteful at all hours even 3 in morning coming out of closed shopping centers *(Oct 23, 2012 5:57 PM)*
- Less cars on the road. Help promote a healthy person and healthy environment. Growing up in Knoxville we never had "Orange air quality days" and the fact that the sky is actually "orange" on those days is really depressing. I miss those blue bird days that existed when I was growing up back in the 70's/80's *(Oct 23, 2012 5:54 PM)*
- Please fix infrastructure that is falling apart before you build anything new *(Oct 23, 2012 5:54 PM)*
- I normally ride my bike 50-100 miles a week however most of that has to occur on back roads on weekends because it's simply not safe to commute to work or for normal transit in this city (I'd love to do it as it's only 7 miles away.) There are plenty of roads where all it would take is some paint to make a reasonable bike lane. Alternative transportation will not take off in this community until people can find safe transit on their commute to work. Until then we will have to deal with the massive drain on resources that are caused by motor vehicles. *(Oct 23, 2012 5:51 PM)*
- The KAT buses could be very helpful to more people if the number of routes were increased, and the boundaries expanded. *(Oct 23, 2012 5:47 PM)*
- Limitation or Reduction of billboards and reducing the amount of highway signage clutter. *(Oct 23, 2012 5:29 PM)*
- Most streets in the region are terribly dangerous to ride a bike on - please focus on resolving this serious problem. *(Oct 23, 2012 5:16 PM)*
- Maintain what we have. Building new roads to serve sprawling development is irresponsible. *(Oct 23, 2012 5:13 PM)*
- Bike lanes/crosswalks *(Oct 23, 2012 5:10 PM)*
- Timing of lights is horrible. There is a lot of waste and frustration. At late night, when possible and safe they should switch to flashing red (same as stop sign). This would both save gas and increase safety in crime ridden neighborhoods. Road conditions in this city have taken a turn for

the worse. Buffet mill by the fire station is horrible and has been for 9 months to a year. *(Oct 23, 2012 5:09 PM)*

- Encouraging alternative fuel vehicles and safe ways to move in community on foot and bicycle and access to public transportation in county with park/ride access for express routes on interstate. *(Oct 23, 2012 5:08 PM)*
- Existing roadways are poorly utilized. Poorly programmed traffic lights increase congestion and pollution. Decrease sprawl by urban renewal projects along existing roadways. Charge suburban developers for transportation improvements based on typical commuter patterns. *(Oct 23, 2012 4:50 PM)*
- Transit needed from outlying communities and cities, into the metro areas. Cutting back on long distance commuters. *(Oct 23, 2012 4:38 PM)*
- A Knoxville bypass for I-75, running from the I-40/I-75 junction near Lenoir City to near Clinton would do much to reduce west Knox congestion on I-40/I-75 *(Oct 23, 2012 4:44 AM)*
- Fast transit to Chattanooga/outlying areas like Marta etc. *(Oct 22, 2012 10:32 PM)*
- Sidewalks are far more important to a community than most developers think. We need regulations to make them include sidewalks in new development. *(Oct 22, 2012 11:18 AM)*
- To get cars off the road, it needs to be easier and safer for people to walk to close distances. It would be easy for kids over the age of 12 and adults to walk to a store, a local eatery or a move if they only live a block or two away. That is not the case if they only places they can walk to that location are in the street or even worse, a trash filled ditch. *(Oct 22, 2012 3:56 AM)*
- Adequate maintenance should be of paramount importance. Funding needs to be used to do so - not necessarily more funding, but better use of existing funding. *(Oct 21, 2012 5:08 PM)*
- Extend James white parkway. *(Oct 20, 2012 5:31 PM)*
- I believe that we need to look at more mass transportation here such as Trains, bus services in Knox County and surrounding counties. With economic conditions now so many people do not have the means to get to food sources, medical services, church, and other basic necessaries to live. *(Oct 19, 2012 1:16 PM)*
- For safety's sake, drivers should have to take a driving test every 5-8 years. *(Oct 18, 2012 5:04 PM)*
- Transportation options for elderly & non-drivers *(Oct 18, 2012 3:07 PM)*
- Develop passenger rail on low-use lines *(Oct 18, 2012 7:06 AM)*
- Sidewalks are unsafe. The society has no qualms to block and generate hazards in sidewalks they would never do in any road. *(Oct 18, 2012 12:44 AM)*
- Improve transportation options for seniors. Public transit transportation options are very expensive and limited for low-income seniors. *(Oct 17, 2012 9:35 PM)*
- Bike and pedestrian facilities should receive a specific percentage of the transportation budget just as other communities have done in their long term plans *(Oct 17, 2012 7:28 PM)*
- Expanded multi-county public transit. *(Oct 17, 2012 6:15 PM)*
- North Knoxville (Cedar Lane area) has NO sidewalks or bike lanes. You have to drive everywhere or take a dangerous walk. *(Oct 17, 2012 4:21 PM)*
- I think as a whole the conditions for cars are fine. Sure I-40 backs up, but I don't think things will measurably improve with one more lane. Making the Alcoa/640/75 interchange a bit more intelligent is the only place where real improvements could be easily made. I'd like more access from South Knoxville, but I can live with what is there. What is badly needed is walkability improvements and mass transit improvements. I think efforts should be focused there. *(Oct 17, 2012 3:49 PM)*
- Need focus on reducing single person short trips. *(Oct 17, 2012 3:42 PM)*
- Our focus should include development of sustainable (best practice) urban-suburban development (high density and more walkable). If we could cut down on the 20-minute trips to corner stores, the bank, etc. and instead have many of these amenities within a reasonable walking distance / biking distance congestion will decrease, the air will be cleaner, and we may improve our regional health in the process (building routine exercise in to our daily routines). *(Oct 17, 2012 2:37 PM)*
- Get the economy back on track first. When people are back to work, there will be more $s to provide services. *(Oct 17, 2012 2:26 PM)*
- Knoxville is one of the cheapest places to live. It's time we paid a little extra to boost our infrastructure. I would love to see arterial greenways feeding downtown for pedestrians and cyclists as can be found in many other major cities. If I could I'd ride my bike 10 miles to work but it's just too dangerous. *(Oct 17, 2012 2:12 PM)*
- If you provide alternative transportation and except people to use it as part of their daily lives, it needs to be efficient and accessible, making it more appealing than driving. If it adds stress being out of the way or

waiting too long, most people will opt to sit in traffic instead. *(Oct 16, 2012 10:33 PM)*

- Providing pubic and demand responsive transportation to all residents of Knox County. *(Oct 16, 2012 8:09 PM)*
- Transit service area should be expanded to include the balance of the region through the creation of a regional transportation authority, new revenue sources should be created to support increased transit options and alternatives to the single occupant vehicle. *(Oct 16, 2012 7:45 PM)*
- I would like to see some inner-county transport available i.e. like KAT LIFT between surrounding counties at a reasonable rate. (I have a friend in assisted living in Maryville that I would like to visit more often) *(Oct 29, 2012)*

Regional Forum Series, Round One (Partnered with Plan East Tennessee)

Similar ideas created at each table were combined for keypad polling. These ideas were quickly combined during the meeting to allow for shorter lists to poll upon, so they were a best effort to get the intention of the ideas provided. In some cases, the exact wording of one idea was used because it best captured the intention of all similar ideas.

For some meetings, the ideas were too different to combine enough to fit on one slide, and there is a longer list, split between two slides. Remember, the polling prioritization provides only a snapshot of priorities of those in the room, not a conclusive vote on any ideas.

In the lists below, the summary idea is in bold, with the similar ideas that were combined into the summary idea below. The summary ideas are the ones that were used for keypad polling.

Regional Strengths

Anderson County

- **Diverse recreation opportunities and attractions for all ages**
  - Diversity of interests, ages, attractions
  - All of your needs within region
  - Outdoor Recreation and proximity to mountain, lakes and streams
- **Natural beauty, area is centrally located to be convenient to mountains, lakes, and other recreational amenities.**
  - Natural resources
  - Quality of life: Natural beauty, arts, low cost of living
  - Green space open space
  - Area is centrally located to be convenient to mountains, lakes, and other recreational amenities.
  - Oak Ridge: Preserve the natural beauty of the areas and limit sprawl.
  - Natural beauty (mountains, valleys, lakes, etc.), climate
  - Beauty and natural assets of the area between Cumberland Plateau, Smokies, TVA Lakes
  - Natural environment--parks, rivers, bicycling, general outdoor activities, beauty
- **Strong regional identity with a rich history and unique culture**
  - History of the five county area
  - Proximity to big city cultural, sports activities, shopping
  - Anderson County: he would like to build on the rich history of the area and play up the unique aspects of each of our communities.
  - Strong regional identity of east Tennessee – where else do you get 100,000 people singing together on a Saturday afternoon?
- **Good health care system**
  - Good health care system
- **Job opportunities, strong workforce and home to a diverse economy**
  - DOE facilities with large employment that draws from surrounding area
  - Diverse job opportunities, with different areas of region having different strengths
- **Good schools and upper level education with many options**
  - Good schools and upper level education with many options
  - Good economic mix, recreation, education all within region
- **Sustainability energy efforts - Solar City, Windmills, Hydroelectric Power, Biofuels**
  - Sustainability energy efforts - Solar City, Windmills, Hydroelectric Power, Biofuels
- **Preservation of rural character**
  - Marlow: He would like the rural character to remain intact and limit negative impact of government regulations.
- **Pretty good connectivity between the counties - roads, culture, recreation, etc.**
  - Knoxville is a good hub for the region with services, amenities, etc.

    - Pretty good connectivity between the counties - roads, culture, recreation, etc.
- **Well connected through easy access to transportation options: interstates, rail, etc**
    - Convergence of major road systems (75, 40, 81), Good rail systems, Nice logistics
- **Room for population and job growth due to open land**

Blount County

- **Recycling opportunities**
    - Recycling opportunities
- **Increased sense of regional communication and cooperation**
    - Increased sense of regional communication and discussion
    - Willingness to cooperate, open minded people
- **Diversified by having urban and rural opportunities along with native citizens and new residents**
    - Diversified by having urban and rural opportunities along with native citizens and people moving into the area
- **Strong pride in culture and Appalachian heritage and rural character; a personal interest in the area**
    - Patriotic, proud of culture and heritage
    - Great cultural and scenic identity
    - People care about the area, strong sense of volunteerism, personal interest in the area
    - Public involvement in governmental processes
    - Open spaces, farm land, and churches
    - Rich heritage - great history
    - Appalachian heritage is important
- **Low cost of living**
    - Low cost of living, 4
- **Independent county identity without interference**
    - Best place to live without interference from other counties/cities
    - Independent county identity with an independent will and lawmaking ability
- **Benefits of natural resources like regional identity, tourism and recreation**
    - Natural beauty of rivers and mountains provide a regional identity to the nation
    - Natural Beauty
    - Tourism, natural areas, only free national park
    - Lake Systems
    - Good area for tourism based on environmental assets
    - Benefits of natural resources
    - Recreational opportunities - mountains, rivers, etc
    - Low taxes
    - Low taxes
    - No income tax
    - Low taxes - all across the board
- **Technology institutions - ORNL, UT, tech corridor – providing important research and entrepreneurial spirit**
    - Small businesses, entrepreneurial spirit - takes advantage of technology surrounding us, a lot going on, important research.
    - ORNL
    - Technology corridor, UTK - Oak Ridge connection
- **Geographic location and transportation system**
    - Transportation network is strong, central location for industrial base for the greater
    - Southeastern US.
    - centrally located destination & national accessibility to other places, interstate infrastructure, 5
    - geographic location and transportation infrastructure
    - Connectivity of our road networks
    - Transportation system, connectivity between communities and connection to the national system

Knox County (Monday)

- **Affordable cost of living**
    - Cost of living (housing is a factor)
- **Strategic geographic location, proximity to other cities**
    - Strategic geographic location: proximity to other cities, regions, 4
- **Distinct music, food, and historical culture**
    - Distinct culture and desire to celebrate it (history, music, food) (2)
    - Culture and music, 4
    - Cultural, Music Scene: WDVX, Bluegrass, Access to multiple genres, Venues: Ritz, Clayton Center, Bijou, Tennessee
- **Natural assets like the Smoky Mountains and access to recreation and outdoor an opportunities**
    - Location within the larger region and good access to Regional and National parks, Geographic setting is close to other large metropolitan areas
    - Forested ridges, mountains, and communities

  - Feel at home in the mountains! Beautiful, access to outdoor activities
  - Scenic views or vistas
  - Natural resources (Smokies, lakes, mineral, recreation)
  - Natural resources: mountains, lakes and natural attractions within close proximity attractive us and people outside the region
  - Urban to rural to agricultural to wilderness; diverse landscapes and places
  - Natural beauty and opportunities for outdoor recreation, 4
  - Natural Assets such as Smoky Mountains and waterways
  - Outdoor recreation, Public lands: Smokies, national parks and forests, Availability of almost any outdoor activity
  - Smoky Mountains and the Cherokee National Forest, the Big South Fork, and other state parks, TVA lakes, etc
- **Friendliness of people**
  - Mid-size city, lot to offer, with friendly people
- **Educational institutions throughout the region**
- **Widespread community involvement including outreach to marginalized groups**
  - Widespread community involvement, such as the faith community, and the outreach it provides to the entire community particularly marginalized and at risk people.
- **Diverse economic, infrastructure and institutional assets including ORNL, TVA, and UT**
  - Oak Ridge National Lab and Department of Energy has a large economic, cultural, and educational impact for the area.
  - Regional employment is relatively diversified - not as hard hit by recession; UT, ORNL, Innovation Valley, healthcare
  - Involvement in innovation and technology, especially ORNL/DOE (2)
  - Economy based on technology driven by ORNL, TVA and UT enhanced by central access to multiple eastern markets (interstates)
  - Infrastructure, Power, TVA and DOE, Economic Asset to region, Transportation, Communication: TVA data center, Digital Crossing, Corporate Data centers, HGTV WDVX Rivr media
  - There are a lot of intellectual (UT, Oak Ridge) and physical resources for business opportunities (water, land, energy)
- **Diversity of job opportunities and strong economic development efforts**
  - Economic development effort (2)
  - There is a diversity of job opportunities with infrastructural accessibility (transportation hub) without being dependent on a single industry.

Knox County (Wednesday)

- **Low cost of living**
- **Museums (e.g. Museum of Appalachia, ET Historical Society, Beck Cultural Exchange Center, American Museum of Science and Energy)**
- **Weather, having four seasons**
- **Local agriculture, lots of fresh fruit and vegetables and dairy, small family farmers**
- **Small family businesses**
- **Higher education opportunities and access to world class research, tech/jobs (e.g. ORNL, UT, TVA)**
  - Oak Ridge National Lab and UT; world-class educational access, technology, and global view
  - Many educational opportunities especially higher education-4
  - Distribution of higher education - UT and ORNL brain power and retention
  - Presence of large regional institutions (Oak Ridge, TVA, UT) that spawn jobs and other benefits
- **Appreciation of Appalachian heritage and a sense of history and place/belonging**
  - Crossroads between small towns and large towns, an appreciation of the small town character, An appreciation of Appalachian Heritage. Know everybody and appreciation of family. There is a lot of history here and people appreciate it.
  - Sense of place and belonging
- **Geographic location and connectivity within the region/rest of U.S. (e.g. to the E and SE)**
  - Geographic location in relation to the rest of the eastern US and the urban centers, Centrality, Transportation network
  - Interstates and other highways provides quick access to region and eastern US-5
  - Connectivity of the transportation system (Highway system)
  - Accessible to other major cities in the Southeast and location in the country (geographic centrality to major cities) Interstates and MegaBus
  - Good proximity to major cities, east coast, Midwest, a large portion of the population
- **Natural resources (e.g. Smoky Mountains, Big South Fork) provide scenic beauty and recreation/tourism**

  - Natural beauty
  - Natural resources, such as GSMNP, state parks, lakes, Tennessee River
  - Access to outdoor activities, mountains, hiking, streams, Big South Fork, Great Smoky Mountains, And an appreciation of some of these places.
  - Diversity of recreational opportunities lakes, mountain biking and strong competitive sports at all levels and natural areas-7
  - Scenic richness and beauty of East Tennessee
  - West Knoxville: Access to parks, Knoxville: Access to Smoky Mountain National Park, South Knox: Ease of access to major recreational waterways with potential for access to smaller water ways
  - Natural resources / tourism - Smoky Mountains, Big South Fork, rivers and waterways, open spaces
- **Variety in types of communities, neighborhoods, & municipalities (country atmosphere and big city amenities)**
  - Variety in types of communities, neighborhoods, & municipalities
  - Country atmosphere, but big city availability

Loudon County

- **Commuting within the region is easy, un-congested**
- **Entertainment and recreational, amount and variety of events**
- **Access to the water throughout the community, lakes, rivers, etc**
- **Climate - severe weather is rare, the valley protects the region**
- **Diverse higher education opportunities (vocational, community colleges, universities)**
  - Higher education, UT, Technology Corridor, "Brain Power"
  - Higher education - lots of choices close to home
  - Network of higher education
  - Affordable higher education opportunities including vocational, community colleges, colleges and universities
- **ORNL, UT, TVA, airport and hospitals as economic development drivers**
  - Economic strengths; University of TN, Oak Ridge National Lab, airport
  - DOE facilities being in region is a large asset for bringing in employment. Other employment assets are the Hospitals, U.T., TVA - 5
  - Oak Ridge National Lab and UT as economic development drivers
- **People attracted to the region by the weather, economy and low cost of living**
  - Economy and weather attracts people to the region from all over. Also low cost of living here such as low housing cost. - 4
- **Beautiful area that supports recreation and tourism**
  - Tourism, beauty, natural recreation spot
  - Attractive area - we need to make sure we keep it that way
  - Natural Beauty. Mountains, Lakes and rivers, Season.
  - Natural beauty (e.g. mountains, lakes)
- **Transportation accessibility via road, air, water and rail, coupled with central location provides easy access to multiple markets**
  - Transportation capabilities; air, interstates, railways, rivers
  - Within a days drive to over half the country.
  - Strong highway system, access to the highway system
  - Transportation accessibility via road, air, water and rail, coupled with central location provides easy access to multiple markets
- **Flexibility to use the land how we want**
  - Flexibility to use the land how we want
- **Low taxes**
  - Low taxes
- **Friendly, engaged citizens (lots of volunteerism)**
  - Friendly people throughout region
  - Lots of citizens who volunteer
- **Diversity of employment opportunities from government to private, warehouse to professional services**
  - Diversity of employment opportunities from government to private, warehouse to professional services
- **Rural nature of the area (farmland, mountains, remote areas)**
  - Overall rural nature of the area; within 30 minutes to an hour you can be within the most rugged mountains, remote areas
  - Rural flavor - the presence of farmland (2)

Union County

- **Well developed infrastructure including rail network, interstates, river ports**
- **Availability of resources - things people like to do, what people need (healthcare and jobs); within one hour drive**
- **Publicly managed land is an asset and an economic driver.**
- **Small, rural feel but near major metro area**
  - Small, rural feel but near major metro area
- **Moderate weather**
  - Moderate weather

- **Access to pristine lakes, mountains, and parks, especially Smoky Mountains**
  - Smoky Mountains National Park, State parks, variety of lakes
  - Access to lake, views and mountains, including state & national parks - bass fishing, fly fishing, hiking
  - Mountains and lakes are pristine as comparison to other areas in East Tennessee.
  - Lakes, mountains and parks
- **Robust scientific and research community (federal and universities)**
  - Strength of science, diversity, research in UT, Oak Ridge
  - Robust scientific community (federal and universities)
- **Access to quality public and higher education**
  - Access to quality public & higher education, UT, Carson Neman, Tusculum, ETSU, Walters State, Pellissippi State, Roane State

Regional Challenges

Anderson County

- **Poor air quality, high asthma levels – non-attainment of EPA standards, etc.**
  - Green growth and sustainability, Air, water quality
  - Poor air quality - non-attainment, asthma levels, etc.
- **Limited services for aging and other special needs populations.**
- **Public education system needs improvement, especially in poorer areas**
  - Public (K-12) Education
  - K-12 education in the region needs improvement
  - Raising the floor of public education (5)
  - Pockets of low education, esp. in poorer areas--need for economic equalization.
- **Poverty and illiteracy major problem, especially in rural areas**
  - Poverty - major problem in rural areas
  - Need to Reduce illiteracy - major problem especially in rural areas, and for attracting employers
- **Lack of regional thinking and collaboration**
  - Collaboration among elected officials
  - Lack of strong intergovernmental relationships
  - Five counties---five visions/getting people to think regionally
  - We fail to think and act regionally and therefore, we compete with each other, which doesn't capitalize on our resources.
  - Makeup of the counties is different: what fits for one, may not fit for another
  - We do not market ourselves collectively as a region.
- **Lack of regional public transportation network to reduce dependency on cars**
  - Lack of public transit
  - public transportation reducing dependency on automobile
  - We do not have a regional transportation network.
- **Drug abuse linked to crime**
  - Drug problem creates crime problem (comprehensive approach) (4)
  - Meth and drug abuse
- **Lack of activities for younger people, childhood obesity**
  - Lack of activities for younger people
  - Childhood obesity
- **Lack of employment opportunities, economic growth**
  - Need to attract more industry to grow jobs, especially manufacturing, not just any jobs but good, diverse jobs
  - Econ growth
  - Economic development - regional coordination and cooperation - stop competing with each other (3)
  - More employment opportunities
- **Lack of or failing infrastructure - roads, water, sewer**
  - Failing infrastructure systems
  - Lack of infrastructure--roads, water, sewer

Blount County

- **Need to attract visitors to the area and welcome them to go home after they spend their money.**
- **Gap between rich & poor**
- **Lack of crisis services**
- **Voter apathy throughout**
- **Few transportation choices - e.g., public transit, ped/bike**
  - Public transportation is not available
  - Lack of sidewalks, pedestrian accessibility, public transportation, other ways to get around aside from the car, 6
  - Poor public transportation, crowded roads
  - Public transportation between Knoxville, Oak Ridge and the airport and within major cities
- **Lack of affordable housing**
- **Maintain local independence in decision making e.g. counties and municipalities operate independently, protect personal rights**
  - Protecting each communities autonomy

  - Protect our personal rights and our freedoms and property rights
  - Inappropriate Use of eminent domain
  - Sounding the alarm that PlanET juggernaut is about to gobble up their personal property rights
  - Need to give the people in Blount County through a referendum a choice when any regional plan is to be implemented because sustainable development is not always appropriate for everyone
  - Keeping all county and municipality governments independent of the others
- **Maintaining our environment, including air and water quality**
  - Maintaining our environment, air quality
  - Air & water quality; protection of natural resources, 4
  - Pollution of streams, air, etc
- **Lack of land use controls**
  - Land use controls
- **Shared responsibility in maintaining local roads**
  - Improvement of local roads shared by multiple jurisdictions
- **Education is low quality and poorly funded**
  - Education improvements such as public school system (K-12)
  - Overcrowded public schools
  - Not willing to adequately fund and value public education
  - Education level of the workforce - availability of High School vocational training
  - Quality of k-12 education
- **Lack of quality jobs and job training**
  - Jobs that pay decent wages are scarce ($10-$12/hour jobs not adequate).
  - Unemployment
  - Job Market - creating quality jobs, job availability, need to develop more good jobs, an emphasis on green jobs
  - Available job and trade training
- **Public health issues e.g., drugs, obesity**
  - Overall substance abuse problem
  - Childhood obesity epidemic
  - Personal health
  - Drugs and crime
- **Too many small business regulations**
  - Too many regulations for small business

Knox County (Monday)

- **We do not want to grow so fast that we lose the inexpensive cost of living and the friendliness**
- **Poor air quality and lack of respect for environmental resources and concern for land planning**
  - Air pollution (most of the PlanET area has been and will be in non-attainment).
  - Poor regional air quality
  - Limited transportation options within the region & beyond: rail, air, bus, 5
  - Bad air quality due to natural terrain and lack of public transportation, which may lead to various health issues (asthma, etc)
  - Lack of respect for natural resources, development patterns, litter, mining
  - Maintaining a viable agrarian economy with thoughtful development, Lack of concern for land planning
- **Lack of regional coordination and poor resource allocation and funding prioritization**
  - Lack regional coordination among governments and other entities, Separate city and county government is not cost effective.
  - Resource allocation and funding prioritization
- **School planning done separately from county planning; hard to retain kids in school**
  - Retaining kids in school and job opportunities young adults
  - School planning is done separately from overall county planning process. Zoning and land use planning are not valued
- Decrease in manufacturing creating related poverty and drug abuse problems
  - Drug abuse and manufacturing
  - Poverty
- Poor health of the population
  - Health (diabetes, heart disease, obesity)
  - Poor health of the population, 4
- Lack of transportation options; development patterns not conducive to options
  - Development patterns are not conducive to transportation other than car.
  - Lack of transportation options – rail, air, cycle, public
- Stereotype of the region

    - Stereotype of the region (country bumpkins, hillbilly, negative view of Appalachia, ignorance, and backwards)
- Resistance to change and maintaining the status quo
    - Resistance to change and maintaining the status quo
    - Resistance to change/Involving more people in community issues including economic development, planning, preservation and community policy issues (more champions, fewer naysayers).
    - Inadequate distribution of quality education in poor and rural communities
    - Educational attainment (at high school level) and workforce development (new and future jobs)
    - Inadequate distribution of quality education, inadequate adult education
    - Lack of education in rural areas and lack of quality of education
    - lack of valuing education; low high school graduation rate, 4
    - Inequity in the quality of education in poor communities
    - Primary education
    - Poor educational standards, achievement and performance, fear of change, Appalachian mindset

Knox County (Wednesday)

- Drug problem and how it relates to crime
- Better connectivity between counties (Greenways, transit, etc)
- Greater intergovernmental cooperation and public/private partnerships (between cities and counties, regional cooperation)
- Single parenthood and lack of transmission of values to younger generations, Addictive personalities and declining cultural values
- Need to continue to grow economic options for future generations
- Small farmers losing their property rights- rezoning is an issue
- Taxes- inheritance tax, too many restrictions and paperwork
- Lack of environmental conscience, low air and water quality
    - The environment: A lot of litter, not enough ownership of the environment, Lack of environmental conscience, Air Quality-4
    - Cleaner air and water
- Lack of or poor land use planning
    - Develop "greener," more than just the buildings, developers particularly are not good at looking at the land, it really comes down to the easiest and cheapest options, particularly commercial. We have not done a good job as a region with our commercial and retail centers. Many times, they become an eyesore within our region - particularly big box and industrial
    - Lack of land use planning
- Lack of access to quality jobs and education/training
    - Lack of jobs
    - Access to quality jobs and education
- Health concerns (e.g. obesity, drug use, asthma) and lack of healthcare access
    - Public healthcare
    - Health concerns, such as asthma, allergies, diabetes, obesity; pollution effects on health; lack of health care access, especially in rural areas
    - Drug use and abuse
- Regional planning complicated by areas being too different from each other
    - Regional planning
    - Danger of creating consensus at too general a level to be applied, Needs and current states are so different. Difficult to have actionable items to apply within each of those communities
    - Areas too different from each other- e.g. Oak Ridge is federal property, whereas other areas are more rural
- Poor transportation options across all modes/connectivity among five counties
    - Poor transportation options across all modes/connectivity among five counties
    - Proximity that does not exist, challenges to connect transportation systems. We do not no complete streets, transportation oriented to automobile. We do not have enough sidewalks and mass transit could be a lot better. Buses do not run in certain parts of the region. No Park and Rides- 6
- Low quality of life for marginalized populations (immigrants, homeless, aging, poor)
    - Quality of life for marginalized populations (e.g. immigrants, homeless, aging, minorities)
    - A gap in economic diversity, people that are extremely poor and then extremely wealthy, Poorer counties, How can we increase employment?- 4
- K-12 schools: better achievement and equity for schools and students
    - Improving the schools (test scores, graduation rates, better teachers)
    - K-12 schools: better achievement for schools and students, Inequality amongst schools
    - Inferior public schools

- Growing very rapidly
  - We are going to grow in a big way in the next 5 to 10 years. Knoxville is at a tipping point, transportation and zoning wise, isolated neighborhoods, and a shifting economy. We need to fix the problem proactively not reactively.
- (This is normative, not a descriptive statement: Decisions made at the local government level are made with consideration of impact of that decision on issues of transportation, housing, health, and access to opportunity.)

Loudon County

- Lack of viable local economic opportunities for local people
- Transportation system; improvements are 10 years outdated when completed
- Jet aircraft chemical trails causing impacts to the soil quality for farming
- **Protecting the recreational opportunities**
- **Lack of awareness of what is going on in the community**
- **Region is attracting illegal aliens - needs to be more enforcement of laws on the books**
- **Maintenance and construction of infrastructure, Focus on new pedestrian facilities**
- Regional air and water quality
- **Expensive and extensive duplication in government because of multiple jurisdictions**
- **Reliance on public sector jobs**
- **Lack of respect for historic places and loss of historic properties**
- **Encouraging businesses to locate in the area by beautification and being more business friendly**
  - Small towns in region need some improvements (beautification efforts) and incentives to attract and support more small businesses to downtown. - 3
  - Encouraging businesses to locate in the area, be more business friendly
- **Educational attainment and funding are big issues (K-12 and higher education)**
  - Education; TN is 48th in our level of support of our educational system, detriment to attraction of industry
  - Educational attainment is a big issue (K thru 12 and higher education) - 4
  - Need for recognition of importance of k-12 education - funding as measured by per pupil expenditure.
- **Poverty, drug use and abuse**
  - Drug use and abuse
  - Pockets of poverty, drugs, and dependency
- **Too much government interference/regulations**
  - Need to be left alone by government regulations, not to add more regulations
  - Too much government interference
- **Transportation challenges resulting from reliance on automobiles and lack of proximity to jobs**
  - Interconnectivity of transportation especially railways (rail public transit) and greenways
  - Transportation challenges resulting from reliance on automobiles and proximity to jobs (housing plus transportation costs are high)
- **Lack of opportunity for everyone - jobs, education; leading to economic disparities**
  - Provide "good" job opportunities for everybody
  - An extreme economy - economic disparities
  - Lack of opportunity for everyone - jobs, education, keeping out of trouble – these opportunities are available for fewer people

Union County

- **Unequal opportunities for advancement throughout East Tennessee due to amount of isolation that exists**
- **Environmental problems, lack of attainment of air quality standards, putting RAD waste in landfills in Oak Ridge**
- **Lack of regional leadership to get sustainable energy (including TVA)**
- **Reluctance to change**
  - Lack of regional mass transit
- **Decent jobs are far away and it requires long travel times.**
  - Lack of jobs
- **Balance between economic development and preservation of natural resources (lakes, ridges, streams, air).**
  - Lack of values for education, no uniform education, education system archaic, need a charter or multiple charter schools
  - Alcohol and drug abuse, tearing apart families, destroying futures
  - No industry or job opportunities, 64 percent work out of the county
  - Union County; long distances between towns
- **Urban areas get more funding and planning attention than smaller rural areas: have to fight for funding opportunities**

    - Insufficient Infrastructure, water/sewer, roads, schools, broadband
- **Hard to inform the rest of the country of the regional assets; natural beauty, job opportunities, cost of living; hard to break old stereotypes**
- **Major health problems incl. obesity, tobacco use, drug abuse, which are a drain on the economy**
    - Unhealthy choices and unhealthy behaviors
    - Regional health - drug abuse is a problem (meth), obesity - exacerbated by lack of education
    - Major health problems: obesity, tobacco use, drug abuse and trafficking - economic drain on the economy

Regional Forum Series, Round Two (Partnered with Plan East Tennessee)

Anderson County

Economy and Workforce

- **More accessible and affordable health care; reasonable insurance premiums**
- **More diverse employment options; region too reliant on ORNL and UT**
- **Better vocational training and higher education options**
- **Education that empowers the individual to succeed - teaches entrepreneurial skills, trades**
- **Government regulations that are not an impediment to production**
- **Would like to see better quality education and a more equal access to education**
- **Classes to show people how to manage their finances**
- **Businesses tie together with resources to provide jobs and conserve natural beauty**
- **See everyone have an education beyond high school in order to qualify for good jobs (opportunities to keep learning)**
- **Regional economy to have a strong and diverse local basis, including local farming, local entrepreneurial leadership**
- **Personal property rights are paramount; Less government involvement in education and employment options**
- More high quality jobs
- More rigorous curriculum for teaching profession; more high quality teachers
- Reclaim jobs that have been moved overseas
- Encourage entrepreneurship in K-12 education
- Better develop job skills in secondary schools
- Better working conditions in factory jobs
- Less government involvement in business
- Expansion community college with open up opportunities (small business incubators and nursing)
- More education choice for a 4-year degree
- More manufacturing jobs to increase employment opportunities and get people to stay
- Charter schools
- Lower taxes in Anderson County to attract industry
- Government that honors its commitments and keeps its word
- Airport in Oak Ridge
- Cleaner air
- Community-wide Wi-Fi
- Community Center/gathering place in Oak Ridge and in other communities
- More housing choices for people in different income brackets - especially in the middle
- Growing economy by producing products of value and export to other regions - net exportation
- Maintain self-sufficiency and independence (Scotch/Irish heritage)
- Keep taxes on housing, real estate low to attract new investment
- Reduce unnecessary government borrowing (Knox County)
- More good paying jobs (including manufacturing)
- Don't grow too much to destroy the qualities that are here (not becoming Atlanta)
- Knoxville keeping self-sufficiency and being a national model
- Maintain right to enjoy and develop property
- Preserve right to work
- retain what we have and significantly improve it as well - education & employment
- No career opportunities for career politicians
- Employers that like to come to East Tennessee because the tax base is low and a good work ethic
- City of Oak Ridge needs to be more business friendly - not selective
- Employment needs to be more widely developed
- People want to come here because they aren't strangled by red tape. They can start a business
- Walkable neighborhoods, sidewalks, and have places to go

Environment

- **Preservation of water resources; availability of drinking water**
- **Less government intrusion in environmental regulations and otherwise**
- **More alternatives for transportation than just the automobile**
- **More housing choices for people in different income brackets - especially in the middle**
- **Protect lakes, mountains, and valleys from inappropriate development**
- **Protect agricultural land from development**
- **Preserve enjoyment of and access to mountains, camping (public parks)**
- **Land needs to develop in the way that the land owners choose**
- **Provide necessary tools to achieve a good clean environment and great places to raise families**
- **Stable population, instead of population growth**
- **Maintain clean air, clean water, and open space**
- Cleaner air
- Community-wide Wi-Fi
- Explore alternative resources such as natural gas - possibly in automobiles
- Need cheap energy
- Don't grow too much to destroy the qualities that are here (not becoming Atlanta)
- Preserve the beauty of the area
- Clustered development for open spaces
- Businesses tie together with resources to provide jobs and conserve natural beauty
- Significant improvements toward reducing pollution to the environment
- See community efforts so we do not destroy the land
- State parks and Great Smokey's protected from over-development and use

Healthy Communities

- **More healthy lifestyle choices (restaurants, grocery stores, etc.) within a better built environment**
- **Less reliance on prescription drugs**
- **Better working conditions in factory jobs**
- **Less government intrusion into healthcare**
- **Food revolution resulting in healthier people**
- **Would like to see better quality education and a more equal access to education**
- **Classes to show people how to manage their finances**
- **Improved policing of the drug problem(especially meth)**
- **Health is a personal responsibility matter and individual choice**
- **Create a community feeling where people look out for each other and work together**
- **See medical be available to everyone and more emphasis on preventative healthcare**
- **Less government expansion at the expense of our children**
- **More personal responsibility for health**
- **Medical services need to move to recognizing healthcare as a right of American citizens and not as a privilege**
- **Personal property rights are paramount; Less government involvement in education and employment options**
- Less illicit and illegal drug use
- Better built environment that promotes healthy living
- More accurate determinations of overweight and obesity rates
- Self-contained services in each community
- Preservation of water resources; availability of drinking water
- Prepare for influx of retirees/baby boomers
- More accessible and affordable health care; reasonable insurance premiums
- Free market on healthcare
- Living longer and less pollution
- More affordable health care options
- Freedom in choice and no government intervention in health care choices
- More alternatives for transportation than just the automobile
- Cleaner air
- Community-wide Wi-Fi
- Community Center/gathering place in Oak Ridge and in other communities
- Explore alternative resources such as natural gas - possibly in automobiles
- Need cheap energy
- Expanded health care to those that don't have access
- Smaller housing and sustainable neighborhoods
- Region connected to rest of the nation and the world
- More parental control in education; Less centralized rules based on funding; Less Nashville and Washington DC involvement
- More community orientation, a community that wants to do things for the general good, not just for themselves
- More private schools, charter schools, lot more educational choice

- Education system that allows the development of the maximum potential of each young person and critical thinking skills - only science should be taught in science classes
- Educational system: Get rid of the Unions
- Bigger government equals less actual results
- Walkable neighborhoods, sidewalks, and have places to go
- Facilities available for walking and biking within and between communities

Housing and Neighborhoods

- **More diversity in housing stock; more housing choices with respect to location and quality**
- **Self-contained services in each community**
- **More single family housing in rural areas**
- **More self-sufficient homes and home gardens**
- **More housing choices for people in different income brackets - especially in the middle**
- **Community-wide Wi-Fi**
- **Freedom of choice of where to live and type of housing**
- **Maintain right to enjoy and develop property**
- **Interested in helping housing be more accessible**
- **Small sustaining neighborhoods**
- **Neighborhood will collectively be what each individual homeowners makes as their choice on their property**
- **Sustainable development from United Nations and ICLEI out**
- Prepare for influx of retirees/baby boomers
- Use of alternative building materials (tractor trailer/cargo containers, straw, etc)
- More housing options
- Improve, maintain, improve housing deterioration
- Deal with slum land lords
- More affordable housing
- No more cities

Transportation and Infrastructure

- **More transportation options**
- **Well thought-out infrastructure to support future growth and development**
- **Preservation of water resources; availability of drinking water**
- **No government interference in transportation choices**
- **Shorter travel for single families in their own vehicle - flying cars**
- **More alternatives for transportation than just the automobile**
- **Need cheap energy**
- **Reduce truck traffic on roads by increasing use of rail and barges**
- **Provide better transit and transportation options**
- **Transportation systems that is not dependent upon fossil fuels**
- **Let the market decide what transportation options will be available**
- **Automobile most important part of our society**
- **Individual vehicles: Maximum individual freedom**
- User fees for all transportation modes
- Transportation options/services for elderly citizens
- Better designed rural roads; safer roadways
- Prepare for influx of retirees/baby boomers
- Personal choice in transportation
- Expansion of carpool, alternatives modes of public transportation
- Use the our location in the region to our advantage to utilize mass transportation
- Alternative fuels (propane and others)
- Airport in Oak Ridge
- Community-wide Wi-Fi
- Explore alternative resources such as natural gas - possibly in automobiles
- Deal with local congestion
- Don't grow too much to destroy the qualities that are here (not becoming Atlanta)
- Ferrari in every garage
- See additional opportunities for transportation; particularly for people that cannot drive anymore
- Facilities available for walking and biking within and between communities
- Personal property rights are paramount; Less government involvement in education and employment options
- Bigger government equals less actual results
- No government transportation
- No light rail; People to be free to travel anywhere in the continental United States
- Alternative to just a car
- Walkable neighborhoods, sidewalks, and have places to go
- More private sector transportation, less top down; Less regulation for people related to transportation

Other

- **More accountability in government decision-making**
- **Less globalization in our system; More American exceptionalism**
- Minimize taxes
- Fewer unfunded federal mandates on local governments
- Maximize personal freedoms
- Reduce unnecessary government borrowing (Knox County)
- Stop taking federal money
- Maintain self-sufficiency and independence (Scotch/Irish heritage)
- No regional government at any point in time; Maintain local control and autonomy
- Get rid of the AMA
- We need to prepare for all possibilities in education
- Only local government needs to be involved in education
- To build upon the varied educational systems (technical schools) that are available in the area

Blount County

Economy and Workforce

- **Better fit between (quality) education/training of students and good available jobs in a changing workforce**
- **Population growth pressures in county; Need to be able to provide jobs; Need to be able to provide good education; Creating demand for housing, driving up cost and making it more difficult to afford housing**
- **Improve education and job training for those who currently don't have access to it**
- **Promote ecotourism rather than shopping/entertainment attractions**
- **Need more technology-based jobs to replace potential loss of manufacturing jobs; Proximity to amenities like airport, ORNL, Smokies should make it attractive to high tech industries**
- **Needs to be a focus on STEM education for K-12 and beyond**
- **Unelected and unaccountable government stifling the region**
- **Natural resources bringing people into the area**
- **The mountains drawing people to live in the area because of their beauty**
- **People want a large farm with their own personal equipment to manage it, with their own livestock**
- **Minimize planning**
- **more educational opportunities in the trades for those not bound for college**
- **Less restrictions/regulations on manufacturing and industrial jobs**
- **Free Market should decide what services will be available**
- **Better job of basic education and workforce development**
- **Reduce government involvement in job market**
- **Ordinance so that people not from this county cannot participate in any decisions that impact the lives of the people in this area, particularly pertaining to property rights - sovereignty**
- **Rather than policies, let the market regulate**
- **Allow the free market to develop the local economy through limited governmental regulations**
- **Job opportunities that provide a living wage**
- **Small businesses and individuals are micromanaged, we need to lessen the tentacles (restrictions) imposed upon us**
- **We need less use eminent domain, especially that which benefits private companies**
- Economy going global; Losing local jobs; Shrinking manufacturing sector; How do we balance demand for cheaper products with need for better paying jobs
- Value/higher quality of college education today will affect economy of 2040; Need quality vocational education today and into future; Without it, labor force will be left behind
- Need for vocational training; Find niche in economy for craftsmen; Not all talented workers have to go to college; But they need opportunity
- Be mindful of skills needed for whole range of future employment, not just higher education
- Still see value in farming/agriculture. Need to attract new generation of workers interested in farming
- Increase infill development between urban centers
- Increase job diversity (don't rely on Alcoa (company) to provide jobs into future)
- Attract better paying jobs
- Attract retirees by keeping the cost of living low and adequate health
- Keep jobs, retail and commerce local (as opposed to shopping online and from foreign sources)
- Keep flow of goods local
- Higher density neighborhoods close to larger employment centers
- Maintain low cost of living
- Tourism growth for the region
- High tech jobs as a growth area
- 2040 - University of Tennessee will be a major research and graduate institution

- Education having more public private partnerships to train needed workers
- Large farmlands with livestock still throughout the region
- People will move here because of the honest, hard working population, and they value diversity
- More individual freedom
- County schools will be up to par with City schools
- Preserve the regions unique cultural, historic, and scenic qualities
- Encourage entrepreneurship
- The option to home school your children is still available
- Vocational education (training)
- Reduce entitlements to create more private sector incentives for business
- Creating local jobs
- Blount County Debt to be addressed
- Uneven attractiveness to employers
- Education
- Training people for jobs for the future
- In 20 years, government doesn't need the people monitoring it at every turn
- Invest in better educational opportunities in the region to attract better jobs and incomes
- Don't want projects that increase taxes
- Personal responsibility
- We need more options for good work, good benefits, and good pay for young people; Concerned that the job creation will be for low skilled workers

Environment

- **Environment: mix of uses, like parks; How we take care of infrastructure of environment e.g. water**
- **Still see value in farming/agriculture; Need to attract new generation of workers interested in farming**
- **Preserve natural beauty and environmental quality (air/water) for economic and health reasons**
- **Recreation opportunities/accessibility to promote health**
- **Water and Air quality need continued improvement; Recruitment of "clean" industries to Region**
- **Tourism growth for the region**
- **Natural resources bringing people into the area**
- **Do not crowd the people into urban areas**
- **People will have the options to live where they want to and to buy land in the country**
- **Choice to maintain property rights**
- **Less land taken by the federal government**
- **Get rid of federal environmental regulatory agency**
- **Educate people to do what is ethically right, so regulation is not needed**
- **No permitting for air and water pollution by companies or anyone**
- **See the environment as least as good as it is today in 2040**
- **Access to the national parks for public use**
- **I'd like the air and water to be cleaner**
- **I would like for our parks and natural resources to remain for our enjoyment**
- Preservation of green space
- Keep the green.
- Prevent encroachment onto agricultural land where possible and sensible
- Improve air quality - better health and visibility of scenic vistas
- Keep flow of goods local
- Combine housing development plans with land conservation plans
- Unelected and unaccountable government stifling the region
- Personal car will continue to be the primary source of transportation
- Communities will be more self contained and walkable
- The mountains drawing people to live in the area because of their beauty
- Preservation of open space and limiting of sprawl
- Minimize planning
- Preserve agricultural land
- More urban renewal
- Allow individuals to live they way they want
- Preserve the regions unique cultural, historic, and scenic qualities
- The option to home school your children is still available
- No ICLEI
- Personal responsibility

Healthy Communities

- **Better access to preventative care**
- **Expansion of pedestrian infrastructure: greenways, sidewalks; Connectivity with other uses, like schools**
- **Make better use of developed, under-utilized properties (e.g. Downtown Maryville)**

- **Keep flow of goods local**
- **Continued growth of Blount Memorial Hosp as a regional health center**
- **Recreational facilities available to all areas and communities; Have parks centrally located to all communities.**
- **Unelected and unaccountable government stifling the region**
- **Personal car will continue to be the primary source of transportation**
- **Fewer hospitals, using more outpatient services**
- **Insurance incentives for health, rather than used primarily for illness**
- **Minimize planning**
- **Allow individuals to live they way they want**
- **Have health care become completely apart of the private sector**
- **Eliminate fluoridation of water**
- **Sovereignty - of county, municipalities, and property owners**
- **Protect private property rights for people and their children**
- **Improve health through local community and resources**
- **Take personal responsibility for your own personal health**
- **Freedom of health care choice**
- **Right to choose health care providers and have health care needs met**
- Recreation opportunities/accessibility to promote health
- Complete Greenway to the Smokies
- Higher density neighborhoods close to larger employment centers
- Greenbelt access to rest of Region; more greenways are interconnected to others in the region.
- Lesser use of generic medications
- The number of uninsured growing, needing to find a system to provide care
- Aging population requiring additional care in their homes or new ideas of property ownership to provide care
- People will know each other better
- More urban renewal
- Preservation of open space and limiting of sprawl
- Preserve the regions unique cultural, historic, and scenic qualities
- The option to home school your children is still available
- Alternatives to automobile transportation are available, including walking
- In the future, kids won't have asthma, obesity, etc.
- quality of education can be solved by localizing in the county, remove state and federal funding and management
- decisions about density or zoning should be maintained by government entities that are elected
- Federal government out of geographical and topic areas, no federal or state mandates on local governments
- Need to be more people involved, open meetings
- Don't want to get locked into a plan that is not flexible
- Prepare for more people, think about where people will live, where they will work, infrastructure
- In 20 years…
- Improved access to mental health services for the working poor
- Improve citizen health through education and access to healthy foods
- Improve access to farmers market
- Do away with the food stamp cards and provide WIC
- No forced vaccinations

Housing and Neighborhoods

- **Housing types will change; Houses with a lot of acreage will be fewer; Running out of land and natural resources to support the current type of housing development**
- **Population growth pressures in county; Need to be able to provide jobs; Need to be able to provide good education; Creating demand for housing, driving up cost and making it more difficult to afford housing**
- **Combine housing development plans with land conservation plans**
- **Increase affordable housing (don't neglect the lower income population and minorities)**
- **There are a variety of housing choices available**
- **There will be ample affordable housing available**
- **Unelected and unaccountable government stifling the region**
- **Light rail loop adding access to all areas for housing and decreasing highway traffic and use on gasoline**
- **Large farmlands with livestock still throughout the region**
- **Neighborhoods be more cooperative and more accepting of differing view points**
- **People will have the options to live where they want to and to buy land in the country**
- **Do not crowd the people into urban areas**
- **Choice of housing for local residents**
- **No forced housing arrangements**
- **Zoning regulations should be against living facilities that are too densely packed**
- **Decisions about density or zoning**
- **County or local sovereignty**
- **Personal choice when comes to housing**

- **We need less use of eminent domain, more respect for property rights**
- **I want my children and grandchildren to be able to live individual housing units, where they want in what they can afford, without having to go into multiple housing units**
- Maintain low cost of living
- Higher density neighborhoods close to larger employment centers
- Live closer to work
- Communities will be more self contained and walkable
- Neighborhoods should have neighborhood schools, not large community schools
- Neighborhoods will still predominantly be single family home ownership on owned land
- Aging population requiring additional care in their homes or new ideas of property ownership to provide care
- People want a large farm with their own personal equipment to manage it, with their own livestock
- More urban renewal
- Allow individuals to live they way they want
- Minimize planning
- More individual freedom

Transportation and Infrastructure

- **Better transportation system, especially would benefit from rail transit**
- **Need for more mass transportation; Less dependence on foreign oil and other resources**
- **Offer alternatives using cars - reduce congestion and address dwindling gas supply**
- **Higher density neighborhoods close to larger employment centers**
- **Need to finish road projects, highway infrastructure. Complete roads that have been planned such as Pellissippi Pkwy**
- **Greenbelt access to rest of Region; More greenways that are interconnected to others in region**
- **Need more public transit options in the region; A public transit system is needed in Blount County**
- **Personal car will continue to be the primary source of transportation**
- **Light rail loop adding access to all areas for housing and decreasing highway traffic and use on gasoline**
- **Use more trains used for goods, and have hubs for trucks**
- **Preserve the regions unique cultural, historic, and scenic qualities**
- **Increased transportation routes for cars**
- **Bicyclists and bicycles should have to be licensed and that should pay for the bike lanes, paths they use through license and plates (excluding children)**
- **Good infrastructure for automobiles**
- **Transportation network around the region that keeps up with the traffic demands**
- **No one dictating what kind of car I am going to drive**
- **I do not see bicycling as a form of transportation, but rather a way to recreate, I need my freedom of choice in transportation**
- **I would like to maintain infrastructure to support rural communities**
- Live closer to work
- Increase infill development between urban centers
- Keep flow of goods local
- Make better use of developed, under utilized properties (e.g. Downtown Maryville)
- Unelected and unaccountable government stifling the region
- Alternatives to automobile transportation are available, including walking
- Better transportation system, for example trains and buses
- Minimize planning
- More individual freedom
- Maintained local roads for cars
- Personal responsibility
- I want the right to keep my car
- We need ways to help the elderly get around when they can no longer drive

Other

- **Need mix of land uses to generate revenues to support public infrastructure, etc.**
- **Need to look at whole systems: environment, transportation, education, economy, and how they interrelate**
- **Unelected and unaccountable government stifling the region**
- **Revamping of the educational systems - more emphasis on fields of study (math, science, reading, etc.)**
- **Preservation of personal property rights (4th Amendment)**
- **No people coming in from other areas telling us how to live including United Nations, ICLEI, HUD, EPA**
- **Protect our personal/private property rights**
- **All laws should comply with the state of Tennessee and the US constitution**

- Improve governance and responsiveness to citizens
- Respect property rights
- Maintain low tax rates
- Strengthen local government sovereignty
- Smaller government
- Overcome national and county debt (all levels of government)
- Eliminate participation with the United Nations
- Personal responsibility
- Less federal government involvement in our lives
- No International Council for Local Environmental Initiatives
- Keep the decisions on a local level
- Community autonomy
- No change
- Elected officials need to be aware of their role as a public servant
- Government to be the servant of the people
- I want the freedom I had 40 years ago in 40 years from now
- Maintain the sovereignty of individual counties and not give it over to the region

Knox County East

Economy and Workforce

- **Well trained work-force that has jobs in the region**
- **Continue the trend in offering more community colleges and educational opportunities and easier access to education. Private and public**
- **Diverse educational system with community support and involvement (Ex. a wide range of educational options from preschool to universities)**
- **Employment opportunities where people live**
- **Increase business incubators throughout the region and support entrepreneurial opportunities**
- **Need an educated work force, including technical skills, especially need a sync between the education and the available jobs; Involving the school board and local governments**
- **Make more direct connections between regional farms and where people get their food**
- **Increase access to healthy, local food and get to know the area farmers**
- **Educational improvements throughout the region that increase job opportunities**
- **Improvement in the quality of schools; Excellence in schools attracts excellence in economic development**
- **Increase high paying jobs. Recruit businesses that pay higher wages**
- **Training the workforce for the industries that we want to attract; Get educational programs in community colleges to train for industries we want to attract**
- Keep private party innovations involved in solutions
- Fewer children living in poverty
- Continue to re-evaluate plans and include short range plans
- Education and employment have to go hand in hand. Balance of jobs with integrated education from research and development to production
- A wide range of educational options from preschool to universities
- Use of our assets such as UT, ORNL to make us a leader in efficiency and technology
- Working within community financial resources
- Better opportunities for job choices and transportation without taking personal property rights and personal freedom
- Legalize marijuana to support economy
- Adaptation of existing agriculture from large industrial farming operations to smaller more specialized farm; Change from livestock to other crops/produce
- More hemp in the economy to support agriculture and industry
- Continue the trend to support agriculture and farmers market; Supporting younger farmers
- More jobs and support/services to reduce homeless population
- Make college education more affordable, more examples like Pellissippi and community colleges
- Diverse types of employers including small business, large business, and industry to ensure that when one sector is ailing, another can pick up the slack
- Regionally supported education system
- Need to support a technical skill system for manufacturing jobs such as Volkswagen
- Focus large industry in appropriate small locations
- Grow the career and technical education (CTE) programs and opportunities throughout the region
- Knoxville and the region could support Oak Ridge more in retail, business etc. More of a regional support system
- Improve attraction of international industry
- Maintain the environment to support tourism industry. Maintain the accessibility to the region by transportation
- Regionally supported education system

- More organic, healthy, local foods
- Quality jobs
- Need to help kids graduate from high schools
- Education needs to be improved - directly related to future health outcomes
- Increase/Promote businesses in region that serve healthy, local foods
- Reduce disparities between lower and middle/high income communities (particularly in education)
- Providing future generations the opportunity to continue living here
- More resources within communities
- Making enough opportunities for students to keep them in the region
- Diversity of jobs; small business
- Opportunities for diverse cultural nurturing
- Healthy, livable neighborhoods with residential and commercial services
- Retrofitting existing neighborhoods with sidewalks and creating sidewalks in new neighborhoods
- Quality of life attracts economic development
- Improve regional competitiveness to attract corporations with incentives
- Drug free community
- Educating larger community on investing in education

Environment

- **Significant air quality improvements**
- **Keep private party innovations involved in solutions**
- **Smaller human footprint (making due with less material goods) and a larger presence for the natural**
- **Recreational access to clean public spaces and water bodies**
- **Decrease the amount of impaired streams**
- **More organic, healthy, local foods**
- **Clean air and clean water**
- **Reduce energy waste and become more sustainable communities - particularly for transportation**
- **Tighter urban development; walkable, transit, brownfield development, higher density**
- **Clean air**
- Continue to re-evaluate plans and include short range plans
- Improved air quality
- Use infill development and brownfield redevelopment
- Every household and business to be recycling
- Continue the trend to support agriculture and farmers market. Supporting younger farmers
- Adaptation of existing agriculture from large industrial farming operations to smaller more specialized farm; Change from livestock to other crops/produce
- Legalize marijuana to support economy
- More hemp in the economy to support agriculture and industry
- Reduce disparities between lower and middle/high income communities (particularly in education)

Healthy Communities

- **Increase safe sidewalks region-wide - to encourage walking and better health. More government support of sidewalks**
- **Fewer children living in poverty**
- **Better access to health care with lower cost**
- **Recreational access to clean public spaces and water bodies**
- **Make sure people have resources and capacity to support themselves**
- **Increasing access and equity to quality education in underserved communities**
- **Promote healthy, local eating/foods within the educational system**
- **Reduce disparities between lower and middle/high income communities (particularly in education)**
- **Reduction in obesity and opportunity for exercise**
- **Healthy, livable neighborhoods with residential and commercial services; Retrofitting existing neighborhoods with sidewalks and creating sidewalks in new neighborhoods**
- **Drug free community**
- Significant air quality improvements
- Improved public transportation from rural areas to hospitals and health care
- Continue to re-evaluate plans and include short range plans
- Keep private party innovations involved in solutions
- A focal point for people with disabilities
- Measure the cost of what we do not do - ex. not providing adequate healthcare to a segment of the population
- Improvement of opportunities and support of the homeless population
- Recognition of history around racial discrimination
- Less racial segregation - more acceptance
- More organic, healthy, local foods
- No cost or low cost for high speed internet to support more educational opportunities
- Network to support the elderly
- Everyone gets a high school education - reduce drop out rate

- Support and improve infrastructure and health care to support retirees
- Regionally supported education system
- Use infill development and brownfield redevelopment
- Continue the trend to support agriculture and farmers market. Supporting younger farmers
- Services and centers to support aging in place
- Legalize marijuana to support economy
- More hemp in the economy to support agriculture and industry
- Increased access to health care for improved health
- Integrated neighborhoods - making communities more walkable and not as dependent on cars
- More connected communities - schools, jobs and housing
- Promote communities being more involved with each other
- More resources within communities
- Education needs to be improved - directly related to future health outcomes
- Increase access to healthy, local food and get to know the area farmers
- Increase/Promote businesses in region that serve healthy, local foods
- Work life balance; enjoying life
- Improvement in the quality of schools
- Education for parents on parenting skills; early childhood development
- Investment in all children; youth wellbeing
- Get educational programs in community colleges to train for industries we want to attract
- Educating larger community on investing in education
- Better community dialogue

Housing and Neighborhoods

- **Offer mixed use housing with blended neighborhoods, including increased housing support designed for seniors**
- **See disasters (e.g., April 2011 storms) as an opportunity to improve community and redevelop. Have plans and preparations for this and flexibility for different use of our funds**
- **Housing options to live urban, suburban, and rural**
- **More efficient (energy, footprint, materials) housing stock**
- **More and integrate affordable housing**
- **Services and centers to support aging in place**
- **Improving the preservation of our region's culture and history**
- **Reduce disparities between lower and middle/high income communities (particularly in education)**
- **Tighter urban development; walkable, transit, brownfield development, higher density**
- **Code enforcement resources to protect existing housing stock**
- Continue to re-evaluate plans and include short range plans
- Keep private party innovations involved in solutions
- Smaller human footprint (making due with less material goods) and a larger presence for the natural
- Employment opportunities where people live
- Improvement of opportunities and support of the homeless population
- Retrofitting existing neighborhoods with sidewalks and creating sidewalks in new neighborhoods
- Healthy, livable neighborhoods with residential and commercial services

Transportation and Infrastructure

- **More access to all forms of transportation, especially sidewalks to schools, to transit, to shopping**
- **Improved public transportation from rural areas to hospitals and health care; Increased transportation services for seniors that cannot drive**
- **Employment opportunities where people live**
- **Improved local and regional public transportation**
- **Increase alternative transportation**
- **Improved cluster/mixed use development**
- **More connected communities - schools, jobs and housing**
- **Integrated neighborhoods - making communities more walkable and not as dependent on cars**
- **Tight mass transit system that stretches throughout the 5-county area**
- **Healthy, livable neighborhoods with residential and commercial services**
- Increase safe sidewalks region-wide - to encourage walking and better health
- See disasters (e.g., April 2011 storms) as an opportunity to improve community and redevelop. Have plans and preparations for this and flexibility for different use of our funds
- Continue to re-evaluate plans and include short range plans
- Keep private party innovations involved in solutions
- Better transit service within Knox County with longer hours and more stops
- Better opportunities for job choices and transportation without taking personal property rights and personal freedom

- Regional mass transit, including in to the counties; Such as Knox County which is affordable and accessible
- Walking and biking lanes to increase access between homes and amenities like education
- Regional light rail
- Expanded bus services, even out of region
- Increase transportation options for seniors who do not drive
- Better roads - maintenance and new roads to accommodate growth
- Will continue to use cars as transportation
- More resources within communities
- Reduce disparities between lower and middle/high income communities (particularly in education)
- Better regional mobility and distribution of services
- Retrofitting existing neighborhoods with sidewalks and creating sidewalks in new neighborhoods
- Tighter urban development; walkable, transit, brownfield development, higher density

Other

- Local governments will be in control of their own future
- Remain an independent region
- Healthy, livable neighborhoods with residential and commercial services
- Retrofitting existing neighborhoods with sidewalks and creating sidewalks in new neighborhoods
- Opportunities for diverse cultural nurturing
- Cultural acceptance and tolerance, regionally
- Drug free community
- Investment in all children; youth wellbeing
- Educating larger community on investing in education
- Better community dialogue

Knox County South

Economy and Workforce

- **Develop and foster music and cultural heritage as a tourism engine and economic growth generator**
- **Encourage consumer support of small, locally owned businesses**
- **Promote mixed uses along major arterials. Repurpose vacant strip malls**
- **More cottage industries - provide work from home solutions for those who cannot easily leave home; Allow small, home-run businesses in homes. With zoning controls**
- **Would like to find indigenous economies, such as locally grown food to diversify from state, local federal, government jobs**
- **Would like a population education in a way that attracts good employment opportunities; Global companies locate to Knoxville because they are attracted to our educational system**
- **More vocational training to ensure transferable skills**
- **Attract more industrial and manufacturing business to promote more jobs**
- **Knoxville needs to be promoted as a destination - ex: urban wilderness**
- **Need to support funding for schools (education)**
- **Education needs to improve on a larger scale**
- **Families and neighborhoods solidify the structure of the family**
- **No UN Agenda 21 plan**
- **Shortcomings of local schools would be addressed - schools as investments, fully fund**
- **Jobs that replace manufacturing jobs that offer a living wage**
- **Market has to demand improvements in education and transportation**
- **Less reliance on government assistance**
- **An education of such quality that the children of this area have the ability to get the jobs of the future; A good solid education that prepares the children for the future**
- **Improve our transportation system to be accommodating of various modes of transportation**
- More support for local agriculture and local farmers
- Prepare children/students for workforce needs; Consider alternative forms of education, like apprenticeships
- Preservation of agricultural land
- More neighborhood schools; Fewer mega-schools
- Foster/encourage smaller, local, artisan businesses
- Innovation at every level of education
- Affordable higher education including two-year programs
- Improve maintain quality of life
- Hope to see local tie-in to Volkswagen coming to the area
- Would like to see the schools, university, and companies to work together to provide more opportunities and think outside the box
- Would like to see a global connection and an international feel with jobs and even within the community itself
- Would like the region to be competitive to other mid-sized cities

- Would like a large portion of the food we eat to be grown locally or regionally
- Would like to see the fine arts integrated into the educational system
- High paying jobs - technical or skilled jobs
- Similar opportunities for education should be provided to all
- Improved working conditions such as hours of operations
- Increase taxes
- Increased connection between agencies and municipalities to maximize regional resources
- Increased promotion that is focused on our regional assets
- Economic Development standpoint - need to be more supportive of a regional approach (tourism, jobs, etc.)
- Other educational opportunities for general public
- More vocational opportunities
- Urban wilderness will attract people to come to Knoxville
- Need educated and trained workforce
- There will be an increase/improvement of local markets for local agricultural products
- No unified regional government
- Regional cooperation
- Centered around technology - UT, etc
- Region should be more self reliant on food production
- Appreciation for our natural resources, understand the need to hold on to that
- Reuse of vacant buildings in the cities (incentives)
- Focus on healthy lifestyles
- Concerned about increasing level of student loans; Should increase practical job training programs in high school programs; de-stigmatize vocational program
- Currency and inflation are a concern. Need for competing currencies
- Nice educational system around Knox and surrounding counties
- Get government out of our private life
- Mountain biking and biking generally is an important economic driver
- We need better vocational programs
- Reinforce/preserve individual community identity
- Various safe alternatives for transportation, happy to pay for things that help keep them safe

Environment

- **Preservation of agricultural land**
- **Encourage commercial development that adopts more sustainable building practices**
- **Preserve scenic beauty (meadows, fields, and ridges) and outdoor recreation; Conservation subdivisions as one option**
- **Clean up streams and waterways (rivers and lakes included): Stream buffers, reduce erosion, remove bacteria**
- **Like the system of nature trails in South Knoxville and would like to see them continued for future generations**
- **Legacy of parks and natural areas that is a destination that is provided for the next generation**
- **Improved air quality**
- **Maintain the natural beauty**
- **Increased funding for public lands, public recreation opportunities and trails**
- **Improve air quality for outdoor recreation**
- **No indiscriminate use of eminent domain**
- **Utilization of natural resources available in our region; No reliance on foreign sources of energy**
- **Appreciation for our natural resources, understand the need to hold on to that and understand dangers of urban sprawl**
- **Better air quality, reduced greenhouse gas emissions**
- **Get government out of our private life**
- **Dealing with drug use (meth) and the associated crime**
- Daylighting and rebuilding of urban waterways
- Growth of Urban agriculture practices
- No power mowers; Sustainable lawn maintenance
- Allow small, boutique farming operations from home in neighborhoods
- Focus on redeveloping rather than green field
- Avoid development in vulnerable and sensitive areas
- Apply stormwater standards at all development scales. Reduce impervious surface
- Alternative energy used in power plants
- More town centers to facilitate walkable communities
- Improve air quality - reduce car use or lower emission vehicles
- Improve maintain quality of life
- Would like a large portion of the food we eat to be grown locally or regionally
- Increase connectivity of public lands and greenways
- Bike lanes being built into new roads
- Urban wilderness will attract people to come to Knoxville
- Good greenway infrastructure

- More emphasis on ridesharing and carpooling

Healthy Communities

- More neighborhood schools; Fewer mega-schools
- Pocket parks everywhere; Walkable communities
- Resolve disparities in access to good, quality health care
- More town centers to facilitate walkable communities; Complete street in neighborhoods including safe routes to schools
- Improve and increase greenway system, improve connectivity
- Improve air quality - reduce car use or lower emission vehicles
- Would like to be able to age in place without a car, but have access to services
- Would like a large portion of the food we eat to be grown locally or regionally
- Improved air quality
- Health insurance that is available to all
- Providing opportunities/activities for middle & high schoolers (after school)
- Bike lanes being built into new roads
- Knoxville needs to be promoted as a destination - ex: urban wilderness
- Return of small individual community ideals
- Continuation of faith-based outreach
- Focus on healthy lifestyles, healthier individuals
- Better air quality
- Less reliance on imported food, stronger local farming
- Clearinghouse website where every volunteering opportunity is available on one site
- Dealing with drug use (meth) and the associated crime
- We need to look ahead and make sure that get ahead of the curve for the coming demand that is needed regarding the healthcare system
- Reinforce/preserve individual community identity
- Connectivity of parks and recreation spaces with greenways and pedestrian and biking facilities/opportunities
- Ensure affordable health care and within close driving range
- Alternative energy used in power plants
- Clean up meth labs
- Legacy of parks and natural areas that is a destination that is provided for the next generation
- Sidewalks and greenways that connect to green spaces and open spaces that are easily accessible to all ages and abilities
- Increased availability of alternative medicines
- Improve healthcare by creating smaller communities
- Decrease of drug (pill) use
- Community centers for both elderly and children (make affordable)
- Continue to strengthen communities in Knoxville
- Maintain and foster tight, small communities (ex: community farms)
- Families and neighborhoods solidify the structure of the family
- Good greenway infrastructure
- Children have access to healthy food and activities in schools
- Strong, vibrant city core that expands into areas surrounding it
- Region should be more self reliant on food production
- Reuse of vacant buildings in the cities (incentives), more infill
- More cradle to cradle definition of what is in/on food and how it is grown
- Municipalities forcing companies to label the ingredients/additives on food/produce
- Bicycle lanes and shoulders for safety
- Motorcyclists need a safe travel lane
- We need better vocational programs
- Mountain biking and biking generally is an important economic driver

Housing and Neighborhoods

- **Encourage housing development in denser pattern. Reduce development trends that tend toward sprawl. Encourage residential verticality, but protect natural views/vistas**
- **Re-examine local building codes, zoning, and other regulations to allow and encourage more sustainable forms of development. Allow alternative building methods**
- **Reutilize vacant housing**
- **More town centers to facilitate walkable communities**
- **Would like the region to be competitive to other mid-sized cities**
- **Housing developments that integrate public transit opportunities**
- **Housing that is versatile allowing people to age in place and continuing living if disabled**
- **Property ownership rights are protected**
- **No indiscriminate use of eminent domain**
- **Strong, vibrant city core that includes areas surrounding it, more infill**
- **Affordable housing options are integrated an all regions**
- **More diversity in housing where you have affordable housing where there isn't now**
- **Reinforce/preserve individual community identity**
- Offer a wide range of housing

- Zoning that is going to preserve community character and protect property values
- Educate the public and include them in the process on the future impacts of land use decisions
- Property owners responsibility regardless if it is a primary home or not
- No spot zoning

Transportation and Infrastructure

- **Improved public transportation and more alternatives to single automobiles**
- **Connectivity of parks and recreation spaces with greenways and pedestrian and biking facilities/opportunities**
- **Accommodate safe passage for people who cannot drive cars**
- **In 30 years there will be a train to take workers to Chattanooga, Atlanta, or wherever**
- **Bus shelters at public transit stops**
- **Options to include more sidewalks to make it easier to get to a bus, rapid bus, light rail and never have to get into a personal vehicle to shop, visit, work**
- **Promote public transportation options - including sidewalks**
- **Increased funding for public lands, public recreation opportunities and trails**
- **Preserving personal choice in transportation**
- **Strong, vibrant city core that expands into areas surrounding it**
- **Good greenway infrastructure**
- **Won't have to spend as much money on vehicles and insurance, etc. Transportation costs are high. People could spend more on housing**
- **Less dependence on auto travel around the city; Better options besides a car**
- **Improve our transportation system to be accommodating of various modes of transportation**
- **Bicycle lanes and shoulders for safety**
- More walkable, bikeable community options/facilities
- Resolve disparities in access to community facilities and amenities between affluent areas and less affluent areas
- Improve connectivity of neighborhoods with networks of roads. Provide connectivity options
- Improve and increase greenway system, improve connectivity
- Bike/ped. transportation alternatives
- More town centers to facilitate walkable communities; Complete street in neighborhoods including safe routes to schools
- Would like to be able to age in place without a car, but have access to services
- Like the system of nature trails in South Knoxville and would like to see them continued for future generations
- Wider streets with curbs
- Educate the public and include them in the process on the future impacts of land use decisions
- Have the public transportation options reflect the needs of the population
- Bike lanes being built into new roads
- Connecting communities with sidewalks/greenways
- More sidewalks
- Need additional transportation options in region - ex: park-n-rides
- More emphasis on ridesharing and carpooling
- Long distance passenger train service
- That we will understand the dangers of urban sprawl and have more infill development
- Various safe alternatives for transportation, happy to pay for things that help keep them safe
- Motorcyclists need a safe travel lane
- Get government out of our private life
- More convenient transit service (especially later services and higher frequency). Create regional public transit
- Move utilities underground and allow trees to grow

Other

- **Would like to see the schools, university, and companies to work together to provide more opportunities and think outside the box**
- **Would like to see Knoxville as a center of Enlightenment**
- **Long-term funding strategy**
- **People should know about what goes on in the region (ORNL, UT, etc.)**
- **Enforcement of immigration laws/immigrants that come here assimilate to American ideals and English language**
- **Keep things exactly like they are, but we need stronger communities and the government shouldn't do it. Stronger families**
- Pace rate of development - no premature development
- Improve aesthetic standards (especially signage and billboards. make public signs more beautiful)
- More cultural Forum Locations in rural areas and well distributed throughout the region
- Focus on redeveloping rather than green field

- Increased opportunity for community input in planning for the future
- Daycare after typical working hours
- Promotion of diversity and more open-mindedness
- Knoxville should be more welcoming for everyone
- Increase taxes

Loudon County

Economy and Workforce

- **Diversify workforce for healthier environment to expand opportunities, create healthier economy**
- **Identify future skill sets required and provide training for next generations (high schools, trade schools, voc. schools, etc.)**
- **State and county governments should work to create a pro-business environment**
- **Less regulation**
- **Keep all types of taxes low**
- **Change driven by individuals not government**
- **Protect individual property rights because their wealth is tied to their land**
- **We need to focus on the federal deficit**
- **Why are we discussing things about the future when we don't have the money to finance it?**
- **Stronger schools**
- **Higher quality jobs**
- **Less government intervention on farming; Over-regulation on farms and impact of inheritance tax on farms**
- **Smaller government to help society, not bigger government, particularly for education; More local control for education; Need to improve competency overall in education; Stop passing kids on that are not meeting competency standards**
- **Make sure planning is done bottom-up, responsible planning; Not top-down over-reaching planning**
- **Self-reliance and self responsibility for our region**
- **We need jobs and education and need more agricultural education like they have in Lenoir City**
- **I like the community the way it is. We need a good mix of industry for jobs. Our area attracts a lot of people for a lot of reasons. We don't need to grow with bigger roads and more asphalt but need more agriculture**
- Drug problem - employers need workers that can pass a drug test
- Low taxes to attract investments
- Bring the jobs to the people rather than the people to the jobs
- See people taking responsibility for themselves, rather than just government
- Need for a variety and quantity of affordable energy
- Maintain adequate power and energy and tap into national energy resources
- Need to have good jobs
- Continue to grow medical centers
- Maintain private property rights
- Low taxes and conservative government
- Live without government involvement in choices
- Doesn't want to tell future generations what to do
- Would like to maintain control of property with minimal government involvement
- We need to have mandatory math and science
- Improve the education here, as it provides better opportunities for jobs
- Growth of jobs and economy for the area, so that educated locals do not leave for other areas
- Farms will still be a part of 2040. Agriculture is definitely part of the future
- Small farms are disappearing. Teaching kids to farm as a primary goal is going backwards. We need math and science education
- If we stay the way things are we are going backwards. We need an effective labor pool the better educated starting locally. Effective schools, teachers, and plan for putting that together
- Attract the right growth - seniors/Baby Boomers who will not require services
- Want manufacturing jobs to provide jobs for workers
- People in TN are capable of self-reliance and self-direction
- Keep jobs local or provide more jobs for region
- 5-county region plan could create unelected officials or councils that make decisions
- How do we go about funding these things?
- Not have over (to many) regulations
- Future generations not have their lives controlled by the government
- We don't want the government owning land and giving it to the United Nations
- Protect the mountains, views, rivers
- How are these environmental areas going to be protected?
- Privately owned housing opportunities for elderly

- Need for planning in a regional or larger scale context
- Local level planning allows and provides for more decision making and helps deter waste fraud and abuse

Environment

- **Need to sustain our resources to ensure they are available to future resources**
- **Ensure that we protect the rural areas that attract people to the region**
- **Less regulation**
- **Maintain adequate power and energy and tap into national energy resources**
- **Change driven by local voters not government**
- **Protect individual property rights**
- **Enjoy the way things are**
- **Local level planning allows and provides for more decision making and helps deter waste fraud and abuse**
- **Preserve the trees, lakes, water, and recreation that we have here**
- **Air quality and water quality needs to be improved, need to have a driving force locally to improve our air and water quality**
- **Affordable energy for the region**
- **Maintain the locks and the waterways and other natural resources and the ability to use them for boating and recreation and commercial transportation**
- **I like Loudon the way it is and couldn't imagine living in a huge city. Like the small town character**
- **Like the area the way it is now and would like it to stay this way**
- Need for a variety and quantity of affordable energy
- More conservations areas, better resources management
- Pristine community
- Maintain private property rights
- Live without government involvement in choices
- Recreational facilities expanded and developed
- Doesn't want to tell future generations what to do
- Education to change driving habits of individuals (rules of the road)
- Improved drinking water quality, quantity and the local control of the supply
- Maintaining open space, low density, and extreme rural character, Don’t want the area to be overbuilt / overdeveloped with no views of what brought you here/beautiful scenery
- Minimal federal government regulation and intervention
- People in TN are capable of self-reliance and self-direction
- Protect the mountains, views, rivers
- How are these environmental areas going to be protected?
- Not see a lot of change
- Environmental protection
- Need for planning in a regional or larger scale context
- Less EPA stuff
- Remove the 12 million illegal aliens, which will improve air and water quality
- Government should get the chemicals out of food
- Like Loudon County the way it is, keep it that way
- Equal access of the natural resources for recreation and industry

Healthy Communities

- **Need more opportunities to walk (greenways, bike trails, etc.) to be healthier**
- **Everyone needs to take personal responsibility on their role in a healthier community**
- **Maintain private property rights**
- **State and county governments should work to create a pro-business environment**
- **Let people make their own choices / individual freedom, Freedom of choice to live and drive where you want**
- **Protect individual property rights**
- **Stronger schools**
- **Local level planning allows and provides for more decision making and helps deter waste fraud and abuse**
- **Government should get the chemicals out of food**
- **People need to take more ownership of their health, Personal responsibility for their health**
- **Insurance companies need less control over healthcare**
- **Give the same choices to our children that we have been able to choose from**
- **Independent of the federal government when knowing how to govern our area**
- **Need a balance between industry, industry growth, and agriculture**
- **Would like to see things much they way they are now, Want rural communities to maintain their unique, independent identities**
- Need to educate people on how to protect air quality, where emissions come from
- Need to educate people on healthier eating habits - sugar, school food programs, etc.

- Government should not be the ones telling people how to run their lives
- Improve local agriculture, farmers markets, buy local
- Low taxes to attract investments
- Preserve historical areas
- Doesn't want to tell future generations what to do
- Recreational facilities expanded and developed
- Loudon County - more of a bedroom community with not as much tourism (like Sevier County)
- Having a good, comfortable place to live
- Less regulation
- Education to change driving habits of individuals (rules of the road)
- Change driven by individuals not government
- People in TN are capable of self-reliance and self-direction
- Better opportunities for health education for people to take care of themselves
- Privately owned housing opportunities for elderly
- Need for planning in a regional or larger scale context
- Farmers markets need to be expanded. Broaden the times and places they occur
- Privatize healthcare, more of a market-based approach to healthcare.
- Too many fast food restaurants
- Health education needs to be taught in school, including nutrition education
- Like the area the way it is now and would like it to stay this way
- I like Loudon the way it is and couldn't imagine living in a huge city. Like the small town character

Housing and Neighborhoods

- **Need for accessible and affordable housing for middle income people**
- **Preserve the option for low-density housing, rural living**
- **Maintain private property rights**
- **Less regulation**
- **Freedom of choice to live where you want, Let people make their own choices / individual freedom, not government**
- **Protect individual property rights**
- **Privately owned housing opportunities for elderly**
- **Enjoy country atmosphere and residing in it while being in proximity to city**
- **More education and awareness on ways to save energy, particularly for private homeowners**
- **More single family housing, less apartments or government projects (public housing)**
- **Maintain property rights of the individual and personal choice of where you live**
- **Allow every person to live where they want throughout the region**
- No smart meters on homes (with Wi-Fi signal)
- Rather not see housing density in concentrated areas
- Preserve historical areas
- Would like to maintain control of property with minimal government involvement
- Loudon County - more of a bedroom community with not as much tourism (like Sevier County)
- Having a good, comfortable place to live
- Live without government involvement in choices
- Doesn't want to tell future generations what to do
- People in TN are capable of self-reliance and self-direction
- Enjoy the way things are
- Not see a lot of change
- Need for planning in a regional or larger scale context
- Local level planning allows and provides for more decision making and helps deter waste fraud and abuse

Transportation and Infrastructure

- **More emphasis on multiple modes of transportation - including greenways, high speed rail, etc**
- **Need for a variety and quantity of affordable energy**
- **Maintain mobility with cars**
- **Less regulation**
- **Would like government not to tell oil companies when and where to drill**
- **Alternatives to gas, alternatives for coal use. More alternative energy - natural gas, etc.**
- **Maintain property rights of the individual and personal choice of where you live**
- **Affordable energy for the region**
- **Don't want alternative transportation at the expense of losing our private property and our freedom to choose our transportation**
- **Need to use alternative modes to moving goods than only big trucks**
- More affordable public transportation
- More luxurious transportation
- Education to change driving habits of individuals (rules of the road)

- Maintain private property rights
- Doesn't want to tell future generations what to do
- Would like to be able to get on a train or bus to go to Nashville, Memphis, or wherever
- Need bus connections between Knoxville and surrounding communities
- Transportation funded by the local economy and is financially sustainable, private economic growth
- Improved infrastructure that keeps up with the growth and is economically viable
- Better mass transit of sorts to help people get around
- Need for planning in a regional or larger scale context
- Local level planning allows and provides for more decision making and helps deter waste fraud and abuse
- Change driven by individuals not government
- Protect individual property rights because their wealth is tied to their land
- People in TN are capable of self-reliance and self-direction
- No trains as a form of mass transit
- Protect the mountains, views, rivers

Other

- **Maintain private property rights**
- **Less regulation**
- **Need for planning in a regional or larger scale context**
- **Local level planning allows and provides for more decision making and helps deter waste fraud and abuse**
- **Term limits on congressman, max 2 terms, term limited politicians**
- **I don't want any European Union over here, or United Nations influence**
- **Maintain property rights of the individual and personal choice of where you live**
- **Respect of individuals and freedom of individuals (Individual freedoms and federal government intrusion was the predominant discussion topic for our group)**
- **More freedom, less government**
- **Less reliance on the Federal Government**
- **Education should be strong in this area and our school systems should be improved**
- **Would like to see our education curriculum controlled by the local school boards**
- Ensure that in the future elected officials are making the decisions
- Change driven by individuals not government
- Protect individual property rights because their wealth is tied to their land
- People in TN are capable of self-reliance and self-direction
- The school systems need to be simplified
- The school system is not run by administrators in 2040, but by the educators

Union County

Economy and Workforce

- **Keep government out of private business - reduce business regulations**
- **Breaking down good ole boy government**
- **More good paying jobs - increase the amount of manufacturing jobs available in the area**
- **Education will be more electronically available**
- Regional economic partnership
- Minimize government involvement in the markets
- Keep local money in local communities, without sending and receiving it from state or federal government
- Better communication between employers (needs) and schools (training)
- Local presence of community college
- Union County will be more of a retirement area

Environment

- **Find opportunities for farmers - tourism, etc**
- **Local flexibility to address local situations**
- **Increase the amount and support local foods/farmers**
- More public works projects related to water and sewer

Healthy Communities

- **Access to medical care in union county**
- **More opportunities for young people to be involved in healthy activities**
- **Union County needs a Boys and Girls club**
- **Union County will be more of a bedroom community**
- Access to preventative care
- Increase the availability of health care providers
- Summit medical will establish a presence in Union County
- Instead of providing food stamps for people to be able to eat - provide them with seeds and help them gain the ability to grow their own food

- Increase availability of locally grown foods

Housing and Neighborhoods

- **Expand individual rights**
- **Communicator of needs in the marketplace**
- **Union County will be more of a bedroom community**
- **Union County will be more of a retirement area**
- Need codes to protect other property owners
- More rental options in Union County
- Government housing is creating the blight it plans to try to stop - make these programs local

Transportation and Infrastructure

- **Minimize state and federal role in local planning/funding**
- **Reform the federal and state process**
- **More public transportation options for folks who do not have access - particularly seniors (Union County needs more than ETHRA)**
- **Major highway (four-lane)**
- Better maintenance of existing roads - planning for maintenance, scheduling when it is needed
- Split RPO a barrier to transportation planning/funding in the region
- Better access to air transportation - airport in Union County
- More decisions need to be done by referendum
- Bridge to connect Hickory Star to Sharps Chapel - with minimal environmental impact
- More educational programs for youth - and provide transportation in order to gain participation

Other

- Increased access to virtual education - building upon what is already present
- Union County needs a Boys and Girls club
- Government is a necessary evil but should be minimally intrusive in individuals' lives
- Need input from more people for decision-making
- Less government involvement
- Maintain the status quo

Transportation and Infrastructure Working Group One (Partnered with Plan East Tennessee)

Small Group Discussion

The Working Group broke out into three smaller groups. Each breakout group briefly reviewed the issues and trends, identified any items that were missing, and identified the group's highest priorities. Below is a summary of each breakout group's discussion.

Group A

ADD:

Transit:

- Lack of concentration in corridors to allow transit
- Need for models of successful transit-oriented development
  - Look at potential nodes for transit (being strategic)
  - Possible park and ride locations
  - Discussion of BRT/Bus vs. long-term vision for possible rail
  - DOE, airport
- Looking at fixed routes outside City of Knoxville
  - Improve van pools (actually worse than in previous years)
  - Emphasis on programs like Smart Trips
- No fares = need for funds
  - Private sector
  - Counties
- KAT – needs to expand into Knox County
- Need safe places to leave vehicles – look strategically at locations
- When people choose to live in rural areas
  - Transit network may not be possible
  - Nodes (park-n-ride) to catch their commute is strategic way to serve their need
- The region needs a regional transit authority

Need for more/better information:

- Need a better understanding of why people live where they do
  - Especially when it differs from what would make financial sense (quality of life, lifestyle choice)
  - People may live in outlying counties because of housing costs
  - Issue of property taxes
  - Issue of families is huge
- Need a better understanding of growth

- Who will move here & what they want/need

Need to change the culture (mindset):

- People need to become accustomed to using transit
- UT – students cannot bring cars – presents a way to expose people to transit early
- Bicycling/walking
  - Currently is recreational
  - Need to work to incorporate into commute
  - Issue of terrain limits the number of bicycles and pedestrians
  - But need to be bicycle and pedestrian friendly
  - Lack of bicycle/pedestrian friendliness is also about land use
- Politically, construction is more attractive as an accomplishment but improving utilization of infrastructure is a better use of resources
- Need for a focus on improving existing infrastructure over building new
  - More efficient infrastructure

General Issues:

- Lack of coordination and development
- Need to differentiate issues: which issues for which counties
- Keep in mind that these issues relate to counties outside PlanET area
- Lack of discussion of land use in both transportation and infrastructure

PRIORITIES:

- Transit: Look at potential nodes for transit (being strategic)
- Transit: Looking at fixed routes outside City of Knoxville
- Transit: The region needs a regional transit authority
- Transit: Need for models of successful transit-oriented development
- Transit: Looking at fixed routes outside of City of Knoxville
- Transit: No fares = need for funds
- Lack of discussion of land use in both transportation and infrastructure
- Need to change the culture (mindset)
- Lack of coordination and development
- Need for a focus on improving existing infrastructure over building new
- Politically, construction is more attractive as an accomplishment but improving utilization of infrastructure is a better use of resources

MOST URGENT:

- Know where right-of-way needs to be preserved
- Making transit more available & improve utilization and efficiency
- Political understanding: new infrastructure vs. existing
- The region needs a regional transit authority

Group B

INFRASTRUCTURE:

- Report only looks at area within the region ***(See Priority A)***
  - Look at movement in/out of region
  - Source capacity
- The accuracy of reported capacities of natural gas, water, and wastewater
- Y-12 does have services (being provided by Oak Ridge)
- How does climate change affect the capacity to continue to provide services?

ADD:

- Map: cargo-oriented vacancy
- Address transportation needs of cargo area
- Funding (lack of Federal Transportation Bill) ***(See Priority B)***
  - Increased gas prices
  - Inflation (lack of increase in gas tax)
- Rising maintenance cost moving to locals only ***(See Priority C)***
- Regional Transit Corridor Study
- Water freight planning (barges and other users of the rivers)
- General aviation (McGhee Tyson is addressed, but many small general aviation airports exist across the region)
- Need for a stronger link of transportation/land use coordination ***(See Priority A)***
- Outside interstates/highways, regional connectivity breaks down (*e.g.*, rural areas with limited connectivity) ***(See Priority A)***
- Topography limitations
- Congestion extends beyond Central and Western Knox County (Oak Ridge, Alcoa, Maryville, North Knox)
- Delays with project development along significant corridors
- Planning further out (50 years) ***(See Priority A)***
- Roane corner (Add the section of Roane County between Anderson County and Loudon County due to transportation corridors)

PRIORITIES:

A.) Planning needs for region
B.) Funding uncertainty (rising transportation costs)
C.) Rising maintenance costs (rising transportation costs)

Group C

ADD:
NOTE: (I) = Imminent issue

- Aging population **(I)**
  - In place
  - Choices
  - Cost
  - Ability
  - Income
- Aging Infrastructure
  - Union County
- "Split" Planning Structure **(I)**
  - Union County is in a different RPO
- Cultural Barriers (Appalachian Spirit)
  - For example, transit
- Maintain Connectivity
  - Economic advantage
- Freight
- Water transportation

PRIORITIES:

Top Priorities:

- Dispersed development patterns (4 votes)
- Transportation costs **(I)** (4 votes)
- Funding **(I)** (4 votes)
- Limited transportation options (3 votes)

Other Priorities:

- Connectivity (1 vote)
- Transit hub (1 vote)
- TOD potential (1 vote)

FINDINGS FROM REPORT:

1.) Connectivity
2.) Dispersed development patterns
3.) Transportation costs **(I)**
4.) Cross-county community
5.) Single-occupancy vehicle use (high)
6.) Congestion not "too" bad
7.) Congestion in west/central
8.) Limited transportation options
9.) Growing greenway network
10.) Transit hub
11.) TOD potential
12.) Funding **(I)**

Transportation and Infrastructure Working Group Two (Partnered with Plan East Tennessee)

Regional Drivers

The Working Group focused heavily on a group exercise that introduced a list of regional drivers that related to transportation and infrastructure and asked if there were any other drivers that should be listed.

The group felt that 7 of the 8 identified drivers really pertain to Transportation and Infrastructure. *Low Educational Attainment, Low Wages, & Limited Job Advancement* was the driver deemed to not be pertinent.

1.) Dispersed development causing longer trips
2.) Fewer transportation options (Lack of Transit and Sidewalks)
3.) Rising Energy Costs
4.) Location decisions of housing (length of trips)
5.) Demographic shifts (Aging Population)
6.) Access to food (Seniors, less home grown food)
7.) Loss of Agriculture Land (Longer shipping for food as access to locally grown food is reduced)

The group determined that two addition regional drivers were missing from the initial list of 8:

8.) Zoning (As a separate driver or highlighted within the Dispersed Development and Separation of Land Uses)
9.) Lack of Wastewater Policy

The participants then assigned ten sticker dots to assign a priority to each driver (high = 3 pts, medium = 2 pts., low = 1 point or none = 0 points).

Drivers Impact Matrix (Total Score of Group)

RATING	High	Medium	Low	None	Total Score	Number of Dots
Number of Points	3	2	1	0		

1.	Demographic shifts	2	13	3		**35**	18
2.	Dispersed development patterns	24	1			**74**	25
3	Loss of agricultural land	1	11	9		**34**	21
4.	Few transportation options	20	3	1		**67**	24
5.	Location decisions	10	10			**50**	20
6.	Rising energy costs	10	9			**48**	19
7.	Low educational attainment, low wages, and limited job advancement opportunities	4	6	11		**35**	21
8.	Food, activity, & lifestyle	7	8	7		**44**	22
9.	Zoning and Development Regulations	7				**21**	7
10.	Wastewater Policy	8				**24**	8

Review of Forum 2 Themes Summary

The participants reviewed the vision

1.) Quality Infrastructure
    - needs to include water, wastewater and electric
2.) Link infrastructure and economic development
3.) Need to fund the infrastructure improvements
4.) Specifically link transportation and development patterns
5.) Redevelopment of old shopping centers to take advantage of existing infrastructure
6.) Financial impact of redevelopment
    - Cost analysis of greenfield development vs. brownfield development and greyfield development (needed to help inform decision and policy makers)
7.) Identify nodes and corridors for more intensive development
8.) Competitive advantage for regional centers
    - Centers are the draw for economic development

Outreach Methods and Next Steps

Chairperson, Cindy Pionke wrapped up the meeting asking members to think of the following questions and to contact either Amy Brooks or Sherith Colverson with any information obtained:

- Who can help us promote PlanET to the regional community?
- Who can get behind the process and help us build support for our regional vision and the policies and strategies to achieve it?
- Who can help us create a partnership network?
- Who might be a strong partner for implementation?

Cindy Pionke thanked all the attendees for participating in this meeting and encouraged them to continue their participation. The next meeting will be scheduled around the August 20th time frame.

Transportation and Infrastructure Working Group Three (Partnered with Plan East Tennessee)

Introduction to Scenario Development

Employment and Population data was vetted through the Knoxville Regional Transportation Planning Organization update to the transportation demand model that is currently underway. Below are the bulleted points from the presentation.

- Scenarios show how the region COULD absorb expected population growth
    - Provide examples of what the region's development patterns and transportation system might look like
    - Distribute in different ways the same amount of growth for a given period to produce different scenarios
    - Analyzing differences allows results of policy, regulatory, and investment decisions to be understood
- Trend scenario: first scenario to be developed
    - Provides the best estimate of how the region will develop if no changes occur in development practices or plans, market forces, or transportation and infrastructure investments
    - Provides baseline against which to measure other scenarios
- Alternative scenarios: Depict what could happen if particular policy, regulatory, or investment changes are made
    - Show different ways in which homes, jobs, roads, transit, utilities, and open spaces could be spread out or concentrated
- Scenarios are compared against the baseline (trend) scenario using indicators
    - Indicators are quantitative measurements applied to each scenario
    - Measure spatial aspects of growth only
- Comparing indicator values of the alternative scenarios shows differences between each scenario

Presentation of the Trend Scenario

The trend scenario, which is the first scenario to be developed for our region and will be used to measure against other scenarios. The trend scenario asks and answers, "What's happening today? If we keep doing things the way we are

doing, what will happen by 2030-2040? What will our region look like? What happens if we change course?" The trend scenario provides the following look at the future:

- Allocate the next 30 years of population and employment growth using the following projections.
  - By 2040, the population is expected to grow by 298,163 persons
  - By 2040, employment is expected to grow by 240,274 jobs
- Using the "Business as usual" approach for our region, the following current development patterns are assumed to continue for the next 30 years. These patterns are:
  - Strip commercial and regional centers
  - Industrial and office parks and strip office
  - Mix of suburban housing and rural residential

The regional development pattern for 2010 was shown, as was the estimated development pattern for 2014, and the trends for 2024, 2034 and 2040. (Please refer to the PowerPoint presentation that was presented during the meeting for corresponding images. By 2040, the trend scenario for the region is expected to yield:

- 115,000+ acres of greenfield development
- 112,000+ new homes consuming 98,000+ acres (0.88 dwelling units per acre)

Kevin discussed scenario indicators – explaining what they are and what indicators are best used to evaluate transportation and infrastructure. The next step is creating alternative scenarios so we can begin to evaluate what options will provide different development patterns.

Questions and Answers

- Q: How were Employment and Population numbers derived?
  - Historical data as well as national trends were used by Bernardin, Lochmueller & Associates, Inc. to use in the development of the transportation demand model for the Long Range Mobility Plan update.
- Comment: The data of how development moves out as sprawl is very indicative of increased transportation and infrastructure costs.
- Comment: Heavy density across all portions of the counties is not required for transit to be viable.

Presentation of Draft Regional Vision Statement

This draft is a result of the public input since the project's kickoff in October 2011. These themes were collected through the large community forums, meetings in a box, leadership dialogue, stakeholder interviews, Mindmixer, and the community survey. The regional vision statement is written in the language of someone speaking in 2040. The small groups at this meeting were asked to focus particularly on the connected section of the draft vision statement as it is most closely aligned with the Transportation and Infrastructure focus area.

Small Group Discussion

Participants broke into three small groups to discuss the following questions:

- Do you agree with the components of the draft Regional Vision Statement?
  - Are any important vision ideas missing?
- How does the trend scenario compare to the Regional Vision?
  - Does it align?
  - Are there major differences?
- What are the most important scenario benchmarks/indicators for your focus area?

Participants evaluated and added to an initial list of indicators, which are measures to be used to quantify and evaluate each scenario. The initial list is as follows:

- Commuters via walking, biking or transit
- Pedestrian environment index
- Daily VMT per capita
- Average commute time to work
- Percentage of jobs accessible by transit
- Occupied units within ¼ mile of KAT fixed route
- Miles of sidewalk and bike lanes
- Total road miles

Group #1

- Draft Vision Statement Comments
  - Retrofitting existing network of roads for bikes/pedestrians
  - Land use – needs to address infill development
  - Rural areas need more connectivity to transportation
  - Innovative transportation solutions to connect the region
  - Transportation providers will communicate/coordinate. (better model for operation)
  - New institutional models for transportation coordination

- Air travel connectivity to world
- Revise 1st paragraph to include land use patterns as a factor
- Combine 2nd and 3rd paragraphs
- Small towns connection to the region

- Trend Scenario Comparison to Draft Regional Vision Comments
  - Not consistent
  - Low density means higher costs for transportation/infrastructure
  - Not connected/ no improved transportation choices available
  - Trend scenario is not financially feasible
  - Little rural land in the scenario
- Missing Indicators and Comments on Indicators
  - % of each household's budget spent on transportation
  - Accessibility of rural residents to transportation options
  - # of vehicles per household (avg) – correlated/compared to age of household residents
  - Air Quality measures
  - % of broadband coverage – finding a measure of quality of broadband coverage

Group #2

- Draft Vision Statement Comments
  - What are we going to do to change minds about efficiency? Transportation and Land Use
  - Add to improve and expand in paragraph #2
  - Serve suburban areas with transit in paragraph #2
  - Should specify other infrastructure other than transportation in paragraph #7
  - Differentiate between public infrastructure and communication infrastructure in paragraph #7
  - Emphasize energy diversification and efficiency in paragraph #7
  - How do these different infrastructure components work together? Joint planning of systems?
  - Add an airport component to paragraph #7
    - Our local airport may not exist for passenger and rail may be needed to get to other hub
  - Look at the competitiveness of our transportation system and add air
- Trend Scenario Comparison to Draft Regional Vision Comments
  - Trend shows sprawl, if we do nothing that is what we will get.
  - Trend does not align with the connected 2040 vision
    - If we want to get to vision, we need to encourage new types of development
    - What types of incentives are necessary? Higher Density? Energy Efficiency?
  - Decision makers need to be brought into the fold
  - Some trends are already incrementally changing and that is not represented in this trend.
    - Commercial (Northshore Town Center, University Commons)
    - Congestion concern
  - Corridor development is what we do now
    - There needs to be nodes of development
    - Alternative transportation becomes an option (biking, walking)
  - Development gets more complicated to achieve the vision. How to make it worth it for the developer and greater community
- Missing Indicators and Comments on Indicators
  - Communications as an infrastructure (broadband, cellular, etc)
  - Pipelines – units of material moved
  - Building energy consumption should include residential

Group #3

- Draft Vision Statement Comments
  - Not reduce development pressure, just change how it develops (better manage it)
  - Vibrant urban cores in paragraph #1
  - Make 1st paragraph less generic
  - More emphasis on the aging population in terms of transportation
  - Mixed use development in centers and corridors
  - Enables transit
  - Sidewalks – add trails and greenways
- Trend Scenario Comparison to Draft Regional Vision Comments
  - Safety seems overlooked
  - Vision is not aligned to the trend
  - Need more information about the trend scenario
- Missing Indicators and Comments on Indicators
  - Safety component for indicators

Next Steps

1.) Developing Alternative Scenarios
2.) Preparing Scenario Visualization

Online Town Hall (Mindmixer, Partnered with Plan East Tennessee)

Strengths

East Tennessee

Idea Title: East Tennessee Culture, Sense of Where You're From

Idea Detail: While not unified, appears to be a strong sense of identity with East Tennessee. This relates to the strong regionalism in the state.

Idea Author: Kevin W
Number of Seconds: 2 **Number of Comments:** 1

Comment 1: I spent the majority of my adult life in Middle Tennessee with a stint of several years in Jacksonville FL and I agree that residents of East TN tend to identify more strongly with their community/heritage than other parts of the state from my experience. This sense of ownership is a source of pride for many and is worth nurturing. | By Jason S

Idea Title: Location

Idea Detail: Location along the I-75 and I-40/I-81 corridors. Knoxville is within a relatively easy driving distance of population centers such as Nashville, Atlanta, Charlotte, and Louisville.

Idea Author: Kevin W
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: Agreed, Knoxville is a hub between numerous major cities, but it maintains a degree of small town charm but has an abundance of metropolitan amenities. | By Jason S

Idea Title: Research Institutions

Idea Detail: Home of a major flagship university (University of Tennessee) and major research institution (Oak Ridge National Laboratory).

Idea Author: Kevin W
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: I agree that having major research institutions leads to a more progressive atmosphere in terms of culture and the sciences as well as good paying career oriented jobs. | By Jason S

Idea Title: Including Jefferson County

Idea Detail: It would be great to see Jefferson County somehow included in this process, either directly or indirectly as a sub-group of this initiative. Jefferson County is so closely connected to Knox County and has several big projects on the horizon that will affect the livability of this entire region through TDOT, Norfolk Southern and others. With current revitalization projects ongoing in both Jefferson City's Historic Mossy Creek District and Historic Dandridge, as well as being surrounded by two of the areas' most picturesque lakes, this county could bring a lot to the table as we work to make a better future for all of East Tennessee.

Idea Author: Michael E
Number of Seconds: 1 **Number of Comments:** 2

Comment 1: Why not? The more East TN communities involved, the more input and perspectives to be had. | By Jason S

Comment 2: Why not, I think the more East TN communities involved the better the representation. | By Jason S

Idea Title: Strengths

Idea Detail: Location along the I-75 and I-40/I-81 corridors.

- Major flagship university (University of Tennessee) and major research institution (Oak Ridge National Laboratory)
- Health care sector - location of major hospital centers
- Natural beauty
- Attractive destination for retirees
- While not unified, appears to be a strong sense of identity with East Tennessee. This relates to the strong regionalism in the state.

Idea Author: Kevin W
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Health Care Sector

Idea Detail: East Tennessee, especially Knoxville, is home to a number of major hospitals and health care providers. Covenant Health, St. Mary's, UT,

and Baptist are large East Tennessee employers. Health care spending is likely to continue to grow with an aging population.

Idea Author: Kevin W
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Attractive Destination for Retirees
Idea Detail: With the low taxes, warmer weather, and location along I-75 corridor the Knoxville area is an attractive destination for retirees.

Idea Author: Kevin W
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: Cost of living in this region is also significantly lower than many other parts of the country. In some cases, communities like Farragut, don't charge any property tax. That's tough to beat in terms of value. | By Jason S

Idea Title: Riverfront
Idea Detail: The Holston, Tennessee, and many other rivers that flow through several counties in East Tennessee are very scenic and provide a great venue for boating, rafting, and swimming

Idea Author: David B
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: Agreed. Water resources in East TN not only provide nourishment, but an abundance of recreation and aesthetic enjoyment opportunities. It is important that we balance recreation and access with protection to assure the sustainability of these resources. | By Jason S

Anderson County

Idea Title: Proximity to arts and culture
Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:

1.) Norris, Oak Ridge: access to cultural events, arts (symphony, play house, farmers market)
2.) Norris: Proximity to arts, culture recreation

Idea Author: Jason L
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: Oak Ridge could use some focus on the mission of the town. For instance, there must be a way to balance the history of the Atomic City, as well as utilize progressive resources/ideas/developments. | By Kelly A

Idea Title: Natural Surroundings
Idea Detail: Proximity to both beautiful natural landscapes and comforts of a city (community).

Idea Author: Sherith C
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: What's great about this positive is that it applies to the majority of East TN. A shared body of regional treasures. | By Jason S

Idea Title: Character of the people and sense of community
Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:

1.) Marlow: He likes living here because of the character of the people enables through personal and professional relationships.
2.) Anderson County - Sense of community - willing to help others, neighborly attitude, sense of volunteerism

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Good schools and upper level education with many options
Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:

1.) Anderson County, Clinton, Oak Ridge: Good school systems, high scholastic achievement in area
2.) Anderson County: good schools and upper level education

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Proximity to mountains and the beauty of the area
Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these individual ideas:

1.) Anderson County: Proximity to Mountains and the beauty of the area

2.) Oak Ridge, Anderson County, Norris: Scenic beauty open space recreational opportunities green areas rural character
3.) Clinton: he likes the natural beauty of the environment and outdoor recreational opportunities.
4.) Beauty - Mountains, valleys, lakes - their effect on people
5.) Anderson County: Beautiful place - mountains, trees, rivers, etc. Close to Smoky Mountains.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: Natural beauty and the access to it tends to be a plus across all of East TN. Seems like it should be of the highest priority to protect these resource. I.e. protections from mountain top removal, ridge top development, etc. Take away the mountains and East TN loses its charm. | By Jason S

Idea Title: Small town feeling with some metro advantages and conveniences
Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these individual ideas:
1.) Clinton: close to services (shopping, major university)
2.) Clinton Norris conveniences and needs close by , love community feel, small community facilitates interaction with neighbors
3.) Clinton: small town feeling with some metro advantages like OR with technology

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Diversity in population including age, religion, language...
Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:
1.) Anderson County: diversity - interests, ages, attractions, everyone has a place to fit in/find what they are looking for
2.) Oak Ridge: highly diverse population--ethnic, place of origin, language, religion, economically

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Eclectic, people open to new ideas and philosophies
Idea Detail: This summary idea came from the November 15th community forum in Anderson County and included these ideas:
1.) Oak Ridge: eclectic, people open to new ideas and philosophies
2.) Anderson County: We're the right place for new ideas

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Blount County

Idea Title: The people: friendly, caring, "can do" attitude
Idea Detail: This summary idea came from the November 14th community forum in Blount County and included these individual submissions:
1.) Alcoa: Friendly.
2.) Wider community: people are passionate about this place & stand their ground; people who express their opinions and share information; a "can do" attitude; an intimate & caring community; people care about safety, 5
3.) Citizens. Friendly environment.
4.) Blount County: Blount County is a rural place with grass roots personality

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Conservative, independent attitudes and spirit
Idea Detail: This is a summary idea from the November 14th community forum in Blount County. The original idea read:
1.) Conservative attitudes, independent governments, independent spirit of people, diverse religious community

Diverse religious community was added as a separate idea for Blount County strengths.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Diverse religious community
Idea Detail: This idea was submitted on November 14th at the community forum in Blount County. This idea includes these submissions:
1.) Conservative attitudes, independent governments, independent spirit of people, diverse religious community

2.) Chilhowie: religion supports education and industry

The first part of the idea was created as a separate strength for Blount County.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Appreciates rural character and small community atmosphere
Idea Detail: This summary idea came from the November 14th community forum in Blount County. It included these submissions:
1.) Blount County: Rural and agricultural character
2.) Blount County: Appreciates rural character and small community atmosphere
3.) Townsend, Maryville, Alcoa, Rockford, Blount County: The small town feel of the area

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Respect for property rights and neighbors
Idea Detail: This summary idea came from the November 14th community forum in Blount County. The full idea was submitted as:
1.) Maryville/ laws chapel: respect for property rights and neighbors, less government intervention, most free state in the country

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Great climate, proximity to recreation and natural beauty
Idea Detail: This summary idea came from the November 14th community forum in Blount County. It includes these individual submissions:
1.) Natural beauty - rural nature.
2.) Close to a lot of things to do - outdoor activities
3.) Climate of East Tennessee, four seasons, none are to harsh, outdoors, natural beauty,
4.) Maryville: Proximity to mountains and recreation and National Park
5.) Natural beauty, biodiversity, agriculture, open space, temperate climate, 5
6.) Maryville: Close access to greenways and parks (3)
7.) Blount County: Natural resources of the area
8.) Blount County: Accessibility to work and to recreation

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: I agree with this statement | By Frank W

Idea Title: Bright night skies, no light pollution
Idea Detail: This summary idea came from the November 14th community forum in Blount County. The original idea was submitted as:
1.) Louisville/Blount County: Bright night skies---no light pollution, appreciation of natural environment

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Abundant natural resources, cheap electricity, quality water
Idea Detail: This summary idea came from the November 14th community forum in Blount County. It includes these ideas:
1.) Walland/Townsend: Little River source of tourism and as a high quality water supply
2.) Blount County: Natural resources, water supply is plentiful, electricity is cheap.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: 3 great school systems and the college
Idea Detail: This summary idea came from the November 14th community forum in Blount County and includes the following submitted ideas:
1.) School systems
2.) Blount County: 3 great school systems and the college

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Affordable cost of living
Idea Detail: This summary idea comes from the November 14th community forum in Blount County and includes these individual ideas:
1.) Alcoa: Good value for money - cost of living.
2.) lower cost of living
3.) Maryville: Affordable place to live

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Access to the Smoky Mountains (and related tourism)

Idea Detail: This summary idea comes from the November 14th community forum in Blount County and includes these ideas:

1.) Blount County: The Great Smoky Mountains National Park and the aesthetic beauty of the area.
2.) Tourism / Access to Smoky Mountains

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: History of strong planning policies

Idea Detail: This is a summary idea from the November 14th community forum in Blount County. The full idea submitted is:

1.) Blount County: History of strong planning policies, a strong effort to get things right the first time.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Blount Memorial Hospital

Idea Detail: This idea was submitted during the November 14th community forum in Blount County.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Quality social services network

Idea Detail: This idea was submitted at the November 14th community forum in Blount County.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Knox County

Idea Title: A vibrant downtown

Idea Detail: This summary idea was submitted during the November 14th community forum in Knox County.

Here are the individual ideas submitted:

1.) Downtown Knoxville: In the last 10-15 years, the rejuvenation of activities in Downtown
2.) Knoxville allows for working, living, playing, eating, and a start retail (walkability).
3.) Downtown: development is improving downtown, while preserving historic places, 4
4.) Downtown Knoxville: Sense of community. Walk-ability. Downtown revitalization.
5.) Downtown is vibrant and has a nice scale

Idea Author: Jason L
Number of Seconds: 8 **Number of Comments:** 6

Comment 1: Is our downtown used to its full potential by people of color? By Non-native English speakers? I LOVE downtown Knoxville. But where is our diversity? Seriously. | By Ben E

Comment 2: Preserved and built upon. Downtown Knoxville truly is a gem. | By Jason S

Comment 3: Downtown Knoxville has become the jewel in our crown and is a place where you can take visitors so they can see something that is unique to us. It is important to continue preserving that character. | By Lisa S

Comment 4: I like Melissa's idea of subsurface parking lots to free up space for dynamic infill that would only further enhance the variety and draw of the Downtown Knoxville area. | By Jason S

Comment 5: Increase property taxes in the CBD to reflect potential land use and the value of surrounding lots and infrastructure, rather than basing it on current land use and lot development. Make it economically disadvantageous for owners to land-bank with surface parking lots. Private/public partnership on building and operating underground parking could help development of infill without loss of parking. | By Melissa B

Comment 6: I agree that tremendous progress has been made in creating a community hub in the Downtown Knoxville area and would like very much to see that continue. The Downtown genuinely operates like the heart of Knoxville. When people visit from out of state or other

countries I feel as though taking them to the Downtown area represents the best of Knoxville. | By Jason S

Idea Title: Unique, diverse neighborhoods that maintain a small town feel

Idea Detail: This summary idea was submitted on November 14th at the community forum in Knox County. It includes these ideas:

1.) Bearden: Quality of Life.
2.) Knox County: Our unique neighborhoods are the basis for community involvement
3.) Corryton: Beauty, rural but convenient
4.) Knoxville: Small town feel with all the big city amenities
5.) Diversity of neighborhoods and sense of neighborhood identity.

Idea Author: Jason L
Number of Seconds: 4 **Number of Comments:** 9

Comment 1: Perhaps we should put up signs to mark the rough boundaries of neighborhoods. For people that are new to the area, they don't know if they're in Bearden, Old North Knoxville, or what. (There are some signs - Fourth and Gill, Old North. But not all of the communities have them.) | By Kevin M

Comment 2: I like Ben's mention of wild space as a separate amenity from parks/recreation space. Far too often the focus on natural areas, particularly in urban environments, is largely limited to manicured park & rec type facilities leaving natural/wild areas to the rural areas surrounding the urban environment. I would like to support Ben's motion for mixed-use zoning and specifically his emphasis on wild space as a community amenity. | By Jason S

Comment 3: I think that in order for neighborhoods to maintain a small town feel, each of them needs to have those amenities that make for a real community: food, parks, wild space, mixed businesses, SCHOOLS!, community centers, etc. I would say that without a push to make small neighborhoods more self-reliant/small town/mixed-use, this positive doesn't come off as believable or relevant. | By Ben E

Comment 4: I think the Sunsphere could be utilized more. I love the overlook, but is there anything else it can be used for or perhaps expanded to allow for more creative uses. | By Jason S

Comment 5: One of the features that make Knoxville interesting is the uniqueness in our downtown and our neighborhoods. We look and feel like Knoxville and no place else. If we can preserve and enhance the uniqueness of Knoxville, it will improve our desirability for economic development and our quality of life. This is related to the historic preservation theme. | By Lisa S

Comment 6: yes, this city and county are characterized by unique neighborhoods, a real positive. We need to reinforce these by creating community centers of walkable, mixed-use development that encourage interaction and reinforce identity and sense of community rather than strip retail that focuses on the car and minimizes social contact. | By Glenn R

Comment 7: Good ideas. | By Melissa B

Comment 8: Farragut has zoning on our books for mixed use development which hasn't really caught on yet, but moving into the future we're hoping to see it used a lot more. For Farragut as a specific community, I think it would be tremendous to see a mixed use "town center." I think something like that would really make Farragut jump out as its own community as opposed to just another segment of Turkey Creek and Kingston Pike retail. | By Jason S

Comment 9: I would encourage expanding this sense of community identity to an increasing number of sub-communities within the Knoxville area and focus on recreating the identity of communities that are commonly viewed as less desirable by addressing concerns such as crime, access to community resources, etc. | By Jason S

Idea Title: Good system of parks, trails, greenways for recreation

Idea Detail: One of the top ideas submitted during the November 14th community forum in Knox County. This summary idea includes these submissions:

- Knoxville: historic preservation is a priority in our neighborhoods
- Knoxville: Still has a sense of history and uniqueness and people dedicated to preserving its culture and strengths.
- Knox County: Good system of parks and greenways for recreation (West Knox Co and West Knoxville)
- Knoxville: parks and greenways, blueways
- Bearden: Greenways.
- Knox County: Recreational opportunities including trails and parks

- Knox County: greenways and other alternative transportation opportunities
- Karns: Natural beauty. Seasons, Lakes, Mountains. Family community. Community strength in individual smaller communities.
- West Knox: Live in rural / work in urban. Natural Landscape. Safety. Big city amenities. Natural beauty of area; rural character; opportunities for walking and biking

Idea Author: Jason L
Number of Seconds: 3 **Number of Comments:** 2

Comment 1: Some of the submissions seem to fit other ideas better, such as: Knoxville: historic preservation is a priority in our neighborhoods Knoxville-Still has a sense of history and uniqueness and people dedicated to preserving its culture and strengths. | By Melissa B

Comment 2: I agree that greenways are a great strength to the community and in order to keep that going forward we need to make sure that we continue to acquire / create connections that allow the majority of the population walkable access to community amenities. | By Jason S

Idea Title: Partnerships to Enhance and Protect Water Resources

Idea Detail: Having worked in Water Quality for several years now in Knox County, I have observed an atmosphere of significant collaboration between Government, Non-Profit and Private entities working towards finding solutions to local and regional water quality concerns. This sense of collaboration is so lively in fact that it often extends into other subject areas such as air quality, solid waste and even the arts. These collaborations are often in education & outreach efforts as well as on-the-ground projects.

In 2010 the Water Quality Forum, a consortium of entities invested in water resources in the region (primarily Knox Co.), won the State of Tennessee's Environmental Stewardship Award for Environmental Education and Outreach for it's Rainy Day Brush-Off Artistic Rain Barrel Program which has helped, to date, to put over 2.5k Rain Barrels on homes across the county area. That same year the City of Athens in Anderson County won an Environmental Stewardship Award for Aquatic Resource Preservation.

With solid momentum behind these types of efforts, I would propose that these sorts of partnerships be nurtured further and environmental resource protection and restoration be prioritized as an area of regional interest and pride. East TN is a region rich in natural beauty, recreation opportunities, and history that are firmly tied to these resources.

Some ways I imagine to potentially achieve these goals would be to:

- Expand the number of outdoor classrooms in the area or enhance existing outdoor classrooms reconnecting people with the resources around them through education and interaction.
- The Establishment of more operational watershed groups addressing the specific needs of different parts of the county.
- Acquisition of properties along flood ways of streams for the purpose of enhancing stream buffers preventing building near these areas to prevent flooding and perhaps offering passive interactive/interpretive educational opportunities.

Idea Author: Jason S
Number of Seconds: 3 **Number of Comments:** 2

Comment 1: Watershed issues have always been important in the region and will only grow in importance. Any development needs to be done with careful attention to and mitigation of what happens to water runoff and waste, during build and after. Anyone who can't build without caring for the water shouldn't build. I don't care if it's a bird house made of Popsicle sticks-- don't flush the leftover sealant down the toilet and when you dig the post hole, don't toss the dirt into the storm drain. Enforcement needs a big stick. | By Melissa B

Comment 2: I would like to include the fact that Knox County is seeing strengthening in partnership watershed planning opportunities between the three municipalities within the county (city of Knoxville, town of Farragut, and Knox County). It's great that we are starting to embrace the idea that water does not know political boundaries. | By Parci G

Idea Title: Accessibility and proximity of downtown and jobs

Idea Detail: This was one of the emergent ideas submitted during the November 14th community forum in Knox County. Look for other ideas from the forums throughout this website.

Idea Author: Jason L
Number of Seconds: 2 **Number of Comments:** 0

Idea Title: A sense of history and strong historic preservation

Idea Detail: This idea was submitted as a top idea during the November 14th community forum in Knox County.

This is a summary of these ideas:

- Knoxville: historic preservation is a priority in our neighborhoods
- Knoxville-Still has a sense of history and uniqueness and people dedicated to preserving its culture and strengths.

Idea Author: Jason L
Number of Seconds: 2 **Number of Comments:** 2

Comment 1: The history of the Knoxville and Knox County area extends outside of the city limits and into the rural county where remnants of early historical settlement patterns can still be seen. Programs could be offered to educate property and homeowners about their local context and history in their area. Perhaps each small rural community should have a 1-3 page history paper available online that provides residents with the background of their community and an inventory of historical resources. We're doing a great job of preserving things within the core of downtown; let's extend that to the rest of Knox County and the other counties. | By Kevin M

Comment 2: Knoxville has a lot of interesting history and there are several strong groups already dedicated to preservation and history education, including the East Tennessee Historical Society and Knox Heritage, to name just a couple. History is a huge tourism driver and it would be great if we had a stronger connection between government and the history groups to enhance each other's efforts. | By Lisa S

Idea Title: Growing Season, Land Availability, Farmers, and FOOD!

Idea Detail: We have an almost year round growing season here. We still (luckily) have adequate rural land around our towns and cities. Some families and communities still retain the knowledge of how to farm and produce food. Our Farmers Markets are growing and new businesses are springing up to provide local food retail. Knoxville and all of East Tennessee could be the "Good Food Capitol of the South", bringing in tourism, business, supporting and expanding a local economy benefitting all. What barriers exist for young farmers, retailers, and distributors. Hey! Where are our processors, food hubs, and commercial kitchens!?!?!?

Idea Author: Ben E
Number of Seconds: 2 **Number of Comments:** 0

Idea Title: Arts and placemaking make vibrant communities

Idea Detail: Consider arts and placemaking in the planning process of building vibrant communities.

"Placemaking capitalizes on a local community's assets, inspiration, and potential, ultimately creating good public spaces that promote people's health, happiness, and well being".
http://www.pps.org/articles/what_is_placemaking/

Idea Author: Liliana B
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: Interesting concept that seems very democratic taking into account the opinions of individuals in communities and sub-communities. I suppose this website is kind of placemaking in intent although I suppose to really get into it you would need to take this down to a sub regional level into parts of individual communities.. Then again, part of this process is community forums. Do you think there are more things this process can encompass that can build in more components of placemaking seeing as there is already some momentum building behind it? | By Jason S

Idea Title: Affordable cost of living

Idea Detail: This was one of the top ideas submitted during the November 14th community forum in Knox County.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Good availability of higher education

Idea Detail: This idea was submitted during the November 14th community forum in Knox County. This summary idea included these submissions:

- Knoxville: Good higher education availability.
- Knox County: Affordable, higher education options and research
- Knoxville/Knox County: Positive influence of UT on the Knoxville/Knox County community
- West Knox County: health of local economy: diverse economy, low unemployment, well- educated work force

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: A vibrant downtown center

Idea Detail: This summary idea was submitted during the November 14th community forum in Knox County.

Here are the individual ideas submitted:

1.) Downtown Knoxville: In the last 10-15 years, the rejuvenation of activities in Downtown Knoxville allows for working, living, playing, eating, and a start retail (walkability).
2.) Downtown: development is improving downtown, while preserving historic places, 4
3.) Downtown Knoxville: Sense of community. Walk-ability. Downtown revitalization.
4.) Downtown is vibrant and has a nice scale

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: 24 hour community center

Idea Detail: Knox County is a great place for struggling families, in this economy to rebuild their lives once again. It seems almost impossible to gain the America dream with lost of jobs, income, homes ECT. It's my goal to one day in the future to open a 24-hour food pantry & clothing closet. Each family will be able to put clothing items, shoes for them and their kids all that can fit in a bag for a small donation of just $5.00. They will take their receipt and give to the volunteers that are working the food pantry for two bags of food that will have at least two meats, frozen veggies, snacks drinks for kids, and personal hygiene etc. This is just one of my ways, I'm trying to help struggling families get back on their feet. I receive dozens of emails from people all across America, waiting for me to bring my idea to their city and state. I believe that Knox county community is an awesome place for new opportunities. The people here are hard working and very friendly.

Idea Author: Dionne F
Number of Seconds: 0 **Number of Comments:** 2

Comment 1: Another good idea by Dionne that may stand to benefit from other local partners. I know the Knoxville Community Action Committee (CAC) offers a lot of programs serving disadvantaged communities in our area. They would likely be a really solid resource. | By Jason S

Comment 2: Thank you much, for your wonderful comments, It great people like you, is the reason I want to improve our community. Good Luck in all you do. | By Dionne F

Loudon County

Idea Title: Transportation accessibility via road, water and rail

Idea Detail: This summary idea came from the November 17th community forum in Loudon County and includes these ideas:

1.) Loudon County: railroad, waterways, interstates supports and attracts industry
2.) Loudon County: Transportation accessibility via road, water, and rail.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Medical needs are easily met in the area

Idea Detail: This is a summary idea from the November 17th community forum in Loudon County and includes these ideas:

1.) Loudon County: Medical needs are easily met in the area
2.) Loudon County: good health facilities and services

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Union County

Idea Title: Connection to Knoxville

Idea Detail: UC has a connection to Knoxville - Hwy 33. With improvements to this connection, we can attract industries looking to expand or re-locate to the Knoxville area. But it's our only connection, so it's important we improve it to make UC easily accessible for industries.

Idea Author: Mark J
Number of Seconds: 7 **Number of Comments:** 0

Idea Title: Natural Beauty

Idea Detail: UC is full of scenic landscapes. Rolling farmlands, wooded hills, Norris Lake, Big Ridge Park. Whatever happens in UC, I think we have to protect the natural beauty that God has blessed us with. (And improve it where man has already begun to destroy it.)

Idea Author: Mark J
Number of Seconds: 7 **Number of Comments:** 1

Comment 1: Agreed, as with much of the East TN area, I believe the natural beauty the region is blessed with is clearly something that sets us apart from other parts of the country and even the state. | By Jason S

Idea Title: People are loyal and friendly, with a long line of ancestry

Idea Detail: This summary idea came from the November 15th community forum in Union County and includes these ideas:

1.) Union County: People loyal and friendly with people moving in being welcomed and part of the community, people in court house also
2.) Union County: people of the county are the strength here - ancestry is long and strong.
3.) Plainview: rural feel, friendly people

Idea Author: Jason L
Number of Seconds: 5 **Number of Comments:** 6

Comment 1: Everybody has a long line of ancestry. Friendly is not the first word I would use to describe everyone. | By Seth W

Comment 2: Ancestry is a big source of pride, individually and community-wide. I live in Sharps Chapel and am fascinated with any "Sharp" family member I come across and want to know more about their history. I am sure if someone came in and formally interviewed each family member to capture that history and document it in some way (video interviews for website, geo tours, etc), it would be a huge boost to the pride and self-worth of those individuals and the community. I love the interactivity of this website, but it is not available to those individuals in the country with no internet access or internet skills. Interviewing them would also get fresh new ideas. | By Mary J

Comment 3: Mary, this is a great idea and fits into the storytelling theme of our kick-off meeting! You are correct; this site will only be able to reach people who have access to the internet. This is just one tool we will be using to capture people's ideas. We will definitely look into video interviews for our website and as another way to get input! | By Amy0 B

Comment 4: Agreed that other formats should be utilized and I'm glad to see this is the case. I love the convenience of the website format. I might not be able to make one of the community planning sessions in person, but I certainly have no barriers keeping me from contributing on here. | By Jason S

Comment 5: To follow-up on my earlier comment, the problem is that it will be difficult to get others interested in your local ancestral history. I can't see it attracting tourists, jobs, money, etc.

Is it still valuable to pursue? It depends upon your goals. I was shocked to see that the average household income was something like $20,000 / year. It is difficult to clothe, pay for internet, have goals of going to college, when all you are thinking about is surviving from paycheck to paycheck.

If the goal is to raise the prosperity of the region, you must improve the quality of life of the residents. And yes, improving their self-esteem is a basic building block to achieve this. But I can't see it giving quick, measurable results. | By Mary J

Comment 6: Also, I see two other ways to achieve prosperity:

1.) Attract outsiders with money to create jobs, tourist attractions, etc. that attract tourists and their money.
2.) Use local people to create those jobs (train, subsidize, etc.)

The problem with #1 is that it creates a further divide between the haves and have-nots. There already is resentment from the locals toward the outsiders that buy up the land and put in private runways, private communities, etc. that further restrict the access of the locals to the land/water. Of course, if they get to participate with better paying jobs, that would help.

Is your goal to change the character of the county/region to be like other suburban areas, or to accept its uniqueness and rural aspect and improve the lives of the people that live there now?

The problem with #2 is that it takes money (cash flow), an entrepreneurial spirit, a good idea, know-how, technology, persistence, etc. to have a successful business that makes money. I sincerely doubt that people making $20K a year have the skill set to do this. | By Mary J

Idea Title: Blank Canvas

Idea Detail: Much of UC is undeveloped, so we have a chance to PLAN how we want it developed, as opposed to how we want it redeveloped. We have a chance to protect and preserve high quality natural resources, before they are affected by development. We have a chance to build sidewalks on new streets, instead of trying to retrofit them when there isn't room. We can put into place regulations now that shape how the developed UC will look and how it will be to live here. We can learn from Knoxville's and other's experiences and apply that information the first time around.

Idea Author: Mark J
Number of Seconds: 5 **Number of Comments:** 0

Idea Title: Safe, rural atmosphere with a small town feel

Idea Detail: This summary idea came from the November 15th community forum in Union County and includes these ideas:

1.) Union County: like sense of community, small town/hometown feel
2.) Plainview: rural atmosphere, comfortable, protected, sufficient law enforcement

Idea Author: Jason L
Number of Seconds: 4 **Number of Comments:** 2

Comment 1: People cannot drive, other than that sure I feel safe. | By Seth W

Comment 2: Here is an idea that I think could be replicated in Union County. **http://youngsdairy.com/** This family-owned business is a popular and thriving tourist attraction. It retains the local flavor of the area (in Ohio) and community pride. They started out small, with just the ice cream store, and then added other attractions over the years. Most days the parking lot is packed! | By Mary J

Challenges

East Tennessee

Idea Title: Get rid of Ugly

Idea Detail: Fix and enforce signage ordinances... one of the best and easiest ways to improve communities. Visually it looks like a cluttered mess out there and reflects very poorly, if inaccurately, on the power of the government and the quality of the people.

Idea Author: Daniel S
Number of Seconds: 5 **Number of Comments:** 4

Comment 1: Farragut also has a much stricter landscaping ordinance, both for preservation of existing trees and for new. This combines with the sign ordinance to greatly improve visual impact of development. Contrary to what opponents of these two measures say, it doesn't seem to hinder development in Farragut. | By Glenn R

Comment 2: Daniel makes a good point. Farragut is a much more contained geographical area that allows for a much greater sense of awareness on the part of staff. Because of this scale advantage, staff is able to observe and react proactively. | By Jason S

Comment 3: The Town of Farragut has had great success with this by heavily enforcing its sign regulations which results in significantly less clutter which creates a cleaner looking community. | By Jason S

Comment 4: They also have more restrictive zoning regulations, which is not to say better. It makes for a nice suburban environment. They probably have proactive signage enforcement too. My understanding is that Knoxville has only one sign inspector and that most, if not all, their activity is complaint-driven. | By Daniel S

Idea Title: That's mine! Ewww... that's yours.

Idea Detail: There's an amazing amount of mistrust and selfishness between communities and within communities... this seems to pit communities against one another and prevent positive growth and unified solutions... I'm going to be a bit harsh to make a point.

S.C., people that live in Surrounding Counties, quite frequently comment that they hate Knoxville/ Knox county and wouldn't even set foot in it if they didn't have to due to the number of poor, blacks, homeless, cheats, and uppity city dwellers. People in Knox County meanwhile don't like "city folks" and consistently make it clear that they are steadfast in their opposition to investing dollars within city limits or accepting any burden for helping with urban problems. City dwellers meanwhile think people that live in Knox County and other S.C. are straight-up yokels with no chance of ever understanding the world like forward thinking sophisticates such as

themselves. Within the City people are divided by the compass: People in the West being much wealthier and higher class, South more rednecky, East poor and/or black, and North a few crazy artists and yuppies living with a bunch of homeless and god-fearing white trash. The point is, people believe these things, and government is, more or less, led by the people. So these stereotypical beliefs become laws, investments, and actions by governments.

Coming to a regional "common good" is impossible when the region, county, and city are odds. Obviously the way to solve this is, oh wait, this one requires going back and reversing 50 years of poor governmental decisions... and getting rid of ignorance and selfishness, hmmmm...tough one. Seriously there is a lack of commonality which brings people together and allows them to let down barriers and work together. Another World War may work, although that seems a little much, bring back the Cherokee? How about a common goal, like money, and a system to make it happen? Everybody's your friend when you have money.

Idea Author: Daniel S
Number of Seconds: 2 **Number of Comments:** 2

Comment 1: Unfortunately, I think you have described the situation pretty well. | By Bill M

Comment 2: I support the underlying theme of working together to build more unified, stronger communities =) I've seen great progress in cross jurisdictional work from a water quality perspective, but that is helped by the fact that watersheds know no political boundaries. Your water is my water and we're all in this together. If we could just extend this through the whole of our local politics, governments, and communities, we'd be in awful good shape I suspect. | By Jason S

Idea Title: Rapid Rail for ET

Idea Detail: My idea for East Tennessee involves mass transit, tourism, downtown redevelopment, and reduction of pollution and congestion.

There has been a proposal for rapid rail between the Northeast corridor and Atlanta. I would like to see our congressional delegation seek to get Knoxville included in this plan. If rapid rail is brought through the downtown area Knoxville, we could have light rail feeder lines running from Sevierville, Oak Ridge, and the airport converge at the same place as the rapid rail.

This would open the Gatlinburg/Pigeon Forge area to tourism via rail. The Knoxville area would benefit by the same tourists having the ability to stay in Knoxville and visit Gatlinburg.

In addition the University/Oak Ridge alliance would benefit from the direct connection via rail. The same corridors would provide commuter access to downtown employers and government offices. Pollution could be substantially reduced as well as on-site parking needs.

Downtown development spurred by the influx of visitors from the Northeast as well as South, as well as bringing visitors directly to downtown Knoxville from the airport.

Idea Author: Roy J
Number of Seconds: 2 **Number of Comments:** 6

Comment 1: Trying to get true High Speed Rail (150 MPH or greater) will be very difficult. It would be better to take the route of improving the Norfolk Southern or the CSX to Chattanooga and Atlanta to emerging or regional fast speed rail. Emerging is defined by the Transportation Dept. as 70- 110 MPH track speed, and Regional 110 to 150 MPH. Both can operate on Freight rail. In this region, we could target 79 to 110 with a target average of 90 to 100. That can be done, and get trucks off of our interstate highways as well. Costs of doing it would be shared extensively with regular and intermodal freight operations. See more here: **http://steelinterstate.org/** or **http://www.railsolution.org/** | By Pete L

Comment 2: I suppose it depends on the city then. In places like NYC, Chicago and Boston where traffic is consistently dense, stalled and hellish rail would be a comparable or even better option but in a less densely populated area like Knoxville maybe not as much. Perhaps then the emphasis should be on emphasizing mixed used development and connections through trails and biking paths to discourage the use of cars. | By Jason S

Comment 3: Ohio went through some studies on this recently trying to connect Cincinnati to Cleveland. The reality is that because of the stops along the way, what seems like "high speed" is a fallacy -- you could drive faster. The cat is out of the bag...people do not want to give up the freedom that comes with cars. | By Mary J

Comment 4: Good idea, but not feasible. High speed rail is extremely expensive especially in an area with such hilly topography. Also there is the other issue that high speed rail is basically a duplication of the interstate system intended to bypass small communities and link only large ones. Now, regular rail service would be much easier and less costly, if you could get the N-S to agree to it, but since this is part of their crescent corridor project it would be very difficult. | By Daniel S

Comment 5: I'd also like to see the East Coast rail system linking with us. Joe Hultquist has done a lot of work on light rail exploration. | By Carol M

Comment 6: This is one of my favorite ideas on here yet. I think rapid rail connecting Knoxville within itself with fingers to neighboring communities would create jobs and boost economic growth for all of those involved. | By Jason S

Idea Title: Walkability of communities

Idea Detail: I think the entire East TN region would benefit from ensuring all neighborhoods and communities have sidewalks or greenways, regardless of which area of the town one lives in, and making cities more cyclist-friendly. Communities that are "walkable" not only help to save on transportation, it's an enjoyable way to exercise, and there's a certain social aspect to it as well.

Idea Author: Elizabeth J
Number of Seconds: 2 **Number of Comments:** 1

Comment 1: I agree that we need more sidewalks and greenways. The east Tennessee region is very car-oriented, and that contributes to air pollution, high cost of personal transportation, and obesity. We need more alternatives that would allow people of all ages and income levels to get around without having to always use a car. One possibility is to ensure that new roads are built with bike lanes and side walks along them. | By David B

Idea Title: Fast Speed 20th Century Rail in East Tennessee and beyond

Idea Detail: Truck freight traffic on our I-40, I-75, and I-81 is clogging the system in Tennessee and beyond, and we have not seen anything yet like the congestion in the future. There is mounting pressure to widen these roads to accommodate trucks, and there are not sufficient funds to do it. Also, the region has no passenger rail transportation and very slow freight rail.

But there is a new idea- the Steel Interstate System is being proposed as a grade separated, minimum of double tracking, fast system (79 to 110 MPH with future increase possible), and electrified. It would enable trucks to be diverted to rail, and passenger rail service would be a key component. The system initially could have average intermodal train speed of 70 mph and passenger speed of 90 mph with stops. The improvements would be paid for by freight truck diversion and faster, more efficient operations, lower cost energy, and by passenger rail revenue.

It is possible to do this on the Norfolk Southern System line that runs from Memphis thru Huntsville and Chattanooga to Knoxville and on to Bristol, Roanoke, and up the Shenandoah Valley in Virginia to Harrisburg, PA. This system is being advocated by Rail Solution. See more here: **http://steelinterstate.org/** and **http://www.railsolution.org/**

Rail Solution is looking at innovative ways for mostly private financing of a Prototype Steel Interstate System, which would run from Memphis to Harrisburg, PA through Knoxville. Support of the political structure of Tennessee is needed, and we would need legislation in Congress to do it. This concept is more feasible that High Speed Rail because it shares tracks with freight and thus financing is more feasible. The system could connect in Chattanooga with the High Speed trains to Atlanta if they ever exist. If they do not, the Steel Interstate could be extended to Atlanta. It would provide eventually speeds in the range of 120 to 150 MPH. You could get to Atlanta fast on the Steel Interstate.

Idea Author: Pete L
Number of Seconds: 2 **Number of Comments:** 1

Comment 1: Great idea that branches off from the initial "high speed" post, but seems to be more feasible and utilizes pre-existing rail infrastructure. Not only that it would remove congestion from the interstate as well as replace material transport driven by fossil fuels by renewable resources. Thanks for sharing these websites! | By Jason S

Idea Title: Planning versus Zoning

Idea Detail: We are on a trend that replaces Zoning Laws with Planning. The trend is to have each new project undergo a public review and scrutiny. The Challenge is this - HOW CAN THE SMALLER PROPERTY OWNERS PAY THE COST ASSOCIATED WITH THE PLANNING PROCESS. Planning trends to the LARGE project that can afford to pay engineers, architects, public relations companies, and lawyers to achieve approvals. Pay those costs even if the

project does not achieve approval. PLANNERS, please understand the burden.

Idea Author: Frank W
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: And while I firmly believe Architects are essential to the Process, we really could do without the engineers and lawyers. Ha! | By Daniel S

Idea Title: Rails to Trails
Idea Detail: Finding safe places to bicycle is a challenge. It would be great to have a rail-to- trail project in East Tennessee. This can also attract tourism, as shown by the Virginia Creeper trail that goes from White Pine to Damascus to Abingdon. Does anyone know of an abandon rail line around here?

Idea Author: David B
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: Clarksville, TN has had really good luck with a rails-to-trails program.
http://www.theleafchronicle.com/article/20110701/NEWCOMERS/108280312/Trails
I'm not sure about specific abandoned lines in east TN though. Anyone? | By Jason S

Idea Title: Challenges
Idea Detail: - Fear that Knoxville will be eclipsed by Chattanooga for economic development opportunities
- Very spread out - large number of activity centers that don't really relate to one another. A good example of this is the relationship between the Turkey Creek Shopping Center and Downtown Knoxville. For all intents and purposes, Turkey Creek is the default downtown for people who live to the west of the city.
- Highly reliant on large public institutions that may face funding difficulties in the near future - U of Tennessee, Oak Ridge, Knox County Schools
- Not a very diverse private, job-producing sector.
- Huge infrastructure maintenance costs

Idea Author: Kevin W
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Declining Regional Competitiveness
Idea Detail: There is a fear that Knoxville will be eclipsed by Chattanooga for economic development opportunities.

Idea Author: Kevin W
Number of Seconds: 0 **Number of Comments:** 3

Comment 1: But I still have to wonder why? Things like cost of living are pretty comparable and scale in terms of population is pretty much on the same level. Both cities emphasize a downtown area. There was talk of mixed use development but I think, again, both areas address that. Maybe it's just a matter of Knoxville stepping it up? | By Jason S

Comment 2: This idea needs some more specifics. What are the reasons that Chattanooga might eclipse Knoxville in terms of economic development opportunities? What are things that Chattanooga offers that Knoxville does not that makes it more attractive? | By Jason S

Comment 3: According to the US Census Bureau, between 2000-2010 Knoxville's population grew by 2.9% while Chattanooga's population grew by 7.8%. The following video from channel 10 news has some items to think about: **http://www.wbir.com/news/local/story.aspx?storyid=124936&provider=rss** | By Kevin W

Idea Title: Numerous Competing "Downtowns"
Idea Detail: Very spread out - large number of activity centers that don't really relate to one another. A good example of this is the relationship between the Turkey Creek Shopping Center and Downtown Knoxville. For all intents and purposes, Turkey Creek is the default downtown for people who live to the west of the city.

Idea Author: Kevin W
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Reliance on Public Sector
Idea Detail: Highly reliant on large public institutions that may face funding difficulties in the near future - U of Tennessee, Oak Ridge, Knox County Schools.

Idea Author: Kevin W

Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Lack of Diverse Private Sector Jobs

Idea Detail: Not a very diverse private, job-producing sector.

Idea Author: Kevin W
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Maintenance Costs

Idea Detail: Huge infrastructure maintenance costs. Lots of roads that have been built and have to be maintained.

Idea Author: Kevin W
Number of Seconds: 0 **Number of Comments:** 5

Comment 1: So it seems what we might do moving forward is making better choices in the way we approach growth by redeveloping and building closer as opposed to continuing to sprawl, but at the same time our region did buy into this format of development so aren't we kind of stuck with much of the infrastructure we have and the responsibility to maintain it? I suppose over time this can be adjusted, but in the short term, we have what we have. | By Jason S

Comment 2: It's sadly true that this problem is a national issue. The need for jobs post WWII created "the American Dream" which was a well-orchestrated national jobs initiative. Roads, houses, schools, power plants, coal mines, refineries, on and on. The American dream was built on unsustainable use of the world's energy resources and heavy subsidies from the federal government... From infrastructure to Fannie Mae all to support the "dream". Everything was built on a pyramidal structure with the over-indebted homeowner commuting to their far-away-from-the-problems-of-the-city home on cheap fuel as the driving force. Then banks got greedy and gas hit $5 a gallon. Suburban developments built on "cheap land" started to crumble... and people started to wake up. However even in the face of economic collapse, "some" communities are still living in a dream state. The smart ones, like Portland, never bought into it and have controlled their growth through zoning and road development limitations. | By Daniel S

Comment 3: This tends to be a problem around the country many times based on development patterns that encourage sprawl. I don't think this problem is necessarily limited to East TN. | By Jason S

Comment 4: Quite true... | By Kevin W

Comment 5: While I agree that this problem isn't just limited to East Tennessee; there is a strong possibility that the problem may be more acute in this region than in others. As the Development Pattern section of the State of the Region (on the PlanET website) points out, according to Smart Growth America the Knoxville MSA is the 8th most sprawling metropolitan area of the 83 they studied. | By Kevin W

Idea Title: a schizophrenic bipolar urbanism

Idea Detail: Knoxville "should" be a City. It should be the anchor to the region, the spring board for activity. And it believes it is, however the actions say otherwise and reveal a city conflicted. Issues from homelessness to business recruitment exhibit a lack of strong leadership and that seems to stem from a fear of government, a small town perspective and an attitude of "hey we like the comforts of City life, but don't want to face the realities of what it takes to be one".

The conflict of desire to be a Big City and the practicalities of it (dealing with the necessary growth and urban issues) rightly becomes greater farther away from the center city. Knoxville proper is now not really a City with suburban residential areas, but rather a large collection of suburbs with a novelty City. This means that the controlling vote staunchly supports policies that are small town minded and work to preserve their "best of both worlds". The City is treated like a place where all the Urban Issues should be kept and dealt with like a 10-year-old's soiled pants that he shoves under the bed so mom won't find out he had an accident. Eventually mom will find 'em, have to deal with them and won't be happy that you hid the problem.

The issue is that, like it or not, Knoxville and the regional will need to embrace urbanism and what it takes to make a great City or it will continue to loose Jobs to Cities that know they are a City, understand that in order to be a Big City you have to act like one, and has the leadership to make the tough, more than likely unpopular, decisions associated with being a City. Only then will we be able to recruit big businesses and build Knoxville and the region into a sustainable future.

Ps. I didn't think I needed to say Chattanooga, but since that seems to be what everyone here references as the Mecca for urban growth ideas, there I

said it. And they are doing many things Knoxville should be doing, but Charleston is better though. ;)

Idea Author: Daniel S
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: At the same time, I would say that the balance between small town and big city may be a theme worth protecting although operationally perhaps some challenging decisions need to be made. | By Jason S

Anderson County

Idea Title: Lack of alternatives to the car

Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:

1.) Anderson County: no walkability to goods or services
2.) Oak Ridge/Anderson County: lack of mobility for people without cars, lack of alternatives to cars

Idea Author: Jason L
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: I would agree and suggest that this is not only a problem for Anderson County and Oak Ridge, but east TN and probably the state in General. The state has long developed based on a dated sprawl model and while there are certainly efforts to move away from this, there is still a lot of business as usual when it comes to development. | By Jason S

Idea Title: Protecting our environment; esp. surface water resources

Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:

1.) Anderson County: Protecting our environment (4)
2.) Anderson County: Preserving the beauty and water sources (esp. surface water) because they are extremely fragile.

Idea Author: Jason L
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: It is important to get all of the major players involved in the protection of water resource, particularly elected officials, on the same page and making this a priority. The Clean Water Act has provided a lot of progress in terms of the protection of surface waters, but major limiting factors on the extent of these protections and the degree of enforcement have much to do with local political priorities and funding. | By Jason S

Idea Title: Disparity of education opportunities and continuing improvement

Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:

1.) Anderson County: We are concerned over the disparity of educational opportunities across the county.
2.) Anderson County: Continuing improvement of education, must be more consistent, improve culture of education

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Improving the diversity and quality of housing stock

Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these individual submissions:

1.) Oak Ridge: We need to improve the diversity and quality of our housing stock.
2.) Diversity of housing stock. Having a sufficient range of prices and options; entice a variety of lenders into the area that help to remodel and renovate older homes for a wide range of buyer income levels.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Lack of activities to attract younger population

Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:

1.) Anderson County Lack of activities to attract younger population
2.) Oak Ridge: Not enough young people and not much being done to attract them.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Drug use and related crime

Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:

1.) Anderson County: drug-related crime
2.) Norris: maintaining safety and keeping crime low.
3.) Anderson County - drug problem fuels crime problem

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: Another post talked about Anderson County / Oak Ridge having trouble attracting high end retail etc. and relocating professionals with higher incomes to the area to try to encourage economic expansion. I would say that rampant drug-related crime and the perception of such would likely play a large factor in limiting the appeal of the area to folks with more cash and subsequently high-end businesses. | By Jason S

Idea Title: Aging and insufficient infrastructure and the related costs

Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:

1.) Anderson: cost of building and maintaining sidewalks, community facilities
2.) Lack of sufficient infrastructure (sewer, water, etc). Aging infrastructure.
3.) Oak Ridge: decaying infrastructure--water, sewer, and housing.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Attracting quality residential growth and retail development

Idea Detail: This summary idea came from the November 15th community forum in Anderson County and includes these ideas:

1.) Anderson County: We are challenged with attracting quality residential growth and retail development.
2.) Oak Ridge: lack of retail, esp. upper-end due to limited demand. How do we get those spenders to live here?

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: Major retail is going to locate around areas where demand is high, and cost to operate is low. For example, the Town of Farragut recently got a Publix and a Costco for what I what attribute to 3 reasons:

1.) The Town of Farragut charges 0 property tax (low cost to operate)
2.) Demand in the area is high (high enough to support a place like Turkey Creek) and
3.) Demographic (Average household income in TOF is around 100k.. that' suggests a lot of extra cash to spend) Keeping that in mind, in order to attract big spenders, you are going to have to differentiate yourself from competing markets like Farragut and offer more quality of life for less cash and find grounds to stand out on besides retail initially particularly if it isn't already a strong point. Proximity of jobs will also be a big factor. | By Jason S

Blount County

Idea Title: Lack of effective land use controls and environmental awareness

Idea Detail: This summary idea came from the November 14th community forum in Blount County and includes the following ideas:

1.) Blount County: Lack of effective land use controls, such as zoning, ridge top protection and air quality (inability of protecting assets that bring people to area)
2.) Blount County - More environmental awareness with respect to development, water and ridges

Idea Author: Jason L
Number of Seconds: 2 **Number of Comments:** 4

Comment 1: I think the idea is that we should just consider smarter ways to develop that encourage healthier communities and provide a product that will last and will respect and protect the natural amenities of the region that keep the tourism economy moving. I agree that balance is important and unnecessary burden should be avoided, but at the same time I think the balance to that comes in with a responsibility to community. | By Jason S

Comment 2: We already have zoning, planning, and development controls. As Brad stated, the economy has placed a moratorium on real estate growth. Please do not place more burdens on land owners. We will need a balance. | By Frank W

Comment 3: I second this idea based on Brad's input. The problem with a lot of these "ideas" from the group meetings is that they are more

effectively statements as opposed to presentations of a problem accompanied by a proposal for a solution. | By Jason S

Comment 4: Blount County is poised at a crossroads. The economy has effectively put a moratorium on development, but there is strong pressure to go the substandard cheap/sprawl/pave the county type of growth. We need to protect the rural, natural, and historic aspects of Blount County that make tourism such a huge part of our economy. If we promote quality | By Brad A

Idea Title: Elected officials (county and state) not listening to voters

Idea Detail: This summary idea came from the November 14th community forum in Blount County. The full idea is:

1.) Blount County: Elected officials (county and state) not listening to voters (73% of population don't want Pellissippi Parkway extension)

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Too much government interference

Idea Detail: This summary idea was submitted on November 14th at the community forum in Blount County and includes the following ideas:

1.) Chilhowie: apathy and lack of resistance to tyrannical county government
2.) Maryville: too much interference from fed and state government with mandates and grants that Blount county is forced to adhere to which is detrimental to financial well-being

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: What mandates are specifically interfering with the financial well being of the county would be my first question? It's tough to address something as broad as "fed and state government mandates." | By Jason S

Idea Title: We have homeless people in Blount County

Idea Detail: This summary idea came from the November 14th community forum in Blount County and includes the following ideas:

1.) homelessness
2.) WE HAVE HOMELESS PEOPLE IN BLOUNT COUNTY

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 2

Comment 1: There are homeless people in most any place with a population. The question is, if homelessness is indeed a problem (as deemed by the community), how does it get solved? A plus listed for Blount County was a strong social service system, but perhaps there is room for improvement or better means of connecting the homeless to these services. | By Jason S

Comment 2: Many of Blount counties "homeless" are individuals with poorly managed mental illnesses. They can't hold a job or manage themselves and have run out of "family resources. If they are not one the streets they are often found in our jail. | By Donna D

Idea Title: Balancing growing needs against limited tax funds

Idea Detail: This summary idea came from the November 14th community forum in Blount County and includes the following ideas:

1.) Blount County: Inadequate tax base.
2.) How tax money is spent, limited funds, lots of needs, unfunded federal mandates, aging infrastructure, roads, bridges, utilities, maintaining schools and teachers as the population grows

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Protection of natural resources

Idea Detail: This summary idea came from the November 14th community forum in Blount County and includes these individual ideas:

1.) Air & Water quality; protection of natural resources
2.) Blount County: Pollution of streams, air, etc.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Substandard, congested and unsafe roads

Idea Detail: This summary idea came from the November 14th community forum in Blount County and includes these individual submissions:

1.) Wildwood Community: Substandard and unsafe roads. US-411 North and SR-33 (Old Knoxville Hwy or E. Broadway).
2.) Blount County: Southern loop, Pellissippi Pkwy Ext and Alcoa Hwy Bypass

3.) Blount County: Traffic congestion, Hwy 321 heading into the Smokies and Alcoa Hwy.
4.) Blount County: Secondary roads are in need of improvement (Hwy 411/Sevierville Road, Hwy 129, others)

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Limited transportation options
Idea Detail: This summary idea was submitted during the November 14th community forum in Blount County and includes these individual submissions:
1.) Blount County: Limited transportation options (not bicycle friendly and no public transportation)
2.) lack of sidewalks, pedestrian accessibility, public transportation, other ways to get around aside from the car
3.) Blount County: poor public transportation, crowded roads

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Lack of affordable housing
Idea Detail: County and included these individual submissions:
1.) Blount County: Lack of Section 8 and public housing
2.) Blount County: Housing - some people cannot afford to live in this area and some of the housing that does exist is very poor

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Increase in drug abuse and related crime
Idea Detail: This summary idea came from the November 14th community forum in Blount County and includes these submissions:
1.) drug abuse
2.) Increase in crime, especially meth growth

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Need for more economic opportunity (education and jobs)
Idea Detail: This summary idea came from the November 14th community forum in Blount County and summarizes this full idea:
1.) Blount county: bedroom community to Knox County; need for more economic opportunity; lack of opportunity in rural areas (education and jobs)

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Lack of affordable healthcare
Idea Detail: This idea was submitted during the November 14th community forum in Blount County. There are no other submissions directly related to this idea from the forum.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Balancing between planning and too much regulation
Idea Detail: This summary idea came from the November 14th community forum in Blount County and includes these individual submissions:
1.) Need to maintain and protect our rural character but protect individual property rights
2.) Need to plan but not over regulate
3.) Blount County: Balancing private property rights with public land use policy.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Need more pedestrian oriented environments in appropriate places
Idea Detail: This summary idea came from the November 14th community forum in Blount County and summarizes this original idea:
1.) Townsend: Slow traffic and create more pedestrian oriented environment along major 4- lane.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Getting special interest and nepotism out of local government
Idea Detail: This summary idea came from the November 14th community forum in Blount County and summarizes the following idea:
1.) Maryville: getting special interest conflict of interest nepotism out of local government

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Keeping government economical and accountable

Idea Detail: This summary idea came from the November 14th community forum in Blount County and includes the following individual submissions:

1.) Need to work on keeping taxes low, need to be an economical government
2.) Alcoa: Transparency of where local dollars are being spent.
3.) Blount County: Local government budget and overspending

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Low education level of the workforce

Idea Detail: This summary idea came from the November 14th community forum in Blount County and summarizes the following submission:

1.) education level of the workforce- availability of high school vocational training

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Alcoa-Knoxville Light Rail

Idea Detail: Please stop the new Alcoa High School construction before it interferes with connecting the Norfolk-Southern railroad to McGhee Tyson Airport. The Airport MUST have a boarding platform on their site to have a successful Light Rail system to downtown Knoxville. The Parallel Alcoa Hwy idea would destroy Light Rail because TDOT has NO plans of putting a tunnel underneath the Hunt Rd Bridge to allow rail access to the Airport. The new High School would interfere with rail access, and highway construction costs are becoming cost prohibitive. Rail is 700% more efficient than Automobile traffic. The present Alcoa Hwy has wrecks that stop traffic several times a week, whereas a Light Rail TYS-downtown Knoxville would allow a safe ALTERNATIVE. Please consider the lives of our children and grand- children before we destroy rail access. If we as a community continue to ignore all other forms of transportation, then we'll be held hostage by the same people that gouged us at the fuel pumps in the summer of 2008. Please get over the asphalt fetish, because it's coming to an end quickly, and help our community and future get on the rails. Folks that drive Alcoa Hwy would jump at the chance of riding an efficient form of transportation, and McGhee-Tyson airport traffic would be enhanced with offering multiple modes of transportation. Please think about the future, and get over the temporal ideologies. Asphalt based economies are coming to a screeching halt--don't be caught on the wrong end of technology. Diversify transportation. Protect our infrastructure, and save the rail beds--please, for our descendents' sake.

Idea Author: Gary W
Number of Seconds: 0 **Number of Comments:** 0

Knox County

Idea Title: Too much unattractive development

Idea Detail: This summary idea was submitted on November 14th at the community forum in Knox County. It included this idea:

1.) Knoxville/Knox County: Move away from ugly strip centers to aesthetically pleasing development; including redevelopment of underutilized and vacant commercial space.

Idea Author: Jason L
Number of Seconds: 7 **Number of Comments:** 7

Comment 1: - Implement stronger exterior lighting restrictions. The county has some nice ones in the code, but there's nothing in the city that prevents a store from shining a bright light into the window of an adjacent residential house.

- I know this will be controversial, but we need to review the one house per acre that Agricultural (A) zoning allows in the county. Most of our rural landscape can be legally carved up into one acre lots today, and that's not the vision any of us want to imagine.
- Proactively rezone many of the existing C-# and GC zones to a planned commercial type of zoning. Update the city zoning codes to allow a better translation to PC-1 and other planned zoning districts. | By Kevin M

Comment 2: The country and the city can both do a lot to strengthen their building codes and zoning ordinances to make development more attractive. Generally, a developer will do the minimum that is required by code + whatever their customer is willing to pay for (some developers do go above and beyond).

There should be:

- Clear screening and setback requirements between commercial and residential/rural/agricultural areas. Right now some businesses can build a commercial building within 10 feet of the side lot line next to a house with no requirement for screening. That's pretty close.
- Much stricter sign codes that reduce the size and height of signs
- Require screening between parking lots and roads / sidewalks. I've heard a lot of businesses complain that they can't be seen from the road due to landscaping, and that's horse pucky.
- Amortize existing signs and require them to be replaced within 10-20 years with signs that meet the stricter zoning requirements.
- Implement stronger | By Kevin M

Comment 3: Strict zoning ordinances (and enforcement!) can achieve this goal. Mixed use zoning: move away from R-1 and RA toward something more pedestrian and transit friendly. Adopt Complete Streets policies and standards. Limit large signage focused on fast-moving cards. Move parking to the side and rear of buildings. Only allow developers in who CARE about our community and region. If they can't conform to higher standards, they shouldn't be welcome. Probably no easy answers concerning upgrading and improving. | By Ben E

Comment 4: I don't think you can force aesthetics on a community unless the zoning places some sort of restrictions on the property. Perhaps conceiving an incentive system to encourage redevelopment and retrofitting for healthier, more aesthetically compelling communities would be a good option. I agree with Parci in that this solution is heavily rooted in community planning and having the foresight to make smart growth decisions. | By Jason S

Comment 5: How do you implement this Idea? Do you force private property owners to upgrade and improve? Where will the money come from? Property Owners pay the taxes. Downtown Knoxville keeps its property taxes to fund building improvements. Will Knox County property owners get the same help? | By Frank W

Comment 6: Good point; we cannot expect the same standards for city and county governments. Knox County is a different animal with different challenges from Knoxville. Urban development should follow a different plan than rural development, and most of the areas in the PlanET footprint are rural. County governments should focus on rural development while city governments focus on their own vision. Each one should leverage its relative strengths: urban areas must find ways to benefit from their population density to make themselves more attractive to investors (businesses and families) while rural areas should leverage their cheaper land, cheaper labor, and minimal oversight to attract other industries. | By Sanjay W

Comment 7: It seems like there is a lack of planning vision when it comes to where and how we build as a community. There are a number of factors that play in to how a community decides to grow. Knox County needs to figure out what that vision is. | By Parci G

Idea Title: Poor overall connectivity and few transportation choices

Idea Detail: This summary idea was submitted on November 14th at the community forum in Knox County. It included these other ideas:

1.) Knoxville/Knox County: Walkability and bikeability (need for on-street bike lanes and sidewalks).
2.) Knox County: Urban sprawl and reliance on automobiles for transportation.
3.) Lack of connectivity by greenways, public transportation
4.) Knoxville/Knox County: Poor connections create reliance on cars and few opportunities for walking and biking
5.) countywide: narrow roads, lack of connectivity of sidewalks, bicycle lanes, greenways & parks, need for north-south roads, 5
6.) Knoxville-Bad air quality due to natural terrain and lack of public transportation which may lead to various health issues (asthma, etc).
7.) Transportation infrastructure outside of cars and trucks. Lack of choices, lack of pedestrian facilities and bike lanes.
8.) Lack of connectivity between downtown and other neighborhoods - pedestrian, bicycling, public transit, and automobile.
9.) Corridors - Chapman Highway and Broadway needs more thoughtful development and connection to downtown.

Idea Author: Jason L
Number of Seconds: 3 **Number of Comments:** 2

Comment 1: County roads are generally not safe for cyclists. I wouldn't dare try to ride my bicycle into a point where I could catch the bus. | By Kevin M

Comment 2: These improvements should focus, first, on low-income communities. | By Ben E

Idea Title: Why you so trashy?

Idea Detail: Many people have commented to me that Knox County is one of the trashiest communities they have visited. My belief is that this comes from a very rural mindset. I was appalled when a guy I knew professionally asked me to accompany him to his family farm. When we were there he drove over to throw out some trash in an area that had been his private family "dump" for years. It was a very nice creek at one point but was filled with roofing, tires, and anything else. Many people, it seems, don't appreciate the natural beauty of the area (or nature or beauty in general) and the result is both small scale, throwing trash on the ground, and large scale, well-educated people (and politicians) make decisions that allow "trashy" development. And by trashy I mean both visually cluttering (signage) and environmentally destructive (turkey creek). Getting people to dispose of their waste properly is going to be a challenge (change should start in schools), but stopping government from allowing businesses to conduct in destructive practices should be easier. Or is it? The system of zoning and signage here needs to be strengthened, but variances are given so frequently for politically motivated projects that it doesn't seem worth the fight to try to make improvements to it without strong county council leadership. (Not to mention the fight over property rights). Although, it seems we are entering a new era, so we may not be as trashy in the future.

Idea Author: Daniel S
Number of Seconds: 3 **Number of Comments:** 1

Comment 1: This is a tough one. We indeed are a trashy community. Every month I pick up two yard bags of garbage from the road frontage on part of my farm. | By Kevin M

Idea Title: Build capacity in community organizations.

Idea Detail: Neighborhood associations and organizations require leadership skills in order of actively participate in the decision-making process. More active communities will generate better and stronger community development. Non-profit organizations and NGOs could invest resources in leadership building among MSA communities.

Idea Author: Liliana B
Number of Seconds: 3 **Number of Comments:** 3

Comment 1: Not every citizen is represented by a neighborhood organization. There should also be opportunities for individuals to receive training about organizing and capacity-building around neighborhood interests. | By Sanjay W

Comment 2: Amen | By Ben E

Comment 3: Great idea! An engaged citizenry leads to an active community. | By Jason S

Idea Title: Poor economic conditions affecting health and recreation

Idea Detail: This is a summary idea submitted on November 14th at the community forum in Knox County. It included these ideas:

1.) Knox County: Poor economic conditions less opportunity recreation, walking and food has lead to health problems
2.) Knoxville-Disproportionate disease burden on younger, older, economically disadvantaged, and non-English speaking individuals.

Idea Author: Jason L
Number of Seconds: 2 **Number of Comments:** 1

Comment 1: Can we say that this is caused by a lack of sufficient investment in poor communities? Maybe it is not that these communities are poor (there are some poor places where poor folk get equal and fair access to the things they need) but that investment and improvement continue to be focused in more affluent neighborhoods. Why not make a regional effort to focus our resources on those that need them the most? Try it out, if only for a few years. Let's level the playing field for ALL of East Tennessee's residents. Not just the "well to do". | By Ben E

Idea Title: U of Tennessee and the Downtown

Idea Detail: Is it possible to build better connections between U of Tennessee and the downtown? It seems like Henley Street (and the Convention Center) is a huge barrier between the university and the downtown.

Idea Author: Kevin W
Number of Seconds: 2 **Number of Comments:** 9

Comment 1: Yes, Henley Street is a physical barrier between campus and downtown, but the Convention Center and the World's Fair Park are

psychological barriers. Clinch Ave is the primary pipeline/connector, but there needs to be more retail space at the World's Fair Park to attract foot traffic and other activity to Clinch. The World's Fair Park needs to be considered for a re-use that will allow more businesses to utilize that valuable space. | By Sanjay W

Comment 2: Does anyone recall, a few years ago, that MetroPulse readers voted Market Square Knoxville's best kept secret. How was that possible?

It's easy and encouraging for pedestrians to walk West on Cumberland and becomes less and less so the further a person walks East from campus. Wayfinding signs and a few small "on the way" destinations could go a long way toward solving this problem. What do ya'll think? | By Ben E

Comment 3: My concern is that geographically there are some built in limitations based on geography. At this time there are already overpasses to take pedestrians across Henley St. as well as several cross walks. I'd like to see more specifics on this inquiry. Are you thinking maybe a trail system connection of some sort? Did you have a specific spot / connection in mind? | By Jason S

Comment 4: One of the things I was thinking of was bike lines and/or bicycle tracks. Depending upon where you live around UT I think the distances on foot can be slightly long so perhaps encouraging the use of bicycles would help. One place might be along Clinch since you have the art museum, park, easy access to market square and then could take a left down Central to the Old City. Unfortunately, it looks like there isn't a lot of ROW. | By Kevin W

Comment 5: Related to Kevin W1's comment: in my experience as a UT student, a worker downtown, and a commuting cyclist, a special bicycle facility between downtown and UT is not needed. The route he suggests is pretty good as is. (I'd take Gay St. to the old city.) However, there are other ways to encourage bicycling between UT and downtown. For example, UT has started an electric bicycle-sharing program. See **http://cycleushare.utk.edu/cycleushare/Home.html.** | By Peter S

Comment 6: Yeah, ROW would be your biggest limitation, particularly in built out urban environments. Although I'm not sure what might be done in changing design standards for driving lane widths. Recently when going through the water quality scorecard for my community it brought up minimizing lane widths to decrease impervious surface and the associated runoff, might be able to do something like that, maybe make the surface something that would allow for infiltration or perhaps a strip between the driving lane and bike lane? Could be a win for green transit and water quality. | By Jason S

Comment 7: While your experience may differ, I wouldn't completely rule out a special facility for bikes. While in theory you can in fact ride your bike on any road, a special bike lane or track might encourage those who are less brave to venture out. | By Kevin W

Comment 8: A cheap improvement would be to lengthen the green light for the UT to Downtown direction on Clinch at Henley to give cyclists more time to get across. This is the way riders get from 2nd creek greenway (and Neyland greenway beyond) to Downtown, not just Ft. Sanders. | By Melissa B

Comment 9: I like bike lanes because they clearly define a "safe space" for cyclists that motorists seem better able to respect, not that they won't from time to time drive into a bike lane, but it creates a better sense of awareness I think. I guess you can't engineer a solution for everything, but I would like to see expanded biking opportunities that simultaneously expand the safety of those bikers. | By Jason S

Idea Title: Air Pollution

Idea Detail: Knoxville and the Knoxville area have again been listed as having some of the poorest air quality ratings in the country despite significant gains in recent years. As this is outside of the scope of my technical expertise, I'm not sure what the answer is to this but I'd be interested in discussing what some of the limiting challenges may be and if there are any that can be overcome to achieve better air quality. It seems to me that air quality would significantly impacts quality of life and health, which would both have direct impacts on tourism, business, and all sorts of other things. Thoughts?

Idea Author: Jason S

Number of Seconds: 2 **Number of Comments:** 3

Comment 1: I appreciate your input Albert; it sounds like you might have some specific insight into this. Another recommendation I saw elsewhere on this was for a fast rail system that connects Knoxville internally with finger service to surrounding communities. I think this concept might have great potential for improving air quality and contributing to community development. What kind of things could TVA plants do to improve air quality? | By Jason S

Comment 2: Some of the biggest contributors to this problem in ET are emissions from TVA power plants and heavy trucks on I-40 and I-75. Unfortunately, there are limited options at the local / metro level to address these problems. We can work on issues like mass transit and controlling industrial sources, but until these larger problems are addressed on a wider scale our ability to improve air quality will be limited. Natural sources of pollen and mold also contribute to poor air quality in the valley; not much can be done about these. The implementation of reformulated (low sulfur) diesel fuel helped air quality some, but the impact of the recession on reduced trucking hit around the same time so it's hard to tease apart the two impacts on air quality. Public education on the costs of poor air quality (such as costs due to health impacts) must be ongoing to build public support for the added costs to utility bills that it will take to implement cleaner energy generation technologies. | By Albert I

Comment 3: This came up as a challenge as well during the first Knox County community forum on November 14th. The concern was submitted by one group as: Environmental (air quality, impaired streams, litter, especially Styrofoam) | By Jason L

Idea Title: Stronger investment in public and alternative transportation.

Idea Detail: Improve infrastructure in transportation that allows pedestrians and bicyclist make a better use of public infrastructure.

Idea Author: Liliana B
Number of Seconds: 2 **Number of Comments:** 2

Comment 1: Increase funding for bicycling, walking (sidewalks/greenways/etc), and public transportation. Reduce/limit car usage in pedestrian zones (neighborhoods, near parks, near schools!, near playgrounds) | By Ben E

Comment 2: The more pedestrian friendly the better. On a slightly different note, I'm thrilled to see all of the charging stations for the electric vehicles popping up. Now if only the vehicles didn't put you out 50k to participate. | By Jason S

Idea Title: Resistance to change and ideas from outside

Idea Detail: This summary idea was submitted on November 14th at the community forum in Knox County. It includes these submissions:

1.) Political system does not adapt to change; need new approach to decision-making.
2.) division between City and County government can be counterproductive (different ordinances, priorities)
3.) Knoxville: Cas Walker 'againer' Mentality: 'You ain't from around here, are ya?'. Result: missed opportunities.

Idea Author: Jason L
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: Agreed, city and county governments should share a common vision for the future of our communities and identify ways to work together to achieve that vision. Failure to have a unified vision is the most immediate obstacle to positive change. | By Sanjay W

Idea Title: Inadequate distribution of education

Idea Detail: This summary idea was submitted on November 14th at the community forum in Knox County. It included these ideas:

1.) Knox County: Inadequate distribution of quality education, inadequate adult education
2.) countywide: lack of valuing education; low high school graduation rate
3.) Knoxville-Inequity in the quality of education in poor communities.
4.) Knoxville: Primary Education.

Idea Author: Jason L
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: At the same time, there are an abundance of traditional educational resources available to adults such as the University of Tennessee as well as numerous community colleges such as Pellissippi and I know that organizations like the Knoxville CAC and various

outreach programs from UT make efforts to provide additional opportunities to adults. | By Jason S

Idea Title: Lack of communication and coordination

Idea Detail: This summary idea was submitted on November 14th at the community forum in Knox County. It included these ideas:

1.) Need to facilitate better communication among neighbors - rather than reporting each other.
2.) Anderson County: Need for better coordination between municipalities and inter- governmental entities.
3.) Knoxville/Knox County: Seeking balance between development standards, neighborhood groups and economic development

Idea Author: Jason L
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: I actually think that economic development will follow with development standards that promote a nicer, more pleasing community. Businesses looking to relocate will appreciate the stronger standards, and their employees will like the area. | By Kevin M

Idea Title: Artist Relocation Program for Urban Renewal

Idea Detail: Paducah KY has an artist relocation program that currently operates under the Paducah Renaissance Alliance and offers the following incentives for artist relocation:

- Artist Relocation Incentives
- Zoned for live/work spaces. This enables residents to have gallery/studio, restaurant/café, living, and other mixed uses.
- Properties available for as little as $1 to qualifying proposals. Included is a $2500 reimbursement for architectural or other professional services. (Paducah Renaissance Alliance-owned properties only)
- Marketing and promotional materials for the Arts District
- Matching Funds Program. PRA will match marketing and promotional expenditures dollar for dollar up to the amount designated for individuals and groups of PRA member businesses and artists. Businesses must be located within the Renaissance Area to qualify for matching funds.
- For qualifying artists and businesses:
  - Moving assistance up to $2500
  - Start Up Business Assistance up to $2500
  - Make Ready/ Rehab Costs up to $5000
  - Acquisition Assistance up to $15,000
  - Restaurant Incentive up to $25,000

So essentially artists were leveraged for the purpose of Urban Renewal. I would propose taking this model and moving out from Downtown/Old City to expand the scale of the downtown experience and revitalize the areas surrounding the downtown.

Idea Author: Jason S
Number of Seconds: 1 **Number of Comments:** 0

Idea Title: Ciclovías - Streets for the people. Public spaces for the people

Idea Detail: Ciclovías provide opportunities to engage in physical activity and prevent the consequences of unhealthy lifestyles. Ciclovías help to address other challenges of urban life today, such as air contamination, insecurity and danger in the streets, and a lack of public spaces. **http://www.8-80cities.org/howto_video1.html**

Idea Author: Liliana B
Number of Seconds: 1 **Number of Comments:** 2

Comment 1: Knoxville already does this for the weekly Farmer's Market, for the Dogwood Festival and for other special events. Ciclovías are not a cure-all. The problem is not a lack of public spaces; it is a lack of public participation. | By Sanjay W

Comment 2: Love it. We have tons of roads and looking at them as a public space is creative and I would love to see it explored. Are there specific areas/streets you would think would be particularly good candidates for this? Communities/Sub-Communities that would benefit? Farragut, and I'm sure other communities, do something like this during the 4th of July Parade every year and it is truly a sight to see pedestrians on Kingston Pike before the parade. | By Jason S

Idea Title: Super Athletes

Idea Detail: Knoxville has hundreds of super youth athletes; all they need is the opportunity. It's my goal this year, to raise funds for a youth sports center to help young athletes, become super athletes. And even one day be apart of the junior Olympics team for USA. I want to help support a healthier generation of kids thru all 145 youth sports in America. Playing sports helps control weight, builds lean muscle, reduces fat, promotes strong bone, muscle, and joint development, and decreases the risk of obesity. When

children participate in some type of exercise, like individual or team sports. They are less likely to begin using illegal drugs, less likely to begin using alcohol, less likely to skip school, less likely to become teenage pregnancy.

This Foundation will be dedicated to helping young athletes ages 4-18 years old. I want to help kids all around the world including those in Special Olympics. There are many struggling individuals and their families who need funds to participate in sports. And to have available to them, all the necessary equipment that is needed to participate in their favorite sports.

There are 145 sports, for young athletes all over the world to participate. A list of all the sports I want to help our youth athletes all across globe.

1.) Basketball
2.) Football
3.) Archery
4.) Swimming
5.) Skeet Shooting
6.) Wrestling
7.) Pool Playing
8.) Synchronized Swimming
9.) Volleyball
10.) Badminton
11.) Baseball
12.) Boxing
13.) Canoeing
14.) Cycling
15.) Tennis
16.) Gymnastics
17.) Hockey
18.) Karate
19.) Hang Gliding
20.) Parachuting
21.) Water Skiing
22.) Down Hill Skiing
23.) Cross Country Skiing
24.) Water Polo
25.) Bowling
26.) Racket ball
27.) Darts
28.) Foosball
29.) Decathlon
30.) Hunting
31.) Speed Skating
32.) Figure Skating
33.) Handball
34.) Rowing
35.) Sailing
36.) Synchronized Swimming
37.) Table Tennis
38.) Triathlon
39.) Weight Lifting
40.) Crochet
41.) Horseshoes
42.) Bocce Ball
43.) Soccer
44.) Rugby
45.) Motorcycle Racing etc.

Idea Author: Dionne F
Number of Seconds: 1 **Number of Comments:** 2

Comment 1: Oh, and you forgot Roller Derby. A lot of communities have junior roller derby leagues for a similar reason. Empowerment. At this time our local roller derby league does not have a junior league, but they may make a good partner in this type of effort. | By Jason S

Comment 2: I like the idea of engaging youth in exercise/sports to provide focus and opportunity. Are there any NGO's in the community that may already be doing work in this area or would be good natural partners for this effort? | By Jason S

Idea Title: A vibrant downtown center

Idea Detail: This summary idea was submitted during the November 14th community forum in Knox County. Here are the individual ideas submitted:

1.) Downtown Knoxville: In the last 10-15 years, the rejuvenation of activities in Downtown Knoxville allows for working, living, playing, eating, and a start retail (walkability).
2.) downtown: development is improving downtown, while preserving historic places, 4
3.) Downtown Knoxville: Sense of community. Walk-ability. Downtown revitalization.
4.) Downtown is vibrant and has a nice scale

Idea Author: Jason L

Number of Seconds: 0
Number of Comments: 0

Idea Title: Loss of manufacturing and the need to attract new business

Idea Detail: This summary idea was submitted on November 14th at the community forum in Knox County. It includes these ideas:

1.) East Knoxville: Loss of jobs, manufacturing particularly.
2.) Knox County: Attracting big business and manufacturing

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Lack of participation in civic affairs, especially by youth

Idea Detail: This summary idea was submitted on November 14th at the community forum in Knox County. It included these ideas:

1.) East Knoxville: Greater youth involvement in community.
2.) Politics limit good planning (Transit Center and Convention Center) and lack of participation in civic affairs. Planning without implementation.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 0

Idea Title: Knoxville Music Scene Is Solid, Lets Make it Bigger!

Idea Detail: It seems to me that Knoxville has a healthy and eclectic music scene supported by a number of radio stations and public/private partnerships. It also seems to me that the majority of BIG acts end up going to Atlanta or Nashville. I understand that this may have to do with nothing more than that those two cities have a greater population density, but it seems to me that we have facilities of comparable capacity to accommodate huge acts and draw people to the area to fall in love with Knoxville. My idea would be to develop incentives to draw larger acts away from the larger cities to Knoxville. I believe if people would pay $250+ to see Lady Gaga in Nashville or Atlanta, they would be just as likely to come see Lady Gaga in Knoxville, particularly if there was something that made it less expensive for the musician to perform in Knoxville and make money (i.e. some sort of tax incentive, or even a subsidy). I would also propose extending these incentives to the local music scene and commit a percentage of the additional income to enhance and develop the local music scene. Not saying we will ever take the title of "Music City" from Nashville, but I think scoring several major acts annually could provide an economic benefit to the area and the local music community.

Idea Author: Jason S
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: Or maybe just a big 'ol music festival that would provide a Bonnaroo-like experience. | By Jason S

Idea Title: neighborhood centers

Idea Detail: We've done an excellent job of reinvigorating downtown. We now need to focus on creating livable, walkable neighborhood/community centers. Reshape existing strip-like suburban development, dominated by the parking lot, into small mixed use and denser development, connected retail to community schools, churches, and services (library, post office, parks, recreation, etc) where the neighborhood can gather and connect. Interesting growth planning guide for NW Lower Michigan linked below

Idea Author: Glenn R
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: I like the idea of expanding community centers like the Market Square / Downtown area to other parts of Knoxville, but my concern would be if Knoxville could adequately sustain more than 1 of this type of space? Would Downtown Knoxville lose traction or be diluted with the introduction of additional spaces? | By Jason S

Loudon County

Idea Title: Bicyclists

Idea Detail: There are so many cyclists all over Lenoir City and I feel they would be an excellent thing to expand upon by creating bicycle lanes throughout the county. This can be a relatively inexpensive way to try to impact the air quality. Bicycle lanes on 70, 11, 321, and 72 would be greatly used, I feel.

Idea Author: Sheila B
Number of Seconds: 1 **Number of Comments:** 1

Comment 1: Great ideas that identify a strength, a weakness, and proposes a reasonable solution. I've noticed a strong biking community in East TN in general and think this would make a good recommendation for Lenoir City as well as other regional communities. This might be something to build into road requirements for individual communities. I

for one would also like to see "bumps" or some other "barrier" type solution to accompany these lanes. People sometimes just don't pay attention when driving and if they had bumps a little ways out from the lane to reclaim the attention of unaware drivers it might be a worthwhile investment in safety. | By Jason S

Idea Title: Too many government regulations

Idea Detail: This summary idea came from the November 17th community forum in Loudon County and summarizes the following idea:

1.) Loudon County: need to be left alone by government regulations, not to add more regulations

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 2

Comment 1: I agree with Jason S1. There are regulations for a reason what are the main regulations being considered in this post? | By Sheila B

Comment 2: This recommendation lacks specifics and sounds more like vague anti-government rhetoric without any details that could be used to improve things. I would be interested in hearing what types of regulations are of concern and why so that they can be specifically addressed and worked on. | By Jason S

Idea Title: Low level of support, resources and commitment to education

Idea Detail: This summary idea came from the November 17th community forum in Loudon County and summarizes these ideas:

1.) Loudon County: low level of support, resources and commitment to the education system
2.) Loudon County: Education, high drop out rates, funding issue, increased tax rates, Education infrastructure is overwhelmed, overburdened.
3.) Loudon County: Educational attainment is a big issue (K thru 12 and higher education) - 4
4.) Need for community recognition of importance of education.

Idea Author: Jason L
Number of Seconds: 0 **Number of Comments:** 1

Comment 1: Through organizations such as P16 hopefully the community will learn the positive impact a strong school system can have on our local economy. A great education for our kids is important but for all the residents without children, a good school system has a strong positive effect on the economy as well. It is in ALL of our best interest to have a great school system! | By Sheila B

Idea Title: Loudon City Traffic Lights

Idea Detail: This is an open letter to Loudon city mayor Judy McGill Millsap. I have tried to get an answer from you or your administration for some time now. The question is this: Why don't Loudon city repair the traffic signals they have before spending over $30,000 of our tax money on a new light on State Route 72 in front of Food City. At least two of your six lights are not working correctly and one is completely outdated and you only have six! (my count) According to TDOT the traffic count on 72 doesn't even meet the requirement for a new light. So what is going on?

For a detailed summery of your traffic light problems go to
http://www.LoudonTNInfo.com

Idea Author: Rolf R
Number of Seconds: 0 **Number of Comments:** 0

Union County

Idea Title: Lack of industry or job opportunities

Idea Detail: This summary idea came from the November 15th community forum in Union County and includes these ideas:

1.) Lack of jobs
2.) No industry or job opportunities, 64 percent work out of the county

Idea Author: Jason L
Number of Seconds: 3 **Number of Comments:** 0

Idea Title: Litter & Community Pride | Add Attractive Public Trash Cans

Idea Detail: I've been helping pick up trash on the roads. I find more beer cans than anything. Recently, I picked up little "mini bottles of alcohol" newly discarded within hours of my having picked up along that section of the road.

Some people have drinking problems and unfortunately are drinking and driving (that is another problem). People are discarding open containers in case they get pulled over by authorities.

So my idea is to have "attractive trash containers with lids" along the roadside to give people an opportunity to discard trash properly. There is no way to do so now. These would, of course, have to be emptied regularly.

This would give people a "good" way to discard of their cans while reducing the roadside trash, improving the appearance of the community, and promoting community pride - and possibly increasing self-worth.

The message on signs that "litter is ugly" is not working.

Idea Author: Mary J
Number of Seconds: 2 **Number of Comments:** 1

Comment 1: As the coordinator of a municipal Adopt-A-Stream program I <3 this idea and agree that giving people a readily available solution is more effective than trying to sign away your problems. The trouble is putting up a sign is cheaper than spending the money on put the containers in and then paying for the staff to empty the containers. I think if this is a priority and citizens make it known, I don't think this would be a hard one to implement. Wouldn't it be neat if the containers also allowed for recycling? | By Jason S

Idea Title: Alcohol and drug abuse, tearing apart families

Idea Detail: This summary idea came from the November 15th community forum in Union County and is a summary of this idea:

1.) Alcohol and drug abuse, tearing apart families, destroying futures

Idea Author: Jason L
Number of Seconds: 1 **Number of Comments:** 2

Comment 1: I suppose the next step to take on figuring out how to address this problem is what are the drugs that need targeting and what kind of support services are needed to support recovering families and how to make these services widely available. Is this specifically concerning meth? | By Jason S

Comment 2: That is the most common one, but far from the only one. | By Seth W

Appendix F: Response to Comments on the Draft Mobility Plan

This section includes all comments received by the TPO from the public in response to the drafts and process of the Mobility Plan. TPO staff interpreted this as broadly as possible to include as many comments as possible.

Call for Projects

Date	Public Comment	TPO Response
09/16/2012	Project for Consideration: Construct James White Pkwy. as four lanes from current end all the way to Sevierville. Even with widening of Hwy. 66, it will not be adequate during peak travel season at present and in the future. It would also reduce traffic on Chapman Hwy. I believe I read it this was planned at one time. With the growth in Sevier County, it should be reconsidered to provide better traffic flow between Knox and Sevier counties without the need to travel by I-40.	James White Parkway extension is currently in the Mobility Plan project list and would extend from its current end to the area of Governor John Sevier Highway and Chapman Highway.
09/16/2012	Project for Consideration: Complete the widening of Emory Road or similar route from Clinton Hwy. to Hardin Valley Road ASAP to provide a four-lane east/west route across the county to reduce local traffic on the interstate.	We have a proposed project in the list from Knox County to widen Emory Road from Clinton Highway to Oak Ridge Highway. It would add a center turn lane to prevent some of the safety issues and back up from left hand turns. Knox County also has a couple of projects to widen Schaad Road between Oak Ridge Highway and Pleasant Ridge Road and extend it (4-lane) to Middlebrook Pike. This project looks like the one that probably best addresses your concern.
09/16/2012	Project for Consideration: Add additional lanes to I-40/75 from I-140 to the I-40/75 split and upgrade the Campbell Station Rd. exit ASAP.	There are two proposed projects that address these issues. First there is a project to reconfigure the Campbell Station interchange. Later there is a project to widen 40/75 from 6 to 8 lanes between Lovell Road and the split.

Date	Public Comment	TPO Response
09/16/2012	Project for Consideration: Provide a solution to the need for U-turns at the Highway 62/162 interchange in Solway.	There is a proposed project to reconfigure the Pellissippi (162) at Oak Ridge Highway (62) interchange. I do not have design information, so I cannot tell you whether or not your specific concern is addressed or if anyone has gotten that far. What I do understand is that at least one priority of that project is to allow people driving on Oak Ridge Highway from Karns (west) to be able to make the turn south towards Hardin Valley/Farragut.

Public Comment Period of Draft Regional Mobility Plan

Date	Public Comment	TPO Response
03/20/2013	RMP# 09-232 {Pellissippi Pkwy (SR 162) Extension} will only serve to increase traffic on already dangerously congested roads (US 411 & SR 33 & US 321), as the existing section of SR 162 (from US 129 to SR 33) has already done to SR 33 in the past 10 years (ref the increased traffic portion of your draft RMP). As RMP# 09-232 has a horizon year of 2019 (per table 8-1, or a horizon year of 2024 per table I-7), and US 411 improvements that are needed now (RMP# 09-245 & 09-250) have a horizon year of 2024 – US 411 will become more dangerous between 2019 & 2024 by your RMP. Too many wrecks & deaths occur on this stretch of road currently (please check with trooper/sheriff/police records). Please, let us fix the roads we have before we venture down the 'Southern Loop' circumferential "build it & they will come" route.	An Environmental Impact Statement (EIS) is currently being prepared by the Tennessee Department of Transportation (TDOT) for the Pellissippi Parkway (SR 162) Extension. Additional detailed traffic analysis is part of the EIS. Safety and operational improvements are currently under development by TODT for segments of the US 411 corridor. The proposed Regional Mobility Plan does not include a new “Southern Loop” in Blount County. The Plan proposes improvements to existing roadways.

Results of Public Survey During Public Comment Period

Did Chapter 1 give you a better understanding of the TPO and its process?

Answer Options	Response Percent	Response Count
0 - I have not read Chapter 1	25%	1
1 - No, it did not	0%	0
2 - Somewhat	25%	1
3 - Yes, it did	50%	2
4 - I already understand the TPO process	0%	0

Overall, did you find the plan easy to understand?

Answer Options	Response Percent	Response Count
1 - Very easy	25%	1
2 - Somewhat easy	25%	1
3 - Somewhat difficult	50%	2
4 - Very difficult	0%	0

TPO Response

We would like to recognize the concerns demonstrated here. Per the TPO Outreach Plan, we are in a process of working to make all of our documents easier to understand and use by the public. Some reports must contain a great deal of material in order to be complete, which may make simplifying them difficult, if not impossible. It is clear that to some degree, despite our best efforts the Mobility Plan may still be such a document. In cases such as this, the TPO will also prepare an Executive Summary. We will release the Executive Summary shortly after the Mobility Plan is approved.

How well do you feel the plan represents your priorities for transportation in the Knoxville region?

Answer Options	Response Percent	Response Count
0 - Not sure	0%	0
1 - Very well	0%	0
2 - Somewhat well	100%	3
3 - Somewhat poorly	0%	0
4 - Very poorly	0%	0

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Appendix G: Socioeconomic Control Total Projections Report

June 2012

Prepared by
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Introduction and Executive Summary

The success of traffic forecasting, and more broadly, transportation planning, depends in no small part on the reasonableness and credibility of the socioeconomic forecasts on which it is based. Moreover, the reality of demographic and economic forecasting is that judgments must be made. Most mass producers of projections simplify this process by making the exact same judgments for all of the areas they are forecasting. For example, they may make the assumption that fertility rates in all counties will eventually converge with nationally projected rates; whereas, in reality there may be numerous counties where there is no historical evidence of convergence and there likely never will be. Superior forecasts can be derived by recognizing specific local historical conditions and incorporating them into the forecasting assumptions.

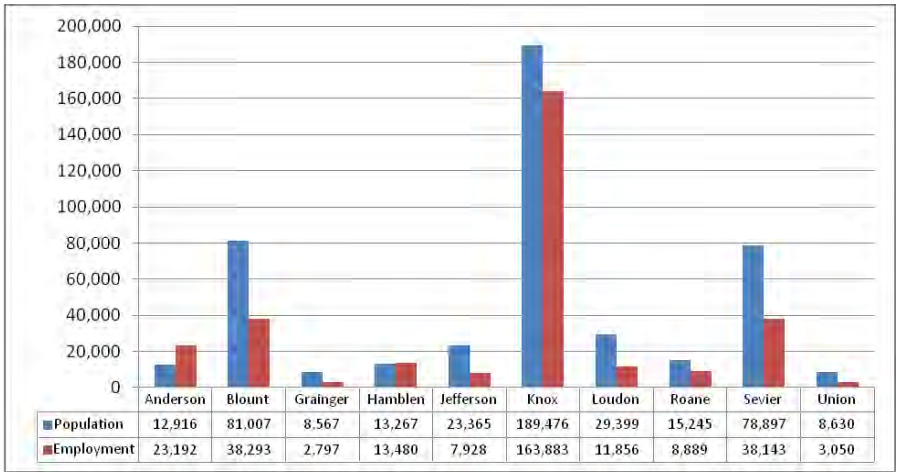
Out of recognition of these facts, as a part of BLA's contract with the Knoxville TPO to update its regional travel model to a new 2010 base year, BLA was also tasked with developing local socioeconomic control total forecasts. These control totals will assist the TPO in developing future land use scenarios for use with the travel model for traffic forecasting and for more general planning for the Eastern Tennessee region.

The forecasts include interrelated county control totals for population, employment (by the model's four sectors), labor force (or workers), seniors and school-aged children. Control totals were developed separately for each of the ten counties in the model area: Anderson, Blount, Grainger, Hamblen, Jefferson, Knox, Loudon, Roane, Sevier, and Loudon counties.

Since the level of traffic growth predicted by Knoxville's travel model, as with most travel models, is driven primarily by population growth and secondarily the number of workers, the focus of the forecasting effort was invested in applying the labor force linkage cohort survival methodology. This method takes advantage of the good annual and quarterly time series labor force data available at the county level to forecast levels of in- and out-migration to supplement basic cohort survival techniques. It provides inter-related and consistent forecasts of population, workers, senior and student-aged populations.

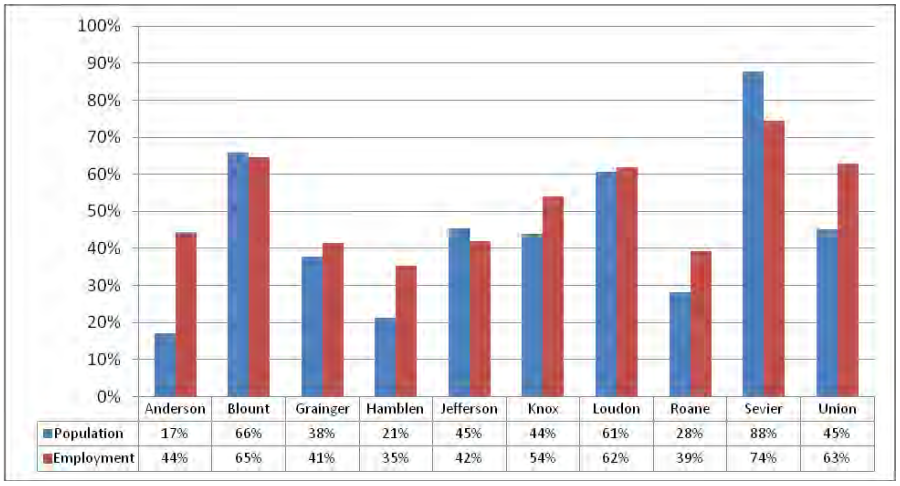
Employment, which determines more the location of traffic than its overall intensity in the context of travel models, is forecast separately, using a simpler approach based on the examination and extrapolation of historical growth rates and patterns. The comparison between the number of workers and employment provides an estimate of unemployment, which serves as an independent reasonableness check on the consistency of the employment forecasts with the labor force and population forecasts.

The population and employment growth from the recommended forecasts are presented below in Figure G-1 through Figure G-3.



	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union
Population	12,916	81,007	8,567	13,267	23,365	189,476	29,399	15,245	78,897	8,630
Employment	23,192	38,293	2,797	13,480	7,928	163,883	11,856	8,889	38,143	3,050

Figure G-1: Projected Absolute Growth, 2010-2040



	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union
Population	17%	66%	38%	21%	45%	44%	61%	28%	88%	45%
Employment	44%	65%	41%	35%	42%	54%	62%	39%	74%	63%

Figure G-2: Projected Percent Increase, 2010-2040

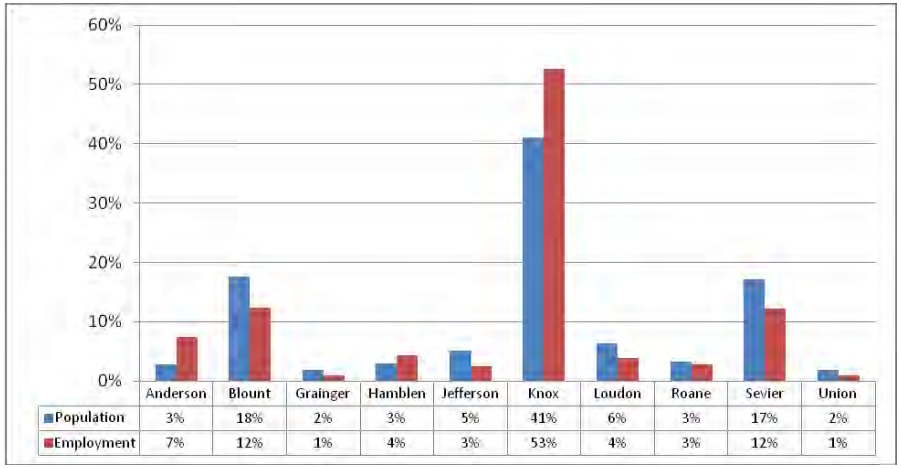


Figure G-3: Share of Regional Growth by County

As expected, the forecasts show Knox County accounting for roughly half the regional growth, followed by Blount and Sevier counties with between 10 and 20% of the regional growth each. Knox and Anderson show stronger employment than population growth, continuing their traditional roles as job centers for the region, while population growth outpaces employment as Blount County continues to develop as a bedroom community for Knoxville and Sevier continues to attract retirees and part time residents.

The subsequent documentation presents the forecasts in detail together with the methodology employed to develop them.

Labor Force Linkage Cohort Survival

The labor force linkage cohort survival method of demographic forecasting relies on the decomposition of population change into three components: births, deaths, and migration. Most responsible methods of population forecasting begin with these three components of change. Independent projections of each component are made and then the "bottom line" is computed using the following simple equation:

$$Projected\ Population = Previous\ Population + [(Births - Deaths) + Net\ Migration]$$

Although each of the three components of population change are subject to their own sources of uncertainty, detailed historical fertility and mortality rates by county are maintained by the Tennessee Department of Health, Office of Policy, Planning and Assessment, Division of Health Statistics and provide a good basis for forecasting future births and deaths. By far the most unpredictable component of population change at the local level is net migration. The most common method of projecting this variable has been to utilize recent historical net migration rates and assume that they will continue to apply throughout the foreseeable future. Alternatively, some forecasters make the assumption that these rates will converge with a "net zero rate" over time. Invariably, neither of these assumptions hold true because of the erratic nature of net migration flows. For example, an area may become popular due to its low cost of new housing and low property tax rate. This may result in net in-migration for a few years. Following this period, a major employer may come on bad economic times laying off or moving a large number of its employees. Consequently, the historical pattern of in-migration then changes to severe net out-migration. A few years later, a major new employer comes into the area and the trend reverses itself again to a flow of in-migrants.

Due to the importance of these volatile net-migration rates, some demographers have modified the traditional "cohort survival method" of forecasting local area population and moved toward methods that relate future population to expected labor force and labor force participation rates. Indigenous labor force is a much easier variable to project than migration rates in large part because it has been estimated quarterly and annually at the county level for many years by the U.S. Department of Labor, Bureau of Labor Statistics using consistent estimation methods based on legally required tax forms, as opposed to migration which is only reliably observed once every ten years from the decennial Census. The labor force linkage cohort survival method therefore generates net migration as an output or by-product of the population projection, based on labor force forecasts, rather than requiring it as an input.

Fertility Rates

Historic birth rates by age cohorts for women aged 10 to 45 were obtained for each county from the Tennessee Department of Health, Office of Policy, Planning and Assessment, Division of Health Statistics for the years 2005-2010 (see Table G-1).

Table G-1: Birth Rates by Age Cohort by County

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union
10 to 14	0.18	0.44	1.20	0.40	0.26	0.52	0.64	0.62	0.64	0.98
15 to 19	47.94	43.29	57.68	75.18	45.75	34.44	59.15	60.03	60.57	58.10
20 to 24	131.00	103.72	142.68	168.60	108.02	77.60	136.10	124.38	144.65	138.40
25 to 29	92.68	86.60	80.63	96.95	77.72	100.92	101.97	78.90	91.97	80.25
30 to 34	92.68	86.60	80.63	96.95	77.72	100.92	101.97	78.90	91.97	80.25
35 to 39	39.10	15.95	10.97	15.10	15.67	22.35	16.90	12.55	17.58	9.87
40 to 44	39.10	15.95	10.97	15.10	15.67	22.35	16.90	12.55	17.58	9.87

The observed rates were meaningfully different by county. For instance, the presence of the University of Tennessee student population correlates with lower fertility rates for women aged 15 to 24 in Knox County. Similarly, the Knox County rates evidence deferred fertility with higher rates in the late twenties and early thirties as is becoming common in larger urban areas; whereas, more rural areas have more traditional patterns with higher birth rates in the early twenties.

The pattern over the period from 2005 to 2010 was less consistent. In most of the age cohorts, in most of the counties, fertility rates decreased in the last few years. However, the pattern was still fairly inconsistent, and to the extent that it is thought to be driven by the economic recession, may be thought to be more of a temporary effect than a long-term trend. For that reason, the six year average fertility rates over the period from 2005-2010 were used for each county.

Mortality Rates

Historic mortality rates by age cohorts by age cohort and gender were obtained for each of the ten counties from the Tennessee Department of Health, Office of Policy, Planning and Assessment, Division of Health Statistics for the years 1990-2010.

In contrast to the birth rates, which appeared to vary significantly across the counties, but not particularly meaningfully over time, the mortality rates clearly varied more significantly over time than geography. Although there was some variation in mortality rates by county, there was not enough data to reliably forecast morality rates (by age and gender) over time for each county separately. The data for the counties was therefore combined and a set of mortality rates by age and gender was forecast over time for the region as a whole. It is important to forecast mortality rates over time rather than rely on historic average rates because mortality rates have been consistently decreasing as life expectancies have increased for more than a century.

Table G-2: Historic and Projected Mortality Rates by Age Cohort and Gender

Males	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
Under 5	218.97	160.33	171.23	175.73	168.19	157.27	150.52	143.77	137.02	130.27
5 to 9	24.99	19.05	17.04	16.22	15.87	14.90	13.67	12.45	11.22	9.99
10 to 14	28.28	16.02	21.07	16.38	16.87	16.86	15.87	14.87	13.88	12.89
15 to 19	108.05	118.89	116.18	93.48	97.04	99.22	96.46	93.71	90.95	88.19
20 to 24	153.05	141.00	169.38	157.66	157.84	158.46	159.34	160.23	161.11	162.00
25 to 29	179.24	140.41	171.95	166.53	165.76	165.07	165.22	165.37	165.52	165.67
30 to 34	203.68	197.09	192.72	185.58	184.56	181.73	178.11	174.49	170.87	167.25
35 to 39	265.29	292.04	267.54	242.01	244.85	244.62	238.49	232.35	226.21	220.07
40 to 44	345.11	334.70	408.58	350.58	370.63	395.66	405.64	415.62	425.60	435.58
45 to 49	491.75	442.21	542.50	561.72	558.11	561.74	576.24	590.74	605.24	619.74
50 to 54	782.56	721.92	756.62	857.67	857.67	857.67	857.67	857.67	857.67	857.67
55 to 59	1274.5	1208.7	1090.3	1089.0	1054.0	995.30	947.99	900.68	853.37	806.06
60 to 64	1975.3	1689.0	1653.6	1594.9	1487.3	1323.5	1211.1	1098.6	986.20	873.78
65 to 69	2984.7	2694.1	2607.2	2254.4	2206.9	2082.9	1929.5	1776.1	1622.7	1469.3
70 to 74	4526.4	4339.8	3717.7	3456.8	3337.6	3090.6	2835.2	2579.8	2324.4	2068.9
75 to 79	7058.4	6545.9	6137.6	5526.7	5406.2	5119.4	4786.6	4453.9	4121.2	3788.5
80 to 84	10481	10141	9727.1	9011.9	8699.4	8152.5	7683.6	7214.8	6745.9	6277.2
85 & up	17704	18140	17503	16269	16107	15709	15238	14767	14296	13825

Females	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
Under 5	150.65	124.70	125.38	121.90	117.48	110.22	104.54	98.87	93.19	87.51
5 to 9	17.63	22.70	18.17	11.16	12.77	13.88	12.90	11.92	10.94	9.96
10 to 14	20.21	24.01	17.44	15.68	15.74	15.24	14.10	12.97	11.83	10.69
15 to 19	42.14	40.84	43.47	33.06	35.01	36.49	35.55	34.61	33.67	32.73
20 to 24	48.19	52.37	59.56	66.88	66.48	67.57	70.58	73.59	76.59	79.60
25 to 29	73.63	56.08	61.24	93.13	86.63	81.59	84.53	87.47	90.40	93.34
30 to 34	76.83	79.42	86.87	96.68	96.10	97.23	100.64	104.05	107.46	110.87
35 to 39	121.89	125.54	159.60	145.64	150.92	159.12	164.94	170.76	176.58	182.40
40 to 44	155.20	183.78	227.45	251.11	255.21	268.16	285.88	303.59	321.31	339.02
45 to 49	259.70	264.85	301.91	344.77	342.44	347.75	363.01	378.27	393.54	408.80
50 to 54	411.18	385.92	465.40	458.80	460.42	467.14	477.37	487.60	497.83	508.05
55 to 59	665.18	644.81	713.73	668.59	676.20	685.55	689.02	692.49	695.95	699.42
60 to 64	1097.0	1099.0	1075.7	980.59	965.28	931.73	895.24	858.75	822.25	785.76
65 to 69	1628.2	1582.1	1541.1	1541.4	1503.6	1448.4	1413.7	1379.1	1344.4	1309.7
70 to 74	2488.1	2563.8	2527.1	2266.7	2252.4	2202.1	2130.0	2057.9	1985.9	1913.8
75 to 79	3881.6	4073.9	4038.8	3589.5	3598.6	3561.1	3468.0	3375.0	3281.9	3188.9
80 to 84	6547.6	6662.1	6946.0	6008.0	6098.5	6132.3	6018.8	5905.3	5791.8	5678.3
85 & up	14199	15129	14973	12808	12934	12864	12471	12078	11686	11293

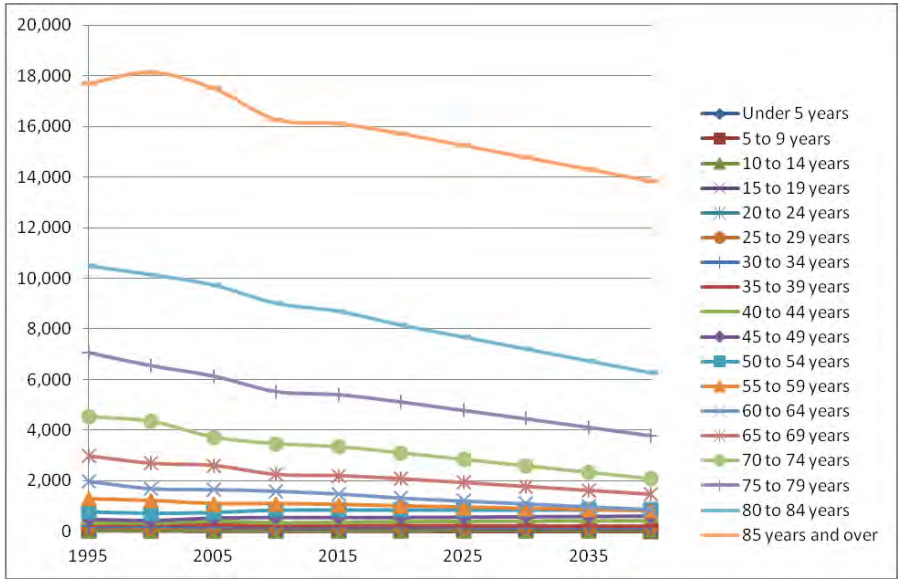


Figure G-4: Eastern Tennessee Mortality Rates per 100,000 Males, 1995-2040

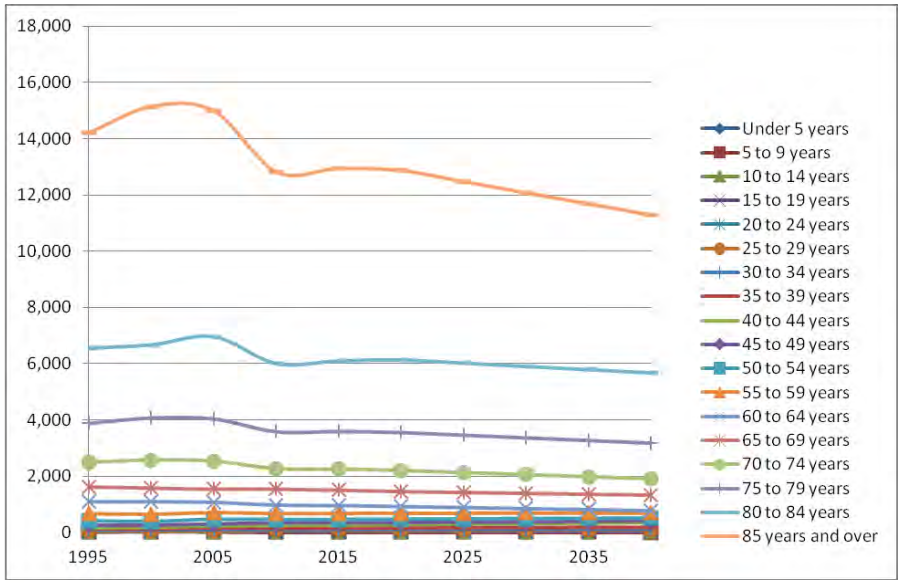


Figure G-5: Eastern Tennessee Mortality Rates per 100,000 Females, 1995-2040

In forecasting mortality rates, BLA generally relied on linear extrapolation of the trends over the past twenty years, but with a few exceptions where dampening was applied to ensure that each male mortality rates remained greater or equal to female mortality rates for the same age cohort and that each successive age cohort's rates are higher than the next younger cohort. Neither Woods & Poole nor UT's Center for Business and Economic Research publish their mortality forecasting methodology, but differences in forecast longevity/mortality rates appears to be one of the differences between the population forecasts.

Labor Force

The U.S. Department of Labor, Bureau of Labor Statistics, provides monthly labor force data based on required payroll tax reporting, unemployment claims, etc. Historic labor force data was obtained for the ten counties for the twenty year period from 1990-2010.

This data was used to make multiple forecasts based on linear regression over the whole and/or a subset of the data, non-linear regression, the twenty-year average growth rate, and the highest and lowest ten-year growth rates observed within the past twenty years. The forecasts produced by these various methods were then compared and professional judgment used to select the best forecast. In some cases, the chosen forecast was a compromise or weighted average between two or more of the basic forecasts.

Table G-3: Historic and Projected Labor Force by County

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union	Region
1990	32,915	41,803	8,018	25,944	16,582	173,808	15,981	21,831	27,257	6,317	372,446
1995	36,151	49,948	9,715	30,455	21,599	196,793	19,127	28,911	33,501	7,373	435,568
2000	34,058	54,348	9,760	29,758	22,593	202,414	19,614	24,900	39,837	8,128	447,410
2005	34,933	59,769	10,171	29,782	23,809	216,490	21,930	25,918	45,540	8,830	479,177
2010	36,211	63,591	10,059	29,586	24,332	232,390	23,640	27,738	49,191	8,888	507,636
2015	37,140	68,884	10,635	30,370	25,860	249,792	25,870	29,122	56,300	9,669	545,658
2020	38,069	74,178	11,211	31,154	27,388	267,195	28,100	30,506	63,408	10,450	583,679
2025	38,998	79,471	11,786	31,938	28,917	284,597	30,331	31,890	70,517	11,232	621,701
2030	39,926	84,765	12,362	32,722	30,445	302,000	32,561	33,274	77,626	12,013	659,723
2035	40,855	90,058	12,938	33,506	31,973	319,402	34,791	34,658	84,734	12,794	697,745
2040	41,784	95,351	13,514	34,290	33,501	336,804	37,021	36,042	91,843	13,575	735,766

Summarized historic, viable, and chosen projections of labor force for each county are found in Appendix A. The resulting projections are displayed together with the historic data for in five-year increments in Table G-3. The projected regional total labor force resulting from the chosen county forecasts was also plotted against simple historic rate based forecasts as an independent reasonableness check (displayed in Figure G-6).

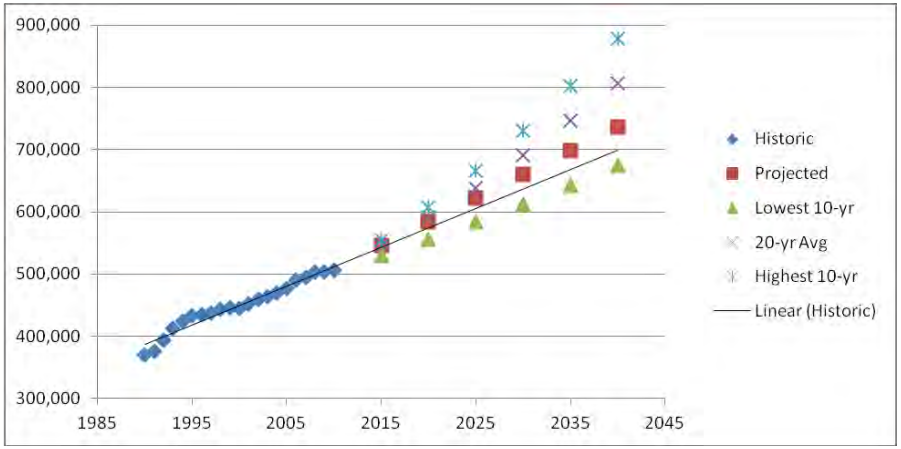


Figure G-6: Eastern Tennessee Regional Labor Force, 1990-2040

Labor force is very closely related to the household workers variable in the travel model, although there are some subtle differences. The differences are that labor force includes unemployed adults actively seeking work and does not include self-employed workers who are ineligible for unemployment insurance; whereas, the household workers in the model do not include the unemployed but do include the self-employed. Because of these definitional differences, the labor force forecasts should not be used directly as a forecast of household workers. However, because of the closeness of the definitions the relative growth in labor force, presented in Table G-4, can validly be applied to the number of household workers to produce future year county control totals for the number of household workers.

Table G-4: Future Growth in Labor Force/Household Workers Relative to 2010

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union
2015	2.57%	8.32%	5.72%	2.65%	6.28%	7.49%	9.43%	4.99%	14.45%	8.79%
2020	5.13%	16.65%	11.45%	5.30%	12.56%	14.98%	18.87%	9.98%	28.90%	17.58%
2025	7.70%	24.97%	17.17%	7.95%	18.84%	22.47%	28.30%	14.97%	43.35%	26.37%
2030	10.26%	33.30%	22.90%	10.60%	25.12%	29.95%	37.74%	19.96%	57.80%	35.16%
2035	12.83%	41.62%	28.62%	13.25%	31.40%	37.44%	47.17%	24.95%	72.26%	43.95%
2040	15.39%	49.94%	34.34%	15.90%	37.68%	44.93%	56.60%	29.94%	86.71%	52.73%

Two additional variables are required to convert the labor force projections into net migration and population projections. Those variables are the labor force participation rate and the dependency ratio. The labor force participation rate is the ratio of the labor force to the total population over 15. The dependency ratio is the ratio of population 15 and under to the population over 15. The labor force linkage cohort survival method of population forecasting then makes use of the following equation:

$$Total\ Population = \frac{(Labor\ Force \div Labor\ Force\ Participation\ Rate)}{Dependency\ Ratio}$$

This equation is used to calculate the total population (and the population over and under 15) and the difference between these values and those produced by simple cohort survival resulting from applying birth and mortality rates is the net migration.

Labor Force Participation Rates

Historic labor force participation rates were calculated for each county from the BLS labor force estimates and Census populations for 1990, 2000, and 2010. Historically, labor force participation rates have risen since the mid-twentieth century as women have entered the labor force until the early part of the previous decade, by which time women's participation in the labor force was nearly approaching men's and the aging of the baby boomer generation became the salient factor driving labor force dynamics, together with the trend towards more time spent in education. However, because these dynamics play out at different paces in different local areas, mitigated by a variety of other factors acting in particular counties, labor force participation rates are perhaps the most difficult variable to predict in the labor force linkage cohort survival method. The national labor force participation rate peaked nearly ten years ago and has since been declining. However, looking at the ten eastern Tennessee counties in the Knoxville model area, various patterns are observed. Some counties peaked in 2000 as the nation did as a whole, while some (particularly those with larger senior populations) were already declining by 2000 and others had not peaked yet. The ten county region as a whole, however, did roughly mirror the nation, peaking somewhere near 2000, but lagging the nation somewhat in that by 2010 the national rate had fallen below its 1990 level, whereas, the regional rate had fallen below its 2000 level but not to its 1990 level.

Four published forecasts of national labor force participation rates were used to develop forecasts of local labor force participation. Two were official forecasts by U.S. government agencies (Bureau of Labor Statistics, Congressional Budget Office) and two were widely sited academic publications (Toosi, 2006 and Szafran, 2002) which have been partially validated over recent years. All four provided estimates of labor force participation in 2020 (0.645, 0.632, 0.645 and 0.630). The two academic sources provided forecasts out to 2040 (0.608 and 0.601, respectively). For counties with historic patterns that mirrored (or lead) national trends, forecasts were developed by simply pivoting off of national forecasts. For counties with historic patterns that lagged or possibly ran counter

to national trends, forecasts were developed as a compromise or weighted average between national forecasts and local historic trends. Some consideration was also given to the in-migration of retirees in some counties and the effects of the University of Tennessee constantly supplying young workers in Knox County. In all cases, rates were forecast to decrease by 2040, but for counties that had not shown any sign of decrease yet, rates were allowed to approximately hold steady out through 2020 before beginning to decline and the final rates in these counties had sometimes not yet dropped to 1990 levels even by 2040. Table G-5 and Figure G-7 shows the historic and projected labor force participation rates by county.

Table G-5: Historic and Projected Labor Force Participation Rates by County

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union	Region	Nation
1990	0.601	0.599	0.585	0.637	0.608	0.637	0.632	0.571	0.663	0.593	0.624	0.665
2000	0.590	0.633	0.584	0.635	0.630	0.651	0.615	0.587	0.692	0.580	0.637	0.671
2010	0.587	0.632	0.543	0.589	0.578	0.658	0.585	0.617	0.668	0.580	0.631	0.647
2015	0.586	0.632	0.536	0.581	0.570	0.657	0.577	0.616	0.667	0.580	0.629	0.642
2020	0.585	0.631	0.529	0.573	0.562	0.657	0.569	0.616	0.666	0.579	0.627	0.638
2025	0.572	0.624	0.518	0.562	0.551	0.649	0.558	0.609	0.652	0.573	0.619	0.624
2030	0.560	0.618	0.508	0.551	0.540	0.642	0.547	0.603	0.637	0.567	0.610	0.611
2035	0.555	0.615	0.506	0.549	0.538	0.640	0.545	0.600	0.632	0.565	0.607	0.608
2040	0.551	0.613	0.505	0.547	0.537	0.638	0.543	0.598	0.628	0.562	0.605	0.605

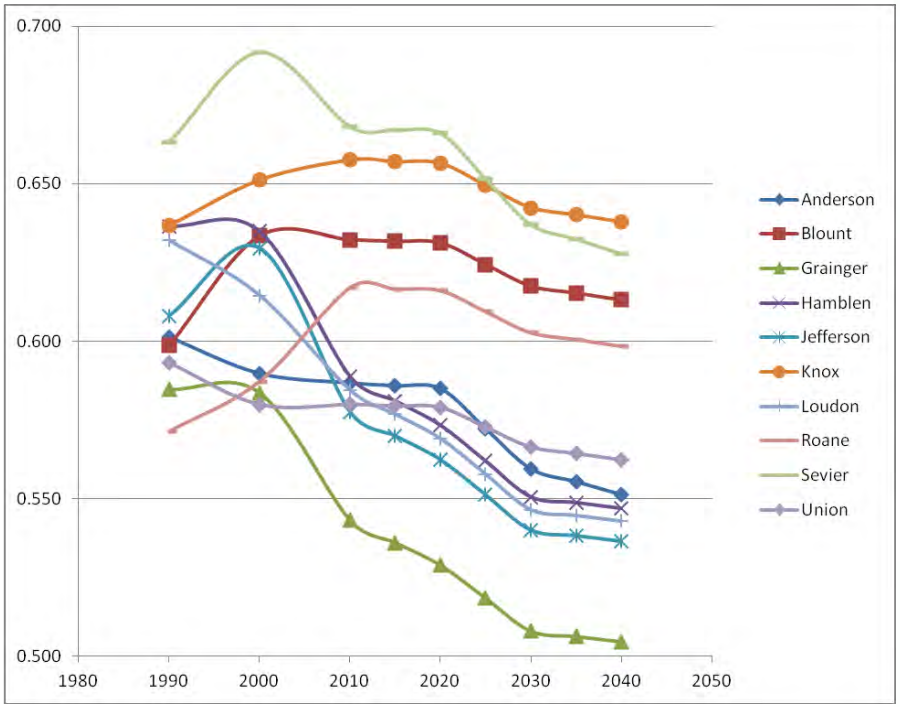


Figure G-7: Labor Force Participation Rate by County, 1990-2040

Dependency Ratios

Historic dependency ratios from the 1990, 2000, and 2010 Censuses were obtained for each county. Dependency ratios have been generally been falling across the country since the introduction of artificial contraception as people have chosen to have fewer children. For this reason, in contrast to labor force participation, dependency ratios are typically easier to project. The national trend is generally observed throughout the eastern Tennessee region, with the exceptions of Hamblen and Jefferson counties. Given the generally clear and consistent local trends observed, future dependency ratios were generally simply linearly extrapolated, although trends were dampened in some counties such as Loudon and Roane to avoid predicting extremely low ratios. Historic and projected dependency ratios are presented in Table G-6 and Figure G-8.

Table G-6: Historic and Projected Dependency Ratios by County

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union
1990	0.247	0.231	0.247	0.239	0.211	0.230	0.236	0.236	0.242	0.286
1995	0.241	0.232	0.241	0.239	0.222	0.229	0.230	0.230	0.239	0.278
2000	0.235	0.233	0.235	0.240	0.234	0.229	0.225	0.224	0.236	0.271
2005	0.226	0.228	0.230	0.242	0.227	0.226	0.213	0.215	0.228	0.259
2010	0.217	0.223	0.224	0.245	0.220	0.223	0.201	0.205	0.221	0.247
2015	0.217	0.223	0.224	0.246	0.230	0.223	0.198	0.203	0.217	0.239
2020	0.217	0.223	0.224	0.247	0.233	0.221	0.195	0.201	0.212	0.229
2025	0.215	0.223	0.221	0.249	0.235	0.219	0.192	0.198	0.206	0.219
2030	0.211	0.223	0.218	0.250	0.237	0.218	0.189	0.196	0.201	0.210
2035	0.208	0.222	0.215	0.252	0.240	0.216	0.187	0.194	0.196	0.200
2040	0.204	0.221	0.212	0.253	0.242	0.214	0.185	0.191	0.190	0.190

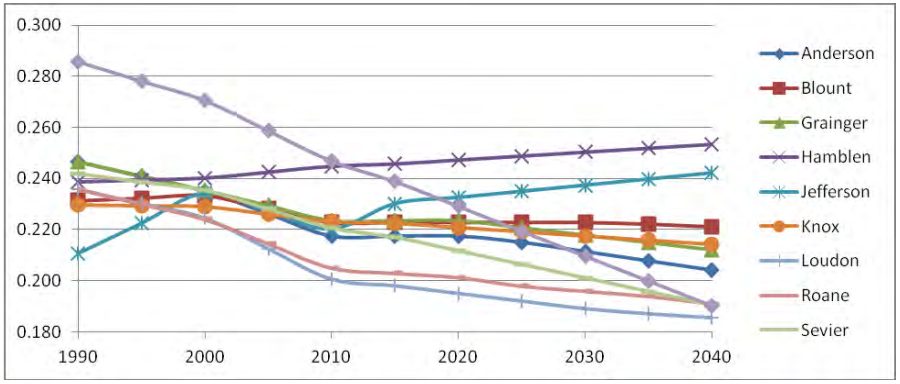


Figure G-8: Dependency Ratios by County, 1990-2040

Calibration

The foregoing variables were used to apply the labor force linkage cohort survival method of population forecasting for the ten-county eastern Tennessee region. Adjustments are necessary to account for large institutional populations. The chief of these in this region being the University of Tennessee student population. These adjustments and other small adjustments to the variables involved (such as any differences in the dependency ratio and age distributions of migrants from current residences, the precise proportion of males to females at birth, etc.) were calibrated to the historic period from 1990 to 2000. For historic years, the model is constrained to reproduce the county total population exactly, but errors can occur and be observed by gender and age cohort. Calculating statistics on these errors by gender and age cohort over all ten counties against the 2000 Census, the root mean square error (RMSE) was 18.7% and the mean absolute percent error (MAPE) was 10.7%, indicating a very good fit overall. The calibrated model was then validated by forecasting from 2000 to 2010. As is generally expected, the error statistics calculated against the 2010 Census were slightly higher than for the 2000 Census since the model was not calibrated specifically for this period. However, the model still performed quite well with a 22.8% RMSE and 15.6% MAPE in 2010. The degradation between 2000 and 2010 appears to be related to the changes over time in the UT student population and their tendency (by gender) to remain in the area after graduation. On the basis of the observed 20-year period alone, it was not possible to forecast these trends with any confidence, so the model was used for forecasting as calibrated. With the small observed errors, a reasonable level of confidence can be had in the model overall.

Population Projections

The application of the labor force linkage cohort survival method described above produced population projections for the ten eastern Tennessee counties which generally tended to be somewhat higher than those by UT's Center for Business and Economic Research (CBER) but just slightly lower than those produced by Woods & Poole (W&P) and slightly lower than the average growth over the period from 1970 to 2010. Table G-7 presents the historic and projected population by county to 2040 and Figure G-9 displays the projected trend for the region as a whole. Detailed graphs comparing each individual county's forecast with historic rates and forecasts from CBER and W&P are presented in Appendix B.

It is important to note that BLA's original forecast for Blount County was revised downward to be more consistent with the county's own population forecasts. The forecasts for Blount County, shown here are generally consistent with, but not exactly the same as, the county's forecasts.

Table G-7: Historic and Projected Total Population by County

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union	Region
1970	60,563	63,822	14,080	39,064	25,134	277,927	24,328	39,058	28,562	9,221	581,759
1980	67,498	77,992	16,782	49,500	31,435	320,932	28,730	48,519	41,725	11,774	694,887
1990	68,250	85,969	17,095	50,480	33,016	335,749	31,255	47,227	51,043	13,694	733,778
2000	71,326	105,823	20,659	58,128	44,294	382,032	39,087	51,910	71,170	17,808	862,237
2010	75,129	123,010	22,657	62,544	51,407	432,226	48,556	54,181	89,889	19,109	978,708
2020	76,609	139,297	24,987	65,487	57,962	482,122	56,997	57,626	112,010	21,442	1,094,539
2030	83,449	162,594	28,517	71,704	67,257	555,118	68,332	63,916	141,899	24,777	1,267,562
2040	88,045	183,913	31,224	75,811	74,772	621,702	77,955	69,426	168,786	27,739	1,419,372

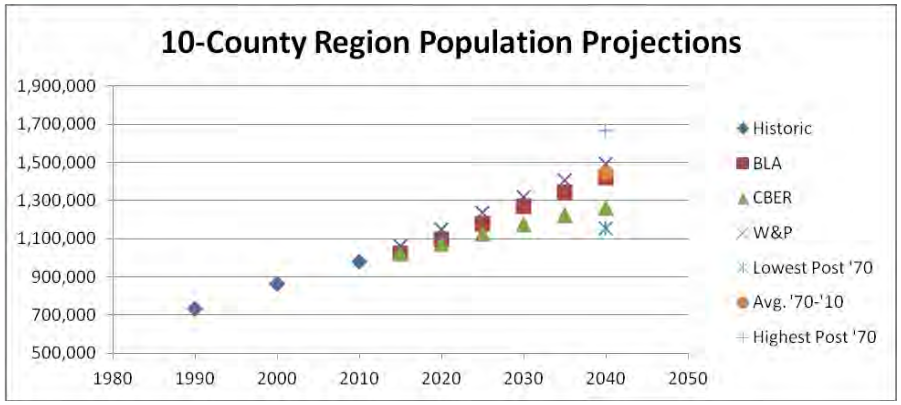


Figure G-9 Eastern Tennessee 10 County Region Population Projections

Student-Age and Senior Populations

The Knoxville regional travel model includes the number of students (per household) and the percentage of households with seniors present as variables for predicting travel patterns. Although it does not forecast these exact variables, the labor force linkage cohort survival method does project two closely related variables that can be used to estimate the future growth in these variables at the county level. The demographic projections include the number of persons in each five-year age cohort. The number of students can be approximated by the student age population taken as the 5-9, 10-14 and 60% of the 15-19 year old cohorts. The growth in these cohorts can be taken as the growth in students and applied to the 2010 base year students to produce future year country control totals. The historic and projected student aged population by county is presented in Table G-8 and the growth in student-aged population (or students) is presented in Table G-9. For some counties, some of the interim year projections were smoothed to avoid some unrealistic oscillation, which can occur as a result of the nature of the method.

Table G-8: Historic and Projected Student Aged Population by County

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union
1990	12,078	14,507	3,147	9,011	5,725	56,254	5,334	8,460	9,063	2,707
2000	12,371	18,040	3,463	9,719	7,590	64,016	6,200	8,439	12,038	3,358
2010	12,119	20,360	3,665	10,630	8,601	70,251	7,201	8,485	14,483	3,257
2015	11,388	21,568	3,805	10,410	8,963	74,895	8,199	7,688	15,349	2,817
2020	11,724	22,777	3,945	11,237	9,325	79,538	9,198	8,160	15,824	3,056
2025	12,352	23,985	4,085	11,611	9,687	84,181	10,197	8,631	18,474	3,295
2030	13,133	25,194	4,225	12,011	10,049	88,824	11,195	9,103	22,013	3,534
2035	13,756	26,403	4,365	12,428	10,411	93,468	12,063	9,574	25,481	3,773
2040	14,489	27,611	4,504	13,332	10,773	98,111	12,931	10,046	28,001	4,012

Table G-9: Future Growth in Student Aged Population versus 2010

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union
2015	-6.0%	5.9%	3.8%	-2.1%	4.2%	6.6%	13.9%	-9.4%	6.0%	-13.5%
2020	-3.3%	11.9%	7.6%	5.7%	8.4%	13.2%	27.7%	-3.8%	9.3%	-6.2%
2025	1.9%	17.8%	11.4%	9.2%	12.6%	19.8%	41.6%	1.7%	27.6%	1.2%
2030	8.4%	23.7%	15.3%	13.0%	16.8%	26.4%	55.5%	7.3%	52.0%	8.5%
2035	13.5%	29.7%	19.1%	16.9%	21.0%	33.0%	67.5%	12.8%	75.9%	15.8%
2040	19.6%	35.6%	22.9%	25.4%	25.3%	39.7%	79.6%	18.4%	93.3%	23.2%

The population projections also include the number of seniors (65+) which can be expressed in relative terms as a percentage of the total population. Although not exactly the same as the percentage of households with seniors (65+), the growth in the percentage of seniors in the population can be assumed to closely approximate the growth in the percent of households with seniors.

Table G-10: Historic and Projected Senior (65+) Population as a Percentage of Total Population by County

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union
1990	15.4%	14.7%	12.9%	12.0%	13.3%	12.7%	14.6%	14.9%	12.6%	11.0%
2000	16.6%	14.1%	12.5%	13.3%	12.9%	12.7%	16.2%	16.1%	12.6%	10.8%
2010	17.4%	16.1%	16.0%	15.9%	16.2%	13.1%	21.5%	18.6%	15.5%	13.8%
2015	19.5%	18.4%	18.4%	18.4%	18.6%	15.2%	23.6%	21.4%	17.4%	15.5%
2020	21.5%	19.8%	19.9%	19.5%	19.6%	16.9%	23.5%	23.3%	18.5%	17.3%
2025	23.0%	20.9%	20.8%	20.6%	20.4%	18.5%	23.0%	24.4%	19.1%	18.9%
2030	24.0%	21.8%	21.2%	21.3%	21.0%	19.7%	21.9%	24.8%	19.4%	19.8%
2035	24.0%	22.1%	21.4%	21.7%	21.2%	20.2%	20.9%	24.4%	19.4%	19.8%
2040	23.4%	21.9%	20.7%	21.8%	21.0%	20.4%	19.9%	23.4%	19.2%	19.0%

The historic and projected senior population as a percentage of the total population is presented above in Table G-10, while the growth in the percentage of seniors is presented below in Table G-11. In general, in coming years seniors are expected to grow as a portion of the population with the aging of the baby boomers, peaking around 2035. The one exception is Loudon County, where in-migration of younger people to support a strong demand for labor is expected to hold the percentage of seniors relatively constant.

Table G-11: Future Growth in Seniors as a Share of the Population

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union
2015	12.4%	14.5%	15.2%	16.0%	14.8%	16.3%	10.0%	15.1%	12.7%	12.5%
2020	23.4%	23.4%	24.2%	23.0%	21.1%	29.5%	9.6%	25.3%	19.6%	25.4%
2025	32.5%	30.1%	30.0%	30.0%	26.0%	41.5%	7.2%	31.6%	23.4%	37.1%
2030	38.0%	35.5%	32.5%	34.5%	29.8%	50.5%	2.1%	33.6%	25.5%	44.0%
2035	38.1%	37.3%	33.8%	36.9%	30.7%	54.3%	-2.7%	31.5%	25.1%	43.8%
2040	34.5%	36.5%	29.5%	37.4%	29.7%	55.8%	-7.3%	26.3%	24.2%	37.9%

Employment

The U.S. Department of Commerce, Bureau of Economic Analysis (BEA), provides annual estimates of employment by industry sector. Unlike employment estimates from the Bureau of Labor Statistics, which only include wage and salary employment, BEA employment estimates include farmers, government workers and the self-employed who are not counted in the former. The BEA employment is consistent with the Knoxville regional travel model's definition of employment. Historic employment data was obtained from the BEA for the ten counties for the forty year period from 1970-2010.

This data was used to make multiple forecasts of employment in each county by each industry sector based on linear regression over the whole and/or a subset of the data, non-linear regression, the twenty-year, forty-year or other average historic growth rates, and the highest and lowest (generally ten year) growth rates observed within the past forty years.

Proprietary employment forecasts from Woods & Poole for the ten counties were also obtained. Because of significant variations in the Woods & Poole forecasts in recent years, both the 2011 and the 2012 series forecasts were considered.
The various candidate forecasts produced by BLA were then compared against each other and Woods & Poole and professional judgment used to select the best forecast. In some cases, the chosen forecast was a compromise or weighted average between two or more of the basic forecasts.

The employment in each of the model's four industry groups (basic, industrial, retail and services) was combined to produce a forecast of the total employment in each county. This forecast was compared to independent forecasts of total employment (from Woods & Poole and by the various methods described above) as a further reasonableness check, and in some cases the industry level forecast s were revised.

Table G-12: Historic and Projected Total Employment by County

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union	Region
1990	41,221	34,590	6,054	35,545	14,834	218,868	12,903	24,032	29,364	3,837	421,248
1995	50,381	41,154	7,089	38,390	16,595	245,034	14,800	26,524	39,969	4,596	484,532
2000	50,603	50,628	7,533	43,067	18,576	269,737	15,709	23,632	44,506	4,625	528,616
2005	52,140	58,451	7,140	42,387	18,165	291,699	18,408	21,778	49,858	4,822	564,848
2010	52,285	59,288	6,764	38,079	18,926	303,682	19,191	22,602	51,322	4,848	576,987
2015	56,150	63,560	7,230	40,326	20,247	330,996	21,167	24,083	57,679	5,356	626,795
2020	60,016	67,831	7,696	42,572	21,569	358,310	23,143	25,565	64,036	5,865	676,603
2025	63,881	72,103	8,163	44,819	22,890	385,623	25,119	27,046	70,393	6,373	726,410
2030	67,747	76,374	8,629	47,066	24,211	412,937	27,095	28,528	76,750	6,881	776,218
2035	71,612	80,646	9,095	49,312	25,532	440,251	29,071	30,009	83,108	7,389	826,026
2040	75,477	84,918	9,561	51,559	26,854	467,565	31,047	31,491	89,465	7,898	875,834

Summarized historic, viable, and chosen projections of employment for each county are found in Appendix C. The resulting projections are displayed together with the historic data for in five-year increments in Table G-12. The projected regional total employment resulting from the chosen county forecasts was also plotted against simple historic rate based forecasts as an independent reasonableness check (displayed in Figure G-10).

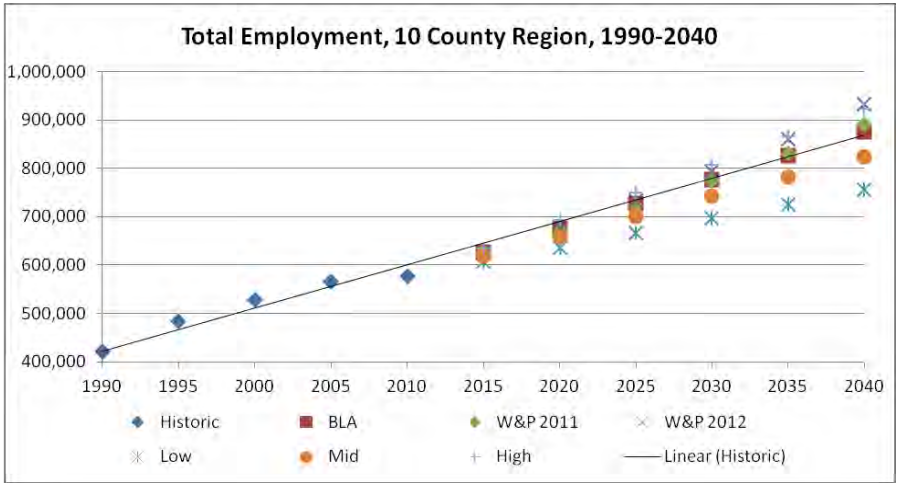


Figure G-10: Eastern Tennessee 10 County Region Total Employment, 1990-2040

Unemployment

The consistency of the employment and population forecasts was checked by estimating the implied unemployment rate for each county in 2040. Unemployment is the difference between the labor force and the wage and salary employment. Since the employment forecasts are for total employment, the wage and salary portion, which are eligible for unemployment insurance,

must be estimated, holding out proprietorships, certain government workers, etc. Given the uncertainty in this, the 2040 unemployment rates should be considered only rough estimates for the purpose of reasonableness checking.

Table G-13: Historic and Implied 2040 Unemployment Rates by County

	Anderson	Blount	Grainger	Hamblen	Jefferson	Knox	Loudon	Roane	Sevier	Union	Region
1990	5.0	5.4	6.8	6.5	7.6	4.3	5.9	8.6	9.0	5.5	5.0
1995	4.0	5.4	6.8	7.1	7.3	3.5	4.1	5.9	8.9	4.7	4.4
2000	4.2	3.6	4.6	4.1	4.4	3.2	3.6	4.4	5.0	3.9	3.3
2005	5.2	4.7	6.0	5.8	5.9	4.2	4.7	5.8	6.1	5.6	4.5
2010	9.0	8.4	12.8	10.8	12.0	7.6	8.3	8.0	10.3	9.3	8.2
2040	6.6	6.7	6.3	3.2	7.8	3.7	5.0	6.5	5.8	5.0	4.7

The estimated unemployment rates ranged from 3.2% to 7.8% with a regional average of 4.7% unemployment. For the region as a whole and most counties, this represented a level of unemployment that was greater than in 2000 when the economy was booming and less than in 2010 when the economy was still in the midst of the great recession. These estimated unemployment rates suggest reasonable consistency between the employment forecasts and the labor force forecasts and therefore also with the population forecasts which derive from them.

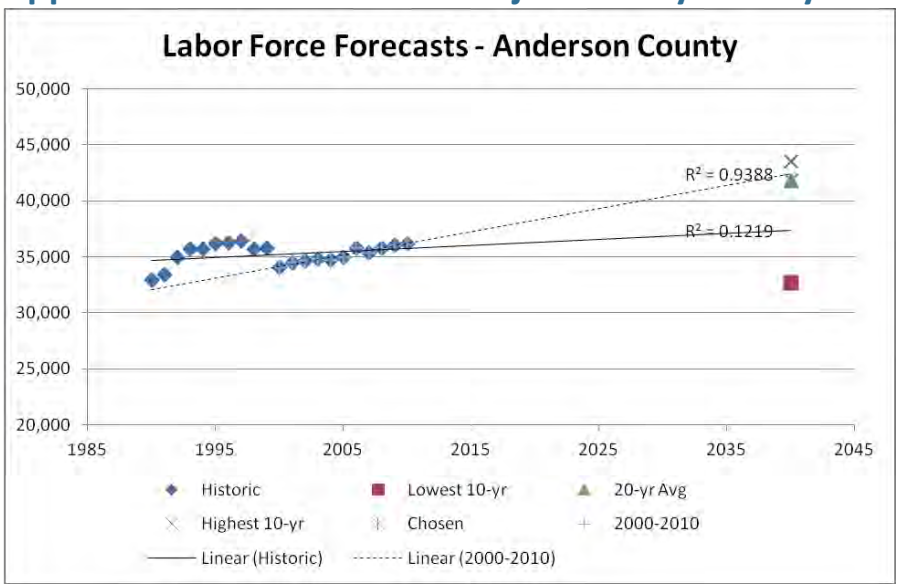
Employment by Industry and by Year

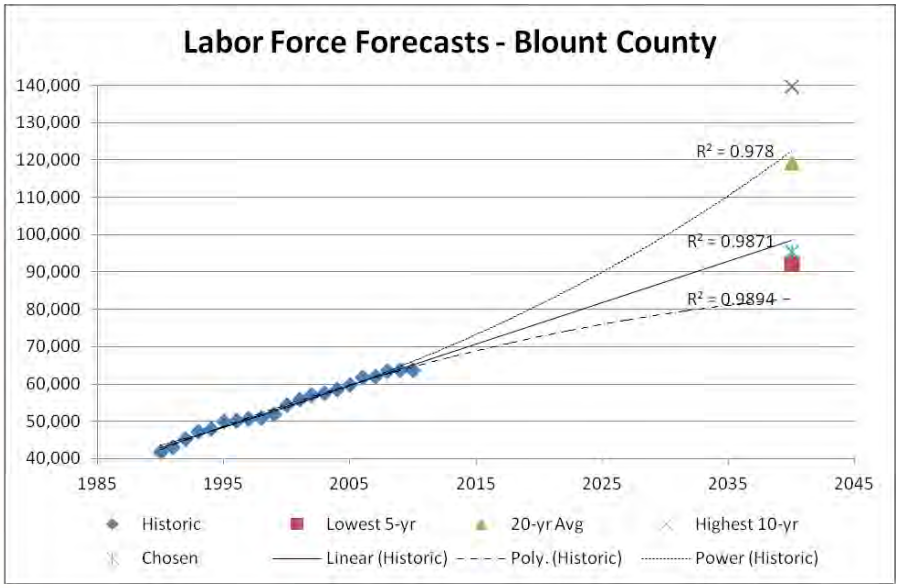
As was noted above, employment was forecast by four industry groups (Basic, Industrial, Retail and Service) and checked against total employment. These employment totals by industry are required for the travel demand model. Since the travel demand model's forecast years vary somewhat from the years originally produced by this process due to the timing of the plan documents and due to some definitional details for the industry groups, the TPO developed the breakout of employment by industry by year for the years required for their plan development displayed in Table G-14. This distribution is a reasonable adaptation of the direct results of the forecasting process for use in the model, given the nuances of the definitions of the industry groups in the travel model.

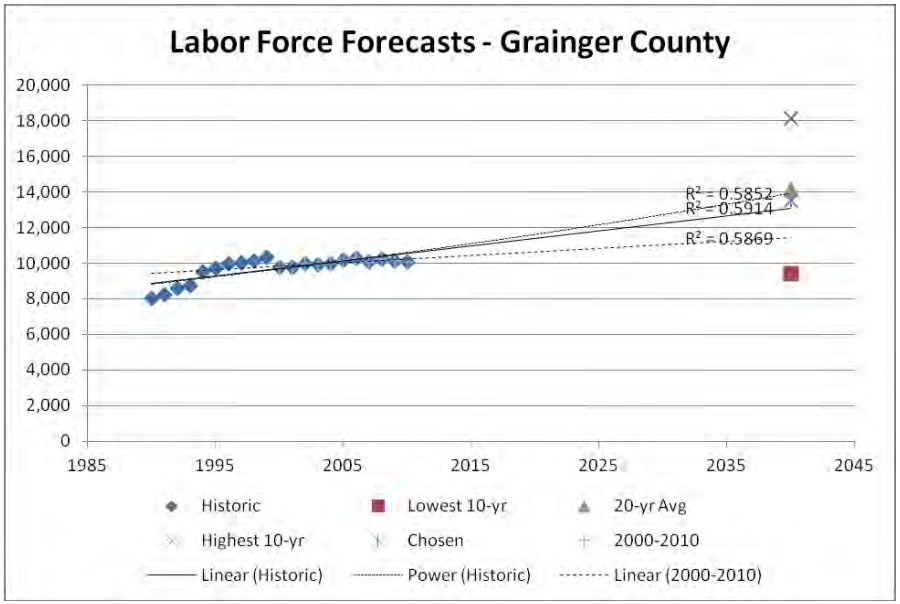
Table G-14: Employment by County by Industry by Year

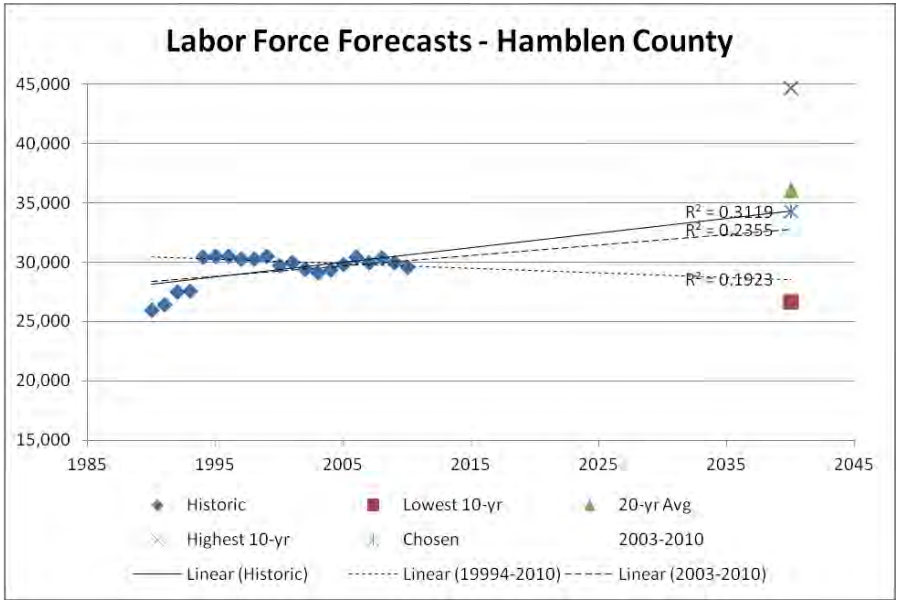
County	Sector	2010	2014	2024	2034	2040
Anderson	Basic	5,612	5,933	6,987	8,068	8,717
Anderson	Industrial	9,861	10,158	10,565	10,831	10,940
Anderson	Retail	8,186	8,639	9,859	11,164	11,981
Anderson	Service	28,908	30,420	35,492	40,708	43,838
Anderson	**Total**	**52,567**	**55,150**	**62,903**	**70,772**	**75,477**
Blount	Basic	7,357	7,357	7,451	7,770	8,002
Blount	Industrial	10,452	10,593	11,883	12,861	13,632
Blount	Retail	11,365	11,839	13,758	15,759	16,959
Blount	Service	30,629	31,988	37,367	42,965	46,324
Blount	**Total**	**59,803**	**61,777**	**70,458**	**79,354**	**84,918**
Grainger	Basic	1,964	1,978	2,052	2,191	2,266
Grainger	Industrial	1,324	1,325	1,412	1,508	1,566
Grainger	Retail	647	679	798	922	997
Grainger	Service	2,981	3,145	3,743	4,361	4,732
Grainger	**Total**	**6,916**	**7,126**	**8,005**	**8,983**	**9,561**
Hamblen	Basic	2,805	2,805	2,805	2,805	2,805
Hamblen	Industrial	11,888	12,310	12,944	14,608	15,606
Hamblen	Retail	6,703	6,893	7,177	8,029	8,540
Hamblen	Service	17,092	18,105	19,625	22,740	24,608
Hamblen	**Total**	**38,488**	**40,113**	**42,550**	**48,181**	**51,559**
Jefferson	Basic	2,941	2,941	2,941	2,941	2,941
Jefferson	Industrial	3,651	3,748	3,893	4,234	4,439
Jefferson	Retail	3,139	3,151	3,550	3,989	4,253
Jefferson	Service	9,603	9,934	11,890	13,972	15,222
Jefferson	**Total**	**19,334**	**19,775**	**22,274**	**25,136**	**26,854**
Knox	Basic	20,933	21,012	21,131	21,537	21,781
Knox	Industrial	37,656	39,066	43,792	48,652	51,568
Knox	Retail	61,220	64,606	75,026	85,662	92,044
Knox	Service	185,579	198,930	238,233	278,195	302,171
Knox	**Total**	**305,388**	**323,614**	**378,182**	**434,046**	**467,565**
Loudon	Basic	2,672	2,672	2,672	2,672	2,679
Loudon	Industrial	4,407	4,498	5,149	5,846	6,264
Loudon	Retail	3,650	3,814	4,573	5,371	5,849
Loudon	Service	8,651	9,124	11,361	14,234	16,254
Loudon	**Total**	**19,380**	**20,108**	**23,755**	**28,122**	**31,047**
Roane	Basic	1,522	1,522	1,522	1,522	1,522
Roane	Industrial	2,044	2,067	2,100	2,191	2,246
Roane	Retail	3,345	3,374	3,742	4,215	4,536
Roane	Service	15,589	16,277	18,876	21,571	23,187
Roane	**Total**	**22,500**	**23,240**	**26,241**	**29,499**	**31,491**
Sevier	Basic	4,696	4,804	5,425	6,154	6,630
Sevier	Industrial	1,863	2,043	2,464	2,882	3,133
Sevier	Retail	21,376	23,802	28,466	33,395	36,550
Sevier	Service	23,461	25,664	31,586	38,499	43,152
Sevier	**Total**	**51,396**	**56,312**	**67,941**	**80,930**	**89,465**
Union	Basic	1,059	1,088	1,221	1,362	1,447
Union	Industrial	994	1,055	1,265	1,481	1,611
Union	Retail	596	623	727	834	898
Union	Service	2,275	2,448	3,013	3,594	3,884
Union	**Total**	**4,924**	**5,214**	**6,226**	**7,271**	**7,840**

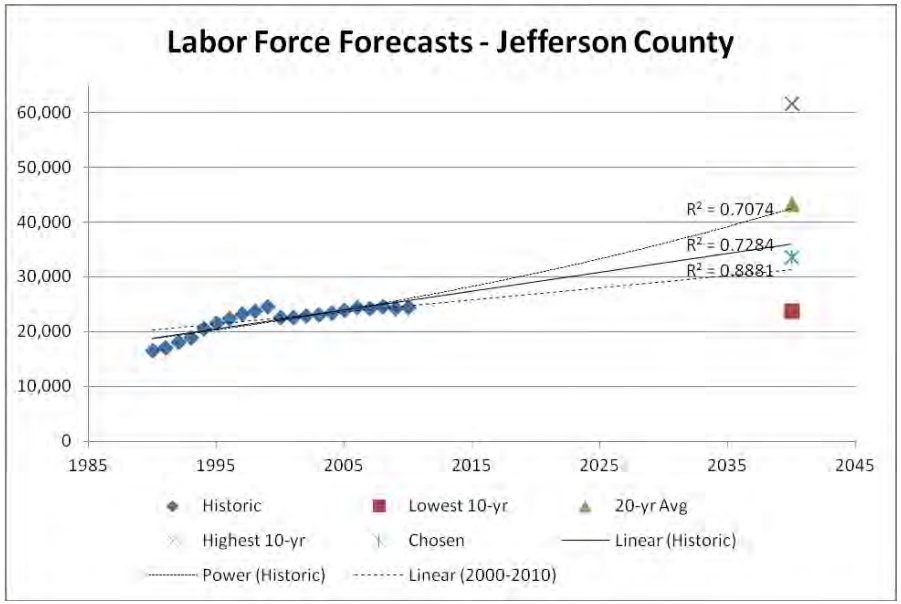
Appendix G-A: Labor Force Projections by County

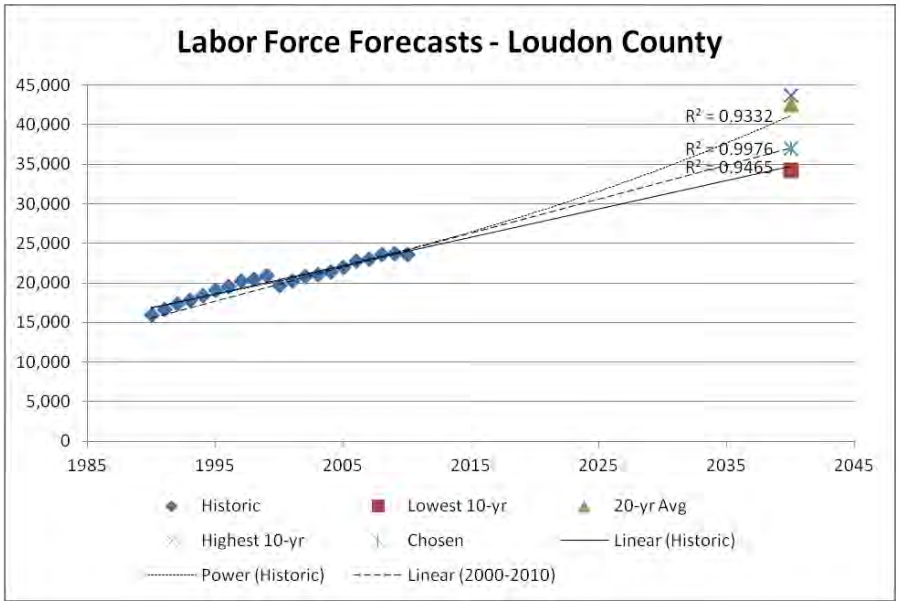


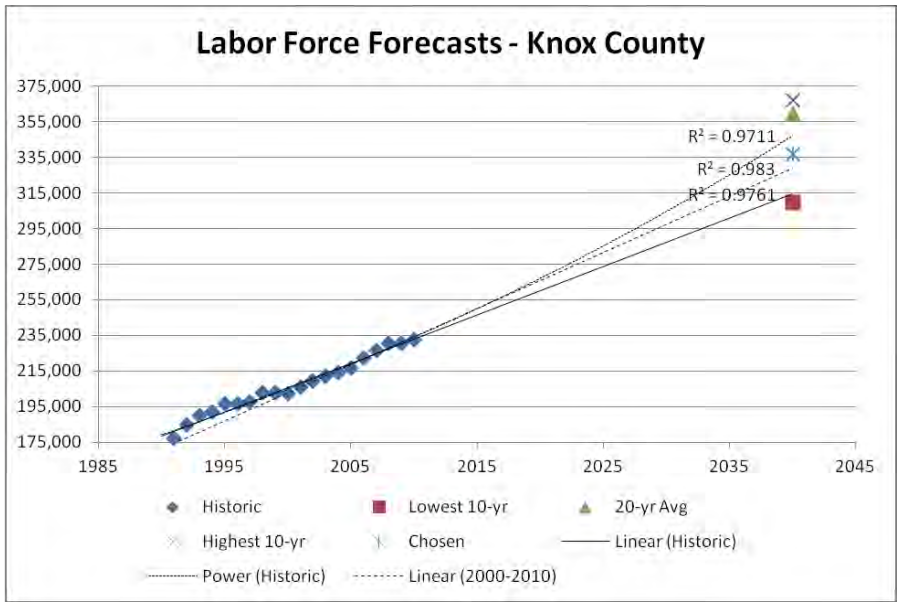


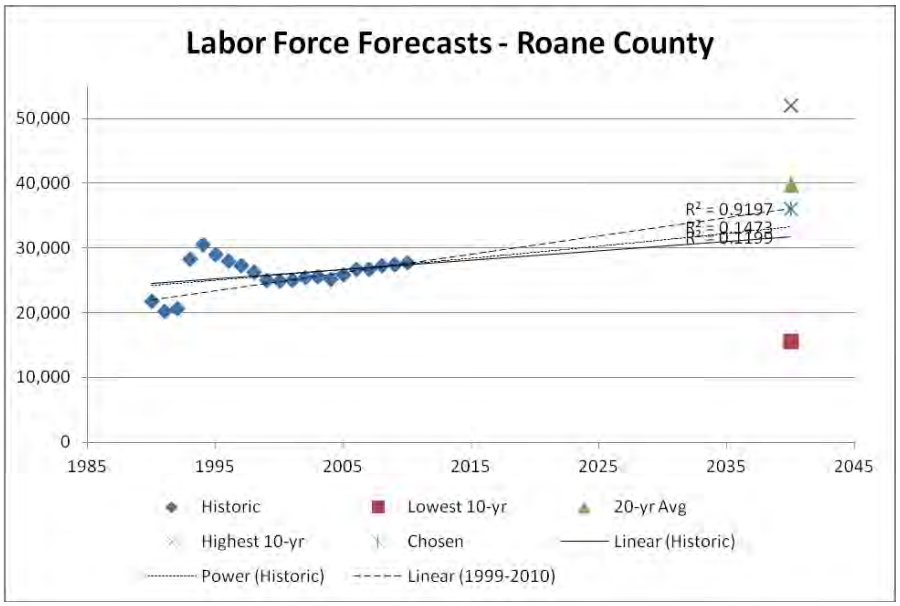


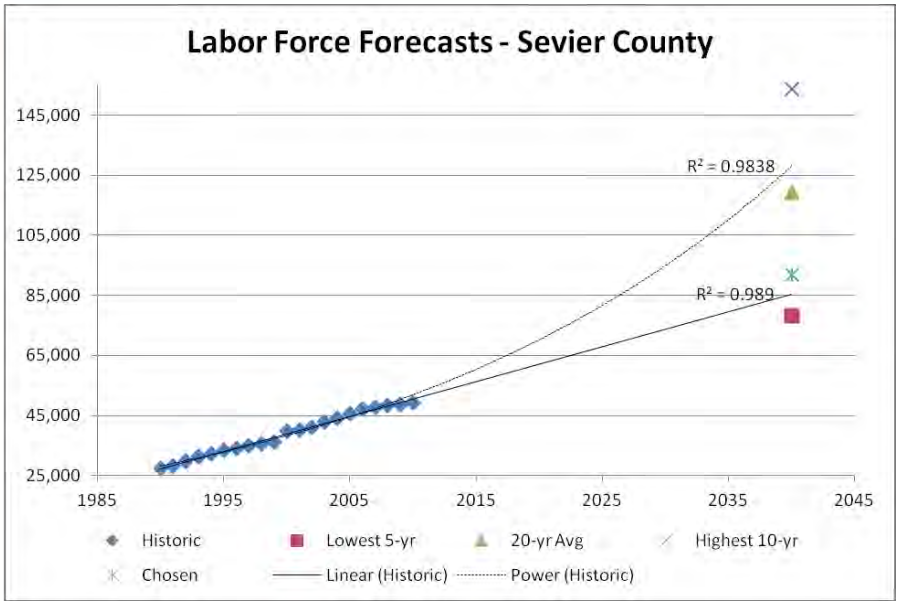


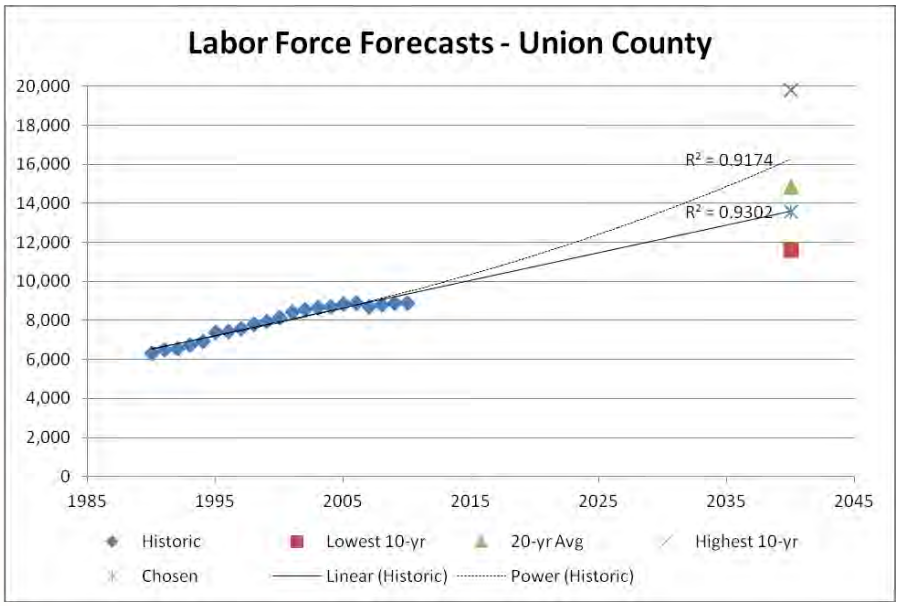

Labor Force Forecasts - Jefferson County
60,000
50,000
40,000
30,000
20,000
10,000
0
1985
1995
2005
2015
2025
2035
2045
R² = 0.7074
R² = 0.7284
R² = 0.8881
Historic
Lowest 10-yr
20-yr Avg
Highest 10-yr
Chosen
Linear (Historic)
Power (Historic)
Linear (2000-2010)


Labor Force Forecasts - Loudon County
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1985
1995
2005
2015
2025
2035
2045
R² = 0.9332
R² = 0.9976
R² = 0.9465
Historic
Lowest 10-yr
20-yr Avg
Highest 10-yr
Chosen
Linear (Historic)
Power (Historic)
Linear (2000-2010)

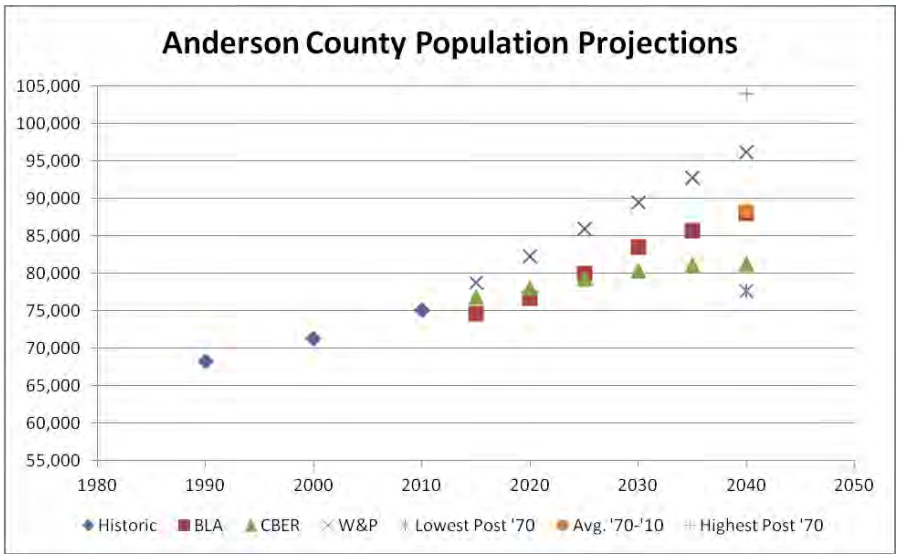

Labor Force Forecasts - Knox County
375,000
355,000
335,000
315,000
295,000
275,000
255,000
235,000
215,000
195,000
175,000
1985
1995
2005
2015
2025
2035
2045
R² = 0.9711
R² = 0.983
R² = 0.9761
Historic
Lowest 10-yr
20-yr Avg
Highest 10-yr
Chosen
Linear (Historic)
Power (Historic)
Linear (2000-2010)

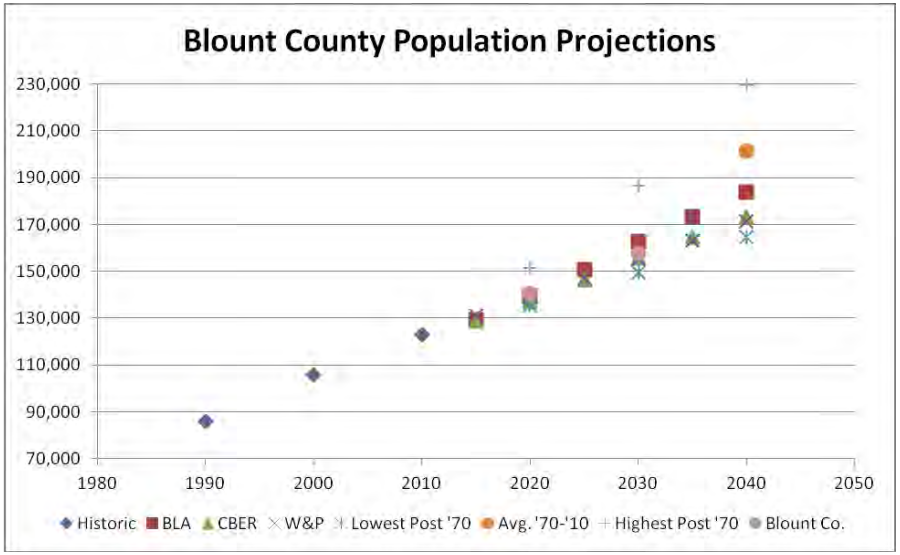

Labor Force Forecasts - Roane County
50,000
40,000
30,000
20,000
10,000
0
1985
1995
2005
2015
2025
2035
2045
R² = 0.9197
R² = 0.1473
R² = 0.1199
Historic
Lowest 10-yr
20-yr Avg
Highest 10-yr
Chosen
Linear (Historic)
Power (Historic)
Linear (1999-2010)

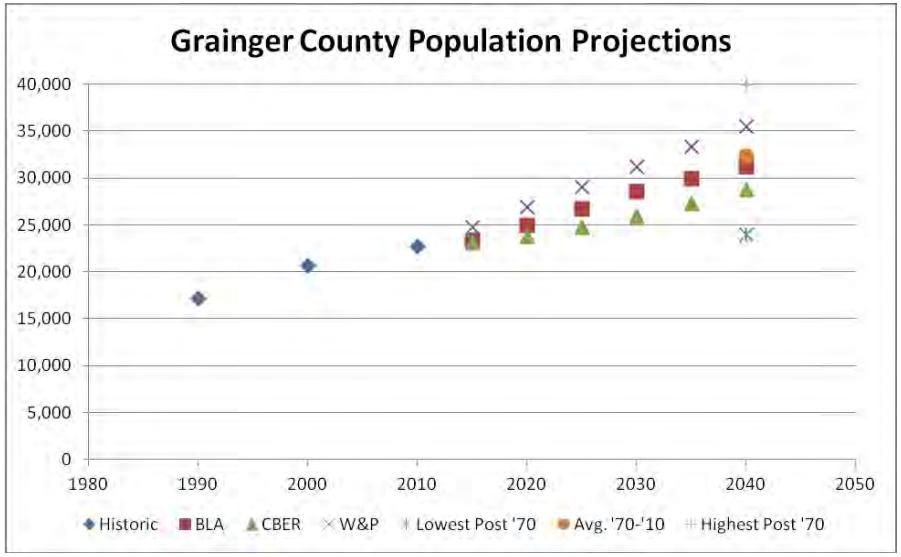


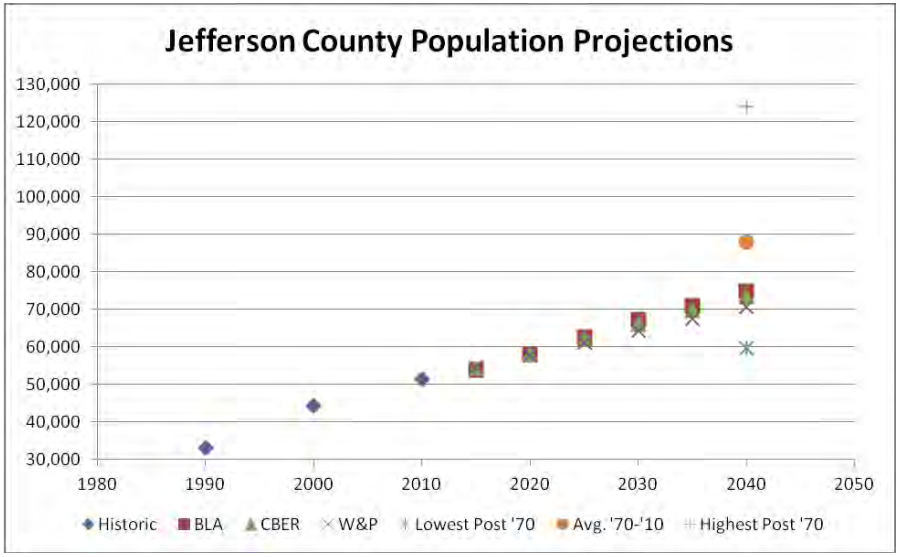


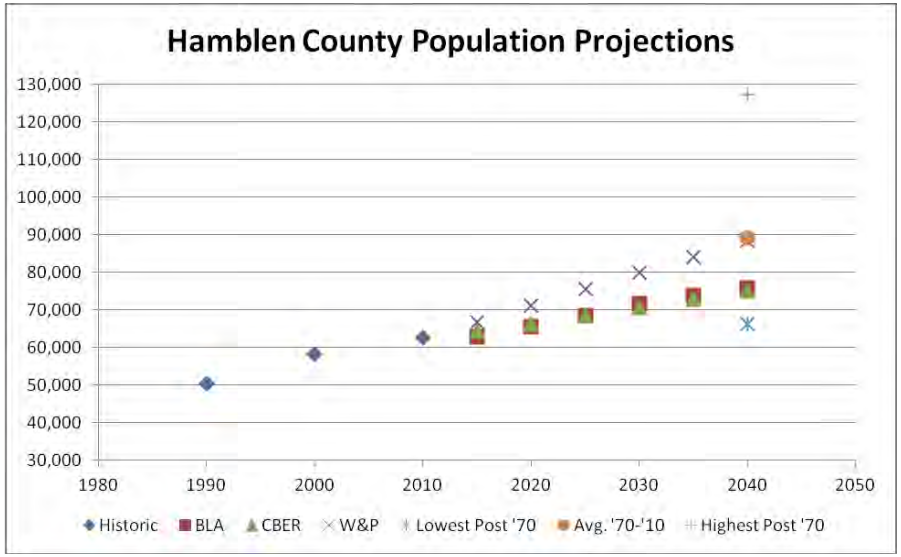
Appendix G-B: Population Projections by County

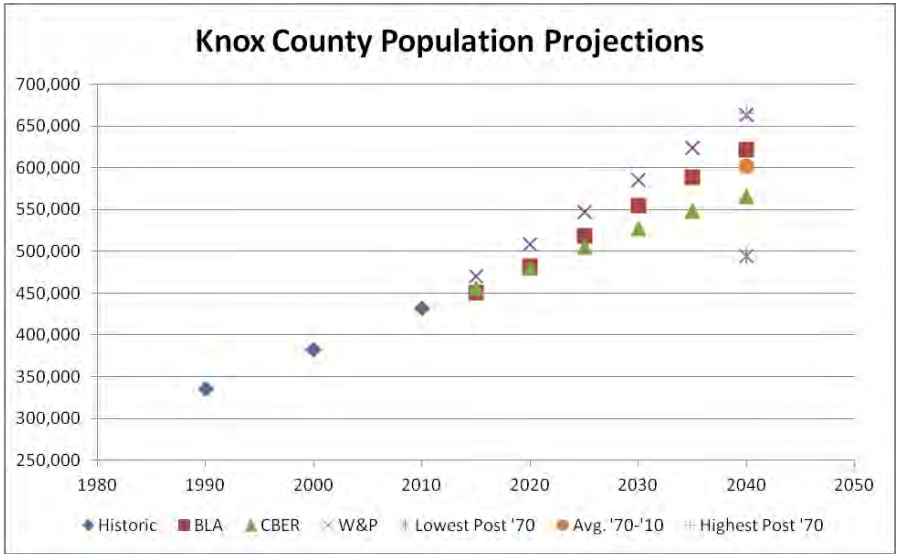


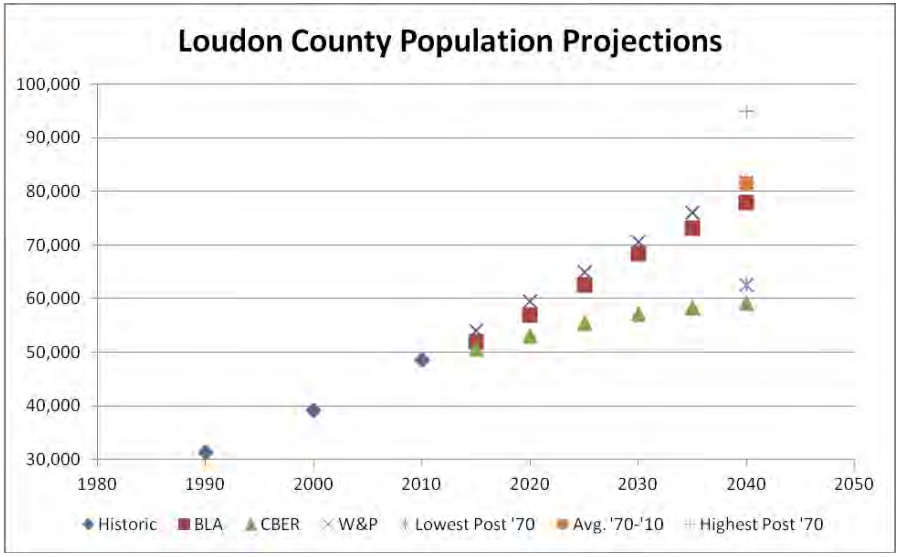


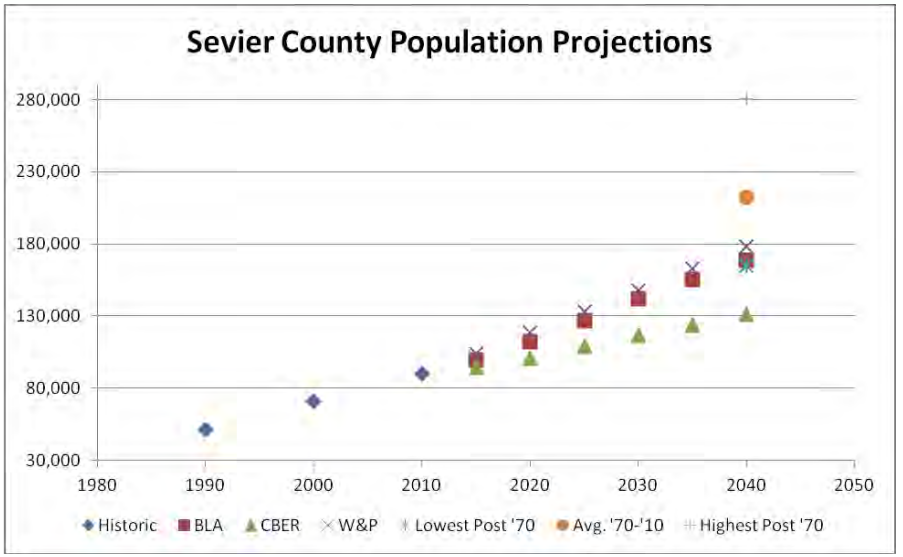

Grainger County Population Projections
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1980
1990
2000
2010
2020
2030
2040
2050
Historic
BLA
CBER
W&P
Lowest Post '70
Avg. '70-'10
Highest Post '70

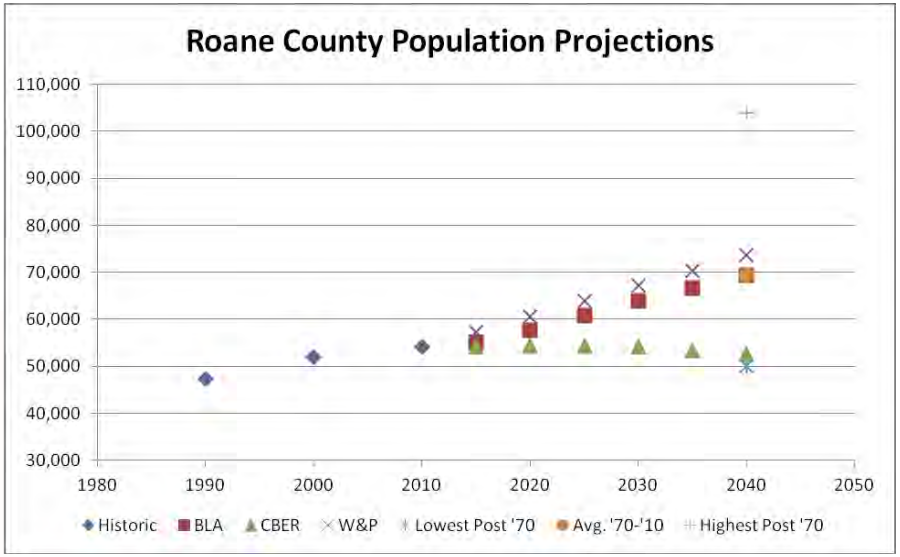

Jefferson County Population Projections
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
1980
1990
2000
2010
2020
2030
2040
2050
Historic
BLA
CBER
W&P
Lowest Post '70
Avg. '70-'10
Highest Post '70

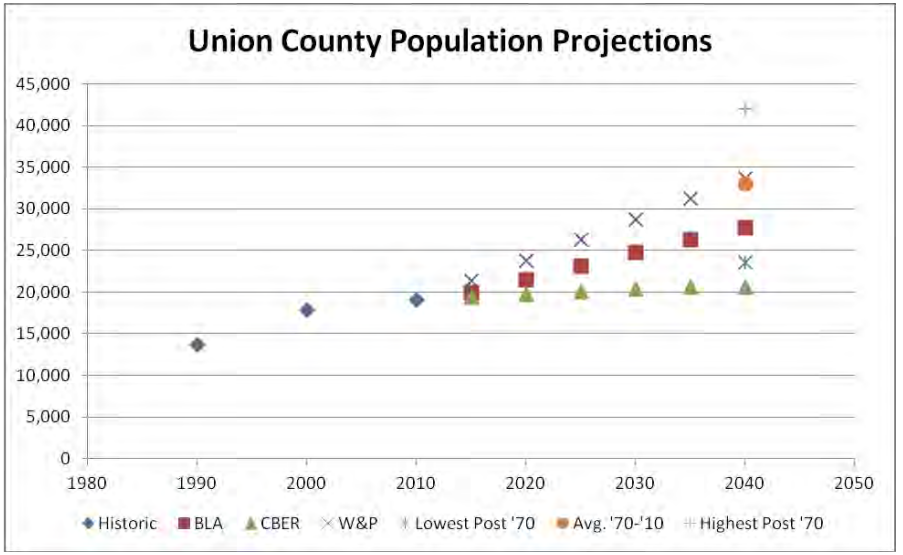

Hamblen County Population Projections
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
1980
1990
2000
2010
2020
2030
2040
2050
Historic
BLA
CBER
W&P
Lowest Post '70
Avg. '70-'10
Highest Post '70


Knox County Population Projections
700,000
650,000
600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
1980
1990
2000
2010
2020
2030
2040
2050
Historic
BLA
CBER
W&P
Lowest Post '70
Avg. '70-'10
Highest Post '70

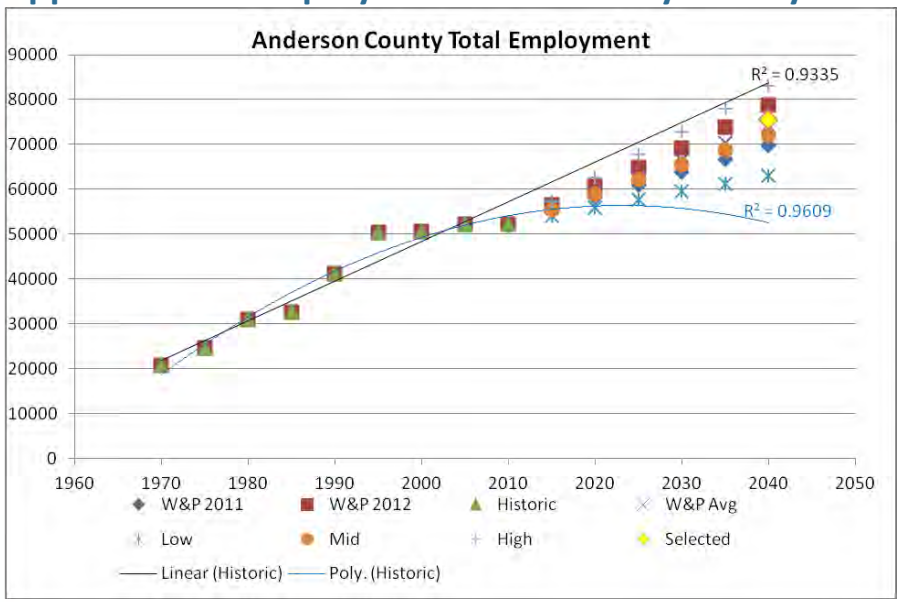

Loudon County Population Projections
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
1980
1990
2000
2010
2020
2030
2040
2050
Historic
BLA
CBER
W&P
Lowest Post '70
Avg. '70-'10
Highest Post '70

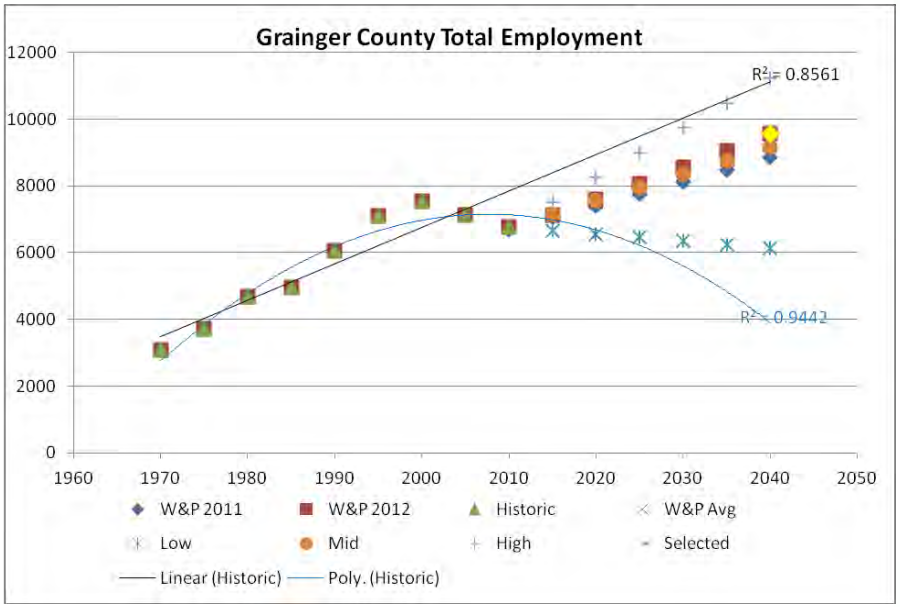

Sevier County Population Projections
280,000
230,000
180,000
130,000
80,000
30,000
1980
1990
2000
2010
2020
2030
2040
2050
Historic
BLA
CBER
W&P
Lowest Post '70
Avg. '70-'10
Highest Post '70

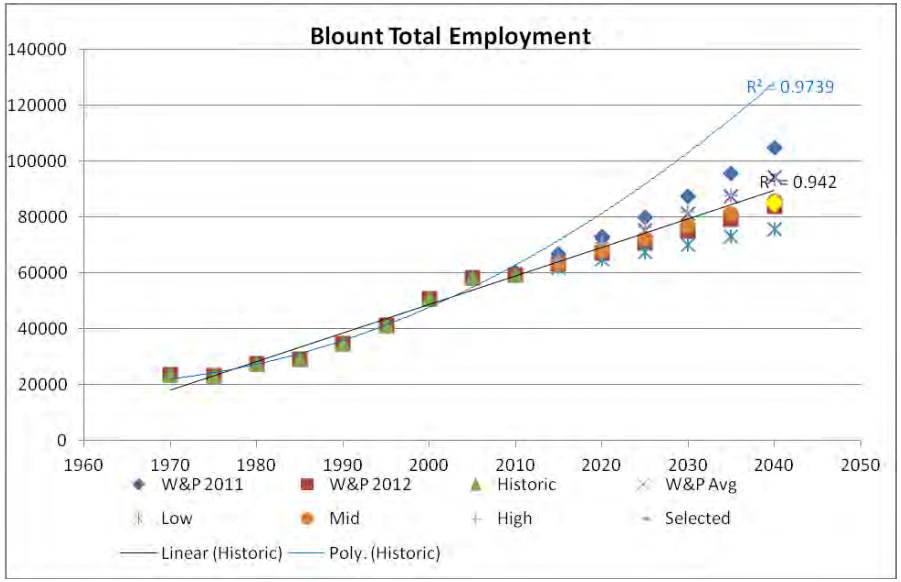

Roane County Population Projections
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
1980
1990
2000
2010
2020
2030
2040
2050
Historic
BLA
CBER
W&P
Lowest Post '70
Avg. '70-'10
Highest Post '70

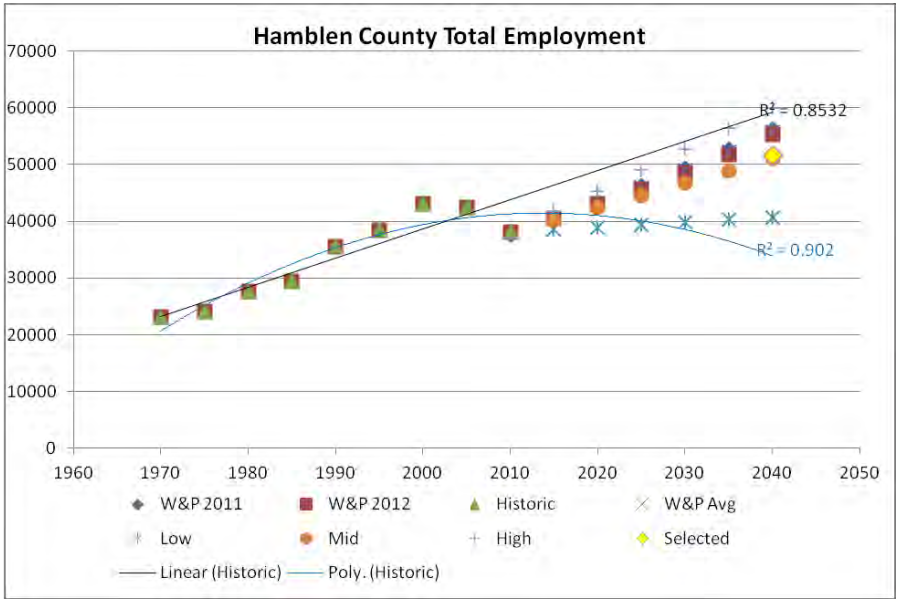

Union County Population Projections
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1980
1990
2000
2010
2020
2030
2040
2050
Historic
BLA
CBER
W&P
Lowest Post '70
Avg. '70-'10
Highest Post '70

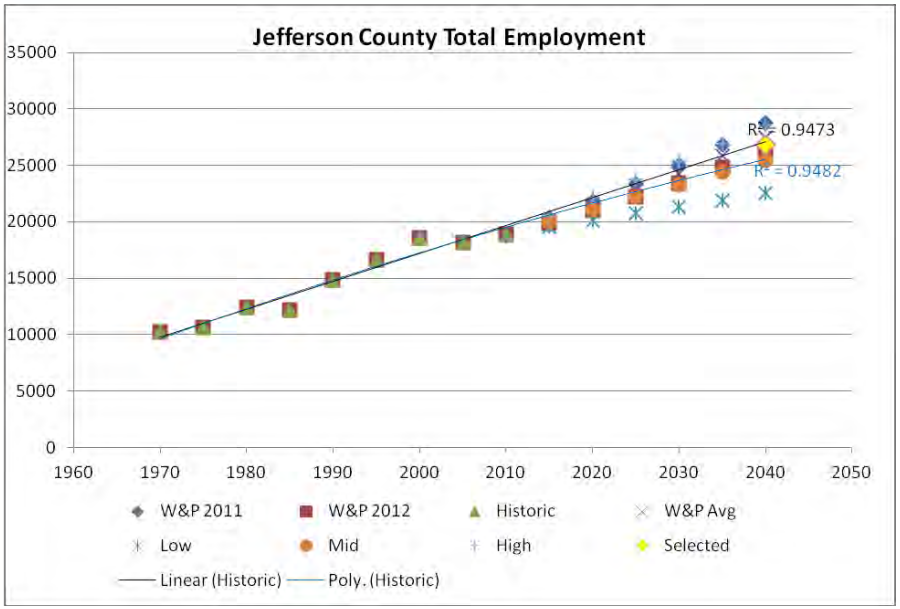
Appendix G-C: Employment Forecasts by County

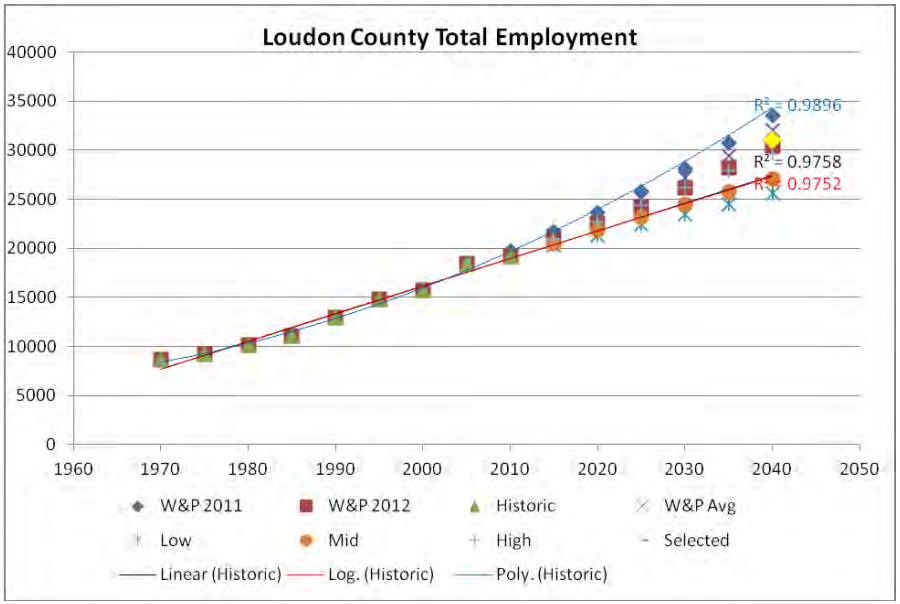


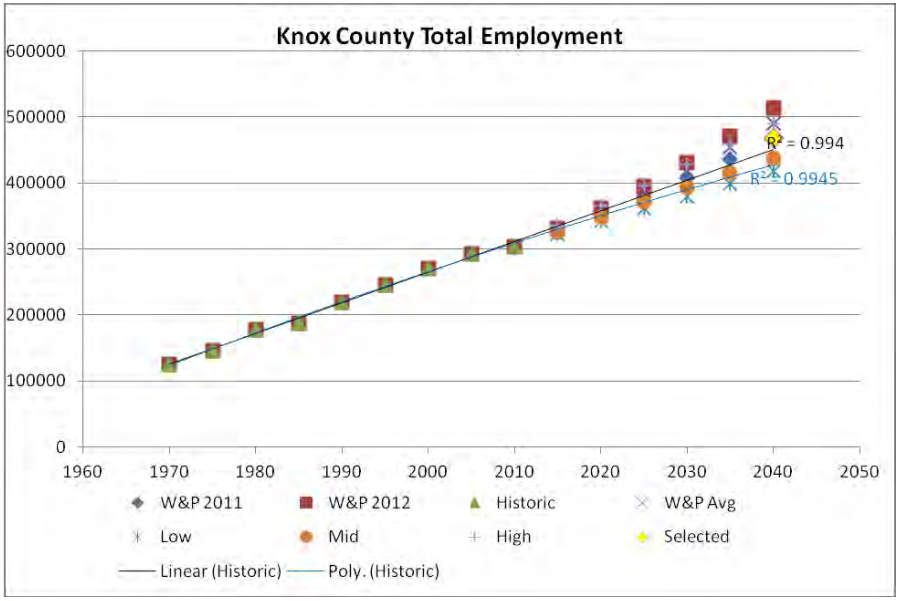


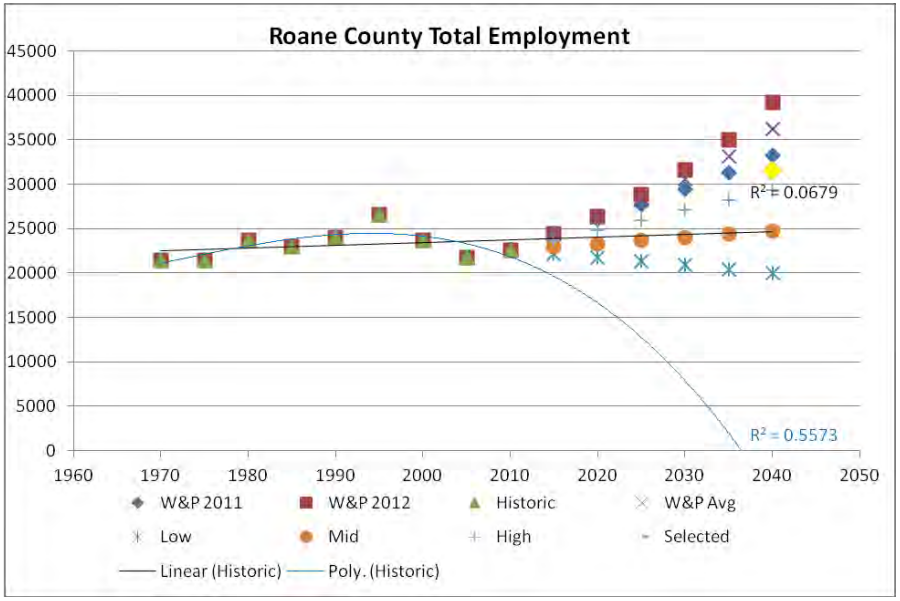


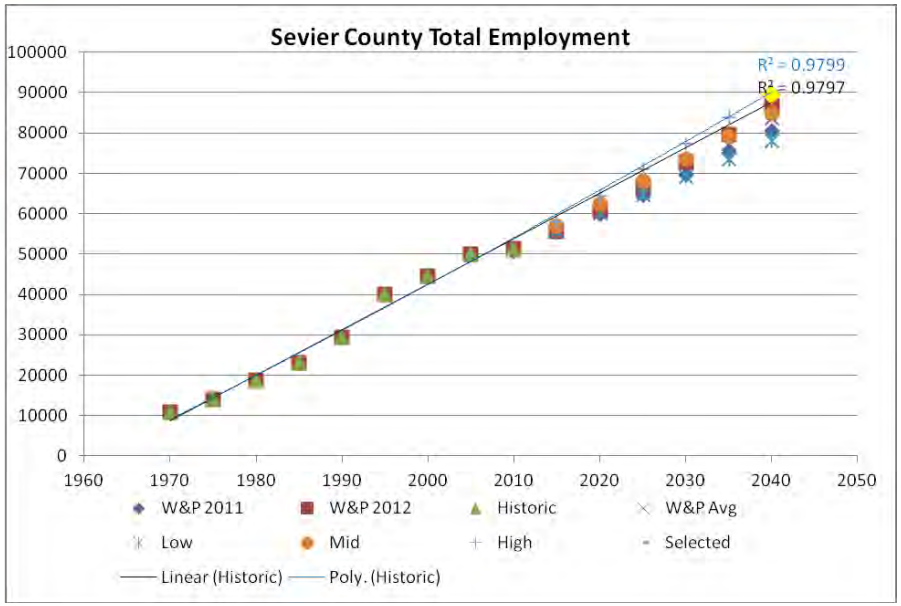


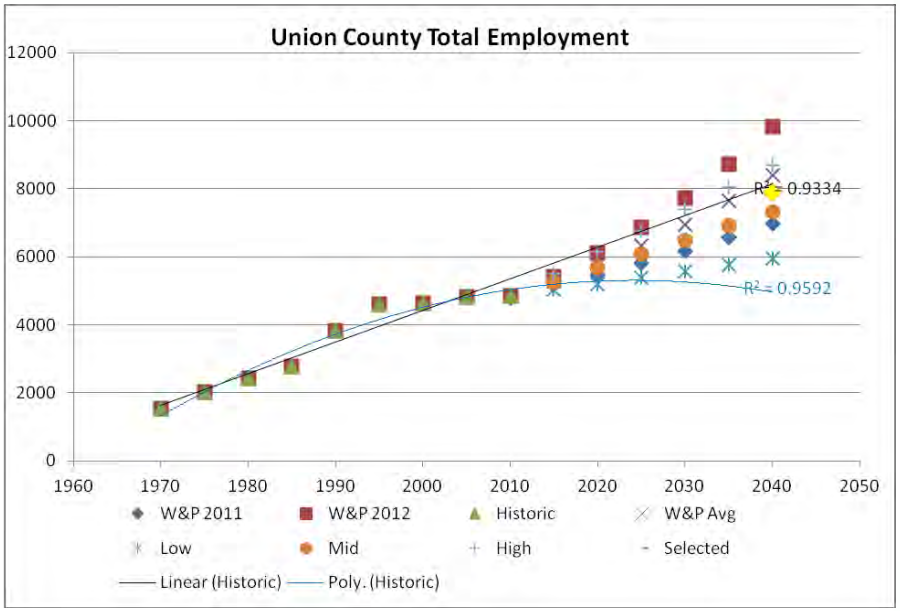

Jefferson County Total Employment
35000
30000
25000
20000
15000
10000
5000
0
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
R² = 0.9473
R² = 0.9482
W&P 2011
W&P 2012
Historic
W&P Avg
Low
Mid
High
Selected
Linear (Historic)
Poly. (Historic)


Loudon County Total Employment
40000
35000
30000
25000
20000
15000
10000
5000
0
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
R² = 0.9896
R² = 0.9758
R² = 0.9752
W&P 2011
W&P 2012
Historic
W&P Avg
Low
Mid
High
Selected
Linear (Historic)
Log. (Historic)
Poly. (Historic)


Knox County Total Employment
600000
500000
400000
300000
200000
100000
0
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
R² = 0.994
R² = 0.9945
W&P 2011
W&P 2012
Historic
W&P Avg
Low
Mid
High
Selected
Linear (Historic)
Poly. (Historic)


Roane County Total Employment
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
R² = 0.0679
R² = 0.5573
W&P 2011
W&P 2012
Historic
W&P Avg
Low
Mid
High
Selected
Linear (Historic)
Poly. (Historic)


Sevier County Total Employment
R² = 0.9799
R² = 0.9797
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
W&P 2011
W&P 2012
Historic
W&P Avg
Low
Mid
High
Selected
Linear (Historic)
Poly. (Historic)


Union County Total Employment
12000
10000
8000
6000
4000
2000
0
R² = 0.9334
R² = 0.9592
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
W&P 2011
W&P 2012
Historic
W&P Avg
Low
Mid
High
Selected
Linear (Historic)
Poly. (Historic)

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Appendix H: Model Documentation

Land Use Model (Partnered with Plan East Tennessee)

Background

The Knoxville Regional Transportation Planning Organization (TPO) and Metropolitan Planning Commission (MPC), in partnership with other agencies across the region, are in the process of undertaking Plan East Tennessee (PlanET), a planning and visioning effort for the five-county region that includes, Anderson, Blount, Knox, Loudon and Union Counties. PlanET includes a scenario planning component, which is a series of hypothetical transportation and land use scenarios that represent distinct alternatives for how the region could develop by the year 2040.

Because of the high degree of overlap and need for consistency between the PlanET scenario planning process and the TPO's Long Range Regional Mobility Plan, it was determined that the results of the PlanET scenario planning process would be used to satisfy the socioeconomic data forecasts required by the travel demand model as part of the Mobility Plan.

Trend Scenario

Scenario planning often begins with a "trend" or "business as usual" scenario that extrapolates current policy and practice for development. The PlanET Trend scenario will form the basis for socioeconomic data forecasts as part of the Mobility Plan. While PlanET is focused on a five-county region, the Trend scenario will include the larger ten-county region to satisfy the requirements of the travel demand model. The ten-county region includes the five PlanET counties plus, Grainger, Hamblen, Jefferson, Roane and Sevier Counties.

Allocation Tool

The PlanET Team intends to use CommunityViz to develop and evaluate the scenarios. CommunityViz is a GIS-based planning tool that estimates the development potential for land and the impacts of that development potential across a wide range of indicators. While the Team will ultimately use CommunityViz in full, the unique requirements of the Mobility Plan necessitate an alternative approach.

The Mobility Plan requires a "top-down" approach for socioeconomic data allocation, in which land use is allocated until prescribed control totals are met. Specifically, the Mobility Plan includes control totals for four attributes (population, commercial employment, service employment, and industrial employment), four forecast years (2014, 2024, 2034, and 2040), and each of the ten counties. All told, there are essentially 80 control totals as part of the allocation.

CommunityViz is configured to allocate one control total within any given study area. Thus, use of CommunityViz to allocate the Trend scenario would entail 80 separate models. Obviously, this approach would not be practical. As a result, a spreadsheet-based tool was developed to allocate the Trend scenario and estimate the socioeconomic data required for the Mobility Plan.

Overview of Allocation Process

The process used to allocate socioeconomic data for the Mobility Plan is a spreadsheet-based method that allocates control totals for each attribute, county and forecast year. It relies on three basic inputs:

- **"Supply"** – Inventories of vacant and redevelopable land based on existing conditions.
- **"Demand"** – A spatial measure of demand; where growth is most likely to happen.
- **"Rates"** – The rates of consumption (dwelling units per acre, employees per acre, etc.).

How and where new growth is allocated depends almost exclusively on these three inputs. Each of these is explained in greater detail below.

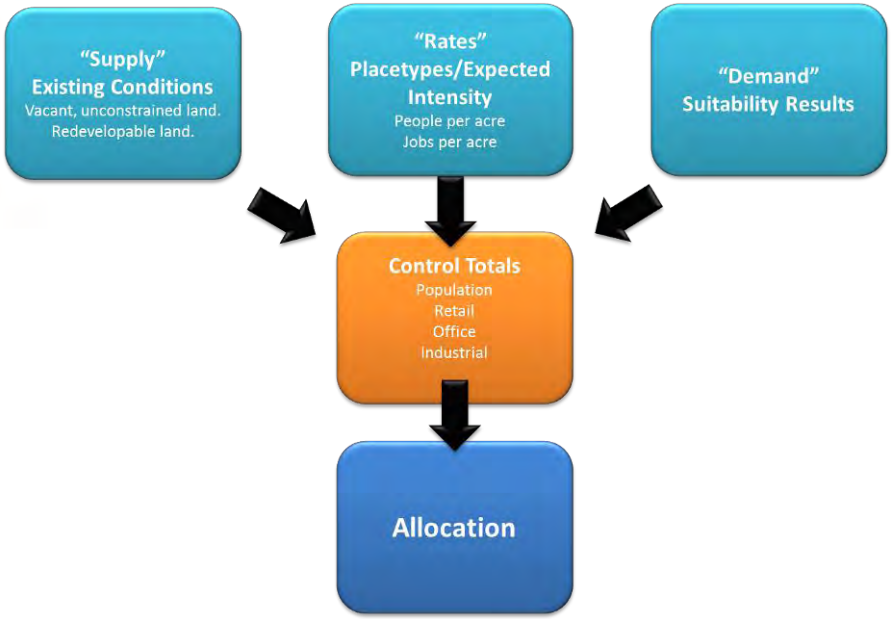

Figure H-1: Overview of Allocation Process

Data Structure

Land use is allocated to polygons formed by a grid of 40-acre cells that cover all ten counties. All polygons are "nested" within a traffic analysis zone (TAZ) so that polygon data can be aggregated to the TAZ level. In cases where a TAZ is smaller than a 40-acre grid cell (such as in many downtowns), the TAZ structure is the polygon. In sum, there are 60,896 polygons in the allocation model.

Existing Conditions

In order to allocate future land use to polygons, it is necessary to have an understanding of existing conditions. Specifically, it is necessary to know the amount of vacant and redevelopable land within each polygon.

Land Use Inventory

Staff from the MPC developed an inventory of existing land use using the computer-assisted appraisal system (CAAS) parcel database for all counties with the exception of Knox County. Existing land use for Knox County was derived from a more detailed inventory developed by the Knox County Property Appraiser. Land use classifications were standardized into nine broad categories:

- Single family residential
- Multi-family residential
- Commercial
- Office
- Industrial/manufacturing
- Public
- Railroad
- Public rights-of-way
- Vacant

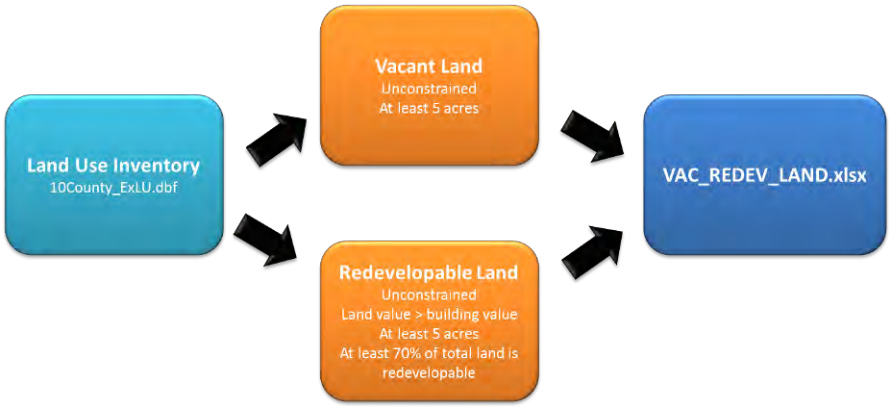

Figure H-2: Allocating Land Use Polygons

Vacant Land

Vacant land within each polygon was derived from the land use inventory. A given polygon is considered eligible for growth allocation if the vacant land meets the following criteria:

- Minimum of five acres for office and residential development.
- Minimum of ten acres for commercial and industrial development.

Redevelopable Land

In addition to vacant land, it is assumed that future growth will also occur through redevelopment of existing development. Existing development within a given parcel is considered eligible for redevelopment if it meets the following criteria:

- Non-residential land.
- The assessed land value (as determined by the CAAS database) exceeds the building value.
- Minimum of five acres in size.

- At least 70 percent of the non-residential land meets the other criteria for redevelopment.

Environmental Constraints

Environmental constraints were taken into account when determining vacant and redevelopable land. Specifically, vacant and redevelopable land that exists on wetlands or very steep (greater than 20 percent) is defined as "constrained" and is not eligible for new growth allocation.

Suitability Analysis

The "demand" portion of the allocation process was derived using the Suitability Analysis module within CommunityViz. The Suitability Analysis is based on an overlay of several factors that influence the location of new growth.

Suitability Factors and Weighting

The Suitability Analysis replicates demand for future growth by taking into account several factors that currently influence development within the region (i.e. current development trends). Separate suitability analyses are developed for commercial, office, industrial and residential land, as each has different development influences. Each polygon receives a relative score from zero to 100 based how "suitable" it is for a given type of development.

Suitability factors are weighted on a scale of one to ten based on the amount of influence of that a given factor has on new growth. A score of ten indicates the greatest amount of influence. Weights were determined through a nonscientific poll of professionals in the planning, real estate and development industries.

Suitability Analysis Weighting Factors

Category	Weight: Residential	Weight: Commercial/Retail	Weight: Professional/Office	Weight: Industrial	Suitability Factor	Description	Scoring Strategy
Environmental / Physical Constraints	7.5	5.0	2.5	5.0	Floodplains	Portion of polygon within the 100-year floodplain.	The higher % of floodplain coverage, the lower the score
	2.5	2.5	2.5	10.0	Topography	Average slope of the terrain with each polygon.	The higher the average slope, the lower the score.
Infrastructure	5.0	10.0	10.0	10.0	Proximity to major roads (arterials)	Straightline distance to the nearest major surface road.	The closer the proximity, the higher the score.
	2.5	7.5	7.5	10.0	Interstate access	Straightline distance to the nearest interchange.	The closer the proximity, the higher the score.
	NA	NA	NA	2.5	Proximity to rail lines	Straightline distance to the nearest railroad.	The closer the rail line, the higher the score.
	10.0	10.0	7.5	7.5	Proximity to sewer	Straightline distance to existing sewer lines.	The closer the sewer line, the higher the score
	10.0	10.0	10.0	7.5	Proximity to water lines	Straightline distance to existing water lines.	The closer the water line, the higher the score
Regulatory	7.5	5.0	5.0	5.0	Zoning compatible districts	Awards a polygon if it is located in a district with compatable zoning.	The higher the percentage of compatible zoning coverage, the higher the score.
	5.0	5.0	5.0	5.0	Future land use policy	Awards a polygon if it is located in a district with compatable future land use.	The higher the percentage of compatible FLU coverage, the higher the score.
Market/other	5.0	5.0	5.0	5.0	Redevelopment potential	Based on MPC analysis of existing commercial/office/industrial properties.	Penalizes a polygon if an existing use is located there (versus a vacant parcel).
	7.5	5.0	5.0	2.5	Regional accessibility to employment and services	TAZ-level index of accessibility to all other TAZs in the TPO travel demand model.	The higher the accessibility, the higher the score.
	5.0	7.5	NA	NA	Proximity to retail / commercial development	Point density analysis of retail employment based on a one-mail radius.	The higher the concentration of retail employment, the higher the score.
	5.0	5.0	NA	NA	Growth hotspot	2000-2010 population growth (TAZ-level) relative to countywide population growth.	The higher the percentage growth, the higher the score.
	NA	7.5	NA	NA	Median household income		
	10.0	NA	NA	NA	School quality	Average test scores by school district.	The higher the average test score, the higer the score.
	7.5	NA	NA	NA	Lakefront access		Score for locations with lake access.
	5.0	5.0	5.0	5.0	Approved development	Places emphasis on polygons that include approved developments.	Higher scores for polygons with approved development.
	5.0	NA	NA	NA	Proximity to parks	Straightline distance to existing park and recreational areas	The closer the park, the higher the score
	2.5	NA	NA	NA	Proximity to greenways and trails	Straightline distance to existing greenways and multi-purpose trails	The closer the greenway/trail, the higher the score

Normalization

The resulting suitability scores are calculated at the regional level, so that the most suitable polygon in the ten-county region receives a score of 100. However, control total allocations are performed at the county level. As a result, each suitability score (commercial, office, industrial, residential) is normalized at the county level, so that the most suitable polygon within a given county receives a score of 100.

Placetypes

The "rate" of allocation, such as persons per acre (for residential allocations) and employees per care (for non-residential allocations) are determined through placetypes. Placetypes are defined at the polygon level and are used as the basic "building block" of growth.

Placetype Definitions

Placetypes are used to define the character and makeup of a place, in this case polygons developed for the ten county region. At a minimum, placetypes define the types of land uses that occur within a given polygon and densities and intensities, but could also be used to describe a host of attributes, such as parking, water consumption, etc.

A series of "trend" plactypes, representing current development practices, were developed by MPC staff for the growth allocation. The placetypes are derived from observations of several actual developments across the region and include prescribed allocation rates.

Table H-1: Placetype Definitions

Placetype	Persons/Employees per Gross Acre			
	Retail	Residential	Office	Industrial
Rural	0.00	0.54	0.00	0.00
Rural Residential	0.00	1.02	0.00	0.00
Rural Neighborhood	0.00	2.41	0.00	0.00
Suburban Residential (Low Density)	0.00	5.99	0.00	0.00
Suburban Residential (Moderate Density)	0.00	8.53	0.00	0.00
Transitional Neighborhood	0.00	10.00	0.00	0.00
Suburban Apartment	0.00	16.87	0.00	0.00
Strip Commercial	8.71	0.00	9.53	0.00
Community Commercial Center	10.98	0.00	1.91	0.00
Regional Commercial Center	24.05	0.00	0.00	0.00
Mixed Use Center/Corridor	12.02	13.30	95.29	0.00
Office Park	0.00	0.00	28.97	0.00
Industrial Park	0.00	0.00	3.31	14.48

Placetype Designations

In order to determine which specific allocation rate (employees/persons per gross acre) applied to a given polygon, MPC staff gave each polygon a placetype designation. The designations were determined through a combination of factors, including existing zoning, recent development trends and consultation with local planning staff. Each polygon received a separate placetype designation for the commercial, office, industrial and residential allocations.

Figure H-3: Placetype Designation

Pre-Allocation

A certain portion of future growth is not allocated through the spreadsheet-based method. This growth is "pre-allocated" based on two distinct factors: growth within existing employers and approved development where construction is underway or imminent. Employment and population associated with these two factors were subtracted from the control totals for the growth allocation.

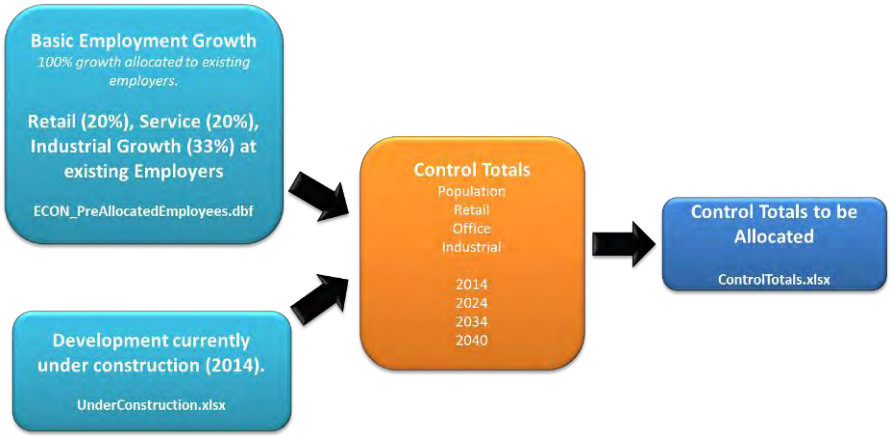

Figure H-4: Pre-Allocation

Existing Employers

It assumed that some future growth within in the region will occur through expansion of existing employers. For the purpose of the growth allocation, it is assumed that 100 percent of growth in the basic employment sector, 20 percent of growth in the commercial and office employment sectors and 33 percent of the growth in the industrial employment sector will occur through expansion at existing locations.

Existing employment growth is allocated from county control totals to polygons in direct proportion to the amount of existing employment. For example, if a given polygon contains 10 percent of that county's total employment in a given sector, it will receive 10 percent of the future growth.

Committed Development

Some developments throughout the region have already been approved and are either under construction or it is imminent. These developments, including land use, population and employment data, were allocated to polygons. Land use associated with committed development was taken out of the vacant land inventory.

Allocation Process

The allocation process itself is a stepwise, iterative process that takes into account vacant a redevelopable land, the suitability score, the placetype designation and the countywide control total. A separate allocation is performed for each control total ((population, commercial employment, service employment and industrial employment) and forecast year (2014, 2024, 2034 and 2040).

Briefly stated, the allocation begins with the retail employment category and the 2014 forecast year. The spreadsheet allocates growth based on the following logic:

- **Suitability score:** Highest scoring polygons are allocated growth first. Growth is allocated in direct proportion to the score (i.e. a score of 80 means that 80 percent of the vacant/redevelopable land will be developed).
- **Vacant/redevelopable land:** If a given polygon has no vacant or redevelopable land, no growth will be allocated.
- **Placetype designation:** If eligible for growth allocation, the polygon will be allocated growth at a rate (employees/persons per gross acre) prescribed by its placetype designation. If a placetype is not oriented to the attributes of a given allocation, it will not be allocated (for example, an Industrial Park placetype designation will not be allocated growth for a retail employment allocation).
- **Control total:** If a control total for a given attribute and horizon year has already been met, that polygon will not be allocated growth.

Once a polygon has been allocated growth, the amount of land that has been developed will be subtracted from the vacant and redevelopable land inventory. The allocation occurs in the following order: retail, office, residential, industrial.

Once the allocation process has passed through all four categories for a horizon year, if a given control total has not been fully allocated, a second iteration will occur. During the second iteration, the highest scoring polygon is allocated additional growth in direct proportion to its score and the amount of remaining vacant and redevelopable land.

The process is repeated for the 2024, 2034, and 2040 horizon years.

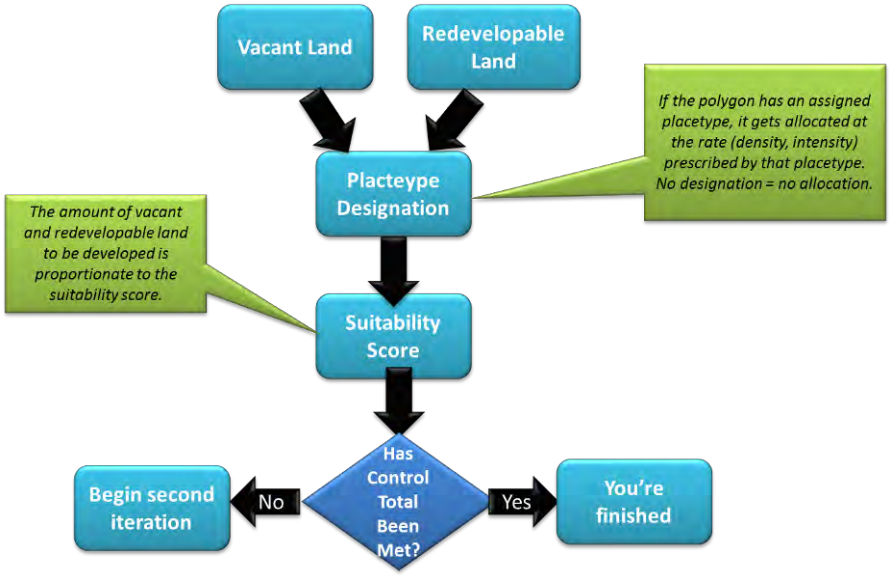

Figure H-5: Allocation Process

TAZ Aggregation

Once the allocation is complete, data is aggregated from polygons to TAZs for use in the travel demand model. Aggregate-level data is provided for population and commercial, office, industrial and basic employment.

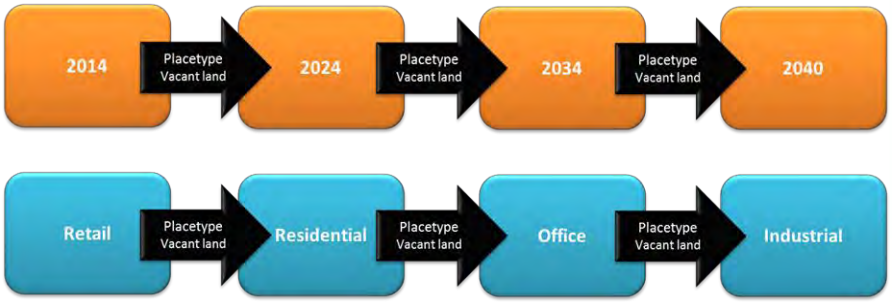

Figure H-6: TAZ Aggregation

Travel Demand Model Development and Validation Report

Introduction

The Knoxville Regional Transportation Planning Organization (TPO) contracted with Bernardin, Lochmueller & Associates, Inc., (BLA) to conduct an update of their travel demand forecasting model. The current version of the Knoxville Regional Travel Model (KRTM) is implemented in TransCAD, version 6.0, a GIS-based travel demand modeling software, using the software's scripting language, GISDK.

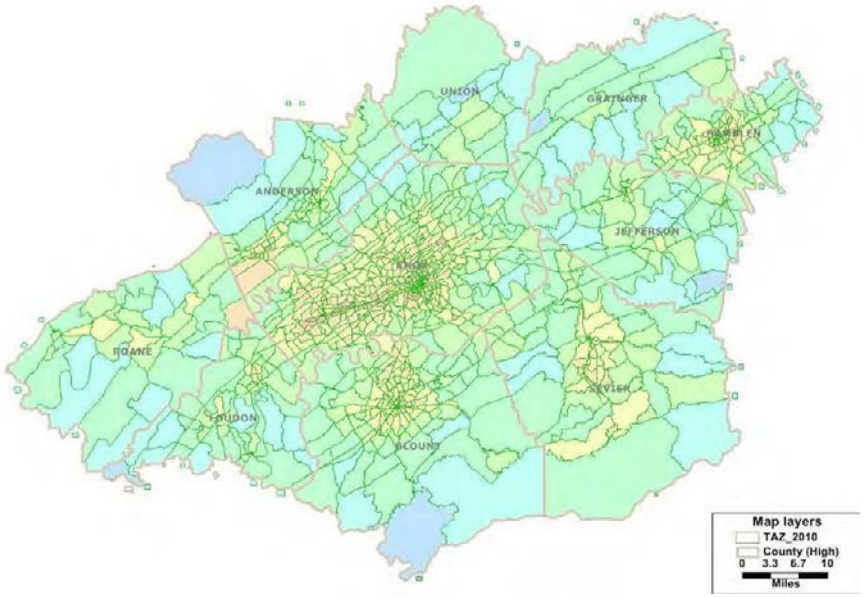

Figure H-7: Knoxville Regional Travel Model Study Area

The KRTM predicts average weekday traffic volumes for all roadway classes of Knox, Blount and Hamblen counties and major arterials and collectors in Anderson, Jefferson, Sevier, Loudon, Union, Roane, and Grainger County. The model's roadway network covers over 7,500 lane miles in total over an area of 3,725 square miles represented by 1,186 traffic analysis zones. The current version of the model also predicts the Knoxville Area Transit (KAT) average weekday system ridership and the number of average weekday bicycle and pedestrian trips within the region.

The current model update was undertaken to accomplish three goals. The first goal was to update and revalidate the model to a new 2010 base year taking advantage of new Census and employment information and the latest traffic counts. The second goal was to incorporate within the regional model Hamblen County, which was previously modeled separately by the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) and provide instead a subarea model for their use. The third goal was to develop scripts to post-process the model results to create inputs necessary for the EPA's new MOVES emission model. Under the same contract, BLA also prepared socioeconomic county control totals for the region to assist in the development of land use forecasts.

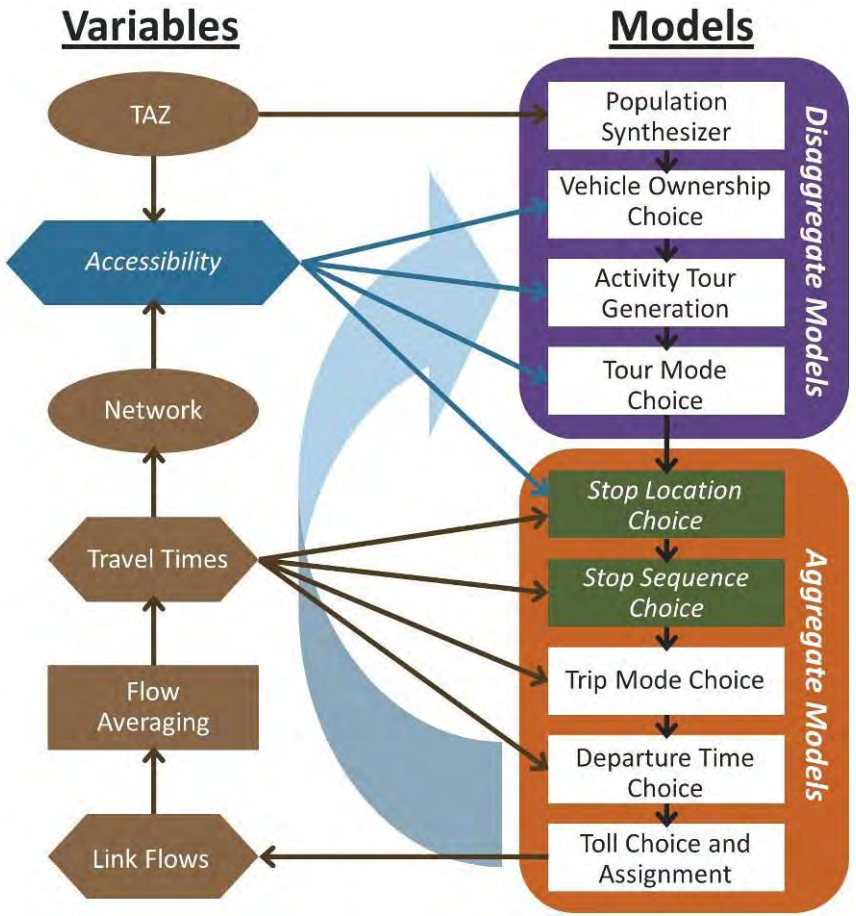

Figure H-8: The Knoxville Regional Travel Model's Hybrid Design

This update did not involve major updates to the core model components or the 'hybrid' architecture first adopted in the 2009 model update. The overall architecture of Knoxville's hybrid model is illustrated in Figure H-8. For an overview of the Knoxville model's architecture and the details of its components please refer to the Knoxville Regional Travel Demand Model Update 2009: Model Development and Validation Report.

This report focuses on the 2012 update, documenting the revalidation of the regional model to the 2010 base year and the incorporation of the Morristown area. The report reviews and documents the calibration of each of the model's major components.

Tour and Stop Generation

The Knoxville Regional Travel Model (KRTM) has a hybrid design using elements of activity based model architecture during generation. The model creates a disaggregate synthetic population of households in the region based on the demographic information associated with the traffic analysis zones (TAZs).

The new 2010 TAZ layer has been updated with household and population estimates from the 2010 Decennial Census, with additional zonal household demographic information from the 05-09 American Community Survey. Zonal employment data was estimated from a combination of sources, including Dun & Bradstreet, using the 2009 Bureau of Economic Analysis (BEA) totals factored to 2010 based on a linear growth rate as a control.

The synthetic population is developed in two steps. First, a set of ordered response logit models predict for each variable (household size, number of workers, K12 students, presence of seniors, and income) the number of households which have each level of that variable (one person, two persons, etc., zero workers, one worker, two workers, etc.). Second, iterative proportional fitting is used to develop the synthetic population based on a seed population file of households and the marginal distributions for each variable provided by the logit models. The use of shadow prices in the generation of the marginal distributions guarantees that the synthetic population created by iterative proportional fitting will fit the control totals set by the TAZ layer (BLA Inc. 9).

A new seed population file was tested using the 08-10 ACS PUMS data. However, initial results showed many zones did not converge during the iterative proportional fitting step resulting in an over estimate of population. Currently, the former seed file based on the combined travel survey data from 2000 and 2008 is being used. The seed file has been edited so that all records are used for the entire model region, rather than designating records for use in smaller regions of the TAZ layer. Using one region for the seed file helped the results of the synthetic population converge to the zonal marginal totals.

The estimation of vehicle availability is accomplished by a separate disaggregate ordered response logit choice model. Unlike the aggregate ordered response logit models used in the population synthesizer, this model does not include average zonal vehicle availability as an input/control variable or shadow prices to ensure consistency with an input variable. Inputs to this model come from the population synthesizer for individual households. The model is also sensitive to the proximity of transit service, urban design factors, and gas price (BLA Inc. 16-19). Analysis showed that when adjusted for inflation back to 2006 dollars, the 2010 average regular gasoline price was $2.41 for the Knoxville region, nearly the same as the $2.40 price used in the 2006 base model.

Table H-2 shows the results of the 2010 base year synthetic population compared with control totals from the Census and ACS.

Table H-2: Synthetic Population Results

Demographic Variable	2010 KRTM Synth Pop	2010 Census from TAZ Layer	05-09 ACS Zonal Averages X Households from TAZ Layer
HH	396,156	396,156	
HH Population	958,490	958,227	
Avg HH Size	2.42	2.42	
Workers	449,938		449,952
Workers Per HH	1.14		1.14
K12 Students	159,880		159,886
Students Per HH	0.40		0.40
% of HH with Senior present	25.1%		25.1%
Vehicles	740,614		765,045
Veh_Per_Person	0.77		0.80
Veh_Per_HH	1.87		1.93

The synthetic population results closely converged to the TAZ layer demographics. The vehicle availability model did under predict region wide vehicles by 3.2% when compared to the TAZ layer's average zonal vehicles multiplied by zonal households. Since the households came from the decennial census, a second check using households from the 2005-2009 ACS source data showed region wide vehicle ownership at 736,724 in aggregate, closely matching the vehicle availability model. An additional vehicle population projection data point of 762,920 was provided by TDEC, which was developed as an interim

estimate for input to the current EPA vehicle emissions model MOVES and is closer to the TAZ layer estimate indicating that the synthetic population's vehicle population may indeed be approx. 3% low. An attempt to use a data set from the University of Tennessee that was developed from vehicle registration data was inconclusive, as the data set did not include Grainger, Hamblen, and Union counties.

Table H-3 shows the difference between the KRTM Synthetic population from base year 2006 and 2010 while distinguishing between growth associated with the additional model coverage area and growth observed in the area, which was modeled during the base year 2006. Table H-4 shows the household income stratification of the synthetic population vs. the 05-09 ACS.

Table H-3: Synthetic Population Growth 2006-2010

Variable	2006 KRTM Synth Pop Old Coverage Area	2010 KRTM Synth Pop Old Coverage Area	2010 KRTM Synth Pop New Coverage Area	2010 KRTM Total Synth Pop	Total Synth Pop Change 2006-2010
HH	360,392	367,264	28,892	396,156	10%
HH Population	843,666	886,278	72,212	958,490	13.60%
Avg HH Size	2.34	2.41	2.5	2.42	3.40%
Workers	429,896	418,222	31,716	449,938	4.70%
K-12 Students	136,264	147,808	12,072	159,880	17.30%
% of HH with Senior Present	23.30%	24.90%	27.20%	25.10%	1.80%
HHs with Senior Present	83,971	91,449	7,859	99,435	18.4%
Vehicles	672,726	686,219	54,395	740,614	10.10%
Veh_Per_Person	0.8	0.77	0.75	0.77	-3.10%
Veh_Per_HH	2	1.87	2	1.87	0.2%
Low Income HH <$25K*	31.4%	29.6%	32.8%	29.8%	-1.6%
Med Income HH>$25K, <$50K*	29.9%	29.1%	29.1%	29.1%	-0.8%
High Income HH>$50K*	38.7%	41.3%	38.1%	41.1%	2.3%

*Annual HH Income in 2006 $

Table H-4: Income Stratification

Variable	2006 KRTM Synth Pop Old Coverage Area	2010 KRTM Synth Pop Old Coverage Area	2010 KRTM Synth Pop New Coverage Area	2010 KRTM Total Synth Pop	Total Synth Pop Change 2006-2010	05-09 ACS	Difference from ACS
Low Income HH <$25K*	31.4%	29.6%	32.8%	29.8%	-1.6%	28.6%	1%
Med Income HH>$25K, <$50K*	29.9%	29.1%	29.1%	29.1%	-0.8%	27.4%	2%
High Income HH>$50K*	38.7%	41.3%	38.1%	41.1%	2.3%	44.0%	-3%

*Annual HH Income in 2006 Dollars

The growth of average household size is notable and suggests that increased household travel rates are to be expected. Growth in K-12 students outpaced overall population growth and higher household school travel rates are expected accordingly. Households containing a senior citizen grew 18.4% in absolute terms, and 1.8% relative to overall household growth. Growth in senior households has a negative effect on work tour and stop generation (BLA Inc. 26).

The income stratification of the synthetic population is closely apportioned to the 2005-2009 ACS data, slightly over estimating low and medium income households, while underestimating high income households by 3%.
The number of workers in the old model coverage area decreased in 2010, yet as shown below, employment increased. Comparing zonal employment between 2006 and 2010 indicates a decrease in basic and industrial employment in the region with growth in the retail and service sectors.

The shift in sector employment is in part due to a change in employment source data category definitions between 2006 and 2010. The 2010 KRTM employment categories were aggregated from NAICS employment codes whereas the 2006 model had used the older SIC codes. Table H-5 shows the difference in definitions included in KRTM's four employment categories with regard to NAICS and SIC codes.

Table H-5: SIC and NAICS Employment Category Changes

KRTM Employment Categories	SIC Categories used in 2006	NAICS Categories used in 2010
Basic	FARM EMPLOYMENT AGRICULTURAL SERVICES, OTHER MINING CONSTRUCTION	FARM EMPLOYMENT FORESTRY, FISHING, RELATED ACTIVITIES and OTHER MINING UTILITIES CONSTRUCTION
Industrial	MANUFACTURING TRANSPORT, COMM. & PUB. UTIL WHOLESALE TRADE	MANUFACTURING WHOLESALE TRADE TRANSPORTATION and WAREHOUSING
Retail	RETAIL TRADE	RETAIL TRADE ACCOMMODATION and FOOD SERVICES
Service	FINANCE, INS. & REAL ESTATE SERVICES FEDERAL CIVILIAN GOVT FEDERAL MILITARY GOVT STATE AND LOCAL GOVT	INFORMATION FINANCE and INSURANCE REAL ESTATE and RENTAL and LEASE PROFESSIONAL and TECHNICAL SERVICES MANAGEMENT of COMPANIES and ENTERPRISES ADMINISTRATIVE and WASTE SERVICES EDUCATIONAL SERVICES HEALTH CARE and SOCIAL ASSISTANCE ARTS, ENTERTAINMENT, and RECREATION OTHER SERVICES, EXCEPT PUBLIC ADMINISTRATION FEDERAL CIVILIAN GOVERNMENT FEDERAL MILITARY STATE and LOCAL GOVERNMENT

In addition to the code definition changes, it is plausible that the retail and service sector employment is attracting more workers from outside of the region in 2010, that more resident workers are working multiple jobs, and higher jobless rates from the 2008 recession persist, resulting in lower growth in resident workers as compared to employment. As a result, lower growth in home-based work travel is expected with an increase in home-based other travel. Table H-6 shows the change in zonal employment between 2006 and 2010.

Table H-6: Zonal Employment 2006-2010

Employment Type	2006 KRTM	2010 KRTM in Old Coverage Area	2010 KRTM in New Coverage Area	2010 KRTM Total	Total KRTM Change 2006-2010
Basic	51,575	48,173	3,065	51,238	-0.7%
Industrial	96,684	71,853	12,588	84,441	-12.7%
Retail	103,165	114,229	7,091	121,320	17.6%
Service	281,632	307,279	18,061	325,340	15.5%
Total	533,119	541,200	40,805	582,005	9.2%

The TAZ layer employment is shown here to provide context, though zonal employment itself is not used during generation directly. Zonal employment is implicit through the incorporation of an accessibility variable in the generation regression equations that describe each zone's accessibility to employment and services (BLA Inc. 27-28). Later on, during the first distribution step, stop location choice, zonal employment is an important term in the logit models that determine destination attractions. Additional care in calibrating the destination choice model will be needed to ensure the change in employment code definitions is accounted for, since the employment sectors have different parameters in the utility terms of the stop location choice logit models (BLA Inc. 43-45).

The KRTM produces person tours and stops at a household level. The number of tours and stops of each type is estimated for each household using multiple regression models utilizing a disaggregate synthetic household and vehicle population as well as zonal accessibility variables. The tour and stop types included in the model are shown in Table H-7, for more detail please consult the full model documentation (BLA Inc. 20-24).

Table H-7: Tour and Stop Types

Tour Type	Stop Type	Description
Work Tour	Work (low income <$25K)	Work outside of home if household income < $25k/year (in 2006 dollars)
	Work (other)	Work outside of home if household income > $25k/year
	University/Education (Non-UT)	School - junior college, college / university, vocational school
	Other	Other Activities on Work Tours
UT Tour	Studies at UT	Studies at U. of Tennessee
	Other Activities on UT Tours	Other Activities on UT Tours
School Tour	School	School – Daycare to high school
	Other Activities	Other Activities on School Tours
Non-Work Tour	Short Maintenance (<30min)	Less than 30 minutes duration & Shopping (incidental or major), Personal Business, Medical / dental, Service pass., Chg mode
	Long Maintenance (>30min)	30 minutes or longer & Shopping (incidental or major), Personal Business, Medical / dental, Service passenger, Change mode
	Discretionary	Volunteer Work, Eat Out, Social / Recreational, Civic, Church Activities, Loop trips

Table H-8 shows the tour and stop types generated by the model and compares the quantity generated from 2006 vs. the new 2010 base year.

Table H-8: Total Tours and Stops Generated 2006 vs. 2010

Tour & Stop Generation	2006 Base	2010 Base Old Coverage Area	2010 Base New Coverage Area	2010 Base Total	Total Change 2006-2010
HH	360,392	367,264	28,892	396,156	10%
Work Tours	353,677	344,923	25,671	370,594	5%
Work Stops (lo inc)	84,190	74,541	6,040	80,582	-4%
Work Stops (other)	352,468	352,014	25,638	377,652	7%
College Stops (non-UT)	8,228	8,510	678	9,188	12%
Other Stops	333,978	327,859	22,652	350,511	5%
School Tours	160,589	178,054	15,002	193,056	20%
School Stops	164,315	182,184	15,350	197,535	20%
Other Stops	73,341	80,418	6,629	87,047	19%
Other Tours	518,874	568,726	46,631	615,357	19%
Short Maintenance Stops (<30min)	422,103	467,383	38,483	505,866	20%
Long Maintenance Stops	262,084	291,873	24,040	315,912	21%
Discretionary Stops	322,591	350,047	28,192	378,239	17%

Growth in work tours was the lowest, reflecting the marginal growth in overall resident workforce. Low-income work stops showed a net decrease even with additional households indicating that low-income workers in particular were affected by workforce contraction more than other income groups. Growth in college stops on work tours is the result of enrollment increases at community colleges across the region. School tours and stops grew the most, caused by strong growth in K-12 student population, which was greater than the rate of overall population growth. Other tours also showed high growth, caused by an increase in non-workers that included a slight uptick in the percentage of households with seniors.

The household generation rates in the 2010 KRTM are shown below in Table H-9. Trips are calculated by adding tours and stops together. For comparison, average rates from the following sources are included: the NCHRP 365 report on Travel Estimation, the combined Travel Survey used in the estimation of the previous Knoxville model, the trip generation rates from the previous Knoxville Model base year 2006, the 2009 National Household Travel Survey Add-On for Tennessee, and those records from the 2009 NHTS Add-On from the Knoxville region. The base year 2010 trip rates have gone up from base year 2006, but remain within an acceptable range of other comparative estimates.

Table H-9: Household Generation Rates

	NCHRP 365 Averages	Knoxville Combined HH Survey from 2000 and 2008	Previous Knoxville Model Base Year 2006	NHTS 2009 TN Statewide	NHTS 2009 Add-On for Knoxville Area	KRTM 2010
Tours/HH/Day	3.47	2.86	2.87	2.99	2.66	2.98
Stops/HH/Day	5.54	5.51	5.62	6.2	5.27	5.81
Trips/HH/Day	9	8.37	8.49	9.18	7.93	8.79
Stops/Tour	1.6	1.93	1.96	2.07	1.98	1.95

The NHTS sample for the Knoxville region is less than 300 households; hence, those estimates may contain somewhat more error. Greater confidence can be had in the rates for TN as a whole, mainly because the sample size is much larger at 2,552 surveys. Also, the sampling scheme and weights were developed at a statewide level and therefore the statewide weights could slightly skew results in a regional sample. The increase in trip rates observed in base year 2010 compared with base year 2006 are attributable to the increase in household size of 3.4%, a demographic shift towards a higher percentage of students resulting in a greater rate of school tours, and an increase in non-workers including seniors that led to greater rates of other tours. The increased rates of school and other tours were greater than a decrease observed in work tour rates.

Special Generators

The KRTM has two special generator sub models for University of Tennessee Tours and Visitors tours. The UT Tours model uses a regression equation that factors UT student residents and University enrollment by zone (BLA Inc. 28). The 2010 TAZ layer was updated with resident student and enrollment data. Few additional resident UT student residents were added from zones in the new model coverage area in Hamblen County.

The visitor model is also a regression model that factors zonal hotel rooms and rental units in Sevier County (BLA Inc. 28). Increases in constructed lodging were added to the zonal layer, in particular in Sevierville, where approximately 890 hotel units were added. The hotel occupancy rate from the previous base year, 82%, which was based on July of 2006, was initially reduced in light of data from Pigeon Forge indicating a summer 2010 occupancy rate of 61%, (Pigeon Forge Department of Tourism 2010). However, during network assignment calibration, a trend of under-loading resulted in a return to the previous 82% rate, which provided a better 2010 calibration for modeled road volumes. Table H-10 shows the UT and Visitor tour and Stops.

Table H-10 Daily UT and Visitor Tours and Stops

Tour & Stop Generation	2006 Base	2010 Base Old Coverage Area	2010 Base New Coverage Area	2010 Base Total	Change 2006-2010
UT Tours	23,835	24,114	55	24,169	1%
Campus Stops	24,367	24,652	56	24,708	1%
Other Stops	18,580	18,797	43	18,839	1%
Visitor Tours	27,555	28,099	-	28,099	2%
Visitor Stops	41,332	42,148	-	42,148	2%

LAMTPO Model Comparison

Since the KRTM 2010 Base year now includes the entire area previously modeled by the LAMTPO model, a comparison of the two models is instructive as a QA/QC check. Figure H-9 shows the geographic area of the LAMTPO model overlaid on the KRTM coverage area.

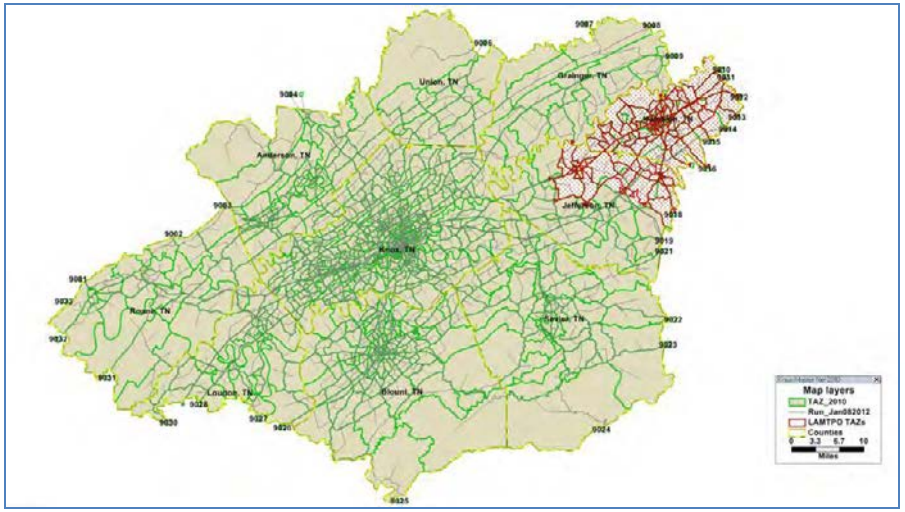

Figure H-9: LAMTPO Model Area Shown Within the KRTM Area

The area includes Hamblen County and a large portion of northeastern Jefferson County. Table H-11 compares the zonal demographic information in the two models. Differences result from both 2006-2010 population growth and apparent employment decline, but are also likely due to data source discrepancies, particularly for employment. Still, the zonal demographics of the two models were similar enough to warrant a comparison of trip generation rates.

Table H-11: LAMTPO Model vs. KRTM Zonal Demographics

Variable	2006 LAMTPO Model	2010 KRTM Synthetic Population (Zones in LAMTPO Area)	Difference KRTM-LAMTPO
HH	32,800	33,386	1.8%
HH Population	80,202	83,556	4.2%
HH Size	2.45	2.50	
Workers	38,210	36,680	-4.0%
Employment	56,021	48,541	-13.4%
K12 Students	N/A	13,962	
% of HH with Senior present	N/A	25.8%	
Vehicles	61,485	62,730	2.0%

Veh_Per_Person	0.77	0.75	-2.1%

The LAMTPO model is a trip-based model that uses regression equations to generate HBW, HBO, and NHB trips (WSA 10). The generation rates in the model were informed by a Lakeway Area Households Survey conducted in 2009 that sampled 498 households, as well as the 2009 NHTS Add-On for small and non-MSA areas in Tennessee. Household trip rates from the LAMTPO model have been converted to tours and stops in Table H-12, below for comparison.

Table H-12: LAMTPO Model vs. KRTM Generation Rates

	Lakeway Survey	LAMTPO Model 2006 Base	2010 KRTM (Zones in LAMTPO Area)
Tours/HH/Day	2.77	3.10	3.03
Stops/HH/Day	6.06	6.09	5.83
Trips/HH/Day	8.83	9.19	8.86
Stops/Tour	2.19	1.97	1.92

The overall household tour and trip generation rate was slightly higher in the LAMTPO model area when compared with the overall KRTM model. This was reflected in the LAMTPO Model as well as the KRTM, at just over three tours per household. The stops per tour and trips per day in the KRTM are slightly lower than the LAMTPO model, though overall the generation rates between the two models are quite close.

External Trips

The KRTM generates external travel with input files for auto and truck external-external (EE) origins and destinations, as well as an external-internal (EI) productions input file. The model uses a process of modeling internal attractions with regression equations that include employment, households, and lodging. After internal attractions are generated, a doubly constrained gravity model is used to connect EI trips to external stations (BLA Inc 91).

For the 2010 update, external stations at the edge of the old model located in Hamblen and Grainger Counties were moved to reflect the new extent of the model. There are 12 new external station locations. By subtracting the loss of 8 previous station locations that are now internal to the model, a net gain of four external stations resulted bringing the total to 33.

In terms of EE travel, the most significant new stations on roads that were not previously modeled as externals (as opposed to stations that were simply moved to a new location further out on the same road) are at US25E and nearby US11W in Grainger County (stations 9007 and 9009 respectively). At these two stations, most of the new EE travel occurs between each other, 52%. Likewise, a station was added at US 70, parallel to the I-40 station entering Roane County (station 9033), where much of the new EE travel is to/from nearby US 27, 67% (station 9032).

Figure H-10 shows the location of the 2010 KRTM external stations with new or moved stations shown in red.

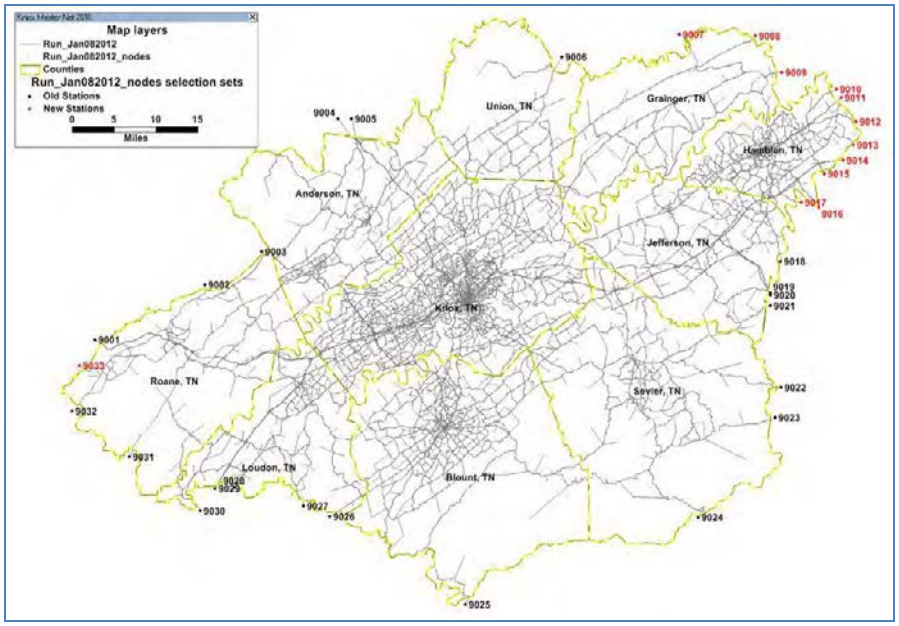

Figure H-10: 2010 KRTM Base Year External Stations

Tour Mode Choice

The tour mode choice model update consisted of creating new input networks for walk and transit as well as well a re-organization of the way the model creates transit impedance during the transit network skimming process. The transit skim changes in the main KRTM model were motivated by a desire to be more consistent with the new transit add-on tool that was developed concurrently with this main model update by The Corradino Group. The transit add-on tool is designed to run after the main model for detailed transit forecasts by transit route and uses a separate trip mode choice model as documented in the report Knoxville Transit Model User Guide (Corradino 2012).

The KRTM tour mode choice approach to a simplified transit forecast based on largely on accessibility variables will continue to be useful for planning purposes

where zonal transit and walk mode shares are of interest, but transit route specific ridership forecasts are not needed. Full documentation on the KRTM's tour mode choice model methodology is available in the main model's technical documentation (BLA inc. 31-42).

Updates to the Non-Motorized Network

The 2010 non-motorized network is used to estimate walk times from zone to zone and was made from a 2010 GIS layer of all streets in the updated model coverage area with the exception of interstate highways. During the non-motorized skimming process, the shortest walk path between each zone is obtained to calculate the various walk accessibility variables to/from each zone. Walk speed continues to be estimated at an average of 3mph. Another important variable in the tour mode choice model is the sidewalk percentage of each zone. This was updated with a new sidewalks and greenways layer created by KRTPO that consisted of an updated and more complete network of sidewalk and pedestrian path coverage than was available in 2006. A comparison of sidewalk coverage between the 2006 and 2010 models is shown below, indicating that overall percentage of sidewalks in the model increased from 9.9% to 11.5%.

Table H-13: Sidewalks as a Percentage of Road Miles

	2006 TAZ Layer Old Coverage Area	2010 TAZ Layer Old Coverage Area	2010 Zones in New Coverage Area	2010 Zones in LAMTPO Model Coverage Area Only	2010 KRTM TAZ Layer Total
Non-Motorized Network Road Miles	16,817	16,932	1,466	1,644	18,398
Sidewalk and Greenway Length in miles	1,660	1,929	184	224	2,113
Sidewalk Percent	9.9%	11.4%	12.5%	13.7%	11.5%

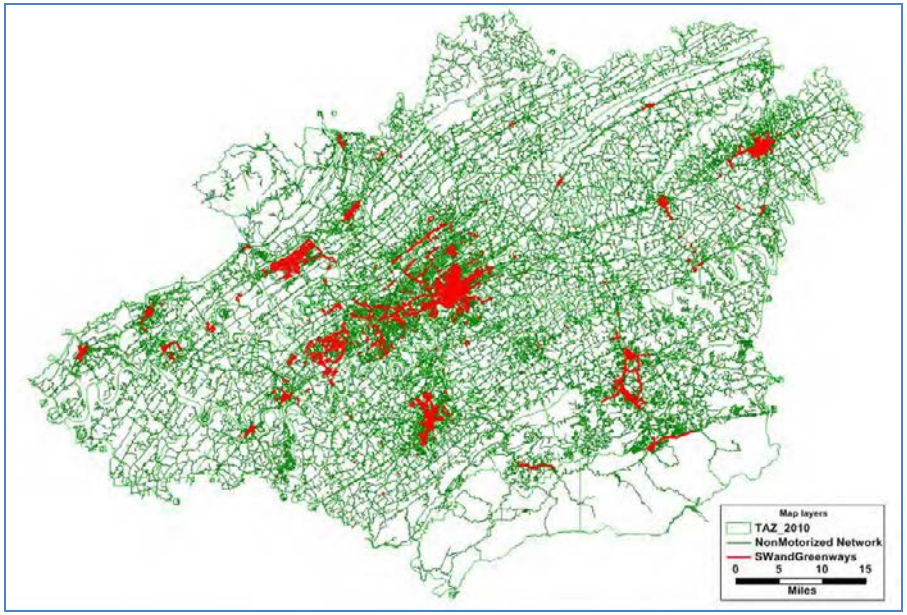

Figure H-11: The Non-motorized Network and Sidewalks and Greenways Layer

Updates to the Transit Network and Skim Process

The transit network reflecting the KATS bus route system was updated by KRPTO to reflect the 2010 system. The footprint and coverage area of the bus system remained nearly the same as before, meaning the area within a half-mile walking distance to transit was essentially unchanged. New to this model update, is the designation of park and ride nodes on the highway layer as part of the Corradino transit add-on tool. Additionally, the KRTM model's tour mode choice model now utilizes the same peak walk and drive transit skims from the transit add-on tool for the estimation of the lowest generalized cost transit path between zones in the transit coverage area. The lowest generalized cost transit paths are then used to calculate each zone's transit accessibility variables, which are then used by tour mode choice to estimate zonal transit share. The transit coverage area for tour mode choice has been expanded from the half-mile buffer around each bus route to include zones within a 5-mile radius around each park and ride station. The 5-mile radius was chosen as being the longest radial distance that still gave a reasonable estimation of daily transit ridership using the tour mode choice model. With KRTM's modified transit skim procedure, the tour mode choice model will be sensitive to service changes such as premium transit and park and ride lots. This will allow the main model's tour mode choice model to remain more consistent with the transit add-on tool over time.

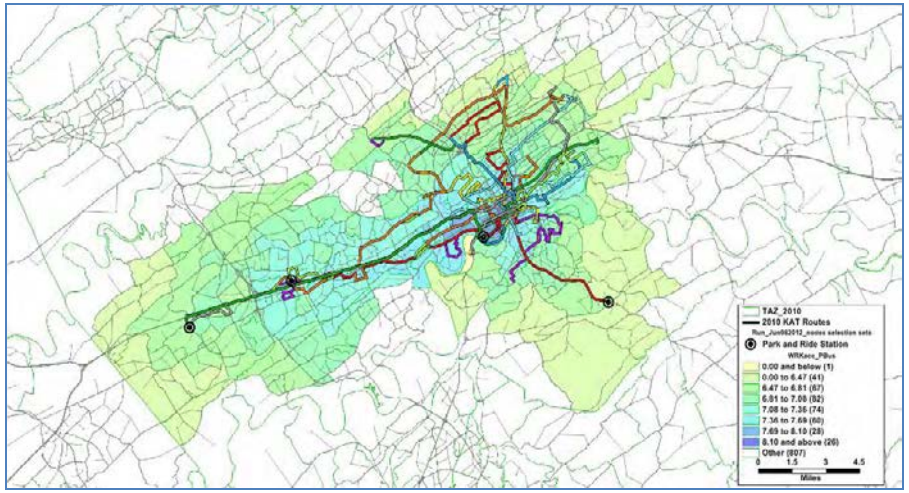

Figure H-12: The 2010 KATS Route System with Transit Work Tour Accessibility by Zone Shown in the Background

The resulting tour mode shares were checked against the 2006 model as well as the shares from the 2000 and 2008 household travel surveys on which the KRTM is based. Results showed that for work, school, and other tours a minor shift toward walking and transit occurred. This is the result of the increase in walk accessibility from added sidewalk coverage and the new approach to the tour mode choice transit skims that includes drive access skims and additional accessibility area around the park and ride nodes. The magnitude of the tour mode shift showed reasonable change when compared to the 2006 model and survey targets so as not to warrant a major re-calibration of the modal bias constants.

Table H-14: Tour Mode Shares by Tour Type

	Work Tours			UT Tours			School Tours			Other Tours		
	Survey	2006 Model	2010 Model	Survey	2006 Model	2010 Model	Survey	2006 Model	2010 Model	Survey	2006 Model	2010 Model
Auto	98.79%	98.77%	98.48%	90.01%	79.06%	82.56%	81.15%	81.15%	81.07%	98.19%	98.18%	97.84%
Transit	0.62%	0.64%	0.75%	1.95%	3.74%	2.49%	0.18%	0.18%	0.14%	0.10%	0.11%	0.12%
Walk/ Bike	0.60%	0.59%	0.78%	8.05%	17.20%	14.96%	1.07%	1.08%	1.29%	1.71%	1.71%	2.04%
School Bus							17.59%	17.58%	17.51%			

In the case of the university tours, a shift towards auto was observed of approx. 3.5%. Causes of this include the splitting of zones in the UT campus area that resulted in a finer zonal fidelity, but also marginally longer distances between campus zones in the model. In addition, the off campus student population had a weighted average distance of about 1 mile further away from campus as compared to the 2006 model. Since the probability of auto in tour mode choice increases with distance from campus, this appears to have raised the auto share of UT tours. As explained in the full model documentation, the UT tours mode split was not calibrated to the household travel survey because of the small sample size of UT tours. The resulting 2010 UT mode split is still between the two bookend data points used during the 2006 model calibration, the household survey and the Indiana University Travel Demand Survey (BLA Inc. 40).

As stated in the main model documentation (BLA Inc. 40), the visitor tours mode share is fixed in the KRTM and remain so in this update. The shares are from The Lake Tahoe Resident and Visitor Model (PB, 2007) and are 90.05% auto, 1.31 % transit, and 1.51% Walk/Bike.

The estimated transit ridership resulting from the tour mode choice mode shares are shown below. The estimated daily weekday transit ridership was 10, 126. This assumes a system wide transfer rate of 1.3 boardings per linked trip. While this is 10% over the averaged 2010 observed ridership target, given the added tour mode choice sensitivity to drive accessibility, these results should be a worthwhile trade off as compared to keeping the tour mode choice model sensitive to walk access only. When detailed transit forecasts are needed, KRPTO will now use the Corradino's Transit Add-on tool, yet the main model's tour mode choice will still remain a useful tool to estimate walk and transit zonal mode share and can also provide a second data point for system ridership potential.

Table H-15: 2010 Transit Ridership Results

	2006 KRTM	2010 Observed*	2010 KRTM	Estimated vs. Observed
Transit Person Trips	7,100		7,789	
Estimated Weekday Transit Boardings (unlinked trips)	9,220	9,194	10,126	10.1%

*2010 Observed Ridership is an average of Oct. 2010 and Oct 2011 due to route system changes in August 2010.

Trip Distribution

Trip distribution is accomplished in Knoxville's hybrid model through a double destination choice framework comprised of stop location choice and stop sequence choice. In the first step, stop location choice, travelers choose where they will stop on various tours (e.g., their work location, where they will stop on the way to and from work, etc.). In the second step, stop sequence choice, the

chosen stop locations are connected to form trips (e.g., from home the traveler will go to Starbucks first, then from Starbucks to work).

For more background on the theory and details of the destination choice model specifications refer to the Knoxville Regional Travel Demand Model Update 2009: Model Development and Validation Report. This update did not include any substantial changes to the destination choice models. As with the 2009 calibration, only two variables' parameters were adjusted in calibration, the parameter on the term comprised of travel time interacted with residential accessibility, which controls general willingness-to-travel and the intrazonal bias term. The original, statistically estimated values for these parameters, along with their 2009 and 2012 calibrated values are displayed in Table H-16. Most of the destination choice models have fairly complex utility functions including a number of other terms, but these have remained unchanged from the estimated 2009 values. Most of the adjustments, particularly to the willingness-to-travel, were small, although some adjustments were needed, more so for the intrazonal biases to adjust for changes to the model including zone splits, the addition of new geography and minor changes in the impedances. The UT Campus stops are not included below because they do not require a destination choice model since their destination is known, by definition.

Table H-16: Calibrated Stop Location Choice Parameters

	Travel Time x Residence Accessibility			Intrazonal Bias		
	Estimated	Calibrated 2009	Calibrated 2012	Estimated	Calibrated 2009	Calibrated 2012
Work Tours						
Work (lo inc)	-0.0114	-0.0137	-0.0156	0.0875	0.4872	0.5615
Work	-0.0101	-0.0103	-0.0108	-0.1310	0.8435	0.7909
College	-0.0064	-0.0112	-0.0113		-5.0000	0.0000
Non-work	-0.0156	-0.0148	-0.0154	1.8346	0.6641	0.2870
UT Tours						
Other	-0.0160	-0.0107	-0.0055	4.2305	0.6858	2.5000
School Tours						
School	-0.0238	-0.0257	-0.0284	0.9530	0.9580	1.4144
Other	-0.0216	-0.0210	-0.0222	1.9198	0.7853	0.4335
Other Tours						
Short Maintenance	-0.0221	-0.0329	-0.0198	-0.2101	0.9721	0.2733
Long Maintenance	-0.0167	-0.0205	-0.0217	0.0790	0.4864	0.1771
Discretionary	-0.0240	-0.0276	-0.0300	-0.0730	0.7572	0.4284

With these fairly minimal calibration adjustments, the model was able to produce trip lengths and intrazonal shares in good agreement with those observed from Knoxville's travel surveys. Table H-17 presents the travel time between home and the stop locations and the percent of intrazonal stops for each stop type, as observed in the combined household survey for the region used to estimate the models and as produced by the calibrated models.

Table H-17: Stop Lengths and Intrazonal Shares

	Mean Travel Time from Home (min)		Percent Intrazonal	
	Observed	Model	Observed	Model
Work Tours				
Work (lo inc)	15.3	14.9	3.3	3.3
Work	18.5	18.4	3.0	3.0
College	20.8	21.7	0.0	0.6
Non-work	14.6	14.4	4.2	4.5
UT Tours				
Other	15.9	14.6	4.2	3.1
School Tours				
School	10.1	9.9	11.3	11.3
Other	12.4	12.8	8.8	9.0
Other Tours				
Short Maintenance	11.7	10.7	7.6	6.3
Long Maintenance	15.0	15.2	3.4	3.6
Discretionary	14.2	15.7	6.6	6.7

The travel times and intrazonal percentages are in good agreement with the observed values from the survey. They were not calibrated to reproduce the observed values exactly as in the prior version of the model in part due to emerging research that suggests that over-calibrating to trip lengths can result in a worse model overall (See Ye, X., W. Cheng and X. Jia, A Synthetic Environment to Evaluate Alternative Trip Distribution Models, Presented at the 91st Annual Meeting of the TRB, January 2012).

The results of the work location choice models were also compared to Journey-to-Work data from the US Census Bureau. The most recent available Census Transportation Planning Package (CTPP) that provides county-to-county workflows is based on the 2006-2008 American Communities Survey (ACS). The flows are displayed in Table H-18.

Table H-18: Census Journey-to-Work Flows from ACS 2006-2008

	ANDERSON	BLOUNT	GRAINGER	HAMBLEN	JEFFERSON	KNOX	LOUDON	ROANE	SEVIER	UNION	Total
ANDERSON	19,040	315		30	25	9,265	105	975	15		**29,770**
BLOUNT	885	37,005				13,910	640	175	1,655		**54,270**
GRAINGER	50	55	3,175	2,130	570	2,505		15	425		**8,925**
HAMBLEN		150	305	20,355	1,860	720			455		**23,845**
JEFFERSON	20	100	75	3,835	10,000	4,470	35		2,690		**21,225**
KNOX	11,810	6,725	90	285	555	177,015	2,195	885	2,005		**201,565**
LOUDON	775	1,495				5,990	10,580	230	55		**19,125**
ROANE	4,380	230				3,855	1,095	11,005			**20,565**
SEVIER	215	1,010		345	320	7,455	125		29,670		**39,140**
UNION											**0**
	37,175	**47,085**	**3,645**	**26,980**	**13,330**	**225,185**	**14,775**	**13,285**	**36,970**	**0**	**418,430**

Due to limited sample sizes and disclosure protection rules, however, some data including all data for Union County was suppressed. It was therefore helpful to estimate a complete set of flows for the year 2010 by enhancing the CTPP 2006-2008 data with information from the more complete CTPP 2000 as well as more recent estimates of total county workflows from ACS for 2010. The resulting estimated 2010 flows based entirely on Census Journey-to-Work data are presented in Table H-19.

Table H-19: 2010 County-to-County Work Flows from Census Journey-to-Work Data

	ANDERSON	BLOUNT	GRAINGER	HAMBLEN	JEFFERSON	KNOX	LOUDON	ROANE	SEVIER	UNION	Total
ANDERSON	20,480	319	17	32	26	9,424	114	1,108	15	21	**31,557**
BLOUNT	906	35,585	0	82	43	13,431	660	190	1,607	11	**52,515**
GRAINGER	50	51	3,223	2,125	550	2,338	12	16	399	208	**8,970**
HAMBLEN	35	146	324	21,253	1,880	706	23	12	448	13	**24,839**
JEFFERSON	20	95	77	3,892	9,813	4,249	36	28	2,572	0	**20,782**
KNOX	12,240	6,550	95	297	560	173,111	2,290	971	1,972	577	**198,664**
LOUDON	793	1,436	0	11	32	5,779	10,897	249	53	0	**19,251**
ROANE	4,618	228	0	21	0	3,839	1,162	12,269	0	0	**22,137**
SEVIER	225	994	47	363	326	7,364	132	0	29,471	12	**38,934**
UNION	347	81	10	17	26	3,651	28	13	53	2,695	**6,921**
	39,715	**45,486**	**3,794**	**28,092**	**13,256**	**223,892**	**15,352**	**14,855**	**36,591**	**3,537**	**424,571**

The modeled county-to-county workflows, presented in Table H-20, agree very well. The level of agreement between these flows is, in fact, noteworthy. The commuting pattern exhibited in this ten county region is complex and asymmetrical. For instance, the reverse out-commute is dominant between Knox and Anderson Counties. The ability of the destination choice models to reproduce this pattern with the fidelity they exhibit is not to be taken for granted. Earlier trip-based gravity models of the region were not able to reproduce these patterns even with large k-factors. The destination choice models include no k-factors or any similar ad hoc factors that bias the model for or against particular OD pairs for no reason. The pattern is reproduced by the model completely on the basis of observed variables including travel times as well as accessibility variables and river crossings, land use mixtures, pay parking, etc.

Table H-20: Modeled 2010 County-to-County Work Flows

Estimated 2010 ACS	ANDERSON	BLOUNT	GRAINGER	HAMBLEN	JEFFERSON	KNOX	LOUDON	ROANE	SEVIER	UNION	Total
ANDERSON	21,727	193	11	6	22	7,447	128	1,189	43	125	**30,891**
BLOUNT	872	36,664	17	17	62	16,793	1,579	308	1,918	13	**58,243**
GRAINGER	123	64	3,270	2,561	768	2,684	20	13	126	266	**9,896**
HAMBLEN	14	11	817	22,689	2,500	538	3	2	241	8	**26,822**
JEFFERSON	140	113	378	4,593	9,529	4,593	27	17	2,680	34	**22,104**
KNOX	11,383	5,574	559	188	735	183,831	2,542	1,566	1,374	822	**208,574**
LOUDON	714	1,623	6	4	13	7,736	9,016	1,592	48	6	**20,758**
ROANE	4,943	210	3	2	6	2,835	1,718	12,848	13	5	**22,582**
SEVIER	191	1,861	48	418	1,429	7,212	50	24	33,489	18	**44,740**
UNION	935	53	270	35	45	2,897	20	24	33	2,517	**6,828**
	41,040	**46,366**	**5,380**	**30,513**	**15,110**	**236,565**	**15,101**	**17,582**	**39,966**	**3,815**	**451,438**

While the stop location choice models continued to reproduce travel patterns very well for the region as a whole, the Knoxville regional stop location choice models did not initially do a particularly good job for non-work tour stops in the new Morristown area. Without further adjustments, the models predicted stop locations too close to home in Morristown. Therefore, an adjustment was made to the travel time residential accessibility interaction variable in Hamblen County to produce stop locations more appropriately spaced from home. While this does raise some questions about the transferability of these models to predict travel behavior in Morristown in general, the ability of the work location choice models to reproduce CTPP commuting flows for Hamblen County with a high degree of accuracy offers an encouraging counterpoint.

The Knoxville regional model also includes a simple gravity model for visitor stops generated by tourists staying in Sevier County's tourism area from the Smoky Mountains and Gatlinburg north through Pigeon Forge to Sevierville. Lacking any local data, that model was borrowed from the Ohio Statewide Model. In this update, it was adjusted in response to low traffic in Sevier County and the willingness-to-travel parameter on travel time was increased from -0.10 to -0.05 resulting in slightly longer trips and more tourism related traffic.

After the completion of the stop location choice models, the second step of Knoxville's double destination choice framework are the stop sequence choice models. These models are simpler than the stop location choice models as there sole purpose is to connect the predicted stops into trips, and ultimately, tours. For more information on Knoxville's stop sequence choice models, refer to the 2009 model development and validation report referenced previously. One peculiarity of these models worth repeating here is the meaning of travel time sensitivity in this context. After stop location choice, the stop locations have been determined; hence, the sensitivity to travel time in stop sequence choice really just controls the relative length of home-based and non-home-based trips. Since home-based trips tend to be longer, on average, they actually take a positive travel time parameter; whereas, since non-home-based trips tend to be shorter, they take a negative parameter.

Table H-21: Stop Sequence Choice Model Parameters

Trip Type	Travel Time		Intrazonal	
	2009 Model	2012 Model	2009 Model	2012 Model
Work Tours - Home-Based Trips	0.070	0.069	-1.743	-1.720
Work Tours - Non-Home-Based Trips	-0.194	-0.185		
UT Tours - Home-Base Trips	0.000	0.000	-3.963	-3.963
UT Tours - Non-Home-Base Trips	-0.055	-0.055		
School Tours - Home-Based Trips	-0.080	-0.080	-3.912	-4.269
School Tours - Non-Home-Based Trips	-0.119	-0.110		
Other Tours - Home-Based Trips	0.030	0.029	-2.064	-2.096
Other Tours - Non-Home-Based Trips	-0.146	-0.117		

The stop sequence choice parameters are displayed in Table H-21. Some adjustments were made to the original values from the 2009 model development, but they were small. Table H-22 displays the resulting average trip lengths and interzonal percentages and the observed values from the combined regional survey. With the minor adjustments documented above, the models remain well calibrated, in good agreement with the survey.

Table H-22: Stop Sequence Choice Model Calibration Statistics

Trip Type	Average Travel Time		Percent Diagonal	
	Observed	Model	Observed	Model
Work Tours	14.9	14.5	5.1	4.0
Work Tours - Home-Based	16.3	16.1	4.1	5.0
Work Tours - Non-Home	12.4	11.7	7.0	2.1
UT Tours	15.0	10.6	1.2	1.6
UT Tours - Home-Base	16.3	10.8	0.6	2.0
UT Tours - Non-Home	12.1	9.9	2.7	0.3
School Tours	10.5	10.5	10.7	8.8
School Tours - Home-Based	10.3	10.2	11.0	10.3
School Tours - Non-Home	11.2	12.2	9.8	0.6
Other Tours	12.1	11.9	8.5	5.5
Other Tours - Home-Based	12.7	12.7	7.6	7.4
Other Tours - Non-Home	10.6	9.9	10.8	1.2

Trip Mode Choice

As in activity-based models, Knoxville's regional model develops mode splits and vehicle occupancies in two stages, tour mode choice and trip mode choice. While tour mode choice assigns the dominant mode for the tour and largely determines mode splits between transit and auto, trip mode choice is important for splitting auto travel into single occupant vehicle (SOV) and high occupancy vehicle (HOV) trips as well as identifying walk trips on auto-based tours, as when a person drives to and from work but walks to and from lunch midday.

A review of Knoxville's 2009 trip mode choice model by Dunbar Consulting produced a recommendation to eliminate the multiple HOV classes in favor of a simpler scheme with a single HOV class. In response to this recommendation, the trip mode choice models were re-estimated from the original survey data using this scheme. The new model specifications are presented below in Table H-23 through Table H-28.

Table H-23: Work Tour Home-Based Trip Mode Choice Model

Variable	Alternative	Parameter	t-statistic
-- Alternative Specific Parameters			
CONSTANT	Walk	-8.3507	*
CONSTANT	HOV	-5.2394	*
LnWalkTime	Walk	-0.9544	-3.2642
Zonal Average Household Size	HOV	0.382	6.2559
K-12 Enrollment	HOV	0.0003	6.9309
Employment to Population Ratio	HOV	-0.0019	-2.9363
General Accessibility	DriveAlone	-0.0819	-3.7213
Intersection Approach Density	Walk	0.0008	1.7378
Gas Price (2006 $)	Walk	1.7234	2.9396
-- Model Statistics			
Log Likelihood at Zero		-8603.9381	
Log Likelihood at Constants		-3037.7239	
Log Likelihood at Convergence		-3482.0213	
Rho Squared w.r.t. Zero		0.5953	

*Constants were adjusted in calibration. The original estimated values were -8. 1845 for walk, -6.4800 for HOV.

Table H-24: Work Tour Non-Home-Based Trip Mode Choice Model

Variable	Alternative	Parameter	t-statistic
-- Alternative Specific Parameters			
CONSTANT	Walk	-4.1133	*
CONSTANT	HOV	-1.7371	*
WalkTime	Walk	-0.0551	-5.2483
Employment to Population Ratio	HOV	-0.0014	-2.7322
Intersection Approach Density	Walk	0.0007	3.5787
Percent Pay Parking	Walk	4.6914	5.1745
Percent Pay Parking	HOV	0.945	2.0421
Gas Price (2006 $)	Walk	0.728	3.2965
Gas Price (2006 $)	HOV	0.2242	3.4314
-- Model Statistics			
Log Likelihood at Zero		-4956.6986	
Log Likelihood at Constants		-2030.9258	
Log Likelihood at Convergence		-2256.9768	
Rho Squared w.r.t. Zero		0.5447	

*Constants were adjusted in calibration. The original estimated values were -4.3257 for walk, -3.3156 for HOV.

Table H-25: School Tour Home-Based Trip Mode Choice Model

Variable	Alternative	Parameter	t-statistic
-- Logsum Parameters			
Drive		0.7769	constrained
-- Alternative Specific Parameters			
CONSTANT	Walk	-1.8050	*
CONSTANT	HOV	-0.7769	*
WalkTime	Walk	-0.0234	-3.6705
Zonal Average Household Size	HOV	0.1686	1.4871
K-12 Enrollment	Walk	0.0003	1.9752
General Accessibility	HOV	0.0508	1.872
-- Model Statistics			
Log Likelihood at Zero		-3134.9913	
Log Likelihood at Constants		-2498.361	
Log Likelihood at Convergence		-2868.9366	
Rho Squared w.r.t. Zero		0.0849	

*Constants were adjusted in calibration. The original estimated values were -1.517 for walk, -1.4932 for HOV.

Table H-26: School Tour Non-Home-Based Trip Mode Choice Model

Variable	Alternative	Parameter	t-statistic
-- Logsum Parameters			
Drive		0.7093	constrained
-- Alternative Specific Parameters			
CONSTANT	Walk	-2.5221	*
CONSTANT	HOV	-0.7332	*
WalkTime	Walk	-0.0434	-2.8182
K-12 Enrollment	Walk	0.0003	1.5146
Gas Price (2006 $)	Walk	0.7781	1.7504
-- Model Statistics			
Log Likelihood at Zero		-942.9249	
Log Likelihood at Constants		-765.4386	
Log Likelihood at Convergence		-868.2207	
Rho Squared w.r.t. Zero		0.0792	

*Constants were adjusted in calibration. The original estimated values were -2.7998 for walk, 0.2756 for HOV.

Table H-27: Other Tour Home-Based Trip Mode Choice Model

Variable	Alternative	Parameter	t-statistic
-- Alternative Specific Parameters			
CONSTANT	Walk	-4.8577	*
CONSTANT	HOV	-0.4572	*
WalkTime	Walk	-0.008	-2.9291
Zonal Average Household Size	HOV	0.1143	3.3696
Zonal Average Vehicle Ownership	Walk	-0.5917	-2.8215
Zonal Percent of HH with Seniors	Walk	-1.9187	-1.7424
Tourist TAZ	Walk	0.5151	1.0181
Tourist TAZ	HOV	0.43	4.1341
Percent Pay Parking	Walk	0.8474	1.#IO
Percent Pay Parking	HOV	0.8474	1.8385
Gas Price (2006 $)	Walk	1.3209	4.2616
Gas Price (2006 $)	HOV	0.0677	2.1235
-- Model Statistics			
Log Likelihood at Zero		-13668.6753	
Log Likelihood at Constants		-9789.4925	
Log Likelihood at Convergence		-11368.7602	
Rho Squared w.r.t. Zero		0.1683	

*Constants were adjusted in calibration. The original estimated values were -4.485 for walk, -1.8086 for HOV.

Table H-28: Other Tour Non-Home-Based Trip Mode Choice Model

Variable	Alternative	Parameter	t-statistic
-- Alternative Specific Parameters			
CONSTANT	Walk	-3.7155	*
CONSTANT	HOV	0.1672	*
WalkTime	Walk	-0.0168	-3.2439
Employment to Population Ratio	HOV	-0.0011	-2.8089
Percent Pay Parking	Walk	4.4276	2.7863
Percent Pay Parking	HOV	1.3371	2.4474
Gas Price (2006 $)	HOV	0.2709	5.4371
-- Model Statistics			
Log Likelihood at Zero		-5754.1179	
Log Likelihood at Constants		-3988.2919	
Log Likelihood at Convergence		-4933.536	
Rho Squared w.r.t. Zero		0.1426	

*Constants were adjusted in calibration. The original estimated values were -3.5136 for walk, -1.6492 for HOV.

Comparison with the 2009 trip mode choice models will show that the models are very similar in both specifications and parameter estimates as would be expected given the same base data, although a few marginally significant variables fell out of the specifications with the simplified mode alternatives. This last fact provides some evidence that Dunbar's comments may have been at least partially right in suspecting some over-specification in the original models. Moreover, the new simplified models were easier to calibrate to both observed mode shares and vehicle occupancies. Table H-29 displays the observed and modeled vehicle occupancies and it is clear the model is reproducing the observed occupancies well.

Table H-29: Trip Mode Choice Calibration Statistics

		Walk	SOV	HOV	Vehicle Occupancy
WHB	Observed	0.15%	82.55%	17.30%	1.12
	Modeled	0.15%	82.57%	17.28%	1.11
WNH	Observed	1.89%	78.37%	19.74%	1.11
	Modeled	1.90%	78.35%	19.74%	1.15
SHB	Observed	1.46%	17.00%	81.54%	1.91
	Modeled	1.43%	18.26%	80.30%	2.02
SNH	Observed	2.17%	21.51%	76.32%	2.04
	Modeled	2.16%	22.96%	74.88%	1.93
OHB	Observed	0.40%	42.98%	56.62%	1.52
	Modeled	0.40%	43.11%	56.49%	1.48
ONH	Observed	1.01%	38.87%	60.13%	1.49
	Modeled	1.00%	39.62%	59.38%	1.55

Network Assignment

In the final step of the travel model, the vehicle trip tables for each class are assigned to the model network. External automobile trips and single and multiple unit trucks are loaded first, on the assumption that they do not divert do to congestion. Then, local automobile trips are assigned routes through the network on the "user equilibrium" assumption that only minimum congested travel cost routes are used. The Knoxville regional model makes use of TransCAD 6.0's origin-based algorithm to solve for the user equilibrium solution to a greater precision (0.0001 relative gap) in less time. More precise or more tightly converged assignment solutions are more stable and have more localized sensitivity.

The previous version of the model included a simple improvement to just the truck assignment. In the absence of detailed information on truck prohibitions, load limitations, overhead clearance, turning radii and other detailed design and operational characteristics that impact truck route choice, a simple distance-based penalty was developed on the basis of the functional classification system with the assumption that higher functional class roadways would generally have

design characteristics more appealing to trucks. This penalty term was added to the generalized cost for multi-unit trucks used in assignment.

The values of the penalties were developed heuristically, through trial and error, testing a variety of simple schemes and values. Although the overall statistical improvements were modest, there were significant improvements on several key routes and major origin-destination patterns in the area. Figure H-13 and Table H-30 present one extreme example. The fastest and shortest distance route from I-75 north of Knoxville to I-40 west of Knoxville is a combination of several state highways and a local road, Frost Bottom Road. However, from traffic counts it is evident that most trucks traveling between I-75 to the north and I-40 to the west do not use this route.

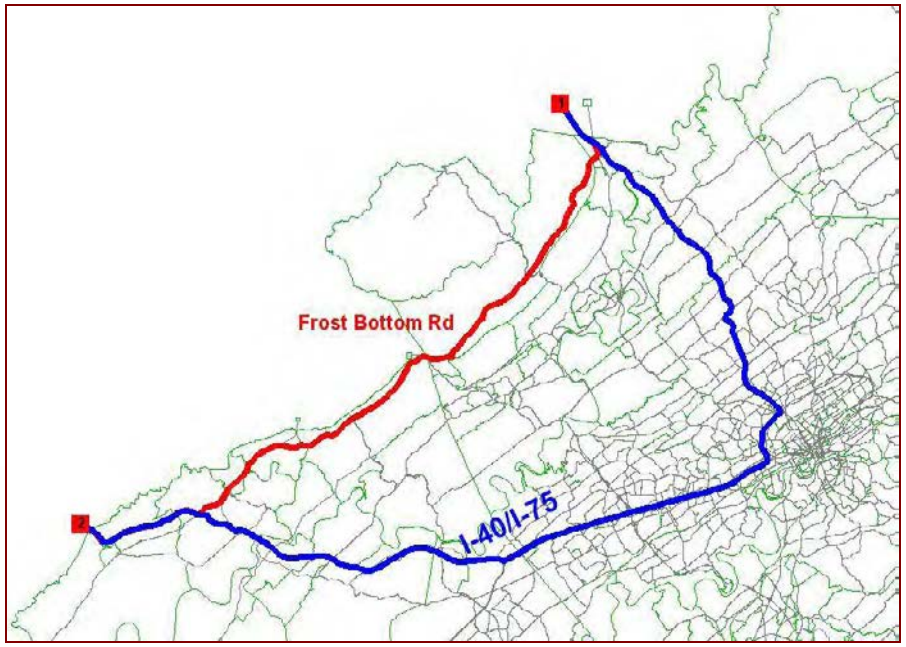

Figure H-13: Example of Competing Routes between I-75 and I-40

Table H-30: Generalized Costs for Competing Routes in Knoxville Example

Route	Travel Time (min)	Distance (mi)	Penalty (min)	Generalized Cost (min)
Frost Bottom Rd	60.2	48.0	61.3	121.5
Interstates I-40/I-75	66.7	73.5	37.0	103.6

The simple functional class-based penalty scheme presented above results in the realistic route choice following the designated interstate system and avoiding local roads and discontinuous state highways. Whereas assignments based only on travel time and distance always favored the Frost Bottom Road route, the generalized cost with the penalty shows the clear preference for the Interstates.

The new model built upon the success of the functional class-based penalties for multi-unit trucks and includes a complex generalized cost function with length penalties, which vary by functional class for each vehicle class: cars, single unit trucks, and multi-unit trucks. Higher penalties on lower functional classes capture drivers' preference to avoid lower class facilities and their lack of knowledge of lower class roads.

In this model, update a genetic algorithm was used to statistically estimate the penalties based on their ability to reproduce observed traffic counts on the network rather than by simple trial and error. The procedure "evolves" a solution by making many assignments with different randomly generated parameters. Sets of parameters that result in poor loading errors (as measured by the %RMSE) are discarded, while parameters that produce good results survive and are recombined to find the best parameters for reproducing the observed truck counts. The random generation of new "mutant" parameters also informally incorporated Bayesian statistics by drawing from distributions, which were conditioned on previous results, as well as an original prior distribution.

Table H-31: Length Penalties in Minutes per Mile by Vehicle Class and Functional Class

	Cars	Single Unit Trucks	Multi-Unit Trucks
Local Streets/Roads	1.71	2.70	25.50
Minor/Urban Collectors	0.78	2.24	21.17
Rural Major Collectors / Urban Minor Arterials	0.54	1.79	16.93
Rural Minor Arterials / Urban Principal Arterials	0.33	1.34	12.70
Rural Principal Arterials / Urban Freeways	0.25	0.89	8.38
Interstates	0.13	0.44	4.19

The length penalties estimated by the genetic algorithm are presented in Table H-31 and Figure H-14. Several logical patterns can be observed in the results. First, greater penalties are observed for lower functional classes. This corresponds to drivers' preferring higher-class facilities, which stands to reason. (The parameter estimation was constrained to ensure that lower functional classes received equal or greater penalties than higher functional classes and assumed a linear pattern to start.) Second, drivers' preference to avoid low class facilities varies depending

on their vehicle. Car drivers mainly prefer to avoid local roads and streets, and exhibit some preference for higher functional classes beyond that, but not an especially strong preference. Multi-unit truck drivers, on the other hand, prefer each successively higher functional class significantly more. This result is plausible, since trucks are affected by issues such as vertical clearance and turning radii that cars are not; whereas, cars' bias towards higher functional class facilities is likely mostly reflective of their imperfect knowledge of the network and lack of consideration of all possible routes using low class roadways. Third, the multi-unit trucks value saving distance much more relative to saving time as compared to single unit trucks and cars. This is generally reasonable and expected because fuel consumption is more based on distance, large trucks consume much more fuel per mile than smaller vehicles and are often more concerned with minimizing their operating costs than cars. Single unit trucks also value distance more than compared to cars, which generally are more concerned about minimizing travel time than travel costs.

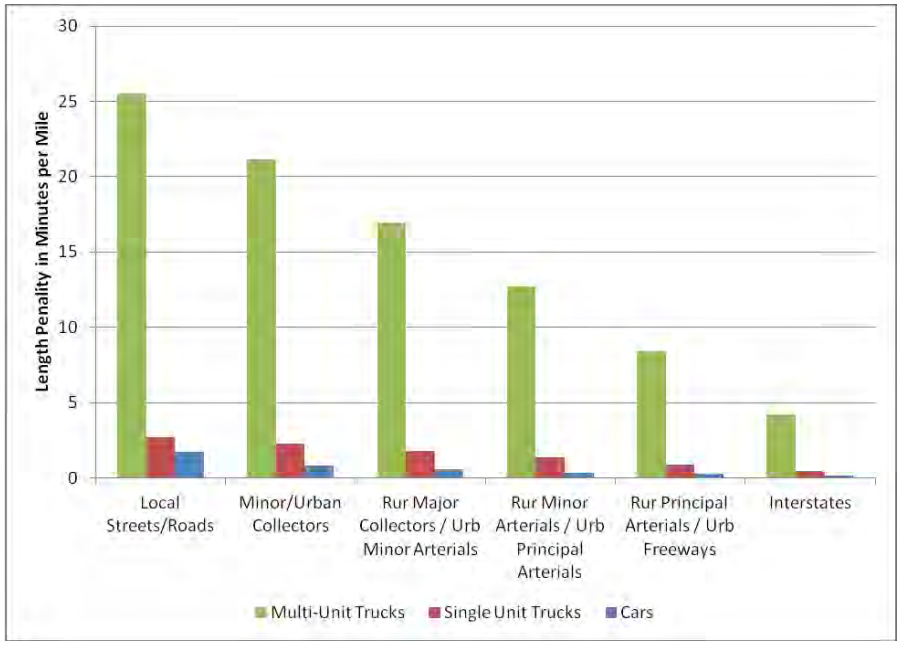

Figure H-14: Patterns in Length Penalties across Functional Classes and Vehicle Classes

Table H-32: Volume Delay Functions

	Alpha	Beta
Freeways	1.30	7.24
Partial Access Controlled	9.90	3.79
Signal Controlled	9.80	3.10
Special - Bridges	8.89	3.15
Special - Curves	8.00	4.00
All Other	0.99	4.36

The genetic algorithm also estimated turn penalties, truck PCE factors, and volume delay function parameters for the assignment. The left turn penalty was estimated at 39.8 seconds of delay, while the right turn penalty was estimated at only 2.6 seconds of delay. Passenger car equivalencies of 1.4, 1.9, and 3.6 were used for four tire commercial vehicles, single unit and multiple unit trucks, respectively. The estimated volume delay functions are displayed in Table H-32 and Figure H-15. Functions were estimated for several broad categories of facilities as well as a few special facilities, such as bridges.

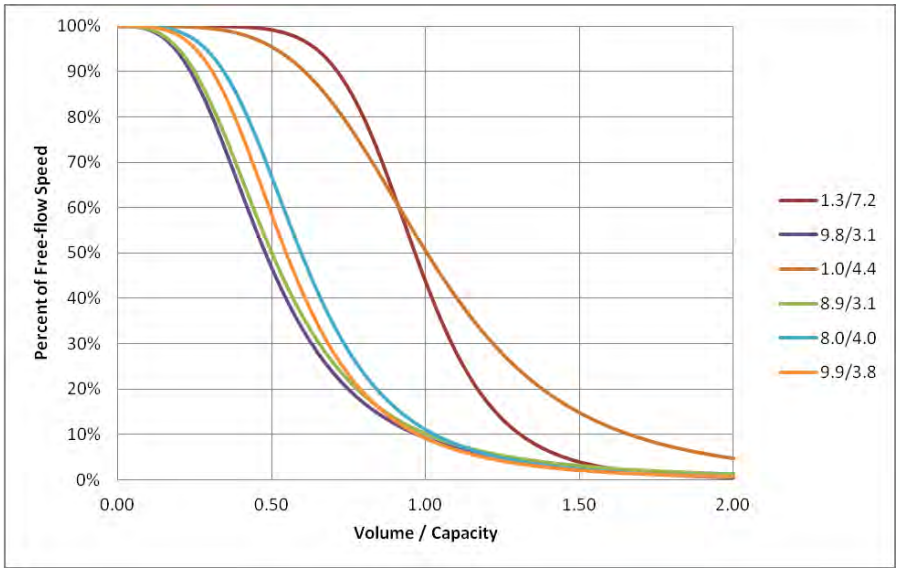

Figure H-15: Volume Delay Functions

Total link daily volumes from the base year am, pm and off-peak assignments were validated by comparing the percentage difference between observed traffic count and estimated model volume on the link. The calibration/validation checks were performed based on Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee. It recommended conducting the following checks using the criteria suggested by Federal Highway Agency (FHWA).

Criteria for acceptable errors between observed and estimated traffic volumes vary by facility type, according to the magnitude of traffic volume usage. For example, higher volume roadways have stricter calibration guidelines than those with lower volumes.

A new CAL_REP module was developed using the Geographic Information System Developer's Kit (GIS-DK) script language to create maps with a color theme based on loading error and a scaled symbol/width theme on absolute error as well as to report model performance for the:

- network as a whole,
- functional classes,
- volume group ranges,
- designated screenlines,
- designated corridors,
- area types, and
- counties.

Error statistics reported and used for diagnosing the possible sources of model error are:

- percent root mean square errors,
- system wide average error,
- mean loading errors and percentage errors, and
- total VMT and percentage errors.

Attention is always needed to the traffic counts, themselves, since the validation is only as good as the counts. In the course of the model's validation, several bad counts/count errors were identified and removed or corrected in coordination with the TPO and TDOT. Interestingly, the interstate counts seemed to have the most issues. The two most significant and notable were the counts for I-81, which were recalculated by TDOT (being based on ramp counts, not actual counts on the mainline), and the truck counts on I-40 through Knoxville. There may be additional problems with some of the 2010 interstate counts on I-40 and I-75, which do not agree well with counts from early years, but they have been retained in the absence of better information. The model generally agrees better with the older counts and its error statistics would be lower if the new interstate counts are revisited.

Calibration and validation efforts always begin by trying to address any systematic global issues first and then proceeding to address more specific problems with particular subareas, corridors, or individual links. In the course of this validation effort, the only two global adjustments were made:

- Some trip mode choice models were adjusted to reduce sensitivity to fuel prices since changes in fuel prices between 2006 and 2010 indicated some over-sensitivity to fuel price in vehicle occupancies.
- The genetic algorithm described above made adjustments to volume delay functions to improve the model's overall goodness-of-fit.

The limited number and nature of these global adjustments is a positive indication for the core validity of the model suggesting that the 2006 model was well calibrated.

A number of issues, however, were identified which affected particular subareas or corridors and the following actions were taken:

- The interaction between travel time and accessibility was altered for Hamblen County only to produce longer trip lengths to correct for under-loading specifically in the Morristown area.
- Different cost sensitivity parameters where assigned to various external stations in the distribution of internal-external trips. For instance, it was necessary to decrease the cost sensitivity for I-81 and I-40 east so that a reasonable portion of their external-internal trips would reach Knoxville.
- The visitor tour generation rate was increased to address under-loading in the tourism areas of Sevier County.

A variety of centroid connectors were adjusted, mostly in Hamblen County.

The Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee identify several guidelines for demonstrating that a model is well calibrated. However, as the document itself is clear to state, the fulfillment of these guidelines does not ensure that a model is well validated nor does the failure of a model to meet every target or standard mean the model is necessarily not well calibrated. The tables below correspond to the standards adopted by TNMUG. In each case, they compare the modeled traffic volumes to observed traffic counts. A variety of error statistics are used. Most of the guidelines focus

on the simple Percent Error. The Percent Root Mean Square Error (% RMSE) is also used and is the traditional and perhaps the single best overall error statistic for comparing loadings to counts. It has the following mathematical formulation:

$$\%RMSE = \frac{\sqrt{\frac{\sum(Count - Loading)^2}{Number\ of\ Observations}}}{Average\ Count} \times 100$$

Although none of the Tennessee guidelines currently requires other error statistics, two additional error statistics have been included in some of the tables below. The Mean Absolute Percentage Error (MAPE) has also been included as complimentary to the RMSE and representative of the absolute error based goodness-of-fit statistics. It is becoming a common error statistic in many other forms of computer modeling. It complements the RMSE in that the RMSE treats larger volumes as more important (i.e., it is most important to have the Interstates rights, not so important to have local street right); whereas, the MAPE treats all observations/errors equally. So, in many cases in travel modeling the %RMSE will be lower than the MAPE indicating that the model does better on larger facilities. The MAPE is calculated using the following formula:

$$MAPE = \frac{\left|\frac{Count - Loading}{Count}\right|}{Number\ of\ Observations}$$

The (student) t-statistic has also been included in some cases. The t-statistic indicates whether or at what level of confidence the difference between the model and the counts is statistically significant. The value of the t-statistic that indicates a significant difference between the model and the counts depends on the number of observations. Tables and calculators are widely available on the internet (Excel also includes this functionality). However, for large samples (more than 100 observations), a t-statistic of about 2.6 indicates 99% confidence that there is a significant difference and a t-statistic of about 2.0 indicates 95% confidence and about 1.7 indicates 90% confidence. However, higher t-statistics are required for the same level of confidence with fewer observations. So, for instance, for a category with only 10 counts, a t-statistic of 3.2 is required to reach the 99% confidence level.

Table H-33: Volume to Count Ratios/Percent Error by Functional Class

	Area	# of Obs.	Mean Count	Mean Load	% Error	TNMUG Standard		% RMSE	MAPE	t
						Acceptable	Preferable			
Freeways	Urban	114	71,397	71,335	-0.1%	+/- 7%	+/- 6%	13.3%	14.4%	0.0
	Rural	83	42,156	44,386	5.3%			14.4%	13.0%	0.6
Principal Arterials	Urban	200	24,379	24,094	-1.2%	+/- 15%	+/- 10%	19.0%	16.2%	-0.2
	Rural	40	11,756	12,378	5.3%			19.4%	12.5%	0.4
Minor Arterials	Urban	237	10,057	9,256	-8.0%			31.4%	31.9%	-1.4
	Rural	80	7,733	8,014	3.6%			21.4%	22.5%	0.4
Collectors	Urban	226	4,471	3,941	-11.9%	+/- 25%	+/- 20%	58.5%	47.3%	-1.5
	Rur Maj	148	3,089	3,551	14.9%			49.7%	51.4%	1.6
	Rur Min	144	1,518	1,456	-4.1%			73.5%	64.6%	-0.4
Locals	Urban	61	3,151	2,897	-8.1%	none	none	69.2%	99.9%	-0.5
	Rural	22	1,576	826	-47.6%			77.5%	59.7%	-2.5
All	Urban	838	19,811	19,346	-2.3%			23.9%	34.9%	-0.3
	Rural	517	10,248	10,781	5.2%			27.2%	41.8%	0.5
	All	1615	14,388	14,389	0.0%			27.1%	37.9%	0.0

Table H-33 displays the volume to count ratios or percent errors for the model by functional class together with the Tennessee standards. The model clearly meets the standards for all classes. Based on the t-statistic, none of the classes are meaningfully different in the model versus the counts except possibly for rural local roads, which appear significantly under-loaded, based on the limited sample of 22 counts. The minor overloading in rural areas is likely due in part to the sparseness of the network and coarseness of the zones in these parts of the model. Overall, however, the model appears well calibrated with an overall RMSE notably less than 30% and better than any of the previous versions of the Knoxville regional model.

Table H-34: Volume to Count Ratios/Percent Error by Volume Group

AADT	# of Obs.	Mean Count	Mean Load	% Error	TNMUG Standard		% RMSE	MAPE	t-stat
					Acceptable	Preferable			
0 - 1000	159	613	864	41.0%	+/- 200%	+/- 60%	154.2%	96.3%	3.3
1001 - 2,500	283	1,687	1,903	12.8%	+/- 100%	+/- 47%	78.5%	58.7%	2.6
2,501 - 5,000	297	3,714	3,740	0.7%	+/- 50%	+/- 36%	55.2%	39.7%	0.2
5,001 - 10,000	305	7,244	7,185	-0.8%	+/- 29%	+/- 25%	36.5%	27.7%	-0.3
10,001 - 25,000	317	15,355	14,667	-4.5%	+/- 25%	+/- 20%	26.1%	19.8%	-1.9

25,001 - 50,000	145	36,039	37,443	3.9%	+/- 22%	+/- 15%	16.8%	12.5%	1.2
> 50,000	111	83,422	82,744	-0.8%	+/- 21%	+/- 10%	11.4%	9.8%	-0.1

The volume to count ratios/percent errors by volume group are given by Table H-34. Comparison of the percent error with the acceptable range indicates that the model far exceeds the calibration minimum criteria for all volume ranges. The table also displays the expected general pattern of higher errors on lower volume groups and decreasing errors on higher volume groups. Tennessee also has standards for %RMSE by volume group (but for different groupings of volumes) which are displayed in Table H-35, which shows that again, all standards are met.

Table H-35: Root Mean Square Error (RMSE) by Volume Group

AADT	# of Obs.	Mean Count	Mean Loading	% RMSE	TNMUG Standard	% Error	MAPE	t-stat
0 - 5000	737	2,272	2,420	**70.4%**	**115%**	6.5%	59.1%	1.7
5001 - 9,999	305	7,244	7,185	**36.5%**	**43%**	-0.8%	27.7%	-0.3
10,000 - 19,999	270	14,189	13,670	**27.6%**	**30%**	-3.7%	20.5%	-1.6
20,000 - 39,999	143	28,854	29,403	**19.9%**	**25%**	1.9%	14.5%	0.5
40,000 - 59,999	87	48,902	51,288	**14.4%**	**20%**	4.9%	11.0%	1.3
> 60,000	73	97,828	94,597	**10.2%**	**19%**	-3.3%	8.5%	-0.4

Tennessee also has standards for volume to count ratios/percent errors on screenlines and cutlines. Figure H-16 and Figure H-17 illustrate the cutlines and screenlines for the model. The cutlines are unchanged. The old North Counties screenline was replaced with a new NorthEast Counties screenline, to help demonstrated that the flows into out of the northeast counties is correct with the addition of Hamblen County in this update of the model. Table H-36 displays the errors for screenlines and cutlines. All of the screenlines meet the standard, as do two of the three cutlines. The Old #6 cutline, however, is slightly over the standard percent error. The underloading on the Old #6 cutline is almost entirely due to I-40. The counts on this section of I-40, however, are somewhat suspicious, being 22% higher than the 2006 counts. If the I-40 counts from 2006, 2007, or 2008 were used instead, the model would match this section of I-40 and the Old #6 cutline very closely.

Table H-36: Volume to Count/Percent Error for Screenlines and Cutlines

	Area	# of Obs.	Count AADT	Model AADT	% Error	TNMUG Standard	% RMSE	MAPE	t-stat
Screenlines	**Knox - Blount Border**	7	219,353	232,337	5.9%	+/- 10%	7.7%	14.8%	0.1
	Knox & Blount Boundary	22	507,342	530,665	4.6%		22.1%	58.5%	0.1
	Knox Co Boundary	37	1,359,408	1,397,034	2.8%		17.1%	42.6%	0.1
	Blount Co Boundary	9	157,940	164,143	3.9%		10.7%	22.0%	0.1
	Rivers	18	482,057	508,843	5.6%		10.6%	20.5%	0.2
	Inner Knoxville	16	789,571	795,463	0.7%		15.1%	14.4%	0.0
	East Counties	10	182,368	176,064	-3.5%		15.5%	66.8%	0.0
	West Counties	9	275,692	267,530	-3.0%		9.5%	34.9%	0.0
	Northeast Counties	12	186,342	200,243	7.5%		12.1%	62.0%	0.1
Cutlines	**Old #2**	7	242,470	253,185	4.4%	+/- 15%	16.0%	33.4%	0.1
	Old #6	4	188,607	157,313	-16.6%		22.6%	19.3%	-0.2
	Old #7	3	78,390	75,027	-4.3%		8.2%	4.6%	-0.1

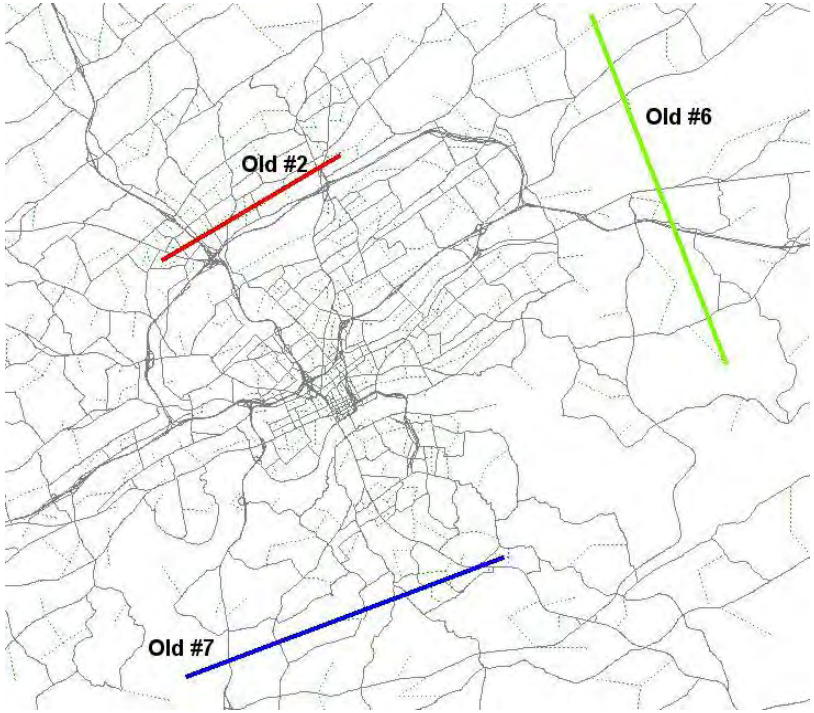

Figure H-16: Calibration Cutlines from the Old MINUTP Model

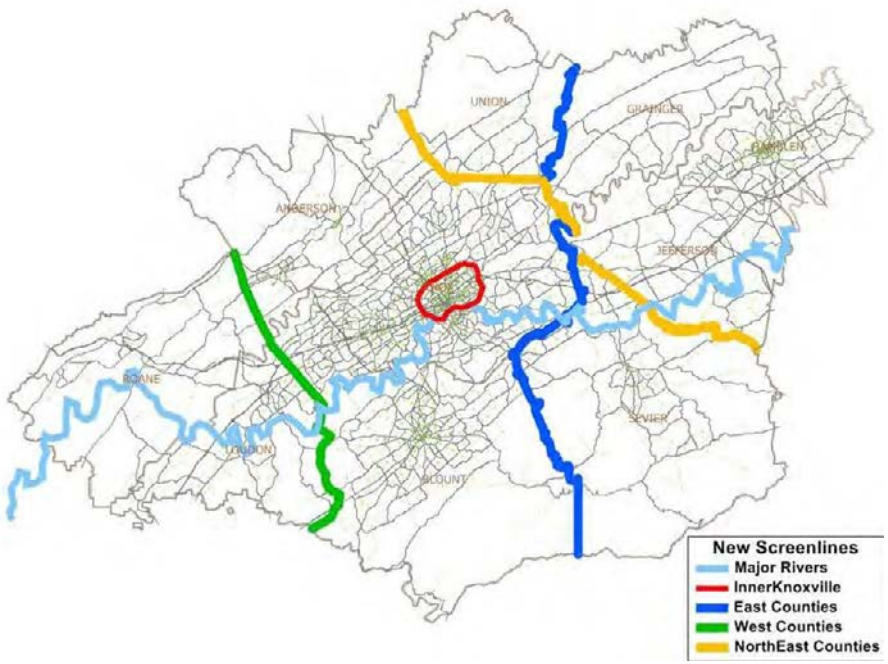

Figure H-17: Regional Screenlines

The correlation coefficient estimates the correlation between the actual ground counts and the estimated traffic volumes, and can be obtained using the linear regression method. Tennessee specifies a minimum standard of 0.88 for the correlation coefficient as recommended by FHWA. The linear regression results of the Knoxville model are shown in Figure H-18. The correlation coefficient is 0.949, which is significantly greater than the 0.88 minimum that was suggested by FHWA and the Tennessee standard as well as better than the previous version of the model. The results indicate a good performance of the model at the overall level.

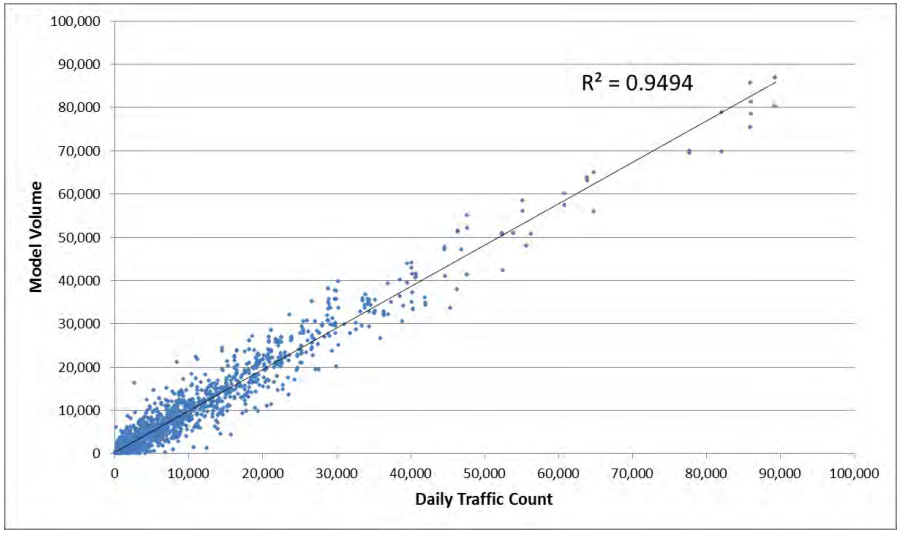

Figure H-18: Correlation Coefficient and Daily Traffic Count vs. Model Volume

A breakout of model errors by county, provided in Table H-37, offers further evidence of the model's validity and that it is not limited to only a particular geographic area. In particular, the RMSE for each county is essentially at or below the 30% standard applied across all facility types/volumes groups.

Table H-37: Validation Statistics by County

AADT	# of Obs.	Mean Count	Mean Loading	% Error	% RMSE	MAPE	t-stat
Anderson	107	9,219	9,085	-1.5%	26.3%	51.4%	-0.1
Blount	199	9,323	9,081	-2.6%	23.9%	32.6%	-0.2
Jefferson	126	11,782	12,555	6.6%	22.1%	52.2%	0.3
Hamblen	157	7,595	6,993	-7.9%	25.3%	36.4%	-0.6
Knox	641	20,907	20,825	-0.4%	25.6%	37.9%	0.0
Loudon	108	15,207	15,811	4.0%	23.0%	36.8%	0.2
Roane	110	9,795	10,563	7.8%	30.6%	30.7%	0.4
Sevier	75	14,457	13,691	-5.3%	21.9%	28.2%	-0.3
Union	27	3,852	4,097	6.4%	26.8%	46.2%	0.2

The model meets all of the assignment validation standards set forth Minimum Travel Demand Model Calibration and Validation Guidelines for State of Tennessee with the exception of one cutline, which is still close to the standard and may be attributable to a suspicious count. The new 2010 model also performs better than the previous 2006 base year model (which performed better than all its predecessors did). The 2010 model achieved a 27.1% RMSE and correlation coefficient of 0.95 compared to 28.1% RMSE and 0.92 correlation

coefficient for the 2006 model. It is reasonable to conclude that the model is well calibrated and validated by observed traffic counts.

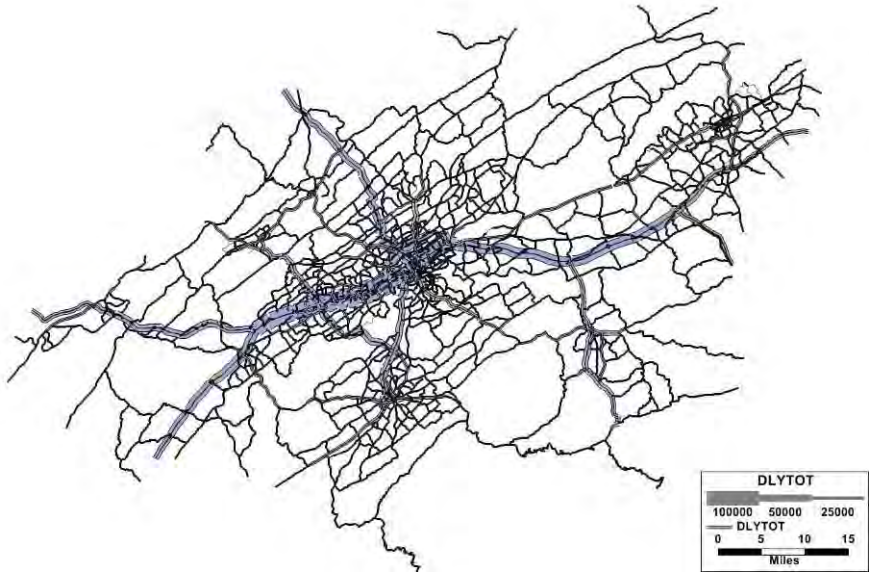

Figure H-19: Knoxville Loaded Regional Network

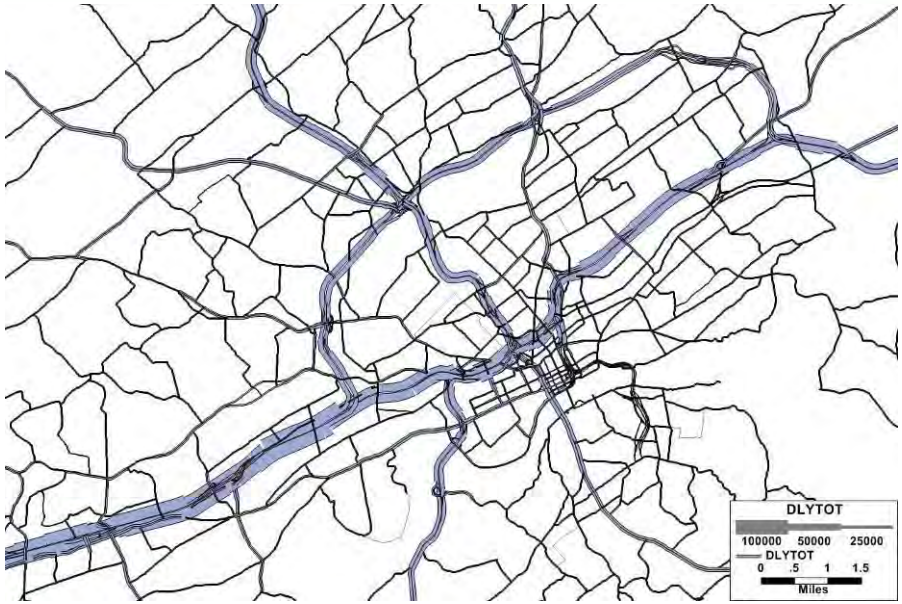

Figure H-20: Knoxville Loaded Network (central area detail)

Appendix I: Congestion Management Process (CMP)

Technical Evaluation of CMP Network – Overview

The following tables are part of the CMP analysis that was documented in Chapter 7. Tables Table I-1 through Table I-5 list all roadway corridors in the TPO's Metropolitan Planning Area (MPA) and also includes other corridors beyond the MPA that are included in the TPO's travel demand forecasting model. Table I-6 lists the "Congestion Hot Spots", which are congested intersections within the Knoxville Urbanized Area that were identified through travel time data collection, Table I-7 are the projects with additional capacity for single occupant vehicles that resulted from the CMP analysis and finally
Table I-8 lists the types of strategies that were considered for congested corridors.

Congested Corridor Identification

The TPO uses a V/C ratio threshold of 0.85 to determine roadways that are becoming congested for this Plan. In simple terms, this means that a roadway has reached 85 percent of its theoretical capacity, and therefore traffic operations are becoming unstable. As the V/C ratio approaches 1.0 the traffic flow starts to break down, and even minor disruptions can cause major queues as disruption waves propagate through the upstream traffic flow. There is also a strong correlation between high V/C ratios and crash rates.

The travel demand model was run for the base year of 2010 and for future socioeconomic conditions in years 2014, 2024, 2034, and 2040 in order to determine potential congested areas on the existing plus committed roadway network. Tables Table I-1 through Table I-5 show the results of the V/C analysis for each travel demand model network year. The corridors are color-coded based on the first horizon year in which the corridor reaches a V/C ratio of 0.85, i.e. purple for year 2014, red for year 2024, orange for year 2034 and yellow for 2040. These tables also include information about the strategies that have been selected to mitigate congestion and the project ID if there is a roadway project included in the Mobility Plan that addresses the corridor.

Exhibit I-1

Congested Corridors in the Region

long range regional mobility plan 2040

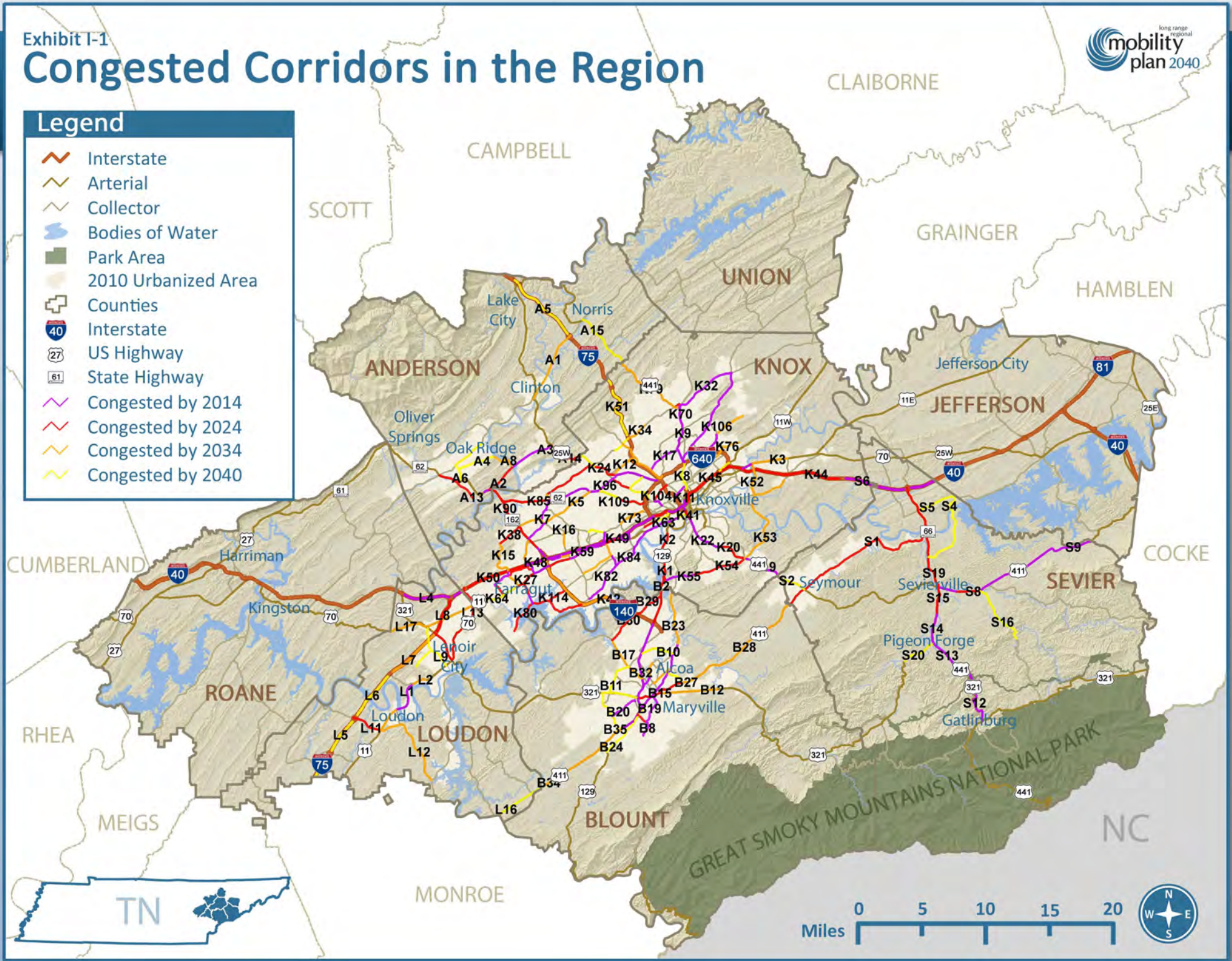

Table I-1: TPO Regional Congested Corridors – Anderson County

Route	Corridor Limits	Corridor Map ID	Capacity	2014 V/C	2024 V/C	2034 V/C	2040 V/C	TDM	ITS/ Operations/ Geometric	Public Transit	Added Capacity	RMP Project ID
Charles G. Seviers Blvd	SR 9 - I-75	A1	34,500	0.72	0.83	1.02	1.16	X				0
Clinch Ave	Edgemoor Rd - SR 61		35,700	0.53	0.60	0.68	0.78					
Edgemoor Rd	SR 62 - Melton Lake Rd	A2	16,900	0.83	0.98	1.12	1.19	X			X	09-101a
	Melton Lake Rd - Clinton Hwy	A3	16,900	0.89	1.02	1.14	1.22	X			X	09-101b
Emory Valley Rd	Lafayette Ave - Melton Lake Rd	A4	15,600	0.66	0.74	0.80	0.91	X				0
I-75	US 25 - SR 61	A5	76,500	0.53	0.61	0.71	0.86	X				0
	SR 61 - Knox Co Line		76,500	0.43	0.50	0.58	0.63					
Lafayette Ave	Oak Ridge Tpk - Illinois Ave	A6	32,900	0.70	0.77	0.82	0.85	X	X			0
Main St	I-75 - SR 61	A7	13,520	0.68	0.75	0.85	0.97	X				0
Melton Lake Rd	Oak Ridge Tpk - Emory Valley Rd	A8	12,480	0.70	0.81	0.91	0.97	X				0
	Emory Valley Rd - Edgemoor Rd		12,480	0.59	0.69	0.78	0.79					
N Illinois Ave	Oak Ridge Tpk - W. Outer Dr		35,700	0.37	0.39	0.41	0.43					
N Main Ave	I-75 - SR 61	A9	13,520	0.76	0.82	0.88	0.87	X				0
Norris Fwy	I-75 - Norris Fwy		35,700	0.39	0.46	0.63	0.70					
	Knox Co Line - SR 61		13,520	0.12	0.16	0.35	0.57					
	SR 61 - Campbell Co Line		13,520	0.07	0.10	0.18	0.70					
Oak Ridge Tpk	Roane Co Line - Illinois Ave		35,700	0.59	0.67	0.75	0.83					
	Illinois Ave - New York Ave		34,500	0.58	0.63	0.68	0.72					
	New York Ave - Melton Lake Rd	A10	34,500	0.71	0.77	0.83	0.86	X				0
Oak Ridge Tpk/ Charles Seviers	Melton Lake Rd - SR 9		33,915	0.55	0.61	0.67	0.72					
Raccoon Valley Rd	SR 61 - Campbell Co Line		13,520	0.31	0.38	0.55	0.70					
Rutgers Ave	Oak Ridge Tpk - Illinois Ave		32,900	0.34	0.36	0.37	0.38					
S Illinois Ave	Knox Co Line - Bethel Valley Rd	A11	46,800	0.89	1.00	1.09	1.13	X	X			0
	Bethel Valley Rd - Lafayette Ave		53,500	0.59	0.65	0.70	0.72					
	Lafayette Ave - Oak Ridge Tpk	A12	34,500	0.77	0.85	0.91	0.96	X	X			0
S Main Ave	I-75 - SR 61		13,520	0.33	0.34	0.37	0.50					
Scarboro Rd	Illinois Ave - Bethel Valley Rd	A13	15,600	0.77	0.91	1.01	1.09	X				0
SR 116	US 25 - SR 62		13,520	0.19	0.20	0.22	0.24					
SR 61	SR 62 - Oak Ridge Tpk		13,520	0.37	0.41	0.45	0.49					
	I-75 - Norris Fwy		35,700	0.46	0.55	0.75	0.82					
	Norris Fwy - Union Co Line		13,520	0.45	0.54	0.73	0.82					
Tri-County Blvd	W Outer Dr - Roane Co Line		35,700	0.55	0.59	0.63	0.67					
US 25 W	Knox Co Line - Edgemoor Rd	A14	26,775	0.80	0.91	1.03	1.13	X				0
	I-75 - SR 61		13,520	0.44	0.47	0.52	0.67					
US 441	Knox Co Line - SR 61	A15	13,520	0.29	0.35	0.59	0.87	X				0

Table I-2: TPO Regional Congested Corridors – Blount County

Route	Corridor Limits	Corridor Map ID	Capacity	2014 V/C	2024 V/C	2034 V/C	2040 V/C	TDM	ITS/ Operations/ Geometric	Public Transit	Added Capacity	RMP Project ID
Alcoa Hwy	Hunt Rd - I-140	B1	56,100	0.97	1.03	1.10	1.09	X			X	09-218, 09-257
	I-140 - C.L.	B2	56,100	0.78	0.85	0.92	0.95	X			X	09-216
Bessemer St	US 129 - Hall Rd	B3	15,600	0.89	1.10	1.23	1.29	X	X		X	13-205
	Hall Rd - Springbook Rd	B4	12,480	0.49	0.71	0.96	1.04	X	X		X	13-204
Blockhouse Rd	Montvale Rd - Wilkinson Pk		12,480	0.10	0.11	0.14	0.16					
Brick Mill Rd	US 129 - US 411		12,480	0.12	0.14	0.16	0.26					
Broadway Ave	US 129 - Lamar Alexander Pkwy	B5	13,520	1.23	1.30	1.39	1.45	X	X			09-242
	Lamar Alexander Pkwy - Cusick St	B6	13,520	0.91	1.01	1.10	1.16	X	X			0
Brown School Rd	Sevierville Rd - Old Knoxville Hwy	B7	12,480	0.36	0.47	0.78	0.94	X	X			09-236
Burnett Station Rd	Chapman Hwy - Sevierville Rd		12,480	0.30	0.35	0.43	0.52					
Calderwood Hwy	State Line - Monroe Co Line		13,520	0.08	0.10	0.14	0.16					
	Monroe Co Line - US 411 S		13,520	0.29	0.34	0.41	0.49					
Calderwood St	US Hwy 411 - Alcoa Hwy		24,675	0.64	0.76	0.81	0.84					
Carpenter Grd Rd	Mint Rd - Raulston Rd		12,480	0.09	0.11	0.14	0.16					
	Raulston Rd - Sandy Springs Rd	B8	12,480	0.92	1.16	1.39	1.46	X	X			09-223
Chapman Hwy	Boyds Creek Hwy - Knox Co Line	B9	35,700	0.52	0.60	0.73	0.86	X	X			09-626
Court St	Memorial Dr - US 321		12,480	0.55	0.59	0.62	0.65					
Cusick Rd	Singleton Station. Rd - US 129		12,480	0.26	0.35	0.50	0.63					
Dogwood Dr	Sevierville Rd - Lamar Alexander Pkwy		12,480	0.14	0.18	0.25	0.29					
Everett High Rd	Sevierville Rd - Lincoln Rd		12,480	0.37	0.46	0.52	0.57					
Foch St	US 321 - US 129		12,480	0.42	0.44	0.50	0.46					
Foothills Mall Dr	Alcoa Hwy - US 411		32,900	0.52	0.65	0.71	0.74					
Hall Rd	Alcoa Hwy - Lincoln St	B36	32,900	0.61	0.90	0.93	0.93	X				0
Hunt Rd	Louisville Rd - Alcoa Hwy		15,600	0.49	0.62	0.72	0.74					
	Alcoa Hwy - SR 33	B10	15,600	0.50	0.65	0.82	0.90	X				0
Hunt/Old Glory Rd	US 321 - Topside Rd	B11	12,480	0.55	0.68	0.78	0.85	X				0
I-140	C.L. - Old Knoxville Hwy		76,500	0.50	0.62	0.72	0.80					
Lamar Alexander Pky	Tuckaleechee Pk - Washington St	B12	35,700	0.61	0.69	0.86	0.93	X	X			0
	William Blount Dr - Alcoa Hwy	B13	35,700	0.67	0.75	0.83	0.89	X	X			0
	Alcoa Hwy - Broadway Ave	B14	34,500	0.84	0.95	1.04	1.09	X	X			0
	Broadway Ave - Washington St	B15	34,500	0.82	0.89	0.96	1.00	X	X			0
	Loudon Co Line - Wm Blount Dr		35,700	0.48	0.56	0.64	0.73					
	Tuckaleechee Pk - SR 337		35,700	0.33	0.38	0.44	0.47					
Lincoln Rd	Hall Rd - Old Knoxville Hwy	B16	12,480	0.60	0.74	0.94	1.01	X				0
Louisville Rd	Alcoa Hwy - Topside Rd	B17	13,520	0.62	0.80	0.90	0.98	X	X			13-207, 13-215
McArthur Rd	Springbrook Rd - Old Knoxville Hwy		12,480	0.22	0.32	0.46	0.55					
Mentor Rd	Wright Ferry Rd - Louisville Rd		12,480	0.13	0.26	0.33	0.49					
Merritt Rd	Sevierville Rd - Lamar Alexander Pkwy		12,480	0.18	0.22	0.29	0.34					
Middlesettlements Rd	US 129 - Old Glory Rd		12,480	0.17	0.26	0.32	0.36					
Mint Rd	Carpenters Grade Rd - Old Niles Ferry Rd		12,480	0.22	0.25	0.27	0.29					
Miser Station Rd	Quarry Rd - Louisville Rd		12,480	0.13	0.16	0.19	0.23					
Montvale Rd	Southview Dr - Boardman Ave		13,520	0.49	0.52	0.54	0.59					
	Boardman Ave - Lamar Alexander Pkwy	B18	13,520	0.90	0.98	1.04	1.09	X	X			09-262
	Six Mile Rd - Southview Dr		13,520	0.28	0.30	0.33	0.36					
Montvale Station Rd	Carpenter Grd Rd - Montvale Rd	B19	12,480	0.85	1.01	1.15	1.22	X				0

Route	Corridor Limits	Corridor Map ID	Capacity	2014 V/C	2024 V/C	2034 V/C	2040 V/C	TDM	ITS/ Operations/ Geometric	Public Transit	Added Capacity	RMP Project ID
Morganton Rd	Foothills Mall Rd - Wm Blount Dr	B20	12,480	0.87	0.99	1.08	1.14	X	X			09-211
	Wm Blount Dr - Henry Ln		12,480	0.44	0.47	0.51	0.56					
Old Knoxville Hwy	Williams Mill Rd - Hunt Rd	B21	13,520	1.17	1.46	1.78	1.99	X			X	09-203
	Hunt Rd - Washington St	B22	13,520	1.03	1.16	1.27	1.38	X	X			09-212
	Sam Houston Rd - Knox Co Line	B23	13,520	0.53	0.69	0.85	1.06	X	X			09-231
Old Niles Ferry Rd	Calderwood Hwy - Broadway Ave	B24	12,480	0.40	0.52	0.73	0.92	X	X			09-213
Pleasant Hill/Memorial	Court St - Lamar Alexander Pkwy		12,480	0.08	0.10	0.17	0.22					
Raulston Rd	Montvale Rd - Carpenter Grade Rd		12,480	0.38	0.50	0.64	0.72					
Sandy Springs Rd	Montvale Station Rd - US 411	B25	12,480	0.72	0.87	1.00	1.05	X	X			0
Sevierville Rd	Brown School Rd - High St	B26	13,520	0.83	0.94	1.08	1.19	X	X			09-214, 09-245
	Brown School Rd - Davis Ford Rd	B28	13,520	0.64	0.75	0.93	1.06	X	X			09-250
	Davis Ford Rd - Sevier Co Line	B27	13,520	0.63	0.73	0.85	0.92	X	X			09-245
Singleton Station Rd	US 129 - Old Knoxville Hwy		12,480	0.28	0.32	0.40	0.49					
Six Mile Rd	Calderwood Hwy - Montvale Rd		12,480	0.09	0.10	0.11	0.12					
Springbrook Rd	Hunt Rd - Wright Rd		12,480	0.16	0.33	0.57	0.64					
SR 333	US 321 - Topside Rd		13,520	0.24	0.33	0.38	0.42					
Topside Rd	Alcoa Hwy - I-140	B29	13,520	0.78	0.96	1.11	1.23	X			X	09-248
	I-140 - Louisville Rd	B30	13,520	0.78	0.97	1.11	1.26	X				0
Tuckaleechee Pk	US 321 W - US 321 E		12,480	0.33	0.37	0.42	0.46					
US 129 Bypass	US 411 - Louisville Rd	B31	34,500	0.98	1.15	1.29	1.37	X	X		X	09-202
	Louisville Rd - Hunt Rd	B32	56,100	0.87	0.99	1.08	1.12	X	X		X	13-203
US 411	William Blount Dr - US 129	B33	35,700	0.86	1.02	1.16	1.25	X	X			0
	Loudon Co Line - Wm Blount Dr	B34	35,700	0.56	0.70	0.88	1.00	X				0
Washington St	Lincoln St - US 321		32,900	0.67	0.71	0.76	0.77					
Wildwood Rd	Old Knoxville Hwy - Nails Creek Rd		12,480	0.23	0.31	0.49	0.60					
Wilkinson Pk	Blockhouse Rd - Court St		12,480	0.36	0.40	0.43	0.45					
William Blount Dr	US 321 - US 411 South	B35	12,480	0.59	0.71	0.83	0.92	X				0
Wright Rd	US 129 - Hunt Rd		12,480	0.44	0.55	0.63	0.74					
	Hunt Rd - Lincoln Rd		12,480	0.25	0.32	0.45	0.55					
Wrights Ferry Rd	US 129 - Topside Rd		12,480	0.20	0.25	0.29	0.34					

Table I-3: TPO Regional Congested Corridors – Knox County

Route	Corridor Limits	Corridor Map ID	Capacity	2014 V/C	2024 V/C	2034 V/C	2040 V/C	TDM	ITS/ Operations/ Geometric	Public Transit	Added Capacity	RMP Project ID
17th St	Melrose Av - Western Av		23,940	0.77	0.80	0.83	0.83					
Alcoa Hwy	C.L. - Maloney Rd	K1	56,100	0.80	0.87	0.95	0.97	X			X	09-628
	Maloney Rd - Cherokee Tr	K2	56,100	0.82	0.90	0.98	0.99	X			X	09-653
	Cherokee Tr - Kingston Pk		105,400	0.53	0.61	0.69	0.70					
	Kingston Pk - I-40		105,400	0.55	0.62	0.68	0.69					
Amherst Rd	Middlebrook Pk - Ball Camp Pk		12,480	0.32	0.38	0.44	0.47					
Andrew Johnson Hwy	C.L. - Asheville Hwy		35,700	0.48	0.54	0.66	0.77					
Asheville Hwy	Asheville Hwy -Brakebill Rd		35,700	0.61	0.65	0.70	0.83					
	Brakebill Rd - John Sevier Hwy	K3	35,700	0.63	0.71	0.86	1.01	X	X			0
	I-40 E Ramps - Prosser Rd		35,700	0.38	0.42	0.51	0.64					
	John Sevier Hwy - I-40 E Ramps	K4	35,700	0.87	0.99	1.29	1.46	X	X			0
	AJ Hwy - Sevier Co Line		13,520	0.39	0.42	0.54	0.78					
Atlantic Ave	Bruhin Rd - Broadway		12,480	0.42	0.47	0.48	0.49					
Ball Camp Pk	Middlebrook Pk - Oak Ridge Hwy	K5	12,480	0.53	0.70	0.85	0.87	X			X	09-605
Beaver Ridge Rd	Emory Rd - Oak Ridge Hwy	K6	12,480	0.60	0.74	0.89	0.93	X	X			09-636
	Oak Ridge Hwy - Hardin Valley Rd	K7	12,480	1.10	1.28	1.41	1.48	X			X	09-650
Blount/Sevier Ave	Henley St - James White Pkwy		16,380	0.32	0.34	0.36	0.39					
Bluegrass Rd	Northshore Dr - Ebenezer Rd		12,480	0.21	0.36	0.40	0.43					
Broadway	I-640 W Ramps - Grainger Ave	K8	31,160	0.78	0.80	0.83	0.85	X	X			0
	Central St - Summit Hill Dr		24,600	0.39	0.40	0.41	0.43					
	Brown Gap Rd - Cedar Ln	K9	35,700	1.11	1.19	1.28	1.31	X	X			0
	Cedar Ln - I-640 W Ramps	K10	32,800	1.19	1.26	1.33	1.36	X	X	X		0
	Grainger Ave - Central St	K11	16,300	0.86	0.90	0.93	0.99	X	X	X		0
Callahan Dr	Central Ave Pk - Pleasant Ridge Rd	K12	32,900	0.62	0.77	1.00	1.03	X	X			0
Campbell Station Rd	Kingston Pk - Parkside Dr	K13	34,500	0.62	0.83	0.90	0.92	X	X			0
	Parkside Dr - I-40	K14	32,900	0.89	1.12	1.19	1.12	X	X			0
	I-40 W Ramps - Hardin Valley Rd	K15	12,480	0.44	0.80	0.93	0.95	X	X			10-700
	Concord Rd - Kingston Pk		32,900	0.34	0.47	0.49	0.56					
Cedar Bluff Rd	Middlebrook Pk - Dutchtown Rd	K16	32,900	0.69	0.79	0.87	0.91	X	X			0
	Dutchtown Rd - Kingston Pk		32,900	0.67	0.74	0.79	0.80					
Cedar Ln	Central Ave Pk - Broadway	K17	12,480	1.10	1.15	1.22	1.26	X	X			09-686
Central Ave Pk	Emory Rd - Bruhin Rd	K18	12,480	0.61	0.72	0.92	1.03	X	X			09-671
Central St	Fifth Ave - Summit Hill Dr		15,600	0.33	0.34	0.37	0.40					
	Bruhin Rd - Woodland Ave		16,380	0.61	0.65	0.69	0.73					
	Woodland Ave - Fifth Ave		24,675	0.30	0.31	0.33	0.36					
Chapman Hwy	C.L. to John Sevier Hwy	K19	26,775	1.04	1.17	1.36	1.50	X	X			09-626
	John Sevier Hwy - Lindy Dr	K20	35,700	0.83	0.90	1.01	1.09	X	X	X	X	09-626, 09-666
	Lindy Dr - Stone Rd	K21	26,775	1.07	1.16	1.27	1.36	X	X	X	X	09-626, 09-666
	Stone Rd - Blount Ave	K22	32,800	1.03	1.10	1.17	1.21	X	X	X	X	09-626, 09-666
Cherry St	Cecil Ave - I-40 W Ramps		26,775	0.45	0.47	0.49	0.50					
	I-40 W Ramps - Magnolia Ave		32,800	0.42	0.43	0.44	0.44					
Choto Rd	Boyd Station Rd - Northshore Dr		12,480	0.32	0.56	0.63	0.69					
Clinton Hwy	C.L. - Emory Rd	K23	35,700	0.66	0.74	0.83	0.91	X				0

Route	Corridor Limits	Corridor Map ID	Capacity	2014 V/C	2024 V/C	2034 V/C	2040 V/C	TDM	ITS/ Operations/ Geometric	Public Transit	Added Capacity	RMP Project ID
	Emory Rd - Callahan Dr	K24	35,700	0.83	0.92	1.03	1.10	X	X			0
	Callahan Dr - Merchant Dr	K25	35,700	0.85	0.93	1.03	1.10	X	X	X		0
	Merchant Dr - I-275/I-640	K26	34,500	0.87	0.95	1.05	1.11	X	X	X		0
Concord Rd	Kingston Pk - Turkey Creek Rd	K27	12,480	0.64	0.87	0.94	0.97	X				0
	Turkey Creek Rd - Northshore Dr	K28	12,480	0.96	1.33	1.38	1.44	X			X	09-632
Concord St	Sutherland Ave - Kingston Pk		24,675	0.23	0.26	0.28	0.29					
Cumberland Ave	Alcoa Hwy Ramps - Volunteer Blvd	K29	31,160	1.17	1.25	1.30	1.29	X	X	X		09-613
	Volunteer Blvd - 17th St	K30	24,600	0.93	0.98	1.00	1.01	X	X	X		09-613
	17th St - 11th St	K31	31,160	0.78	0.80	0.83	0.85	X	X	X		0
	11th St - Henley St		31,160	0.43	0.45	0.48	0.51					
Dutchtown Rd	Pellissippi Pkwy - Cedar Bluff Rd		16,380	0.47	0.56	0.65	0.70					
Ebenezer Rd	Northshore Dr - S. Peters Rd		32,900	0.47	0.57	0.62	0.66					
Ed Shouse Dr	Western Ave - Middlebrook Pk		32,900	0.62	0.67	0.72	0.76					
Emory Rd	Tazewell Pk - Maynardville Pk	K32	13,520	0.85	1.08	1.25	1.31	X	X			09-643
	Maynardville Pk - Norris Fwy	K33	13,520	0.75	0.94	1.11	1.16	X	X			0
	Norris Fwy - Dry Gap Pk		35,700	0.42	0.51	0.61	0.64					
	Dry Gap Pk - I-75N Ramps	K34	34,500	0.68	0.83	0.97	1.01	X	X			0
	Beaver Ridge Rd - Clinton Hwy	K35	13,520	0.70	0.87	1.08	1.18	X	X			09-636
	Clinton Hwy - Gill Rd		34,500	0.37	0.41	0.46	0.51					
	Gill Rd - I-75 N Ramps	K36	34,500	0.50	0.63	0.78	0.85	X				0
	Tazewell Pk - Grainger Co Line		13,520	0.22	0.26	0.34	0.39					
Everett Rd	Yarnell Rd - Kingston Pk		12,480	0.16	0.35	0.50	0.63					
Francis Rd	Middlebrook Pk - Amherst Rd		12,480	0.66	0.70	0.76	0.79					
Gallaher View Rd	Westland Dr - I-40 E Ramps		12,480	0.51	0.56	0.61	0.63					
	I-40 E Ramps - Middlebrook Pk		32,900	0.47	0.51	0.56	0.59					
Gleason Dr	Morrell Rd - Montvue Rd		32,900	0.07	0.09	0.09	0.11					
	Montvue Rd - Ebenezer Rd		12,480	0.55	0.63	0.66	0.69					
Grigsby Chapel Rd	Smith Rd - Campbell Station Rd	K37	16,380	0.86	1.17	1.34	1.57	X	X			0
Hardin Valley Rd	Bryant Ln - Pellissippi SB Ramps	K38	16,380	0.75	1.08	1.24	1.32	X	X			0
	Pellissippi SB Ramps - Middlebrook Pk	K39	32,900	0.55	0.83	1.00	1.07	X	X			0
	Campbell Station Rd - Bryant Ln	K40	16,380	0.47	0.82	0.99	1.08	X				0
	Buttermilk Rd - Campbell Station Rd		12,480	0.19	0.34	0.47	0.58					
Henley St	Summit Hill Dr - Blount Ave	K41	49,300	0.81	0.85	0.88	0.90	X	X	X		09-614
I-140	C.L. - I-40	K42	76,500	0.64	0.79	0.89	0.97	X				0
	Dutchtown Rd - I-40	K43	76,500	0.85	1.04	1.15	1.19	X			X	09-623
I-275	I-640 - I-40		115,300	0.47	0.49	0.52	0.53					
I-40	Midway Rd - I-640	K44	120,200	0.77	0.88	1.02	1.09	X	X			0
	I-640 - James White Pkwy	K45	115,300	0.77	0.85	0.96	1.00	X	X			0
	I-640 - Alcoa Hwy	K46	156,000	0.83	0.91	0.97	0.99	X	X			0
	Alcoa Hwy - James White Pkwy	K47	135,300	0.88	0.96	1.05	1.08	X	X			0
I-40/I-75	Lovell Rd - I-140	K48	135,650	0.90	1.01	1.08	1.08	X	X		X	09-621
	I-140 - I-640	K49	176,000	0.97	1.06	1.13	1.15	X	X			0
	Loudon Co Line - Lovell Rd	K50	120,200	0.81	0.92	0.98	0.97	X	X		X	09-691, 13-603
I-640	I-275 - I-40E		120,200	0.43	0.50	0.59	0.65					
	I-275 - I-40E		120,200	0.43	0.49	0.58	0.62					
I-640/I-75	I-40W - I-275		120,200	0.57	0.63	0.69	0.71					

Route	Corridor Limits	Corridor Map ID	Capacity	2014 V/C	2024 V/C	2034 V/C	2040 V/C	TDM	ITS/ Operations/ Geometric	Public Transit	Added Capacity	RMP Project ID
	I-40W - I-275		120,200	0.56	0.63	0.69	0.71					
I-75	Anderson Co Line - Emory Rd	K51	76,500	0.62	0.71	0.81	0.86	X	X		X	09-692
	Emory Rd - I-640		120,200	0.57	0.65	0.74	0.77					
Illinois Ave	C.L. - Guinn Rd		70,200	0.64	0.72	0.78	0.81					
Inskip Dr	Clinton Hwy - Cedar Ln		12,480	0.41	0.42	0.45	0.49					
Inskip Rd	Clinton Hwy - Cedar Ln		12,480	0.41	0.46	0.52	0.57					
James White Pkwy	I-40 - Hill Ave		70,200	0.64	0.70	0.78	0.82					
	Hill Ave - Sevierville Pk		70,200	0.23	0.26	0.31	0.37					
John Sevier Hwy	Asheville Hwy - National Dr	K52	17,745	0.60	0.68	0.96	1.08	X			X	09-677
	National Dr - Chapman Hwy	K53	17,745	0.67	0.79	1.03	1.18	X			X	09-677
	Chapman Hwy - Martin Mill Pk	K54	17,745	0.81	0.90	1.05	1.13	X			X	09-644
	Martin Mill Pk - Alcoa Hwy	K55	17,745	1.01	1.12	1.29	1.35	X			X	09-644
Keith/ Beaumont Ave	Liberty St - I-275		12,480	0.31	0.32	0.38	0.40					
Kingston Pk	Jamestowne Blvd - Lovell Rd	K56	34,500	0.79	1.02	1.08	1.23	X	X			0
	Lovell Rd - Mabry Hood Rd	K57	34,500	0.86	0.99	1.03	1.11	X	X			0
	Mabry Hood Rd - Cedar Bluff Rd	K58	32,800	0.74	0.85	0.88	0.90	X	X			0
	Cedar Bluff Rd - Gallaher View Rd	K59	32,800	0.88	0.97	1.02	1.06	X	X	X		0
	Gallaher View Rd - Morrell Rd	K60	32,800	0.90	0.96	1.02	1.05	X	X	X		0
	Morrell Rd - Papermill Rd	K61	32,800	0.82	0.87	0.93	0.98	X	X	X		0
	Papermill Rd - Northshore Dr	K62	34,500	0.87	0.92	0.98	1.07	X	X	X		0
	Northshore Dr - Lyons View Pk		32,800	0.73	0.76	0.80	0.82					
	Lyons View Pk - Alcoa Hwy N Ramps	K63	24,600	1.03	1.09	1.16	1.19	X	X	X		0
	Loudon Co Line - Jamestowne Blvd	K64	35,700	0.50	0.70	0.81	1.01	X	X		X	09-668
Liberty St	Sutherland Ave - Keith Ave		24,675	0.30	0.32	0.37	0.38					
Lovell Rd	Kingston Pk - I-40 E Ramps	K65	34,500	1.17	1.35	1.39	1.43	X	X			0
	I-40 E Ramps - Gilbert Dr	K66	34,500	1.07	1.30	1.38	1.37	X	X			0
	Gilbert Dr - Pellissippi Pkwy	K67	34,500	0.64	0.80	0.89	0.89	X	X			0
	Pellissippi Pkwy - Middlebrook Pk	K68	13,520	0.99	1.18	1.27	1.28	X			X	09-637
Lyons View Pk	Northshore Dr - Kingston Pk	K69	12,480	0.95	1.06	1.14	1.19	X	X	X		0
Magnolia Ave	Prosser Rd - Cherry St		34,500	0.41	0.42	0.53	0.69					
	Cherry St - Broadway		34,500	0.46	0.47	0.54	0.68					
Main St	11th St - Henley St		31,160	0.51	0.53	0.54	0.54					
Martin Mill Pk	John Sevier Hwy - Ogle Ave		12,480	0.30	0.34	0.40	0.48					
Maryville Pk	Blount Co Line - Chapman Hwy		13,520	0.44	0.55	0.65	0.81					
Maynardville Hwy	C.L. - Emory Rd		34,500	0.52	0.60	0.71	0.76					
	Emory Rd - Brown Gap Rd	K70	34,500	0.99	1.09	1.21	1.26	X	X			0
McFee Rd	Kingston Pk - Boyd Station Rd		16,380	0.22	0.40	0.44	0.48					
Merchant Dr	Pleasant Ridge Rd - Clinton Hwy	K71	16,380	0.60	0.67	0.80	0.86	X	X			09-616
	Clinton Hwy - Central Ave Pk		32,900	0.62	0.66	0.71	0.73					
Middlebrook Pk	Hardin Valley Rd - Cedar Bluff Rd		35,700	0.44	0.56	0.64	0.68					
	Cedar Bluff Rd - Gallaher View Rd		35,700	0.45	0.54	0.62	0.66					
	Gallaher View Rd - Vanosdale Rd	K72	34,500	0.64	0.74	0.83	0.89	X	X			0
	Vanosdale Rd - Weisgarber Rd		35,700	0.58	0.65	0.71	0.77					
	Weisgarber Rd - Ed Shouse Rd	K73	34,500	0.73	0.80	0.87	0.93	X	X	X		0
	Ed Shouse Rd - Liberty St		35,700	0.46	0.50	0.54	0.58					
	Liberty St - Western Ave		35,700	0.40	0.43	0.46	0.49					
Millertown Pk	Washington Pk - I-640 W Ramps	K74	12,480	0.73	0.75	0.88	0.92	X	X			09-655

Route	Corridor Limits	Corridor Map ID	Capacity	2014 V/C	2024 V/C	2034 V/C	2040 V/C	TDM	ITS/ Operations/ Geometric	Public Transit	Added Capacity	RMP Project ID
	I-640 W Ramps - Kinzel Way	K75	32,900	0.58	0.65	0.88	0.95	X	X	X	X	09-656
	Kinzel Way - Mill Rd	K76	12,480	0.65	0.74	1.15	1.34	X			X	09-656
	Mill Rd - Roberts Rd		12,480	0.26	0.30	0.43	0.55					
Moody Ave	Chapman Hwy - James White Pkwy		32,900	0.26	0.29	0.33	0.38					
Morrell Rd	Northshore Dr - Westland Dr	K77	12,480	1.04	1.17	1.26	1.33	X	X			09-688
	Westland Dr - Kingston Pk	K78	32,900	0.74	0.80	0.85	0.88	X	X			0
Neyland Dr	Kingston Pk - Center Dr		35,700	0.47	0.52	0.55	0.58					
	Center Dr - Lake Loudoun Blvd		35,700	0.29	0.32	0.33	0.35					
	Lake Loudoun Blvd - Walnut St		35,700	0.39	0.43	0.45	0.48					
Norris Fwy	Maynardville Hwy - Union Co Line	K79	13,520	0.54	0.69	0.90	1.07	X				0
Northshore Dr	Choto Rd - Concord Rd	K80	12,480	0.73	1.05	1.07	1.12	X	X			09-680
	Concord Rd - I-140 E Ramps	K81	13,520	0.78	1.17	1.23	1.28	X	X			09-646
	I-140 E Ramps - Ebenezer Rd		34,500	0.53	0.67	0.73	0.77					
	Ebenezer Rd - Morrell Rd	K82	13,520	1.06	1.25	1.35	1.43	X	X			09-645
	Westland Dr - Kingston Pk		35,700	0.56	0.60	0.64	0.65					
	Kingston Pk - Papermill Dr	K83	32,800	0.97	1.00	1.02	0.99	X	X			0
	Morrell Rd - Westland Dr	K84	13,520	1.25	1.40	1.50	1.55	X	X			09-663
Oak Ridge Hwy	Pellissippi Pkwy - Byington-Beaver Ridge	K85	13,520	0.82	1.03	1.22	1.38	X			X	09-673
	Byington-Beaver Ridge - Harrell Rd	K86	16,900	0.90	1.08	1.21	1.29	X			X	09-638
	Harrell Rd - Schaad Rd	K87	13,520	1.44	1.72	1.97	2.06	X			X	09-638
Papermill Dr	Kingston Pk - Weisgarber Rd	K88	12,480	1.20	1.25	1.28	1.30	X	X	X		09-689
	Northshore Dr - I-40 W Ramps		34,500	0.38	0.40	0.42	0.43					
	I-40 W Ramps - Liberty St		12,480	0.66	0.70	0.76	0.76					
Parkside Dr	Campbell Station Rd - Lovell Rd	K89	32,900	0.80	0.93	0.94	0.91	X	X			0
	Lovell Rd - Mabry Hood Rd		32,900	0.41	0.47	0.50	0.52					
Pellissippi Pkwy	Anderson Co Line - Dutchtown Rd	K90	70,200	0.83	0.96	1.03	1.06	X	X		X	09-647
Peters Rd	Seven Oaks Dr - Cedar Bluff Rd	K91	32,900	0.78	0.84	0.87	0.88	X	X			0
	Cedar Bluff Rd - Kingston Pk		32,900	0.46	0.52	0.53	0.54					
	Kingston Pk - Ebenezer Rd		32,900	0.62	0.72	0.77	0.80					
	Mabry Hood Rd - Seven Oaks Dr	K92	12,480	1.43	1.55	1.58	1.61	X	X		X	09-633
Pleasant Ridge Rd	Callahan Dr - Merchant Dr	K93	12,480	0.79	0.90	1.02	1.09	X	X			09-616
	Merchant Dr - Sanderson Rd	K94	16,380	0.70	0.74	0.83	0.85	X	X	X		0
	Sanderson Rd - Western Ave		16,380	0.55	0.57	0.62	0.64					
Raccoon Valley Dr	Norris Fwy - Anderson Co Line		13,520	0.32	0.38	0.47	0.59					
Rutledge Pk	Roberts Rd - Loves Creek Rd		35,700	0.42	0.46	0.60	0.75					
	Loves Creek Rd - I-40 W Ramps	K95	35,700	0.62	0.67	0.84	1.00	X	X			0
	I-40 W Ramps - Asheville Hwy		35,700	0.23	0.25	0.29	0.33					
	Roberts Rd - Grainger Co Line		35,700	0.30	0.32	0.37	0.44					
Schaad Rd	Pleasant Ridge Rd - Oak Ridge Hwy	K96	12,480	1.29	1.59	1.74	1.79	X	X		X	09-625
Smith Rd	Kingston Pk - Grigsby Chapel Rd	K97	12,480	0.64	0.96	1.15	1.36	X				0
Straw Plains Pk	John Sevier Hwy - Cracker Barrel Ln	K98	12,480	0.69	0.78	1.06	1.19	X	X		X	09-667
	Cracker Barrel Ln - Huckleberry Springs Rd		32,900	0.29	0.35	0.55	0.63					
Summit Hill Dr	Broadway - Central St		31,700	0.60	0.64	0.70	0.74					
	Central St - MLK Ave		31,700	0.45	0.46	0.48	0.49					
Sutherland Ave	Westwood Rd - Hollywood Rd		16,380	0.34	0.37	0.40	0.42					
	Hollywood Rd - Liberty St	K99	12,480	0.80	0.89	0.99	1.04	X	X			0
	Liberty St - Middlebrook Pk	K100	12,480	0.72	0.77	0.83	0.85	X	X			0

Route	Corridor Limits	Corridor Map ID	Capacity	2014 V/C	2024 V/C	2034 V/C	2040 V/C	TDM	ITS/ Operations/ Geometric	Public Transit	Added Capacity	RMP Project ID
Tazewell Pk	Emory Rd - Murphy Rd	K101	13,520	0.96	1.06	1.21	1.23	X	X		X	09-640, 09-641
	Murphy Rd - Jacksboro Pk	K102	13,520	0.96	1.03	1.19	1.26	X	X			0
	Jacksboro Pk - Old Broadway	K103	13,520	1.47	1.57	1.70	1.77	X	X			0
Texas/Heiskell Ave	Western Ave - Bruhin Rd	K104	12,480	0.84	0.87	0.91	0.92	X	X	X		0
Turkey Creek Rd	Loudon Co Line - Concord Rd		12,480	0.30	0.50	0.65	0.73					
Vanosdale Rd	Kingston Pk - Middlebrook Pk	K105	12,480	1.35	1.41	1.48	1.50	X	X			09-685
Virtue Rd	Kingston Pk - Turkey Creek Rd		12,480	0.28	0.45	0.46	0.42					
Volunteer Blvd	Cumberland Ave - Lake Loudoun Blvd		32,900	0.22	0.24	0.25	0.24					
	Lake Loudoun Blvd - Cumberland Ave		32,900	0.28	0.29	0.30	0.30					
Washington Pk	Millertown Pk - I-640 WB Ramps		15,600	0.53	0.59	0.64	0.68					
	I-640 WB Ramps - Murphy Rd	K106	15,600	0.95	1.15	1.41	1.49	X	X		X	09-615
	Murphy Rd - Maloneyville Rd	K107	12,480	0.66	0.73	1.04	1.20	X				0
Watt Rd	Everett Rd - Kingston Pk	K108	16,380	0.58	0.91	1.05	1.08	X				0
Weisgarber Rd	Kingston Pk - Middlebrook Pk		34,500	0.51	0.57	0.62	0.66					
Western Ave	Schaad Rd - Palmetto Rd	K109	34,500	0.55	0.73	0.83	0.88	X	X			E+C
	Palmetto Rd - Third Creek Rd	K110	34,500	0.72	0.87	0.97	1.02	X	X			E+C
	Third Creek Rd - Ed Shouse Dr	K111	34,500	0.83	0.98	1.07	1.13	X	X			0
	Ed Shouse Dr - Texas Ave		51,800	0.62	0.67	0.71	0.74					
	Texas Ave - Keith Ave	K112	13,520	1.09	1.12	1.20	1.24	X	X		X	09-610
	Keith Ave - University Ave		35,700	0.38	0.39	0.42	0.44					
	University Ave - Broadway		35,700	0.54	0.57	0.61	0.65					
Westland Dr	I-140 W Ramps - Ebenezer Rd		16,380	0.51	0.62	0.66	0.68					
	Ebenezer Rd - Morrell Rd	K113	12,480	0.70	0.79	0.85	0.89	X	X			09-642
	Morrell Rd - Northshore Dr		12,480	0.37	0.43	0.47	0.50					
	Northshore Dr - I-140 W Ramps	K114	12,480	0.82	1.07	1.10	1.12	X	X			09-674
Woodland Ave	Branner St - St Marys St	K115	12,480	1.31	1.32	1.35	1.36	X	X			09-690
	St Marys St - Broadway		26,775	0.26	0.26	0.27	0.28					
Yarnell Rd	Everett Rd - Lovell Rd		12,480	0.19	0.43	0.60	0.77					

Table I-4: TPO Regional Congested Corridors – Loudon County

Route	Corridor Limits	Corridor Map ID	Capacity	2014 V/C	2024 V/C	2034 V/C	2040 V/C	TDM	ITS/ Operations/ Geometric	Public Transit	Added Capacity	RMP Project ID
Broadway St	Browder School Rd - US 321		32,800	0.34	0.41	0.49	0.62					
E. Lee Hwy	Grove St - Sugar Limb Rd	L1	13,520	0.96	1.17	1.39	1.69	X			X	09-415
	Sugar Limb Rd - Browder School Rd	L2	13,520	0.54	0.69	0.87	1.13	X			X	09-415
Ford Rd	US 11 - US 70		12,480	0.12	0.19	0.27	0.34					
Harrison Rd	Browder Hollow Rd - Old SR 95	L3	12,480	0.40	0.56	0.81	1.06	X	X			09-400
I-40	SR 95 - I-75	L4	76,500	0.94	1.08	1.18	1.26	X				0
I-75	Monroe Co Line - SR 72	L5	76,500	0.54	0.63	0.73	0.93	X				0
	SR 72 - Sugar Limb Rd	L6	76,500	0.63	0.73	0.84	0.96	X				0
	Sugar Limb Rd - US 321	L7	76,500	0.67	0.77	0.86	0.95	X				0
	US 321 - I-40	L8	76,500	0.75	0.86	0.93	0.92	X				0
Kingston St/Old 95	US 321 - US 11	L9	12,480	0.46	0.60	0.77	0.99	X	X			09-412
Martel Rd	Knox Co Line - US 11		12,480	0.27	0.41	0.51	0.61					
Muddy Creek Rd	U.S. 11 - US 70		12,480	0.22	0.38	0.46	0.46					
Mulberry St	SR 72 - Grove St	L10	13,520	0.58	0.70	0.89	1.30	X	X			09-407
	Monroe Co Line - SR 72		13,520	0.34	0.41	0.51	0.65					
Pond Creek Rd	I-75 - US 11		12,480	0.50	0.57	0.65	0.62					
Shaw Ferry Rd	Town Creek Rd - US 11		12,480	0.24	0.32	0.41	0.49					
SR 72	Roane Co Line - I-75 SB Ramps		16,380	0.23	0.24	0.26	0.26					
	I-75 SB Ramps - US 11	L11	16,380	0.71	0.87	1.02	1.13	X				0
	US 11 - Tellico Pkwy	L12	13,520	0.64	0.77	0.93	1.08	X				0
SR 95	U.S. 411 S - US 321		13,520	0.27	0.35	0.43	0.47					
Sugar Limb Rd	I-75 - US 11		12,480	0.50	0.58	0.68	0.66					
Tellico Pkwy	SR 72 - US 321		16,900	0.51	0.57	0.63	0.68					
Town Creek Rd	Old SR 95 - Ford Rd		12,480	0.16	0.20	0.24	0.27					
US 11	US 321 - Kingston Pk	L13	13,520	0.69	0.85	1.01	1.30	X	X		X	09-416
US 321	US 11 - I-75 NB Ramps	L14	34,500	0.77	0.86	0.95	0.97	X	X		X	09-423
	I-75 NB Ramps - I-75 SB Ramps	L15	34,500	0.74	0.89	1.03	0.98	X	X		X	09-422,09-423
	I-75 SB Ramps - US 70		35,700	0.50	0.62	0.79	0.83					
	Blount Co Line - Tellico Pkwy		35,700	0.50	0.60	0.71	0.81					
	Tellico Pkwy - US 11		13,520	0.48	0.57	0.66	0.72					
	US 70 - I-40		35,700	0.37	0.47	0.58	0.66					
US 411	Monroe Co Line - Blount Co line	L16	35,700	0.39	0.53	0.71	0.86	X				0
US 70 E	Roane Co Line - US 11	L17	13,520	0.40	0.65	0.87	1.16	X				0

Table I-5: TPO Regional Congested Corridors – Sevier County

Route	Corridor Limits	Corridor Map ID	Capacity	2014 V/C	2024 V/C	2034 V/C	2040 V/C	TDM	ITS/ Operations/ Geometric	Public Transit	Added Capacity	RMP Project ID
Asheville Hwy	Knox Co Line - Jefferson Co Line		13,520	0.25	0.30	0.42	0.70					
Bird Creek Rd	SR 454 - SR 73		13,520	0.34	0.42	0.49	0.55					
Boyds Creek Hwy	Chapman Hwy - SR 66	S1	13,520	0.81	0.97	1.13	1.23					0
Chapman Hwy	Dolly Parton Pkwy - Boyds Creek Hwy		35,700	0.45	0.55	0.68	0.76					
	Boyds Creek Hwy - Knox Co Line	S2	35,700	0.56	0.67	0.81	0.95		X			09-508
Copeland Rd	SR 416 - SR 73		13,520	0.12	0.14	0.16	0.18					
Dolly Parton Pkwy	Veterans Blvd - Pittman Center Rd	S3	35,700	0.91	1.08	1.27	1.34					0
Douglas Dam Rd	SR 66 - SR 139	S4	13,520	0.36	0.43	0.62	0.85					0
	US 25W - SR 66		13,520	0.19	0.28	0.40	0.53					
	SR 66 - Jefferson Co Line	S5	13,520	0.43	0.54	0.74	1.09					0
I-40	Knox Co Line - Jefferson Co Line	S6	76,500	0.91	1.06	1.21	1.31					0
Jones Cove Rd	US 411 - Cocke County Line		13,520	0.32	0.37	0.45	0.51					
N Main St	SR 66 - Veterans Blvd	S7	34,500	0.95	1.07	1.23	1.26					0
Newport Hwy	Veterans Blvd - Pittman Center Rd	S8	35,700	0.79	0.93	1.10	1.16					0
	Pittman Center Rd - Jefferson Co Line	S9	13,520	0.85	1.04	1.32	1.49					0
Old Knoxville Hwy	SR 338 - SR 71		12,480	0.19	0.24	0.36	0.43					
Old SR 3	US 411 - SR 454	S10	13,520	0.75	0.94	1.10	1.19					0
Parkway	State Line - SR 73 Gatlinburg	S11	16,900	1.42	1.56	1.67	1.77					0
	SR 73 - Dollywood Ln	S12	35,700	0.99	1.11	1.19	1.25					0
	Dollywood Ln - Wears Valley Rd	S13	49,300	0.94	1.07	1.13	1.17					0
	Wears Valley Rd - Collier Rd	S14	49,300	0.97	1.12	1.23	1.26					0
	Collier Rd - Dolly Parton Pkwy	S15	49,300	0.76	0.85	0.94	0.97					0
Pittman Center Rd	US 411 - SR 454	S16	13,520	0.54	0.67	0.79	0.87					0
	SR 416 - SR 73		13,520	0.26	0.29	0.34	0.38					
Pittman Pkwy	SR 454 - Cocke County Line		13,520	0.50	0.56	0.61	0.66					
SR 66	I-40 - Douglas Dam Rd	S17	53,500	0.67	0.88	1.05	1.14				X	09-507
	Douglas Dam Rd - Boyds Creek Hwy	S18	53,500	0.71	0.88	1.04	1.12				X	09-514
	Boyds Creek Hwy - Chapman Hwy	S19	53,500	0.73	0.86	1.00	1.07				X	09-506
SR 73	US 441 - SR 454		35,700	0.42	0.48	0.52	0.57					
US 441	State Line - SR 73 Gatlinburg		16,900	0.51	0.57	0.65	0.70					
Veterans Blvd	Parkway - Teaster Ln		49,300	0.33	0.41	0.48	0.54					
	Teaster Ln - Collier Rd		49,300	0.41	0.52	0.62	0.70					
	Collier Rd - Dolly Parton Pkwy		32,900	0.39	0.48	0.62	0.71					
Wears Valley Rd	Walden Creek Rd - US 441	S20	35,700	0.62	0.73	0.83	0.91					0

Congestion Hotspots

Table I-6 shows the "Congestion Hot Spots" that were identified through travel time data collection performed by the TPO staff in 2009 and 2010 during the AM and PM peak periods. These are intersections experiencing excessive delay as defined by level of service thresholds from the Highway Capacity Manual. A priority was assigned based on the number of approaches at each intersection that are experiencing delays.

Table I-6: TPO Regional Congested Intersections (Hot Spots)

ID	Major Road	Intersecting Road	Jurisdiction	Priority
K1	Oak Ridge Hwy	Schaad Rd	Knoxville/Knox Co	1
K2	Kingston Pk	Gallaher View Rd	Knoxville	1
K3	Kingston Pk	Peters Rd	Knoxville	1
K4	Kingston Pk	Northshore Dr	Knoxville	1
B1	US 129 Bypass	Louisville Rd	Alcoa	1
B2	Calderwood St	Bessemer St	Alcoa	1
B3	Lamar Alexander Pkwy	Broadway Ave	Maryville	1
K5	Central St	Woodland Ave	Knoxville	1
B4	Morganton Rd	William Blount Dr	Blount Co	1
K6	Campbell Station Rd	Parkside Dr	Farragut	1
L1	US 321	US 11	Lenoir City	1
K7	Kingston Pk	Cedar Bluff Rd	Knoxville	1
K8	Pleasant Ridge Rd	Schaad Rd	Knoxville/Knox Co	1
K9	Broadway/Henley St	Western Ave/Summit Hill Dr	Knoxville	1
K10	Papermill Dr	Weisgarber Rd	Knoxville	1
K11	Northshore Dr	Westland Dr/Lyons View Pk	Knoxville	1
B5	Lamar Alexander Pkwy	Foothills Mall Dr	Maryville	1
K12	Clinton Hwy	Merchant Dr	Knoxville	1
K13	Central St	Cedar Ln/Merchant Dr	Knoxville	1
K14	Maynardville Hwy	Emory Rd	Knox Co	1
K15	Kingston Pk	Neyland Dr	Knoxville	1
K16	Lovell Rd	Parkside Dr	Knoxville	1
K17	Kingston Pk	Lovell Rd	Knoxville/Knox Co	2
K18	Emory Rd	Tazewell Pk	Knox Co	2
K19	Oak Ridge Hwy	Byington Beaver Ridge Rd	Knox Co	2
B6	US 411 South	Foothills Mall Dr	Maryville	2
K20	Cedar Bluff Rd	Peters Rd	Knoxville	2
K21	Emory Rd	Andersonville Pk	Knox Co	2
K22	Middlebrook Pk	Weisgarber Rd	Knoxville	2
K23	Broadway	Woodland Ave	Knoxville	2
K24	Kingston Pk	Campbell Station Rd	Farragut	2
K25	Middlebrook Pk	Cedar Bluff Rd	Knox Co	2
B7	Montvale Rd	Montvale Station Rd	Maryville	2
K26	Clinton Hwy	Emory Rd	Knox Co	2

ID	Major Road	Intersecting Road	Jurisdiction	Priority
B8	US 129 Bypass	W Lamar Alexander Pkwy	Maryville	2
B9	Lamar Alexander Pkwy	Court St	Maryville	2
K27	Middlebrook Pk	Lovell Rd	Knox Co	2
B10	Broadway Ave	Washington St	Maryville	2
B11	US 411 South	Sandy Springs Rd	Maryville	3
B12	Middlesettlements Rd	Robert C. Jackson Dr	Maryville	3
K28	Kingston Pk	Concord Rd	Farragut	3
K29	Papermill Dr	Hollywood Rd	Knoxville	3
K30	Alcoa Hwy	John Sevier Hwy	Knoxville/Knox Co	3
K31	Kingston Pk	Buckingham Rd	Knoxville	3
K32	Emory Rd	I-75 Ramps	Knoxville/Knox Co	3
K33	Oak Ridge Hwy	Harrell Rd	Knox Co	3
S1	Chapman Hwy	Boyds Creek Hwy	Sevier Co	3
B13	Lamar Alexander Pkwy	Washington St	Maryville	3
K34	Kingston Pk	Scenic Dr	Knoxville	3
K35	Asheville Hwy	John Sevier Hwy	Knoxville/Knox Co	3
K36	Kingston Pk	Concord St	Knoxville	3
K37	Tazewell Pk	Jacksboro Pk	Knoxville	3
K38	Kingston Pk	Morrell Rd	Knoxville	3
K39	Broadway	Crippen Rd	Knox Co	3
K40	Kingston Pk	Papermill Dr	Knoxville	3
K41	Lovell Rd	Schaeffer Rd	Knox Co	3
K42	Broadway	Central St	Knoxville	3
B14	Lamar Alexander Pkwy	Montvale Rd	Maryville	3
B15	Washington St	High St	Maryville	3
K43	Cumberland Ave	16th St	Knoxville	3
K44	Broadway	Hotel Rd	Knoxville	3
B16	Hall Rd	Bessemer St	Alcoa	3
K45	Broadway	I-640 Ramps	Knoxville	3
A1	Clinton Hwy	Edgemoor Rd	Anderson Co	3
K46	Northshore Dr	Morrell Rd	Knoxville	3
K47	Kingston Pk	Alcoa Hwy Ramps	Knoxville	3
K48	Central St	Summit Hill Dr	Knoxville	3
K49	Rutledge Pk	Loves Creek Rd	Knoxville	3
K50	Northshore Dr	Papermill Dr	Knoxville	3
B17	Old Knoxville Hwy	Wildwood Rd	Alcoa/Blount Co	3
K51	Western Ave	11th St	Knoxville	3
B18	US 411 South	Carpenter Grade Rd	Maryville	3
B19	US 129 Bypass	Foothills Mall Dr	Maryville	3
K52	Western Ave	I-640 Ramps	Knoxville	4

ID	Major Road	Intersecting Road	Jurisdiction	Priority
K53	Watt Rd	I-40 Ramps	Knox Co	4
K54	Westland Dr	Ebenezer Rd	Knox Co	4
K55	Emory Rd	Brickyard Rd	Knox Co	4
B20	Bessemer St	Springbrook Rd	Alcoa	4
K56	Westland Dr	Morrell Rd	Knoxville	4
K57	Northshore Dr	Ebenezer Rd	Knox Co	4
K58	Louisville Rd	Mentor Rd	Blount Co	4
K59	Northshore Dr	Westland Dr	Knox Co	4
K60	Central St	Dante Rd/Callahan Dr	Knoxville	4
L2	US 321	Adesa Blvd	Lenoir City	4
K61	Clinton Hwy	Callahan Rd	Knoxville/Knox Co	4
K62	Central St	Inskip Dr	Knoxville	4
K63	Kingston Pk	Mabry Hood Rd	Knoxville	4
B21	Lamar Alexander Pkwy	William Blount Dr	Blount Co	4
B22	Lamar Alexander Pkwy	Robert C. Jackson Dr	Maryville	4
K64	Western Ave	Keith Ave	Knoxville	4
K65	Summit Hill Dr	Hall of Fame Dr	Knoxville	4
B23	Carpenter Grade Rd	Montvale Station Rd	Maryville	4
K66	Kingston Pk	Sutherland Ave	Knoxville	4
K67	Cumberland Ave	22nd St	Knoxville	4
K68	Millertown Pk	Kinzel Ln	Knoxville	4
B24	Hall Rd	Lincoln Rd	Alcoa	4
K69	Kingston Pk	Montvue Rd	Knoxville	4
L3	US 321	McGee Blvd	Lenoir City	4
K70	Summit Hill Dr	Gay St	Knoxville	4
K71	Northshore Dr	Baum Dr	Knoxville	4
K72	Byington Beaver Ridge Rd	Byington-Solway Rd	Knox Co	4
B25	Topside Rd	Marriott Dr	Alcoa	4
B26	Old Knoxville Hwy	McArthur Rd	Alcoa/Blount Co	4
K73	Westland Dr	I-140 Ramps	Knoxville/Knox Co	4
B27	Callahan Rd	Old Callahan Rd	Knoxville	4
B28	Broadway Ave	Cusick St	Maryville	4
B29	Louisville Rd	Hunt Rd	Alcoa	4
B30	Lamar Alexander Pkwy	Watkins Rd	Maryville	4
K74	Henley St	Cumberland Ave	Knoxville	4
K75	Summit Hill Dr	Walnut St	Knoxville	4
K76	Sutherland Ave	Hollywood Rd	Knoxville	4

Capacity Addition Projects

The federal CMP regulations require that any projects that add significant capacity for single occupant vehicles such as new general purpose lanes must result from the CMP evaluation process in air quality nonattainment areas. Additionally, the regulations state that capacity addition projects must include complementary strategies that will preserve and help to manage the capacity in the future. Table I-7, below lists all projects in the Mobility Plan that add significant capacity within the Knoxville Urban Area along and it includes a justification for the capacity addition and additional measures that are planned to be incorporated with the project to preserve capacity. It should be noted that most projects have not gone through detailed design so some measures are preliminary at this point and could change in the future. The Air Quality Conformity required the use of five horizon years (2014, 2015, 2024, 2034, and 2040). The project list for the Mobility Plan (Chapter 8) included two additional years to subdivide ten-year periods into more manageable periods (2019 and 2029). This list is based on the conformity work, thus projects within 2019 will display as 2024 and 2029 as 3034.

Both the TPO and TDOT have bicycle and pedestrian accommodation policies that state that any roadway project shall include bike lanes and sidewalks unless they are specifically determined to not be feasible. Additionally, there are congestion mitigation strategies that generally apply to all projects in the region as they are implemented on a regional basis such as the TPO's Smart Trips Program that promotes travel demand management strategies and implementation of Operations strategies such as those proposed by the ITS Deployment Plan to upgrade traffic signal infrastructure throughout the region.

Capacity addition is used as the last resort in terms of existing roadway facilities that are congested as noted in the CMP section in Chapter 7. In other cases, there are new roadway facilities that are being proposed in the Mobility Plan that resulted from being identified as a need to provide a bypass route for a congested corridor, provide better general roadway network connectivity, provide access for economic development/ re-development areas or all of the above.

Table I-7: Regional Mobility Plan Projects with Addition of Significant SOV Capacity

RMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Congested Corridor Map ID	Capacity Addition Justification	Additional Measures to Preserve Roadway Capacity
Anderson County Projects									
09-101a	Edgemoor Rd (SR 170)	Oak Ridge Hwy (SR 62) to Melton Lake Dr	Oak Ridge / Anderson Co	2.6	Widen 2-lane to 5-lane with bike lanes	2024	A2	High V/C ratio, operations & public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-101b	Edgemoor Rd (SR 170)	Melton Lake Dr to Clinton Hwy (US 25W / SR 9)	Oak Ridge / Anderson Co	3.6	Widen 2-lane to 5-lane with bike lanes and a bridge	2024	A3	High V/C ratio, operations & public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
Blount County Projects									
09-202	Robert C. Jackson Dr Extension	Middlesettlements Rd to Louisville Rd (SR 334)	Alcoa	0.7	New 4-lane road w/ center turn lane and/or median	2024	B32	Provides additional network connectivity. Project will alleviate congestion from US 129 Bypass as parallel facility	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-204	Pellissippi Place Access Rd	Connect Old Knoxville Hwy (SR 33) to Wildwood Rd through Pellissippi Place Research Park	Alcoa	1.2	Extend 2-lane and 4-lane road w/ center median lane	2024	N/A	Project provides access to Pellissippi Research Park, a major economic development area and additional network connectivity.	Project will include median/continuous center turn lane and accommodations for bikes/peds

RMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Congested Corridor Map ID	Capacity Addition Justification	Additional Measures to Preserve Roadway Capacity
09-216	Alcoa Highway (US 129 / SR 115)	Pellissippi Pkwy (SR 162) to Knox/Blount Co Line	Blount Co / Alcoa	3.2	Widen 4-lane to 6-lane with 2 auxiliary lanes between Singleton Station Rd and Topside Rd (SR 333)	2024	B2	High V/C ratio, operations & public transit not applicable	Alcoa Hwy projects will include a concrete median barrier to provide partial to full access control. Project also includes a separated multi-use path for pedestrians and bicyclists that will connect several mile corridor btwn Knox & Blount.
09-218	Alcoa Highway Bypass (US 129 / SR 115)	From Hall Rd (SR 35)/ Alcoa Hwy (SR 115) Interchange to Proposed Interchange serving McGhee Tyson Airport	Alcoa	1.3	Construct 8-lane freeway on existing and new alignment	2024	B1	Project provides bypass to congested Alcoa Hwy "Airport motor mile" section	Full access control facility
09-220	Home Ave Extension	Home Ave to Calderwood St	Alcoa/ Maryville	0.2	Extend 3-lane Home Ave through existing shopping center to line up with Lindsay St at Calderwood St.	2040	N/A	Project provides additional network connectivity	Provide accommodations for bike/ped
09-232	Pellissippi Parkway (SR 162)	Old Knoxville Hwy (SR 33) to Lamar Alexander Pkwy (US 321 / SR 73)	Blount Co	4.4	Construct new 4-lane freeway	2024	Various	Project completes circumferential route that has been in development several years, alleviates congestion from key facilities in core Alcoa, Maryville areas	Full access control facility
09-246	William Blount Dr Extension (SR 335)	US 411 (SR 33) @ Wm. Blount Dr to Old Niles Ferry Rd	Maryville/ Blount Co	0.6	Construct new 2-lane road	2034	N/A	Project provides additional network connectivity	Provide accommodations for bike/ped
09-248	Topside Rd (SR 333)	Alcoa Hwy (US 129 / SR 115) to Wrights Ferry Rd	Alcoa	1.2	Reconstruct 2-lane to 5-lane	2034	B29	High V/C ratio, operations & public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-257	Alcoa Highway Bypass (US 129 / SR 115)	From Proposed Interchange serving McGhee Tyson Airport to Pellissippi Pkwy (SR 162)	Alcoa	2.4	Construct new 8-lane freeway (6 thru lanes plus 2 auxiliary lanes)	2024	B1	Project provides bypass to congested Alcoa Hwy "Airport motor mile" section	Full access control facility
09-258	Alcoa Highway Bypass (US 129 / SR 115)	From Pellissippi Pkwy (SR 162) to Near Singleton Station Rd	Alcoa	1.4	Construct new 8-lane freeway (6 thru lanes plus 2 auxiliary lanes)	2024	B1	Project provides bypass to congested Alcoa Hwy "Airport motor mile" section	Full access control facility
10-260	McCammon Avenue Extension	Foch Street to existing McCammon Ave	Maryville	0.7	Reconstruct existing 2-lane road to 2-3 lanes and extend on new alignment to tie-in with Watkins Road	2024	B32	Provides additional network connectivity. Project will alleviate congestion from US 129 Bypass as parallel facility	Provide accommodations for bike/ped
13-201	W Plant Redevelopment	Hall Rd (SR 35) / Associates Blvd to Mill St (Future Hunt Rd Interchange)	Alcoa	1.4	Construct 4-lane road with center median	2014	N/A	Project provides access to economic redevelopment area	Provide accommodations for bike/ped

RMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Congested Corridor Map ID	Capacity Addition Justification	Additional Measures to Preserve Roadway Capacity
13-203	Robert C. Jackson Extension	Louisville Rd to US 129 Bypass	Alcoa	0.5	Extension of Robert C. Jackson, Phase 1. Construct new 4-lane section and grade separated interchange connecting US 129 and Associates Blvd	2024	B32	Provides additional network connectivity. Project will alleviate congestion from US 129 Bypass as parallel facility	Project will include median/continuous center turn lane and accommodations for bikes/peds
13-204	Bessemer Blvd	Hall Rd (SR 35) to N Wright Rd	Alcoa	1.4	Widen 2-lane to 4-lane with raised median	2034	B4	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
13-205	Bessemer Blvd	Hamilton Crossing Dr / McCammon Ave to Hall Rd (SR 35)	Alcoa	0.5	Widen 2-lane to 4-lane with raised median or center turn lane	2034	B4	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
13-206	Associates Blvd	Associates LIC Project to Springbrook Rd	Alcoa	0.8	4-lane section with median	2034	N/A	Project provides access to economic redevelopment area and additional network connectivity	Project will include median/continuous center turn lane and accommodations for bikes/peds
13-209	Bessemer Blvd	N Wright Rd to E Hunt Rd (SR 335)	Alcoa	1.1	Widen 2-lane to 4-lane with raised median or center turn lane (0.22 mi), Extension with raised median or center turn lane (0.87 mi)	2040	B4	High V/C ratio, additional network connectivity	Project will include median/continuous center turn lane and accommodations for bikes/peds
13-211	Foothills Mall Dr	US 129 Bypass (SR 115) to Fock St	Maryville	0.5	Extend Foothills Mall Dr across US 129 Bypass on new alignment to Foch St	2024	B32	Provides additional network connectivity. Project will alleviate congestion from US 129 Bypass as parallel facility	Project will include median/continuous center turn lane and accommodations for bikes/peds
Knox County Projects									
09-605	Schaad Rd Extension	Middlebrook Pk (SR 169) to west of Oak Ridge Hwy (SR 62)	Knox Co	4.6	Construct new 4-lane road	2024	K5	Project part of plan to complete 4-lane corridor in northwest Knox County between I-75 north and I-40 west to alleviate congestion on sub-standard roadways	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-610	Western Ave (SR 62)	Texas Ave to Major Ave	Knoxville	0.8	Widen 2-lane to 4-lane	2024	K112	High V/C ratio, eliminates bottle-neck section	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-615	Washington Pk	I-640 to Murphy Rd	Knoxville	1.6	Widen 2-lane to 4-lane	2024	K106	High V/C ratio	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-618	I-275 Industrial Park Access Improvements	I-275 Corridor (Blackstock Ave, Marion St, and University Ave)	Knoxville	0.5	Extend Blackstock Ave from Fifth Ave to Bernard Ave and realign Marion Sreet. Improve intersections of University Ave with W Fifth Ave and Bernard Ave.	2024	N/A	Provides additional network connectivity to promote redevelopment of industrial areas along I-275 corridor	Provide accommodations for bike/ped

RMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Congested Corridor Map ID	Capacity Addition Justification	Additional Measures to Preserve Roadway Capacity
09-623	I-140 (Pellissippi Pkwy)	I-40 to Dutchtown Rd	Knoxville	0.4	Restripe to add one lane on northbound I-140 and remove one lane from the ramp from I-40	2014	K43	High V/C ratio, eliminates bottle-neck section	Full access control facility, ITS strategies
09-625	Schaad Rd	Oak Ridge Hwy (SR 62) to Pleasant Ridge Rd	Knoxville/ Knox Co	1.5	Widen 2-lane to 4-lane	2024	K96	High V/C ratio, Project part of plan to complete 4-lane corridor in northwest Knox County between I-75 north and I-40 west to alleviate congestion on sub-standard roadways	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-627	Alcoa Highway (US 129 / SR 115)	North of Maloney Rd to Woodson Dr	Knoxville	1.4	Widen 4-lane to 6-lane	2024	K2	High V/C ratio, public transit not applicable	Alcoa Hwy projects will include a concrete median barrier to provide partial to full access control. Project also includes a separated multi-use path for pedestrians and bicyclists that will connect several mile corridor btwn Knox & Blount.
09-628	Alcoa Highway (US 129 / SR 115)	Maloney Rd to Blount/Knox Co Line	Knoxville	3.0	Widen 4-lane to 6-lane	2024	K1	High V/C ratio, public transit not applicable	Alcoa Hwy projects will include a concrete median barrier to provide partial to full access control. Project also includes a separated multi-use path for pedestrians and bicyclists that will connect several mile corridor btwn Knox & Blount.
09-632	Concord Rd (SR 332)	Turkey Creek Rd to Northshore Dr (SR 332)	Farragut/ Knox Co	0.8	Widen 2-lane to 4-lane	2024	K28	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-633	Parkside Dr	Mabry Hood Rd to Hayfield Rd	Knox Co	1.1	Widen 2-lane to 4-lane	2024	K92	High V/C ratio, eliminates bottle-neck section	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-635	Karns Connector	Westcott Blvd to Oak Ridge Hwy (SR 62)	Knox Co	0.8	Construct New 2-lane road	2024	K7	Provides additional network connectivity	Provide accommodations for bike/ped
09-637	Lovell Rd (SR 131)	Cedardale Ln to Middlebrook Pk (SR 169)	Knox Co	1.7	Widen 2-lane to 4-lane	2024	K68	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-638	Oak Ridge Hwy (SR 62)	Schaad Rd to Byington-Beaver Ridge Rd (SR 131)	Knox Co	4.2	Widen 2-lane to 4-lane	2024	K86	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-639	Strawberry Plains Pk	Gov. John Sevier Hwy (SR 168) to Moshina Rd	Knox Co	1.6	Widen 2-lane to 4-lane	2034	K98	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-640	Tazewell Pk (SR 331)	Murphy Rd to Emory Rd (SR 131)	Knox Co	4.7	Widen 2-lane to 4-lane	2034	K101	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-641	Tazewell Pk (SR 131)	Emory Rd (SR 131) to Barker Rd	Knox Co	1.2	Widen 2-lane to 4-lane	2024	K101	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds

RMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Congested Corridor Map ID	Capacity Addition Justification	Additional Measures to Preserve Roadway Capacity
09-643	Emory Rd (SR 131)	Maynardville Hwy (SR 33) to Tazewell Pk (SR 331)	Knox Co	4.9	Widen 2-lane to 4-lane	2034	K32	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-644	Gov John Sevier Hwy (SR 168)	Alcoa Hwy (US 129 / SR 115) to Chapman Hwy (US 441 / SR 71)	Knox Co	6.5	Widen 2-lane to 4-lane	2024	K54,K55	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-647	Pellissippi Pkwy (SR 162)/ Oak Ridge Hwy (SR 62)	Edgemoor Rd (SR 170) to Dutchtown Rd	Knox Co	6.0	Widen from 4-lane to 6-lane	2034	K90	High V/C ratio, public transit not applicable	Full access control facility
09-653	Alcoa Highway (US 129 / SR 115)	Woodson Dr to Cherokee Tr	Knoxville	1.6	Widen 4-lane to 6-lane	2024	K2	High V/C ratio, public transit not applicable	Alcoa Hwy projects will include a concrete median barrier to provide partial to full access control. Project also includes a separated multi-use path for pedestrians and bicyclists that will connect several mile corridor btwn Knox & Blount.
09-654	I-640/ I-275/ I-75 Interchange	Interchange at I-640 & I-75/I-275	Knoxville	1.4	Interchange improvements to include additional through lanes on I-75 north and southbound ramps	2034	N/A	High V/C ratio, eliminates bottle-neck section	Full access control facility, ITS strategies
09-656	Millertown Pk	I-640 to Mill Rd	Knoxville	0.6	Widen 2-lane and 4-lane sections to 4-lane and 6-lane sections	2024	K75	High V/C ratio	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-666	James White Pkwy Extension (SR 71)	Moody Ave to Chapman Hwy (US 441 / SR 71)	Knoxville/ Knox Co	5.3	Construct new 4-lane road	2034	K20,K21,K22	Project alleviates congestion from Chapman Hwy corridor as bypass route	Full access control facility
09-667	Strawberry Plains Pk	Moshina Rd to south of I-40	Knoxville/ Knox Co	2.3	Widen 2-lane to 4-lane	2034	K98	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-668	Kingston Pike (US 11/70 / SR 1)	Smith Rd to Campbell Station Rd	Farragut	1.4	Widen 4-lane to 6-lane	2034	K64	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-673	Oak Ridge Highway (SR 62)	Byington-Beaver Ridge Rd (SR 131) to Pellissippi Pkwy (SR 162)	Knox Co	4.2	Widen 2-lane to 4-lane	2034	K85	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-677	Gov John Sevier Hwy (SR 168)	Chapman Hwy (US 441 / SR 71) to Asheville Hwy	Knox Co	9.2	Widen 2-lane to 4-lane	2040	K52,K53	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-687	Moody Ave	Chapman Hwy (US 441 / SR 71) to Maryville Pk (SR 33)	Knoxville	0.4	Construct new 2-lane road w/ center turn lane	2040	N/A	Provides network connectivity	Provide accommodations for bike/ped
09-691	I-40/75	I-40/I-75 Interchange to Lovell Rd (SR 131) Interchange	Knoxville/ Farragut/ Knox Co	6.7	Widen 6-lane to 8-lane	2040	K50	High V/C ratio	Full access control facility, ITS strategies
09-692	I-75	Emory Rd (SR 131) to Raccoon Valley Rd (SR 170) Interchange	Knoxville/ Knox Co	4.8	Widen 4-lane to 6-lane	2040	K51	High V/C ratio	Full access control facility, ITS strategies

RMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Congested Corridor Map ID	Capacity Addition Justification	Additional Measures to Preserve Roadway Capacity
13-603	I-40/75	Lovell Rd (SR 131) Interchange to Campbell Station Rd Interchange	Knoxville/ Knox Co	1.8	Add Full WB Auxiliary Lane	2024	K50	High V/C ratio, eliminates bottle-neck section	Full access control facility, ITS strategies
Loudon County Projects									
09-415	US 11 (SR 2)	Blair Bend Rd to Lenoir City Limit (Browder Hollow Rd	Loudon Co	3.8	Widen 2-lane to 4-lane	2024	L2	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-416	US 11 (SR 2)	Lenoir City limit (Hall St) to US 70 (Dixie Lee Junction)	Lenoir City	5.1	Widen 2-lane to 4-lane	2034	L13	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-422	US 321 (SR 73)	I-75 to Simpson Rd	Lenoir City	1.6	Widen 4-lane to 6-lane	2034	L14	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds
09-423	US 321 (SR 73)	Simpson Rd to US 11 (SR 2)	Lenoir City	1.1	Widen 4-lane to 6-lane	2024	L14	High V/C ratio, public transit not applicable	Project will include median/continuous center turn lane and accommodations for bikes/peds

Table I-8: Congestion Mitigation Strategies

Strategy Class	Strategy Group	Representative Strategies
Strategy 1 - Transportation Demand Management	**A.)** Growth Management/Land Use Controls	**1.)** Promote Infill, Compact and Mixed-use Development **2.)** Enforce Growth Boundaries - Limit Rural Area Growth **3.)** Development Standards - Require sidewalks with new subdivisions
	B.) Congestion Pricing Controls	**1.)** Road User Fees/Peak Hour Tolls **2.)** Parking Fees
	C.) Ridesharing Programs	**1.)** Carpool/Vanpool Incentives **2.)** HOV Priority Systems **3.)** Employer Trip Reduction Programs **4.)** Guaranteed Ride Home Program
	D.) Alternative Work Arrangements	**1.)** Telecommuting **2.)** Flexible work hours
	E.) Non-Traditional Mode Incentives	**1.)** Improved/Expanded bicycle network **2.)** Bicycle storage systems **3.)** Improved/Expanded pedestrian network
Strategy 2 - Traffic Operational Improvements	**A.)** Traffic Signal Improvements	**1.)** Signal re-timing **2.)** Addition of vehicle presence detection **3.)** Additional signal department staffing
	B.) Roadway Geometric Improvements	**1.)** Bottle-neck alleviation **2.)** Turn lane additions at intersections **3.)** Re-striping/lane assignment modifications
	C.) Turn Restrictions	**1.)** Time-of-day restrictions on turning movements
	D.) Ramp Metering	**1.)** Meter freeway entrances to manage traffic flow

Strategy Class	Strategy Group	Representative Strategies
	E.) Access Management	1.) Driveway Management 2.) Median Management
	F.) Construction Management	1.) Encourage construction activities in off-peak times 2.) Coordinate traffic management plans
Strategy 3 - Public Transportation Improvements	A.) Transit Capital Improvements	1.) New exclusive right-of-way service (bus or rail) 2.) Fleet expansion 3.) Transit Support Facilities
	B.) Transit Operational Improvements	1.) Route enhancements 2.) Increased marketing of transit services 3.) Fare incentives 4.) Signal priority
Strategy 4 - Intelligent Transportation Systems (ITS)	A.) Incident Management	1.) Incident detection/surveillance 2.) Incident response/service patrols
	B.) Advanced Traffic Management Systems	1.) Traffic Management Centers 2.) Traffic signal coordination/traffic adaptive signal timing
	C.) Advanced Traveler Information Systems	1.) Dynamic Message Signs 2.) Highway Advisory Radio
	D.) Advanced Public Transportation Systems	1.) Automated vehicle location 2.) "Smart" bus stops
	E.) National ITS Architecture	1.) Additional user services from ITS Architecture
Strategy 5 - Additional System Capacity	A.) Additional Freeway Lanes	1.) Adding capacity with construction of general purpose travel lanes
	B.) Additional Arterial Lanes	1.) Adding capacity with construction of general purpose travel lanes
	C.) New Roadway Construction	1.) Construction on new alignment, "bypass" type routes

Appendix J: Project Application Form

TPO TRANSPORTATION PLANNING ORGANIZATION — mobility plan 2040 (long range regional)

Received By: _____

Date: _____

DEADLINE: September 20, 2012

To submit application, see INSTRUCTIONS on page 3

CANDIDATE PROJECT APPLICATION FORM — REGIONAL MOBILITY PLAN

PROJECT NAME:		
LEAD AGENCY:		
☐ New Project ☐ Existing Project - If Existing, Enter 2009 RMP ID# Here: _____		
COUNTIES/MUNICIPALITIES:		
FACILITY NAME:		
TERMINI (If Applicable):	FROM:	LENGTH:
	TO:	
GENERAL DESCRIPTION:		

PHASES COMPLETED (SELECT ALL THAT APPLY):

- ☐ Design
- ☐ NEPA Documents Approved
- ☐ Partial ROW Acquired
- ☐ All ROW Acquired
- ☐ Portion of Construction
- ☐

PURPOSE & NEED

Primary Objective (SELECT ONE):

- ☐ Mitigate Current Congestion
- ☐ Mitigate Future Congestion
- ☐ Support Economic Development
- ☐ Improve Safety
- ☐ Increase Network Connectivity
- ☐ System Preservation (Maintenance)
- ☐ Improve System Efficiency (Operations)
- ☐ Transit Capital Improvements
- ☐ Bike/Ped. Improvements
- ☐ Other _____

Other Objectives (SELECT ALL THAT APPLY):

- ☐ Mitigate Current Congestion
- ☐ Mitigate Future Congestion
- ☐ Support Economic Development
- ☐ Improve Safety
- ☐ Increase Network Connectivity
- ☐ System Preservation (Maintenance)
- ☐ Improve System Efficiency (Operations)
- ☐ Transit Capital Improvements
- ☐ Bike/Ped. Improvements
- ☐ Other _____

Purpose & Need Statement:

Examples:
Achieving a transportation objective identified in an applicable statewide or metropolitan transportation plan.
Supporting land use, economic development, or growth objectives established in applicable Federal, State, local, or tribal plans.
Serving national defense, national security, or other national objectives, as established in Federal laws, plans, or policies.

1

PROJECT APPLICATION FORM PROJECT NAME: _____

Please fill out one of the Scope of Work sections on this page.

ROADWAY FACILITY SCOPE OF WORK

Proposed Improvements:

- ☐ New Roadway / Roadway Extension
- ☐ Roadway Widening (Additional Lanes)
- ☐ Roadway Widening (No Additional Lanes)
- ☐ Realignment
- ☐ ITS Improvements and/or Operational
- ☐ Streetscaping / Complete Streets
- ☐ Intersection Improvements / Signals
- ☐ Other _____

Proposed Cross-Section:

- ☐ No Median or Center Turn Lane
- ☐ Continuous Center Turn Lane
- ☐ Center Median with Turn Lanes
- ☐ Limited / Controlled Access
- ☐ Other _____

EXISTING # LANES: _____

PROPOSED # LANES: _____

Transit Accommodations:

- ☐ Mixed-Traffic Transit Route
- ☐ Transit-Only Lanes
- ☐ Signal Prioritization
- ☐ Transit Landings or Bulb-Outs
- ☐ Transit Shelters

Proposed Bike/Ped. Features:

- ☐ Bicycle Lane
- ☐ Sidewalk / Side Path
- ☐ Ped. Refuge
- ☐ Ped. Indication (Signal)
- ☐ Marked Crosswalks
- ☐ Shared (Car/Bike) Lane
- ☐ Other _____

☐ Check here if transit service is present on this roadway

TRANSIT FACILITY SCOPE OF WORK

Proposed Improvements:

- ☐ Bus/Trolley Purchase
- ☐ Facility Improvements
- ☐ Passenger Amenities
- ☐ Intelligent Transportation Systems (ITS)
- ☐ Transit-Only Lanes
- ☐ Other _____

Vehicle Use:

- ☐ Replacement
- ☐ Expand Vehicle Fleet
- ☐ Van Pool
- ☐ Express Services
- ☐ ADA Services
- ☐ Other _____

TYPE OF VEHICLE: _____

CAPACITY OF VEHICLE: _____

BIKE/PED FACILITY SCOPE OF WORK

Proposed Improvements:

- ☐ New Bike/Ped Facility
- ☐ Bike/Ped Facility Extension/Connector
- ☐ Bike/Ped Facility Amenities/Upgrades
- ☐ Wayfinding/Signage
- ☐ Intersection Improvements
- ☐ Other _____

Type of Bike/Ped Facility:

- ☐ Bicycle Lanes
- ☐ Sidewalks
- ☐ Shared-Use Trail (Greenway)

Proposed Features:

- ☐ Pedestrian Refuge
- ☐ Marked Crosswalks
- ☐ Pedestrian Indication (Signal)
- ☐ Other _____

Land Uses Within ¼ Mile of Facility:

*Below, check boxes **at left** to indicate if these land uses are present within ¼ mile of your proposed Bike/Ped facility.*

☐ Public Park	☐ Yes	☐ No	☐ Some
☐ School	☐ Yes	☐ No	☐ Some
☐ Library	☐ Yes	☐ No	☐ Some
☐ Transit Stop	☐ Yes	☐ No	☐ Some
☐ Retail	☐ Yes	☐ No	☐ Some
☐ Office	☐ Yes	☐ No	☐ Some
☐ Residential	☐ Yes	☐ No	☐ Some
☐ Other _____	☐ Yes	☐ No	☐ Some

*Check "Yes, No, or Some" **at right** to indicate if there will be a direct Bike/Ped connection between your proposed facility and these land uses. If "Some," please expand on the Notes page.*

Is Proposed Project in Another Plan?

- ☐ Greenway Plan
- ☐ Bike/Ped Plan
- ☐ Other Plan: _____

2

PROJECT APPLICATION FORM PROJECT NAME: _____

PROJECT COSTS, FUNDING, & TIMING

PROJECT COST ESTIMATE IN 2012 DOLLARS: $_____

Source of Cost Estimate:
- ☐ Rough Planning Estimate
- ☐ Detailed Planning Report
- ☐ Preliminary Design & Engineering
- ☐ TDOT Estimate
- ☐ Other _____

Federal Funding Requested:
- ☐ YES, 100% of Cost
- ☐ YES, 90% of Cost
- ☐ YES, 80% of Cost
- ☐ YES, Some % of Cost: _____%
- ☐ NO (State and Local Only)
- ☐ NOT SURE

Are Matching Funds Available?
- ☐ YES, Funds are locally programmed
- ☐ YES, Funds will be locally programmed
- ☐ NO
- ☐ NOT SURE

By When Should This Project Be Completed?
- ☐ 2013 – 2014
- ☐ 2015 – 2019
- ☐ 2020 – 2024
- ☐ 2025 – 2029
- ☐ 2030 – 2034
- ☐ 2035 – 2040
- ☐ NOT SURE

ABOUT YOU

Name: _____ **E-mail:** _____

Title: _____ **Phone:** _____

Department: _____

Agency / Organization: _____

ATTACHMENTS

Please include ALL relevant attachments with this application, including the following:
- ☐ Cost Estimate / Methodology
- ☐ Map of Project (If Applicable)
- ☐ NEPA Approval Letter (If Applicable)
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

INSTRUCTIONS

Please submit this application along with any additional supporting materials to the Knoxville Regional TPO.

ATTN: Alan Huff
By e-mail: alan.huff@knoxtrans.org
By mail: City/County Building, Suite 403 | 400 Main Street | Knoxville, TN 37902
By fax: (865) 215-2068

This form can be found online at: www.knoxtrans.org
More information available at www.knoxtrans.org

DEADLINE: September 20, 2012

PROJECT APPLICATION FORM PROJECT NAME: _____

ADDITIONAL NOTES

Please use this section to expand on any answers throughout the application where you feel additional information would clarify your proposed project.

Please note which section(s) of the application your notes are expanding upon.

PROJECT APPLICATION FORM PROJECT NAME:_____

CANDIDATE PROJECT EVALUATION FACTORS — REGIONAL MOBILITY PLAN

FACTORS IN EVALUATING PROJECTS FOR THE REGIONAL MOBILITY PLAN

1. **Congestion Management (10 points)**
   a. What are the root causes of congestion proximate to the project location (e.g., traffic volume, physical design, crashes, regulations, behavioral, freight, etc.)?
   b. Given the land uses, urban design, and community goals for the project vicinity, what level of congestion is appropriate for the project and vicinity (i.e. In some commercial centers / Downtowns greater congestion may be more appropriate)?
   c. How well does the project address those causes?

2. **Multi-Modal Choices (10 points)**
   a. How well does the project introduce, support, or reinforce multiple transportation choices for people to access residences, jobs, schools, food, entertainment, etc?
   b. How can the project be scoped to incorporate facilities for and/or connections to non-motorized modes and transit?

3. **Freight & Goods Movement (10 points)**
   a. How well does the project support or harm the movement of freight and goods through the region?
   b. Is the project scoped to incorporate facilities that aid in the safe and efficient movement of freight?
   c. Is the project scoped to balance the movement of freight and goods with other community goals?

4. **Safety & Security (10 points)**
   a. How well does the project address safety concerns for all users?
   b. Is the project in a high crash corridor/location?
   c. How well does the project address security concerns?
   d. Does the project aid / harm important evacuation routes?

5. **System Preservation (15 points)**
   a. How well does the project make use of limited financial resources to ensure the continued productivity of the existing transportation system?
   b. How can the project be scoped to include features the make the facility more efficient (e.g., ITS, design, materials, etc.)

PROJECT APPLICATION FORM PROJECT NAME:_____

FACTORS IN EVALUATING PROJECTS FOR THE REGIONAL MOBILITY PLAN (CONT'D)

6. **Quality Growth (10 points)**
   a. How well does the project encourage infill / redevelopment?
   b. Is the project encouraging growth in areas where growth is planned or desired?
   c. Conversely, is the project encouraging growth in areas where additional growth is not planned or desired?
   d. Does the project enhance or contribute to the form and function quality of the surrounding community?

7. **Economic Prosperity (10 points)**
   a. How well does the project support or stimulate the local / regional economy?
   b. How well does the project support freight movements?
   c. To what degree does the implementation of the project create jobs?
   d. How well does the facility connect people with opportunities to engage in economic activity?
   e. To what degree does the project aid in the region's economic competitiveness with other metro areas of the state/nation?

8. **Health & Environment (10 points)**
   a. Does the project aid / harm in the preservation of the region's natural or socio-cultural resources (e.g., open space, animal habitat, historic structures, places of worship, community centers, etc.)?
   c. How well does the project support efforts to improve air and water quality?
   d. Does the project include facilities that provide opportunities for active transportation / physical activity?
   e. Does the project aid / harm the advancement of equal opportunity to destinations throughout the region?

9. **Local Support / Consistency with Plans (15 points)**
   a. Is the project consistent with local, state, or other regional plans for growth and preservation (economic development, land use, natural features preservation, etc.)?
   b. Has the project been endorsed locally through the adoption of official instruments such as, but not limited to, a local major thoroughfare plan, transportation element of a comprehensive plan, or by resolution of the local governing body?
   c. If on a state route, is the project endorsed or supported by TDOT?

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Appendix K: Air Quality Conformity Determination

Adopting Resolution by Knoxville Regional TPO Executive Board for Air Quality Conformity Determination

A RESOLUTION BY THE EXECUTIVE BOARD OF THE KNOXVILLE REGIONAL TRANSPORTATION PLANNING ORGANIZATION (TPO) FINDING THE LONG RANGE REGIONAL MOBIITY PLAN 2040 AND 2011-2014 TRANSPORTATION IMPROVEMENT PROGRAM MEET AIR QUALITY CONFORMITY REQUIREMENTS

WHEREAS, the Clean Air Act Amendments of 1990 (CAAA) and the Moving Ahead for Progress in the 21st Century Act (MAP-21) require that transportation plans and programs conform to air quality goals established by the State Implementation Plan (SIP) for regions in nonattainment of an air pollution standard; and,

WHEREAS, the Knoxville Region is currently designated as a Maintenance Area for the 1997 8-Hour Ozone Standard and a Nonattainment Area for the 2008 8-Hour Ozone Standard, 1997 Annual PM2.5 Standard and 2006 Daily PM2.5 Standard by the United States Environmental Protection Agency (EPA); and,

WHEREAS, the conformity determination used the latest emissions model approved by the EPA; and,

WHEREAS, conformity was demonstrated using the required emissions tests; and,

WHEREAS, the conformity determination addresses the planned transportation improvements included in the Long Range Regional Mobility Plan 2040 and covers the entire Knoxville Ozone and PM2.5 Maintenance/Nonattainment Areas; and,

WHEREAS, the Knoxville Regional TPO FY 2011-2014 Transportation Improvement Program is a subset of the Long Range Regional Mobility Plan 2040; and,

WHEREAS, the TPO's public involvement and Interagency Consultation procedures were adhered to with the Long Range Regional Mobility Plan 2040 and Air Quality Conformity Determination being circulated for public review, presented at more than two open public meetings and coordinated with stakeholder and regulatory agencies through the Interagency Consultation process; and,

WHEREAS, the TPO Technical Committee has recommended approval of the Conformity Determination; and,

WHEREAS, the Air Quality Conformity Determination Report will be sent to EPA for comment and to U.S. DOT (Federal Highway Administration and Federal Transit Administration) for approval;

NOW, THEREFORE, BE IT RESOLVED BY THE KNOXVILLE REGIONAL TRANSPORTATION PLANNING ORGANIZATION EXECUTIVE BOARD:

That the Long Range Regional Mobility Plan 2040 and 2011-2014 Transportation Improvement Program have been found to conform to air quality requirements of the Tennessee SIP in accordance with the Clean Air Act as Amended.

April 24, 2013
Date

Mayor Ralph McGill
Town of Farragut
TPO Executive Board Chair

Jeffrey A. Welch
TPO Director

Adopting Resolution by East Tennessee South RPO for the 2013-2040 Knoxville Regional Mobility Plan Amendments and Air Quality Conformity Determination

**A RESOLUTION BY THE EAST TENNESSEE SOUTH RURAL PLANNING ORGANIZATION (RPO)
ENDORSING THE 2040 KNOXVILLE LONG RANGE REGIONAL MOBILITY PLAN AND AIR QUALITY CONFORMITY DETERMINATION FOR THE KNOXVILLE OZONE AND PARTICULATE MATTER 2.5 NON-ATTAINMENT AREAS**

WHEREAS, the East Tennessee South RPO, developed by the Tennessee Department of Transportation (TDOT), is responsible for ensuring that areas not included in a Metropolitan Planning Organization are involved in the state's transportation planning process; and,

WHEREAS, the 2040 Knoxville Long Range Regional Mobility Plan meets the requirements of transportation conformity found in the Clean Air Act Amendments of 1990; and,

WHEREAS, the Knoxville TPO has prepared a single Air Quality Conformity Determination Report for the entire Ozone and PM2.5 Non-attainment Area, including a portion of the East Tennessee South RPO planning area, which has determined that all proposed transportation projects meet the air quality conformity requirements; and,

WHEREAS, the TPO's public involvement and Interagency Consultation procedures were adhered to with the 2040 Knoxville Long Range Regional Mobility Plan and Air Quality Conformity Determination being circulated for public review, presented at two public hearings and coordinated with stakeholder and regulatory agencies through the Interagency Consultation process; and,

WHEREAS, the Air Quality Conformity Determination Report will be sent to EPA for comment and to U.S. DOT (Federal Highway Administration and Federal Transit Administration) for approval;

NOW, THEREFORE, BE IT RESOLVED BY THE EAST TENNESSEE SOUTH RURAL PLANNING ORGANIZATION EXECUTIVE BOARD:

That the 2040 Knoxville Long Range Regional Mobility Plan and Air Quality Conformity Determination be endorsed for transportation planning decisions in the Knoxville air quality non-attainment area including a portion of the East Tennessee South RPO planning area.

4-12, 2013
Date

Tim Yates
Mayor Tim Yates
Monroe County
East Tennessee South RPO Chair

Terry Bobrowski
Director, East Tennessee Development District

Adopting Resolution by Lakeway Area MTPO Executive Board for Air Quality Conformity Determination

Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO)
Morristown, TN – Jefferson City, TN – White Pine, TN – Hamblen County, TN – Jefferson County, TN

Resolution Number: 2013-008

A RESOLUTION APPROVING THE AMENDED AIR QUALITY CONFORMITY DETERMINATION REPORT AS PREPARED BY THE KNOXVILLE TPO

WHEREAS, a comprehensive, cooperative, and continuing transportation planning process is to be carried out in the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) study area; and

WHEREAS, The Executive Board of the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) serves as a forum for cooperative decision making on transportation issues in the Urbanized Area; and

WHEREAS, the Lakeway Area Metropolitan Transportation Planning Organization promotes the safety, protection, and enhancement of transportation corridors within its jurisdictional boundaries, and

WHEREAS, the Lakeway Area Metropolitan Transportation Planning Organization and the Knoxville TPO are within the same nonattainment area for the 8-Hour Ozone Standard and have a Memorandum of Agreement to cooperatively address transportation conformity requirements for ozone, and

WHEREAS, the Knoxville TPO has prepared a single Air Quality Conformity Determination Report for the entire Ozone Non-attainment Area, including the LAMTPO planning area within Jefferson County, which has determined that all proposed transportation projects from the LAMTPO 2040 Long Range Transportation Plan and the LAMTPO 20011-2014 Transportation Improvement Program; and

WHEREAS, the Clean Air Act Amendments of 1990 (CAAA) and the Moving Ahead for Progress in the 21st Century (MAP-21) require that transportation plans and programs conform to air quality goals established by the State Implementation Plan (SIP) for regions in nonattainment of an air pollution standard; and,

WHEREAS, the Knoxville Region is currently designated as a Maintenance Area for the 1997 8-Hour Ozone Standard and a Nonattainment Area for the 2008 8-Hour Ozone Standard, 1997 Annual PM2.5 Standard and 2006 Daily PM2.5 Standard by the United States Environmental Protection Agency (EPA); and,

WHEREAS, the conformity determination used the latest emissions model approved by the EPA; and,

WHEREAS, conformity was demonstrated using the required emissions tests; and,

WHEREAS, the conformity determination addresses the planned transportation improvements included in the 2040 Long Range Transportation Plan, and the Knoxville

Regional Mobility Plan 2040 and covers the entire Knoxville Ozone and PM2.5 Maintenance/Nonattainment Areas; and,

WHEREAS, the LAMTPO FY 2011-2014 Transportation Improvement Program is a subset of the 2040 Long Range Transportation Plan; and,

WHEREAS, the Air Quality Conformity Determination Report will be sent to EPA for comment and to U.S. DOT (Federal Highway Administration and Federal Transit Administration) for approval;

NOW, THEREFORE, BE IT RESOLVED BY THE LAKEWAY AREA METROPOLITAN TRANSPORTATION PLANNING ORGANIZATION (LAMTPO) EXECUTIVE BOARD:

That the 2040 Long Range Transportation Plan and 2011-2014 Transportation Improvement Program have been found to conform to air quality requirements of the Tennessee SIP in accordance with the Clean Air Act as Amended.

This Resolution shall be effective upon its passage and approval.

ATTEST:

Bill Brittain, Chairman
LAMTPO Executive Board

April 24, 2013
Date

Conformity Approval Letter from USDOT

U.S. Department of Transportation
Federal Highway Administration

Tennessee Division

May 31, 2013

404 BNA Drive, Suite 508
Nashville, Tennessee 37217
Phone (615) 781-5770

In Reply Refer To:
HDA-TN

Ms. Tanisha Hall
Director, Long Range Planning Division
Tennessee Department of Transportation
James K. Polk Building, Suite 900
Nashville, TN 37243

Subject: Air Quality Conformity Determination for the Knoxville Region

Dear Ms. Hall:

The Tennessee Division of the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) Region IV, in coordination with the Environmental Protection Agency (EPA) Region IV, have reviewed the Air Quality Conformity Determination adopted by the Executive Boards for the Knoxville Regional Transportation Planning Organization (TPO) and the Lakeway Area Metropolitan Transportation Planning Organization (MTPO) on April 24, 2013.

The Air Quality Conformity Determination covers the entire Knoxville 8-hour ozone and fine particulate matter ($PM_{2.5}$) maintenance/nonattainment areas and addresses the planned transportation improvements from the Knoxville Regional TPO's Long Range Regional Mobility Plan 2040 and Fiscal Year (FY) 2011-2014 Transportation Improvement Program (TIP) and the Lakeway Area MTPO's 2040 Long Range Transportation Plan and FY 2011-2014 TIP.

Based on our review, we find the documents conform to the National Ambient Air Quality Standards (NAAQS) for the 8-hour ozone and $PM_{2.5}$ standards.

If you have any questions regarding this determination, please contact Corbin Davis at (615) 781-5767.

Sincerely,

Pamela M. Kordenbrock
Division Administrator

Executive Summary

The Knoxville Regional Transportation Planning Organization (KRTPO) and the Lakeway Area Metropolitan Planning Organization have prepared updates to their respective Long Range Transportation Plans (LRTP) to cover the time period from 2013-2040. The purpose of this report is to document that the updated LRTPs and the 2011-2014 Transportation Improvement Programs (TIP) of both the KRTPO and LAMTPO conform to federal regulations from the latest surface transportation act known as "Moving Ahead for Progress in the 21st Century (MAP-21) and the Clean Air Act Amendments of 1990.

An Air Quality Conformity Determination for transportation plans and programs within the Knoxville Region is required since it has been designated as a "Nonattainment Area" for the 8-Hour Ozone and Particulate Matter 2.5 (PM2.5) Standards. The United States Environmental Protection Agency (EPA) sets air quality standards through the Clean Air Act in order to protect human health and the environment from unsafe levels of pollution. The air quality conformity process is used to ensure that federal funds will not be spent on projects that cause or contribute to any new violations of the National Ambient Air Quality Standards (NAAQS); increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone.

The Knoxville Region is currently designated as a Nonattainment or Maintenance Area for four separate NAAQS:

- Maintenance for **1997 8-hour Ozone Standard** – Anderson, Blount, Jefferson, Knox, Loudon, Sevier, and part of Cocke counties
- Nonattainment for **2008 8-hour Ozone Standard** – Blount, Knox, and part of Anderson counties
- Nonattainment for **1997 Annual PM2.5 Standard** – Anderson, Blount, Knox, Loudon, and part of Roane counties
- Nonattainment for **2006 Daily PM2.5 Standard** – same area as Annual PM2.5 Standard

There are two Metropolitan Planning Organization jurisdictions within the 8-Hour Nonattainment Area – the KRTPO covers the urbanized portions of Blount, Knox, Loudon, and Sevier counties and LAMTPO covers the urbanized portion of Jefferson County. The KRTPO compiles a single overall transportation plan that encompasses the entire Nonattainment and Maintenance areas for the purposes of demonstrating conformity for the entire region.

Emissions Analysis Summary

1997 8-hour Ozone Standard

The Ozone conformity analysis consists of a Motor Vehicle Emission Budget (MVEB) Test for ozone-forming emissions of "Volatile Organic Compounds" (VOC) and "Oxides of Nitrogen" (NOx). The MVEB was established for the year 2024 as a part of the 8-Hour Ozone Redesignation Request and Maintenance Plan that was submitted to EPA by the Tennessee Department of Environment & Conservation in May 2010. The MVEB was determined to be "adequate" for purposes of transportation conformity by EPA on July 20, 2010. A notice announcing the effective date of September 30, 2010 for these budgets was published in Federal Register/ Vol. 75, No. 178 on September 15, 2010. The results of the emissions analysis using the MVEBs are summarized in Table K-1:

Table K-1: MVEB Test for 1997 Ozone Standard

	Analysis Year			
Volatile Organic Compounds (VOC):	**2015**	**2024**	**2034**	**2040**
MVEB	N/A	25.19	25.19	25.19
Projected Emissions	27.20	19.90	22.20	25.12

Oxides of Nitrogen (NOx):	**2015**	**2024**	**2034**	
MVEB	N/A	36.32	36.32	36.32
Projected Emissions	39.08	22.63	20.30	22.50

(emissions in tons per day)

In addition, a "qualitative" test is required for analysis years prior to the budget year of 2024, which in this case involves an analysis year of 2015. The qualitative test as determined through the Interagency Consultation process was to use the interim emissions tests used in previous conformity determinations. The interim emissions tests consist of a 1-Hour Budget Test for Knox County and a No Greater than Baseline Year 2002 Test for the other counties for ozone-forming emissions of "Volatile Organic Compounds" (VOC) and "Oxides of Nitrogen" (NOx). The results are summarized in Table K-2:

Table K-2: Analysis Year 2015 Qualitative Test for 1997 Ozone Standard

	Analysis Year 2015	
Volatile Organic Compounds (VOC):	**Knox County**	**Other Counties**
Maximum Allowable Emissions	22.12	25.11
Projected Emissions	13.34	13.86

Oxides of Nitrogen (NOx):	Knox County	Other Counties
Maximum Allowable Emissions	31.71	57.94
Projected Emissions	18.52	20.56

(emissions in tons per day)

2008 Ozone Standard

The nonattainment designation for the 2008 Ozone Standard became effective on July 20, 2012 and since there has not yet been a State Implementation Plan developed for this standard the conformity analysis must rely on existing budgets developed for the 1997 Ozone Standard as described above. This Conformity Determination fulfills the requirement that conformity be demonstrated for the 2008 Ozone Standard within 1-year of its effective date, i.e. by July 20, 2013.

The emissions analysis for years 2024 and beyond is identical to the MVEB test shown in Table K-1 above. Conformity for an analysis year prior to 2024 is demonstrated by combining the emissions from the 2008 Ozone Nonattainment counties (Anderson, Blount, and Knox) and comparing that against the 2014 Knox County 1-hour Ozone MVEB shown in Table K-2. Table K-3 summarizes the 2015 analysis year emissions test:

Table K-3: Analysis Year 2015 Qualitative Test for 2008 Ozone Standard

	Analysis Year 2015
Volatile Organic Compounds (VOC):	**Anderson, Blount, Knox Counties**
Maximum Allowable Emissions	22.12
Projected Emissions	17.30

Oxides of Nitrogen (NOx):	Anderson, Blount, Knox Counties
Maximum Allowable Emissions	31.71
Projected Emissions	21.97

(emissions in tons per day)

1997 Annual PM2.5 Standard

The PM2.5 Nonattainment Area includes Anderson, Blount, Knox, Loudon, and a portion of Roane County. The PM2.5 air quality standard consists of two different measurement timeframes – an annual level and a daily level – based on the health effects that can occur for short-term versus long-term exposures. The Knoxville Region has been designated as nonattainment for both the daily and annual measurement periods. The designation as a nonattainment area under the Annual PM2.5 Standard became effective on April 5, 2005 and

the designation as a nonattainment area for the Daily PM2.5 Standard became effective on December 14, 2009.

The Annual PM2.5 conformity analysis consists of an MVEB Test for the annual PM2.5-related emissions from on-road mobile sources known as "Direct PM2.5" and "Oxides of Nitrogen" (NOx). The results of the emissions analysis are summarized in Table K-4:

Table K-4: MVEB Test for Annual PM2.5

	Analysis Year			
Direct Particulate Matter 2.5:	**2014**	**2024**	**2034**	**2040**
MVEB	283.63	283.63	283.63	283.63
Projected Emissions	167.94	150.94	168.58	187.29

Oxides of Nitrogen (NOx):	**2014**	**2024**	**2034**	**2040**
MVEB	18,024.9	18,024.9	18,024.9	18,024.9
Projected Emissions	10,678.49	6,094.95	5,712.70	6,307.94

(emissions in tons per year)

2006 Daily PM2.5 Standard

In accordance with transportation conformity requirements found in 40 CFR 93.118, the Daily PM2.5 conformity analysis consists of an MVEB Test against the Annual PM2.5 budgets shown above since an MVEB is not yet available specifically for the Daily PM2.5 Standard. Therefore, the results of the emissions analysis are simply identical to the above analysis for the Annual PM2.5 Standard and are repeated in Table K-5:

Table K-5: MVEB Test for Daily PM2.5 (using Annual PM2.5 MVEB)

	Analysis Year			
Direct Particulate Matter 2.5:	**2014**	**2024**	**2034**	**2040**
MVEB	283.63	283.63	283.63	283.63
Projected Emissions	167.94	150.94	168.58	187.29

Oxides of Nitrogen (NOx):	**2014**	**2024**	**2034**	**2040**
MVEB	18,024.9	18,024.9	18,024.9	18,024.9
Projected Emissions	10,678.49	6,094.95	5,712.70	6,307.94

(emissions in tons per year)

In summary, the emissions analysis performed by the KRTPO demonstrates that the projected emissions from the proposed transportation system are less than the allowable amount for each of the required analysis years and thus conformity for the 8-hour Ozone, Annual PM2.5, and Daily PM2.5 standards has been demonstrated for the affected current transportation plans.

The conformity determination was coordinated with stakeholder and regulatory agencies through an Interagency Consultation process and a 30-day public review and comment period was held. A summary of comments that were received and responses is included in the report.

Chapter K-1: Introduction and Background Information

1.0 Introduction

The primary purpose of this document is to demonstrate that the 2013-2040 Knoxville Long Range Regional Mobility Plan (KRMP), the Knoxville Regional Transportation Planning Organization (KRTPO) FY 2011-2014 Transportation Improvement Program (TIP) and the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) 2011-2014 TIP meet Transportation/Air Quality Conformity requirements of the Clean Air Act and Moving Ahead for Progress in the 21st Century (MAP-21). In addition, this conformity determination is being made to satisfy the requirement that a conformity finding be made within one year of the effective date of the 2008 8-hour Ozone Standard nonattainment designation, which is due by July 20, 2013. Section 1.1 describes other requirements that are being met by this conformity determination.

1.1 Transportation Plans Covered under this Conformity Determination Report

The 2013-2040 KRMP is and update to the 2009-2034 Knoxville Regional Mobility Plan, for which the original finding of Conformity by the U.S. Department of Transportation was made on June 1, 2009 for both Ozone and PM2.5. The MAP-21 legislation requires that long-range transportation plans be fully updated at a minimum of every four years in a nonattainment area; therefore, this Conformity Determination Report satisfies the requirement for an update by June 1, 2013.

The 2013-2040 KRMP represents a single overall transportation plan that is compiled by the KRTPO to encompass the entire Nonattainment and Maintenance areas for the purposes of demonstrating conformity for the entire region. Other Plans covered by this Conformity Determination Report include:

- The LAMTPO 2040 Long Range Transportation Plan
- The LAMTPO FY 2011-2014 TIP, and
- The KRTPO FY 2011-2014 TIP

The TIPs for the KRTPO and LAMTPO were adopted prior to and will remain active beyond the date of the adoption of the respective long range transportation plans. All of the projects in the TIPs are included in the updated KRMP, and a new cross-reference of projects between the TIP and KRMP is included in Appendix K-L for KRTPO and K-M for LAMTPO.

1.2 Background on the Knoxville Region Ozone and PM2.5 Nonattainment Areas

The Clean Air Act requires the United States Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for six "Criteria Pollutants" – Particulate Matter, Ozone, Nitrogen Dioxide, Carbon Monoxide, Sulfur Dioxide, and Lead in order to protect human health and the environment from unsafe levels of these pollutants. These pollutants are regulated through the EPA setting maximum limits on exposure levels that must be reviewed periodically. Regions, which are found to be out of compliance with those limits, may be designated as a "Nonattainment Area".

Most of the Knoxville Region has recently been, or is currently in non-attainment for two criteria pollutants (ground-level ozone and fine particulate matter) under federal NAAQS as shown in Exhibit K-1 with detailed history of EPA designations for Ozone and PM2.5 following below.

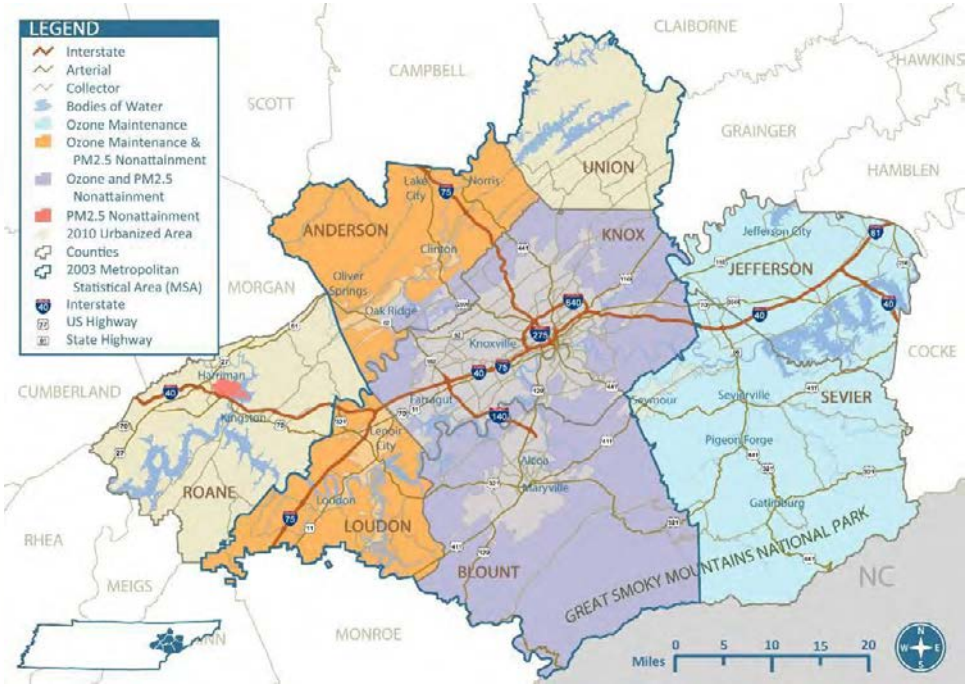


Exhibit K-1: Knoxville 8-Hour Ozone and PM2.5 Non-Attainment Areas

Ozone

The region's first nonattainment designation for ground-level ozone became effective in January 1992 under the "1-Hour Ozone Standard" and included only Knox County. The area was able to demonstrate attainment with that standard effective in October 1993 and was then considered a "Maintenance Area".

EPA promulgated a more stringent ozone standard in 1997 known as the "1997 8-Hour Ozone Standard" which was set at 80 parts per billion (ppb). The 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 1997 8-hour standard for ground level ozone. This nonattainment designation became effective on June 15, 2004. The area demonstrated attainment with this standard effective in March 2011.

A large portion of the 8-Hour Ozone Non-Attainment Area was outside of the currently designated TPO Planning Area and overlapped with an adjoining Metropolitan Planning Organization – the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO). In response to this issue, meetings were held among the County Mayors of the non-attainment counties, TPO Executive Board, Tennessee Department of

Transportation (TDOT), and Tennessee Department of Environment and Conservation (TDEC) to discuss ways to address air quality and transportation planning for the entire Ozone Non-Attainment Area. After alternatives were presented, the consensus was to request the TPO prepare the Regional Long Range Transportation Plan and corresponding air quality conformity analysis for the entire Non-Attainment Area. A Memorandum of Agreement (MOA) was entered into in 2004 between the TPO, TDOT, and LAMTPO, which formalized the responsibilities of each agency to ensure all Transportation Conformity requirements would be addressed.

EPA again strengthened the ozone standard in 2008 based on an updated review of scientific and medical data to ensure that air quality standards are set at an appropriate level to protect the environment and human health. This standard is known as the "2008 8-hour Ozone Standard" and it was set at 75 ppb. A formal designation of nonattainment areas for this standard became effective on July 20, 2012 and included the counties of Blount and Knox plus a small portion of Anderson County surrounding the TVA Bull Run Fossil Plant in the Knoxville Region. A conformity determination for this standard is due within one year of the effective date, i.e. by July 20, 2013 and this conformity determination addresses that requirement. Attainment with this standard is required to be demonstrated by July 2015.

PM2.5

The EPA first promulgated air quality standards for fine particulate matter less than 2.5 microns in diameter (PM2.5) in 1997 due to evidence that these fine particles pose a significant health risk because of their ability to lodge deeply within the lungs. The EPA set standards on both a daily (65 micrograms/cubic meter) and an annual (15 micrograms/cubic meter) basis for levels of PM2.5.

On April 5, 2005, the EPA formally designated the counties of Anderson, Blount, Knox, Loudon, and a portion of Roane in non-attainment for the 1997 Annual PM2.5 Standard. As a result of the PM2.5 designation, the TPO updated the Mobility Plan in 2006, expanding the Knoxville Region to include that portion of Roane County not included in the original Plan and prepared an updated conformity determination.

EPA strengthened the PM2.5 standard in 2006 by reducing the permissible daily levels of PM2.5 from 65 to 35 micrograms per cubic meter. The same counties that were designated under the 1997 Annual PM2.5 Standard were formally designated nonattainment for the 2006 Daily PM2.5 Standard effective December 2009.

1.3 Transportation Conformity Background

Transportation Conformity is required in nonattainment and maintenance areas by federal regulations (40 CFR Parts 51 and 93) and is the mechanism through which on-road mobile source emissions are addressed in the

area's goals for cleaner air. The air quality conformity process is used to ensure that federal funds will not be spent on projects that cause or contribute to any new violations of the National Ambient Air Quality Standards (NAAQS); increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone. The CAA requires that metropolitan transportation plans, metropolitan transportation improvement programs (TIPs) and Federal projects conform to the purpose of the State Implementation Plan (SIP), which details the emissions levels from each sector including mobile sources needed to regain compliance with the air quality standard. If conformity is not demonstrated then the area may enter what is known as a conformity "lapse" period, which can trigger highway sanctions by the EPA under the authority of the Clean Air Act (CAA) meaning only very specific projects may move forward, while funding is essentially frozen for most new roadway construction or widening projects. Under section 179(b)(1) of the CAA, once EPA imposes highway sanctions the FHWA may not approve or award any grants in the sanctioned area except those that are specifically exempted such as safety and air quality improvement projects that do not encourage single occupancy vehicle capacity. The conformity regulations in 40 CFR 93.104(f) allow for a 12-month lapse grace period during which projects that were in the most recent conforming plan and TIP can continue to move forward, but new non-exempt projects cannot be added.

1.4 Nonattainment Area Jurisdictional Coordination

The Knoxville Regional TPO (KRTPO) does not encompass the entire Nonattainment Area for Ozone and PM2.5, and as such, coordination with other transportation planning organizations and the Tennessee Department of Transportation (TDOT) is required in order to ensure all of the proposed transportation projects are included in the conformity analysis. The KRTPO boundary includes the urbanized portions of Blount, Knox, Loudon, and Sevier counties while the LAMTPO boundary includes the urbanized portions of Jefferson County within the 1997 8-hour Ozone Maintenance Area. TDOT is responsible for transportation planning in the rural portions of the nonattainment areas, and TDOT has set up a Rural Planning Organization (RPO) that includes all counties within the Knoxville Nonattainment Area, known as the "East Tennessee South RPO" which was coordinated with for this conformity determination.

A Memorandum of Agreement (MOA) was entered into by KRTPO, LAMTPO, and TDOT in 2004 and subsequently revised in 2007. The MOA specifies that the KRTPO is responsible for compiling a single Conformity Determination Report for the entire Nonattainment Area and that TDOT and LAMTPO will provide the KRTPO with proposed project lists for their respective jurisdictions. Furthermore, since the KRTPO maintains the regional travel demand forecasting model it is responsible for conducting the emissions modeling and overseeing the interagency consultation process. Once the emissions modeling and conformity report have been reviewed through the interagency consultation process the KRTPO and LAMTPO conduct their public involvement process based on their own procedures leading up to formal adoption by each

organization's Executive Board. The East Tennessee South RPO Executive Board also endorses the conformity finding and regional long-range plan. A copy of the MOA is included in Appendix K-N.

1.5 Emissions Analysis Background

Transportation Conformity is demonstrated through a technical process known as an "emissions analysis", in which future estimates of emissions from the transportation system are compared against what has been determined to be sufficient to allow the area to re-attain the air quality standard. Different types of emissions are involved in the production of Ozone and PM2.5 pollution as described below:

- **Ozone:** Ozone is not directly emitted into the atmosphere; rather it is formed through a chemical reaction between "Volatile Organic Compounds" (VOC) and "Oxides of Nitrogen" (NOx) in the presence of sunlight. Mobile-sources contribute both sources of emissions – VOC are primarily formed from the evaporation of motor fuel, while NOx is formed from the internal combustion process and emitted in vehicle exhaust.
- **PM 2.5:** There are some PM2.5 emissions, known as "Direct PM2.5", that are directly emitted from motor vehicles. Direct PM2.5 emissions consist of elements contained in vehicle exhaust as well as particles resulting from brake and tire wear. In addition, it is believed that NOx emissions can contribute to secondary formation of PM2.5 so it is included in the emissions analysis.

1.6 Emissions Analysis Procedure

The emissions analysis is performed primarily using two different models – a Travel Demand Forecasting Model (TDFM), developed by the KRTPO and the MOBILE6 emissions rate model, which was developed by the EPA and allows the user to input localized parameters. The TDFM provides outputs of the estimated Vehicle Miles of Travel (VMT) on the transportation system and associated average speeds by functional classification. The MOBILE6 model provides outputs of emission factors in grams per mile of vehicle travel, such that an overall emissions amount can be calculated by multiplying the VMT output from the TDFM with the emission factor from MOBILE6.

There is one area – the partial Cocke County Ozone Nonattainment Area that is not represented in the TDFM for which an "off-model" analysis was performed. The off-model analysis primarily consisted of using historical traffic count data to determine a growth trend with which to project future VMT and is documented in Appendix K-G.

Appendix K-D describes the Travel Demand Forecasting Model parameters in more detail and Appendix K-E of this document describes the MOBILE6 input structure that was used in the emissions analysis.

Finally, the emissions analysis must also be performed for different years throughout the life of the KRMP. Since the timeframe covered by the KRMP is from 2013-2040, 40 CFR part 93.118 requires:

1.) That a year within the first five years of the plan must be analyzed, i.e. by 2018;
2.) Attainment years within the timeframe of the Plan, i.e. 2014 is the attainment year for the 2006 Daily PM2.5 and 2015 is the attainment year for the 2008 Ozone Standard;
3.) The final year of the plan (2040), and
4.) A year must be chosen in between such that no more than ten years separate any analysis year.

1.7 Summary of Conformity Triggers Being Satisfied

The Conformity Rule sets out specific actions that generate triggers for when transportation conformity must be determined. As examples, conformity of the long range transportation plan must be determined no less frequently than every four years (40 CFR 93.104(b)(3)) and conformity of existing transportation plans and TIPs must be redetermined within two years of the effective date of EPA approval of a maintenance plan which establishes or revises a motor vehicle emissions budget (40 CFR 93.104(e)(2)).

The following conformity triggers are being satisified with this particular conformity determination:

1. Requirement to determine conformity of transportation plans no less frequently than every four years – the conformity determination for the previous full long range transportation plan update was approved by US DOT on June 1, 2009, which means that another full plan update and conformity determination is due by June 1, 2013.
2. Requirement to determine conformity under the 2008 8-Hour Ozone Standard by July 20, 2013 – The nonattainment designation under the 2008 8-Hour Ozone Standard was made effective on July 20, 2012 and generated a requirement to determine transportation conformity within one year.
3. Requirement to determine conformity for the revised 1-Hour Ozone Maintenance Plan SIP motor vehicle emissions budgets for Knox County within two years – the NOx motor vehicle emission budget included in the 1-Hour Maintenance Plan SIP for Knox County was revised from 22.49 tons per day to 31.71 tons per day effective on April 22, 2013.

Chapter K-2: Interagency Consultation

2.0 Introduction

The Transportation Conformity Rule in 40 CFR Part 93.105 requires that Interagency Consultation be a part of conformity determinations. Interagency Consultation allows for formal deliberation of any issues that arise as part of the conformity analysis and allows for input from all stakeholder agencies into the process. Specific consultation procedures are specified in the Tennessee Transportation Conformity Regulation found in 1200-3-34-.01(3) of the Tennessee State Code.

2.1 Participating Agencies

The core list of Interagency Consultation Participants included representatives from the following agencies:

- Knoxville Regional TPO
- Knox County Department of Air Quality Management
- Tennessee Department of Transportation
- Tennessee Department of Environment & Conservation
- Federal Highway Administration
- United States Environmental Protection Agency
- Federal Transit Administration
- Lakeway Area Metropolitan TPO
- Great Smoky Mountains National Park Service

A list of participant names is included in Appendix K-A.

2.2 Overview of Consultation Process

The conformity analysis process began with a presentation of background information and proposed analysis procedures to the Interagency Consultation Group on May 10, 2012 and then a more formal "Kick-off" meeting on August 23, 2012. Several subsequent meetings were held via teleconference in order to discuss modeling parameters, project lists and to receive agreement on necessary assumptions. Appendix K-B contains the minutes of each of the interagency meetings.

Chapter K-3: Mobile Source Emissions Analysis and Applicable Governing Regulations

3.0 Introduction

The Metropolitan Planning Regulations of SAFETEA-LU (23 CFR Part 450, February 14, 2007) and the USEPA Transportation Conformity Rule (40 CFR Parts 51 and 93, August 15, 1997 and amended most recently on March 14, 2012) specify certain minimum requirements that must be addressed in performing a mobile source emissions analysis in order to determine conformity of a Long Range Transportation Plan (LRTP). The following sections in this chapter discuss these requirements and how they were addressed by the KRTPO in making the determination of conformity on the amended 2013-2040 KRMP.

3.1 Regulations related to Development of LRTP and Transportation Conformity

The Metropolitan Planning Regulations found in 23 CFR Part 450 specify the content of Long Range Transportation Plans and relevant aspects related to Transportation Conformity.

- **23 CFR 450.322(a)** – The LRTP must have a minimum 20-year planning horizon. The LRTP covers the period of 2013-2040, which meets the requirement for a minimum 20-year planning horizon. The LRTP is known as the Knoxville Long Range Regional Mobility Plan.
- **23 CFR 450.322(b)(6)** – The LRTP must "include design concept and scope descriptions of all existing and proposed transportation facilities in sufficient detail, regardless of the source of funding, in nonattainment and maintenance areas to permit conformity determinations under the U.S. EPA conformity regulations at 40 CFR part 51. In all areas, all proposed improvements shall be described in sufficient detail to develop cost estimates". The project list included in the LRMP document and in Appendix K-J covers the necessary detail and project scopes to develop cost estimates as accurately as possible.
- **23 CFR 450.322(b)(11)** – The LRTP must "include a financial plan that demonstrates the consistency of proposed transportation investments with already available and projected sources of revenue…" The KRMP main document contains a financial analysis that demonstrates financial constraint, which can be found in Chapter 9 of the 2013-2040 KRMP document.

3.2 Regulations Governing Mobile Source Emissions Analyses

The Transportation Conformity Rule was first promulgated by EPA on November 24, 1993 (58 FR 62188). It has subsequently been amended several times to cover changes such as the implementation of the 1997 8-Hour Ozone and PM2.5 National Ambient Air Quality Standards on July 1, 2004. The most recent amendment to the

Transportation Conformity Rule was published in the Federal Register on March 14, 2012 (75 FR 14979), which was a restructuring of several sections such that the Conformity Rule would not need to be revised each time a new or revised NAAQS is issued by EPA. Applicable guidelines from the Transportation Conformity Rule and how they have been addressed in this conformity determination are as follows:

- **40 CFR 93.106(a)** – The transportation plan must specifically describe the transportation system envisioned for certain future years, which are called horizon years and are subject to the following restrictions:
  - The horizon years may be no more than 10 years apart;
  - The first horizon year may not be more than 10 years from the base year used to validate the transportation demand planning model.
  - If the attainment year is in the time span of the transportation plan, the attainment year must be a horizon year.
  - The last horizon year must be the last year of the transportation plan's forecast period.

The base year for validation of the KRTPO's transportation demand planning model is 2010 and the KRMP's forecast period is from 2013 to 2040. Therefore the analysis years used in developing the conformity analysis are:

For Ozone (1997 and 2008 Standards):

Analysis Years

- **2015** – Required as it is the Attainment Year for 2008 Ozone Standard
- **2024** – Year such that there are no more than 10 years between analysis years
- **2034** – Year such that there are no more than 10 years between analysis years
- **2040** – Final year of KRMP

For PM2.5 (Daily and Annual Standards):

Analysis Years

- **2014** – Required as it is the Attainment Year for Daily PM2.5 Standard
- **2024** – Year such that there are no more than 10 years between analysis years
- **2034** – Year such that there are no more than 10 years between analysis years
- **2040** – Final year of KRMP

The analysis years were discussed and determined to be appropriate in the Interagency Consultation process as noted earlier.

- **40 CFR 93.106(a)(2)(i)** – The transportation plan shall quantify and document the demographic and employment factors influencing the expected transportation demand.

The summary of county-level estimates of socioeconomic data and growth projections for all study years is available upon request. The travel demand model used the following socioeconomic characteristics in order to determine estimates of travel for each analysis year:

- Total Population
- Household Population
- Group Quarters Population
- Number of Households
- Average Persons per Household
- Average Median Household Income
- Workers per Household
- Vehicles per Household
- Students per Household
- School Enrollment (K-12)
- University Student Enrollment
- Total Employment
- Basic Employment
- Industrial Employment
- Retail Trade Employment
- Services Employment

The 2010 Census provided estimates of base year values for the above socioeconomic data. The KRTPO developed regional forecasts of future year county-level control totals for the above variables and allocated the growth to appropriate Traffic Analysis Zones based on a number of factors such as the amount of vacant and developable land. More information on the socioeconomic forecasts and land use allocation process is provided in Appendix K-D.

- **40 CFR 93.106(a)(2)(i)** – The highway and transit system shall be described in terms of the regionally significant additions or modifications to the existing transportation network which the transportation plan envisions to be operational in the horizon years.

The transportation system is described in the travel demand model through a GIS-based network of links and nodes with attributes describing the character of roadway. Some of the key attributes that were used to account for the improvement projects that are being proposed include:

- FHWA Functional Classification
- Divided or Un-divided Roadway
- Level of Access Control
- Number of Lanes in each direction
- Lane Width
- Posted Speed Limit
- Area Type (Rural, Suburban, Urban or Major Employment District)

Transit mode usage is also estimated as part of the travel demand model as it relates to the fixed route transit service that is provided by Knoxville Area Transit (KAT).

- **40 CFR 93.110** – The conformity determination must be based upon the most recent planning assumptions in force at the time of the conformity determination. The KRTPO documented its assumptions and planning data with the Interagency Consultation Group, which is summarized in the meeting information included in the Appendix K-B. The demographic and transportation modeling assumptions are documented in Appendix K-D and K-E.
- **40 CFR 93.111** – The conformity determination must be based on the latest emission estimation model available. The EPA officially released a new emissions factor model known as “MOVES2010” for use in conformity determinations on March 2, 2010 however there was an initial 2-year grace period prior to it being actually required for use in preparing a conformity determination, i.e. March 2, 2012. The EPA subsequently extended the grace period for an additional year out to March 2, 2013. This conformity analysis was conducted using MOBILE6.2 primarily because this was the model used to develop the MVEB for the Annual PM2.5 Attainment Demonstration and Ozone Maintenance SIP. The MOBILE6.2 emissions model was able to be used since it was determined that the “start” of the conformity analysis occurred prior to March 2, 2013 as determined through the Interagency Consultation Process. Development of specific inputs used for MOBILE6.2 to describe the Knoxville Region are documented in Appendix K-E.

- **40 CFR 93.112** – The conformity determination must satisfy consultation requirements in the applicable implementation plan. Chapter 2 and documentation in the appendix relate to the interagency consultation process.
- **40 CFR 93.118 and 93.119** – Motor vehicle emissions budget and other applicable conformity tests that must be used. Chapter 4 of this report documents the emissions tests that were used to demonstrate conformity. The emissions tests were discussed in the Interagency Consultation process to determine their appropriateness.
- **40 CFR 93.122** – Procedures for determining transportation-related emissions. The TPO documented its assumptions and methodology for determining future growth in vehicle miles of travel on the regionally significant transportation system with the Interagency Consultation Group. The primary source for projecting future vehicle activity is the travel demand forecasting model, which includes all regionally significant roadways and represents all regionally significant highway projects being proposed for implementation in the KRMP by analysis year. All counties in the nonattainment area are represented in the travel demand model except for the portion of Cocke County within the Great Smoky Mountains National Park. Exhibit K-2 below shows the extents of the travel demand forecasting model's coverage area as well as the roadways that are included. Again, it should be noted that regionally significant roadways are included; however, greater coverage of lower-order roadways (collectors and locals) is also provided in the core TPO planning area of Knox and Blount counties as shown in the yellow-shaded area.

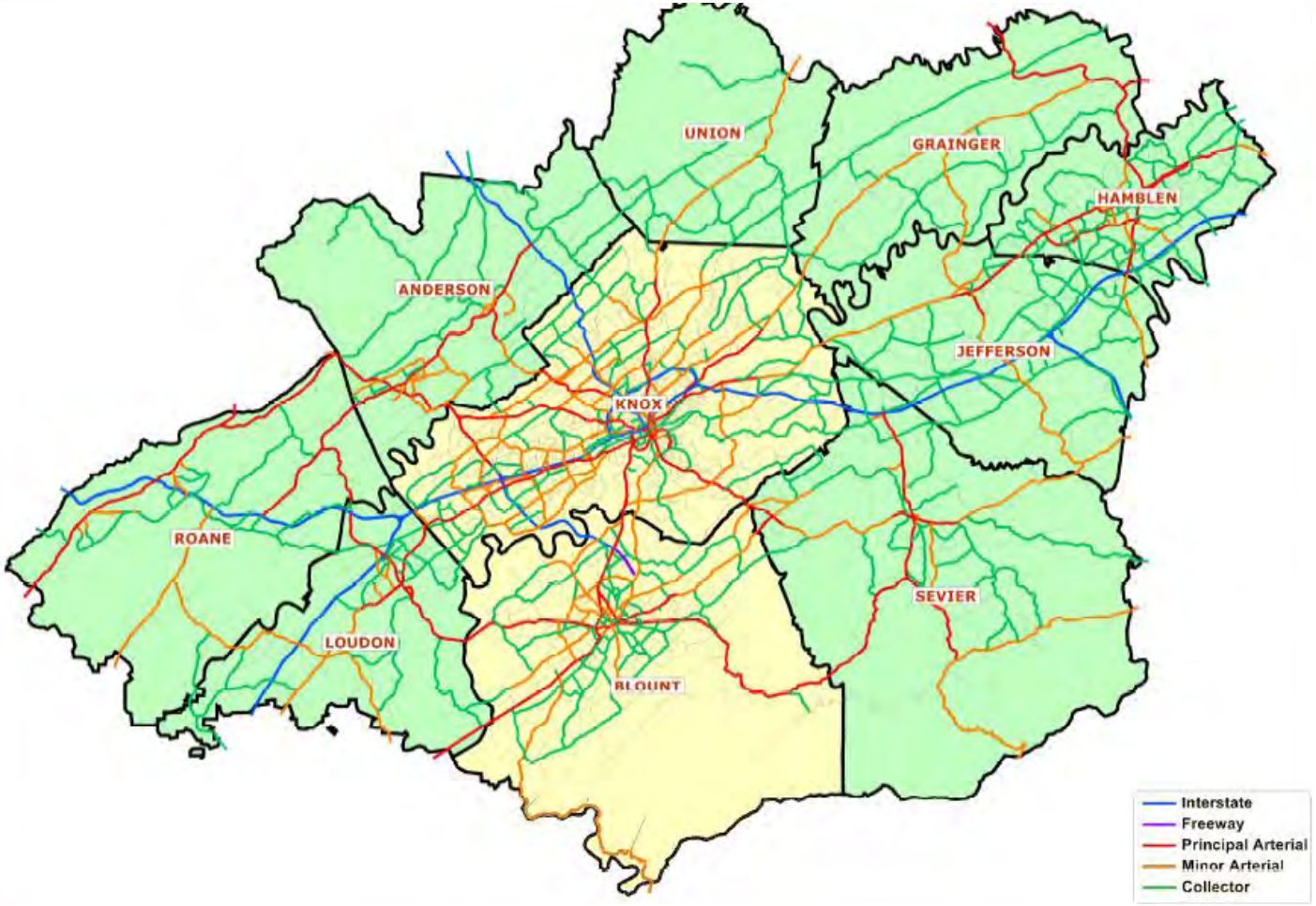


Exhibit K-2: Travel Demand Model Coverage Area

An off-model analysis was performed for Cocke County in which future growth of vehicle miles of travel was estimated using a growth trend that was based on growth of historical observed traffic counts through 2011. Since there were only three roadways that were included in the analysis for Cocke County, and none are proposed for improvement during the life of the LRTP, the off-model analysis used a very simplified approach that is documented in Appendix K-G.

Other than Cocke County, other off-model procedures were performed in order to account for the increase in VMT and change of emissions for the transportation system not included in the model, which is primarily the

local road system outside of Knox County. It was assumed that the local VMT percentage (as a proportion of the rest of the county's VMT on arterial and collector roadways) would remain constant.

- **40 CFR 93.126 and 93.127** – Projects exempt from regional emissions analysis. The highway project list included in the Appendix K-J of this document describes which projects were determined to be exempt from air quality analysis. These projects were deliberated through the Interagency Consultation process to ensure that there was full agreement on the exempt status for projects.

Examples of exempt projects include:

- Bridge Replacement Project – A project that only entails rehabilitating or replacing the existing bridge in-kind without any additional laneage being constructed.
- Pedestrian Improvement Project
- Interchange Reconfiguration Project
- Intersection Project – This could include any type of project that involves only a single intersection such as adding turn lanes (channelization) or a traffic signal.
- Street Lighting
- Pavement Resurfacing
- Reconstruction of a 2-lane roadway, which is only improving the width and geometrics of the roadway and perhaps some additional turn lanes.

3.3 Availability of Technical Information Related to Emissions Analyses

Additional information regarding specific MOBILE6.2 emissions model inputs and outputs and travel demand model assumptions is available upon request on a CD-ROM.

Chapter K-4: Statement of Conformity

4.0 Introduction

This section of the report covers the conformity requirements for the Knoxville Region under both the 8-Hour Ozone Standard as well as the PM2.5 Standard. The conformity report complies with all applicable requirements found in the State Implementation Plan (SIP), Clean Air Act, Tennessee Transportation Conformity Regulation and the MPO Planning Regulations from MAP-21 (23 CFR 450.322).

4.1 Statement of Conformity – 1997 8-Hour Ozone Standard

The 1997 8-Hour Ozone conformity analysis consists of a Motor Vehicle Emission Budget (MVEB) Test for ozone-forming emissions of "Volatile Organic Compounds" (VOC) and "Oxides of Nitrogen" (NOx). The MVEB was established for the year 2024 as a part of the 8-Hour Ozone Redesignation Request and Maintenance Plan that was submitted to EPA by the Tennessee Department of Environment & Conservation in May 2010. The MVEB was determined to be "adequate" for purposes of transportation conformity by EPA on July 20, 2010. A notice announcing the effective date of September 30, 2010 for these budgets was published in Federal Register / Vol. 75, No. 178 on September 15, 2010.

The Maintenance Plan MVEB established for VOC emissions and NOx emissions are as follows:

Pollutant	2024 MVEB (tons/day)
VOC	25.19
NOx	36.32

The results of the emissions analysis are summarized in Table K-6:

Table K-6: Results of the Motor Vehicle Emission Budget Test for 1997 Ozone Standard

	Analysis Year		
Volatile Organic Compounds (VOC):	**2024**	**2034**	**2040**
MVEB	25.19	25.19	25.19
Projected Emissions	19.90	22.20	25.12

Oxides of Nitrogen (NOx):	**2024**	**2034**	**2040**
MVEB	36.32	36.32	36.32
Projected Emissions	22.63	20.30	22.50

(emissions in tons per day)

Note: The above table represents the sum of emissions for the entire Ozone Nonattainment Area including Anderson, Blount, Jefferson, Knox, Loudon, Sevier, and a portion of Cocke County. Appendix K-C contains a summary of the emissions analysis results for each individual county.

In addition, a "qualitative" test is required for analysis years prior to the budget year of 2024, which in this case involves a required analysis year of 2015. The qualitative test as determined through the Interagency Consultation process was to use the interim emissions tests that have been used in previous conformity determinations. The interim emissions tests consist of a 1-Hour Budget Test for Knox County and a No Greater

than Baseline Year 2002 Test for the other counties for ozone-forming emissions of "Volatile Organic Compounds" (VOC) and "Oxides of Nitrogen" (NOx). The results are summarized in Table K-7:

Table K-7: Results of the Qualitative Analysis Year 2015 for 1997 Ozone Standard

	Analysis Year 2015	
Volatile Organic Compounds (VOC):	**Knox County**	**Other Counties***
Maximum Allowable Emissions	22.12	25.11
Projected Emissions	13.34	13.86

Oxides of Nitrogen (NOx):	**Knox County**	**Other Counties***
Maximum Allowable Emissions	31.71	57.94
Projected Emissions	18.52	20.56

(emissions in tons per day)

*The other counties within the 1997 Ozone Nonattainment Area include Anderson, Blount, Jefferson, Loudon, Sevier and a portion of Cocke County within the Great Smoky Mountains National Park.

4.1.1 Summary of 8-Hour Conformity Analysis

Based on the quantitative conformity analysis the KRTPO staff has determined that the 2013-2040 Knoxville Regional Mobility Plan, the LAMPTO 2040 Long Range Transportation Plan as well as the KRTPO and LAMTPO FY 2011-2014 TIPs demonstrate conformity for the 1997 8-Hour Ozone Standard using the necessary emissions tests. Compliance with the regulations of the Clean Air Act, 40 CFR Parts 51 and 93 (Transportation Conformity Rule) and 23 CFR Part 450 (Metropolitan Planning Regulations established by MAP-21) has also been demonstrated. All Plans are financially constrained consistent with 23 CFR Part 450 Subpart C based on the projected costs and revenues as presented in the accompanying KRTPO KRMP and LAMTPO LRTP documents.

4.2 Statement of Conformity – 2008 Ozone Standard

The 2008 8-Hour Ozone conformity analysis consists of a Motor Vehicle Emission Budget (MVEB) Test for ozone-forming emissions of "Volatile Organic Compounds" (VOC) and "Oxides of Nitrogen" (NOx). Since there has not yet been a specific State Implementation Plan developed for the 2008 Ozone Standard, conformity is demonstrated using basically the same procedure as described above for the 1997 Ozone Standard. The only difference is for the first analysis year of 2015 in which the emissions from the entire 2008 Ozone Nonattainment Area (Blount, Knox and part of Anderson counties) are compared against either the 2014 1-Hour Ozone MVEB established for Knox County or against the year 2011 baseline emissions from the 2008 Ozone Nonattainment Area.

The Maintenance Plan MVEB established for VOC emissions and NOx emissions is repeated from above for the 1997 Ozone Standard as follows:

Pollutant	2024 MVEB (tons/day)
VOC	25.19
NOx	36.32

The results of the emissions analysis for analysis years 2024 and beyond is identical to the 1997 Ozone Standard and are repeated in Table K-8:

Table K-8: Results of the Motor Vehicle Emission Budget Test for 2008 Ozone Standard

	Analysis Year		
Volatile Organic Compounds (VOC):	2024	2034	2040
MVEB	25.19	25.19	25.19
Projected Emissions	19.90	22.20	25.12

Oxides of Nitrogen (NOx):	2024	2034	2040
MVEB	36.32	36.32	36.32
Projected Emissions	22.63	20.30	22.50

(emissions in tons per day)

Note: The above table represents the sum of emissions for the entire 1997 Ozone Nonattainment Area including Anderson, Blount, Jefferson, Knox, Loudon, Sevier, and a portion of Cocke County. Appendix K-C contains a summary of the emissions analysis results for each individual county.

As noted above, there are two options for the emissions analysis for the first required analysis year of 2015 – either the 2014 1-Hour MVEB for Knox County compared against the 2015 emissions from the 2008 Ozone Nonattainment Area or the 2015 Emissions from the 2008 Ozone Nonattainment Area compared against the baseline year 2011 emissions from the same area. The TPO staff opted for the first option of these two since the emissions from the 2008 Ozone Nonattainment Area were calculated to be less than the 2014 1-Hour MVEB that was set for Knox County. The results are summarized in the following table (Table K-9):

Table K-9: Results of the Qualitative Analysis Year 2015 for Ozone

	Analysis Year 2015
Volatile Organic Compounds (VOC):	Anderson, Blount, Knox Counties
Maximum Allowable Emissions	22.12
Projected Emissions	17.30

Oxides of Nitrogen (NOx):	Anderson, Blount, Knox Counties
Maximum Allowable Emissions	31.71
Projected Emissions	21.97

(emissions in tons per day)

4.2.1 Summary of 2008 8-Hour Conformity Analysis

Based on the quantitative conformity analysis the KRTPO staff has determined that the 2013-2040 Knoxville Regional Mobility Plan, the LAMPTO 2040 Long Range Transportation Plan as well as the KRTPO and LAMTPO FY 2011-2014 TIPs demonstrate conformity for the 2008 8-Hour Ozone Standard using the necessary emissions tests. Compliance with the regulations of the Clean Air Act, 40 CFR Parts 51 and 93 (Transportation Conformity Rule) and 23 CFR Part 450 (Metropolitan Planning Regulations established by MAP-21) has also been demonstrated. All Plans are financially constrained consistent with 23 CFR Part 450 Subpart C based on the projected costs and revenues as presented in the accompanying KRTPO KRMP (Chapter 9) and LAMTPO LRTP (Chapter 11) documents.

4.3 Statement of Conformity – Annual PM2.5 Standard

As part of the Attainment Demonstration for the Annual PM2.5 Standard the significance of various precursors to the formation of PM2.5 were evaluated. It was determined that the Direct PM2.5 emissions from vehicle exhaust and brake/tire wear and the PM2.5 precursor of Oxides of Nitrogen (NOx) were significant and should be included in the motor vehicle emissions budget. The other types of potential PM2.5 emissions from mobile sources have been determined to not be required until further analysis can be undertaken to determine their contribution to overall PM2.5 pollution – these include the Direct PM2.5 emissions of re-entrained road dust and construction dust, and the PM2.5 precursors of volatile organic compounds, sulfur oxides, and ammonia.

The Attainment Demonstration was submitted to EPA for the Annual PM2.5 Standard (also known as the 1997 PM2.5 Standard) in 2008 and the Motor Vehicle Emission Budgets were officially found adequate and published in the Federal Register / Vol. 75, No. 66 on April 7, 2010. The conformity rule under 40 CFR 93.118 therefore requires a conformity test against the Motor Vehicle Emissions Budgets that are set.

The MVEB established for Direct PM2.5 emissions and NOx emissions are as follows:

Pollutant	2009 MVEB (tons/year)
PM2.5	283.63
NOx	18,024.90

The following table presents the results of the emissions analysis conducted for the analysis years of 2014, 2024, 2034, and 2040 against the established Motor Vehicle Emissions Budget (MVEB) level:

Table K-10: Results of the MVEB Test for Annual PM2.5

Direct Particulate Matter 2.5:	Analysis Year			
	2014	2024	2034	2040
MVEB	283.63	283.63	283.63	283.63
Projected Emissions	167.94	150.94	168.58	187.29

Oxides of Nitrogen (NOx):	2014	2024	2034	2040
MVEB	18,024.9	18,024.9	18,024.9	18,024.9
Projected Emissions	10,678.49	6,094.95	5,712.70	6,307.94

(emissions in tons per year)

Note: The above table represents the sum of emissions for the entire PM2.5 Nonattainment Area including Anderson, Blount, Knox, Loudon, and a portion of Roane County. Appendix K-C contains a summary of the emissions analysis results for each individual county.

4.3.1 Summary of Annual PM2.5 Conformity Analysis

Based on the quantitative conformity analysis the KRTPO staff has determined that the 2013-2040 KRMP and the FY 2011-2014 TIP demonstrate conformity for the Annual Particulate Matter 2.5 Standard using the necessary emissions test. Compliance with the regulations of the Clean Air Act, 40 CFR Parts 51 and 93 (Transportation Conformity Rule) and 23 CFR Part 450 (Metropolitan Planning Regulations established by MAP-21) has also been demonstrated.

4.4 Statement of Conformity – Daily PM2.5 Standard

As noted previously in this report, the Daily PM2.5 Standard (also known as the 2006 PM2.5 Standard) and the designation of the Knoxville Region as nonattainment became effective on December 14, 2009.

Prior to a State Implementation Plan or Attainment Demonstration being available that addresses the Daily PM2.5 Standard an area must use budgets for the Annual PM2.5 Standard if available to demonstrate conformity for the Daily PM2.5 Standard as per 40 CFR 93.109. This case applies to the Knoxville Region since an MVEB was found adequate for the Annual PM2.5 Standard as noted in Section 4.2 above. In addition, the geographic area covered by the Daily and Annual PM2.5 Standards is identical.

The following table (Table K-11) presents the results of the emissions analysis conducted for the analysis years of 2014, 2024, 2034, and 2040 against the established Annual PM2.5 Standard Motor Vehicle Emissions Budget (MVEB) level:

Table K-11: Results of the MVEB Test for Daily PM2.5

	Analysis Year			
Direct Particulate Matter 2.5:	**2014**	**2024**	**2034**	**2040**
MVEB	283.63	283.63	283.63	283.63
Projected Emissions	167.94	150.94	168.58	187.29

Oxides of Nitrogen (NOx):	**2014**	**2024**	**2034**	**2040**
MVEB	18,024.9	18,024.9	18,024.9	18,024.9
Projected Emissions	10,678.49	6,094.95	5,712.70	6,307.94

(emissions in tons per year)

Note: The above table represents the sum of emissions for the entire PM2.5 Nonattainment Area including Anderson, Blount, Knox, Loudon, and a portion of Roane County. Appendix K-C contains a summary of the emissions analysis results for each individual county.

4.4.1 Summary of Daily PM2.5 Conformity Analysis

Based on the quantitative conformity analysis the KRTPO staff has determined that the 2013-2040 KRMP and the FY 2011-2014 TIP demonstrate conformity for the Daily Particulate Matter 2.5 Standard using the necessary emissions test. Compliance with the regulations of the Clean Air Act, 40 CFR Parts 51 and 93 (Transportation Conformity Rule) and 23 CFR Part 450 (Metropolitan Planning Regulations established by MAP-21) has also been demonstrated.

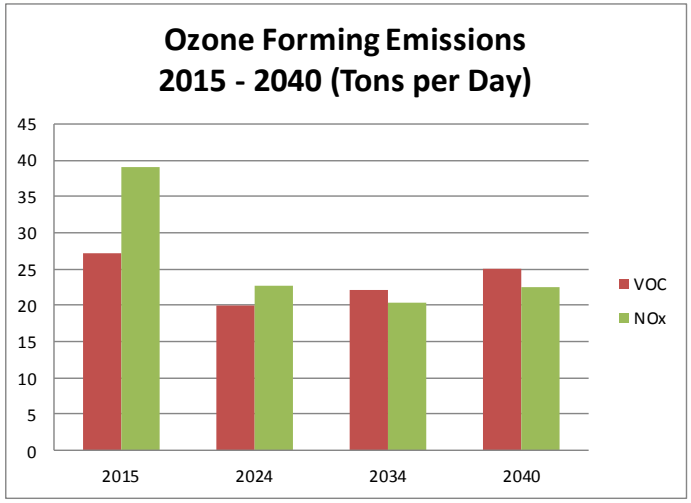
Chapter K-5: Conclusion and Summary of Comments

5.0 Conclusion

The analysis included in this report has demonstrated that the 2013-2040 Knoxville Regional Long Range Mobility Plan and accompanying FY 2011-2014 Transportation Improvement Programs for the entire Knoxville Nonattainment Area are in conformity with air quality regulations found in the Clean Air Act Amendments of 1990 and MAP-21.

Although Vehicle Miles of Travel are projected to increase steadily in the future, the corresponding emissions rates from vehicles are expected to decrease even more significantly according to the modeling performed by

the KRTPO. It should be noted however that the downward trend in emissions does start to slow and even start to curve back upward for some pollutants after the year 2034 (see Figure K-1 below).



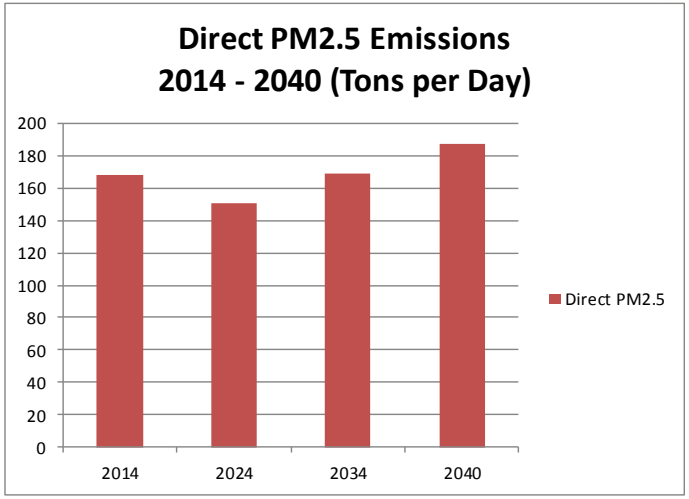


Figure K-1: Emissions Trends for Life of KRMP

The primary reason that emission rates are projected to decline is due to stricter tailpipe emission standards enacted by EPA, most notably the "Tier Two" standards that were enacted in 1999 and phased in between 2004 to 2009. The Tier Two standards represented a 77 to 86 percent reduction in nitrogen oxide emissions for cars and a 92 to 95 percent reduction for trucks from previous standards. A primary mechanism used to reduce emissions was through the reduction in fuel sulfur levels (both gasoline and diesel). The MOBILE6 model incorporates these regulations into its calculations and determines their impacts, which increase over time as the vehicle fleet turns over and includes more of the vehicles affected by the new regulations.

Below is a chart summarizing the growth in VMT for the six primary Nonattainment counties.

Table K-12: VMT Growth in Nonattainment Counties, 2010 to 2040

	2010 VMT	2015 VMT	2024 VMT	2034 VMT	2040 VMT
Anderson	2,147,996	2,176,300	2,527,056	2,890,971	3,240,732
Blount	3,005,088	3,190,928	3,867,345	4,478,448	4,954,605
Jefferson	2,462,960	2,599,888	3,083,703	3,571,290	4,266,707
Knox	14,791,379	15,976,470	18,142,215	21,240,133	23,318,767
Loudon	2,185,018	2,263,860	2,763,251	3,254,637	3,787,007
Sevier	3,566,986	3,927,247	4,780,067	5,681,476	6,341,505
Total	**28,159,427**	**30,134,692**	**35,163,637**	**41,116,955**	**45,909,323**

Currently there are no transportation control measures (TCMs) in the Tennessee SIP for the Knoxville 8-hour ozone and PM2.5 nonattainment areas. However, should TCMs be introduced in the area, nothing in the KRMP nor the Transportation Improvement Program will prohibit the timely implementation of any that are approved in the SIP for the Knoxville area.

5.1 Public Involvement Summary

The Knoxville Regional TPO and Lakeway Area MTPO conducted a 30-day comment period between March 1, 2013 and April 1, 2013 to allow for public review and comment on the Air Quality Conformity Determination. The Knoxville Regional TPO held two formal public hearings as part of regularly scheduled Technical Committee and Executive Board meetings that were on April 16, 2013 and April 24, 2013 respectively. The Lakeway MTPO held formal public hearings on Wednesday, March 13, 2013 at the Jefferson City City Hall, Wednesday, March 13, 2013 at the Morristown City Center Building and Thursday, March 14, 2013 at the White Pine Town Hall.

Copies of the Conformity Determination Report were provided to area libraries and made available on the KRTPO web site. Public notice and advertisements for the hearings and locations to view the draft conformity determination report were placed in newspapers by both KRTPO and LAMTPO including: The Knoxville News Sentinel, Maryville Daily Times, The Oak Ridger, The Clinton Courier, Loudon County News Herald, Citizen Tribune, Jefferson Standard Banner, Enlightener (paper targeted toward minority population), Mundo Hispano and MiVida Today (papers targeted toward Hispanic population).

5.2 Public Comment and Response

No public comments were received on the draft Conformity Determination Report.

References

1.) Technical Guidance on the Use of MOBILE6 for Emission Inventory Preparation, U.S. EPA Office of Transportation and Air Quality, Jan 2002.

2.) User's Guide to MOBILE6.1 and MOBILE6.2: Mobile Source Emission Factor Model, OTAQ, U.S. EPA, EPA420-R-02-028, Oct 2002.

3.) Davis, W. T., Miller, T. L., Reed, G. D., Tang, A. M. Y., Doraiswamy, P., and Sanhueza, P., Effects of Growth in VMT and New Mobile Source Emission Standards on NOx and VOC Emissions in Tennessee, Dept. of Civil and Environmental Engineering in the University of Tennessee, Mar. 14, 2002.

4.) Yun, Jeongran, Draft Report On-Road Mobile Source Emissions in Tennessee for 2002 an Inventory and Analysis, Dept. of Civil and Environmental Engineering in the University of Tennessee, July 2004.

5.) MOBILE6 website, **http://www.epa.gov/otaq/m6.htm**

6.) Guidance for Creating Annual On-Road Mobile Source Emission Inventories for PM2.5 Nonattainment Areas for Use in SIPs and Conformity, U.S. EPA Office of Transportation and Air Quality, August 2005.

Glossary of Terms

1-Hour Ozone Standard – A national ambient air quality standard set for ozone based on the peak 1-hour concentration of ozone measured at a monitoring site. The maximum level of ozone allowed under the standard is 124 parts per billion of ozone. The EPA implemented a revised 8-Hour Ozone Standard effective on June 15, 2004, with the 1-Hour Standard being replaced by the 8-Hour Standard one year later on June 15, 2005.

8-Hour Ozone Standard – Similar to 1-Hour Standard, but changes measurement to a maximum level of 84 parts per billion over an 8-hour average timeframe.

Arterial Roadway – A major roadway facility with the primary functions of traffic movement and connects activity centers in the region.

CAA – The U.S. Clean Air Act, referring to the Air Pollution Control Act of 1955, as amended.

Collector Roadway – A minor roadway facility primarily serving to provide access to and from local streets and adjacent land use.

Conformity – An analysis which demonstrates that a transportation plan, program, or project conforms with the State Implementation Plan purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and that such activities will not cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

EPA – United States Environmental Protection Agency.

Exempt Project – Projects that are determined to be exempt from the requirement to determine conformity such as safety, maintenance, certain transit and other projects as determined through Interagency Consultation. These projects may proceed toward implementation even in absence of a conforming transportation plan and TIP.

Financial Constraint – The requirement that the proposed projects in the transportation plans for an area must not have costs, which exceed the reasonably expected revenues.

FHWA – Federal Highway Administration.

FTA – Federal Transit Administration.

Freeway – A divided highway with two or more lanes for the exclusive use of traffic in each direction, and with full control of access and egress.

HPMS – Highway Performance Monitoring System. Summary information obtained from a sample of the arterial and collector functional systems to assess highway condition, performance, air quality trends, and future investment requirements.

Interagency Consultation – The formal process used to involve stakeholder agencies into the conformity determination development.

Local Roadway – A road, usually with low traffic volume, designed solely to serve adjacent development rather than through traffic.

LRTP/LRMP – Long Range Transportation Plan / Long Range Mobility Plan. Requirement for the metropolitan transportation planning process under MAP-21, must have a minimum of 20-year horizon and be updated every four years in nonattainment and maintenance areas.

MAP-21 – Moving Ahead for Progress in the 21st Century. The federal transportation legislation governing the use of federal funds for transportation investments, it was enacted on July 6, 2012 and supersedes SAFETEA-LU.

Maintenance Area – A classification of an area, which was in nonattainment of an air quality standard at one point in time and is required to demonstrate the ability to maintain the standard.

MOBILE6 – An emissions rate model approved by EPA for estimating on-road vehicle emission factors. Most current version is MOBILE6.2.

MVEB – Motor Vehicle Emissions Budget. Established by the SIP, it sets out the maximum levels of emissions from on-road mobile sources for an area.

NAAQS – National Ambient Air Quality Standards

Nonattainment Area – An area designated by the U.S. Environmental Protection Agency as not being in attainment of the national standard for a specified pollutant.

NOx – Oxides of Nitrogen, an emission resulting from the process of fuel combustion.

Ozone – A secondary pollutant formed by the combination of VOCs and NOx in the presence of sunlight.

PM2.5 – PM2.5 particles are air pollutants with a diameter of 2.5 micrometers or less, small enough to invade even the smallest airways. These particles generally come from activities that burn fossil fuels, such as traffic, smelting, and metal processing.

Ramps – Connections to and from freeway facilities to the arterial and collector roadway system.

Regionally Significant Project – A project which is on a facility, which serves a regional transportation need and would normally be included in the modeling of an area's transportation network. These projects must be accounted for specifically in the regional air quality analysis.

SAFETEA-LU – Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. The federal transportation legislation governing the use of federal funds for transportation investments, superseded by MAP-21.

SIP – State Implementation Plan. Mandated by the Clean Air Act, SIPs contain details to monitor, control, maintain, and enforce compliance with National Ambient Air Quality Standards.

TAZ – Traffic Analysis Zone. A small geographic area for which socioeconomic data is estimated in the KRTPO travel demand model.

TDEC – Tennessee Department of Environment and Conservation

TDOT – Tennessee Department of Transportation

TIP – Transportation Improvement Program. The TIP is the short-range capital program of projects with some phase of work to be implemented such as design, right-of-way, or construction. The TIP shall cover a period of no less than four years, be updated at least every four years, and be approved by the MPO and the Governor. However, if the TIP covers more than four years, the FHWA and the FTA will consider the projects in the additional years as informational.

Travel Demand Forecasting Model – A computer software tool developed to estimate the travel activity of a region based on the correlation between household-level characteristics and travel behavior.

TPO – Transportation Planning Organization. Each urbanized area in the U.S. with greater than 50,000 population must have a MPO (Metropolitan Planning Organization) in order to coordinate transportation planning. In the Knoxville urbanized area the name TPO was chosen to better represent the activities that are performed.

VMT – Vehicle Miles of Travel. Is calculated from the average daily traffic volume multiplied by the length of roadway.

VOC – Volatile Organic Compounds. VOCs are emitted in the storage and use of fuel, solvents, and many industrial and consumer chemicals, as well as from vegetation.

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Air Quality Conformity Determination Appendices

Appendix K-A: Interagency Consultation Participants

Table KA-1: Knoxville-Area Primary Interagency Consultation Participants

Agency	Representative(s)
Knoxville Regional Transportation Planning Organization (TPO) 400 Main Street, Suite 403 Knoxville, TN 37902 (865) 215-2500 | FAX: (865) 215-2068	Jeff Welch, TPO Director Mike Conger, Transportation Engineer Alan Huff, Transportation Planner

Agency	Representative(s)
Knox County Department of Air Quality Management 140 Dameron Avenue Knoxville, TN 37917 (865) 215-5900 | FAX: (865) 215-5902	Lynne Liddington, Director Steve McDaniel, Engineer Brian Rivera, Engineer
Tennessee Department of Transportation (TDOT) 505 Deaderick Street Nashville, TN 37243 (615) 741-2848 | FAX: (615) 532-8451	Bob Rock, Transportation Manager III Angie Midgett, Transportation Specialist Alan Jones, Air Quality Policy Supervisor Deborah Fleming, MPO Program Manager
Tennessee Department of Environment and Conservation (TDEC), **Air Pollution Control Division** 401 Church Street, 9th floor L&C Annex Nashville, TN 37243-1531 (615) 532-0554 | FAX: (615) 532-0614	Quincy Styke, Deputy Director Marc Corrigan, Environmental Specialist
Federal Highway Administration, Tennessee Division 404 BNA Drive, Building 200, Suite 508 Nashville, TN 37217 (615) 781-5767 | FAX: (615) 781-5773	Corbin Davis, Planning & Air Quality Specialist
Federal Highway Administration (FHWA), Southern Resource Center 61 Forsyth Street Atlanta, GA 30303 (404) 562-3570 | FAX: (404) 562-3700	Michael Roberts, Air Quality Specialist
U.S. Environmental Protection Agency (EPA), Region 4 61 Forsyth Street Atlanta, GA 30303 (404) 562-9077 | FAX: (404) 562-9019	Kelly Sheckler, Environmental Planner Dianna Smith, Environmental Scientist
Federal Transit Administration (FTA), Region 4 (Atlanta) 61 Forsyth Street Atlanta, GA 30303 (404) 562-3500 | FAX: (404) 562-3505	Elizabeth Martin, Community Planner
Lakeway Area Metropolitan Transportation Planning Organization (TPO) 100 W. 1st North Street Morristown, TN 37814 (423)581-0100 | FAX: (423) 585-4679	Rich DesGrosseillers, MTPO Director
Great Smoky Mountains National Park (GSMNP), **Resource Management & Science Division** 1314 Cherokee Orchard Road Gatlinburg, TN 37738 (865)436-1708 | FAX: (865) 430-4753	Jim Renfro, Air Quality Branch Chief Teresa Cantrell, Transportation Planner

Appendix K-B: Interagency Consultation Meeting Information and Comments on Draft CDR

B.1: Meeting 1 – Meeting Minutes (05/10/12):

Knoxville Air Quality Interagency Consultation Conference Call

Call Participants:

- Mike Conger, TPO
- Kelly Sheckler, EPA Region 4
- Dianna Smith, EPA Region 4
- Corbin Davis, FHWA TN Division
- Angie Midgett, TDOT
- Marc Corrigan, TDEC
- Steve McDaniel, Knox County Air Quality Mgmt.
- Brian Rivera, Knox County Air Quality Mgmt.

Discussion Items:

1.) Discussion of 2008 Ozone Standard Nonattainment Designation Process and Implications for Current 1997 8-Hour Ozone Nonattainment Area

Mike stated that the final nonattainment designations under the 2008 8-Hour Ozone Standard (75 ppb) were recently released by EPA and that the region designated for Knoxville is smaller than the previous 1997 8-Hour Nonattainment Area as shown on the map that was sent to the group earlier in the week. According to EPA, the designation will have an "Effective Date" as of 60 days from when the final designations are published in the Federal Register, which could occur any day now. There are a couple implications that will occur one year after the Effective Date, first is that a conformity determination for the new standard is due and second is that conformity requirements will be revoked for areas that were designated nonattainment under the 1997 Standard but are not included in the nonattainment area for the 2008 Standard. Mike noted that this has particular importance for our area because Jefferson County is one of those areas that will have conformity revoked, which means that there will no longer be an overlap with the Lakeway MTPO covering a part of the Nonattainment Area.

Angie Midgett asked for clarification about the revocation of conformity requirements and how this will affect the conformity determination for the next Plan update. Mike replied that the Plan update will be due prior to the revocation of conformity and that the current thinking is that the TPO will still address the conformity requirements for the older Nonattainment Area with the next conformity determination.

2.) Discussion of 2013 Knoxville Long Range Transportation Plan Update and Proposed Air Quality Conformity Process using MOBILE6

Following on the discussion of the previous item, Mike noted that a Long Range Plan update was due by June 1, 2013 and that the TPO wanted to begin initial discussions today about likely analysis years and budget tests that would be needed to satisfy the various air quality standards. Mike stated that the purpose of today's call was not to formally begin the conformity process, but that he would like to get some agreement from the IAC group as to the general approach at this time. Mike stated that due to the extension of the MOVES grace period to March 2013, it was the TPO staff's desire to prepare the conformity determination for the next Long Range Plan using MOBILE6 and he asked if anyone on the IAC had any comments or issues about that approach. Marc Corrigan replied that he thought it would be appropriate to use MOBILE6 and that he encouraged its use due to the grace period being extended and due to the fact that the existing motor vehicle emissions budgets were developed using MOBILE6.

There was a discussion about the required analysis years and budget tests to address the 2008 Ozone Standard and Mike noted that he would update the document that he sent to the group earlier in the week, which was developed in February to reflect the latest information for the IAC group to review. Among the items discussed were the likely need to develop a 2011 model network year, which will be the new baseline year for the updated Ozone Standard and that 2015 would be a required analysis year as being the attainment year for the new Ozone Standard. It was noted that the budgets developed for the larger 1997 Ozone Nonattainment Area would be required for analysis years of 2024 and beyond but that the budget test for the larger area would also by default satisfy the requirements of the new smaller area. It was noted that it would be much simpler to perform the budget test for the larger area rather than trying to specifically separate out the emissions related to the new smaller area – especially since it involves a partial county area in Anderson County.

3. & 4.) Discussion of MOVES Model Transition Status and University of Tennessee MOVES Input File Development / Discussion of Possible Knox County 1-Hour SIP Revision to Increase Safety Margin for NOx MVEB

Mike stated that from preliminary testing done using the new EPA MOVES model there were a couple of issues that were identified with being able to meet

existing budgets that were developed using MOBILE6 as shown in the document that was sent to the IAC group. He reiterated that this was the primary motivation for choosing to use MOBILE6 for the next Long Range Plan update.

There was a discussion regarding the need to possibly pursue the addition of safety margin to the existing NOx budget in the 1-Hour Ozone Maintenance Plan for Knox County. Mike stated that the preliminary tests were done comparing a 2014 analysis year to the budget and that he wanted to run a test with a 2015 analysis year since we now know that will be our first analysis year to see how much emissions will be projected to decrease. Mike also noted that there was less urgency in getting the additional safety margin because it would not be needed for the next conformity determination that will be done using MOBILE6. It was noted however that the process should start as soon as possible if determined to be necessary given the lengthy period of time to get it through the process of IAC review, adoption of both the Knox County Air Board and the State Air Board and finally through the EPA process. Kelly Sheckler noted that the EPA review and approval portion could likely be handled as a parallel process that should expedite it somewhat.

5.) Discussion of PM2.5 SIP Development Status – Possible Redesignation Request Pursuit

Mike asked Marc Corrigan to provide an update on the status of the issues related to developing SIPs for both the Daily and Annual PM2.5 standards. Marc stated that the Division's plan for moving forward with these issues is to pursue the Clean Data Determination (CDD) for both the annual and the daily PM2.5 NAAQS. Once that determination is made, we would retract those parts of the annual PM2.5 Attainment Demonstration that EPA has in house (and has acted on the MVEB portion, only) which we could retract, including the MVEB. Following this, the Division's Plan would be to pursue a redesignation request and maintenance plan for the Knoxville area for both of the PM2.5 NAAQS.

6.) Additional Agenda Item – Discussion of TPO FY2011-2014 TIP Amendments

Unrelated to the other items on the call today there was discussion about a TIP amendment that is being processed by the TPO and its conformity status. The project is TIP Project #2011-085 and involves expansion of the existing Intelligent Transportation System deployment on Interstates in the Knoxville Region. The TPO Staff was unsure of where this project would fit in terms of the Exempt project types listed in the Conformity Regulations. Corbin Davis stated that his opinion was that it would fit under the "Safety" grouping of projects listed as being exempt from conformity in 40 CFR 93.126 as a project type of "Traffic control devices and operating assistance other than signalization projects". There was agreement from the rest of the group on this opinion although Kelly Sheckler noted that the next regional emissions analysis should attempt to account for the effects of the project as it may relate to any network speed improvements. Mike replied that he would do that.

7.) Next Steps

Mike stated that there would be another IAC call scheduled in the near future to initiate more formal discussions about the process for the next conformity determination and to address the official beginning of conformity. There was discussion about the Tennessee State Conformity SIP becoming officially effective recently, which includes language about determining the official beginning of conformity through IAC and its importance related to fixing the agreed-on planning assumptions at that point in time so that new information becoming available at the last minute does not trigger the need to revise everything that has already been done. It was also noted that the Conformity SIP formally establishes review period lengths and that these will be included in the timeline that the TPO develops to complete the conformity determination and obtain approvals prior to the June 1, 2013 deadline.

B.2: Meeting 2 – Meeting Minutes (08/23/12):

Knoxville Air Quality Interagency Consultation Conference Call

Call Participants:

- Mike Conger, TPO
- Alan Huff, TPO
- Kelly Sheckler, EPA Region 4
- Dianna Smith, EPA Region 4
- Corbin Davis, FHWA TN Division
- Deborah Fleming, TDOT
- Marc Corrigan, TDEC
- Steve McDaniel, Knox County Air Quality Mgmt.
- Rich DesGrosseillers, LAMTPO

Discussion Items:

1.) Discussion of Knox County 1-Hour Ozone Maintenance SIP Safety Margin Amendment

Mike Conger described that the Knox County 1-Hour Ozone Maintenance Plan SIP was being amended due to preliminary tests showing that the motor vehicle emissions budgets (MVEB) could be exceeded using the new MOVES2010 model. It was determined that safety margin was available and this amendment would allocate all of the remaining safety margin for NOx to the NOx MVEB. Mike went

through the schedule for moving forward with this amendment process, which is the following:

- Aug. 10 – Sept. 10, 2012 - 30-day IAC review period
- Sept. 17 – Send out Public Notice for hearing at October Knox County Air Pollution Control Board
- Oct. 17 – Hearing at Knox County Air Board
- Nov. 14 – Hearing at TN State Air Board

Steve McDaniel noted that part of the justification for this amendment was the fact that all of the excess emissions available in the safety margin were attributable to reductions from the mobile source sector. Kelly Sheckler asked for clarification regarding the amount of safety margin available and what the MVEB would become if this amendment is approved. Steve replied that the NOx MVEB would increase from the previous amount of 22.49 tpd to 31.71 tpd. Marc Corrigan asked Mike if he thought this budget would be sufficient and Mike replied that it should be given that the MOVES tests indicated only about a 1 ton per day shortfall.

There was discussion regarding the timeframe for EPA acting on the final approvals for this amendment. Kelly noted that EPA would not be able to do an "adequacy" process for this SIP revision and rather it would have to be a formal approval process that would take longer. There was agreement that EPA could conduct a parallel process once the formal public comment period was initiated. It was decided that Knox County AQM would send a letter to EPA requesting a parallel process on the same date that the formal public comment period is begun, which is projected to be Sept. 17th. It was noted that EPA could attempt to do this as a direct final rule, but that it would have to be pulled if there were any comments made during the formal comment period. The goal would be to have this amendment approved and the new NOx MVEB available prior to the conformity determination for the Long Range Plan update being due.

2.) Discussion of Timeline for 2013 Knoxville Mobility Plan Update and Air Quality Conformity Process using MOBILE6

Mike explained the proposed timeline for updating the Mobility Plan and the projected schedule for the upcoming major IAC discussion items that was sent to the group previously. He noted that he would like to schedule IAC calls roughly every month from this point forward until the major effort to complete and review the Conformity Determination Report was done. Mike advised the group that the next call would be the primary beginning point for this conformity determination effort with discussion of latest planning assumptions and MOBILE6 inputs. There was some discussion regarding whether this would be the official start of conformity or not and it was clarified that once everyone was comfortable with declaring the official start of conformity it could just be documented in the minutes of the IAC call. Mike stated that the primary importance for formally declaring the start of conformity was that in order to be able to still utilize MOBILE6 instead of MOVES that conformity needed to start prior to the end of the MOVES grace period in March 2013.

Mike discussed the concept of the "existing plus committed" project list that would be developed as part of the Mobility Plan and its relation to the conformity horizon years. Mike stated that in the past the E+C list typically meant all those projects would be included in the first horizon year, but that would not necessarily be the case this time around with the first horizon year of 2014 being so close to the Plan adoption next year. Marc said that he had seen other areas with E+C projects outside of the first horizon year and that the controlling factor has to do with when the project will be actually open to traffic. Deborah noted that one thing to look at would be with big projects that may be considered as committed, but are constructed as smaller segments of independent utility.

3.) Preliminary Discussions on Required Horizon Years and Analysis Tests for Conformity Determination

Mike described the summary horizon year and analysis test document, which he sent to the group previously. Mike noted that with multiple standards comes complexity in terms of different required analysis years and tests. Mike stated the primary required horizon years were the final year of the Mobility Plan, which is 2040, 2014 is required for Daily PM2.5 as the attainment year for that standard and 2015 is required for the 2008 Ozone Standard as its attainment year. The other years were chosen primarily to ensure that the requirement that there be no more than 10 years between horizon years is met.

Mike noted that the recent PM2.5 Clean Data Determination could have an impact on the required analysis tests in terms of the potential retraction of the 2009 Attainment Demonstration that was made for the Annual PM2.5 Standard. Once the clean data determination was completely finalized then TDEC would be able to retract the attainment demonstration, which included an approved MVEB. If this is done prior to the conformity determination for the Mobility Plan then it would change the analysis test for the 2014 horizon year from a budget test against the 2009 MVEB to a less than baseline year test. Mike stated that the TPO would prefer to maintain the 2009 MVEB for this conformity analysis as it would be simpler than developing baseline year 2002 emissions for the Annual PM2.5 Standard and baseline year 2008 emissions for the Daily PM2.5 Standard. It was decided that there would be further discussions on this topic going forward and Marc noted that he would need to determine specific implications of

delaying retraction and discuss those with his management prior to deciding when TDEC would request retraction of the Attainment Demonstration.

Finally, Mike explained that there was a potential option for determining conformity for the 2008 Ozone Standard's first horizon year of 2015 by using the 1-Hour Ozone Maintenance Plan 2014 MVEB for Knox County. He stated that if it can be shown that emissions from the entire 2008 Ozone Nonattainment Area (Knox, Blount, and part of Anderson County) are less than the 2014 Knox-only MVEB then conformity would be satisfied. He noted that this ties in to the previous discussion about amending that Maintenance Plan MVEB.

4.) Discussion of Various Current NAAQS/Air Quality Planning Issues affecting the Knoxville Region

- **Air Quality Monitoring Data Update** – Marc provided an update on current Ozone monitoring data and updated design values across the state based on the preliminary 2012 data that was sent to the IAC group.
- **MOVES Transition** – Mike described latest efforts to make the transition to the MOVES model, of which the primary activity has been related to reviewing a potential software tool known as PPSUITE that provides an interface between travel demand model outputs and MOVES. Mike noted that PPSUITE appears to offer a good mechanism for organizing data inputs and outputs for MOVES and that we need to again start discussions at the statewide level on appropriate inputs for MOVES.
- **List of Conformity Triggers** – Mike noted that he has not documented a current list of conformity triggers recently. He stated that this current conformity determination would be addressing the conformity triggers of the 4-year Plan update requirement and the first conformity determination due for the 2008 Ozone Standard, which is due by July 20, 2013. Marc stated that he was not aware of any others on the immediate horizon but that future triggers would likely result from efforts to develop Maintenance Plans for the PM2.5 standards.

5.) Schedule Next IAC Call

It was determined that the next call would be Tuesday, September 18th at 10:00 am ET (9:00 am CT).

B.3: Meeting 3 – Meeting Minutes (09/18/12):

Knoxville Air Quality Interagency Consultation Conference Call

Call Participants:

- Mike Conger, TPO
- Kelly Sheckler, EPA Region 4
- Dianna Smith, EPA Region 4
- Corbin Davis, FHWA TN Division
- Deborah Fleming, TDOT
- Angie Midgett, TDOT
- Bob Rock, TDOT
- Marc Corrigan, TDEC
- Steve McDaniel, Knox County Air Quality Mgmt.
- Brian Rivera, Knox County Air Quality Mgmt.
- Rich DesGrosseillers, LAMTPO

Discussion Items:

1.) Update on Status of Knox County 1-Hour Ozone Maintenance SIP Safety Margin Amendment

Steve McDaniel stated that no comments were received from the IAC on this amendment and therefore the public notice was sent out on September 11th for the hearing by the Knox County Air Pollution Control Board at their October 17th meeting. Steve asked for clarification from EPA regarding the process to request a parallel review by EPA. It was determined that a letter would first have to come from Knox County to TDEC and that TDEC would then be the agency to request a parallel review from EPA. Dianna Smith & Kelly Sheckler noted that they would follow-up with Lynorae Benjamin at EPA to make sure about the specific protocols and timing of review periods and they will then contact Steve with the additional information. Dianna asked what the timeframe was for needing the final approval of this amendment. Mike replied that the main purpose for the amendment was to have the additional emissions budget available at the time when the use of MOVES was mandatory, but that the additional budget could also be helpful for the current conformity determination as well.

2.) Discussion of Latest Planning Assumptions for Conformity Determination for 2013 Knoxville Mobility Plan Update

Mike reviewed the planning assumptions document that was sent to the IAC group prior to the call. He noted that the purpose of this conformity determination/regional emissions analysis was to address the 4-year Long Range Plan update requirement and also to satisfy the need to prepare a conformity determination for the 2008 Ozone Standard within 1-year of its effective date - by July 20, 2013. Mike first discussed the travel demand forecasting model development process and the validation statistics for the model, which was recently updated to a 2010 base year in order to coincide with the wealth of information that is available from the decennial census. Mike reviewed the model geography, which was expanded to a full 10 counties with this update by taking in

Hamblen County, which is part of the Lakeway MTPO. Mike also briefly discussed the results of the validation analysis that was performed to ensure that the model was accurately representing traffic conditions observed in the year 2010 based on TDOT traffic count and other information available. He noted that the model meets the validation criteria that have been established for travel demand models in Tennessee by the Tennessee Model Users Group.

Corbin Davis asked for clarification regarding the use of the HPMS correction factors. Mike replied that the HPMS correction factors were very important for the development of the air quality analysis as they are applied to the model outputs of vehicle miles of travel (VMT) to ensure that the model is accurately replicating the amount of VMT in the base year, which directly affects the amount of emissions that are predicted. Mike stated that a separate document was provided to the IAC group that shows each HPMS factor by county and functional classification of roadway in the study area. He noted that the HPMS factor was the number multiplied by the model VMT such that if the number is less than 1 it means that the model was over-predicting VMT in the base year and if it is greater than 1 it means that the model is under-predicting VMT. Mike also noted that the travel demand model does not include the entire roadway network particularly the lower-classified and local roadways such that those HPMS factors would be very high. In the case of local roadways, Mike stated that an off-model technique would be used to forecast VMT by relying on historical growth trends instead.

Corbin asked about whether factors would be developed for the other counties included in the travel demand model that were not shown in the HPMS factor table since it included 6-counties whereas the model area includes 10 counties. Mike replied that the 6-counties in the table were part of the nonattainment areas whereas the other four counties were not currently designated as nonattainment and therefore they do not need to have adjustment factors or further analysis performed on them for the purposes of air quality conformity. Mike noted that the travel that is generated outside but enters into one of the nonattainment counties does get accounted for since that traffic volume shows up on the roadway links in the model.

Mike next covered the development of the socioeconomic projections that are used as input to the model for forecasting of future traffic conditions. Mike noted that a document explaining the methodology for the forecasts was sent to the IAC group for review. He stated that in summary the methodology used was based on local characteristics with the labor force linkage cohort survival method of population forecasting. This method projects population based on change in births, deaths, and net migration over the forecasting period with the net migration amount based on growth of the labor force.

Corbin noted that the planning assumptions document stated that these projections had been endorsed by the TPO Executive Board back in April and he asked if they had also been formally endorsed by the LAMTPO Board. Rich DesGrosseillers replied that he had reviewed the numbers and was in agreement with them but that he did not think they had been formally endorsed by his Board. Angie noted that the LAMTPO Board probably should formally review and endorse these and suggested it be done at an upcoming meeting. Rich replied that they would do so.

Mike stated that the final step involved in the socioeconomic forecasting process was to allocate the county-level control totals down to the smaller level of geography represented in the travel demand model known as Traffic Analysis Zones. He stated that the TPO was still working on documenting the methodology for that process and that it would be available for the next IAC call for discussion.

Mike continued to the next section of the planning assumptions document, which deals with the development of inputs for the MOBILE6 emissions rate model that is going to be used for this conformity analysis. He noted that this group has discussed several of these items on the previous IAC call regarding the proposed emissions tests and analysis years. He noted that there have been some additional discussions regarding the 2009 MVEB for the Annual PM2.5 Standard since it may be rescinded due to the area receiving a Clean Data Determination. Mike stated that he had asked TDEC to delay the request to rescind the 2009 Attainment Demonstration in order to leave the MVEB in place during this conformity analysis process, as it will be more straightforward to have a budget than to use separate baseline year emissions tests for the Daily and Annual PM2.5 standards. It was noted that this subject will be discussed again going forward based on further coordination between EPA and TDEC but as of right now it appears that the Attainment Demonstration can stay in place for the duration of this conformity process.

Mike next reviewed the assumptions for major inputs to MOBILE6 as documented and following are the items that were discussed in more detail:

- **Temperature** – Mike asked whether new min/max temperature inputs needed to be developed specifically for the 2008 Ozone Standard. Marc replied that since the emissions tests for the new ozone standard will still be utilizing the maintenance plan budgets developed for the 1997 standard then we should use the same temperature inputs we have

been using in the past in order to remain consistent. Dianna Smith agreed.

- **Humidity** – Same as with Temperature
- **Vehicle Age Distribution** – There was discussion about the availability of updated vehicle registration data and the fact that this should be used instead of the older data although Marc pointed out that we have not fully reviewed the new data for reasonableness as an entire group and that should be done at a future call.
- **Vehicle Activity** – Mike noted that he needed to follow-up with the National Park Service regarding data to utilize in forecasting future traffic in the partial county nonattainment area of Cocke County within the Smoky Mountains National Park.
- **VMT by vehicle classification** – Corbin asked about the note regarding the departure from the technical guidance in using the Arterial/Collector driving cycle for Rural Other Principal Arterials instead of the Freeway driving cycle and whether this was a new procedure being proposed. Mike replied that this was the same assumption that we had made in past conformity determinations based on the fact that most rural principal arterials in the Knoxville region do not function like freeways in terms of their access control.
- **Weekday and Weekend Day Activity** – Mike stated that he needed to follow-up with TDOT to obtain current seasonal adjustment factor information

3.) Schedule Next IAC Call

It was determined that the next call would be Monday, October 22nd at 10:00 a.m. ET (9:00 a.m. CT).

B.4: Meeting 4 - Meeting Minutes (10/22/12):

Knoxville Air Quality Interagency Consultation Conference Call

Call Participants:

- Mike Conger, TPO
- Kelly Sheckler, EPA Region 4
- Dianna Smith, EPA Region 4
- Corbin Davis, FHWA TN Division
- Deborah Fleming, TDOT
- Angie Midgett, TDOT
- Bob Rock, TDOT
- Marc Corrigan, TDEC
- Steve McDaniel, Knox County Air Quality Mgmt.
- Brian Rivera, Knox County Air Quality Mgmt.
- Rich DesGrosseillers, LAMTPO

Discussion Items:

1.) Update on Status of Knox County 1-Hour Ozone Maintenance SIP Safety Margin Amendment

Mike stated that the Safety Margin adjustment was approved by the Knox County Air Pollution Control Board last week on October 17th. The next step is for Knox County Air Quality Management to formally request the revision be incorporated in the SIP by the State Air Board. Marc Corrigan stated the next State Air Board meeting was scheduled for November 14th and it could be heard there. Marc stated that a parallel review request was sent to EPA and Kelly Sheckler said that EPA would be able to start the concurrency process. Dianna Smith noted that this adjustment will be posted to the "Adequacy" webpage to make the public aware of it. Kelly stated she is not aware of any issues and that these types of actions typically are not controversial using Rocky Mount as an example where they were able to do a direct final rule. Assuming that no major issues arise it is assumed that the new emission budget would be effective by the end of the calendar year.

2.) Continued Discussion of Latest Planning Assumptions for Conformity Determination for 2013 Knoxville Mobility Plan Update

Mike reviewed some items as follow-up from the previous month's discussion –

- **Vehicle Age Distribution** – New information on age distribution was developed for TDOT by the University of Tennessee for use in the MOVES model. Angie Midgett stated that TDOT is in the process of re-evaluating that data and other information that was developed by U.T. since there were some known issues with quality of the Department of Revenue vehicle registration data. Mike asked whether the evaluation would be complete in time to be available for this conformity determination and Angie said she was unsure at this time. Marc stated that the primary issues with the data were with its use in determining the overall vehicle populations (vehicle types, counts, etc) and not as much in terms of the vehicle age distribution. Mike proposed that he work with Marc between now and the next call to further evaluate the data and present some recommendations for IAC review on how to proceed for this conformity analysis.
- **Vehicle Activity** – Mike stated that he has contacted the National Park Service to get updated traffic counts and visitation data for the areas of

the park in the partial non-attainment area of Cocke County. He has not yet received anything, but should have it for the next call.

- **Seasonal Adjustment Factor** – Mike reviewed the 2010 SAF information that he received from TDOT. He noted that the TPO's procedure in the past has been to average together the three summer months of June, July, and August. Corbin Davis asked why 2010 was used instead of a more recent year such as 2011. Mike replied that the main consideration was to be consistent with the base year of the travel demand model. Marc asked if there was an explanation for the difference between the rural categories. Mike replied that he was not sure of the exact reason but that there was a significant difference in the weekend factors for the two rural categories. Mike noted that he would try to look into the treatment of weekday versus weekend factors further but that he would like to try to stay as consistent as possible with previous methodology used to develop the SIP budgets.
- **Land Use Allocation** – Mike asked Rich DesGrosseillers if Lakeway had adopted the socio-economic control totals yet. Rich replied that their Technical Committee had approved them already and they were expected to be approved by the Executive Board this week. Mike then reviewed the land use allocation methodology document describing the general methodology that was used. Marc asked for clarification about the table on the bottom of page 6 of the document. Mike replied that these are the rates that were assumed for allocating people and employment to each grid cell of the model. The rates were developed primarily using regional trends – for example the typical average household size in the region and typical land consumption in terms of houses per acre that are normally built given zoning and other characteristics. On the employment side, the floor-area ratio of commercial buildings around the region were reviewed and new developments were assumed to follow a similar trend. National rates from the ITE Trip Generation Manual were used to determine an average number of employees per square feet of the new developments. Mike noted that the result of the allocation at grid cell level was then aggregated to the traffic analysis zones for use in the travel demand model. Mike stated he could provide a TAZ-by-TAZ table showing change although he was not sure how useful that format would be and another option would be to develop maps that show the changes in population and employment by TAZ.

3.) Preliminary Project List Review

Mike reviewed the project lists that had been sent out previously. He noted that the TPO had issued a Call for Projects that ended on September 20th where the TPO jurisdictions re-evaluated the current project list and submitted new projects that are desired in their areas. The current project list has been updated to reflect projects that have been completed or are "committed" and also some projects have been dropped from the list. Mike stated that some projects have had a change in description or termini and these were noted by strikethroughs and the updated information. Mike next reviewed the listing of new projects and described the methodology used to determine regionally significance based on the criteria that our area has already established in consultation with the IAC. He asked if there were any questions about the new projects. Kelly asked what the timeline was for needing a determination by the IAC on regional significance of each project. Mike replied that there is still a few months before the list will be totally finalized as the TPO staff was still refining the list and determining whether additional projects would be added that result from the system deficiency analysis and congestion management process. Mike also noted that the regional significance determination was not very critical in terms of the fact that the TPO intends to include all projects in the travel demand model if possible regardless of their regional significance status.

Mike noted that additional "operations" types of projects would likely be added to the final project list and asked for clarification regarding the exempt status of these types of projects. He said that he was aware of a recent signal system upgrade project in Chattanooga that required a conformity analysis and wanted to know more about the process done for that project. Marc remembered the project and conformity analysis but said he would need to follow-up later with more information as he did not recall specific details at the moment.

Marc asked about the Lakeway Area new project list and wondered why the statement was made that all the projects were exempt. Mike responded that he inadvertently left out a statement to the effect that all of the projects were exempt based on each individual project description fitting the exempt project criteria and the intent was not to make a blanket statement that any project regardless of scope would be exempt in Jefferson County. Kelly stated that she has seen other areas add a column to their project list that describes the specific section of the regulations that applies to each project that has been declared exempt. Mike replied that he could add that information to the next version of the project list.

4.) Schedule Next IAC Call

It was determined that the next call would be Tuesday, November 27th at 2:00 p.m. ET (1:00 p.m. CT).

B.5: Meeting 5 – Meeting Minutes (11/27/12):

Knoxville Air Quality Interagency Consultation Conference Call

Call Participants:

- Mike Conger, TPO
- Kelly Sheckler, EPA Region 4
- Dianna Smith, EPA Region 4
- Corbin Davis, FHWA TN Division
- Angie Midgett, TDOT
- Bob Rock, TDOT
- Steve McDaniel, Knox County Air Quality Mgmt.
- Brian Rivera, Knox County Air Quality Mgmt.
- Rich DesGrosseillers, LAMTPO
- Jim Renfro, GSMNP

Discussion Items:

1.) Update on Status of Knox County 1-Hour Ozone Maintenance SIP Safety Margin Amendment

Kelly Sheckler noted that the public comment period for the proposed SIP revision that is being parallel processed ended on November 26th and no comments were received. This means that an additional 30-day public comment period will not be required assuming that the final SIP submittal from the state does not have significant changes from the initial proposal. Steve McDaniel stated that the Tennessee State Air Board did not meet in November, but may be meeting in December to take action on the SIP revision and if it is approved then it would be submitted to EPA to begin the final steps in becoming an official change to the motor vehicle emissions budget. Kelly stated that she would continue doing everything possible to ensure that this item was staying on track for MVEB availability by April 2013.

2.) Continued Discussion/Finalize Latest Planning Assumptions

Mike explained that the latest planning assumptions document that has been previously sent and reviewed with the IAC has been updated with respect to a few items, which were highlighted in blue in the document. He stated that he is hoping to work through any major issues as soon as possible to avoid issues at the time of the official IAC review of the draft conformity report.

- **Vehicle Age Distribution** – Mike stated that the vehicle age distribution input was probably the main issue that is still not completely resolved at this point. As discussed on previous IAC calls, there is new information on age distribution that was developed for TDOT by the University of Tennessee for use in the MOVES model. Mike noted that in the time since the previous IAC call he and Marc Corrigan investigated whether the new data could easily be converted from MOVES to MOBILE6 format, which is being used for this conformity analysis. Mike stated that it did not appear to be possible to backward convert the data and also it was likely not feasible to completely reformat the original vehicle registration data for use in MOBILE6 given the time and cost that would be involved.

  Mike stated that another issue is that the new data itself was being currently reassessed by TDOT and U.T. due to potential quality control issues of the raw vehicle registration dataset that was received from the Tennessee Department of Revenue. Angie Midgett noted that it would likely be more than six months before any revised data would be available, which would be too late for the purposes of this conformity analysis.

  Mike reviewed a comparison between the 2000 vehicle fleet age data with the new 2010 vehicle fleet data. He noted that there are some cases where the 2000 data shows a newer vehicle fleet, which would produce fewer emissions. Steve McDaniel stated that the biggest differences appeared to be in vehicle categories, which were probably less prevalent in the fleet such as motorcycles and refuse trucks thus making this not a major issue.

  Dianna Smith stated that a question had been posed to the EPA's Office of Transportation and Air Quality (OTAQ) for guidance on this issue. At the minimum, it will need to be fully documented in the conformity report as to why the older dataset was still being used. Once an opinion is received from OTAQ it will be shared with the IAC.

- **Vehicle Activity** – Mike stated that he received updated traffic counts from the National Park Service for the areas of the park in the partial non-attainment area of Cocke County. He shared the historical data with the IAC and showed how it was being projected into the future for use in determining emissions in this portion of the nonattainment area that is not covered by the model.

- **Land Use Allocation** – Mike reviewed the allocation of future population and employment growth at the Traffic Analysis Zone level which was illustrated on color-coded maps. Mike noted that a large portion of the overall regional population and employment growth was projected to occur in Knox County, which is why a lot of color showed up there.

Corbin Davis noted that the planning assumptions document includes a statement about the future year population and employment projection control

totals being adopted by the TPO Executive Board and he asked if the Lakeway Executive Board had also taken action to endorse them as had been talked about on a previous call. Rich DesGrosseillers responded that the LAMTPO Board had adopted the control totals at their most recent meeting, which occurred on October 24th.

3.) Revised Long Range Plan Project List Review

Mike reviewed the most current project lists that are being considered for the Long Range Plan update. Mike noted that separate project lists have been developed for Existing plus Committed projects (E+C), Pedestrian/Greenway projects, Transit projects, ITS/Operations projects and finally Roadway projects. Mike stated that the pedestrian/greenway and transit projects should all be exempt. He noted that some of the ITS/Operations projects would need to include an off-model analysis where updated traffic signal timings were going to be involved, which he would base on the Chattanooga example of a similar project. He discussed the roadway project list in more detail and noted that a column had been added showing which category the Exempt projects fall under according to the conformity regulations. He also noted that some projects on this list have been pushed out to an "illustrative" project category as shown in the horizon year column based on the TPO's financial constraint analysis showing that not all projects can be fiscally constrained.

Mike stated that the project list was still not completely finalized at this point but that he would like to receive comments from the IAC as soon as possible regarding the exempt and regional significance status if there are questions or issues. Corbin asked for clarification regarding some of the information used to make a determination on regional significance. He asked if there was a set threshold for Average Daily Traffic that had been established by the IAC for regional significance. Mike responded that the ADT was just included for informational purposes in terms of being another factor to be considered with the others in making a determination on regional significance and there was not specific threshold that was set for a roadway to be considered regionally significant. Corbin also asked for clarification about some of the responses to the "Connectivity to Major Activity Center" factor that refer to not being the primary access. Mike replied that he was interpreting the connections to major activity centers factor to mean that it was only the primary access point used by traffic coming from outside the region that would be considered regionally significant. Mike used an example of a regional shopping mall that has direct access from an interstate interchange as its primary access, but also has secondary access from the surface street system, which would not typically be considered regionally significant roadway facilities. Corbin stated that perhaps it would be helpful to have some maps of the specific areas in question to illustrate this aspect for those who are not as familiar with the Knoxville regional roadway network. Mike responded that would be possible to do and noted that the functional classification of the roadway was another clue as far as primary/secondary access in terms of if a roadway has a local or collector classification it was most likely secondary. Corbin asked if the roadway functional classifications were reassessed periodically. Mike replied that the TPO would be doing a reassessment soon as part of the process to update functional classification based on the new 2010 Census urbanized area, and the TPO had also done a major classification reassessment a couple years ago as well.

Mike again reiterated that if there are any other specific comments or questions about the project list that they could also be sent to him after the call.

4.) Schedule Next IAC Call

It was determined that the next call would be Tuesday, December 18th at 2:00 p.m. ET (1:00 p.m. CT). The primary purpose for the call would be to review the expected response from EPA's OTAQ on the vehicle age data issue to determine an appropriate course of action. Mike stated that the current schedule is still to submit the draft Conformity Determination Report for the 30-day IAC formal review period on January 11, 2013.

B.6: Meeting 6 – Meeting Minutes (12/18/12):

Knoxville Air Quality Interagency Consultation Conference Call

Call Participants:

- Mike Conger, TPO
- Kelly Sheckler, EPA Region 4
- Corbin Davis, FHWA TN Division
- Deborah Fleming, TDOT
- Marc Corrigan, TDEC
- Steve McDaniel, Knox County Air Quality Mgmt.
- Brian Rivera, Knox County Air Quality Mgmt.
- Jim Renfro, GSMNP

Discussion Items:

1.) Update on Status of Knox County 1-Hour Ozone Maintenance SIP Safety Margin Amendment

Marc Corrigan stated that the notice of the proposed rule to revise the 1-Hour Maintenance Plan MVEBs that was published in today's Federal Register appeared to have higher NOx and VOC MVEBs than what was intended. It was

determined that an apparent misinterpretation occurred in processing the request from TDEC/Knox County Air Quality Management which was intended to be a replacement page for the original SIP instead of a new standalone document. Kelly Sheckler stated that she would attempt to get this issue corrected as expeditiously as possible although it may be delayed due to the upcoming holidays. She stated that she would keep the IAC group apprised of the progress.

2.) Continued Discussion/Finalize Latest Planning Assumptions

Mike updated the group regarding the primary remaining issue, which deals with the Vehicle Age Distribution input to MOBILE6. As discussed on prior calls, there is updated information for this input which has been formatted for the new MOVES model and there are some challenges involved in converting the information to MOBILE6 format. Mike stated that there was an email that had been forwarded by Kelly Sheckler from Gary Dolce with the EPA OTAQ that stated we should use the most current information in order to meet the requirement for using latest planning assumptions. Mike noted that he and Marc Corrigan had been working on developing a conversion spreadsheet but that some issues came up in which further guidance was needed from Gary. Mike stated that he spoke with Gary earlier today and received the guidance he needed to move forward. Mike noted that he would coordinate further with Marc and would also send the information to Gary Dolce for his review to ensure the appropriate methodology was being used.

3.) Revised Long Range Plan Project List Review

Mike stated that he wanted to respond to the comments that were received from the last IAC call regarding the regional significance status of some of the projects. Mike went through the list of projects that Corbin Davis had commented on in an email and noted where revisions had been made in the project list in response to the comments. Mike stated that in general he was fine with changing the regional significance determinations at this point in time since these projects would all be included in the travel model and it should not really affect anything. He noted however that at some point it would probably be good to completely revisit the regional significance definition to refine it based on some of the issues that have recently been discussed such as whether any connectivity to a major activity center would be considered regionally significant or if we should consider only the direct primary access to be such.

Corbin Davis pointed out that the map that was sent to show project 09-688 indicated that Morrell Road was a minor arterial whereas the project listing has it as a collector. Mike replied that he would check into that as it could possibly be that it was reclassified from a collector to a minor arterial as part of a regional functional classification update that was done in the last two years.

Mike noted that a project for an auxiliary lane on I-40 was added to the list of roadway projects in the 2024 horizon year. He also noted that the Lakeway MPO has several individual roadway resurfacing projects in their project list and that he was grouping all of these into a single project for the purposes of the conformity determination project list to keep things simpler. Likewise, Mike noted that there was a project grouping for the Lakeway MPO safety projects as well. Marc asked what types of projects were included in the safety grouping. Deborah Fleming responded that these were minor projects that were by definition categorical exclusions that did not involve major reconstruction or right of way acquisition. She stated that they mostly involve signage and guardrail installation.

Mike noted that he was still uncertain as to how to categorize Project 13-602, which is a citywide replacement of signal hardware for the City of Knoxville in terms of its regional significance. It was noted that the City of Chattanooga had a similar project that was specifically determined to be regionally significant however, nobody on today's call could remark on the specific situation for Chattanooga. Kelly stated that she would try to follow-up with Dianna Smith to get more information. Corbin asked about the methodology that Chattanooga used to determine emissions impacts from the project. Mike stated that he had a copy of the conformity determination but did not remember specifics at this time. He stated he would attempt to contact the Chattanooga TPO for more information and would provide that to the IAC.

Finally, Mike also noted that a project had been added to the E+C project list for Town Creek Pkwy in Lenoir City that had inadvertently been left off previously. Marc asked what the roadway classification for this was. Mike responded that he thought it was an Urban Collector and he noted that this specific project had been through a regional significance determination through the IAC in the last couple of years.

4.) Added Agenda Item – EPA Conformity Updates

Kelly provided the group with a some updates of a few pertinent conformity items such as a forthcoming patch expected for MOVES 2010b to correct an error, a new OTAQ web page, a new version of CAL3QHCR that can be downloaded and a revision to AERMOD model.

5.) Schedule Next IAC Call

It was determined that the next call would be Tuesday, January 22, 2013 at 2:00 p.m. ET (1:00 p.m. CT).

B.7: Meeting 7 – Meeting Minutes (01/22/13):

Knoxville Air Quality Interagency Consultation Conference Call

Call Participants:

- Mike Conger, TPO
- Jeff Welch, TPO
- Alan Huff, TPO
- Corbin Davis, FHWA TN Division
- Deborah Fleming, TDOT
- Marc Corrigan, TDEC
- Steve McDaniel, Knox County Air Quality Mgmt.
- Brian Rivera, Knox County Air Quality Mgmt.

Discussion Items:

1.) Update on Status of Knox County 1-Hour Ozone Maintenance SIP Safety Margin Amendment

There was nothing new to report on this item at the current time.

2.) Discussion of Age Distribution Input Proposal Document

Mike provided a summary of the document that was sent to the IAC group by email last week regarding the proposed approach for the vehicle age distribution input data. Mike stated that the document outlines the two major issues with the most recent data developed by the University of Tennessee, which are possible quality issues with the vehicle registration data itself and the issue of converting it from MOVES format to MOBILE6 format. Mike stated that based on those issues along with the need to use the most recent data available where possible to meet the "latest planning assumptions" requirement that the TPO has proposed using the new data for MOBILE6 vehicle types 1-5, which are the light duty vehicle types and the defaults for vehicle types 6-16. He noted that this was consistent with the methodology used to develop the original MOBILE6 age distribution dataset that has been used in previous conformity determinations and SIP development efforts over the past several years.

Corbin Davis asked which emissions model would be used for the next conformity determination that would be required for the update to the Transportation Improvement Program – MOVES or MOBILE6? Mike replied that if a new regional emissions analysis was needed then likely MOVES would be required since the grace period for being able to still use MOBILE6 expires in March 2013. There was a discussion about when the actual start of conformity would be since that is what determines when MOBILE6 can still be used prior to the end of the grace period. It was decided that for the purposes of this current conformity determination for the long range plan update that conformity has officially begun since the TPO has begun the emissions modeling aspect of the conformity determination and has developed a draft report already. The TIP conformity process however will likely not have reached the point of performing the modeling tasks by the time the MOBILE6 grace period expires since the TIP project application process will extend beyond March 2013. Mike stated that it was the hope of the TPO staff that since we are currently updating the long range plan that there would be no new projects that are generated for the TIP update that are not already reflected in the appropriate long range plan horizon year such that there would be a potential option to rely on a previous regional emissions analysis to determine conformity for the TIP.

Mike asked if there was a consensus among the IAC members as to the TPO's proposed approach for using the updated age distribution data for this current conformity determination. Marc Corrigan stated that he endorses the proposed TPO approach and Steve McDaniel also indicated he was in approval of it. There were no other comments on the proposal such that it is assumed there is IAC consensus on the approach although Mike noted that since EPA was not on the call today that he would attempt to contact them separately about this matter as well.

3.) Discussion of Draft Conformity Determination Report

Mike stated that the links to the draft Conformity Determination Report (CDR) and appendices were provided to the IAC group last Wednesday, January 16th which begins the official 30-day IAC review period through Friday, February 15th. Mike provided a brief summary of the results from the emissions analysis that was performed to demonstrate conformity of the Long Range Plan update known as the 2013-2040 Knoxville Long Range Regional Mobility Plan. Mike noted that there were a few minor edits that would be needed for the final document with regard to references to the appendices in the main document and also that he had not developed the methodology to account for the emissions impacts of the traffic signal coordination projects that had been discussed previously. He stated that he would provide separate documentation of this analysis to the IAC once completed and it would be folded into the CDR as appropriate. Marc Corrigan asked for clarification regarding one of the tables in Appendix K-D involving the travel demand model validation statistics and what the columns "Mean Count" and "Mean Load" represented. Mike responded that the mean count column was the average of the actual traffic count data by functional classification category and the mean load column represented the average volumes predicted by the

travel demand model and that the comparison of these was a validation criteria that we attempt to meet within percent error ranges. Marc commented that it appeared the travel demand model was doing very well in terms of the percent errors shown in this table. Marc also asked how this related to the HPMS correction factors that were developed and shown in a subsequent table. Mike responded that the HPMS correction factors were more disaggregate in terms of being specific to each county and facility type whereas the validation criteria table represented the entire 10-county modeling region.

Mike asked the IAC group if there was a preference about how to provide all of the numerous specific MOBILE6 input and output files, which could be printed out and included in the appendices but that would generate several additional pages to the document. Marc Corrigan responded that the files should be made available to those who desire them in some manner and that perhaps one option could be to post the files for download on the website. Mike stated that he wasn't sure that would be possible but he would check with the IT person about it. Mike also noted that in the past the TPO had prepared a CD-ROM with all of the files that could be provided upon request. Marc stated that whatever option was chosen it needed to be clearly stated someplace in the documentation as to the availability of the files and their location.

Mike asked the group whether another IAC call was desired prior to the end of the comment period on Friday, February 15th or if we should wait until after the comment period and have a call where the TPO would provide a summary of the comments and proposed responses for discussion. Corbin Davis responded that his preference would be for the latter approach and it was decided to tentatively schedule the next IAC call for Friday, February 22nd.

4.) Schedule Next IAC Call

It was determined that the next call would be Friday, February 22, 2013 at 10:00 a.m. ET (9:00 a.m. CT).

B.8: Meeting 8 – Meeting Minutes (02/22/13):

Knoxville Air Quality Interagency Consultation Conference Call

Call Participants:

- Mike Conger, TPO
- Jeff Welch, TPO
- Kelly Sheckler, EPA Region 4
- Corbin Davis, FHWA TN Division
- Angie Midgett, TDOT
- Deborah Fleming, TDOT
- Marc Corrigan, TDEC
- Steve McDaniel, Knox County Air Quality Mgmt.
- Brian Rivera, Knox County Air Quality Mgmt.
- Rich DesGrosseillers, LAMTPO

Discussion Items:

1.) Update on Status of Knox County 1-Hour Ozone Maintenance SIP Safety Margin Amendment

Marc Corrigan noted that both a Proposed and Direct Final Rule have been published in the Federal Register and that the revised MVEB would be effective on April 22nd unless EPA receives adverse comments. Mike Conger stated that he was still not totally clear whether the conformity report should list just the revised budget or both the revised and existing budget as the draft shows. Mike noted that the Executive Board adoption of the Long Range Plan and Conformity is set for just two days after the effective date on April 24th. Marc responded that we should know by around March 22nd whether or not EPA has received significant comments and therefore we can circle back around on that issue. Marc also noted that this conformity finding would immediately satisfy the 2-year conformity trigger requirement that comes along with new MVEBs.

Steve McDaniel stated that he wanted to point out a minor clarification with regard to how the federal register was worded. He noted that whereas the federal register states that the SIP revision was submitted to EPA by the State of Tennessee through TDECs that this action was really initiated by the Knox County Department of Air Quality Management since the Maintenance Area in question is wholly comprised of Knox County and the original Maintenance Plan and this revision being entirely developed by Knox County Air Quality Management and filtered through TDEC and State Air Board.

2.) Discussion of Draft CDR Comments and TPO Response

Mike stated that comments had been received from both FHWA and TDEC and that a summary list was prepared with TPO responses and sent out the morning of this call. He noted that several of FHWA's comments had to do with fairly minor revisions in text or need for additional clarification which can be addressed. Mike asked Corbin if there were any specific comments that he would like to discuss further on today's call. Corbin responded that he had a chance to quickly go through the responses this morning and there were a couple that he wanted to follow-up on. First was comment #25 regarding the determination of PM2.5 precursors. Mike replied that these precursors were determined as part of the 2009 PM2.5 Annual Standard Attainment Demonstration and he would add that information to the revised CDR. Corbin then verified his statement in

comment #37 regarding the update timing of Long Range Plans since Mike had asked for further clarification. Finally, Corbin noted that with regard to comment #45 he recommended that the TPO include the minutes from the May 10, 2012 meeting in the CDR since there was some relevant information that was discussed at that time.

Mike discussed the TDEC comments and noted that a couple of minor changes were identified as Marc Corrigan had identified some errors in the calculations in relation to comments #1 and #2.

Mike reviewed a list of three project changes that had been made since the release of the initial draft CDR. The first one was a change in horizon year from 2014 to 2015 for a short project on I-140 to add a lane in the northbound direction. Mike noted that this affected the emissions analysis for the 2014 Horizon Year in which this project was removed from the travel demand model; he further noted that based on the calculations that the change in estimated emissions was very minor. The second project he discussed was splitting the Cumberland Avenue project into two phases with the first phase moving into the 2014 Horizon Year. He noted that this change did not impact the emissions analysis however since the first phase of the project fell into the Exempt category since it does not affect roadway capacity and the second phase remains in the same Horizon Year as before. The last project he discussed was splitting the Chapman Hwy project into three phases with all three phases remaining in the 2024 Horizon Year, which would not affect the emissions analysis.

Mike stated that he was going through the draft CDR and noting all changes in response to the comments and the above project revisions in green highlighting. He noted that a revised version should be made available to the IAC later that afternoon. He asked if any of the IAC members had an objection to the TPO beginning the formal 30-day public comment period a week from today on March 1st. There was no objection from the IAC members based on the comments and proposed responses that were discussed today.

Corbin Davis asked Mike for an update on the current timeline leading up to the conformity approval. Mike stated that as he mentioned, the public comment period would begin around March 1st and last 30 days until around the end of March or beginning of April. He said that assuming there were no significant public comments then the TPO would move towards getting endorsement from the TPO Technical Committee in mid-April and TPO Executive Board adoption on April 24th. The Plan and Conformity Determination would then be submitted to U.S. DOT for a formal conformity finding with consultation from EPA for a period of up to 30 days ultimately leading up to a final approval by the deadline of June 1st.

B.9: Meeting 9 – Meeting Minutes (04/02/13):

Knoxville Air Quality Interagency Consultation Conference Call

Call Participants:

- Mike Conger, TPO
- Kelly Sheckler, EPA Region 4
- Corbin Davis, FHWA TN Division
- Angie Midgett, TDOT
- Marc Corrigan, TDEC

Discussion Items:

1.) Update on Status of Knox County 1-Hour Ozone Maintenance SIP Safety Margin Amendment

Kelly Sheckler noted that EPA did not receive any public comment on the proposed direct final rule to revise the 1-Hour Ozone Maintenance SIP to include additional safety margin for the NOx MVEB. It was further noted that since this is going through a direct final rule making process and there was no public comment that the revision will become automatically effective on April 22, 2013 as per the Federal Register Notice that was published on February 20, 2013. Mike Conger stated that since the conformity determination will be adopted on April 24, 2013 the final conformity determination report will be updated to reflect the revised MVEB.

2.) Update on Status of Draft CDR for 2040 Long Range Plan – Discussion of Public Comment and Remaining Steps

Mike noted that there had been no public comment relating to the conformity determination portion of the long range plan update. He stated that he would be putting the final touches on the conformity report and drafting the adopting resolutions that would be heard by the TPO Executive Board on April 24th. Angie Midgett stated that she understood that the Lakeway MTPO was also on schedule to adopt their plan update on the same day as the TPO.

3.) Discussion of Timeline and Conformity Process for 2014-2017 Transportation Improvement Program

Mike advised the group of the upcoming process and timeline to update the Transportation Improvement Program which would be following directly on the heels of the long range plan update. He stated that it was his hope that since the TIP is coming along so close to the LRTP that there should be direct consistency in

terms of the project scopes and timeframes such that conformity for the TIP would likely be a formality in terms of verifying that conformity can be demonstrated by relying on a previous regional emissions analysis. He noted that if there were new projects being added or other significant changes then the schedule would likely have to be modified since additional time would be needed to use MOVES for the first time as it is now required to be used for conformity.

B.10: Interagency Comments on Draft Conformity Determination Report

FHWA TN Division Comments

1.) **Page K-6**: The last line of the second paragraph states, "The air quality conformity process is used to ensure that federal funds will not be spent on projects that delay timely attainment of these standards in a nonattainment area." The air quality conformity process is used to ensure that federal funds will not be spent on projects that cause or contribute to any new violations of the National Ambient Air Quality Standards (NAAQS); increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone. Please expand the text.
Response: *Text added*

2.) **Page K-7**: In the first paragraph, it isn't necessary to note the day of the week – Wednesday, September 15, 2010. The other dates did not include the day of the week. Please maintain consistency.
Response: *Text deleted*

3.) **Page K-8:** The titles for Tables K-2 and K-3 are identical even though the qualitative tests are different. Please expand the titles to better describe the differences between the two tests.
Response: *Table K-3 title revised to "2008 Ozone Standard" instead of "1997 Ozone Standard"*

4.) **Page K-9**: Is there a citation for the "EPA guidance" referenced under the "2006 Daily PM2.5 Standard" section? Or was this discussed through the IAC group?
Response: *Changed "EPA guidance" to "transportation conformity requirements found in 40 CFR 93.118.*

5.) **Page K-11**: It would be helpful to reiterate that The KRTPO compiles a single overall transportation plan that encompasses the entire Nonattainment and Maintenance areas for the purposes of demonstrating conformity for the entire region.
Response: *Text added*

6.) **Page K-11**: The second paragraph contains an incomplete Appendix reference.
Response: *Reference updated*

7.) **Page K-12**: For exhibit K-1, the legend has a red symbology for PM2.5 Nonattainment, but I don't see any areas on the map with the red color. Am I missing something?
Response: *Map replaced with corrected version showing the PM2.5 Nonattainment Area in Roane County as red.*

8.) **Page K-13**: It would be helpful to distinguish when the MOA was signed at this point in the text (I see that it's also covered on K-14).
Response: *Added year it was signed (2004) to text*

9.) **Page K-13**: In the last paragraph before the PM2.5 section, it would be helpful to reiterate that that a conformity finding must be made within one year of the effective date of the 2008 8-hour Ozone Standard nonattainment designation, which is July 20, 2013.
Response: *Text added*

10.) **Page K-14**: The first paragraph seems out of place. Maybe it should go before Exhibit K-1 on page K-12.
Response: *Deleted this paragraph – appears to be redundant and probably a carryover from previous CDR.*

11.) **Page K-14**, **Section 1.3**: Again, the air quality conformity process is used to ensure that federal funds will not be spent on projects that cause or contribute to any new violations of the National Ambient Air Quality Standards (NAAQS); increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone. Please expand the text.
Response: *Text added*

12.) **Page K-14, Section 1.3**: The CAA requires that metropolitan transportation plans, metropolitan transportation improvement programs (TIPs) and Federal projects conform to the purpose of the State Implementation Plan (SIP). Please expand the text.
Response: *Text added*

13.) **Page K-14**: Section 1.3 could be improved by expanding the details of a conformity lapse, including the 12-month grace period and highway sanctions outlined by Section 179(b)(1) of the CAA.
Response: *Text added*

14.) **Page K-14**: Section 1.4 could be improved by briefly expanding on the roles of KRTPO, LAMPTO, East Tennessee South RPO, and TDOT in terms of emissions modeling, transportation conformity analysis, interagency consultation, public involvement, and conformity adoption.

Response: *Text added*

15.) **Page K-15**: I wouldn't classify LAMPTO a new MPO. Thirteen years is enough time for an MPO to develop and hone a mature transportation planning process.
Response: *Text deleted*

16.) **Page K-16**: What about the attainment year(s)?
Response: *Text added*

17.) **Page K-18:** Why does the introduction paragraph for section 3.0 reference the amended 2009-2034 KRMP?
Response: *Text amended to 2013-2040 – this is a carryover from previous CDR*

18.) **Page K-18**: Please provide a reference to the page/section in the 2013-2040 KRMP that contains the fiscal constraint demonstration.
Response: *Text added*

19.) **Page K-21**: In the section on 40 CFR 93.111, the description of the 3-year grace period should be expanded to clarify the original two year grace period and the one year grace period extension.
Response: *Text added*

20.) **Page K-23**: Why isn't Cocke County part of Exhibit K-2?
Response: *Cocke County is not included within the Travel Demand Model coverage area*

21.) **Page K-23**: Please provide a reference/link to the previous conformity determination report.
Response: *Expanded on the methodology discussion in Appendix K-G and removed the reference to a previous conformity determination in this section.*

22.) **Page: K-25**: In section 4.1, it isn't necessary to note the day of the week – Wednesday, September 15, 2010. The other dates did not include the day of the week. Please maintain consistency.
Response: *Text deleted*

23.) **Page K-28**: It would be helpful if the "Note" at the top of the page directly followed Table K-8.
Response: *Corrected this formatting issue*

24.) **Page K-28**: Please provide a reference to the page/section in the 2013-2040 KRMP that contains the fiscal constraint demonstration.
Response: *Text added*

25.) **Page K-29**: For the first paragraph of Section 4.3, when was it determined that conformity determinations should address the Direct PM2.5 emissions from vehicle exhaust and brake/tire wear and the PM2.5 precursor of Oxides of Nitrogen (NOx). I didn't see this in the meeting minutes.
Response: *This was determined as part of the Attainment Demonstration evaluation of significant PM2.5 precursors, will add statement in CDR to that effect.*

26.) **Page K-30**: It would be helpful if the "Note" at the top of the page directly followed Table K-10.
Response: *Corrected this formatting issue*

27.) **Page: K-30**: Why does section 4.3.1. reference the 2009-2034 KRMP?
Response: *Corrected*

28.) **Page K-30**: In section 4.4, why does this report satisfy the requirement for a conformity determination by December 14, 2010? What about the 2014 attainment year?
Response: *Text deleted – this was a carryover from the previous CDR that is no longer relevant*

29.) **Page K-30**: The last paragraph should include the 2040 analysis year.
Response: *Text added*

30.) **Page K-31**: Why does section 4.4.1. reference the 2009-2034 KRMP?
Response: *Corrected*

31.) **Page K-32**: "Although Vehicle Miles of Travel are projected to increase steadily in the future, the corresponding emissions rates from vehicles are expected to decrease even more significantly according to the modeling performed by the KRTPO." This statement should be supported by a graph or some other visual display.
Response: *Chart added*

32.) **Page K-32**: Any other explanations for decline in emission rates? E.g. Operational efficiencies? ITS? Congestion reduction?
Response: *The overwhelming factor influencing the emission rates computed by MOBILE6 has to do with the impact from federal emission standards.*

33.) **Page K-32**: Please specify/cite the "regulations" referenced in the second paragraph.
Response: *Text added regarding Tier Two standards*

34.) **Page K-32**: Did the Knoxville Regional TPO and Lakeway Area MTPO hold two public hearings each?
Response: *The public hearing dates will be included in the final CDR, the specific number of public hearings has not yet been determined.*

35.) **Page K-33**: Does the list of newspapers include those in the Lakeway Area?

Response: *I will check with LAMTPO on the appropriate newspapers to include when the public notices go out*

36.) **Page K-35**: The "conformity" definition should be added to pages K-6 and K-14 (see comments above).
Response: *Correction made*

37.) **Page K-36**: For the definition of LRTP/LRMP, these plans must be updated every four years in nonattainment and maintenance areas. Population is not a factor. Please revise.
Response: *Revision made*

38.) **Page K-36**: Please include MAP-21.
Response: *Text added.*

39.) **Page K-37**: The TIP shall cover a period of no less than four years, be updated at least every four years, and be approved by the MPO and the Governor. However, if the TIP covers more than four years, the FHWA and the FTA will consider the projects in the additional years as informational. Please revise.
Response: *Text revised*

Knoxville Air Quality Conformity Determination Appendices

40.) **Page K-33**: The Air Quality Conformity Determination ends on page K-38, yet the appendices begin on page K-33. Please fix this discrepancy.
Response: *Correction made*

41.) **Page K-34**: The FHWA Tennessee Division is located at 404 BNA Drive, Building 200, Suite 508, Nashville, TN 37217.
Response: *Correction made*

42.) **Page K-34**: Corbin Davis' title is Planning & Air Quality Specialist.
Response: *Correction made*

43.) **Page K-34**: Deborah Fleming from TDOT also participated.
Response: *Correction made*

44.) **Page K-34**: Brian Rivera, Knox County Air Quality Mgmt also participated.
Response: *Correction made*

45.) **Page K-35**: Why weren't the IAC meeting minutes from May 10, 2012 included?
Response: *Minutes added to appendix*

46.) **Page K-93**: It would be helpful if the color symbology was defined in a legend.
Response: *Legend added*

47.) **Page K-106**: Please be sure to include the appropriate amendments made to the FY2011-2014 TIPs.
Response: *These will be reflected*

Tennessee Dept of Environment & Conservation (TDEC) Comments:

1.) In looking at the Appendices, on page K-50, there were no 2015 VMT nor HPMS adjustment factor applied to the partial Anderson County table. Why is the methodology different here?
Response: *The methodology is different because of the partial area effects. It is explained to some degree on page K-89 of the appendices. Basically, the adjustment factors were developed separately just for the partial area and were already applied to the model VMT before putting them into the emissions analysis table shown on K-50. The adjustment factors were developed based on 2010 traffic counts in the partial area versus what the 2010 model outputs were.*

I did notice an error in that table however. It looks like I put some VMT into the Rural Ramps category whereas it should have gone into Rural Locals. It looks like it has a very small impact when I correct it, but I will be sure to get it right in the final version.

2.) Why in the attached spreadsheet for Blount County does it appear as if urban interstate is calculated differently than the others in Blount County?
Response: *It appears I had a copy-paste error. The 147,255 number should have been put in the "2024 VMT" column instead of the HPMS Adjusted column. After the correction, it lowered the overall VOC and NOx by .02 tpd, which will be reflected in the final CDR.*

3.) On page K-76 of the CDR, what do 'mean count' and 'mean load' in the table mean? How do they differ?
Response: *The mean count column was the average of the actual traffic count data by functional classification category and the mean load column represented the average volumes predicted by the travel demand model and that the comparison of these was a validation criteria that we attempt to meet within percent error ranges.*

Appendix K-C: Emissions Analysis Summary for Each County

C.1: Ozone Analysis

C.1.1. Baseline Year 2002:

Table KA-2: Ozone Analysis, Baseline 2002, Anderson County

Facility Type	VOC Emission Factor (grams/mile)	NOx Emission Factor (grams/mile)	Factored VMT (miles/day)	VOC (tons/day)	NOx (tons/day)
Rural Interstate	1.392	9.956	585,938	0.90	6.43
Rural Principal Arterial	1.769	2.116	128,009	0.25	0.30
Rural Minor Arterial	1.731	2.216	82,336	0.16	0.20
Rural Collector	1.797	1.974	415,364	0.82	0.90
Rural Local	1.797	1.974	116,956	0.23	0.25
Rural Ramps	1.850	4.611	7,718	0.02	0.04
Urban Interstate	0.000	0.000		0.00	0.00
Urban Principal Arterial	1.820	1.968	621,164	1.25	1.35
Urban Minor Arterial	1.883	1.938	248,731	0.52	0.53
Urban Collector	2.038	1.824	67,900	0.15	0.14
Urban Local	3.196	1.827	131,453	0.46	0.26
Urban Ramps	0.000	0.000		0.00	0.00
TOTAL			**2,405,569**	**4.75**	**10.41**

Table KA-3: Ozone Analysis, Baseline 2002, Blount County

Facility Type	VOC Emission Factor (grams/mile)	NOx Emission Factor (grams/mile)	Factored VMT (miles/day)	VOC (tons/day)	NOx (tons/day)
Rural Interstate	0.000	0.000	0	0.00	0.00
Rural Principal Arterial	1.718	2.348	351,198	0.67	0.91
Rural Minor Arterial	1.776	2.151	82,958	0.16	0.20
Rural Collector	1.824	1.938	384,786	0.77	0.82
Rural Local	1.824	1.938	311,300	0.63	0.67
Rural Ramps	0.000	0.000	0	0.00	0.00
Urban Interstate	1.685	2.268	72,499	0.13	0.18
Urban Principal Arterial	1.772	2.162	867,920	1.70	2.07
Urban Minor Arterial	1.866	2.056	295,955	0.61	0.67
Urban Collector	1.963	1.930	264,581	0.57	0.56
Urban Local	3.189	1.922	281,439	0.99	0.60
Urban Ramps	2.226	2.012	14,744	0.04	0.03
TOTAL			**2,927,381**	**6.26**	**6.71**

Table KA-4: Ozone Analysis, Baseline 2002, Jefferson County

Facility Type	VOC Emission Factor (grams/mile)	NOx Emission Factor (grams/mile)	Factored VMT (miles/day)	VOC (tons/day)	NOx (tons/day)
Rural Interstate	1.372	10.528	1,196,190	1.81	13.88
Rural Principal Arterial	0.000	0.000	0	0.00	0.00
Rural Minor Arterial	1.729	2.557	457,546	0.87	1.29
Rural Collector	1.796	2.009	318,803	0.63	0.71
Rural Local	1.796	2.009	116,648	0.23	0.26
Rural Ramps	1.824	4.796	23,168	0.05	0.12
Urban Interstate	1.372	10.528	42,651	0.06	0.49
Urban Principal Arterial	1.817	2.138	109,802	0.22	0.26
Urban Minor Arterial	1.880	2.095	19,613	0.04	0.05
Urban Collector	1.897	1.977	12,809	0.03	0.03
Urban Local	3.186	1.944	28,856	0.10	0.06
Urban Ramps	1.824	4.796	3,112	0.01	0.02
TOTAL			**2,329,197**	**4.05**	**17.16**

Table KA-5: Ozone Analysis, Baseline 2002, Loudon County

Facility Type	VOC Emission Factor (grams/mile)	NOx Emission Factor (grams/mile)	Factored VMT (miles/day)	VOC (tons/day)	NOx (tons/day)
Rural Interstate	1.410	9.449	1,142,305	1.78	11.90
Rural Principal Arterial	1.693	2.880	166,833	0.31	0.53
Rural Minor Arterial	1.720	2.780	180,844	0.34	0.55
Rural Collector	1.813	1.977	322,713	0.64	0.70
Rural Local	1.813	1.977	107,297	0.21	0.23
Rural Ramps	1.873	4.447	26,892	0.06	0.13
Urban Interstate	1.431	8.915	19,783	0.03	0.19
Urban Principal Arterial	1.857	2.025	138,182	0.28	0.31
Urban Minor Arterial	1.903	1.955	25,580	0.05	0.06
Urban Collector	1.868	1.950	17,458	0.04	0.04
Urban Local	3.188	1.954	23,281	0.08	0.05
Urban Ramps	1.900	4.263	954	0.00	0.00
TOTAL			**2,172,120**	**3.83**	**14.70**

Table KA-6: Ozone Analysis, Baseline 2002, Sevier County

Facility Type	VOC Emission Factor (grams/mile)	NOx Emission Factor (grams/mile)	Factored VMT (miles/day)	VOC (tons/day)	NOx (tons/day)
Rural Interstate			0	0.00	0.00
Rural Principal Arterial	1.834	1.940	479,029	0.97	1.02
Rural Minor Arterial	1.863	1.931	475,683	0.98	1.01
Rural Collector	1.825	2.002	502,438	1.01	1.11
Rural Local	1.825	2.002	509,290	1.02	1.12
Rural Ramps			0	0.00	0.00
Urban Interstate	1.427	8.979	304,608	0.48	3.01
Urban Principal Arterial	1.894	1.903	573,268	1.20	1.20
Urban Minor Arterial	1.876	1.908	55,063	0.11	0.12
Urban Collector	1.948	1.987	44,390	0.10	0.10
Urban Local	3.184	2.034	83,741	0.29	0.19
Urban Ramps	1.895	4.292	7,490	0.02	0.04
TOTAL			**3,034,999**	**6.18**	**8.92**

C.1.2. Analysis Year 2015:

Table KA-7: Ozone Analysis, 2015, Anderson County

Facility Type	HPMS Adj. Factor	2015 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	0.82	583,750	478,675	514,704	0.617	2.366	0.35	1.34
Rural Principal Arterial	0.96	120,241	115,432	114,289	0.794	0.827	0.10	0.10
Rural Minor Arterial	0.80	88,212	70,570	69,871	0.778	0.844	0.06	0.07
Rural Major Collector	1.04	242,615	252,320	249,821	0.803	0.782	0.22	0.22
Rural Minor Collector	2.50	39,143	97,858	96,889	0.825	0.747	0.09	0.08
Rural Local			100,870	99,871	0.825	0.747	0.09	0.08
Rural Ramps	0.82	8,466	6,942	7,464	0.757	1.358	0.01	0.01
Urban Interstate			0	0			0.00	0.00
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.12	569,896	638,283	658,024	0.824	0.808	0.60	0.59
Urban Minor Arterial	1.06	204,542	216,815	223,521	0.844	0.757	0.21	0.19
Urban Collector	2.87	22,754	65,303	67,323	0.953	0.720	0.07	0.05
Urban Local			133,232	137,353	1.315	0.719	0.20	0.11
Urban Ramps			0	0			0.00	0.00
TOTAL		**1,879,619**	**2,176,300**	**2,239,131**			**1.99**	**2.84**

Table KA-8: Ozone Analysis, 2015, Blount County

Facility Type	HPMS Adj. Factor	2015 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate			0	0			0.00	0.00
Rural Principal Arterial	1.07	297,367	318,182	315,032	0.813	0.895	0.28	0.31
Rural Minor Arterial	0.98	105,794	103,678	102,651	0.850	0.816	0.10	0.09
Rural Major Collector	0.99	45,212	44,760	44,317	0.861	0.763	0.04	0.04
Rural Minor Collector	1.22	86,185	105,146	104,105	0.865	0.768	0.10	0.09
Rural Local			190,822	188,933	0.865	0.768	0.18	0.16
Rural Ramps			0	0			0.00	0.00
Urban Interstate	0.80	106,478	85,182	87,817	0.800	0.900	0.08	0.09
Urban Freeway	0.70	43,714	30,600	31,546	0.806	0.877	0.03	0.03
Urban Principal Arterial	0.99	981,372	971,559	1,001,607	0.858	0.845	0.95	0.93
Urban Minor Arterial	1.09	429,396	468,041	482,517	0.893	0.795	0.47	0.42
Urban Collector	1.37	276,394	378,660	390,371	0.925	0.755	0.40	0.32
Urban Local			486,457	501,502	1.376	0.761	0.76	0.42
Urban Ramps	0.80	9,802	7,842	8,085	0.965	0.846	0.01	0.01
TOTAL		**2,381,714**	**3,190,928**	**3,258,481**			**3.40**	**2.92**

Table KA-9: Ozone Analysis, 2015, Jefferson County

Facility Type	HPMS Adj. Factor	2015 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	1.02	1,444,884	1,473,782	1,584,711	0.672	2.673	1.17	4.67
Rural Principal Arterial			0	0			0.00	0.00
Rural Minor Arterial	0.83	409,091	339,546	336,184	0.900	0.988	0.33	0.37
Rural Major Collector	0.76	238,924	181,582	179,784	0.903	0.942	0.18	0.19
Rural Minor Collector	1.18	77,125	91,007	90,106	0.958	0.869	0.10	0.09
Rural Local			127,202	125,943	0.958	0.869	0.13	0.12
Rural Ramps	1.02	8,591	8,763	9,423	0.824	1.536	0.01	0.02
Urban Interstate	1.30	48,849	63,504	65,468	0.633	2.978	0.05	0.21
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.21	138,024	167,009	172,174	0.923	0.941	0.18	0.18
Urban Minor Arterial	0.78	64,982	50,686	52,253	0.957	0.903	0.06	0.05
Urban Collector	1.07	46,771	50,045	51,592	0.971	0.890	0.06	0.05
Urban Local			44,261	45,630	1.479	0.900	0.07	0.05
Urban Ramps	1.30	1,924	2,502	2,579	0.781	1.645	0.00	0.00
TOTAL		**2,479,165**	**2,599,888**	**2,715,848**			**2.33**	**5.99**

Table KA-10: Ozone Analysis, 2015, Knox County

Facility Type	HPMS Adj. Factor	2015 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	1.03	706,050	727,231	781,969	0.542	2.232	0.47	1.92
Rural Principal Arterial			0	0			0.00	0.00
Rural Minor Arterial	0.99	203,483	201,448	199,454	0.614	1.102	0.13	0.24
Rural Major Collector	0.99	90,246	89,343	88,459	0.669	0.805	0.07	0.08
Rural Minor Collector	1.25	129,786	162,232	160,626	0.690	0.776	0.12	0.14
Rural Local	4.93	42,045	207,284	205,232	0.690	0.776	0.16	0.18
Rural Ramps	1.03	4,682	4,822	5,185	0.668	1.303	0.00	0.01
Urban Interstate	1.01	5,326,671	5,379,938	5,546,328	0.624	1.200	3.82	7.34
Urban Freeway	2.17	31,485	68,323	70,436	0.651	0.843	0.05	0.07
Urban Principal Arterial	1.09	2,721,579	2,966,521	3,058,269	0.639	0.928	2.15	3.13
Urban Minor Arterial	1.16	1,894,388	2,197,490	2,265,454	0.714	0.784	1.78	1.96
Urban Collector	1.14	739,570	843,110	869,185	0.724	0.746	0.69	0.71
Urban Local	5.10	551,984	2,815,120	2,902,185	1.134	0.757	3.63	2.42
Urban Ramps	1.01	310,502	313,607	323,306	0.752	0.926	0.27	0.33
TOTAL		**12,752,471**	**15,976,470**	**16,476,088**			**13.34**	**18.52**

Table KA-11: Ozone Analysis, 2015, Loudon County

Facility Type	HPMS Adj. Factor	2015 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	0.93	1,224,181	1,138,488	1,224,181	0.626	2.249	0.84	3.03
Rural Principal Arterial	0.80	228,297	182,637	180,829	0.731	1.170	0.15	0.23
Rural Minor Arterial	0.94	170,632	160,394	158,806	0.764	1.036	0.13	0.18
Rural Major Collector	0.59	198,484	117,106	115,946	0.799	0.819	0.10	0.10
Rural Minor Collector	2.82	50,649	142,831	141,417	0.848	0.760	0.13	0.12
Rural Local			111,151	110,050	0.848	0.760	0.10	0.09
Rural Ramps	0.93	11,963	11,125	11,963	0.765	1.346	0.01	0.02
Urban Interstate	0.86	93,870	80,729	83,225	0.624	2.242	0.06	0.21
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.28	139,738	178,864	184,396	0.785	1.062	0.16	0.22
Urban Minor Arterial	1.54	14,866	22,893	23,601	0.853	0.847	0.02	0.02
Urban Collector	1.33	43,895	58,381	60,187	0.852	0.774	0.06	0.05
Urban Local			54,244	55,921	1.311	0.795	0.08	0.05
Urban Ramps	0.86	5,833	5,016	5,171	0.764	1.343	0.00	0.01
TOTAL		**2,182,408**	**2,263,860**	**2,355,694**			**1.85**	**4.33**

Table KA-12: Ozone Analysis, 2015, Sevier County

Facility Type	HPMS Adj. Factor	2015 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate			0	0			0.00	0.00
Rural Principal Arterial	1.15	254,467	292,637	289,740	0.949	0.853	0.30	0.27
Rural Minor Arterial	0.97	519,338	503,758	498,770	0.925	0.916	0.51	0.50
Rural Major Collector	0.88	260,337	229,096	226,828	0.930	0.870	0.23	0.22
Rural Minor Collector	2.34	90,049	210,714	208,628	0.960	0.831	0.22	0.19
Rural Local			595,470	589,574	0.960	0.831	0.62	0.54
Rural Ramps			0	0			0.00	0.00
Urban Interstate	1.03	343,070	353,362	364,291	0.675	2.594	0.27	1.04
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.14	914,907	1,042,994	1,075,252	0.976	0.860	1.16	1.02
Urban Minor Arterial	1.23	193,707	238,260	245,629	0.976	0.830	0.26	0.22
Urban Collector	1.94	79,566	154,359	159,133	0.996	0.824	0.17	0.14
Urban Local			295,436	304,574	1.484	0.843	0.50	0.28
Urban Ramps	1.03	10,835	11,161	11,506	0.829	1.502	0.01	0.02
TOTAL		**2,666,277**	**3,927,247**	**3,973,923**			**4.26**	**4.46**

Table KA-13: Ozone Analysis, 2015, Anderson County (Partial)

Facility Type	HPMS Adj. Factor	2015 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate				0	0.617	2.366	0.00	0.00
Rural Principal Arterial				0	0.794	0.827	0.00	0.00
Rural Minor Arterial			86,389	85,534	0.778	0.844	0.07	0.08
Rural Major Collector			55,878	55,325	0.803	0.782	0.05	0.05
Rural Minor Collector			12,491	12,367	0.825	0.747	0.01	0.01
Rural Local			17,161	16,991	0.825	0.747	0.02	0.01
Rural Ramps					0.757	1.358	0.00	0.00
Urban Interstate							0.00	0.00
Urban Freeway							0.00	0.00
Urban Principal Arterial			220,930	227,763	0.824	0.808	0.21	0.20
Urban Minor Arterial			143,933	148,385	0.844	0.757	0.14	0.12
Urban Collector			13,543	13,962	0.953	0.720	0.01	0.01
Urban Local			37,814	38,983	1.315	0.719	0.06	0.03
Urban Ramps							0.00	0.00
TOTAL				**599,311**			**0.57**	**0.52**

C.1.3. Analysis Year 2024:

Table KA-14: Ozone Analysis, 2024, Anderson County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	0.82	679,257	556,991	598,915	0.375	0.878	0.25	0.58
Rural Principal Arterial	0.96	129,889	124,693	123,459	0.464	0.476	0.06	0.06
Rural Minor Arterial	0.80	113,071	90,457	89,561	0.454	0.486	0.04	0.05
Rural Major Collector	1.04	305,933	318,170	315,020	0.466	0.468	0.16	0.16
Rural Minor Collector	2.50	45,690	114,225	113,094	0.482	0.450	0.06	0.06
Rural Local			121,821	120,615	0.482	0.450	0.06	0.06
Rural Ramps	0.82	10,370	8,503	9,143	0.469	0.617	0.00	0.01
Urban Interstate			0	0			0.00	0.00
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.12	622,117	696,771	718,321	0.486	0.470	0.38	0.37
Urban Minor Arterial	1.06	257,127	272,555	280,984	0.493	0.459	0.15	0.14
Urban Collector	2.87	25,128	72,117	74,347	0.576	0.452	0.05	0.04
Urban Local			150,754	155,416	0.832	0.447	0.14	0.08
Urban Ramps			0	0			0.00	0.00
TOTAL		**2,188,581**	**2,527,056**	**2,598,875**			**1.37**	**1.61**

Table KA-15: Ozone Analysis, 2024, Blount County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate			0	0			0.00	0.00
Rural Principal Arterial	1.07	380,539	407,177	403,145	0.480	0.523	0.21	0.23
Rural Minor Arterial	0.98	135,247	132,542	131,230	0.505	0.491	0.07	0.07
Rural Major Collector	0.99	55,839	55,281	54,734	0.508	0.480	0.03	0.03
Rural Minor Collector	1.22	97,310	118,718	117,543	0.510	0.480	0.07	0.06
Rural Local			238,198	235,839	0.510	0.480	0.13	0.12
Rural Ramps			0	0			0.00	0.00
Urban Interstate	0.80	147,255	117,804	121,448	0.471	0.533	0.06	0.07
Urban Freeway	0.70	300,314	210,220	216,722	0.474	0.527	0.11	0.13
Urban Principal Arterial	0.99	1,060,105	1,049,504	1,081,963	0.505	0.505	0.60	0.60
Urban Minor Arterial	1.09	508,717	554,502	571,651	0.531	0.489	0.33	0.31
Urban Collector	1.37	293,434	402,004	414,438	0.549	0.476	0.25	0.22
Urban Local			536,687	553,286	0.879	0.479	0.54	0.29
Urban Ramps	0.80		15,257	15,729	0.579	0.532	0.01	0.01
TOTAL		**2,978,761**	**3,837,894**	**3,917,726**			**2.43**	**2.15**

Table KA-16: Ozone Analysis, 2024, Jefferson County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	1.02	1,663,938	1,697,217	1,824,964	0.409	1.000	0.82	2.01
Rural Principal Arterial			0	0			0.00	0.00
Rural Minor Arterial	0.83	499,743	414,787	410,680	0.530	0.561	0.24	0.25
Rural Major Collector	0.76	293,430	223,006	220,799	0.530	0.550	0.13	0.13
Rural Minor Collector	1.18	104,563	123,384	122,163	0.564	0.524	0.08	0.07
Rural Local			158,173	156,607	0.564	0.524	0.10	0.09
Rural Ramps	1.02	10,495	10,705	11,510	0.513	0.692	0.01	0.01
Urban Interstate	1.30	55,419	72,045	74,273	0.390	1.086	0.03	0.09
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.21	171,987	208,104	214,540	0.545	0.545	0.13	0.13
Urban Minor Arterial	0.78	80,671	62,924	64,870	0.571	0.531	0.04	0.04
Urban Collector	1.07	52,528	56,205	57,944	0.574	0.531	0.04	0.03
Urban Local			54,096	55,769	0.939	0.536	0.06	0.03
Urban Ramps	1.30	2,351	3,056	3,150	0.491	0.712	0.00	0.00
TOTAL		**2,935,125**	**3,083,703**	**3,217,270**			**1.67**	**2.89**

Table KA-17: Ozone Analysis, 2024, Knox County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	1.03	800,378	824,389	886,440	0.354	0.847	0.35	0.83
Rural Principal Arterial			0	0			0.00	0.00
Rural Minor Arterial	0.99	220,221	218,018	215,860	0.388	0.549	0.09	0.13
Rural Major Collector	0.99	114,163	113,021	111,902	0.423	0.462	0.05	0.06
Rural Minor Collector	1.25	180,905	226,132	223,893	0.438	0.446	0.11	0.11
Rural Local	4.93	58,815	289,957	287,086	0.438	0.446	0.14	0.14
Rural Ramps	1.03	4,583	4,720	5,075	0.444	0.598	0.00	0.00
Urban Interstate	1.01	5,586,727	5,642,594	5,817,107	0.395	0.582	2.53	3.73
Urban Freeway	2.17	34,247	74,316	76,614	0.414	0.484	0.03	0.04
Urban Principal Arterial	1.09	2,891,937	3,152,211	3,249,702	0.403	0.512	1.44	1.83
Urban Minor Arterial	1.16	2,423,133	2,810,834	2,897,767	0.448	0.458	1.43	1.46
Urban Collector	1.14	960,969	1,095,505	1,129,386	0.460	0.445	0.57	0.55
Urban Local	5.10	663,442	3,383,552	3,488,198	0.774	0.448	2.98	1.72
Urban Ramps	1.01	303,927	306,966	316,460	0.486	0.514	0.17	0.18
TOTAL		**14,243,445**	**18,142,215**	**18,705,491**			**9.90**	**10.80**

Table KA-18: Ozone Analysis, 2024, Loudon County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	0.93	1,384,914	1,287,970	1,384,914	0.389	0.858	0.59	1.31
Rural Principal Arterial	0.80	288,157	230,525	228,243	0.442	0.582	0.11	0.15
Rural Minor Arterial	0.94	224,590	211,115	209,025	0.465	0.540	0.11	0.12
Rural Major Collector	0.59	245,646	144,931	143,496	0.480	0.489	0.08	0.08
Rural Minor Collector	2.82	69,836	196,938	194,988	0.512	0.465	0.11	0.10
Rural Local			144,432	143,002	0.512	0.465	0.08	0.07
Rural Ramps	0.93	13,981	13,002	13,981	0.483	0.627	0.01	0.01
Urban Interstate	0.86	105,560	90,781	93,589	0.386	0.862	0.04	0.09
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.28	176,809	226,315	233,314	0.486	0.544	0.12	0.14
Urban Minor Arterial	1.54	22,588	34,785	35,861	0.522	0.484	0.02	0.02
Urban Collector	1.33	75,996	101,074	104,200	0.517	0.471	0.06	0.05
Urban Local			75,520	77,856	0.853	0.482	0.07	0.04
Urban Ramps	0.86	6,817	5,862	6,044	0.482	0.625	0.00	0.00
TOTAL		**2,614,891**	**2,763,251**	**2,868,512**			**1.41**	**2.19**

Table KA-19: Ozone Analysis, 2024, Sevier County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate			0	0			0.00	0.00
Rural Principal Arterial	1.15	287,367	330,472	327,200	0.562	0.521	0.20	0.19
Rural Minor Arterial	0.97	628,824	609,959	603,920	0.549	0.541	0.37	0.36
Rural Major Collector	0.88	335,023	294,821	291,901	0.549	0.521	0.18	0.17
Rural Minor Collector	2.34	113,998	266,755	264,114	0.567	0.510	0.17	0.15
Rural Local			723,504	716,340	0.567	0.510	0.45	0.40
Rural Ramps			0	0			0.00	0.00
Urban Interstate	1.03	392,333	404,103	416,601	0.411	0.979	0.19	0.45
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.14	1,032,011	1,176,493	1,212,879	0.576	0.519	0.77	0.69
Urban Minor Arterial	1.23	332,130	408,520	421,155	0.577	0.512	0.27	0.24
Urban Collector	1.94	95,673	185,605	191,345	0.592	0.508	0.12	0.11
Urban Local			364,377	375,647	0.939	0.519	0.39	0.21
Urban Ramps	1.03	15,009	15,459	15,937	0.514	0.682	0.01	0.01
TOTAL		**3,232,367**	**4,780,067**	**4,837,039**			**3.11**	**2.98**

C.1.4. Analysis Year 2034:

Table KA-20: Ozone Analysis, 2034, Anderson County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	0.82	781,895	641,153	689,412	0.356	0.515	0.27	0.39
Rural Principal Arterial	0.96	140,216	134,607	133,274	0.436	0.387	0.06	0.06
Rural Minor Arterial	0.80	124,983	99,987	98,997	0.425	0.398	0.05	0.04
Rural Major Collector	1.04	368,916	383,673	379,874	0.436	0.388	0.18	0.16
Rural Minor Collector	2.50	48,515	121,288	120,087	0.451	0.375	0.06	0.05
Rural Local			139,130	137,753	0.451	0.375	0.07	0.06
Rural Ramps	0.82	11,677	9,575	10,296	0.439	0.430	0.00	0.00
Urban Interstate			0	0			0.00	0.00
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.12	708,615	793,649	818,195	0.459	0.386	0.41	0.35
Urban Minor Arterial	1.06	296,770	314,577	324,306	0.463	0.383	0.17	0.14
Urban Collector	2.87	28,280	81,163	83,673	0.542	0.384	0.05	0.04
Urban Local			172,169	177,494	0.791	0.378	0.15	0.07
Urban Ramps			0	0			0.00	0.00
TOTAL		**2,509,867**	**2,890,971**	**2,973,360**			**1.48**	**1.36**

Table KA-21: Ozone Analysis, 2034, Blount County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate			0	0			0.00	0.00
Rural Principal Arterial	1.07	453,647	485,402	480,596	0.449	0.428	0.24	0.23
Rural Minor Arterial	0.98	156,689	153,556	152,035	0.473	0.408	0.08	0.07
Rural Major Collector	0.99	61,799	61,181	60,575	0.475	0.407	0.03	0.03
Rural Minor Collector	1.22	125,070	152,585	151,075	0.477	0.407	0.08	0.07
Rural Local			284,590	281,772	0.477	0.407	0.15	0.13
Rural Ramps			0	0			0.00	0.00
Urban Interstate	0.80	169,462	135,570	139,763	0.440	0.441	0.07	0.07
Urban Freeway	0.70	373,211	261,248	269,328	0.443	0.441	0.13	0.13
Urban Principal Arterial	0.99	1,177,805	1,166,027	1,202,090	0.476	0.419	0.63	0.56
Urban Minor Arterial	1.09	619,091	674,809	695,679	0.497	0.411	0.38	0.32
Urban Collector	1.37	342,984	469,888	484,420	0.514	0.405	0.27	0.22
Urban Local			618,210	637,330	0.835	0.408	0.59	0.29
Urban Ramps	0.80	19,229	15,383	15,859	0.541	0.453	0.01	0.01
TOTAL		**3,498,987**	**4,478,448**	**4,570,521**			**2.66**	**2.10**

Table KA-22: Ozone Analysis, 2034, Jefferson County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	1.02	1,892,174	1,930,017	2,075,288	0.386	0.597	0.88	1.37
Rural Principal Arterial			0	0			0.00	0.00
Rural Minor Arterial	0.83	591,526	490,966	486,105	0.500	0.461	0.27	0.25
Rural Major Collector	0.76	365,353	277,668	274,919	0.499	0.459	0.15	0.14
Rural Minor Collector	1.18	133,057	157,007	155,453	0.531	0.445	0.09	0.08
Rural Local			192,349	190,445	0.531	0.445	0.11	0.09
Rural Ramps	1.02	11,936	12,175	13,091	0.482	0.484	0.01	0.01
Urban Interstate	1.30	61,784	80,319	82,803	0.365	0.638	0.03	0.06
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.21	193,669	234,339	241,587	0.513	0.454	0.14	0.12
Urban Minor Arterial	0.78	89,881	70,107	72,275	0.541	0.445	0.04	0.04
Urban Collector	1.07	58,174	62,246	64,171	0.543	0.448	0.04	0.03
Urban Local			60,619	62,494	0.894	0.451	0.06	0.03
Urban Ramps	1.30	2,674	3,476	3,583	0.462	0.481	0.00	0.00
TOTAL		**3,400,227**	**3,571,290**	**3,722,215**			**1.83**	**2.21**

Table KA-23: Ozone Analysis, 2034, Knox County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	1.03	925,067	952,819	1,024,536	0.339	0.525	0.38	0.59
Rural Principal Arterial			0	0			0.00	0.00
Rural Minor Arterial	0.99	249,056	246,566	244,125	0.369	0.416	0.10	0.11
Rural Major Collector	0.99	153,728	152,190	150,684	0.404	0.387	0.07	0.06
Rural Minor Collector	1.25	282,211	352,764	349,271	0.420	0.374	0.16	0.14
Rural Local	4.93	92,056	453,837	449,344	0.420	0.374	0.21	0.19
Rural Ramps	1.03	5,144	5,298	5,697	0.423	0.432	0.00	0.00
Urban Interstate	1.01	6,205,741	6,267,798	6,461,648	0.379	0.438	2.70	3.12
Urban Freeway	2.17	44,659	96,909	99,906	0.396	0.411	0.04	0.05
Urban Principal Arterial	1.09	3,467,228	3,779,279	3,896,163	0.384	0.418	1.65	1.80
Urban Minor Arterial	1.16	2,837,355	3,291,332	3,393,126	0.426	0.391	1.59	1.46
Urban Collector	1.14	1,143,288	1,303,348	1,343,658	0.440	0.382	0.65	0.57
Urban Local	5.10	783,023	3,993,418	4,116,926	0.746	0.382	3.39	1.73
Urban Ramps	1.01	341,162	344,574	355,231	0.464	0.424	0.18	0.17
TOTAL		**16,529,718**	**21,240,133**	**21,890,315**			**11.13**	**9.99**

Table KA-24: Ozone Analysis, 2034, Loudon County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	0.93	1,546,911	1,438,627	1,546,911	0.371	0.526	0.63	0.90
Rural Principal Arterial	0.80	356,587	285,269	282,445	0.419	0.440	0.13	0.14
Rural Minor Arterial	0.94	270,707	254,464	251,945	0.441	0.421	0.12	0.12
Rural Major Collector	0.59	290,663	171,491	169,793	0.453	0.410	0.08	0.08
Rural Minor Collector	2.82	83,885	236,556	234,214	0.483	0.395	0.12	0.10
Rural Local			174,713	172,984	0.483	0.395	0.09	0.08
Rural Ramps	0.93	14,860	13,820	14,860	0.455	0.448	0.01	0.01
Urban Interstate	0.86	117,480	101,033	104,157	0.369	0.525	0.04	0.06
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.28	233,847	299,324	308,581	0.451	0.423	0.15	0.14
Urban Minor Arterial	1.54	26,171	40,304	41,550	0.494	0.398	0.02	0.02
Urban Collector	1.33	100,780	134,037	138,182	0.492	0.400	0.07	0.06
Urban Local			98,768	101,823	0.814	0.407	0.09	0.05
Urban Ramps	0.86	7,246	6,231	6,424	0.454	0.446	0.00	0.00
TOTAL		**3,049,135**	**3,254,637**	**3,373,869**			**1.58**	**1.74**

Table KA-25: Ozone Analysis, 2034, Sevier County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate			0	0			0.00	0.00
Rural Principal Arterial	1.15	310,759	357,373	353,835	0.530	0.445	0.21	0.17
Rural Minor Arterial	0.97	745,165	722,810	715,654	0.520	0.455	0.41	0.36
Rural Major Collector	0.88	414,847	365,065	361,451	0.519	0.440	0.21	0.18
Rural Minor Collector	2.34	156,614	366,477	362,849	0.538	0.437	0.22	0.17
Rural Local			872,693	864,053	0.538	0.437	0.51	0.42
Rural Ramps			0	0			0.00	0.00
Urban Interstate	1.03	448,276	461,724	476,005	0.386	0.596	0.20	0.31
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.14	1,183,950	1,349,703	1,391,446	0.547	0.441	0.84	0.68
Urban Minor Arterial	1.23	408,566	502,536	518,078	0.548	0.440	0.31	0.25
Urban Collector	1.94	121,147	235,025	242,293	0.562	0.437	0.15	0.12
Urban Local			429,540	442,825	0.894	0.444	0.44	0.22
Urban Ramps	1.03	17,989	18,529	19,102	0.483	0.481	0.01	0.01
TOTAL		**3,807,314**	**5,681,476**	**5,747,590**			**3.50**	**2.88**

C.1.5. Analysis Year 2040:

Table KA-26: Ozone Analysis, 2040, Anderson County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	0.82	931,658	763,960	821,462	0.424	0.500	0.38	0.45
Rural Principal Arterial	0.96	150,193	144,186	142,758	0.437	0.386	0.07	0.06
Rural Minor Arterial	0.80	138,234	110,587	109,492	0.426	0.397	0.05	0.05
Rural Major Collector	1.04	439,553	457,135	452,609	0.437	0.387	0.22	0.19
Rural Minor Collector	2.50	52,798	131,994	130,687	0.451	0.375	0.06	0.05
Rural Local			158,761	157,189	0.451	0.375	0.08	0.06
Rural Ramps	0.82	10,266	8,418	9,051	0.439	0.430	0.00	0.00
Urban Interstate			0	0			0.00	0.00
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.12	763,390	854,997	881,440	0.462	0.386	0.45	0.38
Urban Minor Arterial	1.06	319,939	339,135	349,624	0.465	0.383	0.18	0.15
Urban Collector	2.87	30,042	86,222	88,888	0.544	0.384	0.05	0.04
Urban Local			185,337	191,069	0.791	0.378	0.17	0.08
Urban Ramps			0	0			0.00	0.00
TOTAL		**2,836,073**	**3,240,732**	**3,334,271**			**1.72**	**1.52**

Table KA-27: Ozone Analysis, 2040, Blount County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate			0	0			0.00	0.00
Rural Principal Arterial	1.07	509,744	545,426	540,026	0.452	0.427	0.27	0.25
Rural Minor Arterial	0.98	175,253	171,748	170,048	0.474	0.408	0.09	0.08
Rural Major Collector	0.99	69,469	68,774	68,093	0.475	0.407	0.04	0.03
Rural Minor Collector	1.22	146,890	179,206	177,431	0.478	0.407	0.09	0.08
Rural Local			322,112	318,923	0.478	0.407	0.17	0.14
Rural Ramps			0	0			0.00	0.00
Urban Interstate	0.80	190,010	152,008	156,709	0.441	0.441	0.08	0.08
Urban Freeway	0.70	443,581	310,506	320,110	0.443	0.443	0.16	0.16
Urban Principal Arterial	0.99	1,254,804	1,242,256	1,280,676	0.480	0.419	0.68	0.59
Urban Minor Arterial	1.09	677,045	737,979	760,803	0.500	0.411	0.42	0.34
Urban Collector	1.37	390,143	534,496	551,027	0.514	0.405	0.31	0.25
Urban Local			672,790	693,598	0.835	0.408	0.64	0.31
Urban Ramps	0.80	21,631	17,304	17,840	0.541	0.453	0.01	0.01
TOTAL		**3,878,568**	**4,954,605**	**5,055,283**			**2.95**	**2.32**

Table KA-28: Ozone Analysis, 2040, Jefferson County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	1.02	2,218,354	2,262,721	2,433,033	0.418	0.562	1.12	1.51
Rural Principal Arterial			0	0			0.00	0.00
Rural Minor Arterial	0.83	676,855	561,789	556,227	0.503	0.460	0.31	0.28
Rural Major Collector	0.76	489,234	371,818	368,137	0.503	0.458	0.20	0.19
Rural Minor Collector	1.18	197,083	232,557	230,255	0.533	0.445	0.14	0.11
Rural Local			242,330	239,931	0.533	0.445	0.14	0.12
Rural Ramps	1.02	9,011	9,192	9,884	0.482	0.484	0.01	0.01
Urban Interstate	1.30	71,095	92,424	95,282	0.369	0.605	0.04	0.06
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.21	222,808	269,598	277,936	0.514	0.454	0.16	0.14
Urban Minor Arterial	0.78	99,889	77,913	80,323	0.543	0.445	0.05	0.04
Urban Collector	1.07	69,207	74,051	76,341	0.546	0.448	0.05	0.04
Urban Local			69,690	71,846	0.894	0.451	0.07	0.04
Urban Ramps	1.30	2,018	2,624	2,705	0.462	0.481	0.00	0.00
TOTAL		**4,055,554**	**4,266,707**	**4,441,899**			**2.28**	**2.53**

Table KA-29: Ozone Analysis, 2040, Knox County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	1.03	1,038,523	1,069,679	1,150,192	0.341	0.512	0.43	0.65
Rural Principal Arterial			0	0			0.00	0.00
Rural Minor Arterial	0.99	288,695	285,808	282,979	0.370	0.415	0.12	0.13
Rural Major Collector	0.99	190,231	188,328	186,464	0.406	0.387	0.08	0.08
Rural Minor Collector	1.25	369,142	461,428	456,859	0.424	0.374	0.21	0.19
Rural Local	4.93	125,885	620,614	614,469	0.424	0.374	0.29	0.25
Rural Ramps	1.03	5,387	5,548	5,966	0.423	0.432	0.00	0.00
Urban Interstate	1.01	6,664,570	6,731,216	6,939,398	0.380	0.435	2.91	3.33
Urban Freeway	2.17	47,585	103,260	106,453	0.397	0.410	0.05	0.05
Urban Principal Arterial	1.09	3,728,727	4,064,312	4,190,013	0.386	0.417	1.78	1.93
Urban Minor Arterial	1.16	3,118,840	3,617,854	3,729,747	0.428	0.391	1.76	1.61
Urban Collector	1.14	1,238,780	1,412,209	1,455,886	0.440	0.382	0.71	0.61
Urban Local	5.10	862,289	4,397,673	4,533,683	0.746	0.382	3.73	1.91
Urban Ramps	1.01	357,264	360,837	371,997	0.464	0.424	0.19	0.17
TOTAL		**18,035,918**	**23,318,767**	**24,024,105**			**12.26**	**10.91**

Table KA-30: Ozone Analysis, 2040, Loudon County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate	0.93	1,808,808	1,682,191	1,808,808	0.421	0.514	0.84	1.02
Rural Principal Arterial	0.80	408,534	326,828	323,592	0.424	0.436	0.15	0.16
Rural Minor Arterial	0.94	323,161	303,771	300,764	0.450	0.422	0.15	0.14
Rural Major Collector	0.59	323,048	190,598	188,711	0.456	0.410	0.09	0.09
Rural Minor Collector	2.82	97,641	275,347	272,621	0.484	0.395	0.15	0.12
Rural Local			202,136	200,135	0.484	0.395	0.11	0.09
Rural Ramps	0.93	12,503	11,627	12,503	0.455	0.448	0.01	0.01
Urban Interstate	0.86	132,534	113,980	117,505	0.414	0.504	0.05	0.07
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.28	280,301	358,785	369,881	0.454	0.423	0.19	0.17
Urban Minor Arterial	1.54	31,233	48,098	49,586	0.499	0.399	0.03	0.02
Urban Collector	1.33	114,202	151,888	156,586	0.495	0.400	0.09	0.07
Urban Local			116,514	120,118	0.814	0.407	0.11	0.05
Urban Ramps	0.86	6,096	5,243	5,405	0.454	0.446	0.00	0.00
TOTAL		**3,538,060**	**3,787,007**	**3,926,213**			**1.96**	**2.00**

Table KA-31: Ozone Analysis, 2040, Sevier County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Seasonally Adjusted VMT	VOC Emission Factor (g/mile)	NOx Emission Factor (g/mile)	VOC Emissions (tons/day)	NOx Emissions (tons/day)
Rural Interstate			0	0			0.00	0.00
Rural Principal Arterial	1.15	328,381	377,638	373,899	0.533	0.446	0.22	0.18
Rural Minor Arterial	0.97	823,717	799,005	791,094	0.522	0.456	0.46	0.40
Rural Major Collector	0.88	490,790	431,895	427,619	0.523	0.440	0.25	0.21
Rural Minor Collector	2.34	193,931	453,799	449,306	0.541	0.437	0.27	0.22
Rural Local			993,410	983,574	0.541	0.437	0.59	0.47
Rural Ramps			0	0			0.00	0.00
Urban Interstate	1.03	498,503	513,458	529,338	0.398	0.566	0.23	0.33
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.14	1,277,061	1,455,850	1,500,876	0.557	0.444	0.92	0.73
Urban Minor Arterial	1.23	454,928	559,561	576,867	0.557	0.442	0.35	0.28
Urban Collector	1.94	138,384	268,465	276,768	0.568	0.439	0.17	0.13
Urban Local			470,001	484,537	0.894	0.444	0.48	0.24
Urban Ramps	1.03	17,887	18,424	18,993	0.483	0.481	0.01	0.01
TOTAL		**4,223,580**	**6,341,505**	**6,412,871**			**3.94**	**3.21**

C.1.5. Cocke County Ozone Emissions Analysis:

Table KA-32: Cocke County Ozone Emissions Analysis

	Length	2002 Summer ADT	2002 Summer VMT	2015 Summer VMT	2024 Summer VMT	2034 Summer VMT	2040 Summer VMT
Foothills Parkway	5.6 miles	1,011	5,662	11,886	16,012	20,596	23,347
Cosby Campground Road	2.4 miles	196	471	1,212	1,802	2,457	2,850
State Route 32	9.2 miles	1,233	11,344	11,739	12,668	13,700	14,319
Total			**17,477**	**24,837**	**30,482**	**36,753**	**40,516**
VOC Emissions Rate			1.8410	0.9390	0.5530	0.5190	0.5190
TOTAL VOC Emissions (tpd)			**0.0355**	**0.0257**	**0.0186**	**0.0210**	**0.0232**
NOx Emissions Rate			1.9840	0.9560	0.5300	0.4410	0.4410
TOTAL NOx Emissions (tpd)			**0.0382**	**0.0262**	**0.0178**	**0.0179**	**0.0197**

C.2: PM2.5 Analysis

C.2.1. Analysis Year 2014:

Table KA-33: PM2.5 Analysis, 2014, Anderson County

Facility Type	HPMS Adj. Factor	2014 VMT	HPMS Adjusted VMT	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	0.82	586,464	480,900	175,528,675	0.0381	2.7380	7.37	529.77
Rural Principal Arterial	0.96	121,772	116,901	42,668,734	0.0164	0.9640	0.77	45.34
Rural Minor Arterial	0.80	96,163	76,930	98,684,422	0.0156	0.9870	1.70	107.37
Rural Major Collector	1.04	259,970	270,368	28,079,581	0.0148	0.9130	0.46	28.26
Rural Minor Collector	2.50	39,905	99,763	36,413,486	0.0148	0.8700	0.59	34.92
Rural Local			96,520	35,229,818	0.0148	0.8700	0.57	33.79
Rural Ramps	0.82	9,070	7,437	2,714,515	0.0381	1.5810	0.11	4.73
Urban Interstate			0	0			0.00	0.00
Urban Freeway			0	0			0.00	0.00
Urban Principal Arterial	1.12	556,939	623,771	227,676,541	0.0160	0.9390	4.02	235.66
Urban Minor Arterial	1.06	219,359	232,520	84,869,804	0.0146	0.8800	1.37	82.33
Urban Collector	2.87	22,941	69,987	25,545,286	0.0136	0.8260	0.38	23.26
Urban Local			132,068	48,204,811	0.0136	0.8050	0.72	42.78
Urban Ramps			0	0			0.00	0.00
TOTAL		**1,912,581**	**2,207,166**	**805,615,671**			**18.07**	**1,168.20**

Table KA-34: PM2.5 Analysis, 2014, Blount County

Facility Type	HPMS Adj. Factor	2014 VMT	HPMS Adjusted VMT	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate			0	0			0.00	0.00
Rural Principal Arterial	1.07	309,017	330,648	120,686,511	0.0156	1.0520	2.08	139.95
Rural Minor Arterial	0.98	104,756	102,661	17,171,027	0.0152	0.9550	0.29	18.08
Rural Major Collector	0.99	47,519	47,044	37,471,329	0.0136	0.8960	0.56	37.01
Rural Minor Collector	1.22	95,523	116,538	42,536,552	0.0137	0.9010	0.64	42.25
Rural Local			241,928	88,303,578	0.0137	0.9010	1.33	87.70
Rural Ramps			0	0			0.00	0.00
Urban Interstate	0.80	103,446	82,757	11,344,637	0.0145	1.0610	0.18	13.27
Urban Freeway	0.70	44,402	31,081	30,206,290	0.0140	1.0350	0.47	34.46
Urban Principal Arterial	0.99	951,252	941,740	343,734,946	0.0153	0.9900	5.80	375.12
Urban Minor Arterial	1.09	438,659	478,139	174,520,642	0.0145	0.9290	2.79	178.72
Urban Collector	1.37	270,787	370,978	135,406,889	0.0135	0.8800	2.02	131.35
Urban Local			532,816	194,477,767	0.0135	0.8570	2.89	183.72
Urban Ramps	0.80	9,999	8,000	2,919,843	0.0145	1.0000	0.05	3.22
TOTAL		**2,375,361**	**3,284,329**	**1,198,780,011**			**19.09**	**1,244.84**

Table KA-35: PM2.5 Analysis, 2014, Knox County

Facility Type	HPMS Adj. Factor	2014 VMT	HPMS Adjusted VMT	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	1.03	688,873	709,539	258,981,798	0.0369	2.5900	10.53	739.39
Rural Principal Arterial			0	0			0.00	0.00
Rural Minor Arterial	0.99	197,595	195,619	35,963,985	0.0226	1.2860	0.90	50.98
Rural Major Collector	0.99	99,527	98,531	71,400,793	0.0169	0.9430	1.33	74.22
Rural Minor Collector	1.25	144,134	180,168	65,761,274	0.0173	0.9060	1.25	65.68
Rural Local	4.93	45,148	222,579	81,241,511	0.0173	0.9060	1.55	81.14
Rural Ramps	1.03	4,141	4,265	1,556,680	0.0369	1.5230	0.06	2.61
Urban Interstate	1.01	4,980,626	5,030,432	21,006,021	0.0213	1.4040	0.49	32.51
Urban Freeway	2.17	26,521	57,551	1,836,107,691	0.0147	0.9960	29.75	2,015.88
Urban Principal Arterial	1.09	2,488,717	2,712,701	990,135,952	0.0167	1.0910	18.23	1,190.77
Urban Minor Arterial	1.16	1,965,476	2,279,952	832,182,389	0.0159	0.9170	14.59	841.19
Urban Collector	1.14	744,749	849,014	309,890,045	0.0157	0.8710	5.36	297.53
Urban Local	5.10	549,459	2,802,241	1,022,817,985	0.0157	0.8540	17.70	962.86
Urban Ramps	1.01	274,616	277,363	101,237,320	0.0213	1.0900	2.38	121.64
TOTAL		**12,209,581**	**15,419,955**	**5,628,283,444**			**104.13**	**6,476.39**

Table KA-36: PM2.5 Analysis, 2014, Loudon County

Facility Type	HPMS Adj. Factor	2014 VMT	HPMS Adjusted VMT	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	0.93	1,201,097	1,117,020	407,712,377	0.0367	2.6090	16.49	1,172.56
Rural Principal Arterial	0.80	235,874	188,699	68,875,179	0.0221	1.3660	1.68	103.71
Rural Minor Arterial	0.94	187,454	176,206	43,853,185	0.0214	1.2080	1.03	58.39
Rural Major Collector	0.59	203,637	120,146	64,315,330	0.0152	0.9620	1.08	68.20
Rural Minor Collector	2.82	54,635	154,070	56,235,692	0.0146	0.8880	0.91	55.05
Rural Local			86,116	31,432,503	0.0146	0.8880	0.51	30.77
Rural Ramps	0.93	12,332	11,469	4,186,125	0.0367	1.5720	0.17	7.25
Urban Interstate	0.86	91,675	78,840	0	0.0367	2.6000	0.00	0.00
Urban Freeway			0	28,776,751			0.00	0.00
Urban Principal Arterial	1.28	149,722	191,644	69,950,118	0.0233	1.2350	1.80	95.23
Urban Minor Arterial	1.54	17,514	26,971	9,844,507	0.0178	0.9840	0.19	10.68
Urban Collector	1.33	50,611	67,312	24,569,061	0.0148	0.9050	0.40	24.51
Urban Local			54,740	19,980,173	0.0149	0.8980	0.33	19.78
Urban Ramps	0.86	6,013	5,171	1,887,431	0.0367	1.5670	0.08	3.26
TOTAL		**2,210,563**	**2,278,407**	**831,618,431**			**24.66**	**1,649.39**

Table KA-37: PM2.5 Analysis, 2014, Roane County

Facility Type	HPMS Adj. Factor	2014 VMT	HPMS Adjusted VMT	Days/Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate			101,220	365	36,945,300	0.0397	2.9680	1.62	120.87
Rural Principal Arterial			0	365	0			0.00	0.00
Rural Minor Arterial			0	365	0			0.00	0.00
Rural Major Collector			0	365	0			0.00	0.00
Rural Minor Collector			7,835	365	2,859,775	0.0196	1.1800	0.06	3.72
Rural Local			4,743	365	1,731,195	0.0134	0.9610	0.03	1.83
Rural Ramps			2,883	365	1,052,295	0.0134	0.9610	0.02	1.11
Urban Interstate			0	365	0			0.00	0.00
Urban Freeway			0	365	0			0.00	0.00
Urban Principal Arterial			0	365	0			0.00	0.00
Urban Minor Arterial			17,228	365	6,288,220	0.0397	1.7490	0.28	12.12
Urban Collector			0	365	0			0.00	0.00
Urban Local			0	365	0			0.00	0.00
Urban Ramps			0	365	0			0.00	0.00
TOTAL		**0**	**133,909**		**48,876,785**			**1.99**	**139.66**

C.2.2. Analysis Year 2024:

Table KA-38: PM2.5 Analysis, 2024, Anderson County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Days/ Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	0.82	679,257	556,991	365	203,301,710	0.0217	0.9100	4.86	203.93
Rural Principal Arterial	0.96	129,889	124,693	365	45,513,000	0.0131	0.5130	0.66	25.74
Rural Minor Arterial	0.80	113,071	90,457	365	116,132,015	0.0129	0.5270	1.65	67.46
Rural Major Collector	1.04	305,933	318,170	365	33,016,644	0.0125	0.5070	0.45	18.45
Rural Minor Collector	2.50	45,690	114,225	365	41,692,052	0.0125	0.4860	0.57	22.34
Rural Local			111,263	365	40,611,172	0.0125	0.4860	0.56	21.76
Rural Ramps	0.82	10,370	8,503	365	3,103,642	0.0217	0.6500	0.07	2.22
Urban Interstate			0	365	0			0.00	0.00
Urban Freeway			0	365	0			0.00	0.00
Urban Principal Arterial	1.12	622,117	696,771	365	254,321,552	0.0130	0.5060	3.64	141.85
Urban Minor Arterial	1.06	257,127	272,555	365	99,482,552	0.0125	0.4950	1.37	54.28
Urban Collector	2.87	25,128	79,226	365	28,917,398	0.0121	0.4800	0.39	15.30
Urban Local			149,502	365	54,568,099	0.0121	0.4600	0.73	27.67
Urban Ramps			0	365	0			0.00	0.00
TOTAL		**2,188,581**	**2,522,356**		**920,659,837**			**14.96**	**601.01**

Table KA-39: PM2.5 Analysis, 2024, Blount County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Days/ Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate			0	365	0			0.00	0.00
Rural Principal Arterial	1.07	380,539	407,177	365	148,619,428	0.0128	0.5670	2.10	92.89
Rural Minor Arterial	0.98	135,247	132,542	365	20,177,517	0.0127	0.5300	0.28	11.79
Rural Major Collector	0.99	55,839	55,281	365	48,377,995	0.0120	0.5210	0.64	27.78
Rural Minor Collector	1.22	97,310	118,718	365	43,332,219	0.0121	0.5210	0.58	24.89
Rural Local			289,279	365	105,586,808	0.0121	0.5210	1.41	60.64
Rural Ramps			0	365	0			0.00	0.00
Urban Interstate	0.80	132,845	106,276	365	76,730,253	0.0124	0.5820	1.05	49.23
Urban Freeway	0.70	300,314	210,220	365	38,790,798	0.0123	0.5760	0.53	24.63
Urban Principal Arterial	0.99	1,060,105	1,049,504	365	383,068,942	0.0127	0.5460	5.36	230.56
Urban Minor Arterial	1.09	508,717	554,502	365	202,393,059	0.0124	0.5270	2.77	117.57
Urban Collector	1.37	293,434	402,004	365	146,731,622	0.0120	0.5120	1.94	82.81
Urban Local			650,377	365	237,387,466	0.0120	0.4940	3.14	129.27
Urban Ramps	0.80	15,257	12,206	365	4,455,143	0.0124	0.5810	0.06	2.85
TOTAL		**2,979,608**	**3,988,086**		**1,455,651,249**			**19.85**	**854.91**

Table KA-40: PM2.5 Analysis, 2024, Knox County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Days/ Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	1.03	800,378	824,389	365	300,901,921	0.0212	0.8780	7.03	291.22
Rural Principal Arterial			0	365	0			0.00	0.00
Rural Minor Arterial	0.99	220,221	218,018	365	41,252,800	0.0151	0.5830	0.69	26.51
Rural Major Collector	0.99	114,163	113,021	365	79,576,714	0.0131	0.4960	1.15	43.51
Rural Minor Collector	1.25	180,905	226,132	365	82,538,043	0.0133	0.4770	1.21	43.40
Rural Local	4.93	58,815	289,957	365	105,834,166	0.0133	0.4770	1.55	55.65
Rural Ramps	1.03	4,583	4,720	365	1,722,826	0.0212	0.6300	0.04	1.20
Urban Interstate	1.01	5,586,727	5,642,594	365	27,125,297	0.0150	0.6190	0.45	18.51
Urban Freeway	2.17	34,247	74,316	365	2,059,546,909	0.0125	0.5240	28.38	1,189.62
Urban Principal Arterial	1.09	2,891,937	3,152,211	365	1,150,557,135	0.0131	0.5510	16.61	698.82
Urban Minor Arterial	1.16	2,423,133	2,810,834	365	1,025,954,512	0.0129	0.4910	14.59	555.29
Urban Collector	1.14	960,969	1,095,505	365	399,859,284	0.0127	0.4760	5.60	209.81
Urban Local	5.10	663,442	3,383,552	365	1,234,996,538	0.0127	0.4570	17.29	622.14
Urban Ramps	1.01	303,927	306,966	365	112,042,504	0.0150	0.5530	1.85	68.30
TOTAL		**14,243,445**	**18,142,215**		**6,621,908,650**			**96.44**	**3,823.97**

Table KA-41: PM2.5 Analysis, 2024, Loudon County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Days/ Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	0.93	1,384,914	1,287,970	365	470,109,057	0.0210	0.8920	10.88	462.24
Rural Principal Arterial	0.80	288,157	230,525	365	84,141,756	0.0153	0.6220	1.42	57.69
Rural Minor Arterial	0.94	224,590	211,115	365	52,899,758	0.0150	0.5770	0.87	33.65
Rural Major Collector	0.59	245,646	144,931	365	77,056,932	0.0126	0.5290	1.07	44.93
Rural Minor Collector	2.82	69,836	196,938	365	71,882,226	0.0124	0.5010	0.98	39.70
Rural Local			101,554	365	37,067,238	0.0124	0.5010	0.51	20.47
Rural Ramps	0.93	13,981	13,002	365	4,745,718	0.0210	0.6620	0.11	3.46
Urban Interstate	0.86	105,560	90,781	365	0	0.0209	0.8960	0.00	0.00
Urban Freeway			0	365	33,135,158			0.00	0.00
Urban Principal Arterial	1.28	176,809	226,315	365	82,604,978	0.0158	0.5770	1.44	52.54
Urban Minor Arterial	1.54	22,588	34,785	365	12,696,557	0.0136	0.5160	0.19	7.22
Urban Collector	1.33	75,996	101,074	365	36,892,127	0.0126	0.5060	0.51	20.58
Urban Local			67,892	365	24,780,446	0.0126	0.4950	0.34	13.52
Urban Ramps	0.86	6,817	5,862	365	2,139,739	0.0209	0.6600	0.05	1.56
TOTAL		**2,614,891**	**2,712,744**		**990,151,691**			**18.38**	**757.56**

Table KA-42: PM2.5 Analysis, 2024, Roane County

Facility Type	HPMS Adj. Factor	2024 VMT	HPMS Adjusted VMT	Days/ Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate			115,832	365	42,278,680	0.0223	1.0260	1.04	47.82
Rural Principal Arterial			0	365	0			0.00	0.00
Rural Minor Arterial			0	365	0			0.00	0.00
Rural Major Collector			0	365	0			0.00	0.00
Rural Minor Collector			8,042	365	2,935,330	0.0143	0.6060	0.05	1.96
Rural Local			5,281	365	1,927,565	0.0120	0.5620	0.03	1.19
Rural Ramps			3,198	365	1,167,270	0.0120	0.5620	0.02	0.72
Urban Interstate			0	365	0			0.00	0.00
Urban Freeway			0	365	0			0.00	0.00
Urban Principal Arterial			0	365	0			0.00	0.00
Urban Minor Arterial			19,701	365	7,190,865	0.0223	0.7330	0.18	5.81
Urban Collector			0	365	0			0.00	0.00
Urban Local			0	365	0			0.00	0.00
Urban Ramps			0	365	0			0.00	0.00
TOTAL		**0**	**152,054**		**55,499,710**			**1.30**	**57.50**

C.2.3. Analysis Year 2034:

Table KA-43: PM2.5 Analysis, 2034, Anderson County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Days/ Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	0.82	781,895	641,153	365	234,021,024	0.0193	0.5410	4.98	139.56
Rural Principal Arterial	0.96	140,216	134,607	365	49,131,511	0.0127	0.4180	0.69	22.64
Rural Minor Arterial	0.80	124,983	99,987	365	140,040,476	0.0125	0.4310	1.93	66.53
Rural Major Collector	1.04	368,916	383,673	365	36,495,153	0.0122	0.4200	0.49	16.90
Rural Minor Collector	2.50	48,515	121,288	365	44,269,947	0.0121	0.4040	0.59	19.72
Rural Local			127,521	365	46,545,103	0.0121	0.4040	0.62	20.73
Rural Ramps	0.82	11,677	9,575	365	3,495,028	0.0193	0.4580	0.07	1.76
Urban Interstate			0	365	0			0.00	0.00
Urban Freeway			0	365	0			0.00	0.00
Urban Principal Arterial	1.12	708,615	793,649	365	289,681,771	0.0126	0.4140	4.02	132.20
Urban Minor Arterial	1.06	296,770	314,577	365	114,820,468	0.0121	0.4120	1.53	52.15
Urban Collector	2.87	28,280	90,578	365	33,061,098	0.0118	0.4050	0.43	14.76
Urban Local			170,924	365	62,387,400	0.0118	0.3850	0.81	26.48
Urban Ramps			0	365	0			0.00	0.00
TOTAL		**2,509,867**	**2,887,531**		**1,053,948,978**			**16.17**	**513.42**

Table KA-44: PM2.5 Analysis, 2034, Blount County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Days/ Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate			0	365	0			0.00	0.00
Rural Principal Arterial	1.07	453,647	485,402	365	177,171,758	0.0124	0.4650	2.42	90.81
Rural Minor Arterial	0.98	156,689	153,556	365	22,331,061	0.0123	0.4410	0.30	10.86
Rural Major Collector	0.99	61,799	61,181	365	56,047,798	0.0118	0.4410	0.73	27.25
Rural Minor Collector	1.22	125,070	152,585	365	55,693,626	0.0119	0.4400	0.73	27.01
Rural Local			345,620	365	126,151,183	0.0119	0.4410	1.65	61.32
Rural Ramps			0	365	0			0.00	0.00
Urban Interstate	0.80	169,462	135,570	365	95,355,436	0.0121	0.4810	1.27	50.56
Urban Freeway	0.70	373,211	261,248	365	49,482,992	0.0120	0.4820	0.65	26.29
Urban Principal Arterial	0.99	1,177,805	1,166,027	365	425,599,837	0.0124	0.4530	5.82	212.52
Urban Minor Arterial	1.09	619,091	674,809	365	246,305,155	0.0121	0.4420	3.29	120.01
Urban Collector	1.37	342,984	469,888	365	171,509,049	0.0118	0.4350	2.23	82.24
Urban Local			758,520	365	276,859,897	0.0118	0.4170	3.60	127.26
Urban Ramps	0.80	19,229	15,383	365	5,614,862	0.0121	0.4940	0.07	3.06
TOTAL		**3,498,987**	**4,679,788**		**1,708,122,655**			**22.77**	**839.19**

Table KA-45: PM2.5 Analysis, 2034, Knox County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Days/ Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	1.03	925,067	952,819	365	347,778,901	0.0190	0.5520	7.28	211.62
Rural Principal Arterial			0	365	0			0.00	0.00
Rural Minor Arterial	0.99	249,056	246,566	365	55,549,504	0.0141	0.4460	0.86	27.31
Rural Major Collector	0.99	153,728	152,190	365	89,996,530	0.0126	0.4170	1.25	41.37
Rural Minor Collector	1.25	282,211	352,764	365	128,758,814	0.0127	0.4000	1.80	56.77
Rural Local	4.93	92,056	453,837	365	165,650,601	0.0127	0.4000	2.32	73.04
Rural Ramps	1.03	5,144	5,298	365	1,933,899	0.0190	0.4600	0.04	0.98
Urban Interstate	1.01	6,205,741	6,267,798	365	35,371,820	0.0141	0.4700	0.55	18.33
Urban Freeway	2.17	44,659	96,909	365	2,287,746,420	0.0122	0.4470	30.77	1,127.25
Urban Principal Arterial	1.09	3,467,228	3,779,279	365	1,379,436,660	0.0126	0.4530	19.16	688.82
Urban Minor Arterial	1.16	2,837,355	3,291,332	365	1,201,336,107	0.0124	0.4200	16.42	556.19
Urban Collector	1.14	1,143,288	1,303,348	365	475,722,137	0.0123	0.4090	6.45	214.48
Urban Local	5.10	783,023	3,993,418	365	1,457,597,687	0.0123	0.3880	19.76	623.41
Urban Ramps	1.01	341,162	344,574	365	125,769,408	0.0141	0.4590	1.95	63.63
TOTAL		**16,529,718**	**21,240,133**		**7,752,648,488**			**108.62**	**3,703.20**

Table KA-46: PM2.5 Analysis, 2034, Loudon County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Days/ Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	0.93	1,546,911	1,438,627	365	525,098,939	0.0188	0.5550	10.88	321.25
Rural Principal Arterial	0.80	356,587	285,269	365	104,123,287	0.0143	0.4730	1.64	54.29
Rural Minor Arterial	0.94	270,707	254,464	365	62,594,212	0.0141	0.4510	0.97	31.12
Rural Major Collector	0.59	290,663	171,491	365	92,879,434	0.0123	0.4440	1.26	45.46
Rural Minor Collector	2.82	83,885	236,556	365	86,342,933	0.0121	0.4250	1.15	40.45
Rural Local			116,937	365	42,682,004	0.0121	0.4250	0.57	20.00
Rural Ramps	0.93	14,860	13,820	365	5,044,325	0.0188	0.4780	0.10	2.66
Urban Interstate	0.86	117,480	101,033	365	0	0.0187	0.5540	0.00	0.00
Urban Freeway			0	365	36,876,941			0.00	0.00
Urban Principal Arterial	1.28	233,847	299,324	365	109,253,085	0.0148	0.4510	1.78	54.31
Urban Minor Arterial	1.54	26,171	40,304	365	14,710,798	0.0131	0.4240	0.21	6.88
Urban Collector	1.33	100,780	134,037	365	48,923,457	0.0122	0.4290	0.66	23.14
Urban Local			85,960	365	31,375,516	0.0123	0.4150	0.43	14.35
Urban Ramps	0.86	7,246	6,231	365	2,274,375	0.0187	0.4760	0.05	1.19
TOTAL		**3,049,135**	**3,184,053**		**1,162,179,307**			**19.71**	**615.09**

Table KA-47: PM2.5 Analysis, 2034, Roane County

Facility Type	HPMS Adj. Factor	2034 VMT	HPMS Adjusted VMT	Days/ Year	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate			131,917	365	48,149,705	0.0198	0.6400	1.05	33.97
Rural Principal Arterial			0	365	0			0.00	0.00
Rural Minor Arterial			0	365	0			0.00	0.00
Rural Major Collector			0	365	0			0.00	0.00
Rural Minor Collector			8,390	365	3,062,350	0.0136	0.4800	0.05	1.62
Rural Local			5,708	365	2,083,420	0.0118	0.4700	0.03	1.08
Rural Ramps			3,378	365	1,232,970	0.0118	0.4700	0.02	0.64
Urban Interstate			0	365	0			0.00	0.00
Urban Freeway			0	365	0			0.00	0.00
Urban Principal Arterial			0	365	0			0.00	0.00
Urban Minor Arterial			21,524	365	7,856,260	0.0198	0.5190	0.17	4.49
Urban Collector			0	365	0			0.00	0.00
Urban Local			0	365	0			0.00	0.00
Urban Ramps			0	365	0			0.00	0.00
TOTAL		**0**	**170,917**		**62,384,705**			**1.31**	**41.80**

C.2.3. Analysis Year 2040:

Table KA-48: PM2.5 Analysis, 2040, Anderson County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	0.82	931,658	763,960	278,845,239	0.0193	0.5220	5.93	160.45
Rural Principal Arterial	0.96	150,193	144,186	52,627,767	0.0127	0.4170	0.74	24.19
Rural Minor Arterial	0.80	138,234	110,587	166,854,243	0.0125	0.4310	2.30	79.27
Rural Major Collector	1.04	439,553	457,135	40,364,328	0.0122	0.4200	0.54	18.69
Rural Minor Collector	2.50	52,798	131,994	48,177,883	0.0121	0.4040	0.64	21.46
Rural Local			148,250	54,111,221	0.0121	0.4040	0.72	24.10
Rural Ramps	0.82	10,266	8,418	3,072,485	0.0193	0.4580	0.07	1.55
Urban Interstate			0	-			0.00	0.00
Urban Freeway			0	-			0.00	0.00
Urban Principal Arterial	1.12	763,390	854,997	312,073,955	0.0126	0.4150	4.33	142.76
Urban Minor Arterial	1.06	319,939	339,135	123,784,399	0.0121	0.4120	1.65	56.22
Urban Collector	2.87	30,042	97,600	35,623,921	0.0118	0.4060	0.46	15.94
Urban Local			184,174	67,223,533	0.0118	0.3850	0.87	28.53
Urban Ramps			0	-			0.00	0.00
TOTAL		**2,836,073**	**3,240,436**	**1,182,758,974**			**18.26**	**573.16**

Table KA-49: PM2.5 Analysis, 2040, Blount County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate			0	-			0.00	0.00
Rural Principal Arterial	1.07	509,744	545,426	199,080,441	0.0124	0.4630	2.72	101.61
Rural Minor Arterial	0.98	175,253	171,748	25,102,479	0.0123	0.4410	0.34	12.20
Rural Major Collector	0.99	69,469	68,774	62,688,034	0.0118	0.4410	0.82	30.47
Rural Minor Collector	1.22	146,890	179,206	65,410,072	0.0119	0.4400	0.86	31.73
Rural Local			391,189	142,783,904	0.0119	0.4400	1.87	69.25
Rural Ramps			0	-			0.00	0.00
Urban Interstate	0.80	190,010	152,008	113,334,818	0.0121	0.4800	1.51	59.97
Urban Freeway	0.70	443,581	310,506	55,482,891	0.0120	0.4820	0.73	29.48
Urban Principal Arterial	0.99	1,254,804	1,242,256	453,423,425	0.0124	0.4530	6.20	226.42
Urban Minor Arterial	1.09	677,045	737,979	269,362,194	0.0121	0.4420	3.59	131.24
Urban Collector	1.37	390,143	534,496	195,091,107	0.0118	0.4350	2.54	93.55
Urban Local			834,186	304,478,049	0.0118	0.4170	3.96	139.96
Urban Ramps	0.80	21,631	17,304	6,316,109	0.0121	0.4940	0.08	3.44
TOTAL		**3,878,568**	**5,185,078**	**1,892,553,523**			**25.23**	**929.31**

Table KA-50: PM2.5 Analysis, 2040, Knox County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	1.03	1,038,523	1,069,679	390,432,722	0.0190	0.5390	8.18	231.98
Rural Principal Arterial			0	-			0.00	0.00
Rural Minor Arterial	0.99	288,695	285,808	68,739,791	0.0141	0.4460	1.07	33.79
Rural Major Collector	0.99	190,231	188,328	104,320,047	0.0126	0.4170	1.45	47.95
Rural Minor Collector	1.25	369,142	461,428	168,421,220	0.0127	0.4010	2.36	74.45
Rural Local	4.93	125,885	620,614	226,523,943	0.0127	0.4010	3.17	100.13
Rural Ramps	1.03	5,387	5,548	2,025,175	0.0190	0.4600	0.04	1.03
Urban Interstate	1.01	6,664,570	6,731,216	37,689,778	0.0141	0.4680	0.59	19.44
Urban Freeway	2.17	47,585	103,260	2,456,893,731	0.0122	0.4460	33.04	1,207.89
Urban Principal Arterial	1.09	3,728,727	4,064,312	1,483,474,037	0.0126	0.4520	20.60	739.14
Urban Minor Arterial	1.16	3,118,840	3,617,854	1,320,516,856	0.0124	0.4200	18.05	611.36
Urban Collector	1.14	1,238,780	1,412,209	515,456,358	0.0123	0.4090	6.99	232.39
Urban Local	5.10	862,289	4,397,673	1,605,150,601	0.0123	0.3880	21.76	686.52
Urban Ramps	1.01	357,264	360,837	131,705,521	0.0141	0.4590	2.05	66.64
TOTAL		**18,035,918**	**23,318,767**	**8,511,349,780**			**119.35**	**4,052.71**

Table KA-51: PM2.5 Analysis, 2040, Loudon County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate	0.93	1,808,808	1,682,191	613,999,876	0.0188	0.5390	12.72	364.81
Rural Principal Arterial	0.80	408,534	326,828	119,292,045	0.0143	0.4690	1.88	61.67
Rural Minor Arterial	0.94	323,161	303,771	69,568,344	0.0141	0.4510	1.08	34.59
Rural Major Collector	0.59	323,048	190,598	110,876,470	0.0123	0.4430	1.50	54.14
Rural Minor Collector	2.82	97,641	275,347	100,501,614	0.0121	0.4240	1.34	46.97
Rural Local			135,944	49,619,571	0.0121	0.4240	0.66	23.19
Rural Ramps	0.93	12,503	11,627	4,244,025	0.0188	0.4780	0.09	2.24
Urban Interstate	0.86	132,534	113,980	-	0.0187	0.5290	0.00	0.00
Urban Freeway			0	41,602,548			0.00	0.00
Urban Principal Arterial	1.28	280,301	358,785	130,956,487	0.0148	0.4510	2.14	65.10
Urban Minor Arterial	1.54	31,233	48,098	17,555,873	0.0131	0.4250	0.25	8.22
Urban Collector	1.33	114,202	151,888	55,439,167	0.0122	0.4290	0.75	26.22
Urban Local			100,323	36,617,964	0.0123	0.4150	0.50	16.75
Urban Ramps	0.86	6,096	5,243	1,913,536	0.0187	0.4760	0.04	1.00
TOTAL		**3,538,060**	**3,704,623**	**1,352,187,518**			**22.95**	**704.91**

Table KA-52: PM2.5 Analysis, 2040, Roane County

Facility Type	HPMS Adj. Factor	2040 VMT	HPMS Adjusted VMT	Annual VMT	PM2.5 Emission Factor (g/mile)	NOx Emission Factor (g/mile)	PM2.5 (tons/year)	NOx (tons/year)
Rural Interstate			153,190	55,914,350	0.0198	0.6400	1.22	39.45
Rural Principal Arterial			0	-			0.00	0.00
Rural Minor Arterial			0	-			0.00	0.00
Rural Major Collector			0	-			0.00	0.00
Rural Minor Collector			8,498	3,101,770	0.0136	0.4800	0.05	1.64
Rural Local			6,247	2,280,155	0.0118	0.4700	0.03	1.18
Rural Ramps			2,951	1,077,115	0.0118	0.4700	0.01	0.56
Urban Interstate			0	-			0.00	0.00
Urban Freeway			0	-			0.00	0.00
Urban Principal Arterial			0	-			0.00	0.00
Urban Minor Arterial			24,076	8,787,740	0.0198	0.5190	0.19	5.03
Urban Collector			0	-			0.00	0.00
Urban Local			0	-			0.00	0.00
Urban Ramps			0	-			0.00	0.00
TOTAL		**0**	**194,962**	**71,161,130**			**1.50**	**47.85**

Appendix K-D: Travel Demand Model and Land Use Allocation Model Development

D.1. Travel Demand Model Development

Background:

The following information related to the development of the Knoxville Regional Travel Demand Forecasting Model and associated planning assumptions is intended to fulfill the requirements under Section 93.105(c)(1)(i) of the Transportation Conformity Rule, which requires interagency review of the models and assumptions used in the regional emissions analysis.

Section 1 – Travel Demand Modeling Parameters:

I.) General Information

- **A.) Validation Year:** 2010
- **B.) Calibration Data:** Household Travel Behavior Survey and External Travel Survey conducted in year 2000 in Knox and Blount counties and year 2008 in the 9-county Knoxville Region. Data also taken from U.S. Census since it was conducted in 2010.
- **C.) Model Geographic Coverage:** Ten Counties (Anderson, Blount, Grainger, Hamblen, Jefferson, Loudon, Knox, Roane, Sevier, Union). There are 1,186 traffic analysis zones consisting of 1,153 internal and 33 external zones.
- **D.) Model Structure:** Based on a hybrid of the Traditional "Four-Step" Process and Activity-based models

II.) Model Components

The KRTM is made up of several sub-models. These sub-models are tied together and run in a sequential manner such that the output from one sub-model is an input into the next sub-model. **Error! Reference source not found.** displays the KRTM modeling process, and below is a summary of each component. Please refer to the separate "Knoxville Model Technical Documentation Report" included in Appendix H of the 2013-2040 KRMP for more detail about the model components.

- **Population Synthesis** – Determines the characteristics of individual households in the region based on the aggregate characteristics at the TAZ-level.
- **Vehicle Ownership Choice** – A significant factor in the number of motor vehicle trips made and the choice of mode (driving, carpooling, riding transit, walking, etc.) is the availability and number of vehicles at the household level. This sub-model estimates vehicle ownership based on the household characteristics such as income and number of workers.
- **Tour Generation** – This step is similar to "Trip Generation" in the standard 4-step model. The model predicts the number and types of tours that will be made by each household based on a number of factors. The model includes five different types of tours – Work, U.T., School, Non-Work, and Visitor (for tourist areas in Sevier County).
- **Tour Mode Choice** – Determines the predominant mode of travel for each tour. The KRTM includes four separate modes of private automobile, school bus, public bus, and walking/biking. Additionally the private automobile mode is disaggregated to number of occupants to account for carpooling.
- **Stop Location/Stop Sequence Choice** – This step is similar to "Trip Distribution" in the standard 4-step model. The model predicts the locations of trip ends for each tour. Stops are determined such that daily patterns of travel that begin and end at home are formed. Individual trips within the overall tour can use a different mode of travel than the predominant mode, e.g. a person that drives to work but can walk somewhere for lunch during the day.
- **Departure Time Choice** – This step determines when trips are made throughout the day.

- **Assignment** – The final step in the process is to assign the trips to the roadway network. The model computes the effects on travel time based on congestion and feeds this information back to the earlier sub-models, which affect travel behavior.

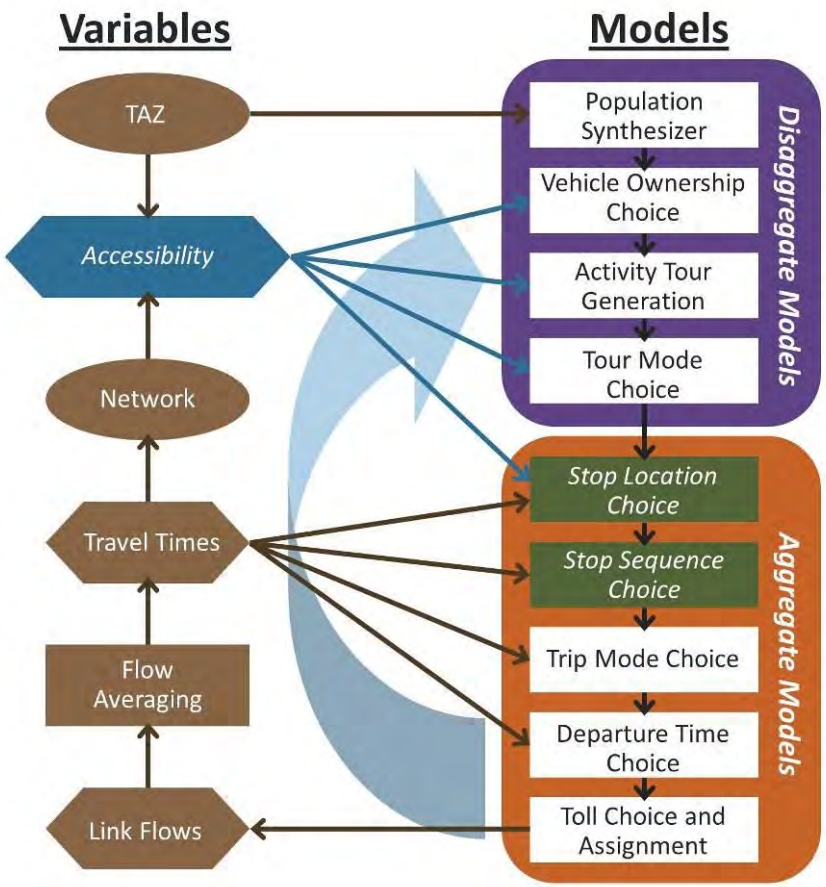


Figure KA-1: Overview of Knoxville Regional Travel Demand Model (KRTM)

The model results estimate statistics such as average speeds, delay and volume-to-capacity (V/C) ratios, and use them to determine performance and congestion on the regional roadway network under various land use and transportation network scenarios.

III.) Model Roadway Network and Traffic Analysis Zone (TAZ) Development

A.) Roadway Network Information: A substantial effort was undertaken to create a TransCAD-based network that included all the necessary roadways (arterials, collectors, and significant local roads) along with appropriate attributes to characterize them. A key resource was the Tennessee Roadway Information System (TRIMS), which is a comprehensive database of roadway attributes (number of lanes, pavement width, posted speed limit, etc) that is maintained by the Tennessee Department of Transportation (TDOT). It should be noted that there is significantly greater detail in terms of the number of

roadway links that are represented between the urbanized and rural portions of the model study area. Traffic signals are included in the network as well for an even greater level of precision in replicating traffic operations.

B.) **Free-Flow Speed Estimation:** A key input to the modeling of traffic on the roadway network deals with correctly estimating the free flow speed on each link. Typically, travel demand models use the posted speed limit as a surrogate for the free flow speed however, this can overstate the travel time since many times vehicles are traveling at well above the posted speed limit in when there are free flow conditions, i.e. when little or no traffic is present and weather conditions are ideal. The Knoxville model incorporates an estimation procedure borrowed from studies performed in Indiana, which relate free flow speed to roadway characteristics such as the area type, facility type, speed limit, and number of lanes. Nonlinear formulas were developed from actual field observations of speed data and then used in the model.

C.) **Capacity Estimation:** Peak hour capacities of the roadway network were estimated using Highway Capacity Manual 2000 procedures, which results in much more precise estimates of capacity verses traditional methods used in models that entail using a lookup table based on functional class and area type.

D.) **TAZ Development:** The study area of the Knoxville regional model was disaggregated into a number of traffic analysis zones (TAZ). The TAZ layer of the model consists of a total of 1,186 zones. Demographic and employment features of the Knoxville model area are reported for each of the 1,153 internal zones for use in trip generation, the remaining 33 zones are external zones. Each zone is characterized by 53 zonal attributes including population, households, vehicle ownership, mean household income, school enrollment, university enrollment, and employment by the North American Industrial Classifcation (NAICS) category. The 2010 Census provided much of the data for the base year model, and projection data was prepared by a consultant as documented in Appendix G of the KRMP document.

Section 2 – Model Validation:

As the travel demand model is developed, each sub-model is calibrated until results are acceptable. The process of determining acceptable results is known as “Model Validation.” The ultimate validation of a travel demand model is in comparing the daily traffic volumes computed by the model for each roadway against actual traffic counts taken in the validation year. The KRTM was calibrated and validated to the base year of 2010. There was a wealth of information available from the 2010 Decennial Census.

I. Validation Criteria

Criteria for acceptable errors between observed and estimated traffic volumes vary by facility type, according to the magnitude of traffic volume. For example, higher volume roadways have stricter calibration guidelines than those with lower volumes. Acceptable error standards have been established as guidelines for use in Tennessee through the Tennessee Model Users Group (TNMUG) and the Tennessee Department of Transportation (TDOT). These standards follow the guidelines developed by the Federal Highway Administration (FHWA) for travel demand models. Tables KA-53 and KA-54 show that the Knoxville model meets or exceeds the standards set by TNMUG for model validation for the main categories of volume to count ratios by functional class and volume group. Additional validation categories are documented in the Knoxville Model Technical Documentation Report in Appendix H of the main KRMP document.

Table KA-53: Knoxville Travel Demand Model Performance by Functional Classification

	Area	Number of Observations	Mean Count	Mean Load	% Error	TNMUG Standard	
						Acceptable	Preferable
Freeways	Urban	114	71,397	71,335	**-0.1%**	**+/- 7%**	**+/- 6%**
	Rural	83	42,156	44,386	**5.3%**		
Principal Arterials	Urban	200	24,379	24,094	**-1.2%**	**+/- 15%**	**+/- 10%**
	Rural	40	11,756	12,378	**5.3%**		
Minor Arterials	Urban	237	10,057	9,256	**-8.0%**	**+/- 15%**	**+/- 10%**
	Rural	80	7,733	8,014	**3.6%**		
Collectors	Urban	226	4,471	3,941	**-11.9%**	**+/- 25%**	**+/- 20%**
	Rural Major	148	3,089	3,551	**14.9%**		
	Rural Minor	144	1,518	1,456	**-4.1%**		
Locals	Urban	61	3,151	2,897	-8.1%	none	none
	Rural	22	1,576	826	-47.6%		
All	Urban	838	19,811	19,346	-2.3%	none	none
	Rural	517	10,248	10,781	5.2%		
	All	**1,615**	**14,388**	**14,389**	**0.0%**		

Table KA-54: Knoxville Travel Demand Model Performance by Volume Group

AADT	Number of Observations	Mean Count	Mean Load	% Error	TNMUG Standard	
					Acceptable	Preferable
0 – 1,000	159	613	864	**41.0%**	**+/- 200%**	**+/- 60%**
1,001 – 2,500	283	1,687	1,903	**12.8%**	**+/- 100%**	**+/- 47%**
2,501 – 5,000	297	3,714	3,740	**0.7%**	**+/- 50%**	**+/- 36%**
5,001 – 10,000	305	7,244	7,185	**-0.8%**	**+/- 29%**	**+/- 25%**
10,001 – 25,000	317	15,355	14,667	**-4.5%**	**+/- 25%**	**+/- 20%**
25,001 – 50,000	145	36,039	37,443	**3.9%**	**+/- 22%**	**+/- 15%**
> 50,000	111	83,422	82,744	**-0.8%**	**+/- 21%**	**+/- 10%**

II. Model Performance by Facility Type/HPMS Adjustment Factors – The model output of vehicle miles of travel (VMT) for the base year 2010 was compared against the actual highway performance monitoring system (HPMS) estimates of VMT by facility type in each county. Below is a table showing the comparison of the model to HPMS and the resulting adjustment factors that will need to be applied to the model VMT in future analysis years to ensure that all emissions will be accounted for. In general, the model appears to be performing very well as most adjustment factors require less than 20 percent adjustment. Those factors that are outside of the 20 percent range occur mostly on the lower-order Collector and Local facility types, which is not much of a concern.

Table KA-55: Vehicle Miles Travelled, 2010

	2010 Vehicle Miles Travelled											
	Rural						Urban					
County	Interstate	Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Interstate	Freeway	Principal Arterial	Minor Arterial	Collector	Local
Anderson HPMS	465,825	115,524	74,128	265,086	98,041	103,993	-	-	603,157	227,780	64,800	129,662
Anderson Model	570,649	120,862	92,431	254,215	39,196	8,218	-	-	538,651	214,053	22,575	16,683
Anderson HPMS Factor	0.82	0.96	0.80	1.04	2.50	Off Model	N/A	N/A	1.12	1.06	2.87	Off Model
Blount HPMS	-	308,195	97,543	42,459	110,879	186,587	84,808	27,851	901,753	447,900	343,995	453,118
Blount Model	-	288,366	99,086	42,953	90,670	22,204	105,846	39,821	909,291	412,742	251,980	23,664
Blount HPMS Factor	N/A	1.07	0.98	0.99	1.22	Off Model	0.80	0.70	0.99	1.09	1.37	Off Model
Jefferson HPMS	1,334,100	-	337,631	186,458	110,052	131,775	60,665	-	160,163	58,435	40,799	42,882
Jefferson Model	1,311,206	-	404,883	244,251	93,169	15,280	46,828	-	132,626	74,635	38,300	193
Jefferson HPMS Factor	1.02	N/A	0.83	0.76	1.18	Off Model	1.30	N/A	1.21	0.78	1.07	Off Model
Knox HPMS	682,089	-	192,556	94,959	169,187	204,253	5,148,928	52,934	2,613,732	2,161,781	808,321	2,662,639
Knox Model	663,111	-	193,849	96,188	135,333	41,429	5,120,232	24,370	2,395,284	1,861,837	706,729	522,232
Knox HPMS Factor	1.03	N/A	0.99	0.99	1.25	4.93	1.01	2.17	1.09	1.16	1.14	5.10
Loudon HPMS	1,079,053	172,914	168,770	111,842	144,045	110,156	80,754	-	179,250	33,651	49,804	54,779
Loudon Model	1,163,736	217,325	179,566	189,535	51,059	1,839	93,380	-	139,974	21,821	37,441	395
Loudon HPMS Factor	0.93	0.80	0.94	0.59	2.82	Off Model	0.86	N/A	1.28	1.54	1.33	Off Model
Sevier HPMS	-	260,728	485,371	223,926	182,551	555,186	331,565	-	912,130	224,901	129,904	260,724
Sevier Model	-	225,822	498,939	255,603	78,090	53,972	320,988	-	800,265	183,572	66,967	17,071
Sevier HPMS Factor	N/A	1.15	0.97	0.88	2.34	Off Model	1.03	N/A	1.14	1.23	1.94	Off Model

III. Average Speed Calibration – In addition to calibrating the travel demand model so that it accurately replicates roadway traffic volumes according to validation criteria, the model was also calibrated to replicate observed average speeds for different time periods of the day. Average speed data that was collected from floating car studies in support of the regional congestion management system plan in the urbanized area was compared with outputs of post-processed speeds from the model. In general, there was very good agreement between the model speeds and the actual speeds with good root mean square errors, however there are no national validation standards for average speeds.

D.2. Land Use Allocation Process

Predicting where future growth in population and employment will occur is critical in determining future travel demand.

The Knoxville Regional TPO, Metropolitan Planning Commission (MPC), and other regional agencies have partnered together in an effort called Plan East Tennessee (PlanET). PlanET is a planning and visioning effort that covers a five-county region that includes, Anderson, Blount, Knox, Loudon, and Union Counties. PlanET includes a scenario-planning component, which shows hypothetical transportation and land use scenarios that represent distinct alternatives for how the region could develop by the year 2040.

There is a high degree of overlap and need for consistency between the PlanET scenario planning process and the Regional Mobility Plan. Thus, it was determined that the results of the PlanET scenario planning process would be used to satisfy the socioeconomic data forecasts required by the travel demand model as part of the Mobility Plan.

Trend Scenario

Scenario planning often begins with a "trend" or "business as usual" scenario that projects development based on current policies and practices. The PlanET Trend scenario will form the basis for socioeconomic data forecasts as part of the Mobility Plan. While PlanET is focused on a five-county region, the Trend scenario will include the larger ten-county region to satisfy the requirements of the travel demand model.

Allocation Tool

The Mobility Plan requires a "top-down" approach for socioeconomic data allocation, in which land use is allocated until prescribed control totals are met. Specifically, the Mobility Plan includes control totals for four attributes (population, commercial employment, service employment, and industrial employment), four forecast years (2014, 2024, 2034, and 2040), and each of the ten counties. All told, there are 80 control totals as part of the allocation.

Overview of Allocation Process

The process used to allocate socioeconomic data for the Mobility Plan is a spreadsheet-based method that allocates control totals for each attribute, county, and forecast year. It relies on three basic inputs:

- **"Supply"** – Inventories of vacant and re-developable land based on existing conditions.
- **"Demand"** – A spatial measure of demand; where growth is most likely to happen.
- **"Rates"** – The rates of consumption (dwelling units per acre, employees per acre, etc.).

Land use is allocated to polygons formed by a grid of 40-acre cells that cover all ten counties. All polygons are "nested" within a traffic analysis zone (TAZ) so that polygon data can be aggregated to the TAZ level. In cases where a TAZ is smaller than a 40-acre grid cell (such as in many downtowns), the TAZ structure is the polygon. In sum, there are 60,896 polygons in the allocation model.

TAZ Aggregation

Once the allocation is complete, data is aggregated from polygons to TAZs for use in the travel demand model. Aggregate-level data is provided for population and commercial, office, industrial, and basic employment. Figure KA-2 below shows dot-density maps that represent growth in both population (left) and employment (right) by TAZ through the year 2040.

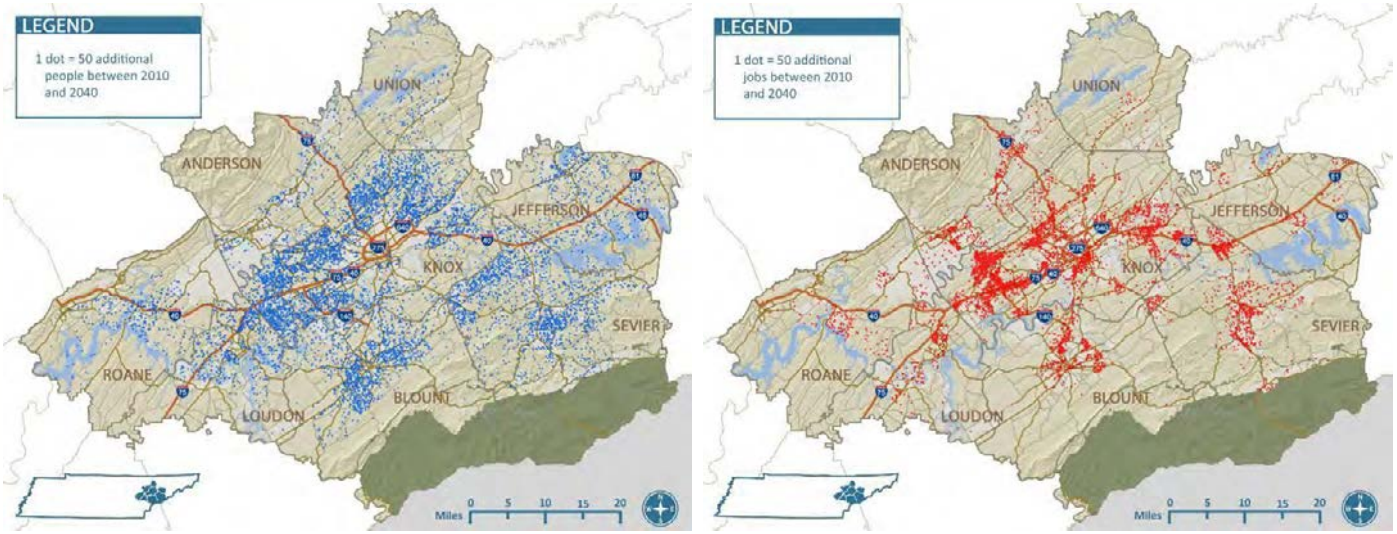


Figure KA-2: Growth in Population (left) and Employment (right) by TAZ Through 2040

Appendix K-E: MOBILE6 Input Description and Updated Planning Assumptions

Originally presented to the IAC on September 18, 2012

I. Background:

The intent of this document is to establish the planning assumptions for the conformity analysis that will be undertaken as part of the 2013 updates to the Long Range Transportation Plans for the Knoxville Regional TPO and the Lakeway Area MTPO. The Knoxville TPO compiles a single overall Long Range Plan – known as the Knoxville Regional Mobility Plan (KRMP) for the entirety of the air quality non-attainment / maintenance areas in order to ensure all planned projects meet air quality conformity requirements. The ultimate horizon year for the KRMP will be the year 2040.

The Knoxville Region is currently designated as Nonattainment for three separate NAAQS:

- **2008 8-hour Ozone Standard** – Blount, Knox and part of Anderson counties
- **1997 Annual PM2.5 Standard** – Anderson, Blount, Knox, Loudon and part of Roane counties
- **2006 Daily PM2.5 Standard** – same area as Annual PM2.5 Standard

It is also considered a Maintenance Area for the 1997 8-Hour Ozone Standard (Anderson, Blount, Jefferson, Knox, Loudon, Sevier and part of Cocke counties) although the conformity requirements for this NAAQS will be revoked one year after the effective date of the 2008 Ozone Standard (July 20, 2013).

An air quality conformity determination for the above pollutants is required by June 1, 2013 as part of the required 4-year update to the Long Range Transportation Plans for the Knoxville Regional TPO and the Lakeway Area MTPO. The first conformity determination addressing the 2008 8-Hour Ozone Standard is also required by July 20, 2013 for the areas designated nonattainment for that standard (Knox, Blount, and part of Anderson counties) and will be addressed by this conformity determination.

II. Planning Assumptions for developing Travel Demand Forecasts:

Technical documentation for the current travel demand forecasting model process is being provided to the IAC group in a separate document. The model is validated to a base year of 2010 to coincide with the latest decennial Census and the appropriate HPMS adjustment factors have been developed to ensure accurate replication of the amount of travel in the region. The travel demand model encompasses 10 counties with the new addition of Hamblen County to the modeling region and it covers the entire nonattainment/maintenance area with the exception of the small partial county portion of Cocke County.

Future year socioeconomic forecasts have been prepared by the same consulting firm that developed the travel demand model (Bernardin, Lochmueller & Associates). The projections and methodology are being provided to the IAC in a separate document for review. The Future Year control totals were adopted/endorsed by the TPO Executive Board at their April 25, 2012 meeting and by the LAMTPO Executive Board at their October 24, 2012 meeting.

III. Latest Emissions Model:

The EPA has officially released a new emissions factor model known as "MOVES2010" however there is a 3-year grace period prior to it being required for use in preparing a conformity determination, i.e. March 2013. This conformity analysis will therefore be conducted using MOBILE6.2 primarily because this was the model used to develop the current MVEBs for the various pollutants.

IV. Emissions Tests:

(For Annual & Daily PM2.5)

Use budget test against the Annual PM2.5 SIP MVEB (assuming adequacy finding is officially approved by EPA). Emissions are calculated based on using the "single-run approach" whereby average annual inputs are used for MOBILE6.2.

The MVEB established for Direct PM2.5 emissions and NOx emissions are as follows:

Pollutant	2009 MVEB (tons/year)
$PM_{2.5}$	283.63
NO_x	18,024.90

(For 1997 8-Hour Ozone Standard)

There is a Maintenance Plan that has been developed for the 1997 8-Hour Ozone Standard that has established an MVEB for the year 2024. This MVEB will be used for emissions analyses for all analysis years of 2024 and beyond. For required analysis years that are prior to 2024 separate emissions tests are required for Knox County and the remaining counties. This is because there was a 2014 MVEB that was developed specifically for Knox County which was originally a Maintenance Area for the old 1-hour Ozone Standard. The remaining counties within the 1997 8-Hour Ozone Maintenance Area are subject to an emission test of "Less than Baseline Year 2002 Emissions" for NOx and VOC. Following are the Baseline Year 2002 emissions from the most recent CDR:

All Counties except Knox – Emission Test of "Less than Baseline Year 2002 Emissions" for NOx and VOC. Following are the Baseline Year 2002 emissions from the most recent CDR:

Pollutant	2002 Emissions (tons/day)
VOC	25.11
NO_x	57.94

Knox County – Emission Test against the 1-Hour Ozone Maintenance Plan MVEB for NOx and VOC. Following are the MVEB established in the 1-Hour Ozone Maintenance Plan for Knox County:

Pollutant	2014 MVEB (tons/day)
VOC	22.12
NO_x	22.49*

* Note: As of the date of the preparation of this document, the 2014 MVEB for NOx is currently in the process of being amended to allocate additional safety margin to the current total of 22.49 tons per day. The final approval date of this amendment is not certain, but could occur prior to the adoption of the 2013 KRMP update and conformity approval. The amended total allowable NOx MVEB would become 31.71 tons per day upon final approval.

The 2024 Maintenance Plan MVEB that will be used for the entire 1997 8-Hour Standard Maintenance Area for analysis years of 2024 and beyond is as follows:

Pollutant	2014 MVEB (tons/day)
VOC	25.19
NO_x	36.32

(For 2008 8-Hour Ozone Standard)

This is a new standard for which there are no specific MVEBs that have been developed and therefore similar emissions tests as the 1997 8-Hour Standard are required. There are two options however for required analysis years prior to 2024:

- **Option 1** – Interim emissions test against year 2011 baseline emissions in the nonattainment region.
- **Option 2** – If the emissions from the nonattainment region (Blount, Knox, part of Anderson counties) is less than the 2014 Knox County 1-Hour Ozone MVEB shown above then conformity will be demonstrated.

V. MOBILE6.2 Inputs:

Following is documentation for the proposed inputs for MOBILE6.2, which is based on the "Technical Guidance on the Use of MOBILE6.2 for Emission Inventory Preparation" published by EPA in August 2004.

1.) **Calendar Year of Evaluation:**
(1997 & 2008 Ozone Standards) –

- **2015** – Required as it is the Attainment Year for 2008 Ozone Standard
- **2024** – Year such that there are no more than 10 years between analysis years
- **2034** – Year such that there are no more than 10 years between analysis years
- **2040** – Final year of KRMP

(Annual & Daily PM2.5 Standards) –

- **2014** – Required as it is the Attainment Year for Daily PM2.5 Standard
- **2024** – Year such that there are no more than 10 years between analysis years
- **2034** – Year such that there are no more than 10 years between analysis years
- **2040** – Final year of KRMP

2.) **Month of Evaluation:**
(Ozone) – Use "7" (July) as it is most appropriate for ozone season analysis.

(Annual & Daily PM2.5) – Use "7" (July) based on single-run approach used in Annual PM2.5 SIP.

3.) **Temperature:**
(Ozone) – The IAC group has previously agreed to use 66/96 as the MIN/MAX temperature input for the ozone analysis. This is based on the requirement to remain consistent with the temperature input that was used in the Knox County 1-Hour Maintenance Plan.

(Annual & Daily PM2.5) – The Annual PM2.5 SIP established the average annual MIN/MAX temperature of 50.1/70.0.

4.) **Absolute Humidity:**
(Ozone) – Use the MOBILE6.2 default value of 75 grains/lb primarily in order to remain consistent with the 1-hour Ozone Maintenance Plan, which also used the default value for humidity.

(Annual & Daily PM2.5) – The Annual PM2.5 SIP established the absolute humidity value of 52 grains/lb.

5.) **Vehicle Age Distribution:**
(Ozone and Annual & Daily PM2.5) – Data originally developed for use in the new MOVES model based on year 2010 vehicle registration data obtained from the Tennessee Department of Revenue and processed by the University of Tennessee on behalf of TDOT was acquired and converted to MOBILE6 format for this conformity analysis. Due to issues described in Appendix K-F, it was determined that the 2010 age distribution data for light duty vehicle types only would be used.

6.) **Vehicle Activity:**
(Ozone) – The TPO forecasts future vehicle activity using a travel demand forecasting model in the entire Ozone nonattainment area except for the portion in Cocke County.

The VMT on local roadways is projected using an off-model technique due to the small number included in the travel demand model in all counties outside of Knox County. The methodology involves using the assumption that the base year (2010) local road VMT as a percent of the collector and arterial VMT by county remains constant into the future. For example, if the collector and arterial VMT increase by 2% in Blount County then the Local road VMT is assumed to also increase by 2%. This methodology is consistent with previous conformity analyses.

The TPO has previously used historical traffic volume and visitation data to determine a growth factor to apply to existing VMT estimates for Cocke County roadways within the partial-county nonattainment area and will continue this methodology for the update.

For ramp facilities, the methodology recommended by the technical guidance is to assume that the HPMS data for Freeway facilities can be broken out as 92 percent VMT on the actual freeway and the other 8 percent on ramps. Since the model network was expanded to include all ramps in the study area, the actual model output values will be used rather than the default percentage breakdown.

(Annual & Daily PM2.5) – Basically the same as above with the ozone analysis for a slightly different study area, which does not include any portions of Cocke, Jefferson, or Sevier counties but adds a small portion of Roane County. All of the PM2.5 Nonattainment Area is covered by the TPO's travel demand forecasting model.

7.) **VMT by vehicle classification:**
(Ozone and Annual & Daily PM2.5) – The VMT by vehicle classification is available from TDOT vehicle classification data. The TDOT data has to be further disaggregated to the several vehicle types recognized by MOBILE6.2 from the three major classifications that TDOT uses. Classification data from the year 2006 will be used for this analysis. The VMT by vehicle classification for future years accounts for the potential of increasing heavy-duty truck utilization based on various projections.

8.) **VMT by functional classification:**
(Ozone and Annual & Daily PM2.5) – The TPO model allocates estimates of VMT into the appropriate functional classification as defined by TDOT. There are four driving cycles used by MOBILE6.2, the following table shows the Driving Cycle proposed for each FHWA functional classification category:

FHWA Highway Functional System	MOBILE6.2 Driving Cycle
Rural Interstate	Freeway and Freeway Ramp
Rural Other Principal Arterial	Arterial/Collector*
Rural Minor Arterial	Arterial/Collector
Rural Major Collector	Arterial/Collector
Rural Minor Collector	Arterial/Collector
Rural Local	Arterial/Collector
Urban Interstate	Freeway and Freeway Ramp
Urban Other Freeways	Freeway and Freeway Ramp
Urban Other Principal Arterial	Arterial/Collector
Urban Minor Arterial	Arterial/Collector
Urban Collector	Arterial/Collector
Urban Local	Local Roadway

* The technical guidance recommends the Freeway and Freeway Ramp driving cycle for the Rural Other Principal Arterial class; however the arterial/collector cycle seems to be more appropriate in this region due to the lack of access control on these types of facilities.

9.) VMT Fraction by Average Speed by Hour of the Day:

(Ozone and Annual & Daily PM2.5) – The TPO travel demand model has three time periods - AM Peak (6 - 9 am), PM Peak (3 - 6 pm) and the rest of the day. Therefore, an average speed can be developed for each of these time periods, by direction of travel in order to capture the peaking effect on speed. The command has a single VMT distribution for the AM peak three-hour period, a single VMT distribution for the PM peak three-hour period and one for the other 18 hours of the day. Separate scenarios will be run for Interstates, Arterials, and Collectors, which would be handled with setting the appropriate field in the VMT BY FACILITY command to 1.0.

10.) Weekday and Weekend Day Activity:

(Ozone) – The technical guidance states, "for most purposes, EPA will not expect States to develop local estimates that vary by day of the week". There is no mention of season variation factors although it is fairly standard practice to apply a seasonal adjustment factor (SAF) to account for differences in travel during the summer months since the HPMS data and travel demand model VMT estimates are normalized to an average annual daily traffic volume. There are seasonal variation factors available from TDOT, which will be used to develop an appropriate SAF, and will be documented in the conformity report.

(Annual & Daily PM2.5) – Since the PM2.5 analysis is based on computing annual emissions and the travel demand model was calibrated to match the HPMS estimates of daily vehicle miles of travel the emissions were calculated first at the daily level and then converted to an annual amount by multiplying by 365.

11.) Gasoline Volatility:

(Ozone) – A Reid Vapor Pressure (RVP) value of 9.0 will be used since that is the type of fuel that is distributed in the Knoxville region during the ozone season months.

(Annual & Daily PM2.5) – As established by the Annual PM2.5 SIP, the annual average RVP value is 11.98.

12.) Diesel Sulfur Content:

(Ozone) – The diesel sulfur content is only applicable to Particulate Matter modeling and will not be used.

(Annual & Daily PM2.5) – The technical guidance states that in the absence of survey data EPA recommends that past data be taken from an EPA spreadsheet called "Diesel Sulfur Levels by County" located at **http://www.epa.gov/otaq/m6.htm**. This spreadsheet was reviewed for the counties located in the Knoxville PM2.5 nonattainment area for the 2002 Analysis Year – the Annual Diesel Sulfur Level Average was the same for each county and was calculated to be 358 ppm based on the information in the spreadsheet.

Beginning in the 2006 calendar year more stringent sulfur levels are phased in going from the current level of 500 ppm to 15 ppm. The technical guidance recommends using the value of 11 ppm for any analysis year after May 2010.

Appendix K-F: Age Distribution Data Discussion

A number of MOVES data elements were developed by the University of Tennessee (UT) for the Tennessee Department of Transportation (TDOT). Included in this preliminary MOVES dataset is county-specific age distribution for the various MOVES sourceTypes. The age distribution data are the fractions of the vehicle fleet in a county that are 1 year old, 2 years old, and so on up to 30 years of age and older.

UT developed this information from data received from the Department of Revenue on vehicle registrations for 2010. One of the largest challenges presented in developing the age distributions is the allocation of vehicles into the MOVES sourceTypes. The Department of Revenues vehicle classification does not match that of MOVES. This created a significant challenge for UT Researchers in placing the vehicles into the appropriate MOVES sourceType categories. This proved to be very difficult, and as a result, UT Researchers lack confidence in the information developed from the registration data (both sourceType population and Age distributions were developed with this data).

In UT's documentation (*The Methodology for Developing For Input Datasets for the MOVES Model: Road Type Distribution, Source Type Population, Vehicle Type VMT, and Age Distribution*, University of Tennessee, Department of Civil & Environmental Engineering, April 2012) of the data developed for MOVES, UT Researchers state on page 5 "confidence in vehicle registration data was not very high". This vehicle registration data was used to develop both the sourceType population and the age distribution data. Both of these data sets need to be carefully evaluated for each county before being considered for use.

Further in UT's documentation, as well as on the notes tab of each county file UT Researchers state: "The motor vehicle registration data for the state were of highly questionable quality…" This indicates that even if the underlying data appear reasonable, caution must be taken in using this data because it might not reflect reality.

A couple sample age distributions that appear to show erroneous distributions are illustrated below.

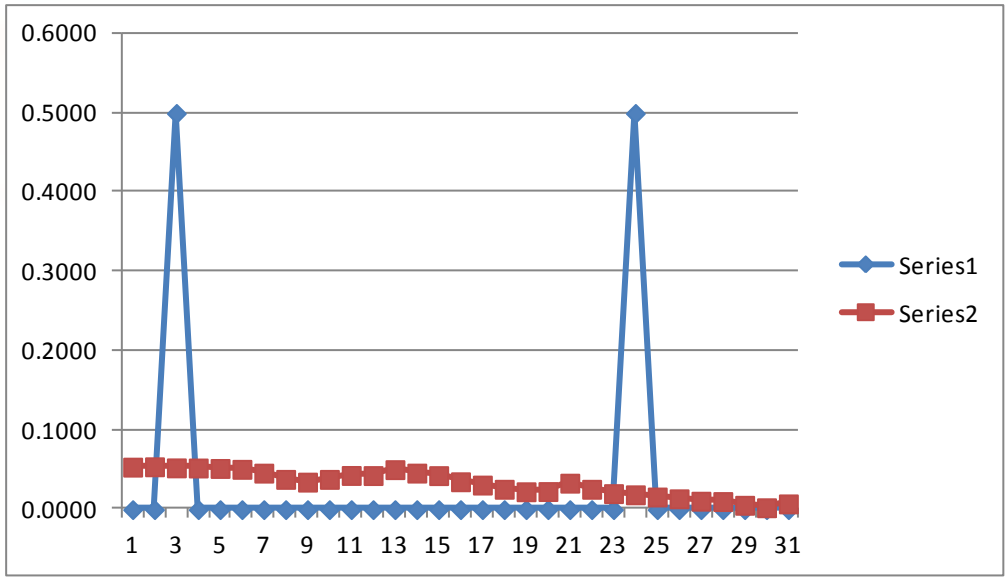


Figure KA-3. Age Distributions for Transit Buses in Cocke County (Series1 is UT data, Series2 is default data)

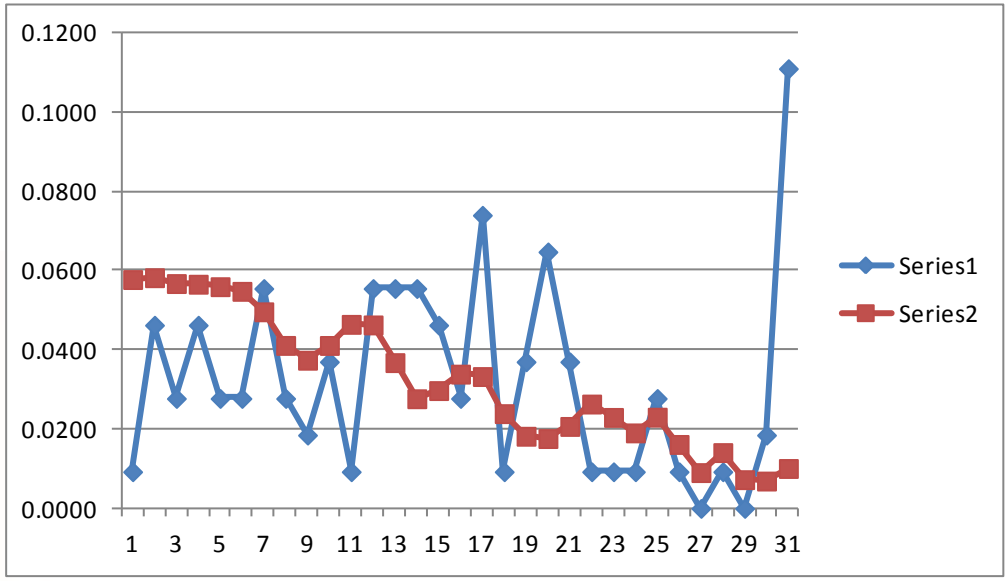


Figure KA-4. Age Distributions for Single Unit Short Haul Trucks in Cocke County (Series1 is UT data, Series2 is default data)

In addition to the concerns about data quality, an additional issue with the 2010 age distribution data is that it was formatted for use in the new MOVES2010 emissions model whereas the Knoxville TPO is using the previous emissions model known as MOBILE6. The EPA does not have a standard process to convert from MOVES format to MOBILE6 and the TPO was forced to develop its own conversion method for the 2010 age data.

The difference between MOVES and MOBILE6 vehicle type definitions cause challenges in trying to convert data between the two models. Below is a table that shows the format of vehicle types for the two different models:

MOVES Vehicle Type Definitions 13 Source Types	MOBILE6 Vehicle Type Definitions 16 Vehicle Types
11 = Motorcycle	1 = Passenger Cars
21 = Passenger Car	2 = Light-Duty Trucks 1
31 = Passenger Truck	3 = Light-Duty Trucks 2
32 = Light Commercial Truck	4 = Light-Duty Trucks 3
41 = Intercity Bus	5 = Light-Duty Trucks 4
42 = Transit Bus	6 = Class 2b Heavy-Duty Vehicles
43 = School Bus	7 = Class 3 Heavy-Duty Vehicles
51 = Refuse Truck	8 = Class 4 Heavy-Duty Vehicles
52 = Single Unit Short Haul Truck	9 = Class 5 Heavy-Duty Vehicles
53 = Single Unit Long Haul Truck	10 = Class 6 Heavy-Duty Vehicles
54 = Motor Home	11 = Class 7 Heavy-Duty Vehicles
61 = Combination Short Haul Truck	12 = Class 8a Heavy-Duty Vehicles
62 = Combination Long Haul Truck	13 = Class 8b Heavy-Duty Vehicles
	14 = School Buses
	15 = Transit and Urban Buses
	16 = Motorcycles (All)

There is a direct translation between a few of the vehicle types such as passenger cars and motorcycles between the two models, however some of the MOVES vehicle types are comprised of several of the MOBILE6 categories such as the Refuse Truck which is comprised of MOBILE6 vehicle types 10, 11, 12, and 13.

Using the MOVES Technical Guidance document the TPO staff was able to apply factors to attempt to convert the MOVES formatted vehicle age distributions to MOBILE6 format. As a test of this converter, the TPO staff input MOBILE6 default age distribution data into the EPA MOBILE6 to MOVES converter to develop a MOVES age distribution and then input the results into the TPO's converter. This "back-conversion" resulted in an inexact match of the original MOBILE6 defaults. Some vehicle types matched exactly; however, there were significant differences for MOBILE6 vehicle types 6 – 9 in particular.

Conclusion

In discussion with EPA on the matter of the use of this information, EPA maintains that the most recent data should be used. Due to the questionable nature of some of the data elements, it is being proposed for the 2013-2040 Knoxville Regional Mobility Plan Update to use the new light-duty vehicle information and rely on MOBILE6 default information for the remaining Vehicle Types.

This approach is consistent with the methodology used to develop the original MOBILE6 age distribution data in year 2000 that has been used in recent SIP development and conformity determinations in the Knoxville Region. The original age distribution data used vehicle registration data to develop ages only for MOBILE6 Vehicle Types 1 – 5, i.e. Passenger Cars and Light-Duty Trucks and relied on defaults for the remaining Vehicle Types 6 – 16.

This approach is being proposed to take advantage of those components of the newer data developed by UT that appear more reasonable, while defaulting to the previously used data for the remaining vehicle types. Additional time is needed to fully review the entire UT dataset that has been developed for MOVES and discuss its reasonableness through the IAC process.

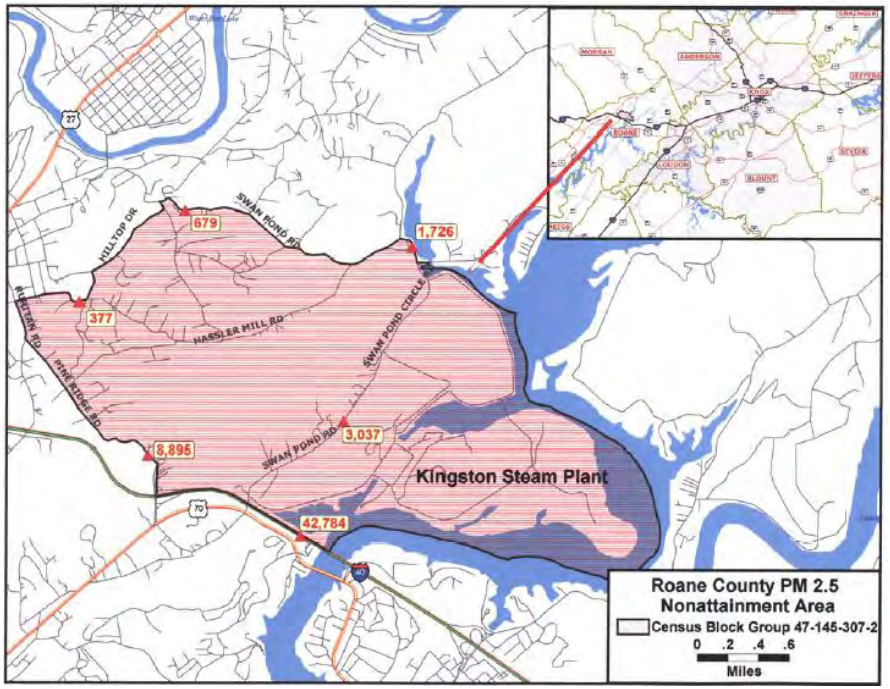
Appendix K-G: Anderson, Roane & Cocke County Partial County Emissions Analysis Methodology

Background:

Following is a brief summary of the methodology used to calculate emissions from the partial county Ozone areas in Anderson and Cocke counties as well as the partial PM2.5 nonattainment area located in Roane County.

Roane County Methodology:

The PM2.5 partial nonattainment area in Roane County consists of one Census Block group around the TVA Kingston Steam Plant and is shown in the map below:



There are five facility types represented within this area: Rural Freeway, Rural Ramp, Urban Minor Arterial, Rural Collector, and Rural Local. The total VMT was calculated for the base year 2010 based on actual TDOT traffic counts also shown in the above map. The 2010 model VMT by facility type within the area was compared to the actual VMT in order to obtain correction factors. The local VMT was calculated based on the length of local roads versus the total length of rural local roads in Roane County. The correction factors and local VMT percentage were assumed to remain constant and were applied to the travel demand model VMT.

Cocke County Methodology:

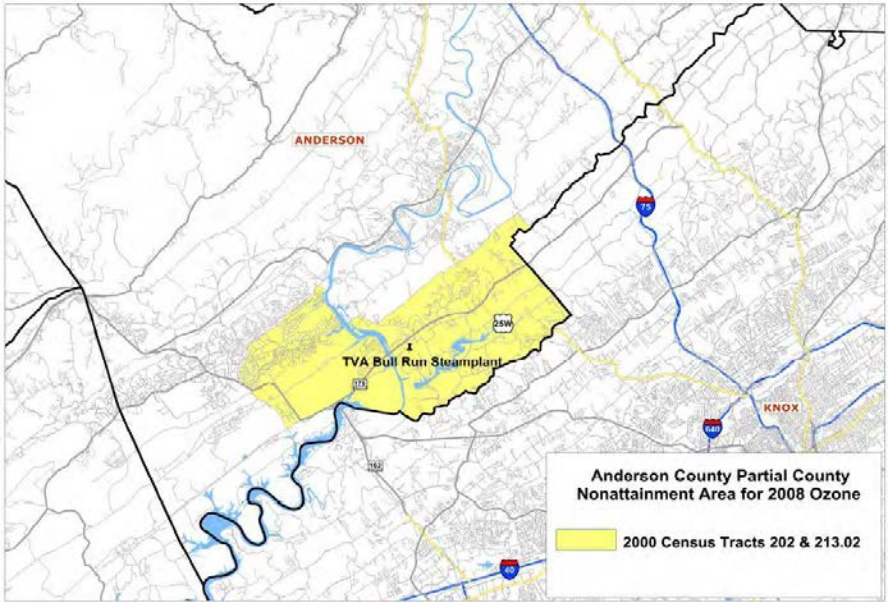
The Ozone partial nonattainment area in Cocke County consists of only the portion of Cocke County within the confines of the Great Smoky Mountains National Park. Three roadways were determined to be included in the partial nonattainment area as agreed upon through the IAC process, which are SR 32, Cosby Campground Road and the Foothills Parkway. The emissions analysis methodology for this area consists of an off-model analysis of future traffic growth on these three roadways since they are not represented in the TPO travel demand model.

In order to project future traffic updated traffic counts were received from TDOT and the National Park Service and input into a spreadsheet. The traffic counts were converted to an average summer day using the appropriate seasonal adjustment factors and then multiplied by the length of the roadway segment to obtain an estimate of daily vehicle miles of travel (VMT). Using Excel growth trend computation procedures the counts for each of the three roadways within the Ozone Nonattainment Area were extrapolated to year 2040 as shown in the following table. The final step in the emissions analysis process is to multiply the VMT by the emission factors that were developed using MOBILE6.2.

Cocke County Partial Ozone Nonattainment Area VMT Projections for 2013 KRMP Conformity Determination			
	VMT Trendline		
	Cosby Campground	Foothills Pkwy East	SR 32
2000	452	6,919	6,707
2001	341	5,570	7,259
2002	471	5,662	8,170
2003	425	6,257	7,884
2004	351	6,513	7,397
2005	274	6,026	8,271
2006	435	7,224	7,434
2007	414	7,125	7,792
2008	849	7,205	7,636
2009	1,040	10,282	8,712
2010	986	10,487	7,544
2011	1,005	10,696	8,142
2012	1,046	10,910	8,229
2013	1,081	10,969	8,303
2014	1,146	11,427	8,378
2015	1,212	11,886	8,452
2016	1,277	12,344	8,526
2017	1,343	12,803	8,601
2018	1,408	13,261	8,675
2019	1,474	13,720	8,749
2020	1,539	14,178	8,824
2021	1,605	14,636	8,898
2022	1,670	15,095	8,972
2023	1,736	15,553	9,047
2024	1,802	16,012	9,121
2025	1,867	16,470	9,195
2026	1,933	16,929	9,270
2027	1,998	17,387	9,344
2028	2,064	17,846	9,418
2029	2,129	18,304	9,493
2030	2,195	18,763	9,567
2031	2,260	19,221	9,641
2032	2,326	19,679	9,716
2033	2,391	20,138	9,790
2034	2,457	20,596	9,864
2035	2,522	21,055	9,939
2036	2,588	21,513	10,013
2037	2,653	21,972	10,087
2038	2,719	22,430	10,162
2039	2,784	22,889	10,236
2040	2,850	23,347	10,310
Count Source: NPS, Public Use Statistics Office & TDOT			
Cosby Campground/picnic area access road is 2.4 miles in length			
Foothills Parkway East is 5.6 miles in length.			
SR 32 is 9.2 miles in length			

Anderson County Methodology:

The 2008 Ozone Nonattainment Area includes a partial county area in Anderson County that surrounds the TVA Bull Run Steam Plant similar to the partial PM2.5 area in Roane County and is shown in the map below:



There are eight facility types represented within this area: Urban Principal Arterial, Urban Minor Arterial, Rural Minor Arterial, Rural Major Collector, Rural Minor Collector, Urban Collector, Urban Local, and Rural Local. The total VMT was calculated for the base year 2010 based on actual TDOT traffic counts. The 2010 model VMT by facility type within the area was compared to the actual VMT in order to obtain correction factors. The local VMT was calculated based on the length of local roads versus the total length of urban and rural local roads in Anderson County. Since the local roadway type and urban collectors were not represented in the travel demand model, it was assumed that the base year percentage of VMT relative to the other roadway types would remain constant into the future. The correction factors and urban collector/local VMT percentage were assumed to remain constant and were applied to the travel demand model VMT.

The analysis for the partial Anderson County Nonattainment area was conducted for year 2015 only as it was only used for the 2015 Analysis Test against the 2014 1-Hour MVEB for Knox County. The chart below shows the correction factors and resulting 2015 VMT by facility type:

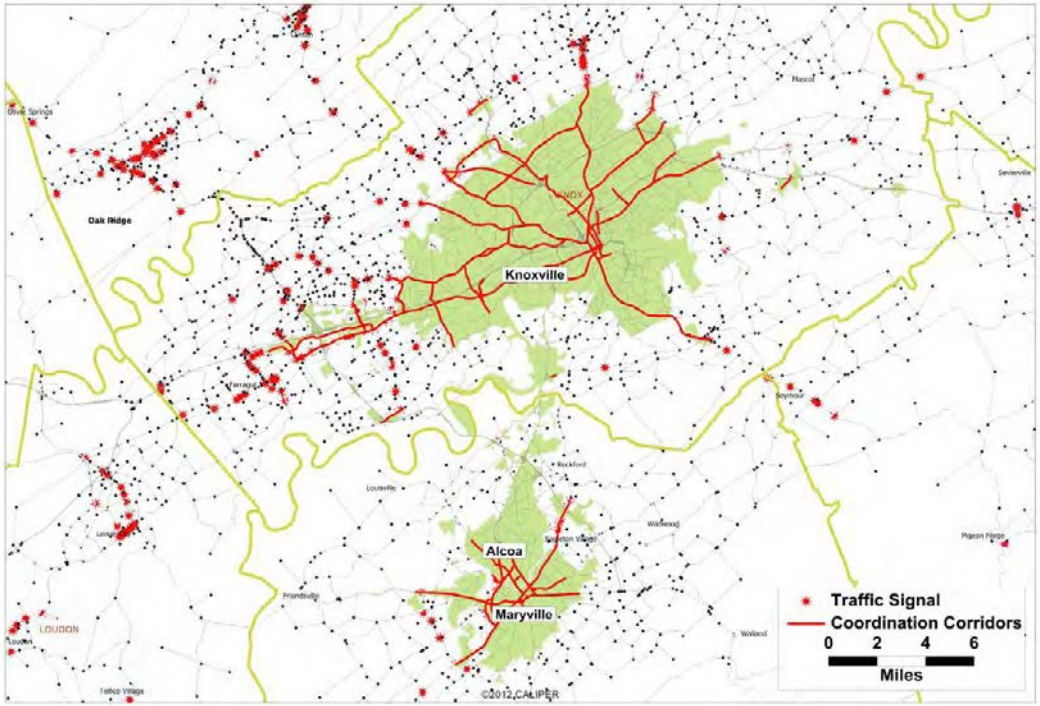
Year 2010 VMT				
Facility Type	**Actual**	**Model**	**Correction Factor**	**% of Other VMT**
Urban Principal Arterial	184,282	177,156	1.04	
Urban Minor Arterial	160,694	145,080	1.11	
Rural Minor Arterial	67,979	87,721	0.77	
Rural Major Collector	58,364	50,530	1.16	
Rural Minor Collector	15,242	15,325	0.99	
Urban Collector	12,681	N/A		0.03
Urban Local	35,408	N/A		0.07
Rural Local	16,069	N/A		0.03
Total	**550,719**			
Model Year 2015 VMT				
		Correction Factor	**Final VMT**	
Urban Principal Arterial	83,048	1.04	86,389	
Urban Minor Arterial	50,449	1.11	55,878	
Rural Minor Arterial	16,118	0.77	12,491	
Rural Major Collector	191,275	1.16	220,930	
Rural Minor Collector	144,717	0.99	143,933	
Urban Collector			13,543	
Urban Local			37,814	
Rural Local			17,161	
Total			**588,140**	

Appendix K-H: Signal Coordination – Off Model Analysis

An off-model analysis was conducted to determine the amount of emissions impacts from any regionally significant traffic signal coordination projects in the Knoxville Regional Mobility Plan or ones that have been completed since the previous Mobility Plan update in 2009. The conformity regulations in 40 CFR 93.128 require that all subsequent regional emissions analyses must include regionally significant traffic signal synchronization projects.

Project 13-602 in the 2024 Horizon Year of the Knoxville Regional Mobility Plan involves updating all of the signal hardware infrastructure within the City of Knoxville and improving signal timing along major corridors as a result. In addition, there was a similar project that was recently completed in the cities of Alcoa and Maryville in Blount County that improved signal timing along their primary corridors. The Blount County project affects all Horizon Years, while the Knox County project only affects horizon years 2024, 2034, and 2040.

An assumption was made that the improved signal coordination would only impact the peak direction of flow for each of the AM and PM peak periods. The travel demand model network was used for each horizon year to determine the amount of peak period VMT and average speed along each affected corridor by functional classification. It was then assumed that the average speed would be increased by 12% based on the typical improvements for signal coordination noted in the publication "*A Toolbox for Alleviating Traffic Congestion and Enhancing Mobility*" from the Institute of Transportation Engineers (ITE). Emission factors for VOC and NOx were determined by running MOBILE6 with the "before" and "after" average speeds. The net change in emissions were calculated and added to the overall emissions for each horizon year. It should be noted that VOC decreased while NOx increased in some cases due to the fact that emission rates for NOx tend to increase when speeds are increased beyond approximately 35 mph. The emission rates for PM2.5 are not sensitive to speed in MOBILE6 and were therefore not analyzed. The table on the following page shows the emissions analysis for each horizon year and the map below shows the location of the affected corridors.



Off-Model Signal Coordination Analysis

Year 2014

Peak Period	County & Functional Class	VMT	Avg Spd Before	Avg Spd After	NOx Em Factor (g/mi) Before	NOx Em Factor (g/mi) After	Change in NOx Emissions
AM Peak	Blount Principal Arterials	51,887.90	39.8	44.6	0.925	0.945	1,037.76
PM Peak	Blount Principal Arterials	55,085.85	35.5	39.8	0.914	0.925	605.94
AM Peak	Blount Minor Arterials	16,695.82	30.7	34.3	0.892	0.886	(100.17)
PM Peak	Blount Minor Arterials	16,684.88	28.9	32.4	0.899	0.889	(166.85)
	TOTALS	**140,354.45**					**1,376.68**
						Tons per Day	**0.0015**

Year 2015

Peak Period	County & Functional Class	VMT	Avg Spd Before	Avg Spd After	VOC Em Factor (g/mi) Before	VOC Em Factor (g/mi) After	Change in VOC Emissions	NOx Em Factor (g/mi) Before	NOx Em Factor (g/mi) After	Change in NOx Emissions
AM Peak	Blount Principal Arterials	66,144.55	39.8	44.6	0.884	0.862	(1,455.18)	0.793	0.808	992.17
PM Peak	Blount Principal Arterials	58,947.62	35.4	39.7	0.907	0.884	(1,355.80)	0.785	0.793	471.58
AM Peak	Blount Minor Arterials	19,903.84	29.9	33.5	0.958	0.926	(636.92)	0.772	0.763	(179.13)
PM Peak	Blount Minor Arterials	17,278.26	28.5	32.0	0.972	0.939	(570.18)	0.778	0.766	(207.34)
	TOTALS	**162,274.27**					**(4,018.08)**			**1,077.28**
						Tons per Day	**(0.0044)**			**0.0012**

Year 2024

Peak Period	County & Functional Class	VMT	Avg Spd Before	Avg Spd After	VOC Em Factor (g/mi) Before	VOC Em Factor (g/mi) After	Change in VOC Emissions	NOx Em Factor (g/mi) Before	NOx Em Factor (g/mi) After	Change in NOx Emissions
AM Peak	Blount Principal Arterials	56,815.51	41.7	46.7	0.516	0.501	(852.23)	0.477	0.486	511.34
PM Peak	Blount Principal Arterials	59,937.43	35.8	40.1	0.538	0.522	(959.00)	0.47	0.474	239.75
AM Peak	Blount Minor Arterials	18,232.41	31.0	34.7	0.566	0.545	(382.88)	0.47	0.464	(109.39)
PM Peak	Blount Minor Arterials	17,720.76	29.2	32.7	0.578	0.556	(389.86)	0.474	0.467	(124.05)
AM Peak	Knox Principal Arterials	148,035.22	37.4	41.9	0.459	0.445	(2,072.49)	0.435	0.441	888.21
PM Peak	Knox Principal Arterials	153,433.24	35.2	39.4	0.467	0.452	(2,301.50)	0.432	0.436	613.73
AM Peak	Knox Minor Arterials	115,109.52	35.8	40.1	0.467	0.453	(1,611.53)	0.429	0.433	460.44
PM Peak	Knox Minor Arterials	119,094.35	33.9	37.9	0.476	0.46	(1,905.51)	0.429	0.431	238.19
	TOTALS	**535,672.32**					**(7,891.03)**			**2,200.57**
						Tons per Day	**(0.0087)**			**0.0024**

Year 2034

Peak Period	County & Functional Class	VMT	Avg Spd Before	Avg Spd After	VOC Em Factor (g/mi) Before	VOC Em Factor (g/mi) After	Change in VOC Emissions	NOx Em Factor (g/mi) Before	NOx Em Factor (g/mi) After	Change in NOx Emissions
AM Peak	Blount Principal Arterials	62,607.98	39.9	44.7	0.489	0.475	(876.51)	0.395	0.401	375.65
PM Peak	Blount Principal Arterials	65,259.32	33.7	37.7	0.514	0.497	(1,109.41)	0.393	0.393	-
AM Peak	Blount Minor Arterials	21,129.75	31.3	35.0	0.53	0.504	(549.37)	0.395	0.39	(105.65)
PM Peak	Blount Minor Arterials	20,383.81	29.3	32.8	0.542	0.521	(428.06)	0.399	0.393	(122.30)
AM Peak	Knox Principal Arterials	154,007.18	37.1	41.5	0.439	0.425	(2,156.10)	0.369	0.373	616.03
PM Peak	Knox Principal Arterials	157,578.33	35.1	39.3	0.446	0.432	(2,206.10)	0.367	0.37	472.73
AM Peak	Knox Minor Arterials	129,685.30	35.0	39.2	0.449	0.435	(1,815.59)	0.367	0.37	389.06
PM Peak	Knox Minor Arterials	130,290.48	32.9	36.8	0.459	0.443	(2,084.65)	0.37	0.368	(260.58)
	TOTALS	**571,561.29**					**(8,262.44)**			**1,217.24**
						Tons per Day	**(0.0091)**			**0.0013**

Year 2040

Peak Period	County & Functional Class	VMT	Avg Spd Before	Avg Spd After	VOC Em Factor (g/mi) Before	VOC Em Factor (g/mi) After	Change in VOC Emissions	NOx Em Factor (g/mi) Before	NOx Em Factor (g/mi) After	Change in NOx Emissions
AM Peak	Blount Principal Arterials	65,762.32	38.5	43.1	0.494	0.479	(986.43)	0.394	0.399	328.81
PM Peak	Blount Principal Arterials	67,769.17	32.3	36.2	0.522	0.502	(1,355.38)	0.395	0.392	(203.31)
AM Peak	Blount Minor Arterials	22,129.14	30.7	34.4	0.533	0.512	(464.71)	0.396	0.391	(110.65)
PM Peak	Blount Minor Arterials	21,231.63	28.7	32.2	0.546	0.524	(467.10)	0.401	0.394	(148.62)
AM Peak	Knox Principal Arterials	161,747.84	36.7	41.1	0.44	0.427	(2,102.72)	0.368	0.372	646.99
PM Peak	Knox Principal Arterials	163,485.54	34.6	38.7	0.448	0.434	(2,288.80)	0.367	0.37	490.46
AM Peak	Knox Minor Arterials	137,018.13	34.8	38.9	0.45	0.436	(1,918.25)	0.367	0.37	411.05
PM Peak	Knox Minor Arterials	136,385.93	32.4	36.3	0.462	0.445	(2,318.56)	0.37	0.368	(272.77)
	TOTALS	**598,637.44**					**(8,628.33)**			**1,275.73**
						Tons per Day	**(0.0095)**			**0.0014**

Appendix K-I: Regional Significance Screening Criteria

Background:

This document is intended to serve as a tool for assisting with determining whether a roadway facility in the Knoxville Region is "Regionally Significant" with respect to the air quality conformity requirements found in the Transportation Conformity Rule (40 CFR Part 93). The purpose is to provide pertinent information to the Interagency Consultation (IAC) group on the characteristics that would normally be used to consider the regional significance of a transportation project and in particular, one that is on a roadway facility classified as a Minor Arterial or lower. The IAC will make the final determination of regional significance on a case-by-case basis as needed, and additional criteria beyond what is being presented in this document may be used at the IACs discretion.

Federal Conformity Rule Definition of Regional Significance:

Regionally significant project means a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guide way transit facilities that offer an alternative to regional highway travel.

Proposed Regional Significance Screening Criteria Interrogatories:

1.) **What are the Exempt status and Functional Classification of the roadway project?**

- A non-exempt project on a roadway facility classified as a Principal Arterial or higher will generally be considered Regionally Significant.
- A project determined to be Exempt under 40 CFR 93.126 or 93.127 will generally be considered Non-Regionally Significant unless the IAC group determines that it will have regional impacts for any reason.

2.) **Is the facility either included in the Regional Travel Demand Forecasting Model, or would it be if it does not currently exist?**

- It is the practice of the Knoxville TPO to include most "major" roadways (most major collectors and above) in order to improve model performance so if a roadway is not modeled it can generally be considered to be Non-Regionally Significant.

3.) **Does the facility provide direct connection between two roadways classified as a Principal Arterial or higher?**

- Direct connections between major principal arterials and in particular, connections to the Interstate can generally be considered Regionally Significant.

4.) **Does the facility provide the primary regional connectivity to a "Major Activity Center"?**

- This is a criterion listed in the federal Regional Significance definition; however, there can be different interpretations as to what constitutes a major activity center. In the Knoxville Region the following are suggested as general types of major activity centers, with specific locations to be determined on a case-by-case basis:
  - Major Hospitals and Regional Medical Centers
  - Central Business Districts of cities with greater than 5,000 population
  - Major Regional Retail Centers and Malls (greater than 1,000,000 square feet)
  - Major Colleges and Universities
  - Tourist Destinations
  - Airports
  - Freight Terminals and Intermodal Transfer Centers
  - Sports Complexes

5.) **Does the project add significant vehicular capacity?**

- A project adding general purpose through lanes will typically be more significant than one that is adding "auxiliary" lanes or a continuous center turn lane or other projects that do not add significant roadway capacity.

6.) **What is the length of the roadway segment being improved and what is the overall corridor length?**

- Projects extending (or completing) long sections (typically greater than one mile) will tend to be more regionally significant.
- If the corridor is lengthy and there is an absence of other principal arterials in the vicinity then the roadway will tend to be more regionally significant.

7.) **What is the current Average Daily Traffic of the roadway segment?**

- This is less important in determining Regional Significance although it will provide additional information to be considered along with the above criteria. Obviously high traffic segments will tend to be more correlated with the increased regional significance of a roadway.

Appendix K-J: Highway Project List

K-J.1. List of Primary Project Types and Exempt Status:

1.) **Construct new roadway (any number of lanes)** – Non-exempt Project, Entails constructing a roadway on new location.

2.) **Modify Interchange** – Exempt Project, Entails ramp modifications such as realignment, relocation, etc…

3.) **Widen roadway from x lanes to y lanes** – Non-exempt Project, Entails addition of capacity through construction of additional through travel lanes on an existing roadway. Multilane facilities will generally include either a non-traversable median or a center turn lane. The final design will usually determine the median configuration, and a project calling for a center turn lane in the project list may end up with a non-traversable median or vice versa, however there is no difference between the two in terms of air quality impacts or treatment in the travel demand forecasting model.

4.) **Install traffic signal** – Exempt Project, Entails addition of traffic signal at a single intersection, may also involve additional improvements at the intersection such as realignment of approaches or additional turn lanes to maximize efficiency of the traffic signal.

5.) **Reconstruct 2-lane road** – Exempt Project, Entails the improvement of an existing 2-lane roadway to bring it up to modern standards in terms of lane widths and geometric design chiefly to enhance the safety of the roadway, it may also involve the construction of turn lanes at major intersections. There are numerous roadways in the region that were not designed to accommodate the type an amount of suburban development that is occurring, which leads to unsafe operating conditions.

6.) **Replace Bridge** – Exempt Project, Entails the replacement of an existing bridge that has been determined to be structurally deficient. The new bridge may include safety enhancements such as wider lanes and shoulders, but will not have more through lanes than the previous structure had.

7.) **Install Street Lighting** – Exempt Project, Entails the addition of overhead lighting to enhance nighttime visibility and improve safety.

8.) **Intersection improvements** – Exempt Project, Entails the modification of a single intersection to include the addition of separate turn lanes or realignment of approaches to improve safety.

9.) **Signal Coordination** – Can be either exempt or non-exempt depending on scope, Entails retiming traffic signals to optimize traffic flow.

10.) **Add Center Turn Lane** – Entails addition of a two way left turn lane on an undivided roadway of two or more lanes, also usually involves reconstructing the roadway to modern design standards for lane width and geometric design. In previous conformity analyses this type of project has been determined to be "Exempt", however it has since been determined that these projects will be considered "Non-Exempt" if they involve turn lanes at more than one intersection or greater than one quarter mile in length.

K-J.2. Regional Highway Projects

The Air Quality Conformity required the use of five horizon years (2014, 2015, 2024, 2034, and 2040). The project list for the Mobility Plan (Chapter 8) included two additional years to subdivide ten-year periods into more manageable periods (2019 and 2029). This list is based on the conformity work, thus projects within 2019 will display as 2024 and 2029 as 3034.

Legend for Following Tables:

Horizon Year Colors	Horizon Year	Description
	2014	Project to be complete by 12/31/2014
	2015	Project to be completed between 1/1/15 - 12/31/2015
	2024	Project to be completed between 1/1/16 - 12/31/2024
	2034	Project to be completed between 1/1/25 - 12/31/2034
	2040	Project to be completed between 1/1/35 - 12/31/2040

Exempt Status & Regional Significance

Exempt Project that is automatically Non-Regionally Significant
Non-Exempt Project that is automatically Regionally Significant because of being a Principal Arterial or higher

Table KA-56: Regional Highway Projects

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
Anderson County Projects								
09-101a	Edgemoor Rd (SR 170)	Oak Ridge Hwy (SR 62) to Melton Lake Dr	Oak Ridge/Anderson County	2.6	Widen 2-lane to 5-lane with bike lanes	2024	Non-Exempt	Yes
09-101b	Edgemoor Rd (SR 170)	Melton Lake Dr to Clinton Hwy (SR 9) (US 25W)	Oak Ridge/Anderson County	3.6	Widen 2-lane to 5-lane with bike lanes and a bridge	2024	Non-Exempt	Yes
13-101	Emory Valley Rd	Intersection at Melton Lake Dr	Oak Ridge	0	Construct roundabout	2024	Exempt	No
13-102	Tulane Ave	Intersection at Pennsylvania Ave	Oak Ridge	0	Construct roundabout	2024	Exempt	No
13-103	Lafayette Dr	Half way between Midway Rd and Midland Rd	Oak Ridge	0	Signalize Intersection	2024	Exempt	No
Blount County Projects								
10-259	McCammon Avenue Relocation	Intersection with Bessemer Street in Alcoa	Maryville	0.1	Re-align McCammon Avenue with Hamilton Crossing entrance to create signalized, 4-way intersection	2014	Exempt	No
13-201	W Plant Redevelopment	Hall Rd (SR 35) / Associates Blvd to Mill St (Future Hunt Rd Interchange)	Alcoa	1.4	Construct 4-lane road with center median	2014	Non-Exempt	No
13-202	Wrights Ferry Rd	Topside Rd to 500' past Base Point Way	Alcoa	1.1	Widening, Intersection relocation, roadway realignment, addition of left turn lanes, pavement overlay	2014	Exempt	No
09-202	Robert C. Jackson Dr Extension	Middlesettlements Rd to Louisville Rd (SR 334)	Alcoa	0.7	New 4-lane road w/ center turn lane and/or median	2024	Non-Exempt	Yes
09-204	Pellissippi Place Access Road	Connect Old Knoxville Hwy (SR 33) to Wildwood Rd through Pellissippi Place Research Park	Alcoa	1.2	Extend 2-lane and 4-lane road w/ center median lane	2024	Non-Exempt	Yes
09-208	Improve Streetscapes & Pavement	Locations throughout Blount County	Alcoa/ Maryville/ Blount County	N/A	Street-scaping and "Complete Street" types of projects throughout Maryville	2024	Exempt	No
09-209	Ellejoy Road	River Ford Rd to Jeffries Hollow Rd	Blount County	3.7	Reconstruct 2-lane section with shoulders	2024	Exempt	No
09-211	Morganton Road Phase 1	Foothills Mall Dr to William Blount Dr (SR 335)	Blount County	2.2	Reconstruct 2-lane section with shoulders	2024	Exempt	No
09-212	E. Broadway Avenue/Old Knoxville Hwy (SR 33)	Wildwood Rd to McArthur Rd	Blount County	1.2	Reconstruct 2-lane section with shoulders	2024	Exempt	No

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
09-213	Old Niles Ferry Road	Maryville City Limit to Calderwood Hwy (SR 115) (US 129)	Blount County	3.3	Reconstruct 2-lane section with shoulders	2024	Exempt	No
09-214	Sevierville Rd (SR 35) (US 411)	Washington St (SR 35) to Walnut St	Maryville	0.4	Widen 2-lane to 3-lane (add center turn lane)	2024	Non-Exempt	Yes
09-216	Alcoa Highway (SR 115) (US 129)	Pellissippi Pkwy (SR 162) to Knox/Blount County Line	Blount County/ Alcoa	2.4	Widen 4-lane to 6-lane with 2 auxiliary lanes between Singleton Station Rd and Topside Rd (SR 333)	2024	Non-Exempt	Yes
09-217	Alcoa Highway (SR 115) (US 129)	Singleton Station Rd to Hunt Rd (SR 335)	Alcoa	3.6	Improve intersections including signals and turn lanes where warranted (upon completion of proposed Bypass)	2024	Exempt	No
09-218	Alcoa Highway Bypass (SR 115) (US 129)	From Hall Rd (SR 35)/Alcoa Hwy (SR 115) Interchange to Proposed Interchange serving McGhee Tyson Airport	Alcoa	1.3	Construct 8-lane freeway on existing and new alignment	2024	Non-Exempt	Yes
09-221	Burnett Station Road	Sevierville Rd (SR 35) (US 411) to Chapman Hwy (SR 71) (US 441)	Blount County	4.4	Reconstruct 2-lane section with shoulders	2024	Exempt	No
09-223	Carpenters Grade Road	Kirkland Blvd to Raulston Rd	Maryville	0.7	Reconstruct 2-lane section with shoulders	2024	Exempt	No
09-224	Foothills Parkway	Lamar Alexander Pkwy (SR 73) (US 321) to Sevier County Line	Blount County	11.3	Construct new 2-lane road	2024	Non-Exempt	Yes
09-229	Morganton Road Phase 2	William Blount Dr (SR 335) to Walker Rd	Blount County	3.3	Reconstruct 2-lane section with shoulders	2024	Exempt	No
09-232	Pellissippi Parkway (SR 162)	Old Knoxville Hwy (SR 33) to Lamar Alexander Pkwy (SR 73) (US 321)	Blount County	4.4	Construct new 4-lane freeway	2024	Non-Exempt	Yes
09-237	E. Broadway Avenue (SR 33)	Intersection with Brown School Rd	Maryville	0.0	Realign and install traffic signal	2024	Exempt	No
09-240	Sandy Springs Rd	Intersection w/ Montgomery Ln	Maryville	0.0	Intersection Improvements	2024	Exempt	No
09-245	Sevierville Rd (SR 35) (US 411)	Everett High Rd to Swanee Dr	Maryville	2.0	Widen 2-lane to 3-lane (add center turn lane)	2024	Non-Exempt	Yes
09-250	Sevierville Road (SR 35) (US 411)	Swanee Dr (Maryville C.L.) to Chapman Hwy (SR 71) (US 441)	Blount County	11.9	Reconstruct 2-lane section with shoulders	2024	Exempt	No
09-257	Alcoa Highway Bypass (SR 115) (US 129)	From Proposed Interchange serving McGhee Tyson Airport to Pellissippi Pkwy (SR 162)	Alcoa	2.4	Construct new 8-lane freeway (6 thru lanes plus 2 auxiliary lanes)	2024	Non-Exempt	Yes
09-258	Alcoa Highway Bypass (SR 115) (US 129)	From Pellissippi Pkwy (SR 162) to Near Singleton Station Rd	Alcoa	1.4	Construct new 8-lane freeway (6 thru lanes plus 2 auxiliary lanes)	2024	Non-Exempt	Yes

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
09-262	Montvale Rd (SR 336)	Montvale Station Rd to Lamar Alexander Pkwy (SR 73) (US 321)	Maryville	0.6	Widen 2-lane to 3-lane (add center turn lane)	2024	Non-Exempt	No
10-260	McCammon Avenue Extension	Foch Street to existing McCammon Ave	Maryville	0.7	Reconstruct existing 2-lane road to 2-3 lanes and extend on new alignment to tie-in with Watkins Road	2024	Non-Exempt	No
13-203	Robert C. Jackson Extension	Louisville Rd to US 129 Bypass	Alcoa	0.5	Extension of Robert C. Jackson, Phase 1. Construct new 4-lane section and grade separated interchange connecting US 129 and Associates Blvd	2024	Non-Exempt	Yes
13-207	Louisville Rd (SR 334)	W Hunt Rd to Alcoa city limits	Alcoa	1.3	Reconstruct existing 2-lane facility with shoulders	2024	Exempt	No
13-208	Harvest Ln	Harvest Ln (cul-de-sac) to Louisville Rd	Alcoa	0.2	Extend existing 2-lane road to connect to Louisville Rd	2024	Non-Exempt	No
13-211	Foothills Mall Dr	US 129 Bypass (SR 115) to Fock St	Maryville	0.5	Extend Foothills Mall Dr across US 129 Bypass on new alignment to Foch St	2024	Non-Exempt	No
13-213	Court St	Intersection at Boardman Ave	Maryville	0	Widen Court St to accommodate left-turn lane onto Boardman Ave and install signal	2024	Exempt	No
13-214	Old Lowes Ferry Rd	Intersection at Louisville Rd (SR 333)	Louisville	0	Realignment of intersection	2024	Exempt	No
13-218	Middlesettlements Rd	Intersection at Miser Station Rd	Blount Co	0	Realignment of intersection	2024	Exempt	No
09-215	Airport Access Road to I-140	Airport Terminus to Pellissippi Pkwy (I-140) (SR 162)	Alcoa	0.0	Add new interchange ramps for direct access to future terminal and cargo area	2034	Non-Exempt	Yes
09-231	Old Knoxville Highway (SR 33)	Pellissippi Pkwy (SR 162) to Knox County Line (Co Op Rd)	Blount County	4.6	Reconstruct 2-lane section with shoulders, including 2 bridges	2034	Exempt	No
09-234	Wildwood Road	Maryville City Limit (Brown School Rd) to Sevierville Rd (SR 35) (US 411)	Blount County	6.1	Reconstruct 2-lane section with shoulders	2034	Exempt	No
09-238	Robert C. Jackson Dr Extension	Lamar Alexander Pkwy (SR 73) (US 321) to Morganton Rd	Maryville	0.9	Construct new 2-lane road	2034	Non-Exempt	Yes
09-239	Montvale Road (SR 336)	Maryville South City Limits to Montvale Station Rd	Maryville	2.4	Add center turn lane	2034	Non-Exempt	No

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
09-241	Tuckaleechee Pk	Lamar Alexander Pkwy (SR 73) (US 321) to Grandview Dr	Maryville	1.1	Reconstruct 2-lane section with shoulders	2034	Exempt	No
09-242	W. Broadway Avenue (SR 33) (US 411)	Old Niles Ferry Rd to Lamar Alexander Pkwy (SR 73) (US 321)	Maryville	0.8	Widen 2-lane to 3-lane (add center turn lane)	2034	Non-Exempt	Yes
09-246	William Blount Dr Extension (SR 335)	US 411 (SR 33) @ Wm. Blount Dr to Old Niles Ferry Rd	Maryville/ Blount County	0.6	Construct new 2-lane road	2034	Non-Exempt	Yes
09-248	Topside Road (SR 333)	Alcoa Hwy (US 129) (SR 115) to Wrights Ferry Rd	Alcoa	1.2	Reconstruct 2-lane to 5-lane	2034	Non-Exempt	Yes
09-249	Montvale Rd (SR 336)	Maryville City Limits (near Hill Ct) to Six Mile Rd	Blount County	2.7	Reconstruct 2-lane section with shoulders	2034	Exempt	No
13-204	Bessemer Blvd	Hall Rd (SR 35) to N Wright Rd	Alcoa	1.4	Widen 2-lane to 4-lane with raised median	2034	Non-Exempt	Yes
13-205	Bessemer Blvd	Hamilton Crossing Dr / McCammon Ave to Hall Rd (SR 35)	Alcoa	0.5	Widen 2-lane to 4-lane with raised median or center turn lane	2034	Non-Exempt	Yes
13-206	Associates Blvd	Associates LIC Project to Springbrook Rd	Alcoa	0.8	4-lane section with median	2034	Non-Exempt	Yes
13-210	N Park Blvd	Intersection at Airbase Rd	Alcoa	0.3	Realign N Park Blvd to Airbase Rd	2034	Exempt	No
13-212	Merritt Rd	E Lamar Alexander Pkwy (US 321) to Fielding Dr	Maryville	0.5	Reconstruct existing 2-lane facility with shoulders	2034	Exempt	No
13-215	Louisville Rd (SR 334)	Alcoa city limits to Topside Rd (SR 333)	Louisville	1.2	Reconstruction of 2-lane with shoulders	2034	Exempt	No

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
13-216	Louisville Rd (SR 334)	Topside Rd (SR 333) to Old Lowes Ferry Rd	Louisville	2.9	Reconstruction of 2-lane with shoulders	2034	Exempt	No
09-220	Home Ave Extension	Home Ave to Calderwood St	Alcoa/ Maryville	0.2	Extend 3-lane Home Ave through existing shopping center to line up with Lindsay St at Calderwood St.	2040	Non-Exempt	No
09-225	Hinkle Road	Sevierville Rd (SR 35) (US 411) to Burnett Station Rd	Blount County	1.9	Reconstruct 2-lane section with shoulders	2040	Exempt	No
09-243	Wilkinson Pk	Court St to Maryville City Limits	Maryville	0.9	Widen 2-lane to 3-lane (add center turn lane)	2040	Non-Exempt	No
09-247	Sam Houston School Road	Old Knoxville Hwy (SR 33) to Wildwood Rd	Alcoa/ Blount County	2.7	Widen 2-lane to 3-lane (add center turn lane)	2040	Non-Exempt	No
13-209	Bessemer Blvd	N Wright Rd to E Hunt Rd (SR 335)	Alcoa	1.1	Widen 2-lane to 4-lane with raised median or center turn lane (0.22 mi), Extension with raised median or center turn lane (0.87 mi)	2040	Non-Exempt	Yes
13-217	Louisville Rd (SR 333)	Lackey Creek Bridge	Louisville	0	Reconstruction of Lackey Creek Bridge	2040	Exempt	No
Jefferson County Projects								
09-309	Old AJ Hwy and SR 92 w/Montcastle St	Intersection at Mountcastle St	Jefferson City	0.0	Realign, Add turn lanes and Signalize Intersection	2014	Exempt	No
09-317	US 11E (SR 34)	Intersection w/ George Ave	Jefferson City	0.0	Intersection improvements	2014	Exempt	No
09-318	US 11E (SR 34)	Intersection w/ Russell Ave	Jefferson City	0.0	Intersection improvements	2014	Exempt	No
09-302	E. Main St/N. Chucky Pk	Intersections at Old AJ Hwy	Jefferson City	0.0	Realign Intersection	2024	Exempt	No
09-303	Municipal Dr	Intersection at Old AJ Hwy	Jefferson City	0.0	Add left and right turn lanes	2024	Exempt	No
09-304	Old AJ Highway	Intersection at Chucky Pk	Jefferson City	0.0	Add left and right turn lanes	2024	Exempt	No
09-307	Old AJ Highway	Mossy Creek E. of Branner Ave	Jefferson City	0.0	Replace bridge	2024	Exempt	No
09-314	SR 92	Bridge in Dandridge	Dandridge	0.6	Replace Bridge	2024	Exempt	No
09-321	US 11E (SR 34)	SR 92S to Hicks Rd	Jefferson City	1.7	Install Pedestrian Signals and Pushbutton Activation	2024	Exempt	No
09-323	US 11E (SR 34)	Intersection at Pearl Ave and at Harrington St	Jefferson City	0.0	Intersection improvement- add left turn lanes	2024	Exempt	No
13-303	US 11E at E. Old AJ Hwy	Intersection at E. Old AJ Hwy	Jefferson City	0	Signalize Intersection	2024	Exempt	No
13-304	Overlook Ave Extension	Universal St to US 11E	Jefferson City	0.1	Extension of Overlook Ave to US 11E	2024	Non-Exempt	No

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
13-305	Jefferson City Pedestrian	Various	Jefferson City	various	Pedestrian Improvements	2024	Exempt	No
13-306	ITS w/Railroad Intersections	Various	Jefferson County	0	ITS w/railroad intersections	2024	Exempt	No
13-307	SR 341	Intersection with SR 113	White Pine	0	Signalize Intersection	2024	Exempt	No
13-308	Signal Pre-emption	Various	White Pine	0	Emergency Vehicle Signal Pre-emption	2034	Exempt	No
13-301	LAMTPO Area	All Classified Roadways	Jefferson County	various	Road Resurfacing	ALL	Exempt	No
13-302	LAMTPO Area	Various	Jefferson County	various	Safety Projects	ALL	Exempt	No
Loudon County Projects								
13-403	SR 72	Intersection with Tellico Pkwy	Loudon Co	0	Install street lighting	2014	Exempt	No
09-401	Improve RR Crossing	South C Street in Lenoir City	Lenoir City	N/A	Improve at-grade RR crossing	2015	Exempt	No
13-402	Queener Rd	SR 72 to River Rd	Loudon	0.7	Widen from 15.8' to 26', drainage, reduce curves	2015	Exempt	No
09-403	Improve Streetscapes and Pavement	Various locations in Greenback	Greenback	N/A	Improve streetscapes and repair pavement	2024	Exempt	No
09-406	US 11 (SR 2)	Intersection w/ US 70 (SR 1) (Dixie Lee Junction)	Loudon County	0.2	Intersection improvements	2024	Exempt	No
09-407	US 11 (SR 2)	Intersection w/ Loudon H.S. Entr.	Loudon	0.5	Improve alignment of roadway at School	2024	Exempt	No
09-410	US 321 (SR 73)	Intersection w/ US 11 (SR 2)	Lenoir City	0.0	Intersection Improvements	2024	Exempt	No
09-414	US 11 (SR 2)	D St to Hill Ave	Lenoir City	0.8	Streetscape improvements and reduction of travel lanes in downtown area to improve pedestrian use	2024	Non-Exempt	Yes
09-415	US 11 (SR 2)	Blair Bend Rd to Lenoir City Limit (Browder Hollow Rd	Loudon County	3.8	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
09-423	US 321 (SR 73)	Simpson Rd to US 11 (SR 2)	Lenoir City	1.1	Widen 4-lane to 6-lane	2024	Non-Exempt	Yes
13-401	Simpson Rd	US 321 to Shaw Ferry Rd	Lenoir City	0.7	Widen from 18' to 26', sidewalks, and left turn lanes at select locations	2024	Exempt	No
09-416	US 11 (SR 2)	Lenoir City corporate limits (Hall St) to US 70 (Dixie Lee Junction)	Lenoir City	5.1	Widen 2-lane to 4-lane	2034	Non-Exempt	Yes
09-420	Sugar Limb Road	US 11 (SR 2) to I-75	Loudon	2.3	Widen 2-lane to 4-lane	2034	Non-Exempt	Yes
09-422	US 321 (SR 73)	I-75 to Simpson Rd	Lenoir City	1.6	Widen 4-lane to 6-lane	2034	Non-Exempt	Yes
Sevier County Projects								
13-501	Dumplin Creek Pkwy	SR 66 to Bryan Rd	Sevierville	1.5	Construct new 4-lane road	2015	Non-Exempt	Yes
09-502	Dolly Parton Pkwy (US 411) (SR 35)	Intersection w/ Veterans Blvd (SR 449)	Sevierville	0.0	Improve Intersection	2024	Exempt	No
09-503	Old Knoxville Highway	Boyds Creek Hwy (SR 338) to US 411/441 (SR 71)	Sevierville	4.2	Widen 2-lane to various 3 and 4 lane divided cross sections	2024	Non-Exempt	No
09-504	Veterans Blvd (SR 449) Extension	US 411 (SR 35) to SR 66	Sevierville	3.5	Construct new 4-lane road	2024	Non-Exempt	Yes
09-508	Chapman Hwy (SR 71) (US 441)	Boyds Creek Hwy (SR 338) to Macon Ln	Sevier County/Seymour	1.2	Add center turn lane	2024	Non-Exempt	Yes
09-509	Thomas Road Connector	Teaster Lane to Veterans Blvd (SR 449) at McCarter Hollow Rd	Pigeon Forge	1.6	Construct new 4-lane road	2024	Non-Exempt	Yes
09-510	US 411 (SR 35)	Sims Rd to Grapevine Hollow Rd	Sevier County/Jefferson County	6.2	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
09-511	Foothills Parkway	Blount County Line to US 321 (SR 73) in Wears Valley	Sevier County	2.5	Construct new 2-lane road	2024	Non-Exempt	Yes
09-512	I-40/ SR 66 Interchange	Interchange at SR 66	Sevierville	0.3	Modify Interchange to a Diverging Diamond	2024	Non-Exempt	Yes
09-513	US 321 (SR 73)	Buckhorn Rd (SR 454) to east of Pittman Center Rd (SR 416)	Sevier County	1.4	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
09-515	SR 139	SR 66 to Bryan Rd	Sevierville/TDOT	0.2	Widen 2-lane to 4-lane	2024	Non-Exempt	No
09-516	Bryan Road	E. Dumplin Valley Rd. to SR 139	Sevierville/Sevier County	2.1	Widen 2-lanes to 4-lanes	2024	Non-Exempt	No

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
09-517	I-40 (mile 408)	New Interchange Proposed near Mile Marker 408	Sevierville/Sevier County	N/A	Construct new interchange	2024	Non-Exempt	Yes
Knox County Projects								
10-696	Downtown Knoxville Wayfinding Project	Downtown Knoxville	Knoxville	0.0	Create a consistent signage system to include gateway signs, pedestrian directionals, trolley signs, etc…	2014	Exempt	No
09-613a	Cumberland Avenue (SR 1) (US 11/70)	Alcoa Hwy to 22nd St	Knoxville	0.2	Operational and Pedestrian improvements including intersection realignment, turn lanes and wider sidewalks.	2014	Exempt	No
09-623	I-140 (Pellissippi Pkwy)	I-40 to Dutchtown Rd	Knoxville	0.4	Restripe to add one lane on northbound I-140 and remove one lane from the ramp from I-40	2015	Non-Exempt	Yes
09-605	Schaad Road Extension	Middlebrook Pike (SR 169) to west of Oak Ridge Hwy (SR 62)	Knox County	4.6	Construct new 4-lane road	2024	Non-Exempt	Yes
09-607	Halls Connector	Norris Fwy (SR 71) (US 441), Emory Rd (SR 131), Maynardville Hwy (SR 33)	Knox County	0.4	Reconfigure intersections and add SB thru lane on Norris Fwy from Emory Rd to Maynardville Hwy	2024	Non-Exempt	No
09-610	Western Avenue (SR 62)	Texas Ave to Major Ave	Knoxville	0.8	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
09-611	I-640/ Broadway (SR 33) (US 441) Interchange Phase II	I-640/ Broadway (SR 33) (US 441) Interchange	Knoxville	0.0	Construct additional ramps and access improvements	2024	Non-Exempt	Yes
09-613b	Cumberland Avenue (SR 1) (US 11/70)	22nd St to 16th St	Knoxville	0.6	Pedestrian Improvements and Reduce from 4 lanes to 2 lanes with center turn lane	2024	Non-Exempt	Yes
09-615	Washington Pike	I-640 to Murphy Rd	Knoxville	1.6	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
09-616	Pleasant Ridge Rd/Merchant Dr Phase II	Knoxville City Limits (Country Brook Ln) to Merchant Dr / Pleasant Ridge Rd to Wilkerson Rd	Knoxville	1.6	Add center turn lane	2024	Non-Exempt	No
09-617	South Knoxville Waterfront Roadway Improvements	Sevier Ave / Blount Ave from Scottish Pk to James White Pkwy (SR 71)	Knoxville	1.9	Add turn lanes where needed and pedestrian and bicycle accomodations where feasible	2024	Non-Exempt	Yes
09-618	I-275 Industrial Park Access Improvements	I-275 Corridor (Blackstock Ave, Marion St, and University Ave)	Knoxville	0.5	Extend Blackstock Ave from Fifth Ave to Bernard Ave and realign Marion Sreet. Improve intersections of University Ave with W Fifth Ave and Bernard Ave.	2024	Non-Exempt	Yes
09-619	Various Railroad Crossings	Various Railroad Crossing Locations	Knoxville	N/A	Improve circuitry on vehicle protection devices of at-grade RR crossings throughout Knoxville	2024	Exempt	No

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
09-620	Cessna Road RR Crossing	Cesna Rd RR crossing	Knoxville	0.0	Improve the at-grade RR crossing at Cessna Rd	2024	Exempt	No
09-624	Cedar Bluff Road	Cross Park Dr to Peters Rd	Knoxville	0.4	Intersection and Operational Improvements	2024	Exempt	No
09-625	Schaad Road	Oak Ridge Hwy (SR 62) to Pleasant Ridge Rd	Knoxville/ Knox County	1.5	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
NEW 09-626a	Chapman Highway (SR 71) (US 441)	Blount Ave to Gov John Sevier Hwy	Knoxville/ Knox County	5.9	Operational and Safety Improvements including center-turn lanes at various locations	2024	Non-Exempt	No
NEW 09-626b	Chapman Highway (SR 71) (US 441)	Evans Rd to Burnett Ln	Knox County/Blount County	0.9	Add Center-Turn Lane	2024	Non-Exempt	No
NEW 09-626c	Chapman Highway (SR 71) (US 441)	Gov John Sevier Hwy to Macon Ln	Knox County/Blount County/Sevier County	4.4	Operational and Safety Improvements including center-turn lanes at various locations	2024	Non-Exempt	No
09-627	Alcoa Highway (SR 115) (US 129)	North of Maloney Rd to Woodson Dr	Knoxville	1.4	Widen 4-lane to 6-lane	2024	Non-Exempt	Yes
09-628	Alcoa Highway (SR 115) (US 129)	Maloney Rd to Blount/Knox County Line	Knoxville	2.3	Widen 4-lane to 6-lane	2024	Non-Exempt	Yes
09-629	I-40/75 / Campbell Station Road Interchange	Interchange w/ Campbell Station Rd	Farragut	0.0	Reconfigure existing interchange to improve safety and operations	2024	Exempt	No
09-632	Concord Road (SR 332)	Turkey Creek Rd to Northshore Dr (SR 332)	Farragut/ Knox County	0.8	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
09-633	Parkside Drive	Mabry Hood Rd to Hayfield Rd	Knox County	1.1	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
09-634	Pellissippi Pkwy (SR 162)/ Hardin Valley Road Interchange	Hardin Valley Rd Interchange at Pellissippi Pkwy (SR 162)	Knox County	0.0	Reconfigure existing interchange to improve safety and operations	2024	Exempt	No
09-635	Karns Connector	Westcott Blvd to Oak Ridge Hwy (SR 62)	Knox County	0.8	Construct New 2-lane road	2024	Non-Exempt	No
09-637	Lovell Road (SR 131)	Cedardale Ln to Middlebrook Pike (SR 169)	Knox County	1.7	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
09-638	Oak Ridge Highway (SR 62)	Schaad Rd to Byington-Beaver Ridge Rd (SR 131)	Knox County	4.2	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
09-641	Tazewell Pike (SR 131)	Emory Rd (SR 131) to Barker Rd	Knox County	1.2	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
09-642	Westland Drive	Morrell Rd to Ebenezer Rd	Knox County	2.7	Reconstruct 2-lane section	2024	Exempt	No

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
09-644	Gov John Sevier Highway (SR 168)	Alcoa Hwy (SR 115) (US 129) to Chapman Hwy (SR 71) (US 441)	Knox County	6.5	Widen 2-lane to 4-lane	2024	Non-Exempt	Yes
09-645	Northshore Drive (SR 332)	Morrell Rd to Ebenezer Rd	Knox County	3.5	Reconstruct 2-lane section	2024	Exempt	No
09-646	Northshore Drive (SR 332)	Pellissippi Pkwy (I-140) to Concord Rd (SR 332)	Knox County	4.5	Reconstruct 2-lane section	2024	Exempt	No
09-648	Pellissippi Parkway (SR 162)/ Lovell Rd (SR 131) Interchange	Lovell Rd (SR 131) Interchange at Pellissippi Pkwy (SR 162)	Knox County	0.0	Reconfigure existing interchange to improve safety and operations	2024	Exempt	No
09-649	Pellissippi Parkway (SR 162)/ Oak Ridge Highway (SR 62) Interchange	Oak Ridge Hwy (SR 62) Interchange at Pellissippi Pkwy (SR 162)	Knox County	0.0	Reconfigure existing interchange to improve safety and operations	2024	Exempt	No
09-650	Byington-Beaver Ridge Road (SR 131)	At One-Lane Railroad Underpass	Knox County	0.2	Construct new road or widen railroad underpass	2024	Non-Exempt	No
09-653	Alcoa Highway (SR 115) (US 129)	Woodson Dr to Cherokee Trail	Knoxville	1.3	Widen 4-lane to 6-lane	2024	Non-Exempt	Yes
09-656	Millertown Pike	I-640 to Mill Rd	Knoxville	0.6	Widen 2-lane and 4-lane sections to 4-lane and 6-lane sections	2024	Non-Exempt	Yes
09-662	I-75/ Merchant Dr Interchange	Merchant Dr Interchange	Knoxville	0.0	Reconfigure existing interchange to improve safety and operations	2024	Exempt	No
10-697	Central Street	Woodland Ave to Depot St	Knoxville	1.2	Road Diet and Streetscape Project, reduce from 4 lanes to 2 lanes with center turn lane	2024	Non-Exempt	No
10-699	Kingston Pike (SR 1) (US 11/70)	Intersection w/Campbell Station Rd	Farragut	0.0	Intersection improvement to add additional eastbound left turn lane	2024	Exempt	No
10-700	Campbell Station Road	Snyder Road to Yarnell Road	Farragut/Knox County	1.8	Add center turn lane	2024	Non-Exempt	No
13-601	Union Rd	Saddle Bridge Rd to Brochardt Blvd	Farragut	0.7	Reconstruct existing 2-lane facility	2024	Exempt	No
13-602	Citywide	Citywide	Knoxville	0	Upgrade signal hardware, communications, and central operating system	2024	Exempt	Yes
13-603	I-40/75	Lovell Rd (SR 131) Interchange to Campbell Station Rd Interchange	Knoxville	1.8	Add Full WB Auxiliary Lane	2024	Non-Exempt	Yes
09-630	Virtue Road	Boyd Station Rd to Kingston Pike (SR 1) (US 11/70)	Farragut	1.4	Reconstruct 2-lane section	2034	Exempt	No

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
09-631	Turkey Creek Road	Brixworth Blvd to Boyd Station Rd	Farragut	0.4	Construct new 2-lane bridge and approaches to connect roads	2034	Non-Exempt	No
09-636	Emory Road (SR 131)	Oak Ridge Hwy (SR 62) to Clinton Hwy (SR 9) (US 25W)	Knox County	5.0	Add center turn lane	2034	Non-Exempt	Yes
09-639	Strawberry Plains Pike	Gov. John Sevier Hwy (SR 168) to Moshina Rd	Knox County	1.6	Widen 2-lane to 4-lane	2034	Non-Exempt	Yes
09-640	Tazewell Pike (SR 331)	Murphy Rd to Emory Rd (SR 131)	Knox County	4.7	Widen 2-lane to 4-lane	2034	Non-Exempt	Yes
09-643	Emory Road (SR 131)	Maynardville Hwy (SR 33) to Tazewell Pike (SR 331)	Knox County	4.9	Widen 2-lane to 4-lane	2034	Non-Exempt	Yes
09-647	Pellissippi Parkway (SR 162)/Oak Ridge Highway (SR 62)	Edgemoor Rd (SR 170) to Dutchtown Rd	Knox County	6.0	Widen from 4-lane to 6-lane	2034	Non-Exempt	Yes
09-651	I-40/75/ Watt Road Interchange	Watt Rd Interchange at I-40/75	Knox County	0.0	Reconfigure existing interchange to improve safety and operations	2034	Exempt	No
09-652	I-75/ Emory Road (SR 131) Interchange	Emory Rd (SR 131) Interchange at I-75	Knoxville	0.0	Reconfigure existing interchange to improve safety and operations	2034	Exempt	No
09-654	I-640/ I-275/ I-75 Interchange	Interchange at I-640 & I-75/I-275	Knoxville	1.4	Interchange improvements to include additional through lanes on I-75 north and southbound ramps	2034	Non-Exempt	Yes
09-655	Millertown Pike	Washington Pike to I-640	Knoxville	0.6	Reconstruct 2-lane section	2034	Exempt	No
09-657	Washington Pike	Millertown Pike to I-640	Knoxville	0.6	Add center turn lane	2034	Non-Exempt	No
09-658	Northshore Drive (SR 332)	Intersection w/ Kingston Pike (SR 1) (US 11/70)	Knoxville	0.0	Intersection improvement	2034	Exempt	No
09-659	Tazewell Pike (SR 331)	Intersection w/ Old Broadway & Greenway Dr	Knoxville	0.0	Intersection improvement	2034	Exempt	No
09-660	Gleason Drive	Montvue Rd to Gallaher View Rd	Knoxville	1.0	Reconstruct 2-lane section	2034	Exempt	No
09-663	Northshore Drive (SR 332)	Lyons View Pk to Morrell Rd	Knoxville	2.2	Reconstruct 2-lane section	2034	Exempt	No
09-664	Broadway (SR 33) (US 441)	Intersection with Hall of Fame Dr	Knoxville	0.0	Intersection improvement	2034	Exempt	No
09-666	James White Pkwy Extension (SR 71)	Moody Ave to Chapman Hwy (SR 71) (US 441)	Knoxville/ Knox County	5.3	Construct new 4-lane road	2034	Non-Exempt	Yes

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
09-667	Strawberry Plains Pike	Moshina Rd to south of I-40	Knoxville/ Knox County	2.3	Widen 2-lane to 4-lane	2034	Non-Exempt	Yes
09-668	Kingston Pike (SR 1) (US 11/70)	Smith Rd to Campbell Station Rd	Farragut	1.4	Widen 4-lane to 6-lane	2034	Non-Exempt	Yes
09-671	Central Avenue Pike	Beaver Creek Dr to Emory Rd (SR 131)	Knox County	2.3	Reconstruct 2-lane section	2034	Exempt	No
09-672	Dante Road	Central Avenue Pike to Dry Gap Pk	Knox County	2.1	Reconstruct 2-lane section	2034	Exempt	No
09-673	Oak Ridge Highway (SR 62)	Byington-Beaver Ridge Rd (SR 131) to Pellissippi Pkwy (SR 162)	Knox County	4.2	Widen 2-lane to 4-lane	2034	Non-Exempt	Yes
09-674	Westland Drive	Northshore Dr (SR 332) to Pellissippi Pkwy (I-140)	Knox County	1.7	Reconstruct 2-lane section	2034	Exempt	No
09-675	Maryville Pike (SR 33)	Gov. John Sevier Hwy (SR 168) to Blount County Line	Knox County	1.2	Reconstruct 2-lane section	2034	Exempt	No
09-676	Emory Road (SR 331)	Tazewell Pike (SR 131) to Grainger County Line	Knox County	7.8	Reconstruct 2-lane section	2034	Exempt	No
09-678	Gleason Drive	Gallaher View Rd to Ebenezer Rd	Knox County	1.1	Add center turn lane	2034	Non-Exempt	No
09-661	I-75/ Callahan Rd Interchange	Callahan Rd Interchange	Knoxville	0.0	Reconfigure existing interchange to improve safety and operations	2040	Exempt	No
09-669	Everett Road	Proposed Synder Rd Extension to Kingston Pk (SR 1) (US 11/70)	Farragut	2.1	Reconstruct 2-lane section	2040	Exempt	No
09-677	Gov John Sevier Highway (SR 168)	Chapman Hwy (SR 71) (US 441) to Asheville Hwy	Knox County	9.2	Widen 2-lane to 4-lane	2040	Non-Exempt	Yes
09-679	I-75/ Raccoon Valley Rd Interchange	Raccoon Valley Rd Interchange at I-75	Knox County	0.0	Reconfigure existing interchange to improve safety and operations	2040	Exempt	No
09-681	Raccoon Valley Road (SR 170)	Norris Frwy (SR 71) (US 441) to I-75	Knox County	2.0	Reconstruct 2-lane section	2040	Exempt	No
09-682	Tazewell Pike (SR 131)	Barker Rd to Union County Line	Knox County	3.1	Reconstruct 2-lane section	2040	Exempt	No
09-683	McFee Road/ Harvey Road	McFee Rd to Harvey Rd over railroad	Knox County/ Farragut	0.6	Construct new road or widen railroad underpass	2040	Non-Exempt	Yes
09-685	Vanosdale Road	Buckingham Rd to Middlebrook Pike (SR 169)	Knoxville	0.9	Add center turn lane	2040	Non-Exempt	No
09-686	Cedar Lane	East of Central Avenue Pike to Inskip Rd	Knoxville	1.0	Add center turn lane	2040	Non-Exempt	No

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Exempt Status	Regionally Significant
09-687	Moody Avenue	Chapman Hwy (SR 71) (US 441) to Maryville Pike (SR 33)	Knoxville	0.4	Construct new 2-lane road w/ center turn lane	2040	Non-Exempt	No
09-688	Morrell Road	Westland Dr to Northshore Dr (SR 332)	Knoxville	0.9	Add center turn lane	2040	Non-Exempt	Yes
09-689	Papermill Road	Kingston Pike (SR 1) (US 11/70) to Weisgarber Rd	Knoxville	0.6	Add center turn lane	2040	Non-Exempt	Yes
09-690	Woodland Avenue	Central St to Huron St	Knoxville	0.6	Add center turn lane	2040	Non-Exempt	Yes
09-691	I-40/75	I-40/I-75 Interchange to Lovell Rd (SR 131) Interchange	Knoxville/ Farragut/ Knox County	6.7	Widen 6-lane to 8-lane	2040	Non-Exempt	Yes
09-692	I-75	Emory Rd (SR 131) to Raccoon Valley Rd (SR 170) Interchange	Knoxville/ Knox County	4.8	Widen 4-lane to 6-lane	2040	Non-Exempt	Yes
09-693	I-40	I-40 at Gov. John Sevier Hwy (SR 168) Interchange	Knox County	0.0	New Interchange	2040	Non-Exempt	Yes

Appendix K-K: Existing Plus Committed Project List

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Comments	Regionally Significant
N/A	Town Creek Pkwy	U.S. 321 to Kingston St	Lenoir City	1.3	New 4-lane median divided roadway	2014	Local & State Funded, Under construction Spring 2013	No
09-102	SR 29	Pine Ridge Rd to SR 61	Harriman/Roane County	0.8	Widen 2-lane to 4-lane	2014	E+C, Totally Funded	Yes
09-201	East Bessemer Street	Intersection w/ E Watt St	Alcoa	0.0	Realign intersection	2014	E+C, Complete	No
09-203	Old Knoxville Hwy (SR 33)	Hunt Rd (SR 335) to Pellissippi Pkwy (SR 162)	Alcoa	0.5	Widen 2-lane to 4-lane w/center turn lane	2014	E+C, Under Construction	Yes
09-206	US 129 Bypass (SR 115)	Intersection with Louisville Rd (SR 334)	Alcoa	0.0	Intersection improvements	2014	E+C, Funded through Safety	No
09-261	Hall Road (SR 35)	Intersection with Alcoa South Plant Entrance	Alcoa	0.0	Add southbound left turn lane	2014	E+C	No
09-301	Chucky Pike	Intersection at US 11E (SR 34)	Jefferson City	0.0	Intersection improvement- add turn lanes and modify signal	2014	E+C, Under contract	No
09-305	Odyssey Rd	Intersection at US 11E (SR 34)	Jefferson City	0.0	Add left and right turn lanes	2014	E+C, Under contract	No
09-306	Odyssey Rd	US 11E (SR 34) to Bridge over RR	Jefferson City	0.9	Add center turn lane, Provide a 3-lane section	2014	E+C, Under contract	No
09-313	SR 66 Relocation	North of I-81 at SR 341 to SR 160	Jefferson County	3.1	Construct new 4-lane road	2015	E+C	Yes
09-315	SR 92	US 11E to Hinchey Hollow Rd	Jefferson City	2.3	Install street lighting	2014	E+C, Complete	No
09-319	US 11E (SR 34)	SR 92 to Morristown City Limit	Jefferson City	4.8	Install street lighting	2014	E+C, Complete	No
09-320	US 11E (SR 34)	All signalized intersections	Jefferson City	0.0	LED signal head replacements	2014	E+C, Under contract	No
09-322	US 11E (SR 34)	SR 92S to Odyssey Rd	Jefferson City	0.5	Signal Coordination	2014	E+C, Under contract	No
09-324	US 411/ US 25W (SR 35)	Grapevine Hollow Rd to 4-lane section of SR 9	Jefferson County	5.6	Widen 2-lane to 4-lane	2014	E+C, Under contract	Yes
09-325	I-40/ I-81 Interchange	I-40/ I-81 Interchange	Jefferson County	0.1	Safety Improvements to increase length of acceleration ramps	2014	E+C, Under contract	No
09-326	Old AJ Highway	Railroad Crossing	Jefferson City	0.0	Bridge replacement	2014	E+C, Under contract	No
09-400	Harrison Road	From Kingston St toGlenfield Dr-(approx. 2,000 ft.)	Lenoir City	~~1.3~~ 0.4	Intersection improvements and reconstruct 2-lane section	2014	E+C, Spring 2013 Construction	No
09-402	Improve Streetscapes and Pavement	Various locations in Loudon County	Loudon County	N/A	Improve streetscapes and repair pavement	2014	E+C	No
09-404	Unitia Rd	Unitia Rd Bridge	Loudon County	0.0	Replace Bridge	2014	E+C, Complete	No
09-405	US 11 (SR 2)	Intersection w/ Shaw Ferry Rd	Loudon County	0.0	Intersection improvements	2014	E+C, Complete	No
09-408	US 321 (SR 73)	I-75 Interchange to Simpson Rd	Lenoir City	1.6	Intersection Improvements from Corridor Study	2014	E+C	No
09-409	US 321 (SR 73)	US 11 (SR 2) to east of Little Tennessee River	Loudon County	1.7	Construct 4-lane road on existing and new alignment	2015	E+C, Under Construction	Yes
09-411	Veteran's Memorial Bridge	Veteran's Memorial Bridge	Loudon	N/A	Install lighting	2014	E+C, Complete	No
09-505	Birds Creek Road (SR 454)	Glade Rd to SR 416	Sevier County	4.6	Reconstruct 2-lane section	2014	E+C, Complete	No
09-506	SR 66	North of Nichols St to Boyds Creek Hwy (SR 338)	Sevierville/Sevier County	4.2	Widen 4-lane to 6-lane	2014	E+C, Complete	Yes
09-507	SR 66	Douglas Dam Rd (SR 139) to I-40	Sevierville/Sevier County	2.0	Widen 4-lane to 6-lane	2014	E+C, Under Construction	Yes

KRMP ID #	Route	Termini	Jurisdiction	Length (miles)	Type of Improvement	New Horizon Year	Comments	Regionally Significant
09-514	SR 66	Boyds Creek Hwy (SR 338) to Douglas Dam Rd (SR 139)	Sevierville/Sevier County	2.1	Widen 4-lane to 6-lane	2014	E+C, Under Construction	Yes
09-600	Old Stage Road/Watt Road Extension	Old Stage Rd. from Johnson's Corner Rd. to Town Limits, Watt Road from Old Stage Rd. to Kingston Pk (SR 1) (US 11/70)	Farragut	0.8	Improve Old Stage Road to 2-lane road with sidewalk from Johnson's Corner Rd to western Town limits and Extend Watt Road from Old Stage to SR-1 with three lanes, sidewalk, curb & gutter	2014	E+C	No
09-601	Campbell Station Road	Jamestown Blvd to Parkside Dr/ Grigsby Chapel Rd	Farragut	0.9	Widen 2-lane to 4-lane w/center turn lane	2014	E+C, Complete	Yes
09-602	Outlet Drive	Lovell Rd (SR 131) to Campbell Station Rd	Farragut/Knox County	0.5	Construct new 2-lane road w/center turn lane along existing and new alignment	2014	E+C, Under Construction	No
09-603	Emory Road (SR 131)	Clinton Hwy (SR 9) (US 25W) to Gill Rd	Knox County	2.9	Widen 2-lane to 4-lane w/center turn lane	2014	E+C, Under Construction	Yes
09-604	Maynardville Hwy (SR 33)	Temple Acres Dr to Union County Line	Knox County	5.9	Widen 2-lane to 4-lane	2014	E+C, Construction Soon	Yes
09-608	Lovell Road (SR 131)	Pellissippi Pkwy (SR 162) SB Ramps to Schaeffer Rd	Knox County	0.2	Widen 2-lane to 4-lane w/center turn lane	2014	E+C, Complete	Yes
09-609	Emory Rd (SR 131)	Intersection w/Tazewell Pk (SR 331)	Knox County	0.0	Intersection improvement	2014	E+C, Construction Soon	No
09-612	Western Avenue (SR 62)	Schaad Rd to I-640	Knoxville	3.7	Widen 2-lane to 4-lane w/center turn lane	2014	E+C, Under Construction	Yes
09-614	Henley Street Bridge (SR 33/71) (US 441)	Bridge over Tennessee River	Knoxville	0.4	Rehabilitate bridge & add bike lanes	2014	E+C, Under Construction	No
09-621	I-40/75	From I-140 to Lovell Rd (SR 131) Interchange Westbound Direction	Knoxville	1.0	Add full auxiliary lane westbound between interchanges (approx 2,700 ft)	2014	E+C, Totally Funded	Yes
09-622	I-40/75 at Weigh Station	Eastbound and Westbound Truck Weigh Stations	Knoxville	0.1	Extend on and off ramps at weigh stations	2014	E+C, Totally Funded	No
09-694	I-140 (Pellissippi Pkwy)/Northshore Dr (SR 332) Interchange	I-140 EB Off Ramp to Northshore Dr (SR 332)	Knoxville	0.2	Construct new slip ramp from existing off ramp to serve the Northshore Town Center Development	2014	E+C, Complete	Yes
09-695	Dutchtown Road	Murdock Rd to E of Pellissippi Pkwy southbound ramps	Knox County	0.3	Widen to 4-lanes with center turn lane, add eastbound decel lane at Pellissippi ramps	2014	E+C, Complete	No
09-698	Kingston Pike (SR-1)(US 11/70)	Intersection w/Everett Rd	Farragut	0.3	Intersection Improvements to include center turn lane and traffic signal	2014	E+C, Under Construction	No

Appendix K-L: KRTPO FY 2011-2014 TIP Project List

TIP #	LRTP #	Horizon Year	PROJECT NAME
2011-001 Rev 0	09-618	2024	Access Improvements to I-275 Business Park
2011-002 Rev 1	09-653	2024	Alcoa Hwy (SR-115 / US-129)
2011-003 Rev 2	09-216	2024	Alcoa Hwy (SR-115 / US-129)
2011-004 Rev 0	09-628	2024	Alcoa Hwy (SR-115 / US-129)
2011-005 Rev 0	09-218	2024	Alcoa Hwy (SR-115 / US-129)
2011-006 Rev 0	09-208	2024	Blount County Streetscape Improvements
2011-007 Rev 0	09-683	2040	Boyd Station Rd, McFee Rd, Harvey Rd Underpass
2011-010 Rev 1	13-834	2014	Kingston Pk Greenway in Farragut
2011-011 Rev 0	13-849	2024	Second Creek Greenway in Knoxville
2011-012 Rev 0	09-406	2024	Dixie Lee Junction (US 11 and US 70)
2011-013 Rev 2	10-696	2014	Downtown Knoxville Wayfinding Project
2011-014 Rev 1	Consistent		Ebenezer Rd / N Westland Dr Intersection
2011-015 Rev 0	09-202,09-238	2024, 2034	Robert C Jackson Dr Extension
2011-016 Rev 2	09-621	2014 (E+C)	I-40 Auxiliary Lane
2011-017 Rev 3	09-622	2014 (E+C)	I-40 Weigh Station Ramp Extension
2011-018 Rev 1	09-611	2024	I-640, Broadway Modifications
2011-019 Rev 0	09-620	2024	Cessna Rd Railroad Improvements
2011-020 Rev 0	09-613	2024	Cumberland Ave (US-70/11 and SR-1)
2011-021 Rev 1	09-632	2024	Concord Rd
2011-022 Rev 0	09-666	2034	James White Pwy (SR 71)
2011-024 Rev 1	Complete		Papermill Bluff Greenway
2011-025 Rev 0	09-232	2024	Pellissippi Pwy (SR-162) Extension
2011-026 Rev 0	09-619	2024	Railroad Crossing Improvements - Knoxville
2011-027 Rev 0	09-401	2015	Railroad Crossing Improvements - Lenoir City
2011-028 Rev 0	09-619	2024	Railroad Crossing Improvements - Knoxville
2011-029 Rev 0	09-214	2024	Sevierville Rd Reconstruction
2011-030 Rev 0	09-211	2024	Morganton Rd Roadway Improvement
2011-031 Rev 2	10-697	2024	N Central St Road Diet and Streetscape Project
2011-032 Rev 1	09-617	2024	Blount Ave / Sevier Ave Corridor Improvements
2011-033 Rev 0	13-850	2024	South Waterfront Riverwalk: Shoals Promenade
2011-034 Rev 0	10-261	2014 (E+C)	Hall Rd (SR-35) at ALCOA South Plant Entrance
2011-035 Rev 1	09-508	2024	Chapman Hwy (SR-71) Improvements
2011-036 Rev 2	09-410	2024	US 321 (SR 73) and Hwy 11 (SR 2)
2011-037 Rev 0	09-257	2024	SR 115 / US 129 (Alcoa Hwy)
2011-038 Rev 0	09-614	2014 (E+C)	SR 33 (Henley St bridge)
2011-040 Rev 0	09-612	2014 (E+C)	SR-62 (Western Ave) Widening
2011-041 Rev 0	09-402	2014 (E+C)	Streetscape / Pavement Repair in Lenoir City
2011-042 Rev 0	Consistent		Tazewell Pk / Beverly Rd Intersection
2011-043 Rev 0	13-852	2024	Tennessee River Pedestrian Crossing
2011-044 Rev 0	09-408	2014 (E+C)	US-321 (SR-73) corridor improvements
2011-045 Rev 1	09-610	2024	Western Ave (SR 62)

TIP #	LRTP #	Horizon Year	PROJECT NAME
2011-046 Rev 2	09-698	2014 (E+C)	Kingston Pk/Everett Rd Intersection Improvements
2011-047 Rev 0	09-616	2024	Pleasant Ridge Rd
2011-048 Rev 1	E+C	Complete	Pleasant Ridge Rd
2011-049 Rev 1	09-615	2024	Washington Pk
2011-050 Rev 1	10-700	2024	Campbell Station Rd Widening
2011-051 Rev 0	10-699	2024	Kingston Pk/Campbell Station Rd Intersection Improvements
2011-052 Rev 1	09-600	2014 (E+C)	Watt Rd Extension and Old Stage Rd Improvements
2011-053 Rev 4	09-409	2015 (E+C)	US-321/SR-73 - New Bridge
2011-054 Rev 1	Consistent		I-140 (Pellissippi Pwy)
2011-055 Rev 0	09-603	2014 (E+C)	SR-131 (Emory Rd)
2011-056 Rev 1	10-259	2014	McCammon Ave Relocation
2011-057 Rev 0	13-602	2024	Traffic Control Equipment Upgrade - Knoxville
2011-058 Rev 0	Consistent		I-40/I-75 Interchange Traffic Cameras
2011-059 Rev 1	13-837	2014	Knox/Blount Greenway - Phase I
2011-060 Rev 0	13-863	2015	Knox/Blount Greenway - Phase II
2011-061 Rev 0	Consistent		Pellissippi Place Greenway - Phase I
2011-062 Rev 0	Consistent		Halls Greenway - Phase II
2011-063 Rev 1	Consistent		Lenoir City Downtown Streetscape
2011-064 Rev 0	Consistent		Broadway (Knoxville) Signal Timing Optimization Program
2011-065 Rev 0	Consistent		Kingston Pike (Knoxville) Signal Timing Optimization Program
2011-066 Rev 1	Consistent		East Knoxville Sidewalk Improvements
2011-067 Rev 0	Consistent		Millertown Pike and Mill Rd Intersection improvements
2011-068 Rev 0	Consistent		Signal System Communications Master Plan and Signal Timing Optimization Program
2011-069 Rev 1	Consistent		Adesa Boulevard
2011-070 Rev 2	Consistent		Browder Hollow Rd
2011-071 Rev 0	Complete		Pleasant Ridge Rd
2011-072 Rev 0	Consistent		Knoxville Regional ITS Architecture Update
2011-073 Rev 0	13-855	2024	First Creek Greenway - Fulton to Edgewood
2011-074 Rev 0	Consistent		Ramsey House Transportation Exhibit
2011-075 Rev 0	Consistent		Jackson Avenue, Bridges over ramp to Gay St.
2011-076 Rev 0	Consistent		Creekwood Park Blvd Sidewalk and Lighting Improvements
2011-077 Rev 1	09-400	2014 (E+C)	Harrison Rd
2011-078 Rev 0	Consistent		Traffic Equipment Control Upgrade Hardin Valley / Pellissippi Pkwy
2011-079 Rev 0	09-604	2014 (E+C)	Maynardville Hwy (Temple Acres Dr. to Union County line)
2011-080 Rev 0	Consistent		Communications Study & Signal Timing Optimization
2011-081 Rev 3	09-609	2014 (E+C)	Tazewell Pk (SR-331) and Emory Rd (SR-131) Intersection Improvements
2011-082 Rev 0	09-262	2024	SR-336 Montvale Rd (from Montvale Station Rd to Lamar Alexander Pkwy)
2011-083 Rev 1	Consistent		University of Tennessee Joint Institute for Advanced Materials
2011-084 Rev 0	09-607	2024	Halls Connector Roadway Improvements
2011-085 Rev 1	Consistent		Knoxville Smartway ITS Expansion
2011-086 Rev 1	Consistent		Knoxville Smartway ITS Communications Upgrade

TIP #	LRTP #	Horizon Year	PROJECT NAME
2011-087 Rev 0	Consistent		City of Knoxville greenway corridor feasibility and assessment
2011-200 Rev 6	Transit Section		KAT Section 5307 Transit Funds
2011-201 Rev 0	Transit Section		Section 5309 - CAC
2011-202 Rev 0	Transit Section		CAC 5310 Funds
2011-203 Rev 0	Transit Section		Section 5317 New Freedom - TPO/MPC
2011-204 Rev 0	Transit Section		Section 5309 Bus Purchase / Technology
2011-205 Rev 0	Transit Section		5316 - Job Access Reverse Commute - TPO/MPC
2011-206 Rev 0	Transit Section		Section 5310 Elderly and Disabled Program (Non-Profits and Local Governments)
2011-207 Rev 0	Transit Section		Vehicle and/or Technology Systems Purchase
2011-208 Rev 0	Transit Section		Transit Center in Knoxville
2011-209 Rev 0	Transit Section		KAT Facility Upgrade
2011-210 Rev 0	Transit Section		ADA Paratransit Vehicles - KAT
2011-211 Rev 0	Transit Section		Purchase KAT Vehicles
2011-212 Rev 0	Transit Section		Purchase KAT Vehicles
2011-213 Rev 0	Transit Section		Neighborhood Service Vehicle Purchase - KAT
2011-214 Rev 0	Consistent		Pilot Locomotive Diesel Retrofit Project
2011-215 Rev 3	Consistent		Smart Trips Program
2011-216 Rev 0	Consistent		Bicycle Parking Program
2011-217 Rev 0	Consistent		Car Share Program
2011-218 Rev 0	Consistent		KAT Transit Vehicles
2011-219 Rev 0	Transit Section		Replacement Trolley Bus
2011-220 Rev 1	Transit Section		Purchase shop equipment
2011-221 Rev 1	Transit Section		Purchase ADP hardware
2011-222 Rev 0	Transit Section		Purchase ADP software
2011-223 Rev 1	Transit Section		Acquire support vehicles
2011-224 Rev 3	Transit Section		Acquire support equipment
2011-225 Rev 3	Transit Section		Preventive maintenance
2011-226 Rev 3	Transit Section		Non-fixed route ADA paratransit
2011-227 Rev 3	Transit Section		Purchase bus shelters
2011-228 Rev 0	Transit Section		Purchase pedestrian access/walkways
2011-229 Rev 0	Transit Section		Purchase signage
2011-230 Rev 2	Transit Section		Program support and administration
2011-231 Rev 0	Transit Section		KAT Transit Vehicles - CMAQ Awarded Funds from TDOT
2011-232 Rev 0	Transit Section		Purchase LIFT vans
2011-233 Rev 0	Transit Section		Rehab/Renovate Maintenance Facility
2011-234 Rev 0	Transit Section		Short Range Transit Planning
2011-235 Rev 0	Transit Section		Real estate acquisition
2011-300 Rev 0	Consistent		Bridge Bond Bucket
2011-301 Rev 1	Consistent		Bridge Replacement Cost Overruns - Local
2011-302 Rev 0	Consistent		Bridge Replacement - Local
2011-303 Rev 0	Consistent		Bridge Replacement - State

TIP #	LRTP #	Horizon Year	PROJECT NAME
2011-304 Rev 2	Consistent		Bridge Replacement Cost Overruns - State
2011-305 Rev 1	Consistent		Enhancement Program Projects
2011-306 Rev 1	Consistent		Freeway Service Patrols
2011-307 Rev 2	Consistent		Highway Safety Improvement Program
2011-308 Rev 0	Consistent		IM - Project Contingency Overruns
2011-309 Rev 0	Consistent		IM - Project Cost Overruns
2011-310 Rev 2	Consistent		Interstate 3R Improvements
2011-311 Rev 3	Consistent		Knoxville ITS (Operations)
2011-314 Rev 1	Consistent		NHS - Project Contingency Overruns
2011-315 Rev 2	Consistent		NHS - Project Cost Overruns
2011-316 Rev 1	Consistent		Project Contingency Overruns
2011-317 Rev 1	Consistent		Project Cost Overruns
2011-318 Rev 1	Consistent		Rockfall Mitigation Program (I-75)
2011-319 Rev 0	Consistent		Safe Routes to School Projects
2011-320 Rev 5	Consistent		Spot Safety Improvement Program
2011-321 Rev 5	Consistent		State Route 3R Improvements
2011-322 Rev 1	Consistent		STP Project Contingency Overruns - State
2011-323 Rev 0	Consistent		STP Project Cost Overruns - State
2011-323 Rev 1	Consistent		STP Project Cost Overruns - State
2011-324 Rev 0	Consistent		CMAQ Cost Overruns

Appendix K-M: LAMTPO FY 2011-2014 TIP Project List

Note: Jefferson County Projects only are shown

TIP #	LRTP #	Horizon Year	PROJECT NAME
2045	09-320	2014 (E+C)	11E LED traffic signal replacements
2074	13-301		Chucky Pike resurfacing
2075	13-301		Mountcastle Ave resurfacing
2076	13-301		Old AJ Hy resurfacing
14	09-306	2014	Odyssey Road resurfacing restriping for 3 lanes
55	09-326	2014 (E+C)	Old AJ Hy bridge replacement
16, 17	09-309	2014	Old AJ Hy realignment
2077	Consistent		Argicultural Park Blvd resurfacing
45008	Consistent		School safety study
10	09-301	2014 (E+C)	Chucky Pike / 11E Intersection improvements
18	09-306	2014 (E+C)	Odyssey Rd
2043	09-317	2014	11E/ George av intersection
2044	09-318	2014	Russell Av and 11E Intersection Improvements
	Consistent		Operations/ Safety/ ITS bucket
	Consistent		STP bucket (cost overruns)
7002	13-301		road resurfacing
7005	13-301		wayfinding signs
11	13-301		George Av resurfacing
12	13-301		russell aa resurfacing
13	13-301		w rhoten st resurfacing
17	13-301		w college st resurfacing
4016	Consistent		school safety projects
4017	Consistent		Pedestrain trail
4015	Consistent		Safe Routes to Schools project

MEMORANDUM OF AGREEMENT
Between the Tennessee Department of Transportation (TDOT), the Knoxville Regional Transportation Planning Organization (TPO) and the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) for the development of the Transportation Conformity Determination(s) under the 8-Hour Ozone and Particulate Matter 2.5 Standards

I. PURPOSE

This Memorandum of Agreement (MOA) is for the purpose of conducting cooperative planning and analysis of, and determining transportation conformity for, all transportation projects outside the TPO metropolitan planning area, but within the nonattainment or maintenance area.

II. BACKGROUND

A. The U.S. Environmental Protection Agency (EPA) has designated the Knoxville Nonattainment Area for ozone as being the counties of Anderson, Blount, Jefferson, Loudon, Knox, Sevier and a portion of Cocke County. This ozone nonattainment became effective on June 15, 2004.

B. The EPA designated the Knoxville Nonattainment Area for Particulate Matter less than 2.5 microns in diameter (PM 2.5) as being the counties of Anderson, Blount, Knox, Loudon and a portion of Roane County. This PM 2.5 nonattainment became effective on April 5, 2005.

C. The above nonattainment areas include, and are larger than, the TPO planning area. In addition, a portion of the Ozone Nonattainment Area in Jefferson County lies within the jurisdiction of the LAMTPO planning area.

D. 23 CFR 450.310(f) states that if the metropolitan planning area does not include the entire nonattainment or maintenance area, there shall be an agreement among the state department of transportation, state air quality agency, affected local agencies and the metropolitan planning organizations describing the process for cooperative planning and analysis of all projects outside the metropolitan planning area but within the nonattainment or maintenance area. The agreement also must indicate how the total transportation-related emissions for the nonattainment or maintenance area, including areas both within and outside the metropolitan planning area, will be treated for the purposes of determining conformity in accordance with the US Environmental Protection Agency (EPA) conformity regulation. The agreement shall address policy mechanisms for resolving conflicts concerning transportation-related emissions that may arise between the metropolitan planning area and the portion of the nonattainment or maintenance area outside the metropolitan planning area.

E. Tennessee has a State Transportation Conformity Rule (1200-3-34-.01), which applies to designated nonattainment and maintenance areas and implements the requirements of the federal transportation conformity rule (40 CFR Part 93, Subpart A) concerning several of the requirements in part D above. This MOA is intended to only address the assumption of the responsibility by the TPO for completing conformity analyses/determinations for the entire Knoxville Nonattainment Area.

F. The TPO, TDOT and LAMTPO have come to an agreement that the TPO will perform the air quality analyses and conformity determinations for the entire nonattainment area based primarily on the factors that the TPO has previous experience with preparing conformity determinations and maintains a travel demand forecasting model that covers the majority of the nonattainment areas. Thus, the TPO is in the best position to develop projections of future traffic demand and air quality impacts of proposed transportation projects in a holistic manner.

III. RESPONSIBILITIES

A. TPO:

1. The TPO, in coordination with TDOT and other affected agencies will prepare the transportation conformity analysis for the entire nonattainment area which will comply with the applicable requirements of 40 CFR Part 93. If analysis requirements for the non-TPO area are not specific, clear or well defined, the interagency consultation process will be used to determine appropriate analysis procedures.
2. The TPO will facilitate meetings of the Interagency Consultation Group as necessary in order to define the specific processes and adhere to schedules required to complete the conformity determination within the appropriate timelines to ensure that the area does not enter a conformity lapse.
3. The TPO will be responsible for the development of a comprehensive and multimodal "Urban Long Range Transportation Plan (LRTP)" that identifies a fiscally constrained transportation project listing for the TPO planning area, which is comprised of urbanized portions of Knox, Blount, Loudon and Sevier counties.
4. The TPO will be responsible for development of a "Regional LRTP" that identifies a single listing of transportation projects for each nonattainment area (for both PM2.5 and ozone). The Regional LRTP will include input from TDOT on projects in the non-urban counties.
5. The TPO will provide for public input opportunities on both the Urban and Regional LRTPs and accompanying conformity analysis.

B. TDOT:

1. TDOT, in coordination with local affected agencies, is responsible for the development of a transportation project listing on state-funded roadway system for the non-urbanized portions of the nonattainment area at appropriate horizon years to be compatible with the conformity analysis.
2. TDOT will provide for public involvement opportunities within the non-urbanized portions of the nonattainment area.

C. LAMTPO:

1. LAMTPO will provide to the TPO a list of fiscally constrained transportation projects that result from a LRTP prepared for the Lakeway Area planning boundary that are within Jefferson County with projects listed in the appropriate horizon years to be compatible with the conformity analysis.

IV. PROCEDURAL CONSIDERATIONS

A. Data Sources:

1. Travel Demand Model – The TPO will maintain a validated travel demand forecasting model in order to project future vehicle miles of travel within the nonattainment area for purposes of determining conformity of the transportation projects that are proposed. If, through the interagency consultation process, a project is determined to be regionally significant but not included in the model then appropriate off model data forecasting methodologies will be pursued.
2. Off Model Projections – Highway Performance Monitoring System (HPMS) and traffic count data will be used to develop future projections of travel along with other assumptions agreed upon through the interagency consultation process in order to determine conformity of projects in geographic areas unrepresented in the regional travel demand forecasting model such as the portion of Cocke County.

B. Conformity Submittal Protocol:

1. The TPO will develop a single conformity determination for the entire nonattainment area on an as needed basis, which will support both the Knoxville Regional TPO and the LAMTPO Long Range Transportation Plans and Transportation Improvement Programs.

2. The TPO will submit the conformity determination to the Federal Highway Administration and the Federal Transit Administration for their review and approval concurrent with EPA.
3. The LAMTPO will include the ozone conformity determination documentation within their transportation plans as an appendix.

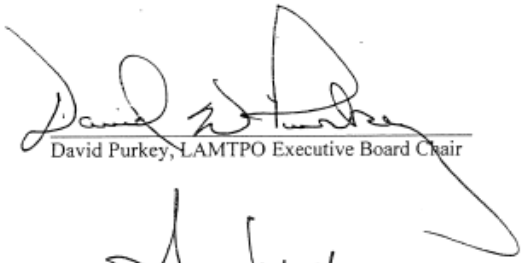
V. AGREEMENT TERMS

A. This MOA shall remain in effect as long as each of the parties is in agreement with its terms. The interagency consultation process shall be used for revision of the MOA as necessary.

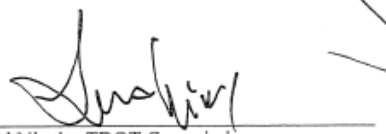
VI. SIGNATORIES

The following signatory parties do hereby agree to comply with the provisions and terms of this MOA.

Bill Haslam, TPO Executive Board Chair



David Purkey, LAMTPO Executive Board Chair



Gerald Nicely, TDOT Commissioner

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prepared by

KNOXVILLE REGIONAL TPO TRANSPORTATION PLANNING ORGANIZATION

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