Moving Forward
Public Transportation in Tennessee

Part I: Land Use and Transportation Planning

Tennessee Advisory Commission
on Intergovernmental Relations

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The Tennessee Advisory Commission on Intergovernmental Relations

226 Capitol Boulevard Building ● Suite 508 ● Nashville, Tennessee 37243
Phone: 615.741.3012 ● Fax: 615.532.2443
E-mail: tacir@tn.gov ● Website: www.tn.gov/tacir

Moving Forward:
Public Transportation in Tennessee

Principal Author:

Reem Abdelrazek, M.P.A.
Senior Research Associate

Other Contributing Staff:

Cliff Lippard, M.P.A.
Associate Executive Director

❖

Elizabeth Swartz, Ph.D.
Contributing Author

❖

Stanley Chervin, Ph.D.
Senior Research Associate

❖

Teresa Gibson
Web Development & Publications Manager

❖

Harry A. Green, Ph.D.
Executive Director

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Purpose

This report is a staff-generated TACIR report written in response to the rapid expansion in federal spending on transportation as part of the stimulus package. It is part one of a four-part series on transportation and land use. This series is included under the broader category of growth policy and infrastructure, which is part of TACIR's fiscal year 2010 work program. The work program was approved by the TACIR Commission on June 30, 2009.

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EXECUTIVE SUMMARY

There is a growing need and demand across Tennessee for sustainable, fundable, multimodal transportation options that include traditional highway traffic and public transit options. With changing travel patterns, billions of dollars being spent on transportation yearly, and federal stimulus dollars supplementing those funds, a perfect storm is brewing to transform attitudes about public transportation.

Tennessee cannot wait on the federal government or other state governments to pave the way to its future. Although the federal government recently changed how transportation projects are awarded funds,[1] giving public transportation policy a needed boost, now is the time to critically assess and improve the state's transportation systems to secure Tennessee's place in the global economy. As suitably stated in a Hudson Institute report on the nation's transportation future, a transportation system "is a necessary element in maintaining national economic competitiveness in a world where the value of saving time and money when it comes to moving people and goods grows by leaps and bounds."[2]

With changing travel patterns, billions of dollars being spent on transportation yearly, and federal stimulus dollars supplementing those funds, a perfect storm is brewing to transform attitudes about public transportation.

SUMMARY OF FINDINGS

While Tennessee has always prided itself on having some of the best roads in the nation and a pay-as-you-go funding method, long range transportation planning only became a focus of the state Department of Transportation in the last ten years. In 2005, the Tennessee Department of Transportation (TDOT) published its first long range transportation plan that outlined a 25-year vision for the state's transportation systems. This was an important first step toward modernizing Tennessee's transportation system and expanding public transportation services. There are 28 public transit systems serving residents across the state, and in 2007 almost 33 million passenger trips were made using public transportation.

[1] Lambert (2010).
[2] Giglio (2005).

Data from TDOT's State Transportation Improvement Program and the 11 statewide metropolitan planning organizations show more than $570 million is needed for urban and rural transit. If public ridership continues to grow at its current rate, the cost will reach $580 million by 2011. That figure may seem small in relation to the $130 billion TDOT estimates is needed over the next 25 years for transportation investments (updating old structures and systems, repairing or replacing damaged and deteriorated structures and systems, and purchasing new materials and technology), but in a tight economy with decreased revenue (and increased demand) every dollar counts. TACIR's 2010 annual infrastructure needs report estimates over $18 billion is needed for transportation infrastructure improvements.

The way people travel is changing, both in the method of transportation and the types of trips they are making.

The way people travel is changing, both in the method of transportation and the types of trips they are making. Non-work trips now surpass work trips, which is the reverse of a long-standing national trend. Additionally, the county in which people live and work is not always the same. In 32 counties, county residents account for less than 50% of the county workforce. These travel trends present a challenge to policy makers and transportation planners. Thirty percent of the state's urban roads are already congested, a situation that will be further exacerbated by the state's growing population. It is projected that Tennessee's population will reach more than 7.5 million by 2025, 20% of whom will be 65 years and older.

While public transportation in one form or another is available to residents in every county, there are still areas for improvement. Moving forward, stakeholders and policy makers must consider innovative and sustainable methods to alleviate congestion, improve the adequacy of public transportation services, and secure funding sources.

IDEAS

1. Local governments should consider taking advantage of the dedicated funding enabling legislation (Public Chapter No. 362) that passed in 2009, while the state pursues further funding alternatives.

2. TDOT may wish to incorporate more performance measurement metrics in its annual state of public transportation report, to include effectiveness and impact metrics such as security, accessibility, operating safety, public satisfaction, and reduction of pollution, congestion and energy consumption. Using effectiveness and impact metrics will help TDOT and local transit agencies locate service deficiencies and also allow lawmakers to address those deficiencies through policy.

3. Human Resource Agencies that service rural counties should explore ways to expand service to residents who are not low income or elderly (which is done currently). HRAs should also consider ways to include intermodal connections so that residents are able to not only travel from county to county, but also within cities as well.

WHAT'S INSIDE

This report provides relevant information on public transportation issues in Tennessee. It has four major sections that include

- a brief background on transportation in Tennessee and the Tennessee Department of Transportation (TDOT),
- select travel trends and demographics,
- public transportation services and needs in the state, and
- a discussion of issues pertinent to public transportation in Tennessee.

This report concludes with ideas to promote and advance a competent and competitive multimodal transportation system in Tennessee.

STATEMENT OF PURPOSE

This staff report is a TACIR staff-initiated project related to growth policy and infrastructure, included in the fiscal year 2010 work program. The work program was approved by the TACIR commission June 30, 2009. This report is part of a series written in response to the rapid expansion in federal spending on transportation as part of the stimulus package. At the same time the federal government increased spending, it also increased emphasis on linking transportation with land use issues. Additionally, the relationship between land use, planning, transportation, and housing options is clearly intergovernmental in theory and practice, which is discussed in two forthcoming reports in this series. Both in Middle and West Tennessee, the state Department of Transportation, several local governments, and area commerce chambers have made transit a priority, as seen with the Interstate 69 corridor transit options study in Memphis and the Transit Alliance of Middle Tennessee.

Transportation is directly tied to an area's quality of living and economic competitiveness. Successful and sustainable transit options are essential for Tennessee to maintain relevance in a changing economy.

INTRODUCTION

Like most states, Tennessee needs to update existing transportation infrastructure, improve old and add new public transportation options, and pursue permanent funding sources for local transit agencies. Transportation is directly tied to an area's quality of living and economic competitiveness.[3] Successful and sustainable transit options are essential for Tennessee to maintain relevance in a changing economy. While the Tennessee Department of Transportation (TDOT) has taken steps toward a progressive multimodal policy in recent years, the state has yet to fully implement a unified vision that incorporates regional and local transportation agencies and that will help propel the state forward.

Now is the time for federal and state transportation policy and infrastructure updates and improvements. Billions of American Recovery and Reinvestment Act (ARRA) stimulus dollars are being poured into transportation projects, and recent trends show a shift toward greater use of public transportation. Additionally, current Transportation Secretary, Ray LaHood, announced a change in federal awards for transportation projects, giving "the green light to popular streetcar projects [that] will strengthen

[3] Rodrigue (2009).

relationships among the Transportation and Housing Departments and the Environmental Protection Agency."[4] Tennessee has taken a proactive step toward integrated land use planning in applying for a National Governors Association grant. The state was chosen as one of five states to be a part of a National Governors Association Center for Best Practices transportation-land use project over a ten-month period starting in 2010. This project will help the state build linkages between local and state planning agencies to better suit existing and planned transportation modes, as well as promote economic development goals.

Why public transportation? Why not build new roads and widen old ones? Even if Tennessee finds more land upon which to build new roads and uses resources to expand existing roads, it would still not be enough to accommodate our growing population, freight traffic, and provide adequate transportation for the driving-impaired (like the elderly and disabled populations).[5] A successful region—and, ultimately, a successful state—has several transportation options from which its residents can choose: single occupancy vehicles, buses, service vehicles, rail systems, ferries, etc. By having efficient transportation systems, people and goods move faster, which leads to lower emissions and requires less energy.[6]

Additionally, there are economic benefits associated with public transportation.[7] Returns on transit investments include increased land value and retail activity, especially surrounding transit-oriented developments (TODs).[8] TODs can be defined as mixed-use areas (commercial and/or residential) situated within a transit system so residents and commuters can move efficiently from one point to another (by car, foot or public transit). Research shows that rising real estate and land values are often found within TODs.[9] So, not only do transit investments create jobs, increase land value, and promote economic competitiveness, but public transportation is also an important service for Tennesseans. Public transportation usage continues to grow and remains relevant in establishing livable, thriving communities.

[4] Lambert (2010).
[5] American Society of Civil Engineers (2005).
[6] Rodrigue (2009).
[7] Southworth, F. et al (2002).
[8] Taylor.
[9] Dittmar and Ohland (2004).

WHO'S WHO?

Like most public-private projects, the transportation industry is made up of several entities known by acronyms. Several of these will appear throughout this report. Below are some of the most commonly mentioned agencies related to public transportation:

1. United States Department of Transportation (DOT)
2. Federal Highway Authority (FHWA), a branch of the DOT
3. Federal Transit Authority (FTA), a branch of the DOT
4. Tennessee Department of Transportation (TDOT)
5. Metropolitan Planning Organization (MPO), specified by city or region
6. Rural Planning Organization (RPO), specified by county or region

Transit authorities reported dramatic increases in ridership in 2008 as gasoline prices soared to over $3.50 per gallon; however, even when gasoline prices declined in late 2008, high ridership levels continued.[10] According to the American Public Transportation Association (APTA), more than 2 billion public transportation trips were taken in the third quarter of 2008, an increase of 6.5% over the third quarter of 2007 and the largest quarterly increase in public transportation ridership in 25 years.[11] At the same time, vehicle miles traveled (VMT) are currently down across the nation as people drive less and turn to more fuel-efficient vehicles.[12]

Though the use of public transportation has grown each year since 2004, funding and revenue sources have not grown accordingly. Ninety-one percent of agencies surveyed by APTA in July 2008 said they face limitations in their ability to add services to meet increased ridership demands. The most common limitation reported was budgetary (65%), and over 50% said it was due to declining or flat (stabilized) state and local financial assistance.[13] In fact, 63% of public transit systems reported capacity problems during their peak load periods. Federal stimulus funds offer only short-term relief to these funding pressures. According to TDOT, the state received $669 million in transportation related stimulus funds, only $21 million of which is for transit.[14] TDOT has obligated all of its awarded money except for a little less than half of its discretionary grants.

The prospects for public transportation improvements also brightened with the recent announcement that the federal Housing and Urban Development and Transportation Departments are partnering with

[10] American Public Transportation Association (2009).
[11] American Public Transportation Association (2009).
[12] This trend shifted upward slightly in 2009, but leveled off. Young (2010).
[13] American Public Transportation Association (2008).
[14] Tennessee Department of Transportation, American Recovery and Reinvestment Act.

the Environmental Protection Agency to promote "sustainable communities." This collaborative focus coupled with the infusion of federal money gives policy makers the chance to update transportation policy and planning. Tennessee has a unique opportunity to explore what a multimodal transportation system in Tennessee could look like.

Moving Forward offers a brief background of transportation in Tennessee, highlights travel trends, demographics, public transportation services, and a discussion of transportation issues, including funding, performance, and rural public transportation.

TENNESSEE TRANSPORTATION HISTORY: A FOCUS ON ROADS

Tennessee has come a long way since its first road that connected Knoxville to Nashville was completed in 1799. The predecessor to TDOT, the Tennessee Transportation Commission, was created by legislative act in 1915 in response to the Federal Road Act of 1915, which provided federal funding for highways.[15] The Commission was renamed in 1929 as the Department of Highways and Public Works and included a Division of Aeronautics. Transportation development took a giant leap in Tennessee and the rest of the nation in 1956 when President Eisenhower signed into law the Federal Aid Highway Act, creating our nation's interstate road system. The state renamed the transportation agency to the Department of Transportation in 1972 to encompass the various modes of transportation, though it took several attempts for that department's plans to more fully reflect anything other than highway needs.[16]

In 1986 during the Alexander administration, TDOT presented its Better Roads Program to the Tennessee

WHAT'S WHAT? MODES OF TRANSPORTATION

Transit has taken on many forms: horse-drawn carriers, trains, electric streetcars, cars, buses, and subways. While rail-based transit has long been available in the nation's largest cities, it has begun to gain attention in medium-sized cities.

Public transportation is usually administered by a transit authority or agency that establishes routes, fares, and schedules. Public transportation can be by air, land, or sea and takes several forms:

- Airplanes
- Buses (rapid transit, express, and local service)
- Rail (commuter, light, high-speed, freight)
- Car or vanpool
- Pedestrian walkways and greenways
- Water bus/taxi or ferries

A more detailed look at the different modes of transit available in Tennessee can be found in Figure 2 on page 20.

[15] Tennessee Department of Transportation, *Transportation milestones in Tennessee history*.
[16] Ibid.

General Assembly. The program outlined the need for additional roadways, better maintenance for existing roads, and shorter maintenance cycles. In response, the General Assembly passed a record gasoline tax increase to support the request, and Governor McWherter pushed for paving four-lane highways from every county seat to the nearest major interstate through conservative funding mechanisms. Tennessee has a long history of funding its roads through a "pay-as-you-go" system.

TDOT presented another major transportation plan in 1994, but it still did not address the state's entire transportation system. It only emphasized highway needs, failing to recognize that most products and services come to Tennessee through a complex transportation system. Former Transportation Commissioner, Gerald Nicely, was appointed in 2003 and quickly set to the task of updating TDOT's planning process to include more multimodal elements in its approach (though its airport system plan was completed in 2001 and the ITS strategic plan was updated in 2002).

Tennessee has always been proud of its pay-as-you-go system for roads and highways. This has proved to be a challenge in the last decade as transportation revenue has decreased while demand and supply costs have increased. As Tennessee looks forward to projects and plans, the chosen funding mechanisms and policy are critical in shaping the transportation future of the state.

The Offices of Research and Education Accountability in the state's Comptroller's office released a report in 2003 on transportation planning with several recommendations for the General Assembly and TDOT. TDOT published its public transportation system modal report, *Tennessee Transit Tomorrow*, in 2004 to establish system objectives for the 2025 transit plan. Many of the recommendations in the Comptroller's report for TDOT were related to the planning process, which were largely addressed when TDOT released the state's first 25-year long-range transportation plan (LRTP), *Plan GO* in 2005. According to TDOT, the LRTP includes all modes of transportation, "taking into account business logistics, access to ports and airports, needs of bicyclists and pedestrians, tourism and quality of life . . . a system that encourages both rural and urban communities to thrive."[17]

Tennessee has always been proud of its pay-as-you-go system for roads and highways. This has proved to be a challenge in the last decade as transportation revenue has decreased while demand and supply costs have increased. The General Assembly and TDOT have recently discussed various bonds and alternative funding options for the state to consider. As Tennessee looks forward to projects

[17] *Plan GO* (2005), 10-12.

and plans, the chosen funding mechanisms and policy are critical in shaping the transportation future of the state.

Despite rising costs and increased demand, spending on surface transportation has placed Tennessee's roads among the best in the nation. *Overdrive* magazine has consistently ranked Tennessee's roads best in the nation based on a survey of truck drivers. For the past four years, the Interstate 40 segment that runs through Tennessee was ranked number one, and the state ranked third for best roads.[18]

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PLAN GO: AN EXPANDED VISION

Tennessee Transit Tomorrow is a modal plan for public transportation, while *Plan GO* is an overall long range plan for all modal systems. Completed in 2004, *Tennessee Transit Tomorrow* includes a needs assessment, goals, objectives and strategies for implementation. This modal plan was guided by a 15-member steering committee and included participation from business, transit industry and community leaders, in addition to ten public meetings.[19] Many of its key goals are also part of *Plan GO*.

Since the release of its long-range transportation plan (LRTP), *Plan GO*, TDOT has been working with community members, local and state officials, and transportation constituency groups to create an ongoing transportation plan for the state. *Plan GO* attempts to anticipate the needs of the state's growing population over the next 25 years. The plan has three objectives:

1. Consideration of the type of transportation system needed in the future with provision for the policy directions needed for investments and operating decisions

2. A ten-year strategic investment plan that will identify programs that need to be in place to support the overall transportation system

3. A three-year evaluation system to guide the selection of projects so state and local leaders can monitor the projects chosen for development

[18] Kvidera (2010).

[19] Tennessee Department of Transportation (2004).

The long-range plan was designed from an in-depth study of the six primary modes of transportation: aviation, bicycle/pedestrian, highway, public transportation, rail, and waterways. These various transportation modes were examined for current use, future travel and freight demands, and the current condition and needs of the transportation system.[20]

TDOT's 25-year transportation plan recognizes that the economy of a region depends on both major transportation arteries and "capillaries," including walkways, bike ways and urban transit systems.[21] This perspective is reflected in the working relationship between TDOT and Tennessee's regional and metropolitan planning offices (RPOs and MPOs, respectively) which encourage broad-based and regular input regarding transportation planning and project selection. In *Plan GO*, TDOT proposes to invest over $600 million in developing more transportation choices to help jump-start public transportation investments and provide more transit choices for Tennesseans. A major component of *Plan GO* is the advancement of the *10-Year Strategic Investments Program* which established three interrelated core investment initiatives: Congestion Relief, Transportation Choices, and Key Corridors.

TRENDS & DEMOGRAPHICS

An examination of ridership and commuting trends and population demographics affecting those trends can help us assess what led to our current situation and plan for the future.

PUBLIC RIDERSHIP IN NUMBERS

Through the mid-20th century, most federal funding for transportation was geared toward highway construction with lesser amounts available for mass transit.[22] Nice roads, affordable cars, cheap gas, city-dwellers' flights to the suburbs, and local, state, and federal funding for interstates and highways all contributed to a car-centric lifestyle in America. The advent of the automobile forever changed American transportation; with it came increased mobility

[20] *Plan GO* (2005), 10-12.
[21] Baldwin (2007).
[22] Federal Highway Administration (1999).

and congestion, higher energy demands and concerns about energy shortages, and a detrimental impact on the environment.

Public ridership has fluctuated dramatically since the mid-20th century, with a peak of 17.2 billion trips in 1950, to a much lower 6.9 billion trips 25 years later.[23] Table 1 shows national passenger trips in five-year increments from 1950 to 2005 and for the most recent year available, 2008. Trip numbers grew from 1997 through 2001, declined for three years, and resumed growing each year through 2008.

The American Public Transportation Association (APTA) reports ridership growth averaged 2% annually between 1995 and 2007. APTA suggests a strong economy, improved transit customer service, and increased public and private investments help spur higher levels of transit ridership.

Table 1. U.S. Public Transportation Ridership: A Historic Glance

YEAR	PASSENGER TRIPS (billions)
1950	17.2
1955	11.5
1960	not available
1965	8.2
1970	7.3
1975	6.9
1980	8.5
1985	8.6
1990	8.7
1995	7.7
2000	9.3
2005	9.8
2008	10.7

Source: American Public Transportation Association (2009).

COMMUTING

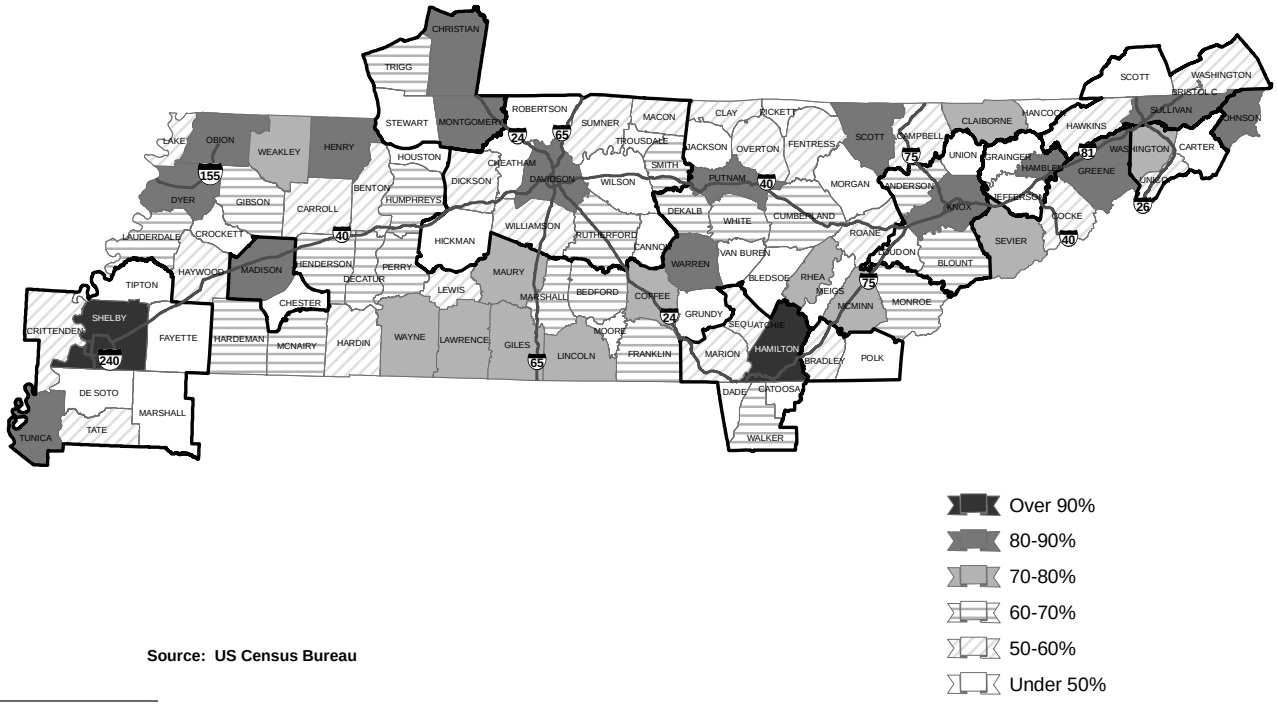
Driving and commuting trends are changing as car makers continue to design (and drivers choose) more fuel-efficient vehicles, population growth becomes more concentrated, and land use patterns change. One thing is clear—driving is on the decline. Americans drove almost 11 billion fewer miles in September 2008

[23] American Public Transportation Association (2009).

compared with September 2007, the 11th straight month of declining driving.[24] According to the Federal Highway Authority (FHWA),[25] cumulative travel for 2008 decreased by 42.1 billion vehicle miles, which the Brookings Institute says is the largest drop in driving that the country has ever witnessed.[26] The American Association of State Highway and Transportation Officials (AASHTO) reports that while vehicle miles traveled (VMT) increased from 2.4 trillion to 3 trillion between 1995 and 2007, by late 2008 it had declined to less than 3 trillion due to high gasoline prices and the economic downturn.[27] While Tennessee's VMT per capita is down from previous years, it is still 15% greater than the national average based on 2007 data from the Bureau of Transportation Statistics (BTS).[28]

What modes of public transportation are commuters using? APTA reports 59% of all public transportation trips in the nation are on buses while 29% are on heavy rail. Since there are only two rail systems in the state (one commuter and one trolley), it makes sense that the BTS reports 92.3% of urban transit ridership in 2005 was by motor bus and only 3.8% by light rail in Tennessee.

Figure 1. Commuter Concentration
Percent of Workers Who Work in County of Residence



Source: US Census Bureau

[24] Federal Highway Administration (2008).
[25] Sun (2008).
[26] Puentes (2008).
[27] Pisarski and Reno (2009).
[28] Bureau of Transportation Statistics (2008).

In 2007, almost 33 million passengers were carried by Tennessee's public transportation systems; 1.5 million passengers were rural and 31.5 million were urban.[29] Between fiscal year 2005 and fiscal year 2006, the number of trips provided by urban and rural operators increased by 3.1%.

Nationally, 73% of all commuters (94 million) work within their county of residence, and over 34 million work outside their county.[30] Tennessee travel trends differ slightly from national trends. As seen in Figure 1, only 18 counties had 80% or more of their residents working in their home county in 2000.[31] The map also shows 32 counties had less than 50% of their residents working in their home county. According to TACIR's *Growth Concentration in Tennessee Regions*, from which this graphic was taken, as employment becomes more concentrated in Tennessee, more Tennesseans have to leave their home county for work.

TACIR's county profile data features county-to-county commuter flow data for the 54 most populated counties.[32] These figures are available below in Table 2 which shows where workers live and where residents work. Davidson County overwhelmingly has the most in-commuters, 21% of the state total. Table 3 on the following page shows recent state commuter data compared to US commuter data. Tennessee public transportation use is four times less than that of the nation. Nashville and Memphis lead the state in use of public transportation.

Table 2. County-to-County Commuter Flows, 2000

Where Do Davidson County Workers Live?		Where Do Hamilton County Workers Live?		Where Do Knox County Workers Live?		Where Do Shelby County Workers Live?	
County	**Percent**	**County**	**Percent**	**County**	**Percent**	**County**	**Percent**
Davidson	62.0%	Hamilton	73.0%	Knox	74.0%	Shelby	83.0%
Sumner	6.5%	Catoosa, GA	6.7%	Blount	6.4%	DeSoto, MS	6.0%
Rutherford	6.3%	Walker, GA	5.0%	Anderson	3.8%	Tipton	2.6%
Williamson	6.2%	Bradley	3.1%	Sevier	3.0%	Fayette	1.7%
Wilson	5.2%	Marion	2.3%	Loudon	2.1%	Crittenden, AR	1.5%
Robertson	2.8%	Dade, GA	1.7%	Jefferson	2.0%	Marshall	1.0%
Where Do Davidson County Residents Work?		**Where Do Hamilton County Residents Work?**		**Where Do Knox County Residents Work?**		**Where Do Shelby County Residents Work?**	
County	**Percent**	**County**	**Percent**	**County**	**Percent**	**County**	**Percent**
Davidson	87.0%	Hamilton	91.0%	Knox	86.0%	Shelby	99.0%
Williamson	5.8%	Bradley	1.6%	Anderson	6.0%	DeSoto, MS	1.9%
Rutherford	2.4%	Catoosa, GA	1.5%	Blount	2.9%	Tunica, MS	0.7%
Wilson	1.1%	Whitfield, GA	1.5%	Sevier	0.9%	Crittenden, AR	0.4%
Sumner	1.0%	Walker, GA	1.2%	Loudon	0.8%	Tipton	0.3%
Maury	0.4%	Rhea	0.6%	Roane	0.7%	Fayette	0.2%

Source: TACIR County Profiles.

[29] Tennessee Department of Transportation (2008).

[30] Pisarski (2006).

[31] Lippard and Green (2008).

[32] TACIR website under the heading "County Profiles" at http://www.tennessee.gov/tacir/county_profiles.html.

Table 3. State Commuter Statistics Commuter Data on Tennessee and the Four Largest Counties						
STATISTIC	**NATIONAL**	**STATE**	**COUNTY**			
	U.S.	**Tennessee**	**Davidson**	**Hamilton**	**Knox**	**Shelby**
Population	299,398,484	6,038,803	578,698	312,905	411,967	911,438
Workers (age 16 and over)	136,926,294	2,710,078	299,514	152,306	198,926	401,796
Percent of population working	45.73%	44.88%	51.76%	48.67%	48.29%	44.08%
Mean travel time	25.5 min.	24.5 min.	23.3 min.	22.6 min.	22.2 min.	23.7 min.
Car, truck or van—drove alone	104,188,550	2,258,112	242,974	126,182	168,575	333,523
Car, truck or van—carpooled	14,525,922	275,354	28,944	15,925	16,673	39,796
Public transportation	6,638,872	20,518	5,415	1,479	1,666	7,382
% drove alone	76.09%	83.32%	81.12%	82.85%	84.74%	83.01%
% carpooled	10.61%	10.16%	9.66%	10.46%	8.38%	10%
% used public transportation	4.85%	0.76%	1.81%	0.97%	0.84%	1.84%

Sources: U.S. Census Bureau (2006) and American Community Survey (2005-2007), Table S0802.

POPULATION TRENDS

Not only does the shift toward more fuel-efficient cars and increased public ridership trends affect transportation demands, but also state and national population rates are increasing, significantly impacting transportation systems. The U.S. Census Bureau projects that the nation's population will grow almost 1% annually through 2030, and the *Bottom Line Report* released by the American Association of State Highway and Transportation Officials projects that the U.S. population will exceed 420 million by 2050.[33] The Center for Business and Economic Research (CBER) at the University of Tennessee projects Tennessee's population will exceed 7.5 million by 2025. The state's existing transportation infrastructure cannot fully support the growing population if cars continue to be the dominant mode of travel; over 30% of Tennessee's major urban roads are already congested.[34] As the population continues to expand and the demand for transportation (freight, single vehicle and public transit) grows, infrastructure improvements, transportation policy, and land use planning need to accommodate these changes in a manner that promotes economic development, sustainability, and improved quality of life.

The expected growth in the elderly population presents new challenges. According to the Council on Aging of Middle Tennessee, 20% of the nation's population is expected to be age 65 or older by 2030, and an estimated 20% of adults age 65 and older do not drive.[35] Additionally, those who are 85 and older often rely on drivers or transit services and may also need to be escorted in and out of

[33] American Association of State Highway and Transportation Officials (2009).
[34] American Society of Civil Engineers (2005).
[35] Council on Aging of Greater Nashville (2009).

their homes (door-through-door service). The 2000 Census figures reveal that 12.4% of Tennessee's population is age 65 or older. Based on projections by CBER and the Nashville MPO, almost 20% of state residents will be 65 or older by 2025.[36] It is important to incorporate safe and accessible transit options for the elderly population in any future plans, as the demand for transit will increase as that demographic grows.

TENNESSEE'S PUBLIC TRANSPORTATION SERVICES

The following section briefly describes the agencies responsible for making decisions on future transportation needs and the modes of public transportation in Tennessee.

STRUCTURE

TDOT is the primary agency responsible for the planning, implementation, maintenance, and management of the state's transportation system for people and products, "with emphasis on quality, safety, efficiency, and the environment."[37] A branch of TDOT, the Division of Multimodal Transportation Resources, is responsible for the following three modal offices: Office of Passenger Transportation (OPT); Office of Freight & Rail Transportation; and Office of Rail Safety.

The OPT is the recipient and administrator of federal and state transit assistance funds for all the transit systems mentioned previously. These transit assistance funds support several programs:

- Transit Planning, Capital and Operating Assistance for Urbanized and Non-urbanized Areas
- Elderly and Disabled Transportation Program
- Statewide Ridesharing Program

As the population continues to expand and the demand for transportation (freight, single vehicle and public transit) grows, infrastructure improvements, transportation policy, and land use planning need to accommodate these changes in a manner that promotes economic development, sustainability, and improved quality of life.

[36] CBER projects the state population will be 7,559,531, and of that, 19.2% (1,450,988) will be age 65 and older by 2025. The Nashville MPO projects that 1,308,597 (17.3%) Tennessee residents will be age 65 and older by 2025.

[37] Tennessee Department of Transportation, *Strategic direction: Fiscal years 2008-2011*.

- Training for Urban and Rural Transit Systems
- Statewide Student Internship Program
- Park and Ride Lot Development
- Job Access and Reverse Commute
- United We Ride
- Families First Program
- New Freedom Initiative

The OPT oversees the operation of the different transit programs, manages the contracts for services and payment, and monitors local transit systems for compliance. It also oversees financial assistance for the operation of the 28 public transit systems that serve all the counties in the state.[38] In addition, OPT's Transit Training Center and consultant services provide various types of technical assistance to the rural and urban transit systems in the state.

Transportation services provided by the transit systems vary depending on the specific needs in a community. The primary transportation systems in operation in the urban areas are scheduled motor buses and demand-response transit (arrangements are made prior to service). The primary transportation system in operation in rural areas is demand-response transit. These services include transporting the elderly and disabled, ride-sharing and vanpools. They also provide transit services for welfare recipients and low-income residents to places of employment and support services.[39]

TDOT also works in coordination with RPOs and MPOs across the state to integrate their plans and programs with its own. Since RPOs and MPOs serve as the transportation planning agencies in their defined jurisdictions, the overlapping interests that exist between them and TDOT are important to understanding transportation planning. These local organizations also conduct studies with or for TDOT to better understand traffic flows and trends along corridors and provide mandated information to federal transportation agencies. The recent announcement that Tennessee will be partnering with

[38] Tennessee Department of Transportation, *Multimodal transportation resources home*.

[39] Tennessee Department of Transportation, *TDOT funds statewide initiatives that include TDOT's transit program grants*.

the National Governors Association Center for Best Practices in a transportation and land use planning project makes clear the importance of the relationship between local and state planning and transportation agencies.[40] The ten-month project will examine and bolster networks between local and state planning and transportation agencies, while also creating new planning and funding frameworks. Additionally, a forthcoming TACIR report addresses the importance of coordinating land use and transportation planning.

MODES

Tennessee residents in cities and rural towns may not be aware of available transportation options. There are many public bus and shuttle transportation services available in the state. The TDOT website houses *Smart Commute*, a clearing house for commuting choices: walking, biking, passenger rail, public transit, and ridesharing, which are hyperlinked to separate pages that list information and resources related to each mode of travel. The walking and biking sites offer links to pedestrian walkways, greenways, safety tips, and resource guides not included in Figure 2.

Relying on TDOT's inventory, Figure 2 features all the public transportation modes available in the state. Rail transit is available through the Memphis Trolley and commuter rail in the Nashville area (the Music City Star operates from Lebanon to downtown Nashville). Local bus and shuttle services are available all across east, middle, and west Tennessee. Additionally, Tennessee now has a bus rapid transit (BRT) route. In September 2009, the Nashville MTA introduced its first BRT that runs from the edge of Sumner County (Gallatin Road) into Nashville with fewer stops than the normal route. These special buses are equipped with green light extender technology, allowing them to pass through traffic faster.

[40] WTVC NewsChannel 9 (2010).

Figure 2. Modes of Public Transportation Available in Tennessee

RIDESHARING (Van/Carpool)
Knoxville Smart Trips
Knoxville Vanpool (classifieds)
Memphis Rideshare
MTA Park and Ride Lots
Regional Transit Authority (RTA) RideMatch
RTA Carpool RideMatch
RTA Park and Ride Lots
Tennessee Carpool Center
The TMA Group (vanpool fleet serving middle Tennessee)
PASSENGER RAIL
Amtrak (Memphis)
Lookout Mountain Incline (Chattanooga)
Memphis Downtown Rail Trolley
Music City Star (Lebanon, Martha, Mt. Juliet, Hermitage, Donelson, Nashville)
BUSES & SHUTTLES
Urban Fixed-Route Buses
Bristol Transit System
Chattanooga Area Regional Transportation Authority (CARTA)
Clarksville Transit System
Cleveland Urban Area Transit System
Franklin Transit Authority
Fun Time Trolley (Pigeon Forge, Sevierville)
Gatlinburg Mass Transit
Jackson Transit Authority
Johnson City Transit System
Kingsport Transit System
Knoxville Area Transit (KAT)
Memphis Area Transit Authority (MATA)
Morristown (LAMPTO)
Murfreesboro Rover
Nashville Metropolitan Transit Authority (MTA)
Nashville RTA
Oak Ridge Public Transit System
Express Bus System
RTA/MTA Relax & Ride (Nashville and outlying cities)
Non-Fixed Route Systems (Rural)
Delta Human Resource Agency (HRA)
East Tennessee HRA
First Tennessee HRA
Hamilton County Rural Transportation System
Hancock County Rural Public Transit

Non-Fixed Route Systems (Rural) *continued*
Mid-Cumberland HRA
Northwest Tennessee HRA
South Central Tennessee Development District
Southeast Tennessee HRA
Southwest Tennessee HRA
Upper Cumberland HRA
AccessRide (for disabled persons)
Care-A-Van
KAT-The Lift
MATA-Memphis Access Ride
MTA Access Ride
Shuttle Services
CARTA Downtown Shuttles
KAT Late-line Trolleys
KAT Trolleys
KAT UT Football Game Shuttles
MATA Downtown Trolley
MATA Special Event Shuttles
MTA Buslink
Park It Downtown (Nashville)

Source: Tennessee Department of Transportation, *Smart commute*.

PUBLIC TRANSPORTATION ISSUES IN TENNESSEE

TACIR staff identified three issues that encompass the most pressing concerns about public transportation in Tennessee: finance, performance, and rural public transit. First, TACIR staff estimated the cost to close existing transportation gaps and considered the strengths and weaknesses of dedicated revenue sources. Second, staff turned to performance management literature and state and local agency objectives to understand service adequacy. Lastly, staff looked at rural public transportation issues which differ greatly from those in urban areas but are just as important and challenging.

Like many states across the nation, Tennessee is experiencing a "transit paradox," in which the demand for public transportation has increased while funding has not.

FINANCE

One of the most decisive elements of any transportation project (transit or otherwise) is funding. In response to a recent survey by Cumberland Region Tomorrow, 80% of leaders in middle Tennessee said that funding is the biggest barrier to making transit options available to all citizens.[41] This section includes transit cost estimates and general information about transportation funding and dedicated funding sources.

"TRANSIT PARADOX"

Like many states across the nation, Tennessee is experiencing a "transit paradox," in which the demand for public transportation has increased while funding has not. Tennessee is dealing with a $1.2 billion revenue shortfall, so transportation is only one of the many areas bearing budget cuts. To add insult to injury, TDOT has sustained over $500 million in federal rescissions since 2002, impacting both state and local governments, with an additional $45 million just rescinded in August 2010.

According to TACIR's infrastructure report, *Building Tennessee's Tomorrow: Anticipating the State's Infrastructure Needs,* the gap between the state's transportation needs and transportation funding is over $12 billion. This gap between needs and revenue is echoed

[41] Cumberland Region Tomorrow (2009).

at the local level.[42] Nashville Metropolitan Transit Authority (MTA) director, Paul Ballard, has said that MTA's existing funding sources cannot expand services to the level needed. Despite higher fares and cutting routes, MTA ridership was still up 10% in July 2008.[43] Early in 2009, the Knoxville Area Transit (KAT) increased the fare for both single fare and express rider bus tickets in an effort to offset service cuts.[44] A recent New York Times article summarizes the problem facing most public transportation authorities across the nation today—increased ridership with decreased funds.

> *Transit systems across the country are raising fares and cutting service even when demand is up with record numbers of riders last year, many of whom fled $4-a-gallon gas prices and stop-and-go traffic for seats on buses and trains.*
>
> *Their problem is that fare-box revenue accounts for only a fifth to a half of the operating revenue of most transit systems—and the sputtering economy has eroded the state and local tax collections that the systems depend on to keep running. "We've termed it the 'transit paradox,'" said Clarence W. Marsella, general manager of Denver's system, which is raising fares and cutting service to make up for the steep drop in local sales tax.*
>
> *The billions of dollars that Congress plans to spend on mass transit as part of the stimulus bill will also do little to help these systems with their current problems. That is because the new federal money—$12 billion was included in the version passed last week by the House, while the Senate originally proposed less—is devoted to big capital projects, like buying train cars and buses and building or repairing tracks and stations. Money that some lawmakers had proposed to help transit systems pay operating costs, and avoid layoffs*

[42] Roehrich-Patrick et al. (2010).
[43] Rau (2008).
[44] Davis (2008).

and service cuts, was not included in the latest version.

[…] The nation's transit woes threaten to deal another blow to the weak economy, keeping some workers from jobs they commute to and forcing some systems to lay off administrators, bus drivers, train operators and mechanics. And while the economic stimulus package being considered on Capitol Hill includes tax cuts intended to put more spending money in people's pockets, fare increases promise to take a big bite for many commuters.

Michael Cooper, "Rider paradox—surge in mass, drop in transit."
New York Times. February 4, 2009.

ESTIMATED NEEDS

TACIR staff used data from TDOT's State Transportation Improvement Program (STIP) and the MPO's Transportation Improvement Program (TIP) to estimate the costs of needed rural and urban transit expenditures. A TIP is a federally mandated (and, consequently, funded) plan or program that establishes major construction and public transit projects over a given time period. According to TDOT's statewide STIP summary, approximately $253.8 million is needed for rural transit costs statewide for years 2008 through 2011. According to data from the state's 11 MPOs, $220 million (state and local dollars) is needed for urban transit costs for years 2008 through 2011. Table 4 shows total rural transit costs and MPO transit costs (broken down by state and local dollars and their combined total).

Table 4. Programmed Transit Costs Rural and Urban (2008-2011)

Rural Transit Total $	Urban (MPO) State $	Urban (MPO) Local $	Urban Transit Total $
$ 253,806,592.0	$136,933,501.7	$ 82,945,753.4	$ 219,879,255.1

It should be noted that these figures do not give the full picture of needs for public transportation because they only reflect costs submitted to the FTA for projects that fall within the designated TIP timeframe (2008-2011). Please see Appendix A for additional details on the MPO data.

COST TO MAINTAIN STATUS QUO

TACIR staff relied on methodology from an American Association of State Highway and Transportation Officials (AASHTO) report (prepared for APTA) to project future transit costs based on annual ridership growth using the STIP transit estimates. The report, *State and National Public Transportation Needs Analysis*, uses ridership forecast assumptions to determine transportation capital needs. Forecasting capital needs provides a monetary figure to define transit needs.

As demonstrated in the AASHTO report, staff calculated the growth in ridership over the last ten years in Tennessee using population projections, public ridership statistics, and annual VMT growth. This was then used to project transit needs if ridership growth continues at its current rate. State ridership grew at an annual rate of 1% between 1996 and 2007. National ridership grew at a rate of 2.4% over the same time period;[45] although it is unlikely that Tennessee will mimic national ridership trends, staff calculated transportation needs at a 2.4% growth rate for comparative reasons. If ridership grew at the same 1% rate, almost $580 million would be needed simply to maintain current transportation service performance with the same physical conditions.

Though the figures presented in Table 5 are useful in identifying gaps in public transportation funding, using monetary figures alone provides a limited glimpse of transit needs (see performance scorecard section below). Table 5 shows STIP transit costs (rural and urban) for years 2008 through 2011 and forecasted needs based on ridership growth.

Table 5. Cost to Maintain Physical Conditions and Current Service Performance

Costs from 2008-2011 Projected by Ridership Growth (in millions)

		Ridership Growth Percentage	
Type	**Estimated Costs**	**1.00%**	**2.40%**
Urban	$320.0	$323.2	$327.7
Rural	$253.8	$256.3	$259.9
Total needs	$573.8	$579.5	$587.6

[45] American Association of State Highway and Transportation Officials (2009).

While these numbers offer a good look at transit needs based on ridership trends, it should be noted that ridership growth is affected by many different factors that are not easily predicted (fuel price fluctuation, employment concentration, economic growth, policy decisions, and transportation investments among other things).[46]

Funding is essential to the success of any transportation project.

For the sake of comparison, ARRA transportation funds for Tennessee are over $650 million. As seen above, more than $570 million is required simply for needed transit costs. While ARRA funds are helping offset tax shortfalls, the funds are for all transportation projects, not just transit.

TRANSPORTATION FUNDING: WHERE'S THE MONEY?

Funding is essential to the success of any transportation project. Most public transportation systems in the United States depend heavily on federal grants for both operating and capital expenditures. The federal grants are financed primarily from a portion of the federal Highway Trust Fund. Estimated grants in federal fiscal year 2009 amount to over $10 billion. Most of the federal grants require some local matching funding.[47] The Federal Transit Administration (FTA), an agency within the United States Department of Transportation, administers and distributes the various public transportation system grants. Appendix B on page 57 details several transportation grants available.

Transportation finance should come from diverse and sustainable sources.

Transportation finance should come from diverse and sustainable sources to maintain stability.[48] One effort by the Tennessee General Assembly to explore funding options was the creation of a Transportation Study Committee comprised of state legislators and representatives from related organizations and industries. It met four times in 2008 and again in December 2009; committee members discussed various measures to generate transportation revenues, including an increase in the gasoline tax. The study committee has already recommended several measures, two of which were passed by the General Assembly: to have TDOT study high occupancy toll (HOT) lanes and a prohibition on any more transfers from the Highway Fund to the General Fund. In a presentation to the study committee, former TDOT Commissioner

[46] American Public Transportation Association (2008), 13.
[47] See details at http://www.fta.dot.gov/funding/grants/grants_financing_3561.html.
[48] Giglio (2005).

Nicely presented the following reasons why funding has declined in recent years:

- The federal Highway Trust Fund is unstable, and without an $8 billion boost from the federal government, federal transportation funds would not have been released to states at all in 2008.
- Gas and diesel tax revenues are down because vehicle miles traveled (VMT) are on the decline.
- Construction costs (materials) have increased by 43% since 2003.[49]

DEDICATED FUNDING

Many public transit advocates claim that a dedicated funding source is essential to the success of transit services. A dedicated revenue source is funding that is secured or collected only for a specific project, and this type of funding scheme is far less volatile than other tax collections or user fees. In a 2006 study of the nation's 25 largest local transit systems, the Government Accountability Office found that 23 systems reported that a portion of their funding came from dedicated revenue sources. The most common dedicated tax source was sales taxes. Dedicated revenue sources are viewed by many as more predictable and stable in comparison to funding based on annual appropriations.[50]

One benefit of a dedicated revenue source for transportation projects is improved revenue stability. In contrast to annual appropriations, dedicated or earmarked revenues avoid the sometimes volatile impact of politics and economic activity on funding. A vehicle registration fee is a stable revenue source, while motor vehicle fuel and property taxes are less stable. An example of an unstable or less stable source is sales tax revenue, which is more responsive to short run changes in general economic activity, but tends to be inelastic in the long run. While all of the state's tax collections fell during the recession, gas and diesel taxes are traditionally less volatile than sales or income taxes. Another benefit of a

[49] Nicely.

[50] Several of these large systems reported that "dedicated funding can have a positive effect by enabling more effective multiyear planning for transit agencies and improving their credit ratings, which in turn lowers their cost of borrowing." General Accounting Office (2006), 4.

dedicated revenue source is its impact on long-range planning. Long-range plans are enhanced by the more predictable, although sometimes cyclical, nature of dedicated revenues in contrast to annual appropriations.

Dedicated revenue sources do have negative aspects as well. Most are inelastic, i.e., they fail to keep up with growth in long run economic activity. Most dedicated revenue sources in other states, like motor fuel gallonage taxes and motor vehicle registration fees, are unresponsive to growth in the tax base.

In 2009, the Tennessee General Assembly passed enabling legislation (Public Chapter No. 362) to allow local governments to seek dedicated funding sources for transportation. Following suit, several governments in middle Tennessee adopted a resolution of support drafted by the Nashville MPO regarding dedicated transportation funding (within the framework established by the enabling law). Most recently the Middle Tennessee Regional Transit Authority (RTA) Board of Directors voted to restructure the RTA so it can receive dedicated funds for public transportation.[51] Additionally, the Middle Tennessee Mayors Caucus proposed and created the Transit Alliance of Middle Tennessee, a coalition of private-sector organizations to support regional transit awareness. Groups like "Nine Counties. One Vision." in East Tennessee or the Middle Tennessee Mayors Caucus are both examples of how policy makers, stakeholders, and citizens can address regional public transportation needs.[52] The Transit Alliance of Middle Tennessee is working with local governments to pursue and adopt dedicated funding.

TACIR staff suggests that local governments consider taking advantage of Public Chapter No. 362 (2009) to pursue funds that will improve and expand their current services.

TACIR staff suggests that local governments consider taking advantage of Public Chapter No. 362 (2009) to pursue funds that will improve and expand their current services. The legislation applies to planning, construction, operation, and maintenance costs for regional and rapid bus transit services, vanpool, and rideshare programs, light and commuter rail services, intermodal connections, and more.[53]

[51] Regional Transit Authority (2011)

[52] "Nine Counties. One Vision." is no longer active; it was initiated in 2000 for a limit of five years. The Middle Tennessee Mayors Caucus was established in 2009.

[53] Tennessee Code Annotated § 64-8-201.

Commissioner Nicely suggested several funding options to the legislative Transportation Study Committee for discussion and consideration, including dedicated revenue sources based on user fees:

- VMT and Mileage User Fees
  - VMT and mileage user fees are a type of fee based on miles driven that could replace the gasoline tax as the principal transportation revenue source; a VMT or usage fee could be easily administered at the pump.
- Tolling, HOT Lanes, and Congestion Pricing
  - Twenty-six states have toll facilities.
  - High Occupancy Toll lanes (HOT) charge a toll on single occupancy vehicles (SOV) if they choose to travel on a HOV road or lane. Denver, Florida, and Minnesota have HOT lanes.
  - Congestion Pricing is a market economics tool that charges users for driving during peak times in an effort to decrease demand of a limited supply (road space during rush hour).
- Various bonding and finance tools
  - General Obligation (GO) and Grant Anticipation Revenue Vehicle (GARVEE) bonds are financing options to accelerate transportation projects, but require 1) legislative action, and 2) debt service payments.
  - A GO bond is backed by the credit and taxing power of the issuing municipality. A GARVEE bond is based on future revenue projections and is primarily repaid with federal aid funds.
- Public-private partnerships (PPP)
  - Private sector organizations/corporations assume significant risk in place of state or local governments. For example, parking garage companies will often invest in local transit in exchange for rights to the "park and ride" garages commuters use.
  - As a revenue source, PPPs are relatively unaffected by economic downturns.

    - Examples include the Chicago Skyway, Indiana Toll Road, E-470 Tollway in Colorado, and the 1-495 Capital Beltway in Washington, D.C.
- Increase gasoline and diesel taxes and vehicle registration fees
    - A $0.01 increase in the gasoline tax would result in an additional $30.5 million.
    - A $0.01 increase in the diesel tax would result in an additional $11 million (of which TDOT would receive $8 million).
    - A $1 increase in motor vehicle registration fees would result in an additional $5 million for five million registered vehicles.
- Earmark a portion of hotel/motel taxes
    - Assuming hotel/motel revenues of $2 billion, a 1% tax could produce as much as $20 million a year.[54]

In line with the Transportation Study Committee recommendations and in an effort to discover new sources of transportation revenue, state and local officials have even explored toll roads in Tennessee. The General Assembly authorized TDOT to conduct two pilot toll projects, and additional legislation was introduced to expand it further. The Tennessee Tollway Act, signed into law in 2007, allows the state to issue bonds and incur debt to pay for the two pilot projects (one bridge and one road) as "an additional and alternative method" to pay for highway improvement and construction. Any future toll projects would include public hearings, environmental studies, and approval by the legislature. For the most part, public sentiment has been against toll roads.[55] Regardless of the method, something must be done to secure funding for infrastructure, roads, highways, and freight and mass transit.

PERFORMANCE SCORECARD

In a money-dependent project, transportation is the business, and riders are customers who are "only interested in getting from here

[54] These funding options (all six bullets and sub-points) were taken from Commissioner Nicely's presentation before the Transportation Study Committee in 2008.
[55] WVLT (2008).

to there as quickly, as inexpensively, and in as hassle-free a manner as possible."[56] Increasing ridership and customer satisfaction are achievable goals that can be measured. Money only defines one (albeit critical) aspect of transportation; the performance of a transit system is just as important to assess and understand.

While TDOT and other affiliated agencies have taken steps forward to create more sustainable, affordable, and equitable transportation choices for the residents of Tennessee, there is still room for improvement. Using established, internal evaluation tools coupled with a critical look at service gaps will propel the state toward improving its transportation systems. Improved public transportation will address congestion, air quality, changing travel patterns, as well as the issue of reliable and affordable service to the elderly, disabled, and economically disadvantaged.

A performance measurement scorecard is a tool that can be used to identify public transportation needs using existing data and resources. In business management, the concept of a "performance scorecard" gained popularity in the 1980s as a tool to measure performance (though transit standards and objectives literature dates back to the 1950s).[57] Certain indicators or "metrics" were developed to determine how well organizational objectives were met. Corporate metrics are founded on four distinct perspectives: financial, customer, internal process, and innovation and learning.[58] By the mid-1990s, the performance scorecard was applied in governments and public agencies (including transit agencies) to offer a fast and comprehensive look at how well a given organization meets its goals.[59]

Since private business goals are often different (and achieved differently) from public goals, the performance scorecard was modified to reflect this difference. Efficiency and effectiveness have always been the catch phrases of public administration and continue to be the cornerstone of measuring organizational success. In addition to efficiency and effectiveness, some authors also incorporate a third indicator to the public transportation

[56] Giglio (2005).
[57] Fielding, et al (1978).
[58] Kaplan and Norton (1992).
[59] Phillips (2004).

performance scorecard, "impact." Table 6 gives a brief description of each measure and sample metrics for public transportation agencies taken from various resources.[60]

Table 6. Public Transportation Performance Scorecard

Category	Description	Sample Metrics
Efficiency	Efficiency indicators evaluate the process by which transit services are produced (input as it relates to output) utilizing the least amount of resources.	labor efficiency, vehicle efficiency, capital, profit maximization, loss minimization, self-sufficiency, energy efficiency, quantity, quality, cost
Effectiveness	Effectiveness is the comparison of produced output (service provided) to the intended output (service objectives).	utilization of service, security, accessibility, operating safety, passenger convenience, frequency of service, reliability of service, service quality, passenger comfort, general public satisfaction
Impact	Impact indicators describe the "macro" effect of public transit, including external and indirect effects on social well-being, economic development and environmental quality.	accessibility of transit-dependent, urban development, attraction and retention of commuter traffic, reduction of pollution, congestion, and energy consumption

Source: Fielding, et al. (1978) and J. Phillips (2004).

Detractors of performance measurement claim, "What you measure is what you get." In other words, if an agency sets its own objectives and how success is measured, the results will always be favorable due to faulty methodology. Incorrect or misinterpreted data can lead to misleading values and, thus, incorrect conclusions. When done fairly and appropriately, indicator values can provide decision-makers and agency officials with direct insight into areas of success and weakness. Furthermore, when uniform metrics are used, peer agencies can compare their performances. While performance measurement has its weaknesses and critics, if used correctly, it is an important tool for policy makers and administrators to evaluate gaps in public transportation service.

TDOT OBJECTIVES AND MEASURES

TDOT estimates that over the next 25 years, $130 billion is needed for transportation investments.[61] Travel time between cities in Tennessee is projected to increase, aging structures must be replaced, and additional structures will deteriorate in the years to come.[62] As TDOT mitigates these and other pressing issues, it is guided by seven principles laid out in its LRTP and highlighted below:

1. **Preserve and manage the existing transportation system**: protect existing assets

2. **Move a growing, diverse and active population**: provide greater access to transportation services for all people

[60] Fielding, et al. (1978) and Phillips (1978).
[61] *Plan GO* (2005).
[62] American Society of Civil Engineers (2005).

3. **Support the state's economy**: make investments that support economic growth, competitiveness, and tourism

4. **Maximize safety and security**: reduce injuries and fatalities

5. **Build partnerships for livable communities**: coordinate land use and transportation planning

6. **Promote stewardship of the environment**: minimize impacts on natural resources and conserve energy

7. **Emphasize financial responsibility**: provide accountability

These objectives can easily be converted to "metrics" in a performance scorecard to gauge public transportation service adequacy and needs in the state, as illustrated below. (Please note: the term "metrics" in this report is used as it is in performance measurement literature, as a measure of performance or activity.)

Efficiency	*Effectiveness*	*Impact*
protect existing assets	provide greater access to transportation services for all people	support economic growth, competitiveness and tourism
financial responsibility and accountability	reduce injuries and fatalities	coordinate land use and transportation planning
		minimize impacts on natural resources and conserve energy

Currently, TDOT calculates the following per capita performance measures as provided in its *Status of Public Transportation in Tennessee Annual Report* (2007).[63]

Farebox Recovery Ratio: a measure of how much passenger fares and contract revenues pay toward a system's total operating expenses.

Expense per vehicle revenue mile: cost to provide service in terms of miles travelled.

Expense per vehicle revenue hour: cost to provide service in terms of hours operated.

Expense per trip: cost to provide service in terms of trips taken.

[63] Available online at http://www.tdot.state.tn.us/publictrans/docs/annualreport.pdf.

Passenger trips per revenue mile: this figure multiplies the number of paying passengers by the miles they travel and is an indication of system efficiency.

Passenger trips per revenue hour: this figure multiplies the number of paying passengers by the hours they travel and is also an indication of system efficiency.

While these per capita figures are important in understanding the cost of public transportation, using other metrics would provide a wider lens to assess transportation adequacy. Performance measurement literature offers several other examples of transportation service metrics.[64] Additionally, the seven goals laid out in *Tennessee Transit Tomorrow* serve as a good benchmark for TDOT to measure success in achieving its goals. TDOT may wish to expand its current performance measures to include effectiveness and impact metrics such as security, accessibility (especially by disabled, elderly, and low-income residents), operating safety, public satisfaction, and reduction of pollution, congestion and energy consumption. Using effectiveness and impact metrics will help TDOT and local transit agencies locate service deficiencies and also allow lawmakers to address these deficiencies through policy.

A LOCAL EXAMPLE: MTA MASTER PLAN IMPROVEMENTS

In its recently published Master Plan, the Nashville MTA elaborated on transit improvements it hopes to implement. While the MTA is based in Nashville, their goals are similar to many transit agencies' objectives across the state (and nation), and the goals can be generalized for most mass transit agencies. These could be converted into efficiency, effectiveness, and impact metrics to be used in a performance scorecard to gauge MTA's success.

- **Re-establish basic levels of transit service**: more buses more frequently.

[64] Please see the following under references for more information on performance measurement: Fielding, et al (1978); Karlaftis and McCarthy (1997); National Performance Review (1997); and Phillips (2004).

- **Improve competitiveness of transit**: increase speed of travel or overall trip time and the availability of space on buses.
- **Serve those in unserved areas**: reinstate routes that were cut in July 2008.
- **Attract new users**: provide service that is competitive with cars and that is easier to use while improving the image of transit.

To be a viable option for Tennesseans, public transportation has to be as timely and economical as private transportation, or at least somewhat comparable.

To be a viable option for Tennesseans, public transportation has to be as timely and economical as private transportation, or at least somewhat comparable. The price of gasoline is not the only factor in driving costs; parking fees, automobile wear-and-tear and maintenance, time spent in traffic, and other considerations should be included when debating transit versus single occupancy vehicles, and transit agencies should market that sort of information to attract new users. Beyond serving as public relations tools and guiding principles, metrics should be developed to measure success in reaching objectives.

Furthermore, attaching accountability to results will promote thinking outside the box and provide incentives for agencies to improve. Accountability should be positive, not punitive, to help agencies learn which gaps exist, what is being done well, and, when possible, offer peer comparison. Practitioners must be careful to translate the data into meaningful information for policy makers. Spreadsheets full of numbers disconnected from any implementable steps are useless; they should identify what is being done well and what areas need improvement.

RURAL MASS TRANSIT

In a state that is considered over 70% rural, rural transit concerns are important to understand.

In a state that is considered over 70% rural (by FHWA standards, see below), rural transit concerns are important to understand. Rural transportation needs are very different but no less important than urban needs.

DEFINING RURAL

The Federal Highway Administration (FHWA) has put together a great deal of information describing the rural transportation efforts of communities and areas outside those regions covered by Metropolitan Planning Organizations (MPOs). The FHWA begins its

2004 "Planning for Transportation-Rural Areas" by defining three types of rural:

- Basic Rural: a county with few or no major population centers of 5,000 or more, mainly characterized by agricultural and natural resource-based economies, and "farm-to-market" transportation patterns.
- Developed Rural: a county with one or more population center(s) of 5,000 or more and its economies are mixed industrial and service-based; therefore, more diverse transportation patterns are available such as commuting to an inter-city, and possible freight transport.
- Urban Boundary Rural: counties with one or more population centers of 5,000 or more and a metropolitan area(s) of 50,000 or more. This county's economic growth, population growth, and transportation are tied to the urban center.[65]

Of Tennessee's 95 counties, 32 have populations of 25,000 to 48,000, and 37 have populations of 27,000 or less. By FHWA's definition, 72% of the state's counties are considered rural. The FHWA proposes that most basic rural areas' primary interest is to preserve existing transportation facilities.[66] A major difficulty for both basic and developed rural areas is that funding is difficult to obtain for new or upgraded roads outside the federal-aid system.

RURAL ROADS

Rural roads make up 80% of national road miles and 40% of vehicles mile traveled.[67] Ninety percent of these roads are two-lane or less, and about half are paved.[68] Many of our rural areas serve as connections between metropolitan centers and even other states.[69] Areas described as "Urban Boundary Rural" (those that border urban areas) have experienced high population growth rates and, consequently, have greatly influenced traffic growth. This has made it difficult to keep up with necessary maintenance and preservation of roads and bridges. Growth management becomes an issue as these boundary areas feel the environmental impact

[65] U.S. Department of Transportation, *Planning for transportation in rural areas*.
[66] Ibid.
[67] Chase (2001).
[68] Ibid.
[69] U.S. Department of Transportation, *Traffic volume trends*.

of urban sprawl. Enhanced public transit options could help offset demand for additional new road lanes and other expensive construction in rural areas.

THE RURAL TRANSPORTATION INITIATIVE

Another federal government initiative that has influenced the direction of rural mass transit is Section 5311 of the Federal Transit Act of 1964 which outlines a formula grant program for providing transportation service in non-urban areas. The funding formula is based on states' populations in those rural areas with less than 50,000 residents. It has five goals:

1. Enhance access of people in non-urbanized areas to health care, shopping, education, employment, public services and recreation
2. Assist in maintenance, development, improvement and use of public transportation systems in rural and small urban areas
3. Facilitate the coordination of programs and services funded by other federal programs
4. Provide for the participation of private transportation providers
5. Provide an equivalent level of transportation service to citizens with disabilities in non-urbanized areas[70]

RURAL SERVICES

TDOT reports that the state's rural public transportation programs serve 2.6 million citizens in all 95 counties. One of the key agencies involved in rural mass transit is the area RPO. There are 12 RPOs in the state that work with local officials on multimodal transportation planning to ensure quality and competent decision-making.[71] According to TDOT, RPOs consider multimodal transportation needs on both a local and regional basis, in addition to reviewing long-term needs and short-term funding priorities, and these considerations influence their recommendations to TDOT.

[70] U.S. Department of Transportation, *Rural and small urban areas* (5311).

[71] Tennessee Department of Transportation, *Rural planning organizations (RPO) section*.

TDOT published a report (prepared by TranSystems) in 2007 that provides a survey and assessment of the state's intercity bus service and demand.[72] Intercity buses travel across city lines in a given region and are the most commonly used mode of public transportation by rural residents, usually operated by a human resource agency (HRA). HRAs serve important demographic groups that have limited public transportation options—the elderly, low-income, and disabled populations.

While over 1.3 million passengers were carried by rural transit operators in 2006, the TDOT report found areas of improvement for these service providers. One key finding is that many of the agencies function as a "social service" and discourage general public users, and only one of all the rural operators was found to promote service for work commuters.[73]

The report identified several issues; below are ones pertinent to this report.

- "Traditional fixed route, fixed schedule intercity bus service, operated on a for-profit basis, has diminished in Tennessee, as it has nationally.
- "Rural transit operators are meeting an increasing share of general public intercity transportation needs…
- "To date, expanded general public intercity transportation by rural operators has not happened consistently across the state. Budget constraints are a key factor in limiting the ability of the rural operators to expand general public service to meet more the intercity transportation needs in the area.
- "The need for non-auto transit is increasing… [and] this applies to intercity trips even more than to local trips.
- "There is little coordination between rural transit operators and either traditional intercity bus service or urban fixed route operators.
- "Even a dedicated consumer has difficulty finding information regarding the service that is operated… [which] applies to all

[72] Available online at http://www.tdot.state.tn.us/publictrans/section/docs/2006TNInterCityNeedsAssessment.pdf.
[73] TranSystems (2007), 6.

> forms of public transportation: Greyhound, other intercity operators, the rural operators, and urban transit systems. There is no 'one-stop' shop. Links to public transit sites on TDOT's website are buried deeply, and not all operators are included. There is no link with the 511 system… [although] TDOT is currently working to make transit information on its website more accessible."[74]

Rural residents who meet certain requirements (age, economic and disability status) can use HRAs to travel within their home city or even further within a given district; however, this service is not available as an option for other rural residents wishing to use public transportation. TDOT announced the development of an Intercity Bus Demonstration Program using federal Section 5311(f) funds in 2008, which would increase public transportation services in rural areas. It was reported in March 2010 that $3.1 million in ARRA funds would be used to expand the Intercity Bus Demonstration Program to purchase new buses, security equipment, support vehicles, computers, ITS software, ADA enhancements, and to provide preventive maintenance.[75] These funds will expand the intercity bus network to cover almost 65% of the state and serve more than 70,000 rural residents annually through 2011.

In addition to the intercity bus program, TACIR staff suggests that local agencies pursue any other available federal rural transportation grants and the state either (1) increase funding to expand service to more residents or (2) loosen restrictions on who can use rural transportation services. Appendix B found at the end of this report lists funding options for local agencies to consider (TDOT already participates in many of the federal programs listed).

As Tennessee moves toward improved multimodal systems, more accessible and affordable transit options need to expand across the state in both rural and urban areas.

[74] Ibid, 6-7.

[75] Business Clarksville (2010).

CONCLUSION

This report is not an exhaustive list of transportation services and shortfalls in the state. It simply offers a glimpse of transportation policy as it has developed nationally and in Tennessee, trends, a limited evaluation of transportation services and needs in the state, as well as related issues. A closer look at each of these individual issues will enrich the current dialogue on transportation policy, particularly transit.

Cumberland Region Tomorrow (CRT), a not-for-profit organization working with governments and agencies in the middle Tennessee area, sponsored a recent survey of area leaders regarding regional collaboration. An overwhelming portion of respondents (two-thirds) said that improving transit options is the most important focus for middle Tennessee.[76] The CRT survey found that leaders in the Cumberland region believe the greatest benefit of an improved transit system would be reduced congestion.[77]

There are several benefits to evaluating transportation policy and looking for ways to increase resident mobility on roads, highways, buses, carpools, rails, and all other available modes of transportation.

Additionally, transportation policy is a chance to embrace regionalism—"the focusing of government, business, or community policies, practices, and efforts on maximizing economic performance in a regionalizing world," as defined in a previous TACIR report.[78] While the literature, theory, and practice may offer mixed results on the usefulness of regionalism, it is worth consideration, if not continued experimentation. Groups like "Nine Counties. One Vision." in East Tennessee, Middle Tennessee Mayors Caucus, and the Transit Alliance of Middle Tennessee are examples of how policy makers, stakeholders, and citizens within a region can address public transportation needs. Transportation systems are inextricably tied to land use decisions, housing choices and overall quality of life. It would benefit the state if policy makers considered this connection when addressing transportation needs. For more information on regionalism, please see TACIR's *Growth Concentration in Tennessee Regions* (September 2008).

There are several benefits to evaluating transportation policy and looking for ways to increase resident mobility on roads,

[76] Cumberland Region Tomorrow (2009).
[77] Ibid.
[78] Lippard and Green (2008).

highways, buses, carpools, rails, and all other available modes of transportation. Accommodating the growing population across the state requires reducing congestion and offering reliable transportation options through sustainable processes.

IDEAS

Throughout this report, TACIR staff has suggested policy improvements at the state and local level to improve multimodal transportation mobility and planning. The following are the most salient points for lawmakers, agencies, and concerned residents to consider.

Local governments may wish to consider taking advantage of the dedicated funding legislation that was recently passed while the state pursues alternative funding options further.

In order for Tennessee to thrive in a growing global economy, it has to have the necessary infrastructure available to transport people, goods, and services in an efficient, effective, and timely manner. State and local lawmakers, transportation agencies, public transportation supporters, and local residents worked diligently to pass legislation through the Tennessee General Assembly to establish dedicated funding sources for public transportation (Public Chapter No. 362, 2009). Local governments should take advantage of this great opportunity to secure funding for public transportation projects in their areas. Additionally, state policy makers should continue in their pursuit of other funding options for transportation investments.

TDOT may wish to incorporate more performance measurement metrics in its *Status of Public Transportation in Tennessee Annual Report*.

If passengers are not satisfied, how important is it to know the actual cost of a public transit trip per passenger? While TDOT measures per capita costs to assess service performance, it should increase its use of performance measures to include effectiveness and service quality metrics in its annual report. Utilizing metrics that compare service provided in relation to agency objectives (output compared to intended output), TDOT and local transportation

agencies can gauge if they are meeting goals and doing so in an efficient manner.

Human Resource Agencies that service rural counties should explore ways to expand service to residents who are not low income or elderly (which is done currently). HRAs should also consider ways to include intermodal connections so that residents are able to not only travel from county to county, but also within cities as well.

Multimodal mobility should include ways for in-commuters to travel in and around town once they reach the central city/travel hub. For example, if someone travels into a given city, there should be appropriate public transportation for the commuter to travel *within* the city.

APPENDIX A

Figure 1A of this appendix offers dollar figures only (federal, state, and local) for programmed costs of each MPO in Tennessee for 2008 through 2011. To see actual fund sources and how these figures were calculated, refer to Figure 2A of Appendix A. Figure 2A contains one table with rural transit costs calculated using TDOT's statewide STIP summary, and 11 tables with urban transit costs using raw data from each of the state's 11 MPO Transportation Improvement Programs (TIP). Because each MPO reports its data slightly differently, the information is not presented uniformly. Additionally, some MPO coordinators sent TACIR staff amended project costs, reflecting more up-to-date data, which is noted in the appropriate tables.

The following codes and abbreviations are used in Figure 2A. More information about these funding sources is available in Appendix B.

5303 Federal Transit Administration Planning Grants
5307 Federal Transit Administration Capital, Operating, and Planning (CAP) Grants
5309 Federal Transit Administration Capital Investments
5310 Federal Transit Administration Capital Investments
5311 Federal Transit Administration Rural Formula Program (administered by TDOT)
5313 Federal Transit Administration Transit Cooperative Research Program (TCRP)
5316 Federal Transit Administration Job Access/Reverse Commute (JARC)
5317 Federal Transit Administration New Freedoms
5339 Federal Transit Administration Alternatives Analysis
CMAQ Congestion Mitigation Air Quality
- **S-CMAQ** State administered CMAQ funds

ES Economic Stimulus (also abbreviated as STIM)
- **ES-State** State administered
- **ES-Local** Locally administered

O&M Abbreviation for Operations and Maintenance
- **O&M Local** Locally administered
- **O&M State** State administered

S&L Abbreviation for State and Local
STP Surface Transportation Program
- **S-STP** State administered
- **L-STP** Locally administered
- **U-STP** Urbanized Area (Nashville/Davidson Urbanized Area)
- **M-STP** Murfreesboro (only in Nashville MPO table)
- **M-STP*** Metropolitan Areas (Jackson)
- **Safety** Safety Improvements

*In the Nashville MPO data, M-STP reflects Murfreesboro projects. In the Jackson MPO data, it simply reflects metropolitan area projects.

Figure 1A of Appendix A 2008 - 2011 Programmed Costs				
MPO	**Year**	**Federal**	**State**	**Local**
Bristol	**2008**	$268,000	$168,000	$168,000
	2009	$357,743	$163,872	$163,871
	2010	$344,000	$163,000	$163,000
	2011	$328,000	$164,000	$164,000
	TOTAL	**$1,297,743**	**$658,872**	**$658,871**
Chattanooga	**2008**	$9,252,333	$2,560,000	$2,000,000
	2009	$21,747,462	$50,000	
	2010	$4,957,259		
	2011	$5,217,621		
	TOTAL	**$41,174,675**	**$2,610,000**	**$2,000,000**
Clarksville	**2008**	$1,881,847	$872,063	$872,064
	2009	$5,397,167	$919,463	$919,463
	2010	$2,216,986	$946,435	$946,435
	2011	$2,278,600	$974,217	$974,217
	TOTAL	**$11,774,600**	**$3,712,178**	**$3,712,179**
Cleveland	**2008**	$1,571,531	$88,763	$541,297
	2009	$877,774		
	2010	$1,382,266		
	2011	$1,886,758		
	TOTAL	**$5,718,329**	**$88,763**	**$541,297**
Jackson	**2008**	$8,774,000	$2,064,000	$1,792,000
	2009	$20,341,000	$928,000	$1,091,000
	2010	$3,601,000	$1,138,000	$1,376,000
	2011	$3,373,000	$1,134,500	$1,447,500
	TOTAL	**$36,089,000**	**$5,264,500**	**$5,706,500**
Johnson City	**2008**	$1,478,974	$554,311	$554,313
	2009	$3,155,301	$642,794	$642,794
	2010	$1,549,950	$644,381	$644,382
	2011	$1,377,402	$644,351	$645,351
	TOTAL	**$7,561,627**	**$2,485,837**	**$2,486,840**

Figure 1A of Appendix A 2008 - 2011 Programmed Costs				
MPO	**Year**	**Federal**	**State**	**Local**
Kingsport	**2008**	$1,037,500	$258,750	$347,750
	2009	$2,427,947	$362,450	$487,450
	2010	$1,135,500	$399,750	$524,750
	2011	$1,227,500	$448,750	$573,750
	TOTAL	**$5,828,447**	**$1,469,700**	**$1,933,700**
Knoxville	**2008**	$7,670,487	$920,000	$18,789,785
	2009	$6,695,387	$920,000	$19,265,248
	2010	$6,720,287	$40,704,896	$9,492,240
	2011	$27,831,348	$43,464,896	$58,733,536
	TOTAL	**$48,917,509**	**$86,009,792**	**$106,280,809**
Lakeway	**2008**	$3,411,868	$709,662	$709,662
	2009	$734,320	$197,696	$197,696
	2010	$734,320	$197,696	$197,696
	2011	$451,892	$197,696	$197,696
	TOTAL	**$5,332,400**	**$1,302,751**	**$1,302,750**
Memphis	**2008**	$21,801,000	$2,960,750	$7,564,500
	2009	$22,505,000	$2,969,125	$4,113,375
	2010	$39,913,000	$7,467,500	$8,124,500
	2011	$41,486,000	$7,433,875	$7,643,875
	TOTAL	**$125,705,000**	**$20,831,250**	**$27,446,250**
Nashville	2008	$36,531,891	$6,281,203	$24,193,801
	2009	$33,627,056	$2,308,217	$2,585,817
	2010	$17,743,028	$1,951,938	$1,951,938
	2011	$16,839,200	$1,957,501	$2,145,001
	TOTAL	**$104,741,175**	**$12,498,859**	**$30,876,557**

Figure 2A of Appendix A

TDOT STIP Summary Rural Transit Costs

Fund Code	Rural FY 2008	Rural FY 2009	Rural FY 2010	Rural FY 2011
5303				
5307				
5309	$14,906,806	$15,406,806	$15,406,806	$15,406,806
5309 EARMARK	$11,298,585	$330,000		
5310	$5,361,408	$5,629,478	$5,910,951	$6,206,498
5311	$29,384,826	$30,854,067	$32,936,771	$34,016,609
5313	$477,000	$477,000	$477,000	$477,000
5316	$1,876,560	$1,970,388	$2,068,906	$2,172,354
5316 EARMARK	$2,451,089			
5339	$618,750			
CMAQ	$2,450,000	$2,450,000	$2,450,000	$2,450,000
NEW FREE	$3,657,202	$1,274,192	$1,388,868	$1,513,866
UNITED	$50,000			
O&M LOCAL				
TRANSIT O&M				
TOTAL	$72,532,226	$58,391,931	$60,639,302	$62,243,133
			RURAL TOTAL	$253,806,592

*Data taken from summary sheet for statewide STIP years 2008-2011, sent to TACIR by TDOT staff.

Bristol MPO

	2008			2009		
Source	**Federal**	**State**	**Local**	**Federal**	**State**	**Local**
5307 Operating	$252,000	$126,000	$126,000	$317,743	$158,872	$158,871
5307 Operating. Asst.		$40,000	$40,000			
5307 Capital Asst.	$16,000	$2,000	$2,000			
5307 Replacements				$40,000	$5,000	$5,000
TOTAL	**$268,000**	**$168,000**	**$168,000**	**$357,743**	**$163,872**	**$163,871**
	2010			**2011**		
5307 Operating	$320,000	$160,000	$160,000	$328,000	$164,000	$164,000
5307 Operating. Asst.						
5307 Capital Asst.	$24,000	$3,000	$3,000			
5307 Replacements						
TOTAL	**$344,000**	**$163,000**	**$163,000**	**$328,000**	**$164,000**	**$164,000**

*Data used was sent by MPO Coordinator in addition to data in the official TIP.

Chattanooga MPO

Source	2008	2009	2010	2011
STP-Safety		$50,000		
S-STP	$2,560,000			
5307	$4,024,245	$4,098,365	$4,110,784	$4,328,823
5309	$1,254,111	$160,793	$168,833	$177,274
5309 (Bus)	$1,383,850			
5316	$385,676	$408,068	$428,478	$449,902
5317	$204,451	$237,299	$249,164	$261,622
53xx-ES		$5,124,608		
State 3R-ES		$500,000		
ES-State		$2,830,000		
ES-Local		$8,388,329		
Local Match	$2,000,000			
TOTAL	**$9,252,333**	**$21,747,462**	**$4,957,259**	**$5,217,621**

Clarksville MPO

Source	2008	2009	2010	2011
5307-Operating	$1,437,392	$1,480,514	$1,524,930	$1,570,678
5307-CAP	$183,628	$163,200	$163,200	$163,200
ARRA 5307 STIM		$3,240,001		
5309		$244,800	$252,144	$259,708
5310				
5316	$260,827	$268,652	$276,712	$285,014
Local Match	$872,064	$919,463	$946,435	$974,217
State Match	$872,063	$919,463	$946,435	$974,217
TOTAL	**$3,625,974**	**$7,236,093**	**$4,109,856**	**$4,227,034**

Cleveland MPO

Source	2008	2009	2010	2011
5307	$1,525,945	$877,774	$1,382,266	$1,886,758
JARC	$45,586			
Local	$541,297			
State	$88,763			
TOTAL	**$2,201,591**	**$877,774**	**$1,382,266**	**$1,886,758**

*FY2009-2011 federal dollars are in reserve funds.

Jackson MPO

	2008			2009		
Source	**Federal**	**State**	**Local**	**Federal**	**State**	**Local**
5307 CAP	$3,456,000	$432,000	$432,000	$1,288,000	$161,000	$161,000
5307 STIM				$2,370,000		
ES-STATE				$14,350,000		
ES-LOCAL				$1,500,000		
5309	$2,760,000	$345,000	$345,000	$300,000	$37,500	$37,500
5310	$120,000	$15,000	$15,000			
5316	$450,000	$225,000	$225,000	$185,000	$92,500	$92,500
5317	$200,000	$100,000	$100,000	$100,000	$50,000	$50,000
S-STP	$248,000	$62,000		$248,000	$62,000	
M-STP*	$1,540,000	$385,000				
State Operating Assistance		$500,000			$525,000	
Local Operating Assistance			$675,000			$750,000
TOTAL	**$8,774,000**	**$2,064,000**	**$1,792,000**	**$20,341,000**	**$928,000**	**$1,091,000**
	2010			**2011**		
Source	**Federal**	**State**	**Local**	**Federal**	**State**	**Local**
5307 CAP	$1,708,000	$213,500	$213,500	$1,720,000	$215,000	$215,000
5307 STIM						
ES-STATE						
ES-LOCAL						
5309	$1,360,000	$170,000	$170,000	$1,120,000	$140,000	$140,000
5310						
5316	$185,000	$92,500	$92,500	$185,000	$92,500	$92,500
5317	$100,000	$50,000	$50,000	$100,000	$50,000	$50,000
S-STP	$248,000	$62,000		$248,000	$62,000	
M-STP*						
State Operating Assistance		$550,000			$575,000	
Local Operating Assistance			$850,000			$950,000
TOTAL	**$3,601,000**	**$1,138,000**	**$1,376,000**	**$3,373,000**	**$1,134,500**	**$1,447,500**

Johnson City MPO

	2008			2009		
Source	**Federal**	**State**	**Local**	**Federal**	**State**	**Local**
Vehicles/Buses	$127,281	$15,910	$15,910	$1,411,011	$30,725	$30,725
Operating Expenses	$1,023,657	$511,828	$511,829	$1,171,090	$585,544	$585,544
Capital Expenses	$215,453	$26,573	$26,574	$573,200	$26,525	$26,525
TOTAL	**$1,366,391**	**$554,311**	**$554,313**	**$3,155,301**	**$642,794**	**$642,794**
	2010			**2011**		
	Federal	**State**	**Local**	**Federal**	**State**	**Local**
Vehicles/Buses						
Operating Expenses	$1,201,700	$600,850	$600,850	$1,261,802	$630,901	$630,901
Capital Expenses	$348,250	$43,531	$43,532	$115,600	$14,450	$14,450
TOTAL	**$1,549,950**	**$644,381**	**$644,382**	**$1,377,402**	**$645,351**	**$645,351**

Kingsport MPO

Source	2008	2009	2010	2011
5307-Operating	$345,500	$587,000	$687,500	$787,500
5307-CAP	$692,000	$549,600	$448,000	$440,000
5309				
5310				
ES		$1,291,347		
JARC				
State Operating	$172,250	$293,750	$343,750	$393,750
Local Match (OP, CAP, PL)	$347,750	$362,450	$399,750	$448,750
Local Match (Prog Income)		$125,000	$125,000	$125,000
State Match (CAP, PL)	$86,500	$68,700	$56,000	$55,000
TOTAL	**$1,644,000**	**$3,277,847**	**$2,060,000**	**$2,250,000**

*Does not include contributions from Virginia, which are included in the Kingsport TIP.

**There is a remiaining balance for FY 2008.

Knoxville MPO

Source	2008	2009	2010	2011
5307	$4,000,000	$4,000,000	$4,000,000	$16,000,000
5309	$3,166,000	$2,174,300	$2,182,600	$9,713,800
5310	$149,400	$166,000	$182,600	$697,200
5316	$221,837	$221,837	$221,837	$887,348
5317	$133,250	$133,250	$133,250	$533,000
S-STP	$920,000	$920,000	$40,704,896	$43,464,896
L-STP	$18,789,785	$19,265,248	$9,492,240	$58,733,536
TOTAL	**$27,380,272**	**$26,880,635**	**$56,917,423**	**$130,029,780**

Lakeway/Morristown MPO

	2008			2009		
Project/Source	**Federal**	**State**	**Local**	**Federal**	**State**	**Local**
ADA Vans	$298,800	$30,600	$30,600			
Transit Facility	$800,000	$100,000	$100,000			
ETHRA	$300,000	$150,000	$150,000	$241,428	$120,714	$120,714
Transit Planner	$20,000	$10,000	$10,000	$21,000	$10,500	$10,500
5316	$200,000	$100,000	$100,000	$20,000	$10,000	$10,000
2005-5307	$437,392	$54,674	$54,674			
2006-5307	$451,892	$56,482	$56,482			
2007-5307	$198,723	$24,840	$24,840			
2007-5307	$253,169	$126,584	$126,584			
2008-5307	$451,892	$56,482	$56,482			
2009-5307				$451,892	$56,482	$56,482
2010-5307						
2011-5307						
TOTAL	**$3,411,868**	**$709,662**	**$709,662**	**$734,320**	**$197,696**	**$197,696**
	2010			**2011**		
	Federal	**State**	**Local**	**Federal**	**State**	**Local**
ADA Vans						
Transit Facility						
ETHRA	$237,878	$118,939	$118,939	$234,276	$117,138	$117,138
Transit Planner	$22,050	$11,025	$11,025	$23,153	$11,576	$11,576
5316	$22,500	$11,250	$11,250	$25,000	$12,500	$12,500
2005-5307						
2006-5307						
2007-5307						
2007-5307						
2008-5307						
2009-5307						
2010-5307	$451,892	$56,482	$56,482			
2011-5307				$451,892	$56,482	$56,482
	$734,320	**$197,696**	**$197,696**	**$734,321**	**$197,696**	**$197,696**

Memphis MPO

Source	2008	2009	2010	2011
5307	$14,166,000	$19,385,000	$26,948,000	$16,191,000
5307 State Match	$1,725,750	$2,264,125	$3,062,500	$1,941,375
5307 Local Match	$6,253,250	$3,363,375	$3,674,500	$2,106,375
5309	$6,060,000	$1,900,000	$11,675,000	$23,935,000
5309 State Match	$735,000	$215,000	$3,887,500	$4,947,500
5309 Local Match	$780,000	$260,000	$3,932,500	$4,992,500
5316	$975,000	$900,000	$950,000	$1,000,000
5316 State Match	$425,000	$450,000	$475,000	$500,000
5316 Local Match	$456,250	$450,000	$475,000	$500,000
5317	$600,000	$320,000	$340,000	$360,000
5317 State Match	$75,000	$40,000	$42,500	$45,000
5317 Local Match	$75,000	$40,000	$42,500	$45,000
TOTAL	**$32,326,250**	**$29,587,500**	**$55,505,000**	**$56,563,750**

Nashville MPO

Source	Federal	State	Local
	2008		
5317	410,286	205,143	205,143
5307	64,000	8,000	8,000
CMAQ	1,000,000	125,000	125,000
U-STP	250,000		62,500
CMAQ	290,000		
5309	16,529,834	2,066,229	2,066,229
5316	684,889	342,444	342,444
5316	336,300	168,150	168,150
5307	400,000	50,000	50,000
U-STP	281,680		
CMAQ	100,000		
5309	200,000	25,000	25,000
5307	1,201,006	150,126	150,126
5307	920,000	115,000	115,000
LOCAL			1,000,000
5307	80,000	10,000	10,000
CMAQ	250,000		62,500

Nashville MPO

Source	Federal	State	Local
5307	2,040,510	255,063	255,063
U-STP	500,000		125,000
LOCAL			6,900,000
5307	4,500,000	562,500	562,500
5307	160,000	20,000	20,000
5307	80,000	10,000	10,000
5307	240,000	30,000	30,000
LOCAL			4,000,000
5307	1,183,953	147,994	147,994
5307	104,000	13,000	13,000
5307	1,344,000	168,000	168,000
LOCAL			1,936,000
5307	99,760	12,470	12,470
5309	2,309,560	288,695	288,695
LOCAL			5,226,597
S-CMAQ		400,000	
S-CMAQ		1,000,000	
5310	20,605	2,575	2,576
5310	95,700	11,963	11,963
5310	33,238	4,155	4,155
5310	63,170	7,896	7,896
5307	581,000	59,500	59,500
5307	160,000	20,000	20,000
5307	18,400	2,300	2,300
	2009		
ES-UT	926,000		
CMAQ	202,000		
5309	30,675	3,834	3,834
ES-UT	250,000		
ES-UT	3,350,000		
ES-UT	3,570,000		
ES-MT	350,000		
ES-UT	400,000		

Nashville MPO

Source	Federal	State	Local
ES-MT	1,235,769		
ES-UT	430,000		
U-STP	250,000		62,500
CMAQ	298,000		
5309	3,629,580	453,697	453,697
5316	166,712	83,356	83,356
ES-UT	1,075,000		
U-STP	290,130		
U-STP	500,000		125,000
CMAQ	250,000		62,500
ES-UT	60,000		
5307	592,199	74,025	74,025
5307	120,000	15,000	15,000
5307	80,000	10,000	10,000
5307	4,800,000	600,000	600,000
5307	100,000	12,500	12,500
5307	80,000	10,000	10,000
5307	80,000	10,000	10,000
5307	80,000	10,000	10,000
ES-UT	1,664,151		
5307	104,000	13,000	13,000
5307	680,000	85,000	85,000
5307	960,000	120,000	120,000
5309	862,440	107,805	107,805
5309	5,600,000	700,000	700,000
U-STP	110,400		27,600
ES-MT	150,000		
ES-MT	300,000		
	2010		
ES-UT	892,985		
5307	160,000	20,000	20,000
S-CMAQ	230,000		
5307	2,000,000	250,000	250,000

Nashville MPO

Source	Federal	State	Local
U-STP	404,500		
5307	375,503	46,938	46,938
5307	120,000	15,000	15,000
5307	80,000	10,000	10,000
S-CMAQ	600,040		
5307	4,800,000	600,000	600,000
5307	100,000	12,500	12,500
5307	80,000	10,000	10,000
5307	80,000	10,000	10,000
5307	80,000	10,000	10,000
5307	700,000	87,500	87,500
5307	1,040,000	130,000	130,000
5309	6,000,000	750,000	750,000
	2011		
5307	785,612	98,202	98,202
U-STP	250,000		62,500
5307	1,214,388	151,799	151,799
U-STP	500,000		125,000
U-STP	429,200		
5307	120,000	15,000	15,000
5307	5,000,000	625,000	625,000
5307	100,000	12,500	12,500
5307	80,000	10,000	10,000
5307	80,000	10,000	10,000
5307	80,000	10,000	10,000
5307	80,000	10,000	10,000
5307	720,000	90,000	90,000
5307	1,200,000	150,000	150,000
5309	6,200,000	775,000	775,000
TOTAL	**104,747,205**	**12,498,859**	**30,876,557**

APPENDIX B

The following are only some of the several funding programs offered by the federal and state governments for transportation projects. TDOT already participates in many of these. The following information was taken directly from the FTA and TDOT websites.

GENERAL TRANSPORTATION FUNDING PROGRAMS AND OPTIONS

Bridge Replacement and Rehabilitation. Funds the replacement and rehabilitation of deficient bridges. This program has an 86.5-13.5 federal-state matching requirement.

Congestion Mitigation Air Quality (CMAQ) Improvement Program. Funds projects that will help attain and maintain air quality standards, including things like improved transit, HOV lanes, traffic flow improvement projects, etc. This program has an 80-20 federal-state matching requirement.

Community Transportation Assistance Program (CTAP). According to its website, the goal of CTAP "is to build a strong network of transportation professionals and allies to support and advance community transportation and to make human services accessible through safe and affordable transportation services. These activities are designed to provide information, support and resources to those working to improve mobility in our nation's communities."[1]

Highways for Life Pilot Program. A new program to promote highway construction processes that result in reduced congestion, improved safety, improved air quality and user satisfaction. This program has up to a 100% federal share.

Human Services Transportation Coordination. A provision aimed to improve transportation services for persons with disabilities, older adults, and individuals with lower incomes by ensuring that communities coordinate transportation resources provided through multiple federal programs. Coordination will enhance transportation access, minimize duplication of services, and facilitate the most appropriate cost-effective transportation possible with available resources.

Metropolitan Planning Program. Funds used to assist MPOs. This program typically has an 80-20 federal-local matching requirement.

National Corridor Infrastructure Improvement Program. Funds are used for highway projects in corridors to promote economic growth. This program has an 80% federal share.

Rural Transit Assistance Program. Eligible projects include activities that support rural transit providers with training and technical assistance, research, and related support services. Each state gets an annual allocation of funds for RTAP that can be used for projects such as newsletters,

[1] Available online at http://web1.ctaa.org/webmodules/webarticles/anmviewer.asp?a=3.

training courses, scholarships for training, and circuit riders. In addition, RTAP funds are used for a national project that supports the state RTAP managers, maintains a rural transit database, produces training modules, and provides a rural transit resource center. There is no local share requirement.

Rural Transportation Accessibility Incentive Program. The purpose is to help over-the-road bus operators finance the incremental capital and training costs of complying with the DOT's final rule on accessibility of over-the-road buses.

Section 5303. Administered by FHWA, provides funding assistance to local governments for conducting transportation planning activities in urban areas with populations greater than 50,000. This program has an 80-20 federal-local share.

Section 5307. Administered by FHWA, is a formula grant program that provides communities with a population over 50,000 with funds to provide public transportation services. This program has an 80-20 federal-state share.

Section 5309. A discretionary grant appropriated by the federal government each year for capital expenses only. These funds purchase buses, vans maintenance facilities and related equipment, staff offices, and support equipment. This program provides public transportation to both urban and rural areas of the state. This program has up to an 80% federal share of the net project cost.

Section 5310. (Elderly and Disabled). Provides grants for non-profit organizations providing transportation services for elderly persons and persons with disabilities. This program supplements existing transportation services in areas: urbanized, small urban, and rural where such services are insufficient, or inappropriate for these persons. This program has an 80-20 federal-state share.

Section 5311. A rural transportation grant program providing federal funds to the Tennessee Department of Transportation for state administration, planning, technical assistance, capital operating and project administration assistance in areas with population less than 50,000. The annual federal allocations are based on the non-urbanized population, the number of vehicles and counties in the service area. This project has an 80% federal share for capital projects, 50% for operating, and 100% for administration.

Section 5311(f). The Intercity Transportation allocation is 15% of the rural transportation apportionment for the State of Tennessee. This program is designed to address the intercity travel needs of residents and persons in non-urbanized areas of the state, by funding services that provide access to the national and regional intercity bus and public transportation networks.

Section 5313. The Transit Cooperative Research Program (TCRP) promotes operating effectiveness and efficiency in the public transportation industry by conducting practical, near-term research

designed to solve operational problems, adopt useful technologies from related industries and introduce innovation that provides better customer service.

Section 5316. Job Access & Reverse Commute (JARC). Provides funding for local programs that offer job access and reverse commute services to provide transportation for low-income individuals who may live in the city core and work in suburban locations.

Section 5317. The New Freedoms program is a formula-based grant program associated capital and operating costs based on population of persons with disabilities. This grant encourages services and facility improvements to address the transportation needs of persons with disabilities that go beyond those required by the Americans with Disabilities Act. This program has a 50% federal share for operating assistance and 80% for capital projects.

Section 5339. The Alternatives Analysis Program funds states, state agencies, MPOs, and local governments and their agencies for potential transit "new starts" projects. This program has an up to 80% federal share.

Small Starts Program. Provides funds for bus corridor improvements (if the project cost is less than $250 million where the federal share does not exceed $75 million). This project usually has a 60% federal share.

State Operating. An operating grant for all transit agencies in the state. The grant is 100% state dollars. Allocation is based on population figures. They are to be used for operating assistance only, and the time frame is for one year beginning every July.

Transportation, Community, and System Preservation Program. Funds projects that promote efficiency, reduced environmental impact, and efficient access to jobs, services and trade centers. This program has an 80% federal share.

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