






FINAL REPORT

TENNESSEE LONG-RANGE TRANSPORTATION PLAN

10-YEAR STRATEGIC INVESTMENTS PROGRAM

DECEMBER 2005

TDOT

PLAN Go.

A Long-Range Multimodal Strategy

Prepared by
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Tennessee Long-Range Transportation Plan

10-Year Strategic Investments Program Final Report

December 2005

Executive Summary

ES.1 Purpose of the Report

The *10-Year Strategic Investments Program* report identifies proposed spending priorities and policy initiatives that will address many of Tennessee's transportation needs and help implement the state's new Long-Range Transportation Plan (LRTP) over the next 10 years. The report describes the proposed 10-year program and highlights critical elements in the long-range plan that warrant accelerated funding or special attention. The 10-year program is one of three major outcomes of the LRTP and represents an important step toward implementation of the plan.

ES.2 Framework to Develop the Strategic Investments Program

Tennessee benefits from an extensive and well maintained transportation system, consisting of highways, railroads, waterways, airports, public transportation, and bicycle and pedestrian facilities. This system provides personal mobility in the state's cities, towns, and rural areas, and makes possible the movement of goods and freight into, through, and within the state. A complex mix of public agencies and private companies offers transportation services for passengers (private automobiles, public transportation, Amtrak, and air carriers) as well as freight (trucks, railroads, barges, and airplanes).

It is estimated that over the next 25 years, Tennessee's transportation needs will amount to nearly $130 billion, when adjusted for inflation. This amount reflects the needs of all modes of travel operating in Tennessee. Included is the cost of building and maintaining the infrastructure, as well as the cost of operating those systems that typically fall to public agencies (highways and public transportation).

Included in the total need estimate is a $40 billion backlog of highway and other transportation needs. While the highway system is generally well maintained, the state has been unable to keep pace with the rapid increase in highway travel, resulting in congestion on approximately 2,200 miles of the 14,150 mile state highway system. It will cost $18 billion to address the existing highway capacity backlog alone—and more miles become congested each year.

Revenue Forecast

Over the next 25 years, the forecast of state, federal, and local revenues available to the Tennessee Department of Transportation (TDOT) is estimated to be $69.4 billion. Annual revenues will grow from $1.6 billion in 2005 to approximately $3.8 billion in 2030. Given current tax rates and forecasts of future economic activity, existing revenues are likely to grow at or below the rate of inflation. Table ES-1 summarizes the 25-year total revenue forecast.

Tennessee's Transportation Future: Summary of the 25-Year Vision Plan

Reflecting considerable input from stakeholders and the general public, the Long-Range Transportation Plan proposes a 25-year vision that will guide efforts to build a well maintained, balanced, and sustainable transportation system for the state. The 25-year vision is defined by a set of Guiding Principles, policies, and investment goals.

Table ES-1. 25-Year Total Revenue Forecast (in Millions, Year-of-Expenditure Dollars)

Revenue Source	2015 ($M)	2030 ($M)	25-Year Total ($M)
State	978.71	1,343.36	26,101.33
Federal	1,502.24	2,340.44	41,557.43
Local Match	62.40	97.21	1,726.12
Total	2,543.35	3,781.01	69,384.88

Source: AECOM Consult, Inc.

Guiding Principles

An early step in developing this plan was to agree upon a set of Guiding Principles that clearly state the standards and values upon which the preservation and improvement of the state's transportation system will be based. Reflecting guidance of the U.S. Department of Transportation, and consistent with planning conducted by TDOT's local planning partners, public input shaped a final set of seven Guiding Principles:

- Preserve and Manage the Existing Transportation System.
- Move a Growing, Diverse, and Active Population.
- Support the State's Economy.
- Maximize Safety and Security.
- Build Partnerships for Livable Communities.
- Promote Stewardship of the Environment.
- Emphasize Financial Responsibility.

Investment and Operating Policies

To achieve the goals and objectives of the 25-Year Vision, a set of policies was developed to guide TDOT's investments and operations. These policies help to define how the Guiding Principles will be put into practice on a day-to-day basis as decisions are made and programs are established. They provide the framework for making operating and investment decisions. Some policies will replace or strengthen existing practices immediately. Others will follow a more formal adoption process. Several of the policies are listed below. The full set of proposed policies is listed in Section 2.3.2.

- TDOT will build new and stronger partnerships, to develop and finance transportation programs and projects that maximize public investments and support community and regional growth strategies.
- TDOT will coordinate transportation planning with local land use plans, to support livable communities and protect, preserve and enhance the social, historic, and natural resources of the state.
- To promote economic development, TDOT will emphasize projects that allow people and freight to move efficiently around the state; this activity will include working with communities and freight carriers to create competitive freight choices.

- TDOT will develop a multimodal project development process that considers all current and future users of the transportation system and a full range of transportation options.
- In the planning process, TDOT will use more robust project evaluation and performance monitoring systems to measure quality, safety, and efficiency.

25-Year Investment Goals

The Vision Plan calls for state transportation spending over the next 25 years of $85.3 billion, a 23 percent increase over current revenue projections of $69.4 billion. Spending would continue to focus heavily on the state highway system, reflecting the continued role of highways as the foundation of the state's transportation system, and TDOT's responsibility to preserve and expand those facilities. State funding for public transportation, aviation, rail, and waterways would also increase. The increased funds would primarily allow more spending for system expansion, helping to reduce the nearly $40 billion backlog of current transportation needs.

Key plan elements include:

- Placing the highest priority on public safety and the continued preservation of existing infrastructure.
- Increasing highway spending by 18 percent to reduce the backlog of urban and rural highway needs.
- Increasing public transportation funding by 45 percent, which raises the state share for capital and operating support for improved rural and urban service.
- Increasing funding for system management efforts to expand intelligent transportation system (ITS) initiatives.
- Increasing investment for modernization of the shortline rail network.
- Creating programs to promote railroad, waterway system, and multimodal freight improvements through public/private partnerships.
- Continuing the state's strong support for regional and community airports by funding needed expansions and upgrades.

ES.3 10-Year Strategic Investments Program

Strategic Investments Context

Findings and recommendations in the 25-Year Vision Plan shaped the development of the 10-Year Strategic Investments Program. The long-range findings and recommendations include the following:

- Tennessee's highway system, including its bridges, is well maintained, with little perceived need to increase funding beyond normal inflationary protection.
- Stakeholders clearly stated that preserving and maintaining the transportation system is the highest priority.
- The state-maintained highway system has a significant backlog of capacity improvements, a situation most pronounced in the state's urban areas.

- Tennessee's freight movement system is under growing pressure. Truck traffic on state highways is rapidly increasing, depleting available capacity on much of the rural interstate system.
- The greatest urban transit need is to improve traditional fixed-route bus service; however, transit investment is not likely to significantly reduce urban or rural congestion.

Institutional and financial considerations are also important to the development of the 10-year program:

- Federal funds are expected to grow more rapidly than the state funds that support Tennessee's Highway Fund, challenging the state's ability to match available federal highway funds.
- The state is only a financial partner in non-highway programs. Caution must be taken not to leave programmed TDOT funding "on the table" by allocating more state funding than can be used by local agencies under the prevailing matching requirements.

10-Year Spending Levels

In order to achieve the 25-Year Vision Plan, at an estimated cost of $85.3 billion, the state will need $16 billion more than is forecasted to be available from existing revenue sources. During the first 10 years, the state will need $26.7 billion[1] to advance the plan on a uniform basis. The 10-year revenue forecast is $22 billion, resulting in a $4.7 billion gap over the next 10 years to begin plan implementation. TDOT has chosen, however, to pursue a more conservative approach to funding the 10-Year program. The proposed 10-Year Strategic Investments Program totals $24 billion and is organized into two parts, baseline funding and strategic investments:

- Baseline Funding: The state will spend $22 billion, the forecasted amount from existing revenue sources, to address transportation needs over the next 10 years. The baseline funding preserves current system performance and begins to reflect the general policy shifts called for in the 25-Year Vision Plan.
- Strategic Investments: The state proposes $2 billion in strategic investments to jump-start specific programs in the 25-Year Vision Plan that are critical to long-term system performance. The investments will help reduce congestion, offer people more choices, and develop key corridors across the state.

10-Year Baseline Program

TDOT's proposed 10-year baseline funding is intended to be a performance maintenance program that supports existing programs that are now adequately funded, while stopping or slowing degradation of services in other areas. Over the next 10 years, the state would spend $22 billion to preserve current system performance.

[1] Based on the $85.3 billion (YOE) 25-Year Vision Plan, assuming steady annual expenditures, with a YOE adjustment of 3 percent per year.

10-Year Program of Strategic Investments

While the proposed $22 billion baseline spending program will allow the state to continue meeting transportation needs in a manner similar to today, it will not allow a significant reduction in backlogged needs or expanded transportation services. To achieve the objectives described in the 25-Year Vision Plan, the long-range plan proposes strategic investments of $2 billion in three areas: Congestion Relief, Choices, and Corridors. The three strategic initiatives are described below.

Strategic Initiative: Congestion Relief

This initiative focuses on the preservation of the existing transportation system and the investments already made in that system. Over the next 10 years, TDOT will accelerate highway system management and construction to improve the highway system statewide.

The 10-year program proposes to invest an additional $840 million to relieve congestion in rapidly growing cities and suburban areas, and improve the performance of rural highways. The $840 million includes $165 million to accelerate improvements on urban interstates and other state highways in Tennessee's cities, $370 million to keep highways and bridges on the state system in current high levels of repair, and $240 million to address safety and congestion concerns on rural highways

TDOT will also spend an additional $40 million to complete critical traffic and transit management systems, and $25 million to manage the demand for transportation services and to promote other travel options.

Strategic Initiative: Choices

To move a diverse and growing population, this initiative focuses on expanding travel choices available to Tennesseans. Over the next 10 years, TDOT proposes to invest an additional $665 million to jumpstart a state-of-the-art public transportation system for Tennessee. Partnering with public transportation operators, the state would help:

- Build as many as four new high-performance transit corridors in major metropolitan areas. TDOT would provide up to half of the non-federal share of capital costs.
- Make major city bus service more frequent, especially on heavily congested routes.
- Replace older, often unreliable city buses and rural vans with modern vehicles.
- Add new service to rural transit routes, including extending service hours.

$5 million would be assigned to improve walking and bicycling facilities throughout the state.

Strategic Initiative: Corridors

Recognizing the significance of certain corridors to the state's economic development, TDOT will focus improvements in a series of key corridors over the next 10 years. Improvements will include critical sections of the state highway system, and multimodal solutions will be applied where practical. The state will pursue public and private partnerships with aviation, public

transportation, rail, and waterways partners to implement needed improvements in critical elements of those systems.

A small segment of the state's 14,150-mile highway system forms the foundation of Tennessee's transportation system, carrying most of the goods and freight and connecting major urban areas and growing smaller cities. To accelerate improvements in the corridors, TDOT proposes an additional 10-year investment of $495 million: $245 million for accelerated improvements on key rural interstate highways and $80 million to advance the County Seat Connector program, under which every county is to be connected to the closest interstate highway by an improved four-lane roadway.

A second significant part of the effort to enhance these corridors will be partnering with other modes of freight transport. TDOT will invest up to $170 million to enhance the speed and safety of freight transport:

- Upgrading Tennessee's shortline railroads to allow them to accommodate the heavier rail cars favored by Class 1 rail operators and major shippers.
- Partnering with Class 1 rail operators on select safety and modernization projects to promote rail as a viable shipping option by improving safety and reducing travel time and cost.
- Creating a challenge grant program, by which the state will encourage preservation of the Tennessee's ability to transport heavy, bulk loads by waterway and make matching funds available for system improvements.

The combination of the baseline spending and the strategic investments amounts to $24 billion. Fund distribution is shown in Table ES-2.

ES.4 Strategic Investments Funding

Revenue Enhancement Options

To generate the $2 billion for the 10-year strategic investments, the state will need to consider some combination of new revenue and financing strategies.

- Tennessee's tradition of pay-as-you-go financing for transportation underpins the financial plan for the 25-year vision. The state can avoid diverting large amounts of future revenue to debt service if it maintains this basic funding approach.
- The long-term erosion of the Highway Fund's buying power has resulted in a growing backlog of needs, which only a significant infusion of additional capital can address.
- By applying limited debt financing, costly major reconstruction and expansion projects can be accelerated, thereby reducing construction impacts and potentially reducing overall project costs.
- Recommended increases in funding for non-highway modes will occur only if TDOT's partners also increase their participation in these programs. Tennessee should consider creating financing tools that will provide incentives to local governments to increase their spending.

In consideration of the points outlined above, Table ES-3 summarizes measures that combine traditional revenue enhancement and more aggressive financing techniques. These combined measures could generate the $2 billion needed to fund TDOT's 10-year strategic investments. If implemented, they would position Tennessee to continue the improvements to its transportation system that will be needed over the long term to support anticipated growth and economic development.

Table ES-2. Proposed Total 10-Year Funding

Investment Areas		Baseline ($M)	% of Total	Strategic Investment	10-Year Total ($M)	% of Total
Maintenance/ Preservation	Highway: Bridge and Roadway Maintenance and ITS	5,878	26.7	410	6,288	26.2
	Public Transportation, Bicycle/Pedestrian, and Transportation Options (TDM): Urban and Rural System Capital and Operating Support	576	2.6	25	601	2.5
	Aviation, Railroad, and Waterway: Regional System Support; Shortline Railroad Rehabilitation Programs	178	0.8	—	178	0.7
	Maintenance/Preservation Subtotal	6,631	30.1	435	7,067	29.4
Safety/ Modernization	Highway: Bridge Replacement, Widening of Narrow Lanes, and Local System Support	4,071	18.5	240	4,311	18.0
	Public Transportation and Bicycle/Pedestrian: Support Systems	23	0.1	5	28	0.1
	Aviation, Railroad, and Waterway: Improved Communication Systems, Rail Grade Crossing Protection, Shortline Track Capacity	325	1.5	170	495	2.1
	Safety/Modernization Subtotal	4,419	20.1	415	4,834	20.1
Expansion/ Enhancement	Highway: Congestion Relief, Local System Expansion, ITS Expansion	10,227	46.5	490	10,717	44.6
	Public Transportation and Bicycle/Pedestrian: Urban and Rural System Expansion Support	478	2.2	660	1,138	5.0
	Aviation, Railroad, and Waterway: Partnered Support of Airport Expansion, Rail Bypass, and Intermodal Yards, Expanded Port Facilities, Intercity Passenger Rail	253	1.1	—	253	1.1
	Expansion/Enhancement Subtotal	10,958	49.8	1,150	12,108	50.4
	Total	22,008	100.0	2,000	24,009	100.0

Investment Areas	Recommended 10-Year Funding Summary				
By Mode	**Baseline ($M)**	**% of Total**	**Strategic Investment**	**10-Year Total ($M)**	**% of Total**
Highway and ITS	20,175	91.7	1,140	21,316	88.8
Public Transportation, TDM, and Bicycle/Pedestrian	1,076	4.9	690	1,766	7.4
Aviation, Rail, and Waterways	756	3.4	170	926	3.9
Total	22,008	100.0	2,000	24,008	100.0

Table ES-3. Potential 10-Year Revenue Enhancement and Capital Generation Initiatives

Revenue Type	Amount of Increase	10-Year Yield ($M YOE)
Gas and motor fuel tax increase with current split	4 cents	$804
Gas and motor fuel tax indexed at 3 percent, 100 percent to Highway Fund	-	$1,054
Registration fees increase	10%	$182
GARVEE-backed bond authorization	<10% of anticipated federal $ for debt service	$1,000
Authorization of new toll road agencies	-	(*)

* Due to time required for agency start-up and project development, no new funds are assumed during 10-Year Strategic Investments Program period.

In addition to these revenue enhancements, additional financing and project delivery tools should be considered.

- Debt finance to stabilize backlog and advance critical capacity needs. Issuance of general obligation or Grant Anticipation Revenue Vehicle (GARVEE) bonds for right-of-way acquisition, bridge construction, and special project acceleration.
- Capitalization of Tennessee's State Infrastructure Bank (SIB), which is now administered by TDOT, as an accelerated funding source for partnering projects, such as transit new starts or rail freight investments. The SIB could be capitalized by new or existing TDOT funds.
- Creation/authorization of either regional or statewide toll road authorities.
- Statutory authorization to allow the use of design/build project delivery and other public-private partnerships to advance highway capacity projects.

Next Steps

Once the state determines the specific programmatic spending recommendations outlined in the 10-Year Strategic Investments Program, additional analysis will be needed to define actual cash flow implications of the plan and to prepare a schedule for any debt issuance and cash management. For program areas such as public transportation and rail rehabilitation, where the state is not the primary funding partner, TDOT must work closely with potential project sponsors to identify the timing and project funding requirements that they may be asked to support.

Equally important will be any changed provisions of the recently enacted extension of the federal transportation authorization legislation. On August 10, 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed into law. SAFETEA-LU authorizes federal surface transportation programs for highways, highway safety, and transit for the 5-year period, 2005–2009.

Many of the key changes to the statewide planning provisions are already components of this LRTP, including:

- Coordinating with regional transportation planning organizations, economic development agencies, and neighboring states.
- Promoting consistency between transportation planning and growth strategies.
- Ensuring the preservation and efficient use of the existing transportation system.

- Providing the opportunity for pedestrians, bicyclists, and the disabled to participate in the planning process.
- Enhancing the overall public participation process.

As TDOT moves forward with implementation of the LRTP, emphasis will be placed on several core provisions of SAFETEA-LU:

- Establishing a Highway Safety Improvement Program that focuses on strategic highway safety planning, construction work zones, older drivers, pedestrians, and children walking and bicycling to school.
- Providing safety and security measures for transit systems and transportation facilities such as ports, intermodal hubs, railroads, and airports.
- Providing congestion relief by promoting real-time traffic management and improving freight movement.

ES.5 Supporting Actions

To advance the 10-Year Strategic Investments Program, several additional strategies and actions must be pursued. These will require a collaborative approach, involving executive branch and legislative leadership, organizational change within TDOT, and active participation by public and private transportation partners. A sustained implementation process will require ongoing review of institutional issues, new planning tools/concepts, and incremental changes to state policies, practices, and laws. Some of these activities are described below.

- Create an LRTP implementation team at TDOT to provide executive-level oversight and structure to the implementation process.
- Pursue legislative authorization for financing initiatives to:
  - Issue bonds secured by future federal funds (GARVEEs).
  - Create toll road authorities, either state or regional.
  - Apply project acceleration techniques such as design/build and/or public/private partnerships.
- Improve planning integration to ensure that the policies calling for early, intensive multimodal project development are established and implemented.
- Implement project evaluation processes to allow a thorough screening of technical and needs-based criteria.
- Monitor and regularly report system performance measures that track progress toward achieving stated goals and objectives.
- Establish long-range plan and strategic program revision cycles, updating the 25-Year Vision Plan every 4 to 5 years and the 10-Year Strategic Investments Program every 2 to 3 years.
- Advance corridor planning in Tennessee, accelerating focused improvements so that these critical corridors can better fulfill their economic development and mobility roles.
- Accelerate project delivery through legislative authority and organizational changes. This could include techniques such as design/build and public/private partnerships, either of which will require legislative authorization and new TDOT organizational structure.

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Acronyms and Abbreviations

ADA	Americans with Disabilities Act of 1990
DOT	Department of Transportation
FY	Fiscal Year
GARVEE	Grant Anticipation Revenue Vehicle
ITS	Intelligent Transportation System
LRTP	Long-Range Transportation Plan
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SIB	State Infrastructure Bank
SIP	Strategic Investments Program
TDM	Transportation Demand Management
TDOT	Tennessee Department of Transportation
YOE	Year of Expenditure

Chapter 1
Introduction

1.1 Purpose of Report

The Tennessee Department of Transportation (TDOT) is developing a Long-Range Transportation Plan (LRTP) to provide a basis for making informed transportation decisions and to guide implementation of an integrated transportation program delivery process. The LRTP identifies Tennessee's transportation system needs to meet user expectations for the movement of both people and goods for the next 25 years. It establishes a vision and policy structures, sets forth investment strategies, redefines needed partnerships, provides a framework for directing investments, and identifies the financial resources needed to sustain the plan's vision.

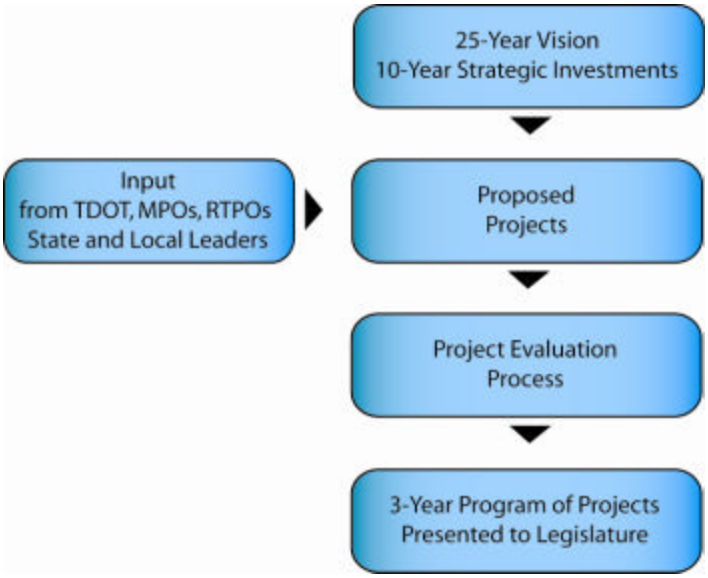
Tennessee's LRTP consists of three principal elements:

- 25-Year Vision Plan, which broadly defines how Tennessee will respond to the trends and challenges facing the transportation system.
- 10-Year Strategic Investments Program (SIP), which identifies critical investments that warrant accelerated funding or special attention over the next 10 years.
- A 3-Year Project Evaluation System, which guides the selection the 3-year program of projects giving state and local leaders a broader view of projects under development.

The 10-Year SIP establishes spending priorities and policy initiatives needed in the next 10 years. These priorities and initiatives are necessary to address the state's modal needs and multimodal program areas. They must also reflect the anticipated financial resources required to implement the 25-Year Vision Plan. This report describes the proposed 10-Year SIP, identifying critical elements of the 25-year Vision Plan that warrant accelerated funding or special attention. The SIP will begin definitive implementation of the plan and set in motion the strategic changes identified in the 25-year plan.

The 10-Year SIP, which will be updated every 2 to 4 years, will be one element of a newly integrated transportation program delivery process that is intended to provide a continuity of planning principles through each of the plan elements cited above. This program delivery process is based on Guiding Principles (see Chapter 2.3) that were established early in the LRTP planning process. The principles reflect both federal transportation planning guidance and the procedures of TDOT's local partners. They provide continuity throughout the plan and they have influenced the development of goals and objectives, alternative long-term investment scenarios, and the transportation system performance measures and project evaluation system. This ongoing, integrated program delivery process is shown in Figure 1-1.

Figure 1-1. Integrated Transportation Program Delivery Process



1.2 Report Organization and Content

The *10-Year Strategic Investments Program* report:

- Provides a framework for development of the 10-Year SIP: (1) the current transportation system and identified long-term transportation needs that might be addressed by TDOT spending and operations; (2) a forecast of anticipated transportation revenues available during the planning period; and (3) the 25-Year Vision Plan.
- Defines the proposed 10-Year SIP baseline spending program and strategic initiatives intended to jump-start implementation of the 25-year plan.
- Identifies potential funding options for the 10-year program.
- Describes supporting actions needed to aid program implementation, including policy and partnership initiatives.

Chapter 2

Framework to Develop Strategic Investments Program

Tennessee benefits from an extensive transportation system consisting of highways, railroads, waterways, airports, public transportation, and bicycle/pedestrian facilities. This system provides personal mobility in the state's cities, towns, and rural areas, and makes possible the movement of goods and freight into, through, and within the state. A complex mix of public agencies and private companies offers transport service, whether for personal mobility (private automobiles, public transportation, Amtrak, and air carriers) or movement of freight (trucks, railroads, barges, or airplanes).

The state's transportation infrastructure consists of:

- 14,150 miles of state highways, including the interstate highway system
- 74,370 miles of local county roads and city streets
- 19,650 state or locally owned bridges
- 25 public transportation systems serving 95 counties
- 19 shortline and 6 major railroads that operate on 3,081 miles of track
- 1,062 miles of navigable waterways and 172 ports
- 84 airports of varying sizes
- Bicycle and pedestrian facilities throughout the state

TDOT is directly responsible for, or is a service partner with some responsibility for, much of this system. From its current $1.6 billion budget, TDOT provides:

- Maintenance, operation, and expansion as needed for the system of state highways and bridges.
- Capital and operating support for public transportation in cities and rural areas.
- Capital support for rehabilitation of shortline railroads.
- Substantial financial support for maintenance and expansion of the state's regional and community airports.

To provide a framework for the LRTP and the 10-Year Strategic Investments Program (SIP), this chapter examines the current transportation system and its estimated long-term needs, the revenues expected to be available to address those needs, and the long-term vision for transportation as defined by the 25-Year Vision Plan.

2.1 Current and Expected 25-Year Performance of the Transportation System

The transportation system today operates and is maintained in varying states of acceptability. The physical condition of the state highway system is generally good; however, in urban areas it is becoming increasingly congested. Public transportation systems are generally seen as

providing marginal service in terms of service coverage and frequency, making transit the mode of last resort for many people. The privately operated and maintained Class 1 rail system has been shrinking, often leaving it to local authorities and small, shortline railroad companies to preserve services that are needed for local economic well-being. Some other key points that reflect on long-term transportation financial needs and performance, drawn from the LRTP *Challenges and Opportunities* report, are described below.

- Between 1980 and 2002, annual vehicle miles of travel on the state's roads and bridges doubled, increasing from 34 billion to 68 billion. Conversely, while the amount of travel doubled, the lane miles in the highway system increased only 8 percent, from 172,000 to 185,000. This difference is contributing to increased traffic congestion.
- A large majority of the high-volume roadways in the state fall to TDOT to operate and maintain. For current traffic conditions, capacity is reasonably sufficient in most intercity travel corridors; however, within the metropolitan areas and several corridors extending from the metropolitan areas, congestion is a growing concern. On the state system, it is estimated that 1,109 of the 2,654 miles (42 percent) of urban highway are congested, while on rural highways, 1,176 of the 11,496 miles (10 percent) are congested.
- TDOT maintains 14,150 miles of highways and 8,043 bridges on the state system. The Tennessee interstate system is in excellent condition. Pavement surface condition for nearly all of U.S. and state highways is in excellent or good condition. For bridges, 1,451 of the 8,043 state-maintained bridges, or 18 percent, are either structurally deficient or functionally obsolete. Nationally, 25 percent of all state system bridges were rated as being deficient in 2002. The good condition of Tennessee's highways and bridges allows flexibility to respond to future transportation needs, rather than having to allocate a disproportionate amount of funds to maintain the existing system. The existing transportation infrastructure, however, is aging and in some cases, is not designed to meet current levels of traffic or current safety and design standards.
- On a tonnage basis, approximately 75 percent of freight (estimated at 370 million tons) transported to, from, or though Tennessee is by truck. Additionally, trucks are the only means of supply to 85 percent of the state's communities and carry approximately 80 percent of the manufactured freight transported in Tennessee. The amount of freight moved by truck continues to increase.
- Tennessee has six commercial service airports. Obtaining sufficient service levels and pricing from commercial operators, important to both the state's residents and businesses, often depends on a number of market-related factors and is a concern for those communities served by smaller commercial airports.
- Tennessee has the nation's fifth largest navigable inland waterway system. The state has 1,062 miles of navigable waterways and 172 ports located along or inside its borders. Tennessee also has two direct links to seaports on the Gulf of Mexico via the Mississippi River and the Tennessee-Tombigbee waterway. These direct links offer significant international opportunities. The Tennessee Valley Authority and the U.S. Army Corps of Engineers have the primary responsibility for capital improvements to and operations of these waterways.

- Tennessee is served by six Class I major freight railroads and 19 shortline railroads, which comprise a network of 3,081 miles of track. In 1998, 80 million tons of freight valued at $33 billion was moved by rail. Freight moved by rail is expected to increase to 137 million tons by 2020.
- Public transportation ridership in Tennessee in 2003 exceeded 30 million trips and, since 1998, ridership has grown by 14.5 percent. Public transportation accounts for approximately 3 percent of the total trips taken in urban areas. In past years, TDOT has provided approximately 17 percent of statewide public transportation operating costs and 11 percent of capital costs. Funding constraints have limited the opportunity for enhancing public transportation to meet additional needs and services. It is anticipated that over the next 10 to 20 years, if funding is available and provided, increased fixed route services and newer premium services could provide cost-effective mobility solutions as our highway system capacity needs become more challenging to construct.

Looking to the future, it is estimated that over the next 25 years, Tennessee's transportation needs will amount to nearly $130 billion, in year-of-expenditure dollars. Year-of-expenditure dollars reflect value adjusted for inflation in the year expenses are incurred, and for this study, assumes a long-term inflation factor of 3 percent per year. The $130 billion reflects the needs of all modes of travel operating in Tennessee, and includes the cost of building and maintaining roads and bridges, railroads, locks and dams, airports, buses and vans, as well as the cost of operating those systems that typically fall to public agencies (highways and public transportation). The figures do not reflect the cost of operating privately owned systems such as railroads, barges, or airplanes, in the same way that we have not estimated the cost to individuals to operate personal automobiles.

The estimate does not identify or differentiate who would be making the investment to address the identified needs. The need might be met by TDOT using state or federal funds, by local governments, or by the private sector. In Table 2-1, and in subsequent tables in this report, costs and current and proposed spending have been assigned to three broad categories. These categories are maintenance and system preservation, safety and system modernization, and system expansion and enhancement; a brief definition of each is provided below.

- **Maintenance and System Preservation**. Investments or expenditures that address the operation of existing infrastructure and services, or which maintain or preserve the condition of existing built facilities.
- **Safety and System Modernization**. Investments or expenditures that improve existing infrastructure without increasing capacity, including reconstruction, replacement, widening without capacity addition (for example, roadway shoulder widening, bridge widening for shoulder, safety improvement, or eliminating deficiencies from standards).
- **Expansion and Enhancement**. Investments or expenditures that add capacity or are a significant betterment to the function of a facility (for example, additional travel lanes, interchange reconstruction or additional ramps, transit service coverage or frequency expansion, new road or transit corridor, shortline railroad load capacity upgrade, airport runway or taxiway addition or lengthening, or railroad bypasses of urban areas or construction of intermodal facilities).

Table 2-1. Summary of 25-Year Statewide Transportation Needs, For All Modes

	Investment Areas	Modal Needs by Summary Category ($M)	(% of Total)
Maintenance/ Preservation	Highway: Bridge and Roadway Maintenance and Intelligent Transportation Systems (ITS)	22,770	17.6
	Public Transportation, Bicycle/Pedestrian, and Transportation Options (TDM): Urban and Rural System Capital and Operating Support	5,220	4.0
	Aviation and Waterway: Regional System Support	2,020	1.6
	Maintenance/Preservation Subtotal	30,010	23.1
Safety/ Modernization	Highway: Bridge Replacement, Widening of Narrow Lanes, Local System Support	21,510	16.6
	Public Transportation and Bicycle/Pedestrian: Support Systems	200	0.2
	Aviation, Railroad, and Waterway: Improved Communication Systems, Rail Grade Crossing Protection, Shortline Track Capacity, and Rehabilitation Programs	2,710	2.1
	Safety/Modernization Subtotal	24,420	18.8
Expansion/ Enhancement	Highway: Congestion Relief, Local System Expansion, ITS Expansion	51,230	39.5
	Public Transportation and Bicycle/Pedestrian: Urban and Rural System Expansion Support	9,190	7.1
	Aviation, Railroad, and Waterway: Partnered Support of Airport Expansion, Rail Bypass and Intermodal Yards, Expanded Port Facilities, Intercity Passenger Rail	14,890	11.5
	Expansion/Enhancement Subtotal	75,310	58.1
	Total	129,740	100.0

Summary, by Mode	Modal Needs ($M)	(% of Total)
Highway and ITS	95,510	73.6
Public Transportation, TDM, and Bicycle/Pedestrian	14,610	11.3
Aviation, Railroad, and Waterway	19,620	15.1
Total	129,740	100.0

By far, the largest long-term needs are for highway maintenance and highway system expansion as population increases.

The $130 billion transportation need is daunting, but while much of it will accrue in the future, a substantial portion already exists. Today, the state's transportation system faces a $40 billion backlog of highway and other transportation needs. While the highway system is well maintained, the state has not been able to keep pace with the rapid increase in highway travel. As a result, 2,200 miles of the 14,150-mile state highway system are over-capacity. It will cost

$18 billion to address the existing highway capacity backlog, while at the same time, more miles will fall into the over-capacity category each year. Other major backlogged needs include:

- $7.4 billion to correct structurally and functionally deficient bridges.
- $12.0 billion to correct geometric and safety issues such as narrow lanes or lack of paved shoulders.
- $570 million to address public transportation service deficiencies and to replace aging buses.
- $300 million to upgrade substandard rail tracks.
- $360 million to replace aging locks.
- $400 million to address the state's airport air side and land side needs.
- $500 million to upgrade and expand ITS infrastructure such as traffic control centers.

Detailed information on the long-term transportation needs facing Tennessee, as well as the current backlog of needs, are in the LRTP *Modal Needs* report.

2.2 Revenue Forecast

The state's response to the long-term transportation needs described above will depend in part on the revenue that can be generated to meet capital and operating needs. The sections below describe TDOT's 25-year revenue forecast.

2.2.1 Summary of Current TDOT Budget (FY 2004–2005)

TDOT's FY 2004–05 budget is just over $1.6 billion. As shown on Table 2-2, federal funds are the largest single revenue source, and together with highway user fees, account for the bulk of state transportation revenues. Transportation Equity Fund revenues, those dedicated to aviation, rail, and waterways, account for 1.3 percent of the total budget. The $65.8 million transfer of transportation revenues to the state's General Fund reflects the state's continued fiscal distress. Although not regular budget items, four such transfers have occurred in recent years as the state works to balance its budget: $30 million in FY 2001–02, $30 million in FY 2002–03, $65.8 million in FY 2003–04, and this fiscal year's transfer of $65.8 million.

Table 2-2. Total TDOT Budget for FY 2004-05 by Major Source of Revenue

	Amount ($M)	Share of Total (%)	Share of Subtotal (%)
Highway User Taxes	650,400	40.2	38.7
Miscellaneous Revenues	28,600	1.8	1.7
Fund Balance and Reserves	12,000	0.7	0.7
Bond Authorization	159,000	9.8	9.4
Transportation Equity Fund	21,600	1.3	1.2
Federal	777,173	48.0	46.2
Local	36,872	2.3	2.1
Subtotal	1,685,645	104.1	100.0
Transfer to General Fund	(65,800)	-4.1	
Total	1,619,845	100.0	

Sources: TDOT Budget Documents

Table 2-3 shows details on the expenditures to support TDOT's various programs. Federal funds account for $777 million of TDOT's budget, spread across modes as shown. Public transportation funding accounts for 2.3 percent of federal dollars; support for aviation, rail, and waterways accounts for 1.9 percent of federal monies invested in Tennessee's transportation system through TDOT. The remainder is divided across highway, road, and bridge programs, with the bulk supporting state highway investments.

Revenue is distributed across all modal programs. Public transportation programs receive $56 million through TDOT and a combination of federal, state, and local funds. The combined budget for the aviation, rail, and waterway modes is nearly $45 million when federal, state, and local sources are totaled. The remaining budget supports system maintenance, administrative functions, and roads and bridges.

Placed in the context of capital and operating investment categories described in the previous section, the FY 2005 budget is allocated as shown in Table 2-4. The principal difference between Table 2-4 and Tables 2-2 and 2-3 is that administrative, equipment purchase, and other non-mode specific costs have been allocated to operational programs. Under this programmatic allocation, system maintenance/preservation efforts receive 36 percent of TDOT funds, while system modernization and system expansion receive 20 percent and 44 percent, respectively. On a modal basis, highway programs receive nearly 93 percent of TDOT's budget. Public transportation and bicycle/pedestrian programs receive 4 percent of funds, and aviation and rail programs receive 3 percent of funds. TDOT currently spends very little on waterway systems.

Table 2-3. Summary of TDOT Expenses by Federal, State, and Local Source, FY 2004–05

Description	Federal ($M)	State ($M)	Local ($M)	Total ($M)	% of Total
DOT Headquarters	0	14,271	0	14,271	0.88
Bureau of Administration	0	32,840	0	32,840	2.03
Bureau of Engineering	0	25,900	0	25,900	1.60
Bureau of Environment and Planning	0	7,174	0	7,174	0.44
Field Engineering	0	26,630	0	26,630	1.64
Insurance Premiums	0	10,282	0	10,282	0.63
Total Administration	**0**	**117,097**	**0**	**117,097**	**7.23**
Equipment Purchases/Operations	**0**	**21,431**	**0**	**21,431**	**1.32**
Highway Maintenance	**0**	**253,428**	**1,100**	**254,528**	**15.71**
Highway Betterments	0	5,700	100	5,800	0.36
State Aid	0	28,922	8,759	37,681	2.33
State Industrial Access	0	10,815	200	11,015	0.68
Local Interstate Connectors	0	1,475	1,475	2,950	0.18
Capital Improvements	0	10,055	0	10,055	0.62
Total 100% State Construction	**0**	**56,967**	**10,534**	**67,501**	**4.17**
Public Transportation	17,573	38,546	238	56,357	3.48
State Planning and Research	12,100	5,100	0	17,200	1.06
Interstate	133,700	14,825	1,500	150,025	9.26
Forest	700	200	0	900	0.06
State Highway Construction	511,700	267,821	14,200	793,721	49.00
Bridge	87,000	5,000	4,100	96,100	5.93
Aviation, Rail, and Waterways	14,400	25,385	5,200	44,985	2.78
Total Federal Construction	**777,173**	**356,877**	**25,238**	**1,159,288**	**71.57**
Total DOT	**777,173**	**805,800**	**36,872**	**1,619,845**	**100.00**

Source: TDOT Budget Documents

Table 2-4. TDOT Expenses by Investment Category, FY 2004–05

	Investment Areas	Actual 2005 Spending ($M)	Actual 2005 Spending (% of Total)
Maintenance/ Preservation	Highway: Bridge and Roadway Maintenance, and ITS	518.7	32.0
	Public Transportation, Bicycle/Pedestrian, and Transportation Options (TDM): Urban and Rural System Capital and Operating Support	54.5	3.4
	Aviation, Railroad, and Waterway: Regional System Support; Shortline Railroad Rehabilitation Programs	15.6	1.0
	Maintenance/Preservation Subtotal	**589**	**36.3**
Safety/ Modernization	Highway: Bridge Replacement, Widening of Narrow Lanes, Local System Support	292.3	18.0
	Public Transportation and Bicycle/Pedestrian: Support Systems	1.1	0.1
	Aviation, Railroad, and Waterway: Improved Communication Systems, Rail Grade Crossing Protection, Shortline Track Capacity	26.7	1.7
	Safety/Modernization Subtotal	**320**	**19.8**
Expansion/ Enhancement	Highway: Congestion Relief, Local System Expansion, ITS Expansion	690.0	42.9
	Public Transportation and Bicycle/Pedestrian: Urban and Rural System Expansion Support	9.5	0.6
	Aviation, Railroad, and Waterway: Partnered Support of Airport Expansion, Rail Bypass and Intermodal Yards, Expanded Port Facilities , Intercity Passenger Rail	7.7	0.5
	Expansion/Enhancement Subtotal	**711**	**43.9**
	Total	**1,620**	**100.0**

	Modal Summary	Actual 2005 Spending ($M)	Actual 2005 Spending (% of Total)
	Highway and ITS	1,505	92.9
	Public Transportation, TDM, and Bicycle/Pedestrian	65	4.0
	Aviation, Railroad, and Waterway	50	3.1
	Total	**1,620**	**100.0**

2.2.2 25-Year Revenue Forecast

To create a revenue baseline for the LRTP, current revenues were projected over the 25-year planning horizon. The baseline forecast of state, federal, and local revenues available to TDOT is estimated to be $69.4 billion for the 25-year period of Tennessee's LRTP. These revenues grow from $1.6 billion in 2005 to approximately $3.8 billion in 2030. The forecast reflects expectations for population and economic growth. For example, motor vehicle registration revenues are tied to expectations for future employment and per capita income growth. The beer and bottle tax revenues are driven by projections for population growth.

While these projections may appear substantial, existing revenues are likely to grow at or below the rate of inflation. TDOT's baseline revenue forecast achieves this modest growth rate because this is a trend forecast that assumes no increases in Tennessee's current tax rates. The largest state revenue sources for TDOT (gasoline and motor fuel taxes) are not protected from inflation because these taxes are levied on a cents-per-gallon basis. The 25-year baseline forecast is summarized on Table 2-5. This forecast is detailed in the LRTP *Financial Plan* report.

Table 2-5. 25-Year Total Revenue Forecast (in Millions YOE Dollars)

State	978.71	1,343.36	26,101.33
Federal	1,502.24	2,340.44	41,557.43
Local Match	62.40	97.21	1,726.12
Total	2,543.35	3,781.01	69,384.88

Source: AECOM Consult, Inc.

Note: The state total revenue forecast also includes annual transfers from the Highway Fund to the General Fund between 2006 and 2011 as projected by the TDOT Finance Division.

Assumptions regarding revenue forecasts are:

- Fuel taxes are cents per gallon-based, not protected from inflation.
- Transportation Equity Fund revenues are sales tax-based so they capture price effects, but consumption of rail and water services is expected to be weak, offsetting price gains.
- Federal funding received by TDOT, the so-called "Federal Funds Released," is assumed to grow at 3 percent annually over the long term. Even with this modest growth rate, federal funds account for more than 60 percent of TDOT's total program by 2030, up from the current 46 percent. The implication is that a rising share of state/local funds will be required to match federal funds, meaning less for discretionary state spending.

2.2.3 Opportunities for Increased Funding

Within Tennessee's current revenue and political climate, the LRTP Financial Plan discusses options for revenue enhancement, based on the premise that the proposed LRTP would call for revenue beyond the forecasted $69 billion. If the state determines that new transportation resources are needed, many options, including the following, might be considered:

- Indexing all or a portion of the fuel tax.
- Raising the tax rate on fuels.
- Tolling selected facilities.
- Bonding.
- Raising registration fees.

Chapter 4 of this report discusses these and other options, including innovative finance techniques, within the context of revenue needed to fund the 10-Year SIP.

2.3 Tennessee's Transportation Future: Summary of the 25-Year Vision Plan

Reflecting input from stakeholders and the general public, TDOT is proposing a 25-Year Vision Plan that is intended to guide the building of a well-maintained, balanced, and sustainable transportation system. This plan is one element of TDOT's effort to develop a transportation vision for the state and to create a process for evaluating, prioritizing, and delivering transportation projects in a financially responsible, environmentally sensitive, and community-oriented manner. To complete the description of the framework of the 10-Year SIP, this section briefly describes key elements of the 25-Year Vision Plan, including Guiding Principles, investment and operating policies, and the 25-year investment program.

2.3.1 Guiding Principles

One of the early steps in developing the LRTP was to agree on a set of Guiding Principles that clearly state the standards and values upon which the preservation and improvement of the state's transportation system will be based. Starting from a set of general principles endorsed by the U.S. Department of Transportation, public input from a broad cross-section of Tennesseans shaped a final set of Guiding Principles. The seven Guiding Principles below are also consistent with planning conducted by TDOT's local partners, such as the 11 Metropolitan Planning Organizations.

- **Preserve and Manage the Existing Transportation System**. Protect existing assets and maintain the efficiency of the system through cost-effective management and new technologies.
- **Move a Growing, Diverse, and Active Population**. Optimize the movement of people and goods by providing greater access to transportation services for all people and by building better connections among different modes of transportation.
- **Support the State's Economy**. Make transportation investments that support economic growth, competitiveness and tourism; build partnerships with communities and regions to link employment, commercial/retail areas, and other key activity centers.
- **Maximize Safety and Security**. Reduce injuries and fatalities in all modes of transportation, minimize construction-related safety impacts; improve disaster preparedness and incident response.

- **Build Partnerships for Livable Communities**. Provide early and ongoing opportunities for broad public input on plans and programs; work closely with local public and private planning efforts, and identify opportunities to coordinate land use and transportation planning.
- **Promote Stewardship of the Environment**. Maintain the integrity of communities and historical sites; minimize impacts on natural resources and conserve energy.
- **Emphasize Financial Responsibility**. Provide accountability; maximize Tennessee's share of federal transportation funding; develop alternative funding strategies and select projects based on identified regional needs; allow flexibility in local management of projects where feasible.

During the LRTP planning process, the Guiding Principles became a thread of continuity running through many elements. Plan goals, objectives and policies reflect the principles. Project evaluation and performance measurement systems build on them as well. Finally, recommended long-term investment strategies were crafted to capture the vision that is provided by the Guiding Principles.

2.3.2 Implementing the Plan: Investment and Operating Policies

Putting the proposed policies into practice will be an important first step in implementing the 25-year Vision Plan and the LRTP. Some policies will augment or replace existing practices and procedures immediately, while others will follow a more formal adoption process. All or parts of many of these policies are already in practice at TDOT.

The set of policies shown in Table 2-6 will guide the state's efforts over the next 25 years, directly supporting the 25-year spending plan. Some examples of how the policies will support the state's efforts over the next 25 years are described below.

- TDOT will build new and stronger partnerships, to develop and finance transportation programs and projects that maximize public investments and support community and regional growth strategies.
- TDOT will coordinate transportation planning with local land use plans, to support livable communities and protect, preserve and enhance the social, historic, and natural resources of the state.
- To promote economic development, TDOT will emphasize projects that allow people and freight to move efficiently around the state; this activity will include working with communities and freight carriers to create competitive freight choices.
- TDOT will develop a multimodal project development process that considers all current and future users of the transportation system and a full range of transportation options.
- In the planning process, TDOT will use more robust project evaluation and performance monitoring systems to measure quality, safety, and efficiency.

Table 2-6. Proposed Long-Range Plan Investment and Operating Policies

A.	Actively engage minority and disadvantaged communities in identifying transportation needs, developing alternative strategies to meet those needs, and implementing solutions that are affordable and sensitive to a community's heritage and supportive of local economic institutions.
B.	Build new and stronger partnerships, public and private, to develop and finance transportation projects that maximize public investments and support community and regional growth strategies.
C.	Consider alternative transportation solutions to relieve congestion and accommodate customer choice for movement of people, goods, and freight in high-growth corridors.
D.	Coordinate transportation investment strategies with other state agencies to support balanced economic growth across Tennessee with particular focus on tourism and similar industries that are highly dependent on the transportation system.
E.	Demonstrate leadership in environmental stewardship by reducing TDOT fleet emissions and fuel consumption, increasing TDOT's use of non-petroleum fuels and technologies, and improving public awareness of these efforts.
F.	Develop and use robust management and performance monitoring systems to evaluate the condition and performance of statewide transportation assets and incorporate techniques to extend service life and quality.
G.	Efficiently manage the existing transportation system by reducing delay and congestion caused by weather events and incidents and by implementing intelligent transportation systems and relatively low-cost improvements such as signal operation and maintenance and travel demand management.
H.	Ensure that all planning studies and design standards for future facilities incorporate specific features that are known to reduce crashes, fatalities, or injuries.
I.	Systematically and periodically seek customer input about Tennessee's transportation system; follow strategies in TDOT's Public Involvement Plan for evaluating and prioritizing transportation projects and services across all modes, understanding that decisions will be made in accordance with adopted professional standards.
J.	Identify and build high-impact projects that connect transportation modes seamlessly so that people and freight can move efficiently around and through the state. Coordinate projects with surrounding states.
K.	Identify and rank critical transportation assets and their vulnerabilities; develop plans and strategies to protect these assets and/or minimize the consequences of potential threats or disasters.
L.	Identify, protect, and/or acquire future right-of-way as early as possible to minimize negative impacts on communities and the natural environment.
M.	Improve access to all modes in the transportation system.
N.	Improve the real-time information available to travelers, freight carriers, pilots, and TDOT personnel.
O.	Improve the well-being of rural Tennessee by building critical highway links, increasing rural transit operations, and expanding bicycle and pedestrian opportunities.
P.	Invest resources so that preservation of existing system assets in all modes receives the highest priority in annual and multi-year budgeting and programming processes.
Q.	Minimize impacts of construction and major maintenance activities on traffic flow, especially during peak-period travel, and promote safety for work crews and the traveling public.

Table 2-6. Proposed Long-Range Plan Investment and Operating Policies (Continued)

R.	Promote and implement Context Sensitive Solutions, taking into consideration safety, mobility, community, and environmental goals in all projects.
S.	Promote competitive freight options by improving existing transportation facilities in strategic corridors.
T.	Reduce the impact of transportation facilities on air and water quality, watersheds, and ecosystems, working to identify and avoid or mitigate impacts to irreplaceable natural resources.
U.	Seek consistency among local land use policies and strategies, TDOT's efforts to manage access and provide transportation choices, and the state's efforts to preserve and protect private and public open space.
V.	Strengthen partnerships with the Department of Safety, local law enforcement and safety agencies, safety advocates, and legislative leaders to enact and enforce appropriate and effective safety laws; deploy at strategic locations technologies and safety systems that have demonstrated benefits.
W.	Support ridesharing programs, park-and-ride programs, telecommuting programs, and transit benefit programs to increase peak-period travel options and reduce the rate of growth of vehicle miles traveled.
X.	Target the highest risk locations and/or segments for system safety, including large truck safety and driver safety programs focused on high risk groups such as teenagers and seniors.

2.3.3 25-Year Investment Program

If TDOT continues its current programs consistent with revenue forecasts, it would spend $69 billion over the next 25 years, leaving a substantial shortfall in meeting the $130 billion of total transportation needs. As shown in the columns headed “Historical Approach” in Table 2-7, spending would be heavily oriented toward maintenance and expansion of the state’s highway system. This would ensure that highways and bridges would continue to be well maintained, but would leave insufficient funding to reduce the current backlog of highway capacity needs and funding for other modal needs.

Table 2-7. Recommended 25-Year Vision Plan Funding

	Investment Areas	Actual 2005 Spending ($M)	Actual 2005 Spending (% of Total)	Historical Approach (YOE) ($M)	Historical Approach (YOE) (% of Total)	Recommended 25-Year Funding (YOE) ($M)	Recommended 25-Year Funding (YOE) (% of Total)
Maintenance/ Preservation	Highway: Bridge and Roadway Maintenance, and ITS	514.7	31.97	22,048	31.8	22,770	26.7
	Public Transportation, Bicycle/Pedestrian, and Transportation Options (TDM): Urban and Rural System Capital and Operating Support	54.5	3.39	2,048	3.0	2,230	2.6
	Aviation and Waterway: Regional System Support	15.6	0.97	666	1.0	690	0.8
	Maintenance/Preservation Subtotal	584.7	36.32	24,761	35.7	25,690	30.1
Safety/ Modernization	Highway: Bridge Replacement, Widening of Narrow Lanes, Local System Support	290.3	18.03	12,437	17.9	15,770	18.5
	Public Transportation and Bicycle/Pedestrian: Support Systems	1.1	0.07	48	0.1	90	0.1
	Aviation, Railroad, and Waterway: Improved Communication Systems, Rail Grade Crossing Protection, Shortline Track Capacity, and Rehabilitation Programs	26.7	1.66	1,143	1.6	1,260	1.5
	Safety/Modernization Subtotal	318.1	19.76	13,628	19.6	17,120	20.1
Expansion/ Enhancement	Highway: Congestion Relief, Local System Expansion, ITS Expansion	690.0	42.86	29,989	43.2	39,620	46.5
	Public Transportation and Bicycle/Pedestrian: Urban and Rural System Expansion Support	9.5	0.59	694	1.0	1,850	2.2
	Aviation, Railroad, and Waterway: Partnered Support of Airport Expansion, Rail Bypass and Intermodal Yards, Expanded Port Facilities , Intercity Passenger Rail	7.7	0.48	328	0.5	980	1.1
	Expansion/Enhancement Subtotal	707.2	43.92	31,011	44.7	42,450	49.8
	Total	1,610.0	100.0	69,400	100.0	85,260	100.0

Investment Areas (by Mode)	Actual 2005 Spending ($M)	Actual 2005 Spending (% of Total)	Historical Approach (YOE) ($M)	Historical Approach (YOE) (% of Total)	Recommended 25-Year Funding (YOE) ($M)	Recommended 25-Year Funding (YOE) (% of Total)
Highway and ITS	1,495	92.9	64,473	92.9	78,160	91.7
Public Transportation, TDM, and Bicycle/Pedestrian	65	4.0	2,789	4.0	4,170	4.9
Aviation, Railroad, and Waterway	50	3.1	2,137	3.1	2,930	3.4
Total	1,610	100.0	69,400	100.0	85,260	100.0

The Vision Plan calls for an increase in state spending over the next 25 years to $85.3 billion, a 23 percent increase over current revenue projections of $69.4 billion. Spending would continue to focus heavily on the state highway system, reflecting the continued role of highways as the

foundation of the state's transportation system, and TDOT's responsibility to preserve and expand those facilities. State funding for public transportation, aviation, rail, and waterways would also increase. The increased funds would primarily allow more spending for system expansion, helping to reduce the nearly $40 billion backlog of current transportation needs. Table 2-7 summarizes the proposed spending elements of the 25-Year Vision Plan.

Highlights of proposed spending in the three broad areas of maintenance, safety, and expansion are described below.

- **Maintenance and System Preservation**. Tennessee's highways and airports will continue to be maintained at a high level. Spending on public transportation maintenance efforts, especially for vehicle replacement, will increase.
- **Safety and System Modernization**. Increases are proposed to widen narrow highway lanes and improve other road conditions that pose safety concerns as traffic levels increase, improve access to the state's public transportation systems, and upgrade the state's shortline railroads.
- **System Expansion and Enhancement**. Significant increases in funding are proposed to reduce congestion levels, to advance the county seat connector program, to support expanded and new public transportation programs, and to improve intermodal freight facilities. The connector program is intended to ensure that every county is to be connected to the closest interstate highway by an improved four-lane roadway.

Other key elements of the plan include:

- The plan places the highest priority on public safety and continued preservation of existing infrastructure. The condition of Tennessee's highways is the envy of many surrounding states, and it is important that the investment be preserved. As other states have found, deferring maintenance results in the need for even more costly repairs in the future.
- The plan proposes an 18 percent increase in highway spending to reduce the backlog of needs that now exists on our urban and rural roads and highways.
- Increased funding for system management efforts to expand ITS initiatives such as traffic control centers that monitor traffic conditions, improved traveler information and HELP truck services, and other technology that allow public transportation systems to operate more efficiently with other modes and within crowded roadways. These measures have been shown to increase system efficiency by 10 to 15 percent.
- Funding for public transportation will increase nearly 45 percent, to increase the state share for capital grants and operating support. This increase will make more funds available for improved service in both rural and urban areas, including funding for New Starts projects such as Nashville's commuter rail system or Memphis' light rail lines.
- Significant investment is directed toward the modernization and maintenance of the shortline rail network in Tennessee, as new, heavier railroad cars require upgraded tracks.
- Programs will be created to promote railroad, waterway system, and multimodal freight improvements through public/private partnerships.

- Development of an expanded intercity passenger rail system in the state will need to be part of a national program. However, the state can be poised to participate in such a program by investigating options for expanding existing Amtrak service and by joining surrounding states in developing partnerships and examining opportunities.
- The plan will continue the state's strong support for regional and community airports, funding needed expansions and upgrades.

2.3.4 Call for Expanded Partnerships

A final note on Tennessee's 25-Year Vision Plan concerns expanded partnerships. The plan charts a new course for the state, defining its direction, establishing investment goals, and creating new policies. A major element that cannot be overlooked is the call for more partnerships between TDOT and both the public and private sector. While the Vision Plan recommends a substantial increase in spending to address transportation needs, some of the proposed funding must be matched if it is to be used at all. It will be used to leverage local public investment or private investment.

As detailed in the *Modal Needs* report (see Chapter 6), the proposed state spending of $85.3 billon could leverage an additional $15.8 billion in local and private spending for public transportation, railroads, airports, and waterways. TDOT retains total responsibility for the state highway system, with spending estimated to be $78.2 billion over the 25-year planning period. The $7.1 billion in proposed spending on other modal programs could leverage the $15.8 billion cited above.

Chapter 3

10-Year Strategic Investments Program

3.1 Strategic Investments Context

The 10-Year Strategic Investments Program (SIP) is one of three critical elements in TDOT's integrated transportation program delivery process (see Figure 1-1). The first element, the 25-Year Vision Plan, defines the state's broad program and policy direction.

The second key element, the 3-Year Program of Projects, identifies and prioritizes projects and programs. As part of this LRTP process, a Project Evaluation System was developed that reflects the plan's Guiding Principles and creates an open and accountable process for setting short-term project priorities. The Project Evaluation System defines evaluation criteria by which projects are evaluated and prioritized in a consistent manner.

Between these two elements is the 10-Year SIP, which establishes spending priorities and policy initiatives needed and addresses critical modal needs, reflects anticipated financial resources, and identifies financial strategies. To advance the SIP, it is necessary to establish program and spending categories (this chapter), identify new program financing initiatives (Chapter 4), and consider certain policy and institutional issues (Chapter 5). The 10-Year SIP consists of two parts:

- A 10-year baseline spending element built from existing revenue sources. The baseline funding preserves current system performance and begins to reflect the general policy shifts called for in the 25-Year Vision Plan.
- A focused strategic investments element that is intended to jump-start those aspects of the 25-Year Vision Plan that are critical to long-term system performance. The investments will help reduce congestion, offer people more choices, and develop key corridors across the state.

From a contextual perspective, analysis undertaken to complete other elements of this LRTP has provided insights that have been taken into consideration in the development of the 10-Year SIP. These insights can be divided into system performance and institutional and financial aspects. From the modal needs task, which included analysis of current transportation systems performance, future needs, and the potential for balancing freight movement among modes, the following top-level insights were instructive:

- Tennessee's highway system, including its bridges, is well maintained, with little perceived need to increase funding beyond normal inflationary protection. Similarly, the state's airports meet current standards, and urban transit systems have been able to replace aging vehicle fleets reasonably well; therefore, incentive funding may not be needed.
- While the highway system is among the best maintained in the country, there is clear direction from the study's stakeholders that preserving and maintaining the transportation system, including system safety, are of highest priority.

- The state-maintained highway system (14,150 miles of the 88,500 statewide total miles of streets and highway) does have a significant backlog of needed capacity improvements. This situation is more pronounced in the state's urban areas than on rural highways, though some sections of the rural interstate system are currently over capacity. Because the state-maintained system includes more of the higher-volume roadways, capacity deficiencies are not thought to be as significant on city and county streets and roads.
- There are growing pressures on Tennessee's freight movement system. Truck traffic on state highways is growing faster than overall traffic, rapidly depleting available capacity on much of the rural interstate system. Even with an extensive waterway system and significant state investment in shortline railroads, both of these modes will be hard-pressed to divert significant amounts of freight from trucks.
- While premium transit "New Start" projects are proposed for Memphis and Nashville, the greatest urban transit need is for improved service by the traditional fixed-route bus systems. An aging and growing rural population has greatly increased the need for improved rural transit services. Such services need to become more than a life-line service, offering true mobility options to those population segments. Even so, it is recognized that transit investment is not likely to significantly reduce urban or rural congestion.
- There is a growing realization among transportation professionals that investment in transportation system management strategies and technologies can significantly extend the life of the state's transportation systems by optimizing the available capacity.

From the institutional and financial perspective, several top-level considerations are important to development of the 10-year program:

- As discussed in Chapter 2, in developing the revenue forecast, federal funds are expected to grow more rapidly than state transportation funds. The implication is that the state may be challenged to match available federal highway funds and may need to consider new and innovative program finance strategies.
- While the 25-Year Vision Plan calls for substantial increases in funding for non-highway programs, consistent with the objective of improving travel options and supporting economic development efforts, the state is only a partner in these programs. In effect, the plan proposes to increase funding for programs such as urban and rural public transportation, shortline railroad rehabilitation, Class 1 railroad system expansion, and waterway systems rehabilitation, if their partners also make similar commitments to increase funding. Caution must be taken not to outspend partners by allocating more TDOT funding than can be used by local agencies under the prevailing matching requirements

With this context in mind, the section below presents the proposed 10-year baseline spending element of the SIP, which is built around the forecast of current revenue instruments. The next section describes a 10-year program of strategic program investments.

3.2 10-Year Baseline Program

During the LRTP planning process, many stakeholders and public meeting participants indicated that new initiatives are important, and it is crucial that TDOT respond aggressively to the new

transportation challenges facing Tennessee. They also noted, however, that it is equally important that the state continue to provide adequate funding for existing programs. In other words, the stakeholders did not expect to see important programs lose their funding at the expense of other programs that might have historically been under funded. For example, the public clearly values the good condition of the state's highways and bridges, and they stressed in their comments a desire that TDOT continue its infrastructure preservation efforts. Maintenance funds should not be diverted to other programs.

With this in mind, the intent of the 10-year baseline spending program is to preserve the current performance of Tennessee's transportation system. This can be achieved with only a marginal increase in spending above what is currently anticipated from existing funding sources. The revenue forecast is described below, followed by a discussion of the baseline spending and implementation of the Vision Plan, and a presentation of the proposed baseline budget.

3.2.1 10-Year Revenue Forecasts

As noted in Chapter 2, it is estimated that over the next 25 years TDOT's current sources of federal, state, and local revenue will generate $69 billion, which can be applied against current or new programs. This forecast is based on a financial forecasting model, defined in detail in the LRTP *Financial Plan* report that considers population, employment, economic development, and income growth at both the state and national levels.

Over the next 10 years, TDOT's current annual budget of $1.6 billion in combined state and federal funds is expected to increase to more than $2.5 billion. This growth reflects forecasted growth of Tennessee's population and economy and an increase in federal funds available to Tennessee as a result of the 2005 passage of the federal surface transportation bill. The 10-year revenue forecast is an estimated $22 billion. The distribution of revenue sources is shown in Table 3-1. During this period, federal funding will provide the majority of TDOT's budget, increasing from 53 percent in 2006 to 59 percent in 2015. Federal funds that come to Tennessee through TDOT's budget primarily support the highway construction program, but also fund public transportation and aviation programs. See the LRTP *Financial Plan* for details on this forecast.

Table 3-1. 10-Year Total Revenue Forecast (in Millions, Year-of-Expenditure Dollars)

Revenue Source	2006 ($M)	2010 ($M)	2015 ($M)	10-year Total ($M)	% of Subtotal
State	876.7	866.4	978.7	8,882.8	40.0
Federal	996.3	1,295.8	1,502.2	12,779.3	57.6
Local Match	41.4	53.8	62.4	530.8	2.4
Subtotal	1,914.4	2,216.1	2,543.3	22,192.9	
Less General Fund Transfer	-55.8	-15.8	-	-184.8	
Total	1,858.6	2,200.3	2,543.3	22,008.1	

Source: AECOM Consult, Inc.

3.2.2 10-Year Baseline Revenue Implications for Vision Plan Implementation

To achieve the 25-Year Vision Plan, at an estimated cost of $85.3 billion, the state will need $16 billion more than is forecasted to be available from existing revenue sources. The estimated cost is expressed in "year-of- expenditure" dollars, which are adjusted for inflation in the year expenses are incurred and revenues are earned. The inflation factor is assumed to be 3 percent per year for the full 25-year study period. Further, for purposes of the plan, it has been assumed that the expenditures are spread evenly over the 25-year period, again factored for inflation.

Under these assumptions of inflation-adjusted constant costs, the state would spend $26.7 billion[2] during the first 10 years (2005-2015) to advance the plan on a uniform basis. It should be recognized that certain plan elements, such as public transportation operating assistance or roadway maintenance, would likely increase over time as they are directly related to units of operation. As Tennessee cities grow and transit systems expand to meet that growth, annual operating costs will increase. Similarly, highway maintenance costs are directly related to the number of centerline miles or lane-miles of roadway, so that as TDOT expands the highway system to meet growing demand, maintenance needs will also increase.

The 10-year revenue forecast is $22 billion, resulting in a $4.7 billion gap over the next 10 years to begin plan implementation. TDOT has chosen, however, to pursue a more conservative approach to funding the 10-year program. That difference could be met through a broad combination of strategies, from enhancement of traditional revenue streams, to acceptance of debt financing, to an active search for new partners to bring additional capital to the program. These strategies are discussed in Chapter 4. In the case of debt financing, it must be recognized that the short-term gain of providing additional capital to advance projects and programs has the distinct downside of adding long-term debt service to TDOT's budget, thereby reducing funds available for future program needs.

Adding to the difficulty of meeting the $4.7 billion funding gap is the reality of the time it would take to generate new revenues. This reflects the need for legislative action, either for tax and fee increases or for passage of enabling legislation that may be needed for innovative finance strategies.

The proposed 10-Year SIP totals $24 billion and is organized into two parts: baseline funding and strategic investments.

- Baseline Funding. The state will spend $22 billion, the forecasted amount from existing revenue sources, to address transportation needs over the next 10 years. The baseline funding preserves current system performance and begins to reflect the general policy shifts called for in the 25-Year Vision Plan.
- Strategic Investments. The state proposes $2 billion in strategic investments to jump-start specific programs in the 25-Year Vision Plan that are critical to long-term system performance. The investments will help reduce congestion, offer people more choices, and develop key corridors across the state.

[2] Based on the $85.3 billion (YOE) 25-Year Vision Plan, assuming steady annual expenditures with a YOE adjustment of 3 percent per year.

Each element of the proposed 10-year SIP is described below.

3.2.3 Proposed 10-Year Baseline Program

The current $1.6 billion budget allows TDOT to maintain the state's highways and bridges at a high standard, fully support needed maintenance and expansion of regional and community airports, assist urban transit systems in acquiring new rolling stock and meeting operating expenses, and support economic and industrial development efforts through programs such as shortline railroad rehabilitation grants and industrial access roads. It also allows TDOT to address the most critical highway capacity and safety issues.

What the current and recent budgets have not allowed TDOT to do is respond to the dynamic growth of the state in recent years. While population and travel have increased dramatically in the past decade, TDOT has been able to make only minor additions to highway capacity. As a result, the backlog of highway capacity deficiencies is growing. Similarly, the state has been unable to support the growth in public transportation programs needed to keep pace with the growth of the state's cites and transit dependent populations. In addition, it has been unable to partner with freight carriers to strengthen their systems, possibly alleviating some pressure on a strained highway system.

Table 3-2 shows the proposed 10-year baseline program. This program might be described as a status quo program, in that it allows the state to continue programs that are being adequately funded, while stopping or slowing degradation of services in other areas. Over the next 10 years, TDOT would spend $22 billion to preserve current system performance. This means that for some investment categories, such as highway and bridge maintenance, TDOT will continue current performance funding, with increases needed to match the effects of inflation. For other categories, spending will be somewhat greater than recent efforts. There will be an increase in funding for highway expansion to help stabilize the backlog in capacity deficiencies. Funding support for public transportation will increase by $190 million over the 10 years to keep pace with urban growth.

3.3 10-Year Program of Strategic Investments

To define the strategic investments program, TDOT considered a range of early initiatives that would provide the greatest benefit and address the greatest needs.

Based on stakeholder and public input, the plan proposes a three-pronged strategic investments program that, if implemented, should allow the state to begin to achieve the plan goals. The proposed 10-Year SIP will be based on an investment of $2 billion in the following three areas:

- **Congestion Relief**. This initiative would be directly responsive to the Guiding Principle of preserving the existing transportation system and our investment in that system. Rapid growth, especially in urban and suburban areas, has substantially outpaced TDOT's programs to manage increased travel. Rural highways that lack standard lane width and shoulders also undermine the performance of the highway system. Over the next 10 years, TDOT will accelerate highway system management and construction efforts to improve the highway system statewide.

Table 3-2. Proposed 10-Year Baseline Program

	Investment Areas	Baseline ($M)	% of Total
Maintenance/ Preservation	Highway: Bridge and Roadway Maintenance, and ITS	5,878	26.7
	Public Transportation, Bicycle/Pedestrian, and Transportation Options (TDM): Urban and Rural System Capital and Operating Support	576	2.6
	Aviation and Waterway: Regional System Support	178	0.8
	Maintenance/Preservation Subtotal	6,631	30.1
Safety/ Modernization	Highway: Bridge Replacement, Safety Improvements, Lane and Shoulder Widening, and Local System Support	4,071	18.5
	Public Transportation and Bicycle/Pedestrian: System Support	23	0.1
	Aviation, Railroad, and Waterway: Improved Communication Systems, Rail Grade Crossing Protection, Shortline Track Capacity	325	1.5
	Safety/Modernization Subtotal	4,419	20.1
Expansion/ Enhancement	Highway: Congestion Relief, Local System Expansion, ITS Expansion	10,227	46.5
	Public Transportation and Bicycle/Pedestrian: Urban and Rural System Expansion Support	478	2.2
	Aviation, Railroad and Waterway: Partnered Support of Airport Expansion, Rail Bypass and Intermodal Yards, Expanded Port Facilities, Intercity Passenger Rail	253	1.1
	Expansion/Enhancement Subtotal	10,958	47.4
	Total	22,008	100.0

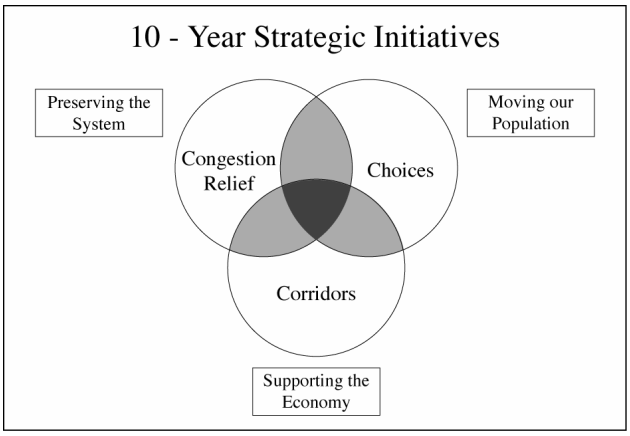
Investment Areas	Baseline ($M)	% of Total
Highway and ITS	20,175	91.7
Public Transportation, Transportation Options (TDM), and Bicycle/Pedestrian	1076	4.9
Aviation, Railroad, and Waterway	756	3.4
Total	22,008	100.0

- **Choices**. Responding to the Guiding Principle that calls for optimizing the movement of a diverse and growing population, this initiative would focus on expanding available travel choices. Today, Tennesseans must generally rely on personal automobiles for their travel needs, with only basic public transportation services available in most areas. TDOT will work closely with local public transportation operators across the state to substantially improve public transportation services and choices.

- **Corridors**. An efficient transportation system is the foundation of a vibrant state economy. Recognizing the significance of certain corridors to the state's economic development, especially those essential to freight movement, TDOT will identify and focus improvements in a series of key corridors over the next 10 years. The improvements will include critical sections of the state highway system and will apply multimodal solutions where practical. Complementing the strategic corridors, the state will pursue public and private partnerships with aviation, public transportation, rail, and waterways partners to implement needed improvements in elements of those systems.

By focusing strategic investments in these three areas, there will also be substantial synergy among the investments. As shown in Figure 3-1, many of the investments that might be made through the 10-Year SIP would provide benefit under more than one of the investment categories. Each proposed strategic investment is further defined below.

Figure 3-1. 10-Year Strategic Initiatives



3.3.1 Strategic Initiative: Congestion Relief

The physical condition of the state's roads and bridges is largely excellent, even the envy of surrounding states. However, the state has not kept pace with the rapid growth in traffic on its highways, resulting in increasing levels of traffic congestion. As shown in Table 3-3, 16 percent of the 14,150 miles of state-maintained roads and highways are currently considered congested, with the greatest percentage of those in urban areas.

Table 3-3. State Highway System Capacity Backlog

	Total Miles	Congested Miles	% Congested
Urban	2,654	1,109	42
Rural	11,496	1,176	10
Total	14,150	2,285	16

Congestion-related delays on Tennessee's roads and highways have increased. Non-recurring congestion caused by traffic incidents or construction often leads to longer rush hours and aggravation for commuters. Studies have found that more than half of congestion and resulting traffic delay is due to non-recurring congestion.

Non-recurring congestion may be significantly reduced by aggressively applying system management techniques such as ITS and incident management. These techniques preserve and optimize existing transportation facilities and services. Another technique, TDM, provides opportunities to reduce the number of vehicles using the roadways through strategies such as carpooling, flexible work schedules, and telecommuting.

Investment Strategies

In the next 10 years, the plan proposes to invest an additional $840 million to relieve congestion in rapidly growing cities and suburban areas and improve the performance of rural highways. These investments strategies include:

- $370 million to address increasing highway and bridge maintenance needs.
- An additional $165 million to accelerate improvements on urban interstates and other state highways in Tennessee's cities.
- $240 million to address safety and congestion concerns on rural highways by increasing lane widths and adding shoulders.

To better manage existing roadways, the state will spend an additional $40 million to complete critical traffic and transit management systems, including:

- Regional Traffic Management Centers in Chattanooga and Memphis, similar to those now operating in Knoxville and Nashville
- Extending freeway surveillance systems to key areas on rural interstates

Additionally, TDOT will spend $25 million to manage the demand for transportation services and to promote other travel options by:

- Boosting the efforts of regional and local vanpool agencies
- Building new park-and-ride lots in and near metropolitan areas to encourage ridesharing
- Developing programs for major employers to encourage telecommuting, flexible work hours, and other methods to reduce the need to commute

Combined, these strategic responses will begin to reduce the backlog of congested roadways. Also, with better-managed systems, the state may realize financial benefit if some construction projects can be deferred. Table 3-4 summarizes the strategic investments proposed to promote congestion relief.

Table 3-4. Strategic Congestion Relief Investments

Congestion Relief Investment	($M)
TDM	25
ITS	40
Urban Highways	165
Rural Highway Safety and Geometric Improvements	240
Highway and Bridge Maintenance	370
Total	840

3.3.3 Strategic Initiative: Choices

While a large percentage of Tennesseans will continue to use personal automobiles for most of their travel needs, many are asking for additional choices. For the growing numbers of elderly, young, and the urban and rural poor who have limited access to personal automobiles, more transportation options mean the ability to meet daily needs and to participate in their communities. Over the next 10 years, TDOT will need to partner with local governments and transportation providers statewide to increase transportation options for all Tennesseans.

Investment Strategies

In the next 10 years, TDOT proposes to invest an additional $665 million to help jump-start a state-of-the-art public transportation system for the state. TDOT will work closely with urban and rural public transportation operators to:

- Build as many as four new high-performance transit corridors in major metropolitan areas. This could include light rail, commuter rail, or bus rapid transit service. TDOT would provide up to half of the non-federal share of capital costs.
- Make major city bus service more frequent, especially on heavily traveled routes and those routes with heavy traffic congestion, and provide connecting service to and from the stations located along high-performance transit corridors.
- Replace older, often unreliable city buses and rural vans with modern ones that are safer, more fuel-efficient, easier to maintain, and fully ADA-accessible.
- Add new service to rural transit routes that have long waiting lists or gaps in service.
- Keep pace with the needs of Tennessee's seniors and the disabled by expanding van fleets available to rural public transportation providers.

To improve walking and bicycling throughout the state, TDOT proposes to:

- Accelerate ADA retrofits in key areas to improve accessibility for the disabled.
- Partner with local governments to match federal "Safe Routes to School" program funds.
- Address major gaps in the state's bicycle network, such as crossing rivers and interstates.

Combined, these strategic responses will give Tennesseans greater access to job opportunities, medical services, and those activities necessary to participate fully in Tennessee's future. Table 3-5 summarizes the strategic investments proposed to promote better mobility choices.

Table 3-5. Strategic Choices Investments

Choices Investment	($M)
Bicycle/Pedestrian Safety Programs	5
New Bicycle/Pedestrian Facilities	10
Rural Transit Expansion	80
Urban Transit Expansion	245
Transit New Starts	325
Total	665

3.3.4 Strategic Initiative: Corridors

The 14,150 miles of roads and highways built and maintained by TDOT crisscross all corners and regions of the state. Their safe and efficient operation is a vital part of the state's economic well being, allowing for access to jobs and for the movement of goods and freight. Responding to wide-ranging needs and pressures, TDOT has an extensive program of preserving and improving this system. Most federal highway funding coming to TDOT is targeted to improvements on the state highway system.

A small set of these highways forms the backbone of the state's transportation system and carries a large percentage of the state's traffic. These highways carry most of the goods and freight moving into and through the state, connect major urban areas and growing smaller cities, and are fundamental to the state's economic development. These are also the highways under the most pressure due to the rapid growth of traffic, especially truck traffic. And while the state has invested in, and continues to invest in, these corridors, there is not currently a coherent strategy for advancing completion of needed improvements to these critical corridors.

Recognizing this challenge, the plan proposes strategic investments in key corridors across the state over the next 10 years. Many of these key corridors already have significant improvement programs well underway. A corridors initiative will allow many improvements in these key corridors to be completed in the next 10 years.

Proposed Corridors

The Corridors concept represents a new approach to transportation planning in Tennessee. It is consistent with the policies contained in the 25-Year Vision Plan that call for alternative transportation solutions, promoting competitive freight options, and building new and stronger partnerships. The concept emphasizes the need to improve, protect, and maximize the capacity of existing highway corridors that are critical to statewide mobility and regional connectivity. By identifying the corridors, the state and its stakeholders have an opportunity to consider long-term vision, decision making consistency, and improved partnerships.

A preliminary set of criteria was used to identify the proposed corridors. Over the next 1 to 2 years, TDOT will refine the criteria and advance projects in the identified corridors. The criteria included:

- **Mobility and connectivity**. The corridor moves or has the potential to move large volumes of traffic and links activity centers, including cities, tourist areas, and employment centers.
- **Improvement need**. The corridor has demonstrated capacity needs to handle current and forecasted travel demand.
- **Potential for completion**. The primary intent of the corridor initiative is to accelerate the completion of corridor improvements that are needed to address immediate and short-term problems. High priority will be given to those corridors for which the overall improvement program is well underway and has high potential for completion.

Figure 3-2 shows the proposed corridors. Corridors are divided into those of statewide and of regional significance. Generally, statewide corridors include interstate highways, and are under the greatest pressure today. The second category is regional corridors. They are critically important to regional economies, face their own improvement needs, and present the opportunity for substantial improvement completion under an accelerated program.

Figure 3-2. Proposed Corridors for 10-Year Strategic Investments

Investment Strategies

The corridors investment strategies will focus on two broad areas:

- Accelerated, focused highway corridor improvements to move identified corridors toward completion.
- Initiatives to improve the movement of goods and freight within the broad corridors parallel to identified highways, supporting safety, mobility and access goals.

To accelerate improvements in the corridors, the plan proposes an additional 10-year investment of $495 million. This funding would provide:

- $245 million for improvements on key rural and regional interstate highways. For some of these corridors, project development is well underway, and in some cases, construction plans are complete and right-of-way acquisition may be in progress. The strategic investments will allow projects to be completed more quickly.

- $80 million to advance the County Seat Connector program, which seeks to provide a four-lane highway from each of the state's 95 county seats to the nearest interstate highway.

A second significant aspect is investing in other modes of freight transport. This initiative recognizes the multimodal dimensions of transportation and economic development.

In addition to improving key highways, TDOT will invest up to $170 million in the programs described below to enhance the speed and safety of freight transport.

- Upgrade Tennessee's shortline railroads to the new, heavier 286k-pound standard, which is the current loading capacity favored by the Class 1 railroads and many major shippers. If unable to meet this standard, shortline railroads and the shippers they serve would remain in an unfavorable competitive position. This program will provide 85 percent matching funds, to maintain the state's ability to ship goods to and from many industries that provide a vital employment base in rural areas.
- Partner with Class 1 rail operators on select safety and modernization projects to promote rail as a viable shipping option by reducing travel time and cost. Examples include building grade separations at major highway/rail crossings on at least one corridor and rail bypasses identified in the State Rail Plan.
- Create a "challenge grant" program to encourage preservation of Tennessee's ability to transport heavy, bulk loads by waterway. A 20 percent TDOT match will be available for either federal or private funds that repair locks and port facilities, or dredge channels to accommodate larger barges.

Table 3-6 summarizes the strategic investments proposed for improving Tennessee's key transportation corridors.

Table 3-6. Strategic Corridors Investments

Corridors Investment	($M)
Waterway System Modernization and Facilities Improvements	15
Rail Freight Safety and Modernization	55
County Seat Connectors	80
Shortline Railroads	100
Rural Highways	245
Total	495

3.4 Proposed 10-Year Funding Summary

The proposed $2 billion, Strategic Investments for Congestion Relief, Choices and Corridors is summarized in Table 3-7. Combined with the $22 billion baseline spending program, which begins to shift spending towards the 25-Year Vision Plan, the 10-Year SIP creates a dynamic vehicle for accelerating funding in needed areas of the transportation system as Tennessee continues to grow. It provides clear direction for how the proposed 25-Year Vision Plan can be realized to reduce congestion, ensure greater choices, and improve key corridors across the state.

Table 3-7. Summary of Strategic Investments

Investment	($M)
Congestion Relief	840
Choices	665
Corridors	495
Total	2,000

While spending on highways and bridges will continue to be the focus of the state's transportation spending in the first 10 years of the long-range plan, the $2 billion strategic investments program will allow the state to make near-term, targeted investments that address critical needs across all modes of transportation. In sum, the following are the benefits of this structured program:

- High preservation standards of existing systems, particularly bridges and highways, will be maintained.
- New initiatives to broaden mobility options in both urban and rural areas are advanced.
- Critical strategic partnerships needed to advance both mobility choices and freight movement systems are created.
- For the first time in many years, TDOT will begin to stop the growth in the mounting backlog of highway capacity deficiencies.

A combination of the Baseline Spending Program, for performance maintenance, and the 10-Year SIP of focused initiatives will amount to $24 billion. The distribution of these funds is shown in Table 3-8.

While these are laudable benefits that should result from this program, the major issue of how the program should be financed remains. It must be determined whether the state can, or should, continue what has become a tradition valued by many: pay-as-you-go financing. The question must also be asked as to whether it will it be necessary, and even beneficial, to examine innovative financing strategies that are being used by a growing number of states. Options, and recommended measures, that might be considered are presented in Chapter 4.

Table 3-8. Proposed Total 10-Year Funding

Investment Areas		Baseline ($M)	% of Total	Strategic Investment	10-Year Total ($M)	% of Total
Maintenance/ Preservation	Highway: Bridge and Roadway Maintenance and ITS	5,878	26.7	410	6,288	26.2
	Public Transportation, Bicycle/Pedestrian, and Transportation Options (TDM): Urban and Rural System Capital and Operating Support	576	2.6	25	601	2.5
	Aviation, Railroad, and Waterway: Regional System Support; Shortline Railroad Rehabilitation Programs	178	0.8	—	178	0.7
	Maintenance/Preservation Subtotal	6,631	30.1	435	7,067	29.4
Safety/ Modernization	Highway: Bridge Replacement, Widening of Narrow Lanes, and Local System Support	4,071	18.5	240	4,311	18.0
	Public Transportation and Bicycle/Pedestrian: Support Systems	23	0.1	5	28	0.1
	Aviation, Railroad, and Waterway: Improved Communication Systems, Rail Grade Crossing Protection, Shortline Track Capacity	325	1.5	170	495	2.1
	Safety/Modernization Subtotal	4,419	20.1	415	4,834	20.1
Expansion/ Enhancement	Highway: Congestion Relief, Local System Expansion, ITS Expansion	10,227	46.5	490	10,717	44.6
	Public Transportation and Bicycle/Pedestrian: Urban and Rural System Expansion Support	478	2.2	660	1,138	5.0
	Aviation, Railroad, and Waterway: Partnered Support of Airport Expansion, Rail Bypass, and Intermodal Yards, Expanded Port Facilities , Intercity Passenger Rail	253	1.1	—	253	1.1
	Expansion/Enhancement Subtotal	10,958	49.8	1,150	12,108	50.4
	Total	22,008	100.0	2,000	24,009	100.0

Investment Areas	Recommended 10-Year Funding Summary				
By Mode	**Baseline ($M)**	**% of Total**	**Strategic Investment**	**10-Year Total ($M)**	**% of Total**
Highway and ITS	20,175	91.7	1,140	21,316	88.8
Public Transportation, TDM, and Bicycle/Pedestrian	1,076	4.9	690	1,766	7.4
Aviation, Railroad, and Waterway	756	3.4	170	926	3.9
Total	22,008	100.0	2,000	24,008	100.0

Chapter 4

Strategic Investments Funding

Funding for the 10-year Strategic Investments Program (SIP) is part of the larger effort to achieve the 25-Year Vision Plan. Many of the same financial tools would be used in both time frames. Because of the $2 to $3 billion gap between revenue expected and the funds needed for the 10-Year SIP, the state will need to pursue new sources of revenue. Financial projections estimate that current revenue sources will provide $22 billion through 2015.

Since the revenue forecast of $22 billion assumes reauthorization of the federal transportation program and an increase in funds flowing to TDOT, then a basic premise of the 10-Year SIP is that the additional funds must come from state sources. This could include some combination of enhancing traditional revenue streams and innovative finance strategies that allow existing revenue streams to be leveraged. Options within both of these approaches are discussed further in this chapter, which concludes with short-term financing strategies.

4.1 Revenue Enhancement Options

Highway user fees currently make up 75 percent of the state portion of TDOT's budget. Two other substantial portions of the state share of the budget are bond authorizations (18 percent) and the Transportation Equity Fund (2.5 percent), which funds TDOT's rail and aviation programs. The user fees are comprised of the state's gasoline and motor fuel taxes, special petroleum taxes, vehicle registration fees, and beer and bottle fees.

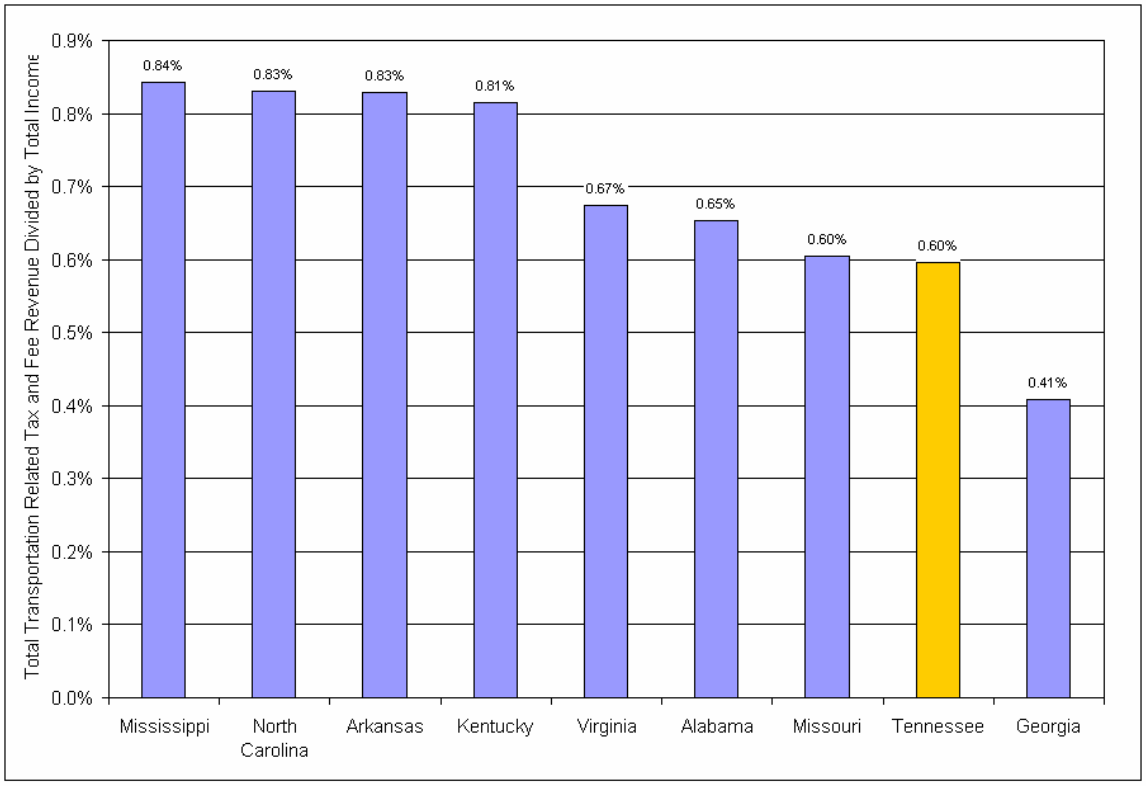
Tennessee last increased its gasoline and motor fuels tax, now 20 cents per gallon and 17 cents per gallon, respectively, in 1989. Of those rates, 48 percent and 72 percent, respectively, go to the state's Highway Fund. Another 12 percent of the gasoline tax is directed to the Sinking Fund. Approximately 38 percent of gas tax revenue and 26 percent of motor fuel tax revenue is allocated to local governments to fund local transportation programs (see Table 2-2 of the LRTP Financial Plan). Since the last tax increase, inflation has reduced the buying power of Tennessee's Highway Fund by 34 percent, based on the rise in the Consumer Price Index.

Due to the impact of inflation since 1989, consideration might be given to increasing these tax rates. But before doing so, some assurance should be provided that increased rates would still be in line with other states.

A comparison of surrounding states (see the LRTP *Financial Plan*, Chapter 3) reveals that the burden of transportation-related taxes and fees is relatively low in Tennessee as compared to neighboring states (see Figure 4-1). In fact, the burden of those taxes and fees is higher in seven of Tennessee's eight neighboring states. In Tennessee, about six tenths of a cent of every dollar of income was paid to transportation-related taxes and fees in FY 2004. Comparable rates were significantly higher in Mississippi, North Carolina, Arkansas, and Kentucky, where the effective burden of transportation-related taxes and fees was in excess of eight tenths of a cent per dollar of income. Only Georgia had an effective burden lower than Tennessee's, due to a lower fuel tax rate and because registration and license fees are not allocated to transportation purposes and are therefore not considered part of the burden.

Several circumstances contribute to the relatively low burden in Tennessee. First, the sales tax on motor vehicles is not allocated to transportation and is therefore not included in the burden. Second, Tennessee does not supplement its state transportation revenue with many additional sources of revenue, as do many neighboring states. A relatively low transportation tax-related burden in Tennessee results in transportation spending that is lower than comparable neighboring states. In fact, despite being fourth in population and employment among neighboring states, Tennessee ranked sixth in highway spending in that group.

Figure 4-1. Effective Burden of Fuel Taxes and Registration and License Fees in Tennessee and Neighboring States



Source: State Departments of Revenue, Taxation, or Transportation, Bureau of Economic Analysis, and AECOM Consult, Inc.

The preceding summary discussion suggests that Tennessee may have some room to increase its transportation revenue through increases in its traditional taxing structure, or variations on the same, without overburdening taxpayers or placing Tennessee out of balance with surrounding states. Most likely revenue enhancement vehicles would include:

- Gasoline tax increase, above the current 20 cents per gallon
- Motor fuels tax increase, above the current 17 cents per gallon
- Vehicle registration increase
- Indexing of gasoline and motor fuels taxes to track with inflation

The first three of these would be simple increases in existing rates. The fourth, which is applied in North Carolina, Georgia, and Florida in the Southeast, would be a variation on the traditional cents per gallon basis. In indexing, statutory authority is given to the state to increase the gasoline and/or motor fuel tax rate on a periodic basis in line with a defined increase mechanism, such as rise in the Consumer Price Index. As shown in Table 4-1, indexing can be a powerful revenue-generating tool over time. Table 4-1 also shows the revenue that would be produced through straight tax rate increases; it also shows the amount that would accrue to the state under different scenarios of revenue sharing with local governments. As noted previously, TDOT today shares gasoline and motor fuel receipts with local governments, providing much of the funding used by them for local street and road construction and maintenance activity.

4.2 Innovative Finance and Project Delivery Options

The use of innovative finance and delivery options remains an approach for consideration by Tennessee. While these options have not been used by the state in the past, the evolution of these options and their wider acceptance by state transportation agencies continues to grow. This section identifies the rationale and methods used in considering and implementing innovative finance and delivery options.

4.2.1 Rationale for Innovative Finance and Project Delivery Approaches

Two major reasons for considering the use of innovative finance and delivery approaches are accelerating program delivery and reducing program costs by shortening the timeframe for implementation. Both considerations should yield the same result: lower overall program delivery costs due to shortened delivery times and less impact from inflationary pressures on those elements that are most subject to increases in costs over time. This is particularly true with construction cost pressures and the cost of right-of-way.

One reason that shortening delivery time reduces costs is that growth in available revenue lags the growth in cost inflation. This is true not only for construction but maintenance costs. The paragraphs below discuss the major reasons for the lag in revenue growth compared to costs.

The new federal transportation funding bill is likely to provide higher overall levels of funding. However, revenues to be gained by those states referred to as "donor states," including Tennessee, will still not be significant in comparison to identified needs. Many "insiders" view the position of the President's Administration regarding a cap on the federal bill of approximately $284 billion as a signal that the states and local governments will be required to do more in the way of generating revenue.

Table 4-1. Summary of Revenue Scenario Forecasts

	10-Years (SIP) 2006-2015 ($M)
1 cent gas tax increase, with current split	130.50
1 cent gas tax increase, 100 percent to TDOT	270.75
1 cent gas tax increase indexed, with current split	145.49
1 cent gas tax increase indexed, with 100 percent to TDOT	301.84
Gas tax indexed at 3 percent, 100 percent to TDOT	802.76
Gas tax directed to Highway Fund indexed at 3 percent, 100 percent to TDOT	386.93
1 cent motor fuel tax increase, with current split	70.43
1 cent motor fuel tax increase, 100 percent to TDOT	97.96
1 cent motor fuel tax increase indexed, with current split	78.69
1 cent motor fuel tax increase indexed, with 100 percent to TDOT	109.44
Motor fuel tax indexed at 3 percent, 100 percent to TDOT	251.05
Motor fuel tax directed to Highway Fund indexed at 3 percent, 100 percent to TDOT	180.50
1 cent gas and motor fuel tax increase, with current split	200.94
1 cent gas and motor fuel tax increase, 100 percent to TDOT	368.71
1 cent gas and motor fuel tax increase indexed, with current split	224.17
1 cent gas and motor fuel tax increase indexed, 100 percent to TDOT	411.28
Gas and motor fuel tax indexed at 3 percent, 100 percent to TDOT	1,053.81
Gas and motor fuel tax directed to Highway Fund indexed at 3 percent, 100 percent to TDOT	567.43
10 percent increase in registration fees, 100 percent to TDOT	182.34

Gas tax revenues continue to grow, but only slightly. The challenge to increasing gas tax revenues for the majority of states is because the revenue source is based on a "cents per gallon" basis. Lowering the rate of fuel consumption on a vehicle base has been a goal for many years. The improved fuel efficiency of vehicles is a direct result of the desire to reduce our dependency on foreign oil imports. In addition, the cost per gallon of gasoline and other motor fuels has continued to climb, reaching record levels throughout the nation. This has resulted in some decrease in fuel consumption. While the cost of gasoline has increased in Tennessee, the amount of revenue received per gallon has not because the gasoline tax is not indexed for inflation or the cost of fuel. Thus, as the fuel consumption rate per vehicle has declined and a slow down in fuel consumption has been realized by higher costs, the amount of revenue provided by the gasoline

and fuel taxes in Tennessee grows only by an increase in the number of vehicles driven and increases in the vehicle-miles driven beyond the improved fuel economy.

In addition to a reduction in revenue from gas and fuel taxes, the cost to build, improve, and maintain the transportation system continues to grow at rates faster than revenues and also general inflation. The increased costs are due to higher costs of basic construction and maintenance materials such as petroleum products for asphalt, concrete products, and steel that is used to reinforce both concrete pavement and structures as well as build structures. The resulting gap between revenues and costs continues to widen over time, creating a growing backlog of needs in the state.

A final challenge to bridging the cost and revenue gap in Tennessee is a traditional "pay-as-you-go" approach to transportation project development and construction. This approach is one in which TDOT does not commit to developing or constructing a project until all funds needed to pay for the project are available. While this does eliminate any costs associated with borrowing funds, the trends in cost inflation versus revenue growth, combined with increased travel demand results in project costs growing faster over time than revenues. Items such as property values for right-of-way are reasons for the need to expedite project development and construction. The past 2 years have also shown general construction material costs, equipment, and labor costs out-pacing revenue growth, resulting in increasing backlogs of projects that cannot be built with existing budgets.

Understanding the problem, TDOT realizes that a key means of addressing the gap between revenues and costs is to reduce the time required to develop and deliver the transportation program. A number of means are available for reducing the time required to plan, design, and construct transportation projects. Also, accelerated delivery can reduce the cost of providing transportation improvements for many reasons. Delivering transportation improvements at an accelerated pace can result in lower overall costs because:

- Earlier construction/implementation reduces the effects of inflation on the cost elements of right-of-way, materials, and labor.
- Earlier delivery of projects reduces the costs to users due to congestion, reduces lost time, and improves safety.
- Earlier delivery of programs results in fewer projects being delayed due to inadequate funding, reducing the growing backlog of projects that would otherwise require larger amounts of capital as delays continue to increase costs.

More and more states are examining techniques by which program delivery can be accelerated, resulting in significant cost savings. Efficiencies in the delivery system are gained by reducing the delivery cycle time, including efficient use of manpower in the planning, design, and acquisition of right-of-way phases, continuous efficient use of construction equipment and labor, and fewer spikes in construction materials (resulting in fewer major supply/demand-based cost impacts). Other efficiency techniques being used include:

- **Increased use of private sector resources to reduce the need for permanent, full-time government positions to address large and varying program development and delivery demands**. These resources have been used by some states to manage the development, design, and construction of transportation programs, working as extensions of staff to traditional transportation agencies on an as-needed basis. This results in reducing the delivery cycle time, resulting in lowering actual product costs.
- **Streamlining the environmental clearance process**. TDOT has shown an admirable intent to adhere not only to the letter of federal environmental regulations that govern development of federally funded transportation projects, but also with the spirit of those regulations, working with regulatory agencies to minimize the environmental impact of proposed projects.
- **Use of design/build techniques (or variations) to reduce overall time required to design and construct the project**. Under these techniques, the design team and constructors join to combine the two project elements, often significantly reducing project delivery time.

Application of one or more of these approaches can result in substantial time and cost savings in delivery of transportation programs.

4.2.2 Innovative Finance Options

Delivery of the transportation system can be performed using traditional and innovative techniques. Those project delivery techniques used in the U.S. include the following:

- **Traditional, Pay-as-you-go**. Constructing and implementing projects as funds are accumulated. Note that the pay-as-you-go approach can be used while increasing traditional or even new revenue sources, through the use of a traditional method of project development-design-delivery as funds are available.
- **Bond programs**. Advancing construction and implementation with bond sales based on future revenue sources.
- **Toll programs**. Adding a new, user-fee revenue source to support revenue bonds to pay for project development, construction, operation, and maintenance.
- **Partnerships**. Involving both public and private sectors in the financing, development, design, delivery, operation, and maintenance of transportation systems and projects.
- **State loan programs**. By increasing capitalization to the existing State Infrastructure Bank (SIB), local governments and public transportation agencies could have access additional funds that allow projects to be advanced.

The three primary alternatives to pay-as-you-go financing are described below.

Highway User Bonds–Leveraging Existing Funds

Highway user bonds are not new to the transportation marketplace. Used for decades by many states, this method allows agencies to advance program and project development. The primary reason for using a bond financing option is realized when the costs of program/project delay outweigh the costs of financing.

This approach allows the issuance of various forms of long-term debt to advance critical highway projects or to fund expanded highway construction programs. Between 2000 and 2005, states issued more than $26 billion in state highway bonds.

Several revenue sources, such as those shown below, can be used to pledge for bonding.

- State gas taxes
- State motor vehicle fees and charges
- Motor fuel sales taxes
- Weight taxes
- Petroleum business taxes
- State recordation taxes
- Local government payments
- A state's Full Faith and Credit (General Obligation pledge)
- Federal highway reimbursements (GARVEE bonds)

Among the many bond program support alternatives, the one receiving the most interest among state Departments of Transportation today is the use of federal highway reimbursement funds, a technique referred to as Grant Anticipation Revenue Vehicles, or GARVEEs. A GARVEE is a debt financing instrument authorized to receive federal reimbursements of debt service and related financing costs under Section 122 of Title 23, United States Code. Among the most recent states to address the use of GARVEEs, North Carolina's legislature is acting on a bill that would allow up to $900 million in GARVEE financing over the next 6 years. Tennessee can also consider this approach. And, as in the case of North Carolina's move toward GARVEE use, a state can limit repayments to a fixed percentage of their federal reimbursements or limit the use of bond revenues to specific types of activities, such as right-of-way acquisition or bridge construction. This gives both policy and technical management a greater comfort for the amount and use of bond finance.

Tolling–Increasing Funds

A second means of implementing innovative finance and program delivery techniques is through the use of tolling. Once the primary means of building highways before the "interstate" era, states have had a resurgence of interest since the 1980s in user fee financing. The advantages of tolling are that toll facilities and toll systems can provide states with a new, significant long-term non-tax revenue source for financing and constructing new highway improvements, while also providing funds for maintaining those highway improvements.

In today's highway industry, tolls are continuing to grow in use as one tool in the transportation agency's toolbox. Indicators of the popularity of this tool include:

- More than 5,000 miles of toll facilities exist in the U.S.
- Toll facilities are owned and operated by 128 entities, from state DOTs to local bridge authorities to private owners.
- Toll facilities produce more than $6 billion annually in revenues

Further indications of the acceptance of tolling at the state level is the creation of new statewide tolling agencies in Colorado and North Carolina, states where toll facilities were not considered an option to the state DOTs. In both Colorado and North Carolina, the state tolling or turnpike agency concept was fostered and championed within the DOT agency. This is a significant change from the typical legislative or local catalysts for toll agencies.

Toll facilities are not the answer for all transportation funding shortfall situations. The most viable toll facilities today are found in congested urban areas where the need for additional capacity is greatest and the demand for travel is daily. That aside, Texas passed legislation in 2003 that required their DOT to consider tolling on every project in which capacity was to be increased, whether new or existing roads. Their goal was to consider the level of financial support generated by potential tolling for each project. Knowing the level of funding available via tolls allows TxDOT to consider the use of funds replaced by tolls for other purposes or projects.

In most states, including Tennessee, tolling will remain an element for use in the major urban corridors with considerable congestion. That application could play a significant role during the 10-Year SIP period.

Partnerships–Expanding Funding Participants and Project Development Options

A third innovative finance technique is the expansion of funding participants and increasing the pool of those involved in project development. Throughout TDOT's public involvement and Regional Work Group meetings, the message was clear that the need for strategic partnerships is vital to the enhancement of Tennessee's transportation system.

The basic models used in partnerships include both public-public and public-private ventures.

Public-public funding collaborations have been used in Tennessee for some time. These are most evident in the distribution of gas tax revenues between the state and local governments. Also, TDOT and local governments partner on transportation projects, from highways to public transit initiatives. The advantages of public-public partnerships include:

- Broadening transportation funding by sharing a portion of expenditure responsibilities among state, regional, and local governments.
- Increasing cooperation that results in functional and political collaborations. These collaborations can generally involve local government authority to impose transportation taxes; and the authority to create regional/local transportation agencies. These techniques are not fully operational in Tennessee as the ability of local agencies to impose transportation taxes does not now exist. However, local governments in Tennessee can impose and use a local "wheel tax" for local road projects. The wheel tax can also be used to fund non-transportation projects.

Public-private funding collaborations, known as public-private partnerships, introduce new partners with their ability to assume project risk and develop projects. A public-private partnership is a contractual agreement between a public agency (federal, state, or local) and a

for-profit corporation, through which the skills and assets of each participant are shared in delivering a service or facility for the use of the general public.

Public-private partnership and related project development options are summarized below.

Public-Private Project Model
The public-private model places more responsibilities on the public sector to finance projects using techniques such as those outlined in the highway user bonds discussion. This model brings the advantages of public sector, tax-exempt debt financing, lowering the cost of developing and delivering the project. While the leader of a public-private project is often the public agency, the private sector is often involved in risk-transfer or acceptance, such as up-front project development work performed for a success fee at closing, as well as project design and construction phases. For a public-private project, the private sector role is typically short-term, ending with delivery of a completed project.

Public-Private Development Corporation Model
The private development-non-profit corporation approach brings the financing advantages of tax-exempt debt financing from a non-profit corporation, or 63-20 corporation, and the advantages of the private sector participation. Often the non-profit corporation is created with a specific project to be developed. The "private sector" advantages brought by a non-profit corporation include the ability to assume risks for project development, design, and construction, and the advantages of a private sector approach and efficiencies in delivery times. This model is not used as frequently as the public-private model, primarily because public agencies feel that control of the process and project by the public agency is reduced.

Concession or Franchise Model
The concession or franchise model of public-private partnerships begins with the public sector agency issuing a request for development. The public agency issues the contract for these services, giving the concessionaire the right to revenues and/or payments from the public sector for a specified time. The private sector participant is typically responsible for most or all of project development and financing, design, construction, operation, and maintenance. Under this model, financing by the concessionaire is taxable because the financing is not done by the public agency. In most cases, the developed facility may revert to the public agency upon completion of a franchise period. Recent examples of this model include:

- **The City of Chicago's Skyway Toll Road**. An international concessionaire paid for the right to operate, maintain, and collect revenues on this toll way for 99 years. In return, the city will receive a significant cash payment.
- **The Trans-Texas Corridor**. TxDOT recently awarded a concession agreement to a large team to construct up to $7 billion in toll roads in Texas and operate them for 50 years, with toll receipts going to the concessionaire. At the end of the concession agreement, the facilities will revert to full TxDOT ownership and operation, at no cost to the public agency. Additionally, the concessionaire will make payments to TxDOT during their period of ownership of the facilities, providing TxDOT with additional cash to use on other programs and projects.

Private Model

A final model for project development is the private model. While technically not a public-private partnership because no formal contract exists with a public entity, these development agreements normally require that a state have legislation in place to allow this action. In such cases, the private entity is solely responsible for the project without the involvement of traditional transportation agencies. This approach has had limited use in the U.S, although it is commonly used in Europe and other parts of the world. The Dulles Greenway, a 14-mile extension of the publicly owned Dulles Toll Road in northern Virginia, is an example of the private model. This facility struggled financially before demand for travel was sufficient to cover the debt financing.

State Infrastructure Banks

SIBs are state revolving funds that, much like private banks, use seed money provided by federal-aid funds or other state or local funds. Projects are then selected for SIB financial assistance, which can include loans, loan guarantees, standby lines of credit, letters of credit, certificates of participation, debt service reserve funds, and bond insurance.

Through the SIB financing mechanism, states can leverage additional transportation resources, accelerate construction timelines for projects with dedicated revenue source, and recycle assistance for future transportation projects. SIBs can be used in conjunction with traditional finance approaches and other innovative tools to maximize transportation infrastructure investment. Further, the credit enhancement techniques offered through SIBs demonstrate public acceptance for projects, enhance the coverage margin on outstanding debt, and improve the credit quality of projects receiving SIB assistance.

While TDOT entered into an agreement with the Federal Highway Administration in 1998 to create the Tennessee SIB, it has been used for only a single project. Five states (Arizona, Florida, Ohio, Texas, and South Carolina) have most often used SIBs. Their participation in 183 agreements has resulted in loan agreements totaling $4.3 billion.

In Texas, the SIB program arose out of the need to improve, rehabilitate and renovate transportation facilities. Facing increasing transportation needs while federal, state, and local financial resources are constant or declining, Texas saw the SIB program as a way to use innovative financing techniques. Texas considers the purposes of the SIB to include:

- Encouraging public and private investment in transportation facilities, including facilities that contribute to the multimodal and intermodal transportation capabilities of the state
- Expanding the availability of funding for transportation projects and reducing direct state costs
- Improving the efficiency of the state transportation system

TxDOT operates the SIB as a self-sustaining, growth-oriented fund. TxDOT will also ensure projects satisfy all appropriate federal, state, and local planning and programming requirements. TxDOT has designed the SIB to enhance the ability of borrowers to access capital funds at lower-than-market interest rates. The success of the SIB program will depend on maintaining strong credit standards and successfully leveraging funds to increase the program's activity through a revolving loan fund structure.

Additional information on these and other innovative finance techniques is in the LRTP *Financial Plan*.

4.3 Potential 10-Year Strategic Investments Program Financing

Chapter 3 presented TDOT program recommendations for the next 10 years that include a $22 billion baseline program and an innovative $2 billion strategic investments program designed to jump-start critical initiatives in the 25-Year Vision Plan. In light of the broad and strong support offered by stakeholders of the LRTP process that increased investment in Tennessee's transportation system is needed and warranted, it becomes vitally important that a balanced, politically and publicly acceptable package of revenue enhancement and new financing instruments be implemented provide the needed increment of funds.

To generate the revenue needed to fund the 10-Year SIP, the state has a wide array of options available. A balanced approach combining revenue enhancement with debt financing and funds leveraging is needed.

- Tennessee's tradition of pay-as-you-go financing is consistent with modal needs estimates that predict future needs in response to long-term population growth and economic development. By continuing to finance at least a large portion of TDOT's overall program by this method, relatively little future revenue will have to be dedicated to debt service. Tennessee should not move completely away from this tradition.
- At the same time, it has been pointed out that the long-term erosion of the Highway Fund's buying power has resulted in a growing backlog of needs, which only a significant infusion of additional capital can address. TDOT's decision to avoid road and bridge maintenance deferral by foregoing some construction, while appropriate, has contributed to the growing backlog of highway capacity needs by limiting funding for expansion that is not tied directly to federal funds.
- The 10-year baseline budget includes $717 million more for highway expansion improvements that will serve to stabilize the highway capacity backlog. And, the $2 billion strategic investments package also includes $410 million in focused spending to address critical state system urban capacity needs ($165 million) and rural interstate needs ($245 million). Other states have found it desirable to use debt financing to help reduce backlogs.
- As the transportation system ages, Tennessee faces some costly major reconstruction and expansion projects, such as the I-40 improvement program in Knoxville. Pay-as-you-go financing can greatly lengthen the time needed to complete such projects. By applying debt financing, these projects can be accelerated, reducing construction impacts and potentially reducing overall project costs, particularly in light of recent trends in construction prices.
- Recommended increases in funding for non-highway modes will happen only if TDOT's partners also increase their participation in these programs. The 10-year program proposes to increase the state's share of public transportation capital and operating program costs where that spending will serve to improve service levels. This implies increased local spending as well.

A series of measures such as those described below, and summarized in Table 4-2, combine traditional revenue enhancement and more aggressive financing techniques. If implemented, they would improve Tennessee's transportation system and support anticipated growth and economic development.

- Traditional revenue enhancement:
  - Increasing by 4 cents per gallon the tax on gasoline (currently 20 cents) and motor fuels (currently 17 cents), split with local governments in current proportions, would generate more than $800 million.
  - Indexing of gas and motor fuel tax, tied to inflation, with all of the revenue generated through indexing accruing to the Highway Fund, would generate more than $1,050 million.
  - Increasing vehicle registration fees by 10 percent, with all new revenue accruing to the Highway Fund, would generate more than $180 million.

  All revenue enhancement initiatives are assumed to be in place by 2008.
- Debt finance to stabilize backlog and advance critical capacity needs: Issuance of general obligation or GARVEE bonds for right-of-way acquisition, bridge construction, and special project acceleration.
- Capitalizing and using the existing SIB as a funding source for partnering projects, such as transit new starts or rail freight investments. The SIP could be capitalized by new or existing state funds. It is now administered by TDOT.
- Creation/authorization of either regional or statewide toll road authorities, with needed starter funds coming from state transportation funds (or from SIB). To advance this concept, TDOT should consider conducting a toll feasibility study to determine consistency of such initiatives with state statute and administrative regulation. Such a study was recently conducted by the North Carolina DOT, leading to establishment of a statewide turnpike authority. During the 10-year period, tolls would likely not generate significant revenues, given time needed to develop the projects and begin the flow of revenue.
- Obtain necessary statutory authorization to allow use of design/build project delivery and other public-private partnerships to advance highway capacity projects and to bring additional capital to key projects.

In combination, a package such as this would provide substantial additional capital to Tennessee's transportation program, add a source of capital for the state's critical partners, and establish new project delivery techniques that give TDOT needed flexibility to advance the 25-Year Vision Plan.

Table 4-2. Potential 10-Year Revenue Enhancement and Capital Generation Initiatives

Revenue Type	Amount of Increase	10-Year Yield ($M, YOE)
Gas and motor fuel tax increase with current split	4 cents	804
Gas and motor fuel tax indexed at 3 percent, 100 percent to Highway Fund	-	1,054
Registration fees increase	10%	182
GARVEE-backed bond authorization	<10% of anticipated federal $ for debt service	1,000
Authorization of new toll road agencies	-	(*)

* Due to time required for agency start-up and project development, no new funds are assumed during the 10-year SIP period.

4.4 Next Steps

Once the recommendations in the 10-Year SIP are finalized, additional analysis will be needed to define actual cash-flow implications of the plan. For program areas such as public transportation and rail rehabilitation support, where the state is not the primary funding partner, TDOT will need to work closely with potential project sponsors to identify timing and project funding requirements.

On August 10, 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed into law. SAFETEA-LU authorizes federal surface transportation programs for highways, highway safety, and transit for the 5-year period, 2005-2009.

Many of the key changes to the statewide planning provisions are already components of this long-range plan. These changes include:

- Coordinating with regional transportation planning organizations, economic development agencies, and neighboring states.
- Promoting consistency between transportation planning and growth strategies.
- Ensuring the preservation and efficient use of the existing transportation system.
- Providing the opportunity for pedestrians, bicyclists, and the disabled to participate in the planning process.
- Enhancing the overall public participation process.

As TDOT moves forward with implementation of the LRTP, emphasis will be placed on several core provisions of SAFETEA-LU, such as:

- Establishing a Highway Safety Improvement Program that focuses on strategic highway safety planning, construction work zones, older drivers, pedestrians, and children walking and bicycling to school.
- Providing safety and security measures for transit systems and transportation facilities such as ports, intermodal hubs, railroads, and airports.
- Providing congestion relief by promoting real-time traffic management and improving freight movement.

Chapter 5

Supporting Actions

Chapters 3 and 4 describe a proposed 10-year program of strategic investments (Chapter 3) and strategies for financing the 10-Year Strategic Investments Program (SIP) (Chapter 4). The 10-year program calls for $2 billion in increased, accelerated spending that will help implement the 25-Year Vision Plan, helping the state to meet transportation needs through improved partnerships, better mobility options, environmental stewardship, and meaningful public participation.

This chapter of the 10-Year SIP defines supporting actions that will aid plan implementation. To move the 10-year program forward, a series of strategies and action steps must be pursued. This will require a collaborative approach, involving executive branch and legislative leadership, organizational change within TDOT, and active participation by transportation partners, both public and private. Conducting a sustained implementation process will require an ongoing review of institutional issues and practices, new planning tools and concepts, and incremental changes to state policies, practices, and laws. The sections below describe a recommended series of key strategies and necessary action steps.

1. Create a TDOT Plan Implementation Team (Technical Oversight). A small team of senior technical staff representing intra- and interdepartmental expertise is recommended to provide executive-level oversight and structure to plan implementation. Team members will offer guidance on how to implement specific plan recommendations and findings, identifying resources and realistic timetables for carrying out the work. Each member will draw upon available data and individuals within their respective divisions to investigate and propose changes that support the direction of the 25-Year Vision Plan and 10-Year SIP. This team will report directly to the Commissioner's senior management team. Because key elements of the plan focus on expanded partnerships, consideration should be given to including representatives of other state agencies (e.g., Department of Environment and Conservation), urban area Metropolitan Planning Organizations, and transportation providers such as public transportation agencies. This would allow plan implementation issues to be addressed at a programmatic level, rather than trying to resolve issues during project development.

2. Explore Legislative Action. Tennessee's transportation landscape is controlled by legislation and other formulas that limit how revenues can be spent. Reasonably, any spending of state transportation revenue must be authorized by legislative action. Other than the little used State Infrastructure Bank described in Chapter 4, legislative authorization largely limits TDOT to "pay-as-you-go" project and program financing. While these policies have served the state well during less dynamic economic cycles, successful pursuit of the financing initiatives that may be needed to implement the 25-Year Vision Plan and the 10-Year SIP could require consideration of debt finance and project delivery measures such as the following:

- Authorization to issue bonds secured by future federal funds (GARVEEs)
- Enabling legislation to create toll road authorities, either state or regional
- Authorization to apply project acceleration techniques such as design/build and/or public/private partnerships.

TDOT should examine in greater detail the feasibility and need for such approaches and work with legislative leadership to create the necessary authorizing legislation.

3. Improve Planning Integration. While TDOT has taken active measures to speed project delivery, the operating polices calling for consideration of multimodal alternatives in critical corridors could result in extended delivery times. To avoid further schedule impact, TDOT can focus attention on integration of its planning functions to ensure that the policies calling for early, intensive multimodal project development procedures are established and implemented. For example, TDOT should continue to explore strategies to streamline the project delivery process. Early consideration of multimodal alternatives by an internal multimodal alternatives screening team, similar to the screening of highway-only options formerly conducted by TDOT under their Advance Planning Report process, would allow early identification of the feasibility of non-traditional alternatives. This is particularly important along the strategic corridors that are experiencing adverse operating or maintenance impacts due to heavy truck volumes. In urbanized areas, TDOT should increase its coordination with Metropolitan Planning Organization staff to incorporate early environmental screening into the long-range planning process, seeking to identify environmental fatal flaws before projects are added to their plans.

4. Implement Project Evaluation System. Another key outcome of the LRTP is development of a Project Evaluation System, the purpose of which is to provide an open, rational basis for prioritizing projects for funding, and which responds to TDOT's commitment to the legislature to present a multiyear, multimodal work program. Using the Project Evaluation System, TDOT and its regional transportation partners will evaluate projects to assess whether they meet technical and needs-based criteria and are financially responsible. Similar projects can then be compared to determine those most deserving of the limited funds available for project implementation. TDOT tested the system during preparation of the LRTP by applying it to the 3-year highway construction program that was presented to the legislature. Because commitments were made during the LRTP development, it is important that the system be expanded and applied to all modal programs under TDOT control.

5. Monitor and Report System Performance. TDOT recently developed a new performance measurement framework that primarily addresses internal program delivery performance (e.g., customer relations). The LRTP complements that framework with a recommended set of performance measures for the transportation system (e.g., average bridge or pavement condition, average bus fleet age, or average highway congestion). By implementing the performance monitoring system, TDOT will have a basis for tracking and reporting the results of its plan implementation efforts. Creating a comprehensive transportation system report card will take time, but will help TDOT clearly communicate the value of various transportation investments to legislators, local officials, media, and stakeholder groups. The analysis should be an integral element of regular updates of the 10-Year SIP. Similar to other states, TDOT should regularly report on progress toward achieving stated goals.

6. Establish Regular Plan Updates. To keep the 25-Year Vision Plan and 10-Year SIP "living documents" that contain robust data and reflect changing public interests, a clear update cycle should be established. Specifically, it is recommended that the Vision Plan be updated every 4 to 5 years. For the 10-Year SIP, with its more detailed recommendations regarding strategic

investments and financing strategies, it is recommended that updates are completed every 2 to 3 years. Responsibility for preparing plan updates could fall within the purview of the Plan Implementation Team (see Item 1 above).

7. Advance the Corridor Planning Concept. In keeping with the corridors initiative, TDOT should continue to develop and advance the strategic corridor planning concept. Corridor planning represents an opportunity for TDOT and stakeholders to consider long-term vision, decision-making consistency, and land use plans. Equally important, this program should allow the state to accelerate corridor-long improvements on a focused basis, so that these critical corridors better fulfill their economic development and mobility roles.

8. Accelerate Project Delivery. As additional funding is made available to address backlogged needs and to implement the long-term vision, TDOT should consider strategies that will allow for accelerated delivery of projects, both by streamlining the project development phase of planning and environmental clearance, and by considering faster project completion during the construction phase. For example, TDOT has recently initiated implementation of the "Tennessee Interagency Agreement" for the environmental and regulatory coordination of transportation projects. The purpose of this agreement is to establish a coordinated planning and project environmental review process for transportation projects in the state, allowing adequate environmental resource agency participation throughout this process. In line with initiatives being undertaken by other states, TDOT might consider expanding this initiative beyond its project-by-project focus on identification of environmental impacts and development of impact mitigation plans. It could do this by creation of a unified, statewide environmental preservation/mitigation program between TDOT and the state's Department of Environment and Conservation; this could take mitigation/preservation off the critical path to project construction by purchasing or building preservation/mitigation sites/credits in advance.

Such early and proactive project development strategies can be combined with alternative project delivery methods, such as design/build and public/private partnerships, to further accelerate project completions. State departments of transportation are increasingly looking to such approaches as ways to speed delivery of critical projects. In addition to obtaining the necessary legislative authority, TDOT should make the organizational changes necessary to pursue these opportunities and consider the use of private consultants in program management and general engineering consultant roles for addressing peak work loads. These organizational and staffing-related challenges have been met through use of these approaches by state departments of transportation and other transportation agencies.

TDOT can quickly implement many of the strategic measures described above, without formal administration or legislative action. Others will require a more extended implementation timeframe. Table 5-1 shows the suggested timing of the implementation strategies described above.

Table 5-1. Long-Range Transportation Plan Implementation Strategies

Strategy	Timing*	Comment
Planning and Project Development		
Create TDOT Plan Implementation Team	Immediate	New policies and programs proposed by the LRTP will require ongoing senior management involvement to refine plan implementation strategies.
Improve Planning Integration	Immediate	Key to plan implementation is consideration of multimodal alternatives to address identified needs. Expanded inter-divisional coordination will be needed.
Advance Corridor Planning	Short-term	The 10-Year SIP identifies focused planning in identified strategic corridors as integral to fiscal stewardship, to promote continuity and optimized operations of these corridors.
Establish Regular Plan Updates	Long-term	TDOT's new statewide planning process calls for regular plan updates, allowing opportunities for public input and consideration of changing needs and opportunities.
Program Development and Project Delivery		
Implement Project Evaluation System	Immediate	Key to development of a 3-year multimodal work program will be application of the PES, to aid in setting project priorities.
Monitor System Performance	Short-term	Regular, ongoing monitoring of transportation system performance will allow timely adjustment of the 3-year work program and the 10-year strategic program to changing needs.
Accelerate Project Delivery	Short-term	To optimize the funding of strategic investments as identified in the 10-Year SIP, and to address the backlog of needed system improvements, TDOT can consider innovative strategies to speed project development, such as environmental streamlining, and project delivery, such as design-build construction methods.
Legislative Action		
Seek project delivery flexibility	Short-term	Legislative action will be needed for authorization to pursue new project delivery options such as design/build or public-private partnerships.
Increased transportation funding	Short-term	The LRTP calls for additional funding beyond current revenue forecasts. Legislative action will be needed for increased revenue.

* Timing:

Immediate: Less than one year
Short-term: 1 to 2 years
Long-term: 3 to 5 years