In accordance with TxDOT’s commitment to operational and innovation excellence, the Texas Transportation Plan (TTP) was developed as a performance-based plan. Scenario analysis developed for the TTP links potential investment approaches with the achievement of long-range goals. Achieving goals depends on the revenues available to meet the state’s growing transportation needs as well as the allocation of those revenues to the best possible transportation projects.

To fully implement the TTP, an approach to performance-based planning and programming will be adopted. This approach will carry the goals and objectives from the TTP through the programming and project selection processes used to inform the development of TxDOT’s Unified Transportation Program (UTP), metropolitan and rural transportation improvement programs (TIPs), and the Statewide Transportation Improvement Program (STIP). Supplemental Program Authority (SPA) projects and other state priority projects identified by TxDOT’s Districts will be prioritized and selected to best meet TTP goals. Prioritized projects will then be programmed in the UTP for further development, listed in the STIP as funds for construction become available, and finally advanced to construction.
8.1 Investment Strategies

TxDOT maintains more miles of highway and more bridges than any other state. With continued population and economic growth, demand on these assets continues to increase. Several broad investment strategies – with identified priorities – are recommended to help frame a performance-based approach and address transportation needs across the State of Texas.

8.1.1 Safety and Maintenance Priorities

While safety is TxDOT’s number one priority, the rate of fatal accidents on Texas roadways in 2012 exceeded the national average by 26.5 percent. The number one goal of TxDOT’s Highway Safety Office is to identify traffic safety problem areas and programs to reduce the number and severity of traffic related crashes, injuries, and fatalities.

In fiscal year 2013, TxDOT funded 298 behavioral and enforcement projects under the Texas Traffic Safety Program at a cost of $56 million in federal and state grant funds. These projects are designed to increase the proper use of safety belts and child safety seats as well as to deter dangerous driving behaviors such as speeding, aggressive or distracted driving, and driving under the influence of alcohol and other drugs. Additional information on TxDOT’s safety goals and performance targets can be found in the 2015 Highway Safety Plan.

Maintenance of existing highway infrastructure is also a high priority for safety, operational, and economic reasons. Priorities for transportation investments should ensure that the state maintains performance standards in all of areas of the state.

Maintenance can be as minor in scope as applying a seal coat surface to an existing roadway, but also includes major interstate reconstruction activities (e.g., IH 10 in El Paso and IH 345 in Dallas).

8.1.2 Energy Sector Priorities

Energy producing areas of the state have seen a tremendous increase in traffic growth (Exhibit 8-1), much of it associated with trucking activities. The continued maintenance and expansion of infrastructure to support the energy industry are integral to continued growth and economic development in the energy sectors throughout the state.

Exhibit 8-1. Energy Producing Areas and Traffic Growth

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*Image of Exhibit 8-1 is included here.*
### 8.1.3 Interstate Corridor Widening and Development

The Interstate Highway System in Texas represents the backbone of our transportation network. Investment should be made to continue efforts to widen key segments of existing Interstate corridors (Exhibit 8-2) to provide for a minimum of three travel lanes in each direction throughout both metropolitan and rural areas of the state.

Additionally, continued investment in the extension and development of future Interstates should be made throughout the state. This would include western extensions of IH 2 in south Texas and continued development of IH 69 across the state. In addition to these routes, future planning consideration may be given to development and extension of other Interstate routes, including possible extensions of IH 27 in west Texas and possible Interstate designation along portions of US 190 in central Texas.

### 8.1.4 Alternative Rural Corridors

In addition to the Interstate Highway System needs outlined above, a number of alternative highway system needs exist throughout the state where corridor improvements are needed to serve existing travel demands and potentially represent opportunities to divert traffic from increasingly congested Interstate Highway corridors. Improvements along these alternative routes may include widening some roadways to “Super 2” standards – providing passing lanes, continuous four-lane widening, and bypasses or overpasses at priority locations. Candidate alternative route projects are illustrated in Exhibit 8-3. These include Texas Trunk System routes and strategic corridors such as:

- **Ports-to-Plains Corridor** – connecting trade through the western portion of the state from the Texas/Mexico border at Laredo, through Del Rio, San Angelo, Midland/Odessa, Big Spring, Lubbock and Amarillo and extending through other US states to Canada.
- **US 190/Ports to Forts Corridor** – generally including portions of IH 10 and US 190 to extend from El Paso (Fort Bliss) through Killeen (Fort Hood) to Fort Polk, Louisiana. The corridor also includes additional highway connections to the ports of Beaumont and Corpus Christi.
8.1.5 Metropolitan Mobility Improvements

Vehicle of hours of delay in urban areas is projected to triple by 2040 from levels reported in 2010. Planning to address these needs in urban areas is coordinated through the twenty-five different Metropolitan Planning Organizations (MPOs) that exist in the urbanized areas of the state. These MPOs, shown in Exhibit 8-4, are governed by policy boards or committees that include representatives of local governments, transportation providers, and TxDOT District offices in the regions they serve. Each MPO is responsible for developing a long-range multimodal transportation plan and a shorter-range transportation improvement program. These plans and programs are in Chapter 2 (Exhibit 2-2), and incorporated into this document by reference.
8.1.6 Freight System Priorities

As the economy in Texas continues to grow, so too does the demand for the efficient movement of freight (Exhibit 8-5). Freight gateways include international border crossings, maritime seaports, cargo airports and rail/highway intermodal hubs. A wide range of freight generators exist throughout the state – ranging from agriculture and energy products in rural areas to manufacturing and distribution centers in urban areas.

Transportation investments should consider our state’s evolving freight needs and prioritize opportunities for improving the speed and efficiency of freight flow. In addition, the department will continue efforts to effectively coordinate with various freight stakeholders in the planning and development of multimodal transportation projects. This includes the on-going work of the Freight Advisory Committee that was established as part of the development of the Texas Freight Mobility Plan. Representation on the committee includes Class 1 and short-line railroads, ports, border trade operators, local officials, and industry experts.

8.1.7 Multimodal Priorities

In addition supporting to a wide range of highway-related needs and improvements, TxDOT will continue to work and partner with multimodal stakeholders to facilitate the development of non-highway improvements to meet freight and passenger needs. TxDOT is presently coordinating with locally and privately funded efforts to develop several intercity high-speed passenger rail corridors as alternative modal options for regional travel.

One of those efforts is a private sector initiative to develop high-speed rail service between Dallas and Houston along the IH 45 corridor, with a locally planned extension between Dallas and Fort Worth (Exhibit 8-6).

In a similar effort, TxDOT is working with the Federal Railroad Administration and local officials on the Texas-Oklahoma Passenger Rail Study (Exhibit 8-7) to examine a potential rail corridor that would connect Oklahoma City to south Texas. This corridor could eventually extend to Monterrey, Mexico.

Additional high-speed and commuter rail corridors are envisioned along the IH 35 corridor. Currently, an environmental study is underway on the Lone Star Passenger Rail Corridor between Austin and San Antonio (Exhibit 8-8).

TxDOT will continue to work with local transit agencies to coordinate the planning and development of transportation improvements that effectively serve both highway and public transportation needs, such as high-occupancy vehicle and managed lanes in congested urban corridors.
TxDOT recognizes that pedestrian and bicycle facilities are essential for creating livable and sustainable communities, for improving residents’ quality of life, and for supporting the use of walking and biking as viable travel modes. While bicycle and pedestrian projects have traditionally been implemented primarily by local governments, TxDOT is working to include bicycle and pedestrian infrastructure in roadway projects. Additionally, through new funding programs such as the Transportation Alternatives Program, TxDOT will directly fund bicycle and pedestrian construction projects throughout the state.

### 8.2 Sustainable Revenue Sources

As previously discussed, reasonably expected, currently available revenues will not be adequate to meet Texas’ transportation needs and growing demand and ensure that Texas remains economically strong.

- At current funding levels and without additional sustainable funding in the future, “good” conditions on pavements and bridges can only be maintained by shifting all highway expansion dollars to preventive maintenance and capital rehabilitation.
- The $1.7 billion for highway infrastructure recently approved by Texas voters under Proposition 1, will address some of the strategic capacity enhancement, connectivity, and maintenance needs for fiscal year 2015, but will not be sufficient to address growing needs into the future.
TxDOT estimates that $5 billion more per year (2014 constant dollars) in highway investment is needed to generally maintain the current level of congestion and condition of our highway infrastructure.

Sustainable funding is necessary to continue to invest in the Texas transportation system across all modes. Stakeholder and public outreach conducted for the TTP shows that these groups value and desire investments in transit and non-highway alternatives. At the same time, TTP outreach initiatives underscore the importance of system preservation and a recognition that Texas must continue to preserve and maintain its transportation system.

TxDOT can maximize the use of existing funding through performance-based project selection and operational enhancements to improve efficiency throughout the department, but these initiatives will not close the funding gap between needs and revenues. TxDOT will need to work closely with state and local elected officials to increase existing revenues and create new capital.

- **Motor Vehicle Sales Tax.** Some legislative leaders have suggested using a portion of vehicle sales tax revenue for transportation.
- **Public-Private Partnerships.** Partnering with the private sector brings in additional money. It allows projects to be built sooner rather than waiting until traditional funding becomes available.
- **Texas Mobility Fund.** Any new revenue sources for the Texas Mobility Fund could help retire debt or expand the capacity of the fund to accelerate new projects.
- **Transportation Reinvestment Zones.** Transportation reinvestment zones provide another local funding option for entities that choose to participate. Increased property values generate revenue within the improved zone to finance transportation projects.
- **Vehicle Miles Traveled tax.** Replacing or augmenting the current per-gallon fuel tax with a user fee based on vehicle miles traveled that directly connects road usage to the user. This fee structure would be more inclusive and compensate for lost revenues due to fuel efficient, hybrid, and electric vehicles.
- **Index or increase the motor fuel tax.** Indexing the motor fuel tax to inflation or increasing it would compensate for the declining purchasing power of the dollar and increased fuel efficiency. A one cent increase in the tax would generate about $110 million a year in revenue for the State Highway Fund.
- **Increase vehicle registration fees.** Each $10 increase in motor vehicle registration fees could yield almost $210 million annually in additional revenues.
- **Tolling.** Toll roads play a significant role in providing revenues to fund transportation solutions. While toll roads cannot be the state’s only approach to providing new roadways, they offer drivers alternative routes and more time-saving choices.

### 8.3 Performance Management

Performance measures and performance management are widely accepted by TxDOT and among the state’s transportation planning partners. Monitoring the performance of the transportation system – including the condition of physical assets and travel times on the network – is critical for transparency and accountability as required under MAP21. Senate Bill 1420 provides additional context and requirements for state-developed and reported performance measures.

While the concepts of performance management and performance measures are generally understood, deciding how to best allocate limited resources across various types of investments to provide acceptable transportation system performance poses a persistent and difficult challenge not only for TxDOT, but for most transportation agencies in the nation. In general, agencies struggle with technical challenges and data analytics, fear of a “black box” approach to project prioritization, and other institutional barriers and historic approaches to resource allocation. This is in addition to the larger agency challenge of the need to directly link planning and programming; in many if not most cases, projects selected for a transportation agency’s capital program are not directly tied to well-thought-out agency goals and priorities. As TxDOT continues to feel the pressures of transitioning to a performance-based planning approach, these linkages will be strengthened.
Work conducted for the National Cooperative Highway Research Program’s (NCHRP) 0891 Project, Cross Asset Resource Allocation and Impacts on System Performance provides a framework for institutionalizing performance-based planning and program development. The simple 5-step framework (Exhibit 8-9) provides the opportunity for TxDOT to link TTP goals and objectives with various modal plans, programs and project lists.

Blending planning principles with readily collected data and available predictive management tools, the framework integrates:

1. Goals and objectives developed for the TTP;
2. TTP performance measures;
3. Predictive models to forecast likely project impacts on system performance;
4. Decision science and utility theory to “score” projects on a level playing-field and optimize their selection for programming based on their anticipated benefits and the relative importance of those benefits to TxDOT; and
5. Tradeoff analysis to reinforce scenario planning and compare priorities given fiscal constraints.

By directing resources towards the most cost-beneficial investments, performance-based planning principles are reinforced in the framework. Critical to the framework is the use of performance modeling to predict project impacts with respect to a holistic set of performance metrics within investment types. This has been conducted in the TTP needs assessment and will be continued.

### 8.4 Transitioning to Performance-Based Planning

Performance-based planning and programming will help TxDOT transform its current project selection and investment strategies to link long-range TTP planning goals directly to performance-based programming decisions that inform mid-range financial plans (Cash Flow Forecast and Asset Management Plan), and programs like the UTP and STIP. TxDOT currently employs criteria-based project selection for highway projects included in its UTP, but the criteria will continue to be evaluated and strengthened during TTP implementation. More information on criteria and selection processes for other modes are documented in TxDOT’s modal-specific plans and programs.

A full performance-based planning and programming approach starts with the planning process and utilizes planning-level goals and objectives as the foundation of not only long-range plan development, but also project prioritization and selection. The TTP provides comprehensive goals and objectives, performance measures, and unconstrained needs as well as a high-level review of long-range revenues. In the short-term, these principles will be incorporated into project selection, where financially-constrained decision-making is directly influenced by needs analyses in the TTP.

As implementation of the TTP progresses, projects will be reviewed with respect to their performance impact on the system. Risk will also be considered, and will be holistically included in the implementation of the TTP by selecting risk mitigation projects, incorporating and simulating probabilistic performance models, and setting aside contingency funds based on risk tolerance.
Guided by the comprehensive performance goals outlined in the TTP, TxDOT is improving its current investment strategies and project selection process to link TTP goals to performance-based programming decisions that inform project selection. This performance-based project selection process and current evaluation criteria are illustrated in Exhibit 8-10. Through this process, projects selected and programmed through mid-range plans and programs such as UTP and STIP can be objectively evaluated and linked to potential performance outcomes.

TxDOT is working on developing systems to manage and maintain project information for use in project evaluation. Furthermore, the department will ensure project information is available and accessible to planning partners, like our metropolitan planning organizations, and to the general public. This involves the development of web-based applications, as shown in Exhibit 8-11, that outline the criteria for evaluating and prioritizing projects.

As a further step toward improving information requirements for performance programming, TxDOT is in the process of implementing its first electronic STIP – a tool that will enable a “real-time” financial evaluation and assessment of projects constructed or implemented against available revenues to improve resource allocation and streamline project delivery.
8.5 Texas Transportation Plan Implementation - Next Steps

To achieve performance goals, an understanding of how to invest and where to achieve long-range performance goals is also needed. TTP implementation requires that projects are analyzed and committed only when their impact on performance is thoroughly understood. Without this planning to programming linkage, it is unlikely that any capital program can meet Texas’ transportation priorities and goals. To complete the implementation of this TTP, TxDOT will:

- Advance asset management planning and predictive capabilities for all project types, both at the Division and District levels;
- Make strategic capacity enhancements to reduce bottlenecks and improve travel times in key passenger and freight corridors;
- Compare preventive treatments against system expansion projects in order to determine the best possible allocation of existing and new transportation funds;
- Build on the existing project selection criteria to develop a transparent performance-based project prioritization process that weights and ranks all UTP projects using both quantitative and qualitative criteria to meet short- and long-term performance goals and state transportation priorities. This will combine asset management priorities with major projects identified in the UTP;
- Continue to work with elected officials to identify and develop sustainable funding sources; and
- Continue its partnerships with multimodal transportation providers to develop and implement new technologies, demand management strategies, system operations and non-motorized transportation improvements to meet identified needs.