

**Sherman - Denison Metropolitan  
Planning Organization**

**TEXAS URBAN MOBILITY PLAN  
(TUMP)**

# Sherman - Denison MPO Transportation Policy Board

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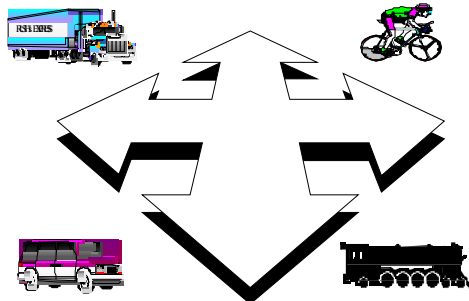
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## **What is the Sherman - Denison Metropolitan Planning Organization?**

The Sherman - Denison Metropolitan Planning Organization (MPO) is the regional transportation planning organization responsible for working with local, state and federal governments, the private sector, and the region's citizens to plan coordinated transportation systems designed to move people, goods and services affordably, efficiently and safely throughout the MPO area. The function of the MPO is to coordinate regional transportation planning between the State of Texas, portions of Grayson County, and the cities of Sherman, Denison, Howe, Pottsboro and Van Alstyne. The major goal of the MPO is to bring about regional planning under one voice while providing the greatest transportation benefit for all. Other goals include: supporting economic vitality, making transportation safer, providing greater access to mobility options, protecting the environment while promoting energy conservation, improving connectivity of the current transportation system, and preserving existing transportation infrastructure.

The MPO was established by the federal government to ensure that transportation decisions within the MPO area are performed in a continuing, comprehensive and cooperative process. The MPO is responsible for creating, developing and reviewing transportation plans, which include the long-range, 30-year Metropolitan Transportation Plan, the short-range, 3-year Transportation Improvement Program, the annual Unified Planning Work Program, travel models, thoroughfare plans, transit plans, and bicycle/pedestrian plans. All of these documents work together to identify transportation programs and funding alternatives.

The MPO provides a forum for local input into the expenditure of federal highway and transit dollars. Citizens and stakeholders can come together and share ideas and information with the decision making body that makes up the MPO known as the Transportation Policy Board (TPB). The TPB is comprised of representatives from the City of Sherman (city manager), the City of Denison (community development director), Grayson County (county commissioner), small cities representative (rotating schedule), and Texas Department of Transportation (district engineer).

President Bush signed into law the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, commonly called SAFETEA-LU, on August 10, 2005. SAFETEA-LU will provide funding for project construction, transit programs, and planning activities from 2005 to 2009. The Transportation Policy Board approves the use of federal transportation funds within the MPO area and operates under the SAFETEA-LU act.

The MPO is responsible for the promotion of safe and efficient transportation modes that maximize the mobility of people, goods and services while minimizing energy consumption, air and water pollution and negative environmental justice impacts. The MPO works with the state on funding issues for transportation improvements, on project planning issues, and with local governments to coordinate land-use and transportation planning. Planning areas include portions of the region that are currently urbanized and are likely to be urbanized within the next 25 years. The MPO continues to work with public

transportation providers and neighborhood groups, within the MPO boundaries, to ensure that our transportation system is at its best, now, and for future generations.

Prepared in cooperation with the Texas Department of Transportation, the Federal Highway Administration, and the Federal Transit Administration.

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*“The contents of this report reflect the views of the authors, which are responsible for the opinions, findings, and conclusions presented herein. The contents do not necessarily reflect the views or policies of the Federal Highway Administration, the Federal Transit System, or the Texas Department of Transportation.”*

## Table of Contents

<b>EXECUTIVE SUMMARY</b>	<b>1</b>
<b>INTRODUCTION</b>	<b>3</b>
Background	3
The Challenge of Traffic Congestion	3
Purpose and Key Elements of the TUMP	4
Goals of the Planning Process	4
Summary of Findings for the Sherman - Denison Region	5
<b>Texas Urban Mobility Plan Charge and Definition</b>	<b>6</b>
<b>Adopted Goals of the TUMP</b>	<b>7</b>
Relieve Congestion	7
Improve Safety	7
Improve Air Quality	7
Improving Quality of Life	7
Improved Opportunities for Enhanced Economic Development	8
Enhance Infrastructure Maintenance	8
Streamline Project Delivery	8
<b>Relationship to the Metropolitan Transportation Plan</b>	<b>9</b>
<b>Texas Congestion Index: Definition</b>	<b>9</b>
<b>Basic Process for Development</b>	<b>10</b>
<b>Non-Transportation Management Area (non-TMA)</b>	<b>11</b>
<b>Demographics</b>	<b>11</b>
<b>Travel Forecasting Process</b>	<b>12</b>
<b>Target Mobility Level</b>	<b>12</b>
<b>Findings / Analysis</b>	<b>14</b>
<b>Strategies to Reduce Congestion &amp; Improve Urban Mobility</b>	<b>14</b>
<b>Land-Use and Travel Demand Management</b>	<b>16</b>
<b>Transportation Systems Management</b>	<b>17</b>
<b>Transit</b>	<b>19</b>
<b>Freight Movement</b>	<b>20</b>
<b>Hazardous Material Truck Routes</b>	<b>20</b>
<b>Pedestrian and Bicycle Issues</b>	<b>20</b>
<b>Prioritized List of Projects</b>	<b>21</b>
<b>Needs Based Plan Cost Estimates</b>	<b>21</b>
<b>Mechanisms for Innovative Financing</b>	<b>22</b>
Funding the Partnership	23
Funding Strategies	23
<b>Goal Attainment – Conclusions</b>	<b>23</b>
<b>Appendix</b>	<b>31</b>

# EXECUTIVE SUMMARY

## Background

The Texas Urban Mobility Plan (TUMP ) is the result of the Texas Legislature's HB 3588 that passed in 2003. The TUMP addresses a statewide initiative to quantify long-range needs within the urbanized areas of the state and to develop a shorter range prioritized listing of projects aimed at improving mobility and air quality impacts as well as reducing traffic congestion. The Texas Urban Mobility Plan is a state-based initiative that requires each of the seventeen (17) urbanized areas of Texas to develop locally conceived, comprehensive regional mobility plans to improve traffic flow.

Historically, the urban areas across the state have experienced consistent growth trends without adequate funding needed to increase the capacity of the transportation system, resulting in loss of productivity, air quality implications, increased costs for services and goods, and a diminished quality of life. The Texas Transportation Commission has indicated that it is time to change the way Texas plans, funds and delivers transportation systems in urban areas. These individual plans will be implemented through a regional baseline allocation of Texas Department of Transportation's Urban Mobility Funds (Category 3) and locally generated "gap funding." "Gap funds" can be derived from any locally generated source, such as tolls or a local option user fee.

The Grayson County area has grown dramatically since the 1980s and demographic projections indicate that it is on track to reach over 175,000 residents by 2030. The dramatic growth of the region will have significant accessibility, mobility, and economic implications. The current travel trends include an increase in automobile ownership, drive alone travel, and suburbanization, which results in an increase in the number and length of trips. If these trends continue,

more travel will be a result, as well as increased traffic congestion and negative air quality impacts. We will have to accommodate the trips of the 175,000 residents on an already heavily-burdened transportation network unless the region starts to strategize about sustainable ways to absorb and deter the increased travel demand. Towards this end, the Texas Urban Mobility Plan contains programs, projects, policies, and partnerships aimed at balancing transportation and land use decisions in a way that provides for growth while minimizing transportation-related externalities. In short, the TUMP seeks to quantify additional needs beyond Sherman Denison MPO's (SDMPO) financially constrained 2030 Metropolitan Transportation Plan (MTP).

The goals of the TUMP, as established in statutory language of HB 3588, are to:

- ❑ Relieve congestion;
- ❑ Improve safety;
- ❑ Improve quality of life;
- ❑ Improve air quality; and
- ❑ Improve opportunities for economic development.

## Conclusions

The TUMP is:

- A recognition that congestion in the smaller metropolitan areas is a major barrier to the economic development of Texas, and a detriment to the quality of life for its people.
- An innovative approach to address the severe limitations in funding that prevents the smaller metropolitan areas from implementing the necessary transportation actions to reduce congestion.
- A successful integration of the 17 smaller, non-TMA, metro areas into

a team that is working together, with TxDOT, in facing mobility and funding challenges.

- A major first step in the development of innovative analytical tools and procedures

The TUMP is *not*:

- Ready to become a vehicle for making policy or funding decisions statewide in its current developmental phase, given that there has to be much progress towards improving the technical analysis procedures and the data that is used, and towards stan-

standardizing the key assumptions for analysis among the metropolitan areas.

- An affirmation from the Sherman - Denison region to the strategy that the Texas Transportation Commission (TTC) is currently proposing for the statewide implementation of the Texas Mobility Fund.

# INTRODUCTION

## Background

Early in 2003, Governor Rick Perry instructed the Texas Transportation Commission (TTC) and the Texas Department of Transportation (TxDOT) to develop a scope of work for a statewide plan under the premise that current funding levels and mechanisms are not sufficient to address congestion in the large urban areas. This scope called for the development of analytical tools and procedures to measure traffic congestion in each region, to quantify the dollar amounts that are required to reduce congestion to a tolerable level, and to determine a set of potential strategies to address the current funding shortage. In the summer of 2003, TxDOT met with all eight Transportation Management Area (TMA) Metropolitan Planning Organization's (MPO's) responsible for the major metropolitan areas within the state. At that meeting, TxDOT discussed the processes for the Texas Metropolitan Mobility Plan (TMMP). It was agreed that each metropolitan area was to develop a regional plan that would address its own "needs-based" local issues. When aggregated, the eight plans would constitute the backbone of the TMMP. The Texas Metropolitan Mobility Plan (TMMP) is the result of the Texas Legislature's HB 3588 that passed in 2003.

Late in 2005, the Texas Transportation Commission (TTC) instructed TxDOT to meet with all seventeen Non-TMA MPO's to begin developing their own "needs-based" plan, a plan based on the TMMP's produced by the eight major metropolitan areas within the state. The

name of this new plan is the Texas Urban Mobility Plan.

The Texas Urban Mobility Plan (TUMP) is a state-based initiative designed to address growing traffic congestion in the seventeen (17) major metropolitan areas in the State of Texas. Through a coordinated effort between the Texas Department of Transportation (TxDOT), the MPO's representing the seventeen Non-Traffic Management Areas (Non-TMA's), and the Texas Transportation Institute (TTI), TUMP will endeavor to develop locally conceived, comprehensive regional mobility plans to improve traffic flow, alleviate traffic congestion, improve quality of life and provide opportunities for enhanced economic development within the seventeen Texas metropolitan areas of less than 200,000 in population including Sherman - Denison.

## The Challenge of Traffic Congestion

Although the smaller metropolitan areas usually have much less congestion, they still share the same problems as their larger counterparts. Congestion in the larger metropolitan areas has typically been a result of the following combination of circumstances:

- Population growth in the urban areas has steadily increased.
- Urban patterns have promoted more travel within the region for each person (an increase in per capita Vehicle Miles Traveled or VMT). U.S. Census Bureau data show a generalized trend of population migrating

from the central areas to the fringes (suburbs).

- The capacity of the transportation network has not increased at the same rate as either VMT or population, mainly because of funding limitations.
- Mobility challenges were not addressed for many years using a multi-modal approach. Congestion will not be resolved just by building more roads.
- The traditional funding sources for transportation projects have been a federal and a state gasoline tax. Both have not increased in more than a decade, thus falling behind with the demand for more transportation projects.

#### Purpose and Key Elements of the Texas Urban Mobility Plan

The scope of work for the TUMP called for the development of the following elements for each of the regional plans:

- **“Needs-Based” Scenario.** Under this scenario, the costs of implementing the necessary actions in the region to reduce congestion to a “tolerable” level were estimated. The difference between this dollar amount and the amounts that are available through the current traditional funding sources is referred to as the funding “gap”. Traditional sources and amounts are those identified in the federally-mandated Metropolitan Transportation Plan for each region.
- **Texas Congestion Index (TCI).** The TCI is an innovative tool to measure regional congestion levels under dif-

ferent scenarios. The index shows how much longer it takes to make a trip under congested peak-period conditions compared to conditions where there is no traffic (free-flow).

- **Short-Term Mobility Strategies and Improvements.** The TUMP will identify strategies that address congestion and mobility concerns in the short term. Many of these strategies have identified funding through Category 3 funds. This is a current funding category that TxDOT uses to implement projects on the interstate and state highway system to enhance mobility in urban areas. The TTC is, for the first time, allowing and encouraging local participation in the programming of these projects into TxDOT’s 10-year Unified Transportation Program (UTP). This will allow new projects with alternative funding, such as tolled facilities, to be integrated into the implementation schedule.

- **Alternative Funding Initiatives.** Having recognized that there is a funding gap, and having quantified its approximate magnitude, the challenge to find and select additional funding sources and mechanisms is left to each of the regions.

#### Goals of the Planning Process

The planning process for creating the Texas Urban Mobility Plan was developed through a coordinated effort between the Texas Department of Transportation (TxDOT) and the MPO’s representing the seventeen Non-Transportation Management Areas, and the Texas Transportation Institute.

Based on the guidance issued by TxDOT and its commission, the specific elements of the Texas Urban Mobility Plan were identified. Detailed processes were then developed so that each MPO would be able to follow the exact same procedure thus providing a consistent level of analysis across the state. The Texas Urban Mobility Plan includes the following eight planning goals which serve as a guide for this Plan: (1) Relieve Congestion; (2) Improve Safety; (3) Improve Air Quality; (4) Improve Quality of Life; (5) Improve Opportunities for Enhanced Economic Development; (6) Enhance Infrastructure Maintenance; (7) Streamline Project Delivery; and (8) Texas Department of Transportation Strategic Goals.

Summary of Findings for the Sherman - Denison Region

**Total Cost of Needs**

The following table summarizes the costs that have been determined for the Needs-Based Plan. The costs of adding the capacity to achieve a tolerable degree of congestion (eliminate level-of-

Needs-Based Plan* (2006 dollars - \$million)	
Eliminate level-of-service F	\$ 144
Right-of-Way Acquisitions	\$ 32
Reconstruction of Existing System	\$ 392
Regional Connectivity	\$ 38
Bridge Rehab & Reconstruction	\$ 18
MTP 2030	\$ 126
Transit	\$ tbd
<b>Total</b>	<b>750.0</b>

*\*reference appendix for 'Needs Report' breakdown*

service F in the peak periods) were estimated, along with the costs associated with right-of-way acquisitions, reconstruction of the existing network, regional connectivity as well as bridge rehab and reconstruction. In addition to

these, the TUMP plan contemplates other investments that are important to the region, such as transit and the preservation of the existing system.

**System Performance**

Optimum congestion is a term associated with the Texas Congestion Index. Sherman Denison MPO has identified an optimum congestion target TCI of 1.04. While 1.04 does not eliminate all congestion, it does reduce it to a more acceptable level of 4% longer than a free-flow speed trip.

The table below demonstrates the TCI scenarios for the Sherman Denison MPO area. If nothing were done to add capacity to the current transportation network in the Sherman Denison MPO area, the nobuild scenario, the travel time would increase by 11 percent because of the increase in demographics by 2030. If added capacity projects in the 2030 Metropolitan Transportation

Total Travel Time (Pers-Hrs)				
	Arterial	Freeway	Total	TCI
1994 Base	2,691	5,375	8,065	1.02
	33%	67%		
2030 No Build				1.11
	5,342	11,164	16,507	
	32%	68%		
2030 MTP				1.10
	4,802	11,688	16,491	
	29%	71%		
2030 Needs				1.04
	5,984	10,242	16,226	
	37%	63%		

Plan were constructed then the travel time would increase by 10 percent by the year 2030. In order to get to the TCI of 1.04 one hundred fifty eight (158) additional miles of capacity to those al-

ready identified in the 2030 MTP would be needed.

### ***Regional Mobility Issues***

The Sherman - Denison MPO, in coordination with the Paris District of TxDOT, prioritized projects within the MPO boundary. The list of projects was approved by the Transportation Policy Board on February 1, 2006. Some of the priority projects on that list are:

- US 75 project from Dulin Street to Travis Street – 4 lane to 6 lane
  - US 82 project from 1417 East to Bethany Road – 2 lane to 4 lane
  - FM 121 Project from Jim Jones to FM 3356- 2 lane to 5 lane
  - US 75 project from 1417 To Dulin Street- 4 lane to 6 lane
  - FM 1417 project from SH 11 to SH 56- New location
- 
- All final decisions regarding funding mechanisms in the region will be made by the Sherman - Denison MPO's Transportation Policy Board.

### **Texas Urban Mobility Plan Charge and Definition**

The Texas Urban Mobility Plan (TUMP) supports balanced transportation and land-use decisions that accommodate growth while minimizing any negative transportation, air quality, and community impacts. The TUMP balances the goals of the region through a diversified

approach of short and long range modal strategies. It is a state-based initiative that will result in each of the urban areas developing locally conceived, comprehensive regional mobility plans to improve traffic flow by using all modes of transportation.

Historically, all of the metropolitan areas across the state have experienced consistent growth trends without adequate funding to increase the capacity of the transportation system. This has affected productivity, air quality, cost of goods and services, and the quality of life for all Texans. The Texas Transportation Commission has indicated that it is time to change the way Texas plans, funds, and delivers transportation systems in urban areas. It is imperative that regional solutions are developed at the local level: governments, partnerships, agencies, and elected officials. It is also important that these solutions are integrated into an overall plan that assures efficient implementation.

From a larger statewide perspective, the intrastate movement of people and goods is being addressed through the adoption of the Trans Texas Corridor System. This is a statewide initiative focused on improving safety, reducing regional congestion, diverting long-haul freight and hazardous materials from entering population centers, creating a comprehensive rail system, providing underdeveloped areas of the state access to competitive utility services, and improving air quality throughout the state. A similar approach is needed to solve the same needs within the state's urban areas.

The TUMP presents a framework in each of the seventeen non-

Transportation Management Areas (TMA's) in the state to provide for the remaining intra-city needs. It is based on the concepts of planning, funding, and streamlined project delivery.

### Adopted Goals of the TUMP

#### Relieve Congestion

One of the underlying goals of this planning and programming exercise is to identify long-range needs in each urban area to help solve transportation problems, with an ultimate goal being an increase in mobility and a decrease in the level of traffic congestion. To help in quantifying this goal and measuring progress over time, TxDOT will adopt a Texas Congestion Index (TCI) to aid urban areas in setting goals for congestion reduction, and it will be based on the delay time experienced by drivers. As an example, a TCI index of 1.15 would indicate that a peak-period trip would take no more than 15% longer than a non-peak period trip on average. Additional measures assist in measuring congestion effects.

#### Improve Safety

Another major goal of the Texas Urban Mobility Plan (TUMP) is to include safety considerations into the plan development process and to look for ways to provide a more safe and reliable transportation system. Each Regional Mobility Plan (RMP) will address specific goals which could include the following:

- Separation of truck and personal-vehicle traffic on high-speed metropolitan corridors;

- Reduction of fatal or injurious crashes, including at-grade railroad crossings;
- Improved safety in metropolitan areas with transit systems; and
- Reduction in vehicle/bicycle and vehicle/pedestrian fatalities and injuries.

#### Improve Air Quality

Air quality has steadily become a major concern for most of the larger metropolitan areas across the state. Through established procedures and future refinements, each of the metropolitan areas will assess the RMP for impact on air quality. It is a stated goal of the TMMP that air quality improvements, in conformance with established guidelines, will be a result of each RMP. If any of the MPO area is classified as non-attainment in the future, this Plan will be revised to include projects that will reduce vehicle emissions. Procedures for developing a conformity analysis will also be completed to determine if the projects in the Plan will succeed in reducing vehicle emissions. These procedures will then be evaluated periodically to determine the effectiveness in reducing those emissions.

#### Improving Quality of Life

Beyond reducing congestion and improving air quality, each RMP will address the quality of life impacts of proposed projects and approaches. Regarding quality of life considerations, it is recognized that, while transportation investment directly impacts such things as urban mobility, air quality and economic development, there are less direct, but equally important impacts of transportation systems and services which ad-

dress quality of life effect on proposed projects and approaches. The issues and goals identified below direct planning efforts to consider urban form and transportation's impact upon the economy and the environment, but also the provision of transportation services and infrastructure to those traditionally underserved.

- Promote the orderly economic development of the region
- Encourage balanced land-use and transportation plans and programs which maximize the use of transportation investments
- Provide transportation opportunities to the traditionally underserved
- Encourage the preservation and revitalization of communities and neighborhoods and address policies to guide in-fill and new development with the Community
- Support recreation and tourism
- Encourage transportation investments that promote healthy and active lifestyles
- Avoid, mitigate and enhance the environmental impacts of transportation improvements
- Reduce energy consumption
- Address the transportation of hazardous materials within and through the region
- Strive to provide access to various modes of transportation
- Consider the effects of noise and aesthetic assessments

### **Improved Opportunities for Enhanced Economic Development**

The way transportation is planned, programmed and constructed in this region must be responsive to regional trends in economic expansion, population growth,

development, public health, and the environment in order to provide mobility and improve air quality. Promoting improved opportunities for enhanced economic development is a specific goal of this plan because of the direct link between land use, transportation, and air quality.

### **Enhance Infrastructure Maintenance**

A key component which must be considered during the development of the TUMP is not only what the future needs are for each region, but also what magnitude the infrastructure will have upon maintenance over time. This must include not only the existing transportation system, but also future facilities. Once these future facilities are constructed, a dedicated source of funding must be available to support its maintenance. Without that support, degradation of service is possible.

### **Streamline Project Delivery**

A final key concept to consider is a method to provide for a more streamlined process for delivery of these projects. Public/private partnerships and more efficient cash-flow management techniques are two possibilities to consider which could provide more timely delivery of improvements. Other innovative tools for project delivery could include the following:

- Improved environmental review to reduce project development and approval timelines;
- Unrestricted use of the authority in comprehensive development agreements;

- Institute the concept of “pass through tolling” for the TxDOT portion of metropolitan projects;
- Institute the policies for allowing metropolitan areas to receive fund credits for their expenditures to construct off-state system projects; and
- Streamline state and federal oversight roles for small off-state system projects.

### Relationship to the Metropolitan Transportation Plan

Metropolitan Planning Organizations across the state have been preparing long-range Metropolitan Transportation Plans (MTP) in order to address and meet state and federal planning requirements. This needs-based TUMP is a new statewide requirement focused specifically on areas that utilize the MPO process. There are many similarities between the two planning documents and both are goal-oriented toward reducing congestion and improving mobility, safety and air quality.

The MTP is a comprehensive, multimodal blueprint for transportation systems and services aimed at meeting the mobility needs of the Sherman - Denison Metropolitan area, and it serves as a statement of regional plans to invest in the transportation system over the 25 year period of this document. The 2005-2030 MTP includes both long and short term policies, strategies, and projects that lead to the development of an integrated inter-modal transportation system that facilitates the efficient movement of people and goods.

The MTP is required to be financially constrained and balanced to anticipate revenue streams over time. One of its

most important aspects is the identification and analysis of the financial resources available to implement its recommendations. Because of the “financially constrained” requirement, the MTP does not address or quantify unmet funding needs. It also does not look beyond what can be achieved with the amount of available funding, which results in a realistic, yet constrained picture.

The TUMP is a state-based requirement intended to serve as a framework for identifying unmet transportation needs in the state’s urban areas. The TUMP requires the state’s Transportation Management Areas (TMA’s) and non-TMA’s to develop a comprehensive, locally developed, visionary, realistic and financially unconstrained plan to reduce congestion while improving mobility and air quality. While the MTP serves a financially constrained plan identifying only projects that can be constructed or funded (given anticipated funding streams), the TUMP goes one step further and becomes a needs-based plan which quantifies transportation needs beyond the fiscal constraint barrier. Instead of taking a conservative approach and focusing only on what funding can be anticipated, the TUMP focuses on the magnitude of unmet needs and provides decision makers with a better understanding of the total transportation needs of each region.

### Texas Congestion Index: Definition

In order to begin identifying the magnitude of unmet needs throughout the state, an innovative planning tool was created to serve as a single performance measure for calculating levels of

congestion. This tool is called the Texas Congestion Index (TCI). This index will use current data and models that have been produced for other purposes to generate congestion-index statistics. This index will measure the mobility of people and goods in each Texas urban area, with attention to the delay time experienced by drivers. For example, a possible target congestion index of 1.15 means that a peak-period trip would take no more than 15% longer than off-peak travel.

Because a single index can obscure some elements or characteristics, the TCI process creates several measures aimed at assessing various elements of urban transportation services. The index will help evaluate the programs and strategies that should be pursued to accomplish mobility objectives. It is designed to complement existing tools, procedures, measures and practices to improve congestion relief analyses.

Key elements of the index include the following:

- Speed, travel rate (e.g. minutes per mile), or travel time
- Person-miles moved (to value passenger-carrying systems)
- Ton-miles moved (to value freight-carrying systems)
- Dollar value (to link the various components of congestion and mobility)
- Target speeds (to identify the beginning of undesirable congestion levels)
- Travel delay (the difference between desirable speeds or travel times) and the current or projected condition
- A method to include the full range of transportation improvements, land

use, and other programs designed to yield transportation benefits

- Variation in speed or reliability of travel time
- Bicycles and pedestrians included

Optimum congestion is a term that seems very appropriate for use with the TCI. The working definition of optimum congestion is “the target speed of person density for a portion of transportation system that identifies the difference between slow or crowded traffic that is slightly inconvenient versus a congested situation that should be remedied.” The “optimum congestion” term would allow agencies to grade the system according to local targets that could be based on local values.

### Basic Process for Development

The planning process that drives the Texas Urban Mobility Plan (TUMP) was developed through a joint coordinated effort between TxDOT; the MPO’s representing the urbanized Transportation Management Areas (TMA), non-TMA, and the Texas Transportation Institute. Based on the guidance issued by TxDOT and its commission, the specific elements of the TUMP were identified and detailed processes were developed so that each MPO would be able to follow the exact same process, thus providing a consistent level of analysis across the state. From a technical standpoint, detailed travel demand models were used to help identify and solve for the various levels of congestion and were used as direct input into the calculation of the TCI values.

## Non-Transportation Management Area (non-TMA)

Each of the eight TMA's and seventeen non-TMA's across the state have specific planning area boundaries related to their MPO functions. The Sherman - Denison Metropolitan Planning Boundary includes the city limits of Sherman, Denison, Howe, Pottsboro and Van Alstyne. The Metropolitan Area Boundary encompasses more than 320 square miles. The Sherman - Denison MPO Transportation Policy Board approved the Metropolitan Area and received approval from the Governor of the State of Texas in 1999.

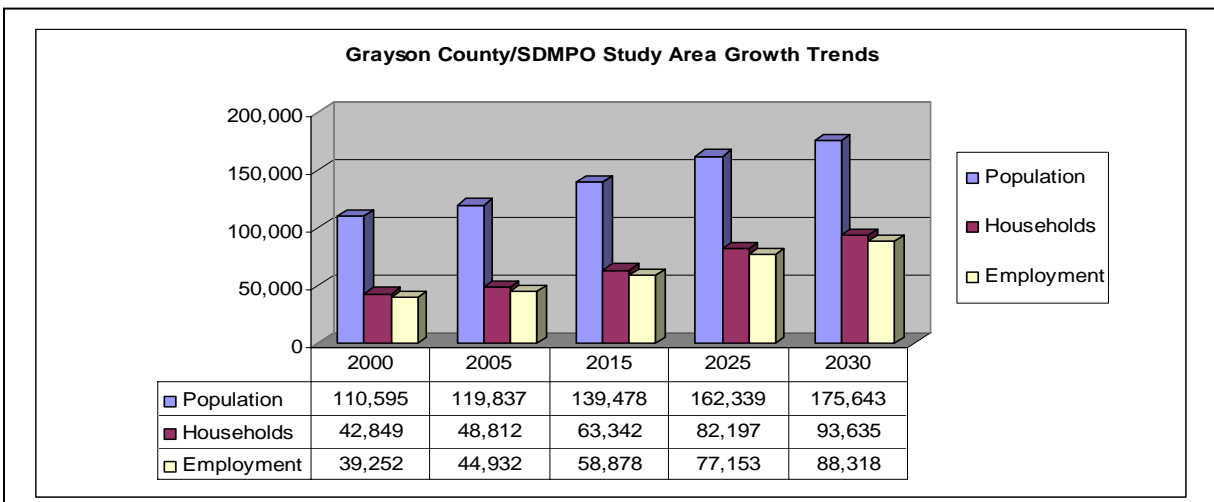
## Demographics

Sound base year data is essential to establishing a firm foundation for transportation planning. Demographic data is used to project land-use patterns and transportation needs. This makes it possible to prepare travel forecasts and demands on the transportation system. The base year for this analysis is 1994.

Demographic data includes population, households, income, and employment. Data is provided for the base year (1994) and the projected year (2030). Sources for determining the existing characteristics include: Census Bureau Reports, the Texas State Data Center and the Texas Employment Commission.

Projections are based upon historic trends modified by local knowledge. The five-year cycle provides for adequate revisions as the trends change. The Sherman Denison MPO relies only on population for its projections rather than high, medium or low estimates. It is felt the range between the high and the low projections is too great for useful application.

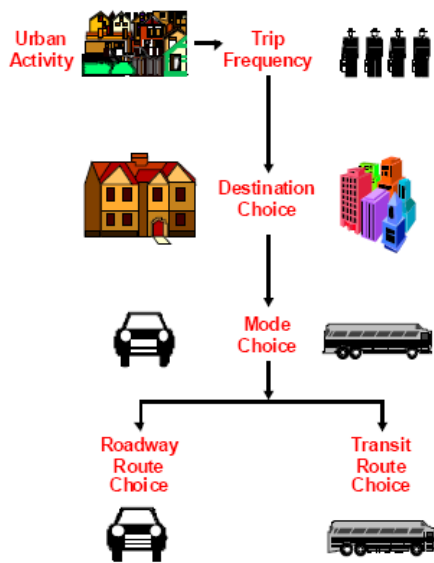
Growth in population and employment is a primary reason for increased congestion in the Sherman - Denison urban area. According to the 2000 Census, the population in the Sherman - Denison MPO/ Grayson County area is projected to increase from 110,595 in 2000 to 175,643 in 2030. This correlates into a 47% increase in population for Sherman - Denison MPO/ Grayson County area.



## Travel Forecasting Process

The forecasting technique of the Sherman – Denison MPO Travel Model is based on a four-step sequential process, as shown here, designed to model travel behavior and predict the level of

### TRAVEL DEMAND FORECASTING PROCESS

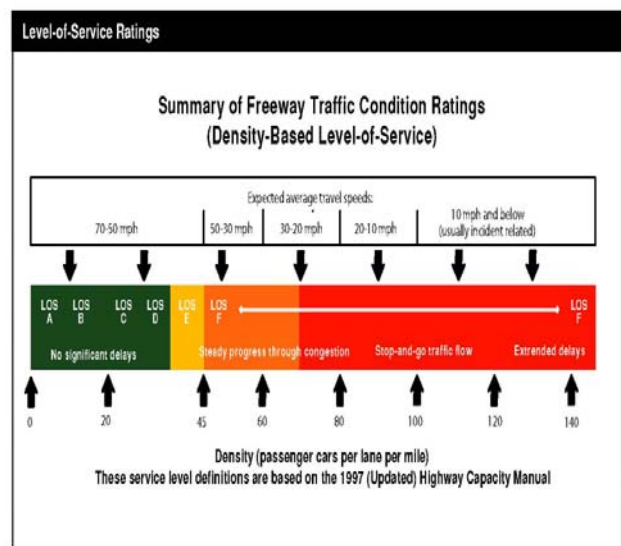


travel demand at the regional, sub-area, or small area levels. The travel modeling process begins with estimating trip frequency, or **trip generation**, which converts population and employment data to a total number of weekday person trips produced by and attracted to each zone. A regional zone system was developed to represent aggregations of population and employment activity and travel within the region. In the second step of the process, the **trip distribution** model uses roadway zone-to-zone travel time information to distribute the trip productions and attractions from trip generation to and from each zone to estimate the weekday travel patterns be-

tween each zone. **Mode Choice** differentiates the modes to be used by residents and employees. The final model step consists of **traffic assignments**. The roadway (traffic) assignments take origin-destination vehicle trips and load them onto the roadway network. The vehicle trips are loaded onto the roadway network based on an incremental capacity-constrained procedure in which the travel speed on the roadway is decreased according to a volume-delay relationship. The results of the travel model are input directly into the Texas Congestion Index model to calculate a corresponding TCI value.

## Target Mobility Level

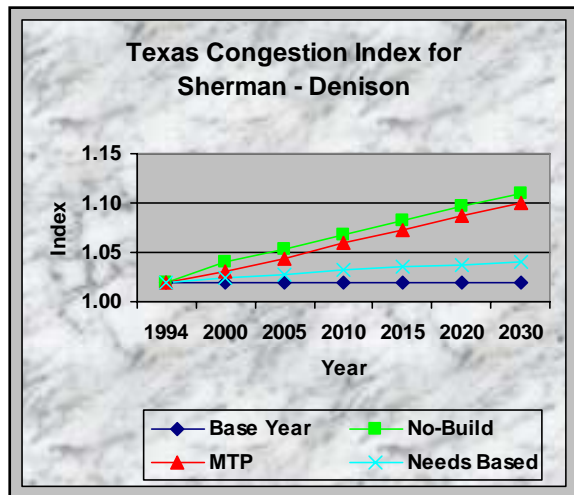
The Texas Congestion Index (TCI) is a variation of the Travel Time Index developed by the Texas Transportation Institute for the Annual Urban Mobility Report. This index compares the travel time in the peak period to the travel time that would be required for the same travel at free-flow (i.e., off-peak) speeds. This formula identifies the travel time



penalty for peak-period congestion. The

value is a ratio with a practical minimum value of 1.0, which indicates that travel time is the same as it would be at free-flow conditions. A value of 1.3, for example, would indicate that a peak-period trip requires 30 percent more time than the same trip at free-flow speeds. In essence, a 20 minute off-peak trip would require 26 minutes in the peak period (20 minutes off-peak multiplied by 30% = 26 minutes peak-period). The graph below shows the relationship between average travel speeds and levels of congestion, indicated by the colored shading. Level-of-service “F” conditions begin when freeway speeds enter a range between 50 to 30 miles per hour.

**Texas Congestion Index.** The results for the TCI analysis for Sherman - Denison are summarized in the following chart. This chart plots three scenarios in the 2030 forecast year that show traffic congestion conditions under different amounts of transportation actions implemented, starting in base year 1994.



The *No-Build Scenario* (1.11 index) refers to having population grow according to accepted forecasts, but with no transportation projects implemented in this period. The *MTP Scenario* (1.10 index) shows the effect of implementing the

financially-constrained actions contemplated under current funding sources and levels. Although it reduces the congestion from the No-Build Scenario, it shows that congestion will get worse. The *Needs-Based Scenario* (1.04 index) illustrates how congestion would be reduced significantly if all of the actions in this plan were implemented.

In the Sherman - Denison region, our baseline value for congestion is 1.02 for year 1994. This number indicates, in that year, traffic congestion for our area was 2% above the practical minimum value of 1.00, which would be the travel time at free-flow conditions. The value 1.02 indicates that a peak-period trip would require 2% more time to complete than the same trip at free-flow speeds. For example, a 30 minute off-peak trip at 12 midnight would require 31 minutes during the peak-period of an 8:00 a.m. morning commute to work (30 minutes off-peak multiplied by 2% = 31 minutes peak-period). Based on the recommendations in the \$208 million MTP, the TCI value in 2030 is expected to be 1.10. This reflects a worsening of congestion (33 minute peak-period trip) even after the financially-constrained MTP has been fully implemented, which indicates the need for additional funding to alleviate a greater level of congestion over time. The No-Build condition shows what our region’s TCI value of 1.11 (33.3 minute peak-period trip) would be if none of the improvements in the MTP were implemented, representing an unacceptable level of congestion and delay time. This translates into slower and more frequent traffic bottlenecks, due to growth over time, if additional transportation improvements are not made.

The Texas Urban Mobility Plan is the tool to identify the needs which exist above and beyond those identified in the regions MTP. By implementing Needs-Based transportation improvements throughout our area, we will be able to maintain a TCI value, and possibly lower, of 1.04. This is the target level of improvement for the Sherman - Denison region. Additionally, the Sherman - Denison region should experience Level-of-Service "E" conditions and avoid Level-of-Service "F" conditions, altogether, for a very long time.

## Findings

### Lane Miles

The results of this integrated coordinated TUMP process is reflected in the table on page 33. The financially constrained Metropolitan Transportation Plan includes **514** total lane miles of roadway improvements for the Sherman - Denison MPO region. After running the travel demand model and having it identify all level of service "F" facilities, and then allowing the model to add capacity in increments of whole number lanes until that level of congestion is eliminated, the resulting additional lane miles needed under this needs-based plan are **158**.

### TCI

Optimum congestion is a term associated with the Texas Congestion Index. Sherman Denison MPO has identified an optimum congestion target TCI of 1.04. While 1.04 does not eliminate all congestion, it does reduce it to a more acceptable level of 4% longer than a free-flow speed trip.

### System Performance

If nothing were done to add capacity to the current transportation network in the Sherman - Denison area, the nobuild scenario, the travel time would increase by 11 percent because of the increase in demographics by 2030. If added capacity projects in the 2030 Metropolitan Transportation Plan were constructed then the travel time would increase by 10 percent by the year 2030. In order to get to the TCI of 1.04 one hundred fifty-eight (158) additional miles of capacity to those already identified in the 2030 MTP would be needed.

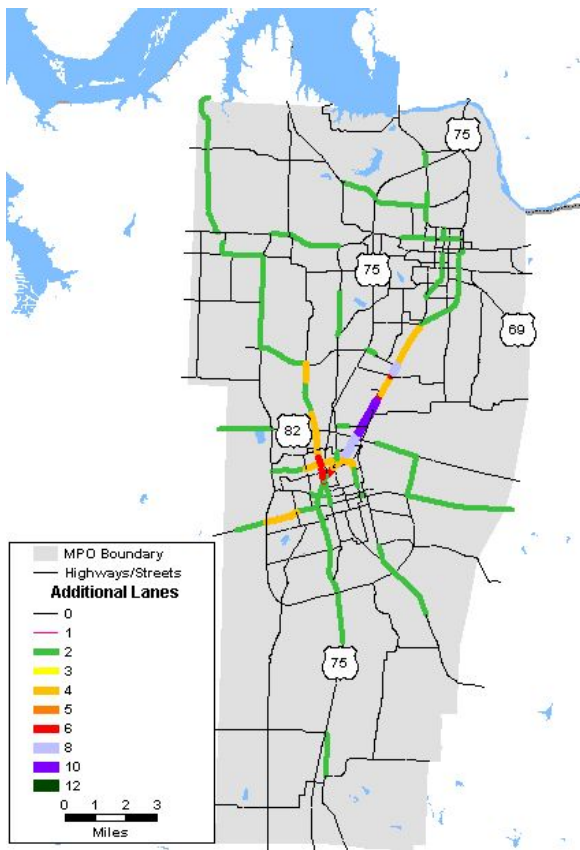
### Needs

The process used to identify this additional need is based on an all-or-nothing travel demand model run, which has a tendency to make the freeway facilities overly attractive due to faster speeds and adds the majority of trips to these faster facilities. It is anticipated that congestion will ultimately be alleviated through a mixture of modes. This analysis provides a good representation of overall need, but does not clearly identify where that need will be accommodated.

## Strategies to Reduce Congestion & Improve Urban Mobility

One of the main purposes of developing a Texas Urban Mobility Plan (TUMP) is to identify the magnitude of long-range needs in each Non-Transportation Management Areas (non-TMA) and to quantify the amount of funding needed to achieve a targeted level of congestion. As mentioned in the previous section, the target level for each non-TMA is to

reduce congestion so that all level-of-service “F” facilities are eliminated, thus providing greater mobility, improved air quality, and a more reliable transportation system. The analysis used to identify the additional **158** lane miles should be interpreted as an overall need which should be reached through a combination of freeway, toll roads, managed lanes, arterial street improvements, transit, freight, and operational system improvements.



The Sherman - Denison region is pursuing a wide range of improvements to the transportation network, and will look for a variety of ways to secure the funding necessary to promote these interests even further. Out of the **158** additional lane miles needed, it is not known exactly how many of these will be accommodated through other modes, but it is the region’s intention to pursue a truly

multimodal network of transportation alternatives. The map identifies, in general terms, the overall corridor needs in the next 30 years, including adding capacity, rehabilitation, and safety considerations.

The map above depicts the lane mile equivalents needed by specific facility in order to accomplish the goals of the TUMP. Again, it is important to note that these are lane mile equivalents, and not actual lanes needed on each facility. In other words, even though the graphic shows that some areas of FM 131 need up to 6 additional lanes, the right-of-way or construction costs may make this expansion unattainable. Therefore, other congestion reduction strategies such as transit, vanpool, or improvements to adjacent facilities would need to be implemented in order to improve mobility in that area. This graph should not be interpreted as a future road expansion tool, but rather an unconstrained need of transportation options and solutions needed by facility in the Sherman Denison MPO study area.

In the Sherman - Denison region, there is an unmet need which the TUMP process will attempt to address. Since the solution to this growing problem will need to be addressed through a variety of techniques involving numerous modes, it is important to identify the anticipated future transportation system that will serve as the starting place. Through the already required process of developing a financially-constrained Metropolitan Transportation Plan, the initial groundwork for this effort has already been accomplished. The paragraphs below discuss each of the specific modes or operational categories already being planned in this area and

provide some idea of the magnitude of the future transportation system which has already been identified, adopted, and embraced.

Significant components of the Sherman - Denison Transportation System are the US 75 & US 82 corridors and its principal and minor arterial system. There is still considerable demand for improved and expanded capacity on the roadway system which will warrant continued network improvement and expansion. Inherent to the region's transportation network are high-cost improvements and maintenance. While there may be little operational costs once constructed, building, maintaining, and expanding freeway capacity is very expensive. Over the last few years, the concept of user-fee based roadways has been growing in popularity and acceptance, and recently, TxDOT adopted a policy that any controlled-access mobility projects, new location facilities, and increased capacity must be evaluated for tolling purposes.

The areas arterial street strategy includes improving operations of the existing and future arterial street system by adding capacity, improving traffic flow, reducing demand by providing adequate paratransit services, bicycle/pedestrian facilities, and improving arterial connections within the study area. The cities of Sherman and Denison have thoroughfare plans with associated requirements.

Working with local and regional partners, as well as citizen input, keeps the plan updated and current. A recent mobility project, funded entirely by a developer, on an access road in Sherman between US 75 and Loy Lake road will

greatly improve traffic flow via a 'ramp reversal'.

### Land-Use and Travel Demand Management

Land-use and transportation are intricately linked. Managing land-use can help to manage the travel demand that leads to congestion. Certain land-use patterns tend to encourage a shift of trips to modes other than single-occupancy vehicle and can reduce overall trip lengths. Transportation investments can influence how land is developed. The Sherman - Denison MPO, its member cities, Grayson County, and other regional transportation partners should work together to develop programs that will help manage congestion and improve local quality-of-life. Strategies that could be implemented include the following:

- Work with local and regional partners to identify and designate regional pedestrian districts and to develop performance measures and strategies for implementing these districts, including allocation of additional resources towards infrastructure.
- Spend STIP/Metropolitan Mobility enhancements and other available funding on transportation infrastructure that supports development projects that help reduce vehicle miles traveled.
- Focus transportation infrastructure to support areas identified as growth areas by local/regional plans, and work collaboratively to support transit-oriented development.
- Identify and publicize land-use strategies that local government can implement to reduce travel demand, improve efficiency of the transporta-

tion system, and improve the relationship between land-use and transportation.

Travel Demand Management (TDM) refers to a strategy of limiting demand for the use of the existing transportation system. TDM strategies are designed to increase the efficiency of a transportation system without increasing its capacity, in particular roadway capacity. TDM strategies can be used to implement the goals of the TUMP and reduce regional congestion without increasing roadway capacities.

### **Transportation Systems Management**

The Transportation System Management (TSM) approach to congestion mitigation attempts to identify improvements to the traffic control infrastructure. These techniques are designed to improve traffic flow and safety through better management and operation of this infrastructure. Compared to major roadway improvements to address capacity issues, TSM related projects are usually lower in cost and can be developed and implemented in less time. Some examples of traditional TSM improvements include traffic signal enhancements, removal of freeway and arterial bottlenecks, and intelligent transportation system (ITS) deployment.

Improved traffic flow and reduction of delay can have positive air quality, public relations, and fuel consumption benefits. Improvements at intersections and in signal timing, which reduce delays at those locations, also reduce vehicle emissions. Reducing traffic congestion caused by incidents on the freeways through better traffic management also

reduces the amount of pollutants by reducing the number of idling vehicles. A new 'Fleet Anti-Idling Policy' by the city of Sherman not only saves fuel but reduces pollutants at the same time.

Along with addressing mobility and air quality goals, elements of TSM address community and quality-of-life goals by supporting sustainable development practices. Access management is one element of sustainable development that is impacted by TSM strategies, such as intersection improvements. Furthermore, bicycle and walking trips can be encouraged by a more safe intersection design and traffic signals that accommodate a timing cycle for bicycle and pedestrian movements.

### **Intelligent Transportation Systems**

Intelligent Transportation Systems are intended to enhance the safety and efficiency of transportation through the application of traffic, transportation and emergency management technology. They help to reduce driver frustration associated with recurring and non-recurring congestion through innovative technologies. ITS usually includes traffic signal control, incident management, railroad grade crossings, freeway management, emergency management services, transit management and regional multimodal traveler information. The use of traffic cameras at major intersections and dynamic message boards located on major highways can warn motorists of possible congestion ahead of time and provide alternate routes. These camera's could be made available to the local media for access so that traffic updates could be provided via TV, Radio and internet. TxDOT will be installing

cameras at US 75/US 82 in the near future.

### **Arterial System**

The Sherman Denison Arterial System is included in this process in recognition of its role in complementing and enhancing the area's freeway system. This system, composed primarily of principal and major arterial streets, provides the necessary transportation support and access to and from local land uses. By 2030, this system of arterials is forecast to carry approximately 28 percent, of all vehicular traffic in the region. Since large portions of the US 75 corridor in the region is constrained from acquiring additional right-of-way, much of the additional out-year demand will likely have to be accommodated through a better connected and more efficient arterial street system. Changes to the major thoroughfare plan are done through a collaborative effort among all planning partners including the cities, County, and MPO (map on page 32).

### **Access management**

Access management is a process that provides or manages access for roadway users entering or exiting adjacent developed land without significantly impacting safety conditions, traffic capacity, and vehicle speeds for other roadway users. Access management strategies, including design and control of driveways, curb cuts, turn lanes, parking lot circulation, public street connections, and intersections, are most often applied to highways or major urban and suburban arterial streets.

Access management improves operation of regional roadways, and can dis-

courage use of regional roadways for local trips, by controlling the number of points where vehicles can access the facility. Access management can also be used as a tool for influencing the location and orientation of new development along a road. The Texas Department of Transportation has amended the rules for access management along Texas highways. These rules will greatly improve traffic flow and safety of new state facilities, and could encourage the development of more pedestrian and transit-friendly development patterns by limiting the proliferation of highway-oriented commercial development. Local jurisdictions can also adopt rules for access management along regional routes that are not part of the state system.

Access management programs seek to limit and consolidate access along major roadways, while promoting a supporting street system and unified access and circulation systems for development. The result is a roadway that functions safely and efficiently for its useful life and is a more attractive corridor.

Since arterials are forecasted to carry 28% of our traffic in the forecast year, it is extremely important that we maintain the functionality of our arterials as thoroughfares instead of allowing them to provide a greater share in providing access. Sherman Denison MPO recommends the implementation of an access management program. This can be accomplished by applying the following principles:

- Provide a specialized roadway system
- Limit direct access to major roadways
- Promote intersection hierarchy
- Locate signals to favor through movements

- Preserve the functional area of intersections and interchanges
- Limit the number of conflict points
- Separate conflict areas
- Remove turning vehicles from through traffic lanes
- Use non-traversable medians to manage left-turn movements
- Working with city engineering departments, provide a supporting street and circulation system

## Transit

During the 1970's Sherman and Denison, like most small communities in Texas, each developed a limited mini-bus program to meet some of the needs of a growing transportation dependent elderly population. Most of the mini bus systems were operated with volunteers, supplemental city funding, and funds raised by the occasional bake sale or other fund raising activities. Operating primarily in conjunction with senior centers, these programs were administered in more recent years by the Texoma Council of Governments and its Area Agency on Aging. When additional federal funding became available, these mini-bus programs were consolidated under an FTA Section 9 grant in the urbanized area at about the same time rural programs were being consolidated under a Section 18 grant organizational structure. Today, the Texoma Council of Governments, as the urban area designated FTA Section 5307 grantee contracts operation of the transportation services with the Texoma Area Paratransit Systems (TAPS). TAPS operates a demand-response transit service serving the general public, the elderly and persons with disabilities (FTA Section 5310) transportation service for the

urban area using a fleet of 15 Texoma Council of Governments owned vehicles, most of which are wheel chair lift equipped.

The Texoma Area Paratransit Systems is also the parent organization of the Texoma Rural Transit District, a seven-county non-urbanized (FTA Section 5311 funded) transit system that operates demand-response public transportation and elderly and persons with disabilities transportation services throughout the surrounding 6,500 square mile north Texas region. The system also provides commuter bus services within the rural transit district, into the small urban area from surrounding rural counties, and to major employers located in the Dallas-Fort Worth Metroplex. Under agreement with DART, connecting service between Sherman, Denison and rural Grayson County and DART light rail and bus services at their PARKER Road Station in north Plano was established shortly after that facility opened. Four daily round trip buses provide service Monday through Friday. TAPS also operates the only intercity (GREY-HOUND) terminal in the urban area and one in their rural service area (Gainesville) to better connect travelers. Coordinated urban, non-urbanized, elderly and disabled, commuter bus, and intercity transportation services have steadily grown over the past ten years to more than 400,000 annual passengers. TAPS now ranks as the state's fourth largest rural transit system.

The Sherman - Denison MPO is currently working with TxDOT to study the current operations of the Texoma Area Paratransit System(TAPS). While it is not quite clear what the long-term effects of this study will play on reducing

congestion, it is a goal of the study to improve operational efficiencies as well as increase the number of passengers who use the TAPS on a daily basis. As a result, an increase in the number of riders could equate into reduced local congestion.

### **Freight Movement**

Goods are moved to, from and through the Sherman – Denison Study Area to destinations across the United States via truck and rail on a daily basis. This commodity flow depends on efficient movement within our region. Recognizing the importance of efficient freight movement to our economy as well as our local traffic patterns, rail and truck bottlenecks in the region would be documented. Potential solutions could include capital improvements, operational changes, or other projects that improve the safety, efficiency, or air quality impacts of goods movement.

With the traffic volume at the Red River on US 75 being generally greater than that on IH 35 at the Red River (according to TxDOT traffic counts), it is imperative that US 75 continue to function at its optimum capacity. East/West movement on US 82 has also increased since the opening of the last section between Bells and Sherman.

### **Hazardous Material Truck Routes**

As of May 2006, the city of Sherman has the fire marshal determine routes on an as needed basis. The city of Denison at this time does not have designated routes. The MPO will work with

TxDOT and individual cities coordinate Hazardous Cargo Routes.

### **Pedestrian & Bicycle Facilities**

While not incorporated into the Congestion Index, the Sherman Denison MPO, in its MTP, has identified bicycle and pedestrian mobility as an important factor in congestion management and air quality management. The MPO supports pedestrian and bicycle projects both as stand-alone projects as well as incorporated into new roadway capacity or reconstruction projects. It is not intended that pedestrian and bicycle programs and facilities will solve the congestion problems in any particular corridor, but will offer an option to those whose travel is conducive to walking and biking.

As part of a recent Statewide Transportation Enhancement Program (STEP), the city of Sherman submitted to TxDOT two candidate projects pedestrian mobility.

Currently, 2.3 percent of the region's total trips occur by pedestrians or bicyclists. These programs and facilities will assist with meeting the region's requirements of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and related FHWA guidance for relying on bicycling and walking as part of the overall transportation system.

The abandonment of railroad "spurs" within the Sherman - Denison MPO area has created opportunities for "hike and bike" trail expansion.

## Prioritized List of Projects

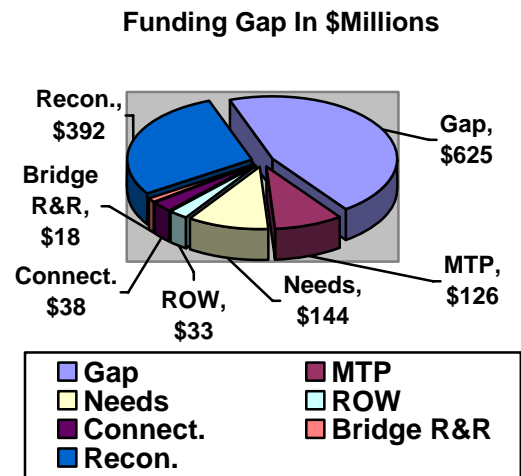
The Texas Urban Mobility Plan includes both long-range and short-range objectives and components. The short-range component is a result of the Texas Department of Transportation's 2007 Unified Transportation Program (UTP). Specifically, projects identified for construction represent the prioritized listing of improvement projects and are a component of the 2007 UTP. The map (Figure 1, page 34) identifies the Sherman - Denison region's short-range high-priority projects which we are aggressively pursuing at this time. The appendix (page 35) to this report contains the prioritized listing of short-range and long-range UTP projects.

## Needs Based Plan Cost Estimates

From a financial standpoint, it is important to not only identify the long-term needs for this Plan, but to also identify the levels of funding needed to reach such a goal. The table on page 33 reflects the lane miles needed as a result of the financially constrained Metropolitan Transportation Plan and the needs-based plan, the Texas Urban Mobility Plan, along with estimated total costs for each scenario. The unit costs assumed for this report were developed by the Texas Transportation Institute and are representative of average lane mile construction costs specific to the Sherman - Denison region in 2006 dollars.

The estimated cost of bridging the gap between the recommendations contained within the financially constrained

MTP and solving congestion to eliminate level-of-service "F" conditions is estimated to be approximately \$144 million. Additional cost to meet the needs in 2030 include \$392 million to rehabilitate (or reconstruct) 402 lane-miles of the existing lane miles, \$38 million for regional connectivity, \$18 million for bridge rehab & reconstruction, \$32.5 million for additional right-of-way costs, \$126 million to meet the requirements of the SDPO Metropolitan Transportation Plan.



Right of Way costs vary throughout the State and even in the different locations within a region. The seventeen non-TMAs have agreed to use a right of way cost of \$2.00 per square foot within rural areas and \$4.20 in urban areas. The SDMPO has chosen to use these numbers as its multiplier. The costs of right of way acquisition for the Sherman - Denison region are \$32,514,240.

While accounting for the addition of new capacity to the system, it is important to also consider that most of the current facilities will be in need of some degree of partial or total reconstruction over the next 30 years, as roadways continue to

age and begin to fail at some point. It is estimated that 402 lane miles will exceed a design life 40 years. The cost of reconstructing these lane miles adds an extra cost \$445 million to the figure above.

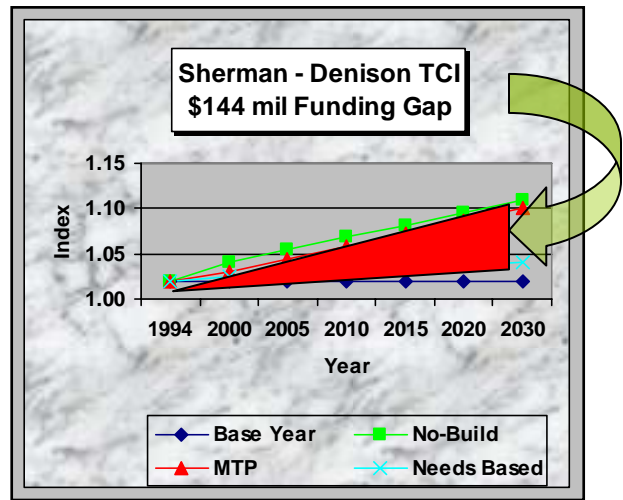
The GAP between anticipated funding through traditional funding mechanisms such as Federal, State and local matching funds, Capital Improvement Bonds, etc. shows that the Sherman - Denison area will receive approximately \$208 million within the next 30-years leaving a "GAP" of approximately \$624 million in additional funds needed to meet all of its goals.

**Mechanisms for Innovative Financing**

With the passage of Proposition 15, the Texas Legislature and the citizens of Texas created very important tools to improved mobility: the use of Toll Equity, the Regional Mobility Authorities (RMA), and the Texas Mobility Fund (TMF). Through the Texas Department of Transportation's (TxDOT's) Strategic Plan 2003-2007, the Texas Transportation Commission (TTC) identified the following appropriation strategies: Plan It, Build It, Maintain It, Maximize It, and Manage It. The Texas Urban Mobility Plan (TUMP) has taken the step to identify and plan for needed future mobility needs, and now the Sherman - Denison MPO needs to identify the means to fund it.

The process used to identify the out-year need of **158** additional lane miles of needed improvements and the maintenance of existing facilities also identified an estimated dollar amount that must be generated in order to make this possi-

ble: **\$144** million dollars (reference above graph & table 1, page 33).



Between now and the year 2030, this region must develop partnerships and research every funding opportunity to generate this level of additional funding needed in excess of current funding streams. Grayson County was one of the first counties in the state to form an RMA. The RMA organization successfully worked for the approval of the extension of SH 289. There will be substantial benefit derived from the implementation of this Plan, and from a cost standpoint, the benefits clearly outweigh the costs.

Under new policies being implemented by the TTC, TxDOT will allocate an annual, baseline amount of money to urban areas to address congestion in their areas. Historically, TxDOT has awarded transportation funds on a project-by-project basis. The TUMP allows for a set, predictable allocation of funds to the state's most congested urban areas. This change, combined with new tools from recent legislation (HB 3588) and the secured TMF, empowers the urban areas of Texas to better address congestion. A recent state legislative ses-

sion provided the ability to secure the TMF, a key component of this plan. The TMF will provide additional new money to help reduce congestion and advance needed transportation projects in the state. The benefits of the TMMP will result in more projects being constructed sooner.

Under the framework for this Plan, TxDOT has said that it will first determine what is needed to reduce congestion in each urban area. Then TxDOT will utilize regional allocations of state funding, including the new TMF, along with locally generated and controlled user-pay funds, to implement projects to reduce congestion at the rate and on the timeframe appropriate to the individual urban area. The result will be more local control, more local decision making, more realistic planning, and more goal attainment based on reducing congestion.

### **Funding the Partnership**

As part of the TUMP, each urban area will be given greater local ability to identify and set priorities for projects that improve mobility. As a starting point, each urban area will be granted a baseline allocation of state metropolitan mobility funds. It is anticipated that this regional baseline allocation of state funding will not be sufficient to meet all of the mobility needs of the region, and as a result, local urban areas will be given increased flexibility to generate user-pay system funds and public/private partnerships to fill the “gap” between the prioritized needs and the baseline state funding allocation. The ability to pursue gap-fund initiatives may require enabling legislation. Most importantly, under the TUMP, the “gap” funds which are gen-

erated within a particular urban area will be for the exclusive use of that urban area and will be used to supplement the baseline, regional allocation of state funding. Some of the potential methods of generating “gap” funding could include the following initiatives:

- Assess traffic impact fees for development;
- Issue local general obligation bonds;
- Toll added-capacity projects;
- Allocate a portion of a statewide gasoline tax increase for urban/metro areas;
- Manage truck utilization of the highway system through specific congestion-based pricing;
- Implement added vehicle registration fees designated for local mobility projects;
- Implement a toll system for projects that ease bottlenecks on existing freeway segments to improve system performance; and
- Implement a retro-toll system allowing for the tolling of existing congested freeways to improve system mobility.

### **Funding Strategies**

- Spend Wiser
- Be More Efficient
- Borrow to Build
- Find Partners

### **Goal Attainment – Conclusions**

As was mentioned on page 8, this Texas Urban Mobility Plan is a bold new way of delivering improved transportation infrastructure. What makes this plan innovative is that not only do we

publicly state our goals, we also define performance measures to assess how well we attained the public goals, and our performance is then tied to our future funding.

### Relieve Congestion

The ultimate goal of this plan is to increase mobility and decrease the level of traffic congestion. Achieving these goals is difficult in a state that is growing as fast as Texas. With population growth far exceeding the growth of funding, increasing congestion is expected. To help in quantifying this goal and measure progress over time, the Texas Department of Transportation will adopt a Texas Congestion Index to aid the urban areas in setting goals for congestion reduction and will be based on the delay time experienced by drivers. If the Sherman – Denison Study Area built only what it could afford in the MTP, it would have a forecasted TCI of 1.10. Our goal is to keep our TCI below 1.04. In future years of this plan, the SDMPO and the other non-TMAs will be held accountable for our performance in attaining this goal.

### Improve Safety

Safety concerns are another consideration for the Texas Urban Mobility Plan and points to the need to provide a safe and reliable transportation system. Highway safety improvements, which reduce highway fatalities and injuries, include a diverse set of activities implemented by a variety of transportation professionals.

Overall, the region's collective effort to provide a safer transportation system is

a challenging and continuous one. The Sherman – Denison MPO is committed to monitoring a variety of safety factors in order to improve safety throughout the transportation system.

Among the numerous points considered regarding the improvement of safety:

- On high volume divided highway's we consider the use of median barriers such as concrete traffic barrier and cable barrier systems.
- On intersections with high volume of traffic, the typical cross intersection results in traffic crossing in front of other traffic. The use of traffic circles are considered where applicable to keep all traffic moving in the same direction, thereby reducing potentially fatal accidents.
- On most rehab. projects, consideration is given to improve design to current standards thereby increasing safety through improved sight distance, horizontal and vertical curvature, shoulders etc.
- On roadways with major generators or attractors, left and/or right turn lanes are provided.
- On added capacity projects in urban areas, a 16' raised median is considered to separate opposing traffic.
- In roadways with lower design speeds on horizontal curves, signs such as chevrons and devices such as candlesticks are used to further alert the traffic.
- We are looking into implementing ITS such as message

boards and camera's to monitor and warn traffic on major highways of potential hazards such as accidents or weather related problems(ice on bridge./road).

- Rumble strips are installed on pavement edges and now on centerline to give the driver an audible warning that the vehicle is leaving the travel lane.
- Paris district sends the roll over vehicle with crash test dummies to some public events and schools to educate drivers on the use of seat belts.
- The new access management policy is followed when new developments request driveways. Driveways are spaced based on posted speed of that roadway so that the number of conflict points are kept to a minimum.
- Reflective tapes are now being installed on all sign posts to obtain additional reflectivity improving nighttime driving conditions.

Finally, based on results from this analysis and taking into consideration the elimination of all level-of service "F" facilities, it is apparent that mobility will be improved and that a higher degree of reliability will be built into the system, which translates into a safer overall transportation system.

### Improve Air Quality

The Sherman Denison Study Area is in full attainment status of EPA Ambient Air Quality Standards and intends to stay that way. The primary four coun-

ties in the D/FW Metroplex (Dallas, Tarrant, Collin, and Denton) are currently designated as a non-attainment area (with a "serious" ranking in low-level ozone pollution) under the Federal Clean Air Act. The State Implementation Plan (SIP) to clean the air in the Metroplex continues to fail in spite of the Texas Commission on Environmental Quality (TCEQ) efforts to the contrary. One recent TCEQ approach, to *de facto* increase the size of the D/FW non-attainment area to neighboring counties in spite of their actual contribution to ozone formation, was defeated by a regional coalition of governments, economic development organizations, businesses and citizen groups. Grayson County was originally targeted by the TCEQ for inclusion in this attempt to administratively broaden the non-attainment area. However, being presented with overwhelming evidence of the fact that Grayson County is "downwind" of the ozone generating processes in the Metroplex and a united government/business/citizen front, the State dropped Grayson County from inclusion in its proposal. As the State SIP continues to not improve the air quality in the Metroplex it is, at the time of this writing, becoming more likely that the EPA will eventually take-over the process there. The possible impact on Grayson County in this scenario cannot be determined at this time as approaches to cleaning the air in the Metroplex will be a function of EPA policy, which is yet to be established and is subject to national political realities.

Additionally, Grayson County air quality will clearly be the beneficiary of near-term national and State efforts to assure cleaner burning automobiles and cleaner burning gasoline. Moreover, as

of the time of this writing, most major gasoline vendors in the County have already added Phase I vapor recovery systems to their tanks, having done so at the time of tank installation and upgrades.

### Improve Quality Of Life

The goal regarding quality-of-life issues remains an integral part of the Texas Metropolitan Mobility Plan as a means to enhance the appeal of or minimize demand on the transportation system and to address some of the more non-traditional concerns regarding transportation. It is recognized that, while transportation investment directly impacts such things as urban mobility, air quality, and economic development, there are other less direct, but equally important, impacts of transportation systems and services. These goals not only direct planning efforts to consider urban form and transportation's impact upon the economy and the environment, but also provide transportation services and infrastructure to those traditionally underserved.

Planning the development of an efficient, effective transportation system must be a top priority in order to maintain the region's quality of life and economic vitality. Many of the policies, programs, and projects included in the region's MTP and this Texas Urban Mobility Plan report address very specific quality-of life issues concerning the promotion of economic development, increases in transportation accessibility, and a balance between transportation and land-use planning while reducing environmental and community impacts.

### Enhance Economic Development

The way transportation is planned, programmed, and constructed in this region must be responsive to regional trends in economic expansion, population growth, development, quality of life, public health, and the environment in order to provide mobility and maintain the region's clean air quality status, thus avoiding a risk of sanctions on federal transportation funds. Promoting economic development is a specific objective of the Texas Urban Mobility Plan because of the direct link between land use and transportation.

As part of the SAFETEA-LU requirements, the Sherman Denison MPO will update and expand the coordination of transportation and land use/economic development. This will include the agencies responsible for growth and economic development such as the local Chambers of Commerce as well as the economic development corporations in Sherman and Denison.

### Enhance Infrastructure Maintenance

A key component considered during the development of the Texas Urban Mobility Plan was not only what the future needs are for the Sherman – Denison Study Area , but also what the magnitude of infrastructure is that it must be maintained over time to ensure proper functioning and usability of the system without any degradation of service. This must include not only the existing transportation system, but also the future facilities, because once they are constructed, a dedicated source to support their maintenance must also exist. The development of out-year needs and cost estimates made the assumption that over time, nearly all of the existing free-

way facilities in this region will either be widened alone (new capacity on existing right-of-way), widened with existing lanes rebuilt (new capacity and reconstruction), or many will not have any new capacity added but will be reconstructed as pavement conditions warrant replacement. Costs for each of these three scenarios was taken into account and included in the cost estimates derived for this report.

### Streamline Project Delivery

Another key concept considered is a way to provide for a more streamline process for project delivery. Public-private partnerships and more efficient cash-flow management techniques are two possibilities to consider which could provide more timely delivery of improvements.

### TxDOT Strategic Goals

The Texas Department of Transportation has adopted five strategic planning goals as part of the Strategic Plan 2003-2007. These goals address many of the previously mentioned goals adopted for the purposes of this report and planning exercise. TxDOT's five strategic planning goals are as follows:

1. Reliable Mobility  
**Goal:** Enhance Texas urban and metropolitan areas and ensure that congestion is less than in comparable peer U.S. cities.
2. Improved Safety  
**Goal:** Reduce the fatality rate on Texas roadways by 5 percent within 10 years.
3. Responsible Systems Preservation
4. Streamlined Project Delivered  
**Goal:** Improve project delivery from project conception to ribbon cutting on average by 15% within five years.
5. Economic Vitality  
**Goal:** Attract and retain business and industry with adequate transportation systems and services.

The five strategic planning goals identified above are already generally covered in the other adopted goals for the Texas Urban Mobility Plan, and the ability to achieve these strategic goals is inherently tied to the ability to generate additional funding. Due to the short range nature of these strategic goals, it is imperative to begin identifying and securing alternative methods of funding for major surface transportation projects within Texas' Urbanized Areas.

### Goals of the Texas Urban Mobility Plan: Conclusions

In summary, the goals adopted as part of the TUMP represents this region's commitment to a comprehensive, cooperative, and continuous transportation planning process that provides for a balanced transportation system by recognizing the evolving transportation needs for the region.

The ability to implement regional projects and achieve these ambitious goals is inherently closely tied to this region's ability to identify and pursue every available funding source.

## FUNDING OPTIONS

“Texas needs access to additional mobility funds, particularly a secured Texas Mobility Fund”. “Urban areas need to know what funds can be expected from TxDOT through state and federal sources for years to come.” “This should be a regional, baseline allocation of expected TxDOT funds”. “These funds will not be reduced because of local innovative financing or because a region is aggressive in meeting goals to reduce traffic congestion”.

“Urban areas need increased flexibility to generate user-pay funds beyond expected TxDOT funding”. “The urban areas need to retain control of any locally generated user-pay funds for locally developed, comprehensive plans to reduce congestion and improve mobility”. “This increased ability will help urban areas fill the gap between a regional, baseline allocation of TxDOT funds and plan implementation”.

“Regions may need to develop mechanisms to secure user-pay funds for implementation of the regional mobility plan”. “Changes will need to be made in rules for funding state projects”. “The purpose will be to maximize the flexibility required to move transportation funds between modes”.

“To allow for better financial planning at the individual urban area level, TxDOT will change from allocating mobility funds on a per project basis to allocating funds to regional urban areas”.

“Regional allocations will be based on a TxDOT assessment of traffic, population, and other factors.” “Under the

TUMP, each urban area would be allocated a portion of the anticipated available metropolitan mobility funds for implementation of their approved regional mobility plans”.

“This allocation would not be reduced if the region were aggressive in developing “gap” funding initiatives.” “In fact, this method would encourage individual urban areas to tailor ‘gap’ funding initiatives based on local needs and desires”. “The number of projects from the prioritized listing in the regional mobility plans that could be funded through TxDOT funds would be known to the urban area well in advance of implementation”. “This will allow a urban area to realistically assess how it will fund needs not met by the regional allocation from TxDOT”.

“The Transportation Commission will determine the total available funds for urban mobility baseline allocation using traditional forecasts of revenue and needs and the implementation of a fully secured state mobility fund”. “This fund will give urban areas instant access to the revenue needed to jump start costly urban projects”. “The Transportation Commission will designate a majority of this new bonding capacity for mobility improvements in the urban areas”. “Additionally, the Transportation Commission may reserve a portion of state high-priority funds for assisting with critical and innovative projects in the urban areas”.

“TxDOT will allocate an annual, baseline amount of money to urban areas to address congestion as they see fit. In the past, the Commission awarded transportation funds on a project-by-project basis. The Texas Urban Mobility Plan allows for a set, predictable allocation of

funds to the state's seventeen urban areas. This change, combined with new tools from recent legislation (HB 3588) and the secured Texas Mobility Fund, empowers the urban areas of Texas to better address congestion."

"The recent legislative session provided the ability to secure the Texas Mobility Fund, a key component of this plan. This fund will provide additional new money to help reduce congestion and advance needed transportation projects in the state, including our urbanized areas. The Urban Mobility Plan will result in more projects being constructed sooner."

"The implementation of this plan means that local areas will have more control and decision making authority over one of the twelve categories of funding TxDOT utilizes to implement projects. In the Urban Mobility Category the urban areas will no longer have to compete against each other. The MPOs from the eight metro areas worked with TxDOT to develop a methodology to distribute the funds by formula rather than project specific. This allows for better financial planning in the urban area and more local control and decision making authority."

"Under the new framework of this plan, we will first determine what is needed to reduce congestion in each urban area. And then utilize regional allocations of TxDOT funds and the new money from the Mobility fund and locally generated, locally utilized and locally controlled user-pay to implement projects to reduce congestion at the rate and on the timeframe appropriate to the individual metropolitan area. More local control and decision-making, more realistic

planning and more goal based to reduce congestion – we are all serious about improving our urban areas. This plan exemplifies that. The public wants reduced congestion –we are implementing with this plan a framework to do that with less bureaucracy and delay."

"We will utilize state, federal and local funds derived from a variety of sources. It will be a local decision on how to generate and use these funds in each urban area. There will have to be some new money generated to really address congestion, the Texas Mobility Fund is a start, but in some urban areas other funds will be needed to "fill the gap" between what is needed to address congestion and what funds are available. We believe that locally generated, locally controlled and locally utilized user-pay funds are the best way and fairest way to fill those funding gaps. In the future these user-pay options may take the form of more toll roads or something else – but it will be a local decision."

### Gap Funding

"In the TUMP, the urban areas will be given greater local ability to identify and prioritize projects that improve mobility". "The urban areas will be granted a baseline allocation of TxDOT metropolitan mobility funds". "It is anticipated that this regional baseline allocation of TxDOT funds will not be sufficient to meet all the mobility needs of the Texas metropolitan areas". "In these cases, local urban areas will be given increased flexibility to generate user-pay system funds and public-private partnerships to fill the gap between their prioritized needs and the baseline TxDOT allocation".

“Enabling legislation will be required for many of these gap-fund initiatives”. “However, under the TUMP, the gap funds generated in a urban area will be for the exclusive use of that urban area to supplement the baseline, regional allocation of TxDOT funds for congestion relief”.

“It is anticipated that the urban areas may develop other initiatives – yet to be identified – for user-pay funds”. “Based on need, each urban area will develop user-pay initiatives to generate gap funds”.

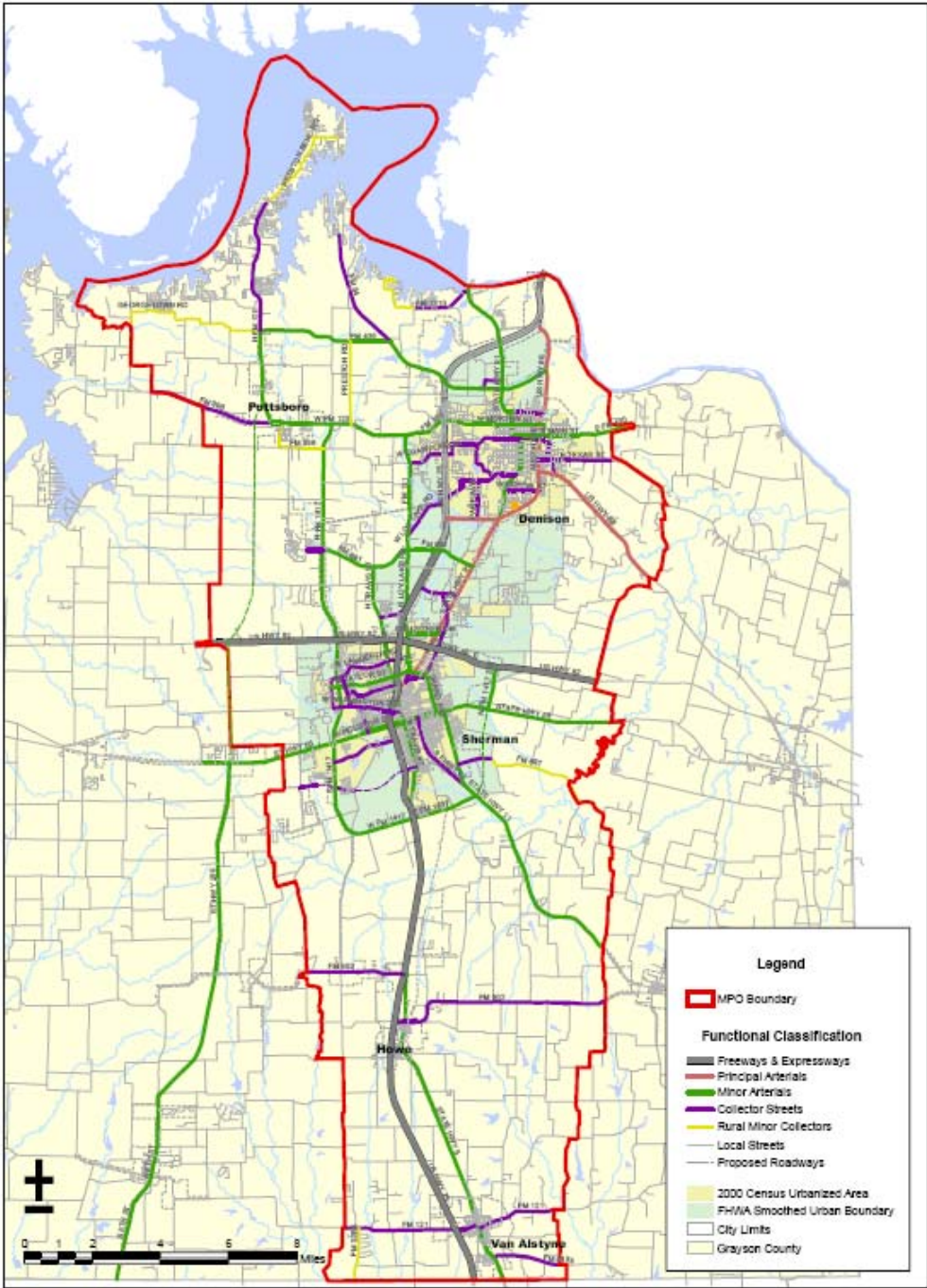
The SDMPPO is researching several alternative means for increasing revenues to cover the shortfall. Among these are:

- Assess traffic impact fees for development
- Issue local general-obligation bonds
- Toll added-capacity projects and issue bonds
- Manage demand and generate funds through a toll-ring concept (as in London, England)
- Develop new local revenue sources, such as a local gas tax, local sales tax
- Manage truck utilization of the highway system through specific congestion-based pricing
- Implement added vehicle-registration fees designated for local mobility projects
- To improve system performance, implement a toll system for projects that ease bottlenecks on existing freeway segments (example: toll approach roads to fund an interchange or bridge project)
- Implement a retro-toll system allowing for the tolling of existing

congested interstates and other freeways to improve system mobility.

# **APPENDIX**

Sherman - Denison  
Metropolitan Planning Organization (MPO)

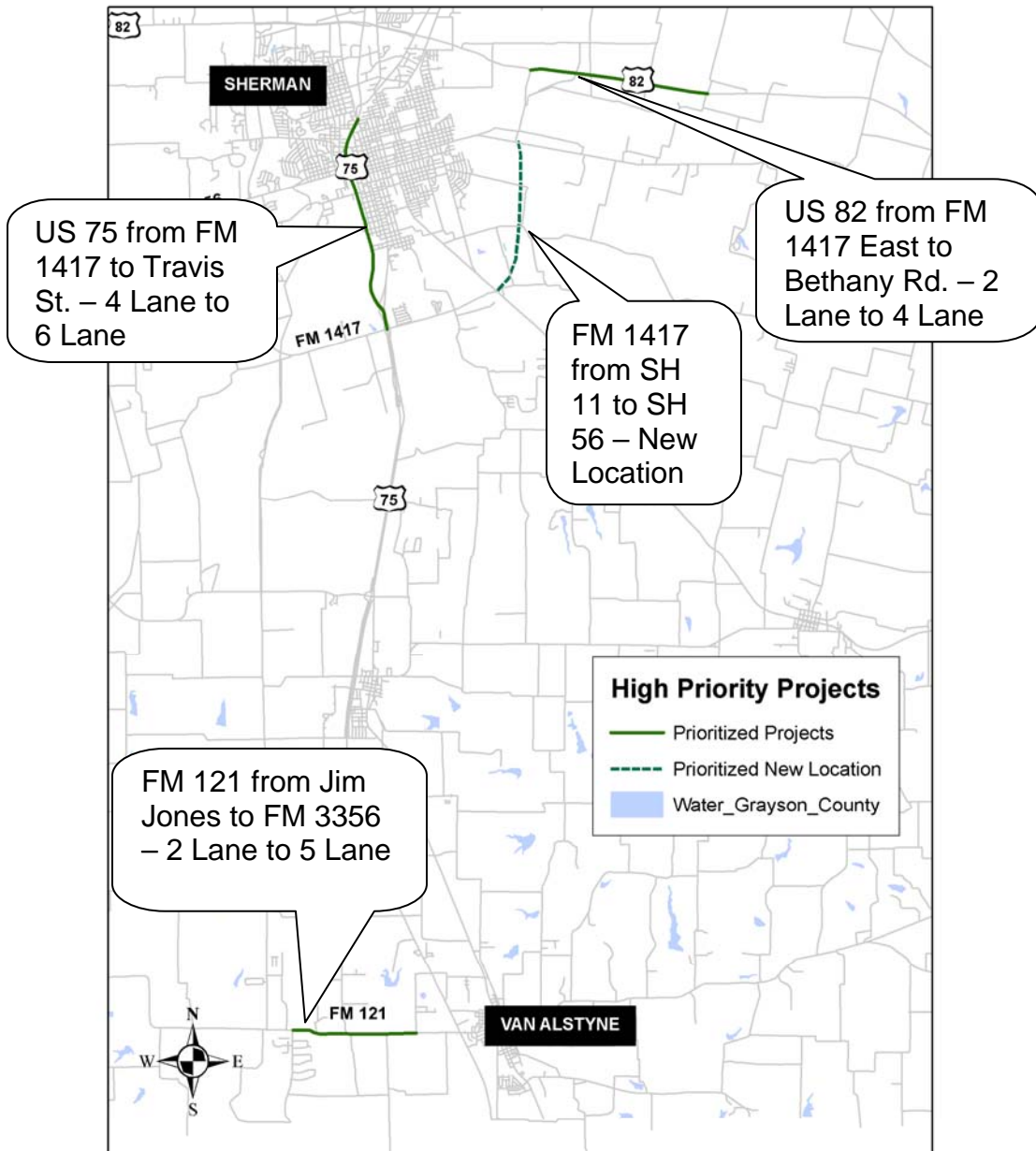


This map was produced by the Sherman - Denison MPO

**Table 1**

Lane Miles Needed and Cost Estimates					
	Base Year	Metropolitan Transportation Plan Traditional Funding Levels		Eliminate Level of Service "F"	
	Lane Mileage	2030 Lane Miles	Cost (1999) \$Millions	Additional Lane Miles Needed	Additional Cost to Eliminate LOS "F" \$Millions
Freeway/Tolls	124	127	\$89	11	\$30
Principal Ar- terials	344	387	\$37	147	\$114
Interchanges	0	0	0	0	0
TOTALS	468	514	\$126	158	\$ 144

**Figure 1 High Priority Projects**



Please reference page 6 for details

**The following lists of projects represents the Statewide Mobility Program that will be part of the Texas Department of Transportation's 2005-2015 Unified Transportation Program (UTP) and those projects that are in the planning stages of the 2016-2030 UTP.**

**Projects listed are not part of the TUMP but represent a significant component in congestion relief and mobility improvements as called for by this program. TUMP specific projects and programs would be a combination of roads, transit operating efficiencies and demand changes. Specific projects and programs will be identified in a follow-up document.**

**Sherman - Denison 2030 Long Range Plan  
2005 - 2015 (10 year)**

<b>Project ID#</b>	<b>Project</b>	<b>Project Limits</b>	<b>Type of Work</b>
SDHHWY015	FM 1417	@ Sand Creek	Replace bridge and approaches
SDHHWY004	FM 1417	from SH 11 to SH56	2 lanes of ultimate 5 lane
SDHHWY009	US 69	1745'S of FM 84 to 1136' N of FM 84	Rehab. Roadway
SDHHWY016	Grand Avenue	in Sherman from SH 91 to Grand Ave O/P	Reconstruct city street
SDHHWY017	SH 289*	from SH 56 to US 82	2 lanes of ultimate 4 lane divided
SDHHWY019	FM 120	from FM 996 to end of state maintenance	Reconstruct 2 lanes of ultimate 5 lane
SDHHWY021	Various Safety Projects		
SDHHWY033	US 69	@ MKT RR O/P	Rehab bridge and approaches
SDHHWY082	SH 289*	from US 82 to FM 120	2 lanes of ultimate 4 lane divided
SDHHWY090	US 75 EFR	at Choctaw Creek	Rehab Existing Bridge
SDHHWY093	FM 120	At SH 91	Construct Left Turn Lanes
SDHHWY015	Various On & Off System Bridge Project	Various	Replace Existing Bridges
SDHHWY064	Various Safety Projects		
SDHHWY083	FM 996	From proposed SH 289 to FM 120	Upgrade existing 2 lane facility to 5 lane section with center left turn lane
SDHHWY084	US 75 SB Frontage Rd.	From US 82 to Loy Lake Road	Rehab Existing Roadway (concrete pavement) and add third lane with curb and gutter
SDHHWY085	FM 121	From US 75 SB Frontage Road to 1 mi. west of Frontage Road (New Grayson County College)	Rehab Existing Roadway and convert to 5 lane section with curb and gutter
SDHHWY113	US 75	US 82 to Loy Lake Dr.	Ramp Reversal

\* This facility may be tolled in the future if necessary

**Sherman - Denison 2030 Long Range Plan  
2016 - 2030 (25 year)**

<b>Project ID#</b>	<b>Project</b>	<b>Project Limits</b>	<b>Type of Work</b>
SDHHWY007	FM 1417	from SH 56 to US 82	Reconstruct to 5 lane undivided
SDHHWY008	FM 1417	from US 75 to SH 11	Reconstruct to 5 lane undivided
SDHHWY024	Frisco Road	in Sherman from Gallagher to SH 91	Reconstruct
SDHHWY028	FM 120	from Denison to Carpenter's Bluff	Reconstruct existing facility and add shoulders
SDHHWY029	Ramp	US 75 & Fallon Drive	Four Ramps
SDHHWY032	Taylor	from FM 1417 to Frisco Road	Improve and Widen
SDHHWY035	FM 691	from US 75 to Grayson County Airport	Reconstruct to 5 lane undivided
SDHHWY068	US 75	0.5 mi S of Center St. in Sherman to Travis St.	Reconstruct existing 4 lanes and add 2 additional lanes
SDHHWY069	US 75	0.3 mi S of FM 1417 to 0.5 mi S. of Center St. in Sherman	Reconstruct existing 4 lanes and add 2 additional lanes
SDHHWY078	FM 996	from FM 120 to end of state maintenance	Reconstruct existing facility & add shoulders

**Texas Urban Mobility Plan  
Preliminary Sherman Denison MPO /  
Grayson County Needs Report  
Highways & Bridges**

**Texas Congestion Index**

The Texas Congestion Index (TCI) was developed by the Texas Transportation Institute (TTI) to provide a consistent measure of congestion across the 25 metropolitan areas within Texas. The TCI is defined as the difference between peak hour travel times (7 to 9 AM and 4 to 6 PM) versus travel during other times of the day. A TCI value of 1.10 would indicate that travel times during the peak hours were approximately 10% greater than at other times of the day. Another way to look at it is if it normally takes a person 20 minutes to get from point A to point B, then during the peak hours it would take 22 minutes to make the same trip.

**Texas Congestion Index for  
Sherman-Denison Urbanized Area**

Scenario	TCI
1994 Base Year	1.02
2030 No Build Scenario	1.11
2030 MTP Projects	1.10
2030 LOS F Eliminated	1.04

According to these figures, in 1994 peak hour travel in the Sherman-Denison Region was about the same as during other times of the day. In 2030, even without any significant capacity expansions, peak hour travel would not expected to be significantly greater than at other times of the day. As a point of comparison, below are TCI values for other selected metropolitan areas.

The limitation of the TCI is that it is a system-wide measure. The Sherman -

Denison system has numerous arterial and two expressway facilities (US 75 & US 82) that are currently at adequate capacity. These facilities have the tendency to hide problem links within the network. To account for this, TTI identified those links that would have traffic volumes in excess of their capacity (Level of Service F) in 2030.

**Elimination of Level of Service F**

While the MTP identified 46 lane-miles of added capacity, in order to eliminate LOS F conditions, an additional 158 lane-miles of highway capacity would be needed at a cost of \$144 million. This cost is above and beyond the estimated federal and state revenues anticipated for the Sherman Denison study area through 2030. This does not include funds to correct safety problems or regional connectivity problems.

Highway Type	Existing Lane-Miles	MTP Added Lane-Miles	Additional Lane-Miles Needed	Estimated Additional Cost
Expressways	124	3	11	\$30,000,000
Arterials	344	43	147	\$114,000,000
Total	468	46	158	\$144,000,000

According to the MPO travel demand model, once all work necessary to eliminate LOS F has been completed, the TCI value decreases to 1.04, close to the 1994 level of 1.02.

**Right of Way**

Much of the capacity expansion identified by TTI will require additional right of way. To calculate the estimated cost, TxDOT staff identified the existing right of way widths for each identified corridor and then assumed that right of way would be acquired equally from each side of the road. TTI provided an esti-

mated cost of \$2.00 per square foot for right of way within rural areas and \$4.20 per square foot for right of way in urban areas. The table below identifies the estimated right of way needs within the Sherman Denison MPO Study Area.

Highway Type	Additional Right of Way Needed	Estimated Cost
Expressways	0 square feet	\$0
Arterials	11,732,160 square feet	\$34,975,776
Total	11,732,160 square feet	\$34,975,776

Some of the needed capacity expansions identified by TTI are included within the funded portion of the MTP. The table below identifies those right of way costs that are beyond the estimated available funds for the Sherman-Denison area.

Total Right of Way Costs	Funded Costs	Estimated Additional Costs
\$34,975,776	\$2,461,536	\$32,514,240

### Regional Connectivity

Grayson County for the most part is accessible within a reasonable time frame from most portions of the county. One section of roadway which would greatly enhance the mobility of the region would be the extension of FM 1417 from US 82 to FM 84 on the eastern side of Sherman and Denison. Travel times reductions between these destinations could be greatly reduced with the construction of this new facility. The table below identifies the unfunded costs associated with the construction of this new facility in two phases.

Corridor	Construction Cost	Right of Way Cost	Total Cost
FM 1417 (SH 11 to SH 56)	\$7,280,000	\$2,745,600	\$10,025,600
FM 1417 (US 82 to FM 84)	\$13,160,000	\$14,889,600	\$28,049,600
Total	\$20,440,000	\$17,635,200	\$38,075,200

### Rehabilitation & Reconstruction

Although Texas arguably does a better job at maintaining its systems of roads than any other state, the existing revenue stream is insufficient to address all of the future maintenance needs. To estimate the need by 2030, the 25 MPO's have agreed on defining a reconstruction or rehabilitation need on any road section or bridge older than 40 years in age. This means that anything built or last significant rehabilitation prior to 1990 would likely need to be rehabilitated by 2030. Another assumption is that road segments, which have been identified as part of a project within the funded portion of the MTP, are to be rehabilitated prior to 2030. The following chart lists the lane miles in need of rehabilitation according to this definition.

Facility Type	Lane-Miles to Re-habilitated	Estimated Cost
Arterials	134	\$247,080,000
Expressways	268	\$198,210,000
Total	402	\$445,290,000

MTP Identified Funds	\$53,060,000
TUMP Requirements	\$392,230,000

The MTP estimated that \$53 million in federal, state and local funds were available for rehabilitation and preventative maintenance through 2030. An estimated additional \$392.2 million will be necessary through 2030 to adequately maintain the existing arterial and expressway network.

### Bridges

Recommended guidance from the seventeen non Transportation Management Areas (TMA's) for rehabilitation work on bridges was provided to the group. The

list below identifies the recommendations.

1. Bridges replaced or rehabilitated since 1990 will not require replacement or rehabilitation before 2030.
2. Bridges along projects identified within the funded section of the MTP will either be replaced or rehabilitated by 2030.
3. Bridges with a current sufficiency rating greater than 90.0 will not require replacement or rehabilitation before 2030.
4. Bridges with a current sufficiency rating between 80.0 and 89.9 will only require rehabilitation before 2030.
5. Bridges with a current sufficiency rating of 79.9 or below will require total replacement by 2030.

The result of the recommended bridge need definition identifies slightly less than half of bridges not already identified as part of a funded MTP project need to be rehabilitated or replaced by 2030. The estimated cost is identified below.

Work Category	# of Bridges	% of Total
No Work Necessary	80	58.8%
Work Identified within MTP	18	13.2%
Bridge to be Removed	0	0.0%
Rehab before 2030	25	18.4%
Replace before 2030	13	9.6%
Total Bridges	136	100.0%

Bridge Rehab Costs	\$11,400,226
Bridge Replacement Costs	\$28,163,827
Total	\$39,564,053

MTP Identified Funds	\$20,761,574
TUMP Requirements	\$18,802,478

The MTP estimated that \$53.1 million in federal and state funds were available for rehabilitation and reconstruction

through 2030. An estimated additional \$392.2 million will be necessary through 2030 to address bridge deficiencies in the Sherman – Denison Study Area.

## Safety

The MPO identified 2,538 crashes from July 2004 through June 2005 within the Sherman Denison metropolitan area. The overall cost of these crashes, including property damage and medical costs, was estimated at \$188.3 million. When extrapolated through the year 2030, the estimated economic impact of highway crashes in the Sherman Denison MPO Study Area is estimated at \$4.5 billion (2006 through 2030)\*. Although eliminating all crashes is not realistic, the MPO working with TxDOT will identify intersections and highway segments with unacceptably high crash rates with the goal of reducing crashes at these locations. Some of these locations may already be identified for capacity expansion within the MTP, with the added benefit of correcting existing safety problems. Some other locations, however, may require better enforcement of existing traffic laws. Other locations may require better access management techniques, but insufficient funds are anticipated to fund the proposed work. The following table provides preliminary costs associated with several types of safety improvements.

\*Study (2001) from North Carolina DOT on costs associated with severity of crashes.

Improvement	Proposed Work	Unfunded Costs
Access Management	Median	\$200,000/mile
	Traffic Circle	\$100,000 to \$500,000*
Intelligent Transportation System (ITS)	Message Boards	\$200,000/location
	Profile Marking	\$8,000/mile

\* Depending on location

## Total

An estimated additional \$625.6 million in funds will be necessary in the Sherman – Denison Study Area to meet the region’s expressway and arterial needs through 2030. Over the next several months, the MPO staff will be discussing potential measures to generate revenues to overcome the funding shortfall.

<b>Work</b>	<b>Additional Funds Required</b>
Added Capacity	\$144,000,000
Right of Way	\$32,514,240
Regional Connectivity	\$38,075,200
Highway Rehabilitation	\$392,230,000
Bridge Rehab & Reconstruction	\$18,802,478
Safety Improvements/Transit	\$TBD
<b>Total All Work</b>	<b>\$625,621,918.00</b>