THIS IS AN “IN PROGRESS” REVIEW

Mobility Needs Assessment
(Draft August 2008)

2030 COMMITTEE

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Why Mobility Matters

Increased Congestion Costs:

- Money (Delay)

Why Mobility Matters

Increased Congestion Costs:

- Money (Delay)
- Jobs (Lost Economic Opportunity)

Why Mobility Matters

Increased Congestion Costs:

- Money (Delay)
- Jobs (Lost Economic Opportunity)
- Lives (Safety)

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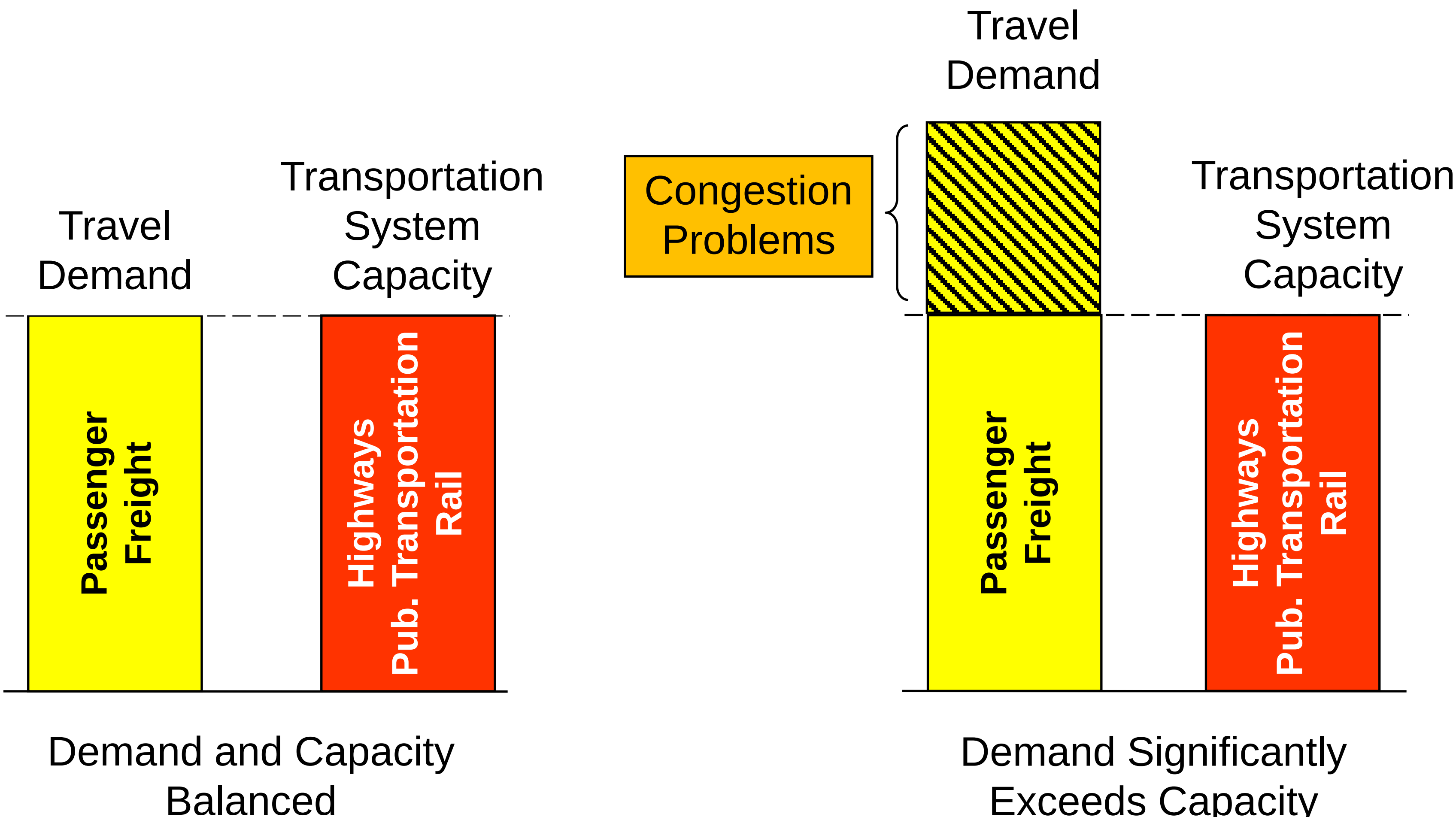
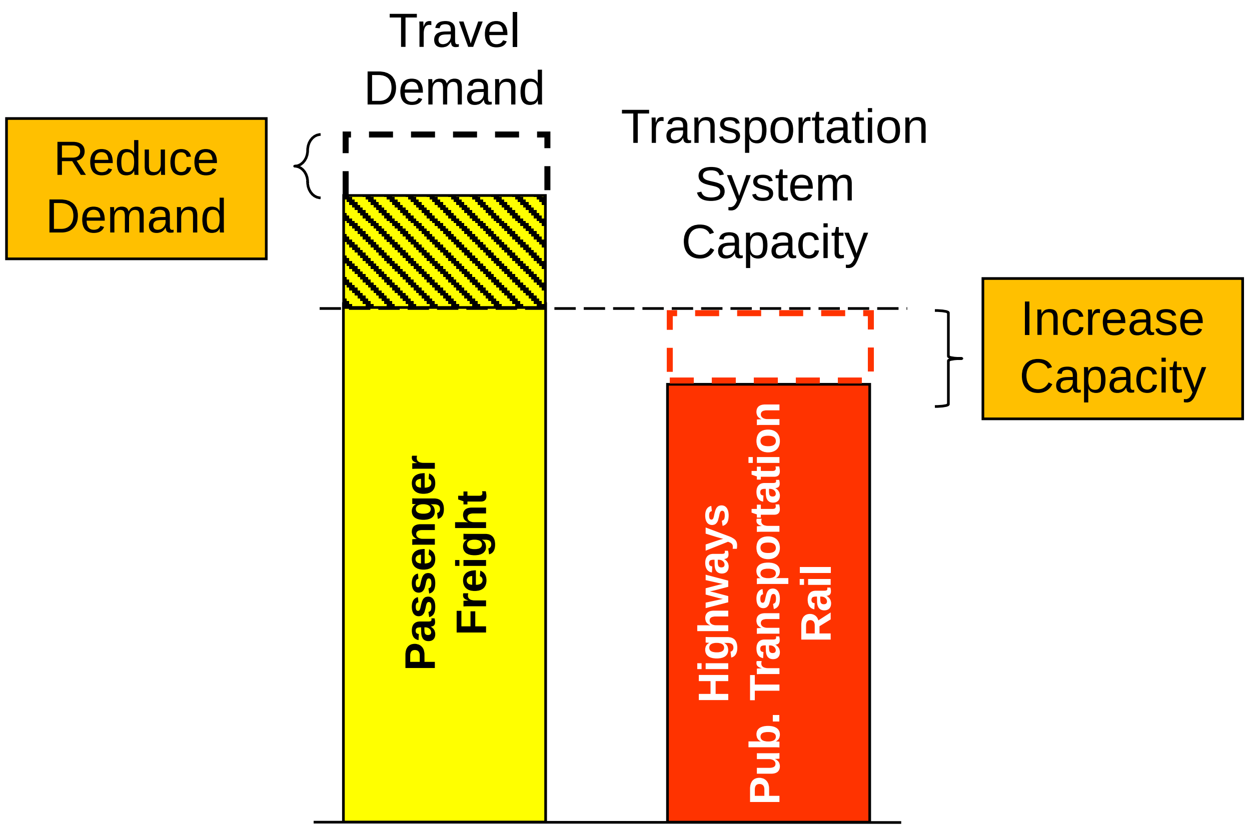
Our Challenge

Determine a feasible and justifiable estimate of statewide transportation need for the next 22 years.

How Do We Define Mobility?



Strategies for Reducing the Problem



Strategies for Reducing the Problem

How Do We Define Mobility?

- For Metro and Urban areas: congestion relief (improved travel speeds)
- For Rural Areas: congestion relief and improved connectivity

What Mobility Scenarios Were Considered?

Because mobility in Metro/Urban and Rural areas are different, the scenarios are different.

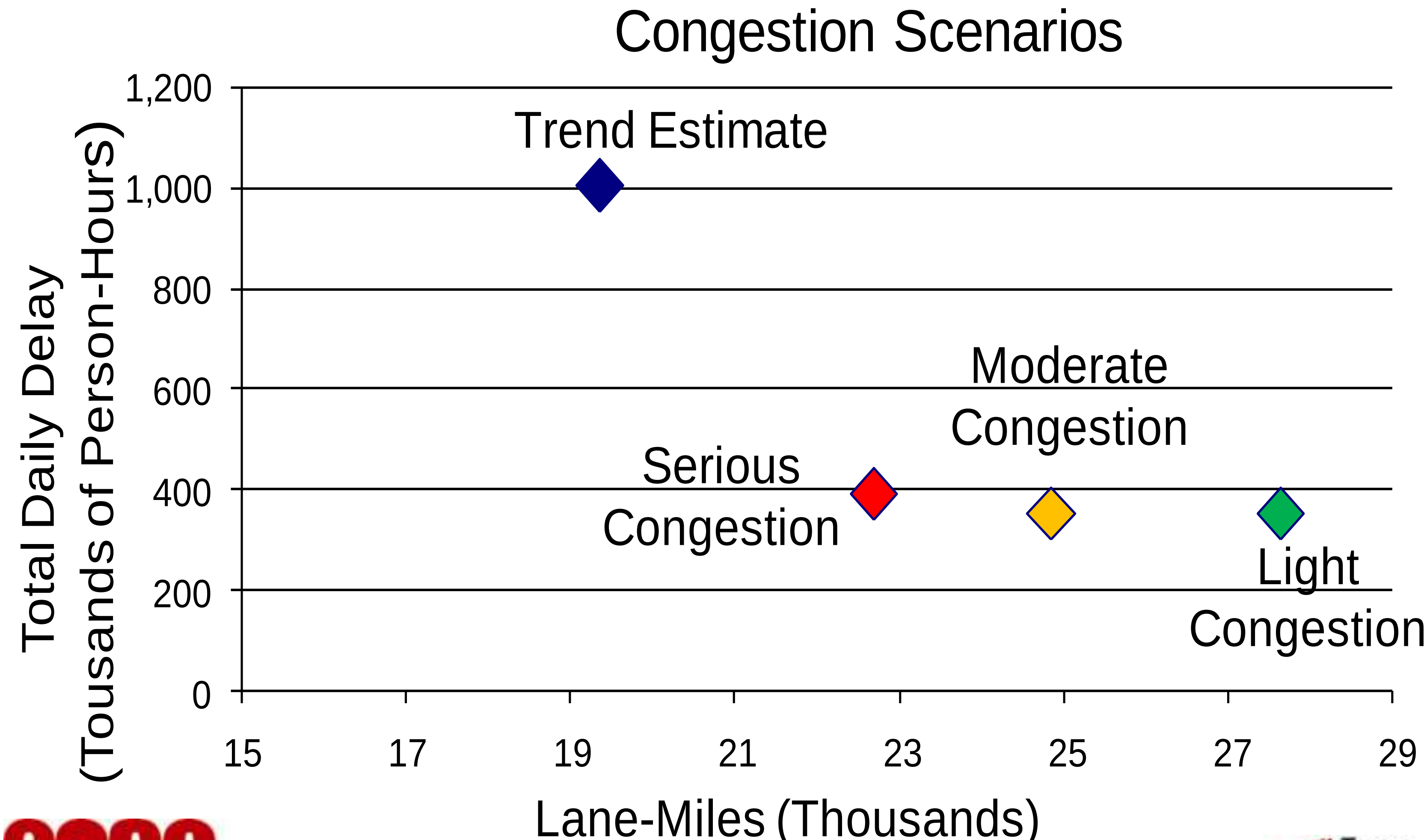
Mobility Scenarios for Metro and Urban Areas

- Scenario M1 – eliminate serious congestion by 2030
- Scenario M2 – prevent congestion from worsening
- Scenario M3 – continue investing at trend levels

What Does This Mean?

Mobility Scenario	Description	Resulting Approx. Peak-Hour Speeds
M1	Eliminate serious congestion	Freeways: 55+ mph Arterials: 35+ mph
M2	Prevent worsening of existing congestion	Freeways 40-50 mph Arterials 20-30 mph
M3	Continue trend investment levels	Freeways 30-40 mph Arterials 15-20 mph

Another Way to Look at It:
Marginal Benefit versus Marginal Cost



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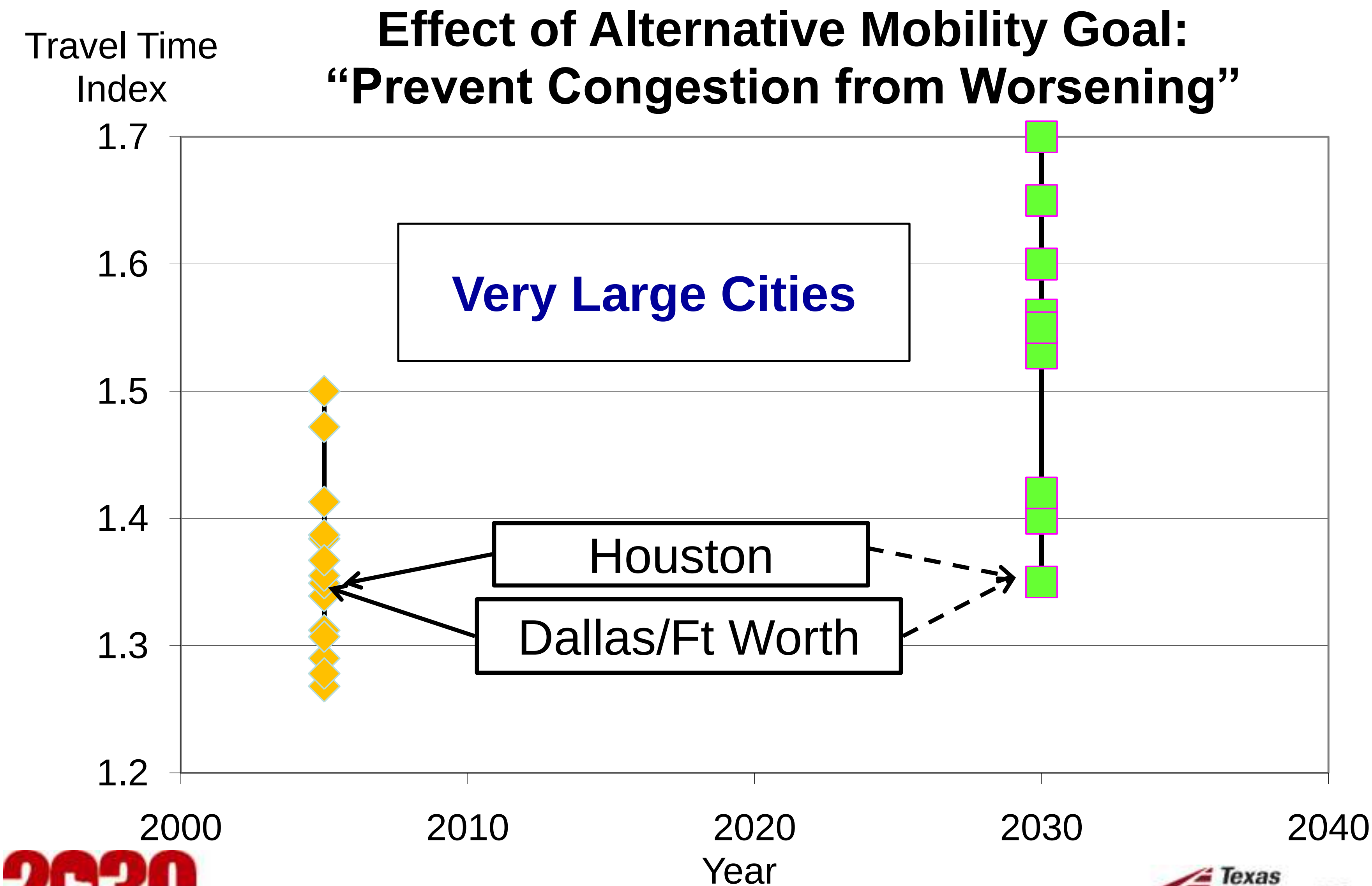
Getting Better by Not Getting Worse:



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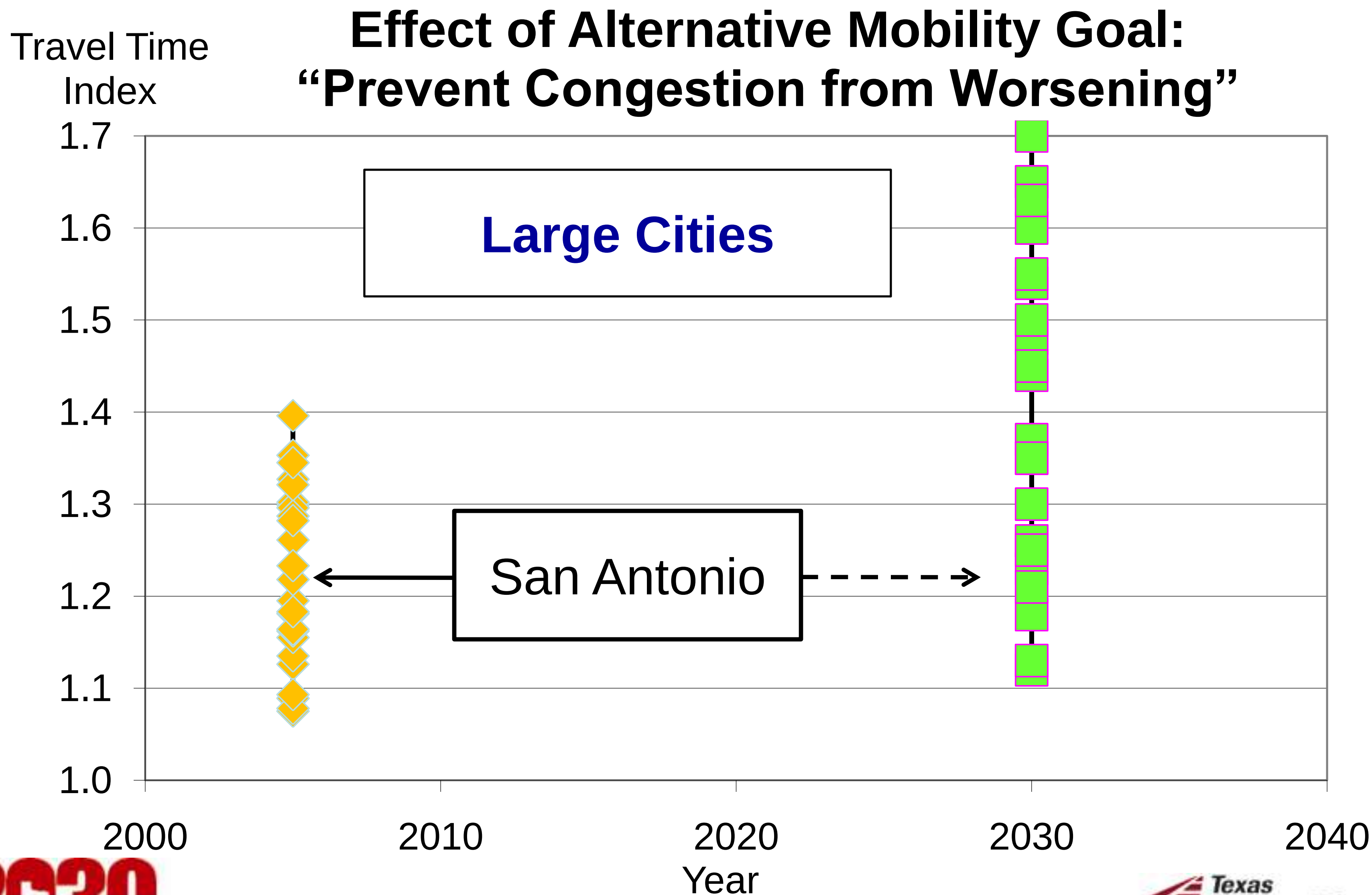

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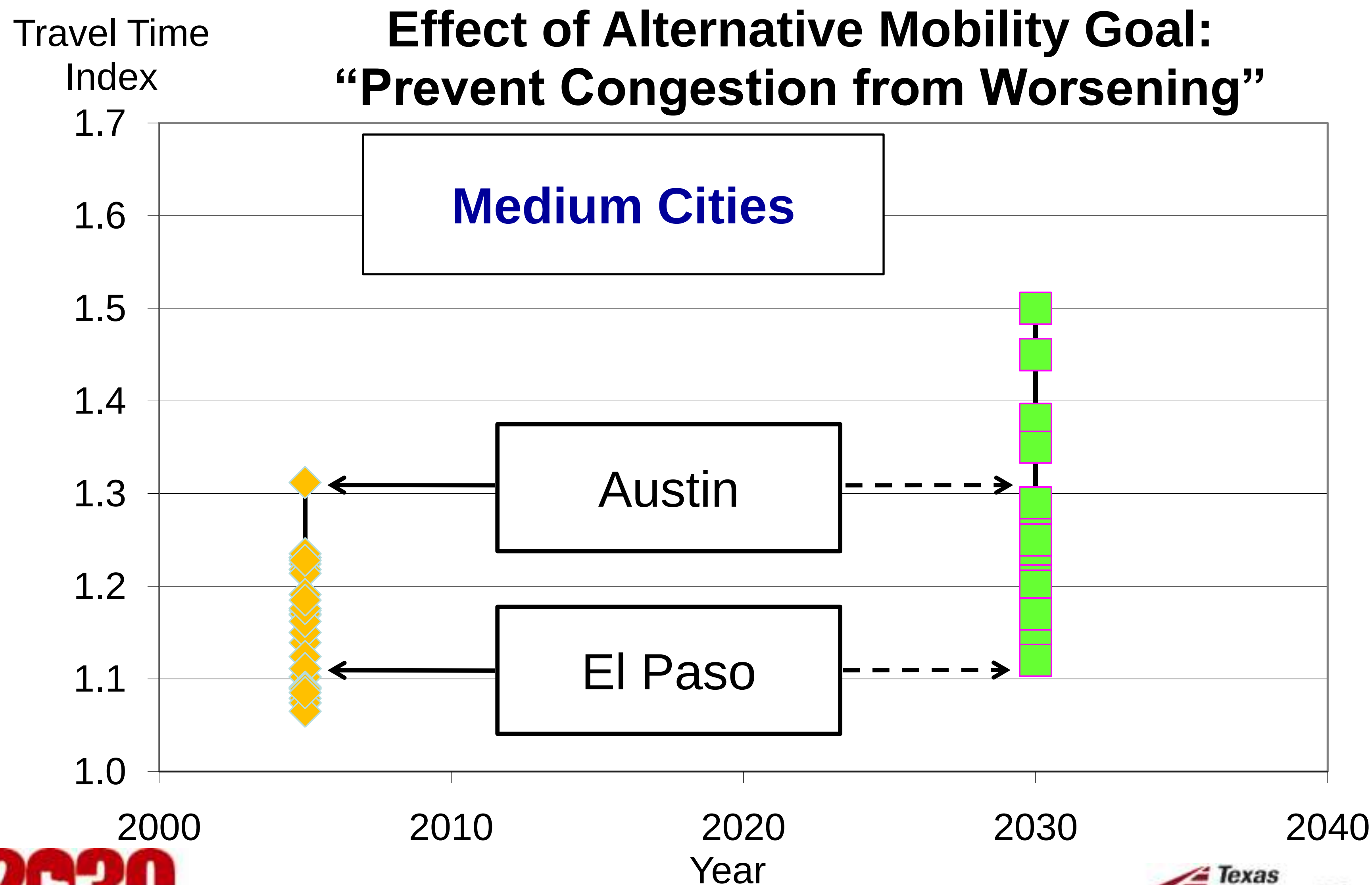
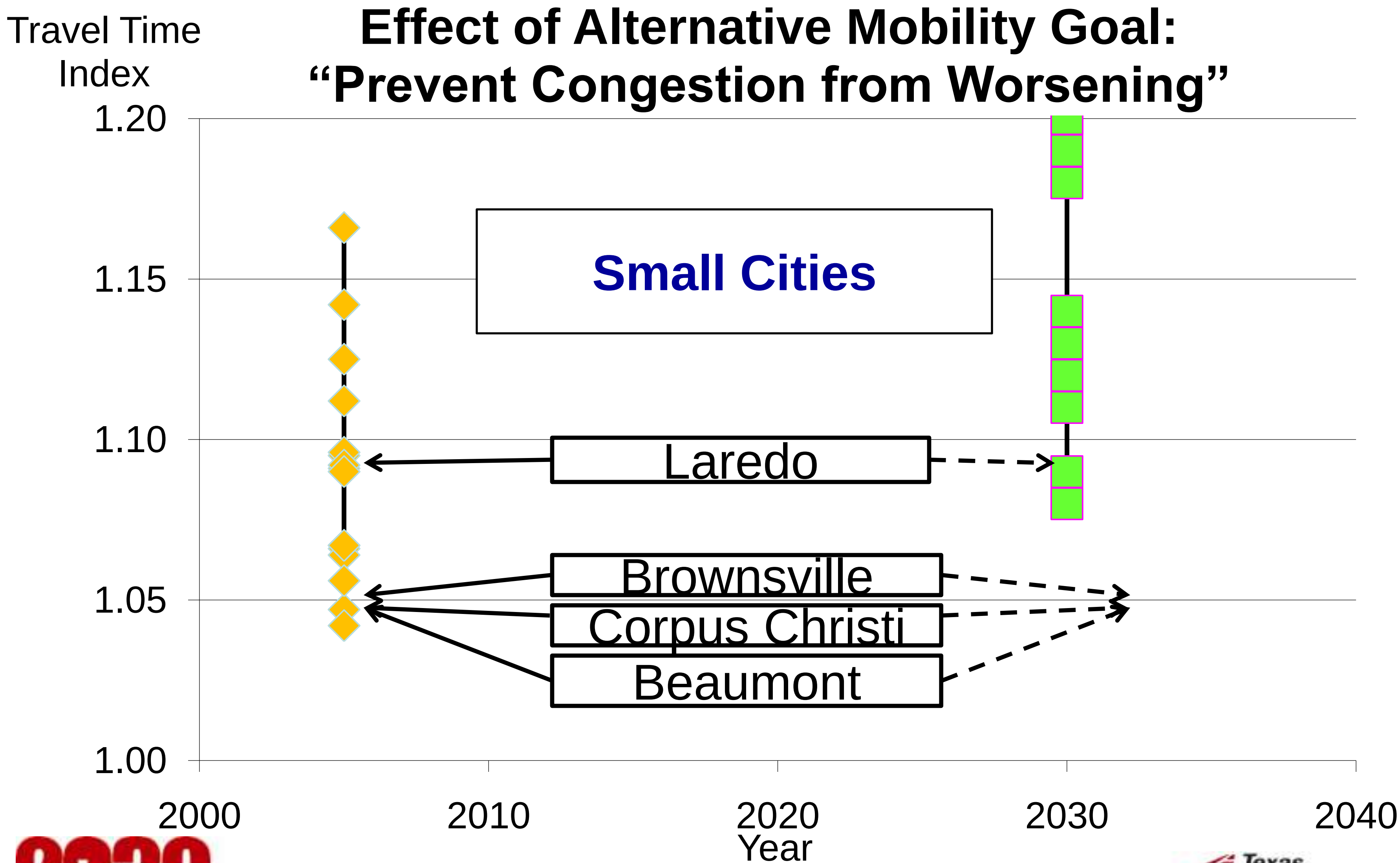


Getting Better by Not Getting Worse:



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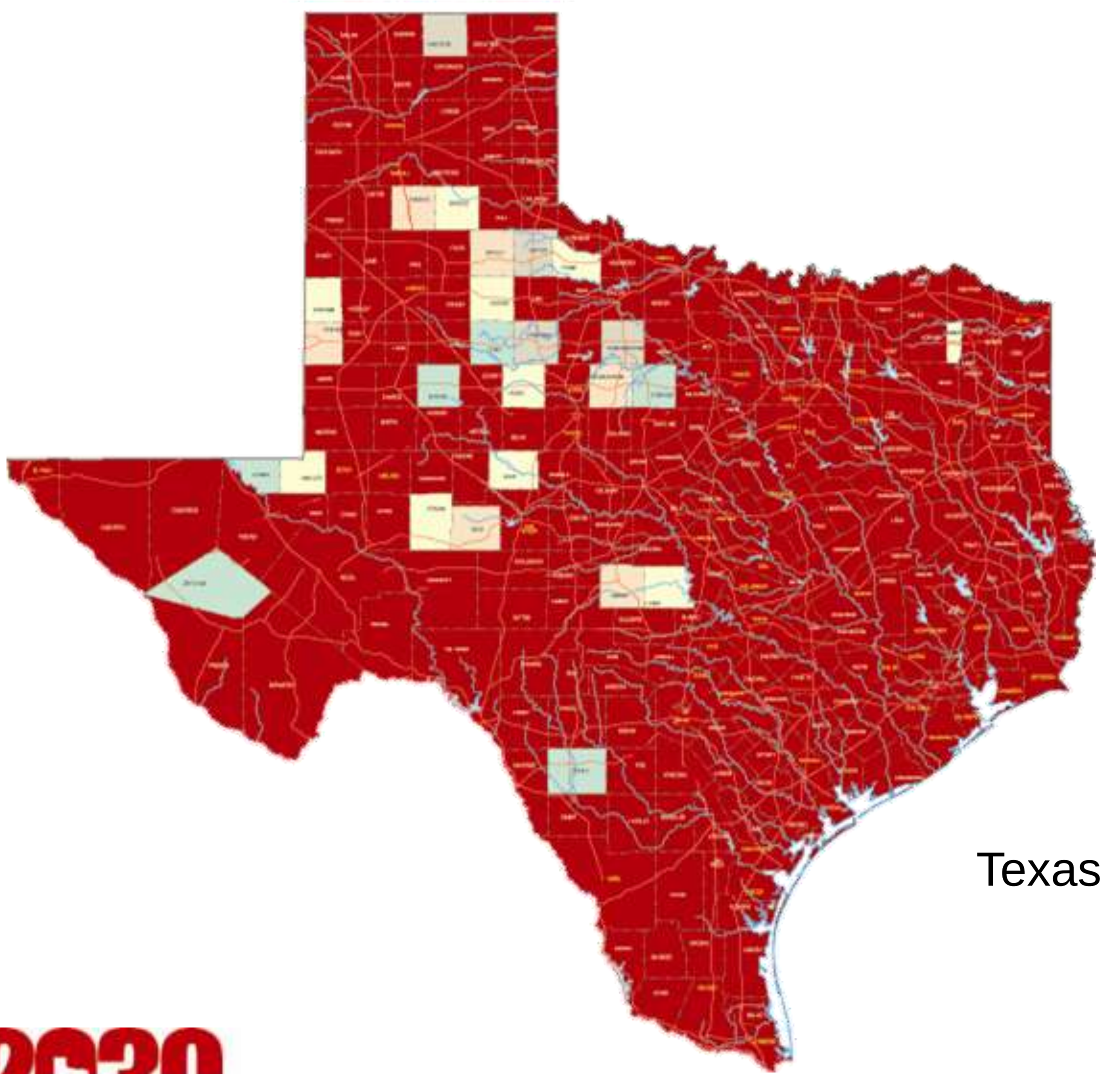
Mobility Scenarios for Rural Areas

- Scenario R1 – Aggressive connectivity and congestion relief
- Scenario R2 – Basic congestion relief and connectivity
- Scenario R3 – Basic congestion relief

What Does This Mean?

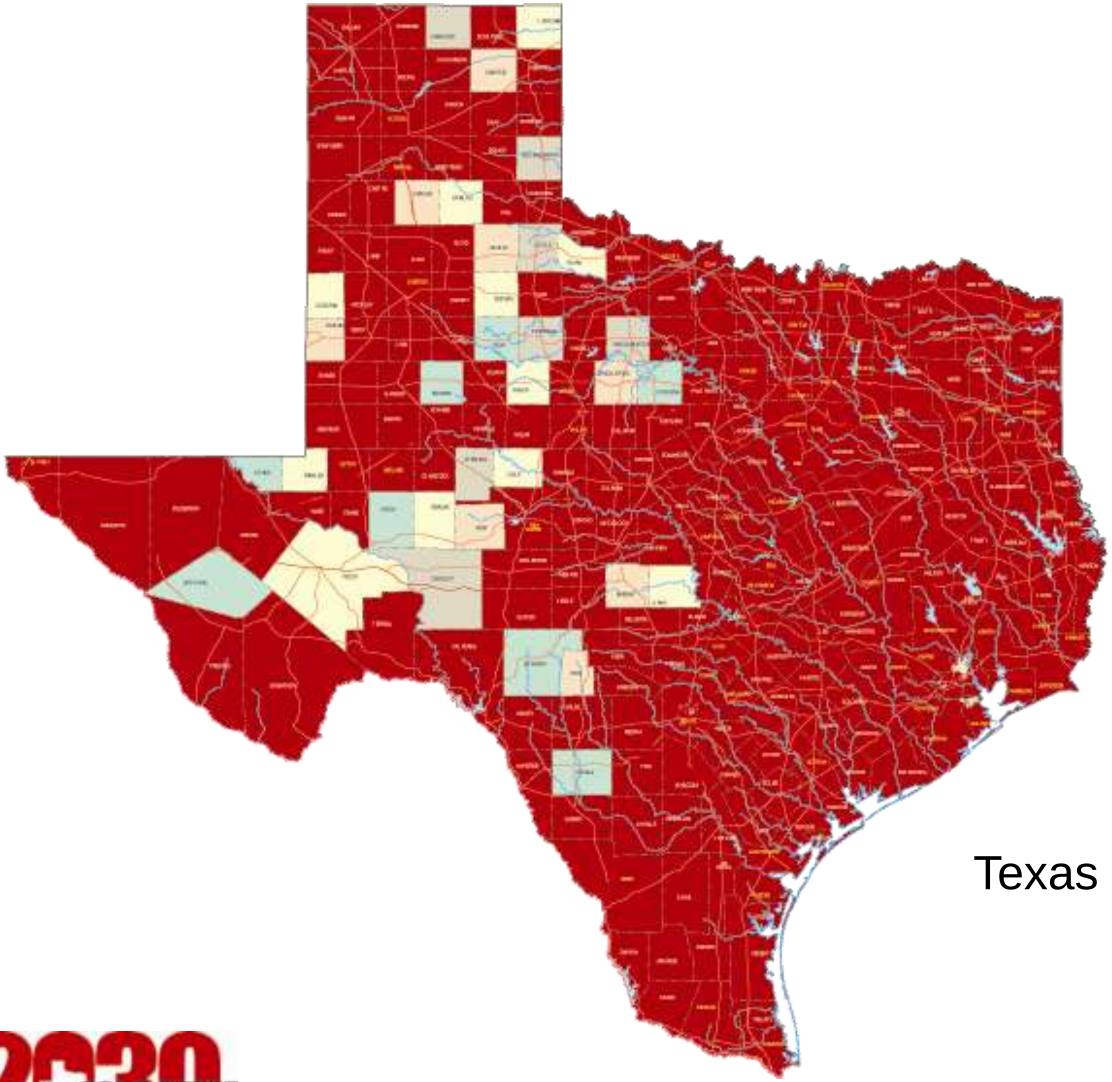
Area Type and Roadway Class	Additional Lane-Miles Required to Meet Scenario Targets		
	R1 - Aggressive Connectivity and Congestion Relief	R2 - Congestion Relief and Basic Connectivity	R3 - Congestion Relief
Small Urban			
Freeway or Tollway	141		70
Major Streets	1,571		1,333
Rural			
Freeway or Tollway	2,073		850
Major Streets	13,379		6,199

What Does This Mean?



Texas Connectivity & Congestion
Scenario A

What Does This Mean?



Texas Connectivity & Congestion
Scenario B

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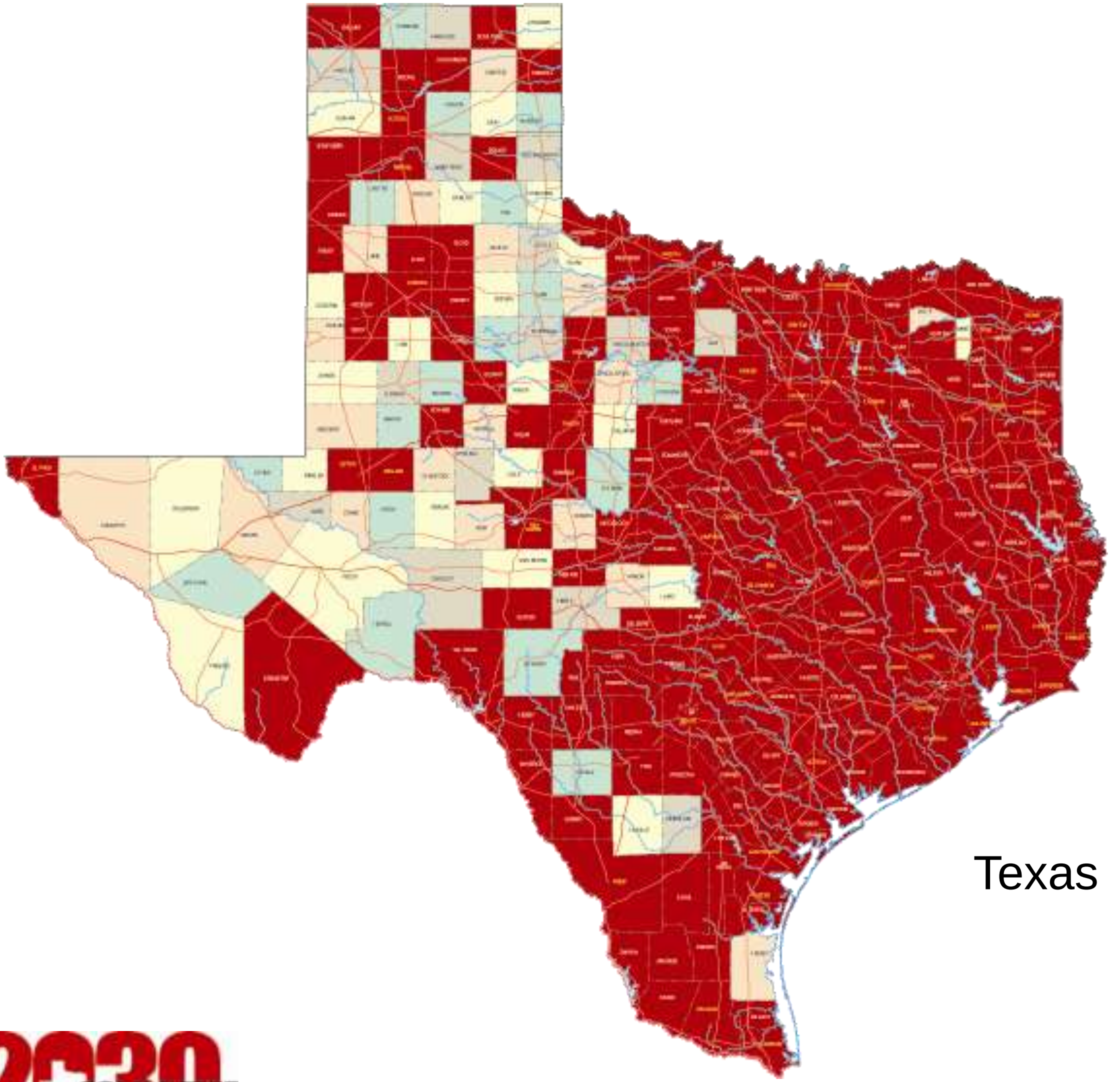
What Does This Mean?



Texas Connectivity & Congestion
Scenario C

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What Types of Mobility Improvements Did the Committee Consider?

A reality:

Modal decisions (autos, bus rapid transit, light rail and commuter rail, etc.) are mostly local and regional decisions.

What Types of Mobility Improvements Did the Committee Consider?

A problem:

If the Committee doesn't know what modal mix will be chosen, how can it assemble an estimate of the total investment required?

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What Types of Mobility Improvements Did the Committee Consider?

An approach:

- Highway planning tools are more advanced
- Roadways will continue to be the most dominant mode for the planning horizon
- Recommend using highway planning methodology as a proxy for investment need.

What Types of Mobility Improvements Did the Committee Consider?

A caveat:

- Does NOT suggest that roadways are the only tool for improving mobility.
- A reliable, consistent measurement
- Mix of modes will be required

How was Investment Need Estimated in Urban Areas?

- Examine current capacity
- Project increased demand
- Increase capacity
  - To eliminate severe congestion (M1)
  - To preserve current mobility levels (M2)
  - To maintain current trends (M3)
- Calculate costs for each alternative

How was Investment Need Estimated in Rural Areas?

- Examine current capacity
- Project increased demand
- Increase capacity
  - To eliminate congestion above the threshold and widen remainder of Trunk System to at least four lanes (R1)
  - To eliminate congestion above the threshold and add lanes to the Trunk System where volumes are greater than 50 percent above threshold (R2)
  - To eliminate congestion above threshold levels (R3)
- Calculate costs for each alternative

What are the Rural Congestion Thresholds to Eliminate Serious Congestion?

Area Type and Roadway Class	Daily Traffic Per Lane Threshold for Serious Congestion
Small Urban	
Freeway or Tollway	16,000
Major Streets	5,500
Rural	
Freeway or Tollway	10,000
Major Roads	4,500

What Does it Cost in Our Metro/Urban Areas?

Mobility Scenario	Additional Travel Capacity Equivalent Needed Statewide (lane-miles)*	Investment Required to Achieve Mobility Goal by 2030
M1	45,210	$236 billion
M2	In progress	In progress
M3	30,094	$146 billion

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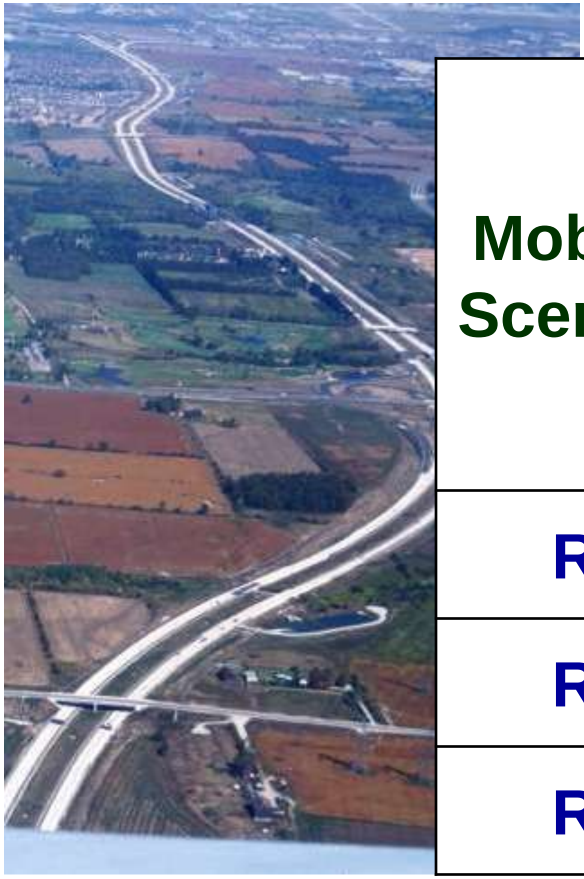
What Does it Cost in Rural Areas?



Mobility Scenario	Additional Travel Capacity Equivalent Needed Statewide (lane-miles)*	Investment Required to Achieve Mobility Goal by 2030
R1	17,164	$21 billion
R2		
R3	8,452	$4 billion

Next Steps

- Complete mobility scenarios **M2** and **R2**
- Finalize all scenarios
- Complete infrastructure needs assessment (pavements and bridges
- Estimate economic impact
- Develop communication tools

Mobility Needs Assessment

(Draft August 2008)

Prepared by

Texas Transportation Institute
College Station, Texas

Texas Transportation Institute
A Member of The Texas A&M University System
Research. Service. Results.

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Mobility Needs Assessment

Summary of Recommendations

(Summary of specific recommendations goes here)

In This Chapter

Overview

Over the last three months, the 2030 Committee has heard testimony from citizens, businesses and public officials statewide. Most of the comments received related to Texans' concerns over current and future transportation mobility. Almost without exception, the concerns expressed regarded the adverse effects of poor mobility on quality of life and economic well being. The 2030 Committee used those expressed concerns as its benchmark in assessing mobility investment needs in Texas.

DRAFT

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Mobility Problems = Billions Lost for Texans

For more than two decades, our state's largest cities have experienced decreased travel mobility that is gradually getting worse. Texas Transportation Institute's (TTI's) *2007 Urban Mobility Report*,[1] which analyzed traffic congestion in 85 urban areas, found that in the nine largest urban areas in Texas, the combined annual congestion cost is almost $6.2 billion. This cost is derived from measuring travel time delay and excess fuel consumption due to traffic congestion when traveling to and from various destinations such as work, school and leisure activities.

Translated into terms all Texans can understand, a billion dollars alone equates to $1,000 per day for 2,737 years, 10 months, and 7 days. The Texas population growth expected over the next 20 years will significantly increase the annual congestion cost in cities, as well as spill over into many adjacent rural areas.

Travel Demand > Transportation System Capacity = Decreased Mobility

Decreased mobility can manifest itself in two ways: increasing congestion and/or inadequacy of connecting routes. Both of these problems result in more hours on the road, which translates into more expensive travel in terms of fuel cost, interference with work, and loss of leisure time with family and friends. Mobility is reduced when travel demand is larger than the available capacity of the transportation system.

Figure 1a illustrates some of the components of travel demand and transportation system capacity. Passenger travel demand includes all modes, but primarily represents passenger vehicles and public transportation such as buses. Though truck and freight vehicles share much of the same transportation system as passenger vehicles, it is important to recognize the unique differences in freight mobility. For example, railroads are a critical component of freight travel in Texas. In summary, the ideal scenario, as Figure 1a shows, is when combined passenger and freight travel demand is in balance with the combined capacity of all modes.

Figure 1b shows what happens when travel demand, fueled primarily by population growth, exceeds transportation system capacity. The result of this scenario is longer travel times, greater fuel consumption and increased costs in time lost and money spent on fuel. Rebalancing travel demand and transportation system capacity requires two actions, as shown in ***Figure 1c***: managing demand and/or increasing capacity.

Descriptions for three projected scenarios showing potential needs for Texas mobility in metropolitan areas are shown in ***Table 1*** and discussed later in this chapter. The three projected scenarios for rural areas are described following the discussion of metropolitan scenarios. While the efficacy and cost of resolving each scenario varies widely, a significant investment will be required.

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[1] *2007 Urban Mobility Report*, Texas Transportation Institute, The Texas A&M University System, College Station, Texas, 2007.

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Our Challenge

The economic development priority goal in *Securing Our Future,*[2] the State of Texas strategic plan, calls for our state's leaders to adequately address transportation needs, including a benchmark of the percent reduction of traffic congestion (using TTI's Travel Time Index).

The challenge presented to the 2030 Committee is to determine a feasible and justifiable estimate of the investment needed to bring travel demand and transportation system capacity more in balance, factoring into consideration estimated population growth in Texas over the next 20 years.

The purpose of this chapter is to provide Texans with an estimate of the investment required to maintain or improve mobility in Texas through the year 2030. The analyses discussed in this chapter will consider several scenarios and estimate the costs and benefits of each. For clarity, the discussion will focus on the following questions:

1. How do we define or describe "mobility"?
2. What procedures did we use to estimate the investment needed?
3. How did we estimate the benefits from each mobility scenario?

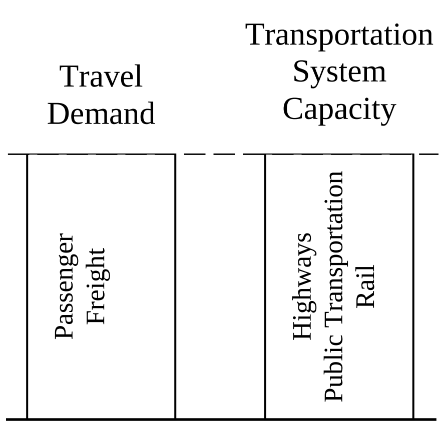

Figure 1a. Demand and Capacity Balanced

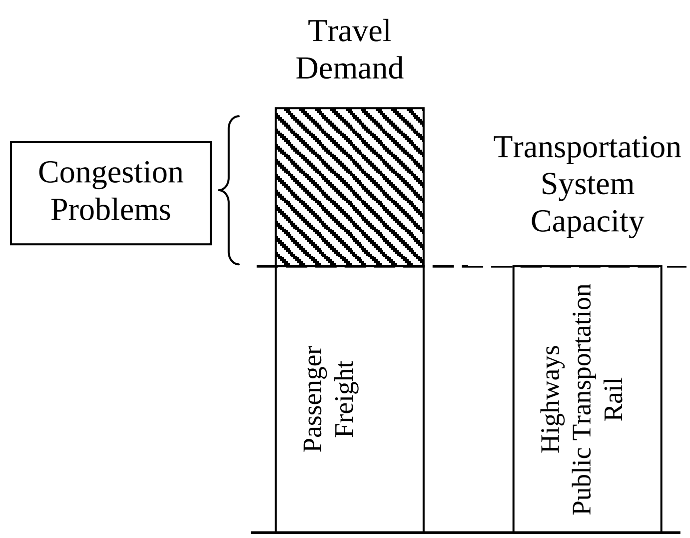

Figure 1b. Demand Significantly Exceeds Capacity

[2] *Securing Our Future, The Statewide Strategic Planning Elements for Texas State Government, 2009-2013* (March 2008).

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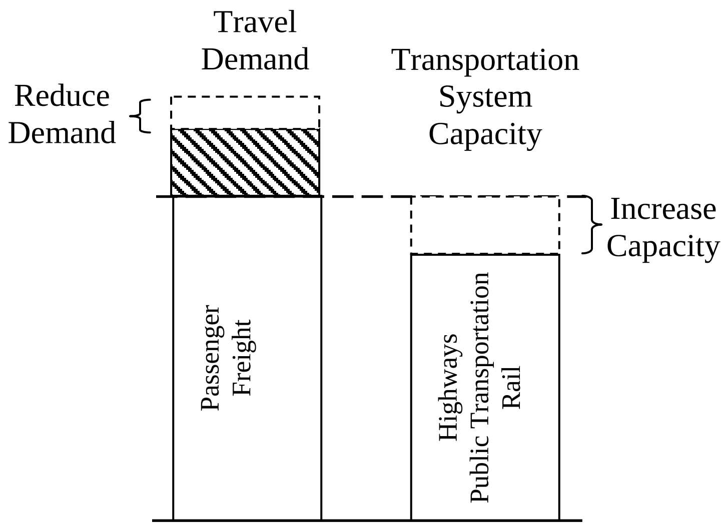

Figure 1c. Strategies for Reducing the Problem

1. How do we define or describe "mobility"?

Mobility may have many definitions, depending on the perspective of the person providing the definition. To the person who lives or works in a metropolitan or urban area of the state, improved mobility would most likely mean "congestion relief." To Texans who live outside metropolitan areas, improved mobility might mean improved intercity travel (on major corridors or between towns or counties), connections that open strategic economic opportunities, or access to emergency medical care or other services. To businesses that rely on the receipt or delivery of goods, it could mean a combination of urban congestion relief and improved rural connectivity, or it could mean increased availability of non-highway modes such as rail or water.

To provide a meaningful estimate of public investment needed by 2030, it is necessary to adopt two simplifying definitions:

- Congestion relief: For metropolitan and urban areas of the state, we treat improved mobility as "congestion relief," measured by average speed on freeways and major arterial streets.
- Improved connectivity: For rural areas of the state, we treat improved mobility as a phased implementation of the Texas Trunk System, a network of highways designated in the 1990s to assure maximum availability of four-lane highways statewide. The term "phased implementation" means that segments of the Trunk System where congestion is forecasted by 2030 are assumed to be the initial investments, followed by less congested segments.

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These two definitions of improved mobility are important because there are analytical tools and data in place that will allow for consistent, objective estimates statewide (rather than a compilation of regional "wish lists"). Thus, the resulting overall investment required will reflect a statewide estimate based on common assumptions. This document refers to these measures in combination as "general mobility."

Unfortunately, analytical tools to isolate "freight mobility" and measure it separately in a similar consistent, objective manner are not yet available. Freight mobility is more complex, because it involves both public and private modes, as well as transfer between modes for some shipments. When general mobility is used as a substitute for freight mobility, useful information is likely lost, such as the need for intermodal facilities and the potential for rail investment to accommodate much of the growing freight demand. As transportation research efforts develop such analytical tools in the near future, they will be of great value in assessing freight mobility needs.

For the time frame under consideration here, 2009-2030, it is likely that freight movement by truck will continue to dominate in Texas. Therefore, the estimates of general mobility undertaken for the metropolitan and rural areas of the state are assumed to provide a reasonable approximation of freight mobility as well.

How does this 2030 mobility needs assessment relate to other similar efforts over the last few years?

The 2030 mobility needs assessment supersedes all prior studies. The 2030 study builds on all prior efforts and adds scenarios not previously considered[3]. Without the contributions of the prior studies, the 2030 effort would not have been possible to accomplish within the short time frame available. All of the authors or contributors from the prior studies have participated in the development of the 2030 needs assessment or have reviewed and concurred in their relevant sections.

What mobility scenarios were considered?

The 2030 Committee considered three scenarios each to describe metropolitan (urban) and rural mobility.

<u>Metropolitan Mobility Scenarios</u>

For the metropolitan and urban areas, the 2030 Committee considered three scenarios. In order of total investment cost to implement the scenarios, high to low, they are:

- Scenario M1: eliminate serious congestion by 2030,
- Scenario M2: prevent congestion from worsening, and
- Scenario M3: continue investing at recent trend levels.

[3] Three such assessments include one done by TxDOT, the Governor's Business Council and a recent study by Cambridge Systematics (under contract to TxDOT). The TxDOT needs value is referenced in the strategic plan available at ftp://ftp.dot.state.tx.us/pub/txdot-info/lao/strategic_plan2007.pdf. The Governor's Business Council study is available at http://www.texasgbc.org/Reports3.htm. The Cambridge Systematics report is available at http://www.txdot.gov/publications/government_and_public_affairs/needs_study_needs.pdf.

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The Texas State Demographer[4] has published official population projections that show growth of 20 million people by 2030, so mobility investments must account for the travel of existing Texans plus another 20 million Texans. In the face of that projection, any of the scenarios—including simply preventing congestion from worsening—will be expensive.

Table 1. Description of Metropolitan Mobility Scenarios

Mobility Scenario	Description	Resulting Approx. Ave. Peak-Hour Speeds
M1	Eliminate serious congestion	Freeways: 55+ mph Arterials: 35+ mph
M2	Prevent worsening of existing congestion	Freeways 40-50 mph Arterials 20-30 mph
M3	Continue typical investment levels	Freeways 30-40 mph Arterials 15-20 mph

Scenario M1 represents the ideal condition of eliminating serious congestion. While this scenario may be financially beyond reach, it is the goal that previous studies addressed, so for continuity we believe it needs to be included in this study.

Scenario M2 represents what the 2030 Committee believes is the minimum acceptable level of investment. While simply "holding our own" over the next two decades may not be very appealing to Texans, it will be a financial challenge and is critical to our state's economic competitiveness. Preventing congestion from worsening will be a challenge, because even though state and local governments at all levels have invested heavily over the last 20 years, congestion has still increased. The Travel Time Index shows that the average increase nationwide has been about 250%. To "hold our own" in Texas would mean an increase in transportation investment to prevent worsening of existing congestion.

The other states and cities that are considered economic competitors of Texas and its cities will be facing challenges of increased congestion as well. If Texas is simply able to prevent congestion from worsening, the state and Texas cities would compare favorably to other locations across the country, which the committee presumes would bode well for Texas economically.

Scenario M3 continues transportation system investment based on recent trend levels, which would be associated with current and predictable funding sources. The committee recognizes that changes at the federal level may be inevitable, but this scenario represents something of a "base case" against which to measure other options. This is consistent with financially constrained metropolitan and urban transportation plans.

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[4] Population projections for the State of Texas are available at http://txsdc.utsa.edu/tpepp/2006projections/.

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Rural Mobility Scenarios

For the rural areas, the 2030 Committee also considered three scenarios. The scenarios are described below from the most aggressive mobility and connectivity target to the most conservative. The analysis used multiple techniques to identify sections that needed treatment, but segregated treated sections from untreated roads at each step to eliminate "double-counting" of needs.

Scenario R1: Aggressive Connectivity and Congestion Relief – This scenario targets congested roads and the population center connectivity system. Roadways that will have traffic volume in 2030 above the congestion thresholds were identified. Lanes were added in increments of two (one in each direction) until the volume per lane was below the threshold. In addition, two levels of road addition were applied to sections of the Texas Trunk System road network. The Trunk System is composed of important regional and interregional connector routes. These roads ensure that every town with a population above 20,000, marine ports and points of entry will be served by a major designated highway. Two lanes were added to any Trunk System road that had volumes in excess of half the congestion standard. In addition, any Trunk System road that was only two lanes wide received two additional lanes, so that all Trunk System roads were at least four lanes wide.

Scenario R2: Basic Congestion Relief and Connectivity – Roadways that were estimated to be congested in 2030 were identified and lanes added to reduce the volume per lane below the threshold levels. Texas Trunk System roads with volumes above 50% of the congestion threshold for that road type received two additional lanes.

Scenario R3: Basic Congestion Relief – Roadways that were estimated to be congested in 2030 were identified and lanes added to reduce the volume per lane below the threshold levels.

In subsequent sections of this chapter, we will describe the estimated investment costs and resulting economic benefits of implementing each scenario.

What types of mobility improvements did the committee consider?

Many Texans would first think of building more highways or adding more lanes to existing highways as the primary way to improve mobility. Highway improvements will no doubt be a very large part of future mobility improvements, but there are numerous other approaches that will certainly play key roles. There are several forms of public transportation options that will be critical to future passenger mobility: bus rapid transit, light rail and commuter rail, for example. In addition, future mobility improvements will likely include incentives to reduce travel demand by telecommuting, flexible schedules or delaying discretionary trips to off-peak times of day.

The 2030 Committee has neither the ability nor the authority to estimate what mix of mobility improvements is ideal statewide or for any individual community. Decisions such as these are delegated by law and policy to the local and regional transportation entities. As a result, one of the challenges the committee faced was: "If we don't know how much of each type of mobility improvement is appropriate, how can we assemble anything approaching a reasonable estimate of total investment required?"

Because the tools and data for long-range highway planning are much more advanced than for any other mode, because the highway-based modes for passenger and freight travel are likely to continue to dominate for most of the next two decades, and because the committee desired a consistent and objective methodology that could be applied statewide, the committee chose to have the technical team use the highway planning methodology to estimate the total investment needed. This approach likely produces a conservative (low) estimate for each mobility scenario.

In no way should this approach suggest that the committee is recommending thousands of miles of highways or that highways are the best or only tools for improving mobility. It is merely a reliable, consistent measurement tool to aid in estimating the total amount of investment needed – in all modes – if we want to improve mobility. In the following section of this chapter, the methods used will be explained in more detail.

2. What procedures did we use to estimate the investment needed?

For consistency among the scenarios, the investment required for each of the mobility scenarios was analyzed by looking at available capacity and simulating increased capacity until congestion was eliminated. As noted earlier in this chapter, there are two definitions for congestion mitigation in metro/urban and rural areas. For metropolitan areas the principal goal was congestion relief, and for rural areas the goal was augmented with connectivity needs.

How were metro and urban area needs estimated?

The technical team from TTI worked with the metropolitan planning organizations (MPOs) throughout Texas to gather data for estimating needs in the metropolitan areas. MPOs have a working travel demand computer model that supports their long-range planning efforts. With a few exceptions, these computer models are consistent among all the MPOs. Using the results from individual MPO travel demand models and demographic data for each MPO, TTI ran its own congestion reduction utility model. This model enabled TTI to estimate additional capacity needed to eliminate congestion for each MPO and each mobility scenario, based on that MPO's forecasted population. Once the forecasted amount of congestion in each metro and urban area was estimated, TTI calculated the cost of eliminating that congestion (in 2008 dollars).

For example, **Scenario M1** calls for "eliminating serious congestion," which, in technical terms, means any location where the total peak-hour demand is greater than existing highway capacity. In traveler terms, serious congestion means traffic moving at 35 mph or less on freeways and 20 mph or less on arterials. TTI calculated the additional capacity needed to match the forecasted demand, which would raise the travel speeds to about 50-60 mph. For each scenario, the total amount of additional roadway capacity required was multiplied by average unit construction costs by roadway type, area type and region to produce a total dollar estimate. Finally, those estimates were accumulated for all 25 MPOs to produce the metro and urban portions of the needs assessment.

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For **Scenario M2**, TTI reran the congestion reduction utility model described above, but this time to reflect congestion levels typical in current conditions. To prevent congestion from worsening, the additional capacity must match the forecasted growth in traffic for each MPO. This result was then converted to total investment using current average actual costs of construction.

Finally, TTI used the additional capacity associated with the continuation of the recent trends investment to produce 2030 mobility estimates for **Scenario M3**.

Table 2 shows the level of investment needed for each of the three metropolitan mobility scenarios.

Table 2. Estimated Metropolitan Investment Needed by Mobility Scenario

Mobility Scenario	Additional Travel Capacity Equivalent Needed Statewide (lane-miles)*	Investment Required to Achieve Mobility Goal by 2030
M1	45,210	$236 billion
M2	In progress	In progress
M3	30,094	$146 billion

** NOTE: Neither the 2030 Committee nor the technical team from TTI is suggesting that constructing additional highway lane-miles is the solution in any part of the state. This is simply a tool for approximating the level of investment needed, regardless of the form of the solution. The actual mix of solutions will vary across all of the MPOs.*

How were rural needs estimated?

For the non-urban areas, the technical team used a similar methodology to that used for metropolitan areas**. Scenario R1** is the ideal—elimination of non-urban congestion and widening of the remainder of the Texas Trunk System to at least four lanes, so the team calculated the amount of additional needed to reach that goal. For **Scenarios R2** and **R3**, TTI used year 2030 travel volume forecasts and calculated the amount of highway capacity needed to address the congestion projected for that scenario. For each scenario, the total amount of additional roadway capacity required was multiplied by average unit construction costs by roadway type, area type and region to produce a total dollar estimate.

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Table 3. Estimated Rural Investment Needed by Mobility Scenario

Mobility Scenario	Additional Travel Capacity Equivalent Needed Statewide (lane-miles)*	Investment Required to Achieve Mobility Goal by 2030
R1	17,164	$21 billion
R2	14,237	
R3	8,452	$4 billion

** NOTE: Neither the 2030 Committee nor the technical team from TTI is suggesting that constructing additional highway lane-miles is the solution in any part of the state. This is simply a tool for approximating the level of investment needed, regardless of the form of the solution. The actual mix of solutions will vary across all of the MPOs.*

3. How did we estimate the benefits from each mobility scenario?

(Economic analysis pending committee decisions on mobility scenarios)

TxDOT 2030 Bridge Needs Assessment Update meeting 8/21/2008

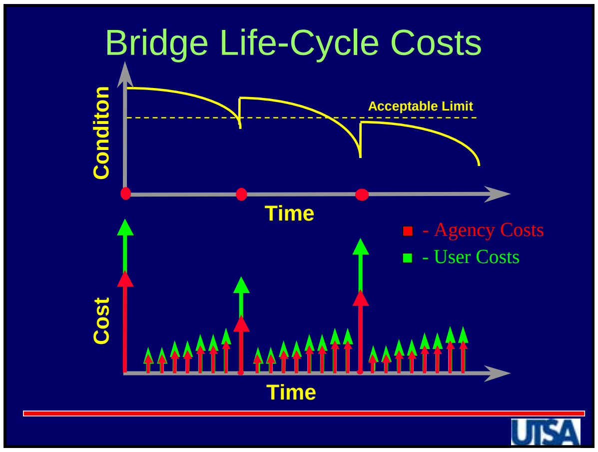
José Weissmann, Karl Frank and Rob Harrison

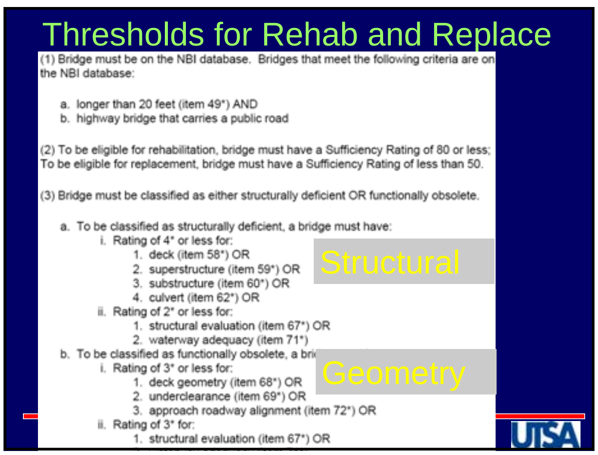
Bridge Chapter Outline

1. NBI data with nationwide summaries and where Texas stands (6/24/08)
2. Federal funding (6/24/08)
3. TxDOT data and report on needs (6/24/08)
4. TxDOT unit costs for rehab and replace (7/24/08)
5. Future needs framework (8/21/08)
6. Deterioration models and thresholds for rehab and replace (8/21/08)
7. Expansion factors and mobility needs
8. Results

Future needs framework

- User Costs Drive Expansion
  - Travel Time
  - Vehicle Operating Costs
  - Accidents
  - Environmental
- Agency Costs
  - Maintenance
  - Rehabilitation
  - Replacement
  - Expansion





Thresholds for Rehab and Replace

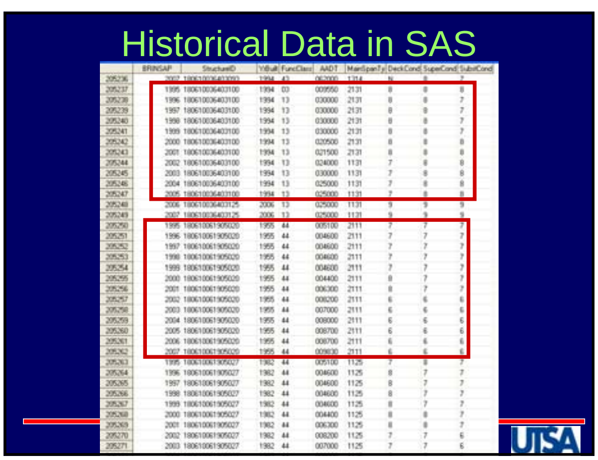
(1) Bridge must be on the NBI database. Bridges that meet the following criteria are on the NBI database:

a. longer than 20 feet (item 49*) AND
b. highway bridge that carries a public road

(2) To be eligible for rehabilitation, bridge must have a Sufficiency Rating of 80 or less; To be eligible for replacement, bridge must have a Sufficiency Rating of less than 50.

(3) Bridge must be classified as either structurally deficient OR functionally obsolete.

a. To be classified as structurally deficient, a bridge must have:
   i. Rating of 4* or less for:
      1. deck (item 58*) OR
      2. superstructure (item 59*) OR
      3. substructure (item 60*) OR
      4. culvert (item 62*) OR
   ii. Rating of 2* or less for:
      1. structural evaluation (item 67*) OR
      2. waterway adequacy (item 71*)
b. To be classified as functionally obsolete, a bri
   i. Rating of 3* or less for:
      1. deck geometry (item 68*) OR
      2. underclearance (item 69*) OR
      3. approach roadway alignment (item 72*) OR
   ii. Rating of 3* for:
      1. structural evaluation (item 67*) OR



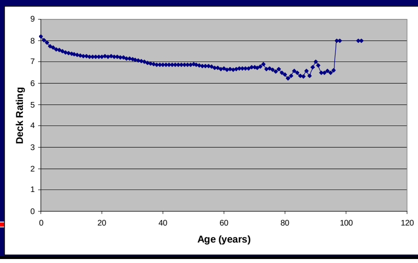
Historical Data in SAS

	BRINSAP	StructureID	YrBuilt	FuncClass	AADT	MainSpanTy	DeckCond	SuperCond	SubstCond
205236	2007	180610036403090	1994	43	062000	1314	N	8	7
205237	1995	180610036403100	1994	03	009550	2131	8	8	8
205238	1996	180610036403100	1994	13	030000	2131	8	8	7
205239	1997	180610036403100	1994	13	030000	2131	8	8	7
205240	1998	180610036403100	1994	13	030000	2131	8	8	7
205241	1999	180610036403100	1994	13	030000	2131	8	8	7
205242	2000	180610036403100	1994	13	020500	2131	8	8	8
205243	2001	180610036403100	1994	13	021500	2131	8	8	8
205244	2002	180610036403100	1994	13	024000	1131	7	8	8
205245	2003	180610036403100	1994	13	030000	1131	7	8	8
205246	2004	180610036403100	1994	13	025000	1131	7	8	8
205247	2005	180610036403100	1994	13	025000	1131	7	8	8
205248	2006	180610036403125	2006	13	025000	1131	9	9	9
205249	2007	180610036403125	2006	13	025000	1131	9	9	9
205250	1995	180610061905020	1955	44	005100	2111	7	7	7
205251	1996	180610061905020	1955	44	004600	2111	7	7	7
205252	1997	180610061905020	1955	44	004600	2111	7	7	7
205253	1998	180610061905020	1955	44	004600	2111	7	7	7
205254	1999	180610061905020	1955	44	004600	2111	7	7	7
205255	2000	180610061905020	1955	44	004400	2111	8	7	7
205256	2001	180610061905020	1955	44	006300	2111	8	7	7
205257	2002	180610061905020	1955	44	008200	2111	6	6	6
205258	2003	180610061905020	1955	44	007000	2111	6	6	6
205259	2004	180610061905020	1955	44	008000	2111	6	6	6
205260	2005	180610061905020	1955	44	008700	2111	6	6	6
205261	2006	180610061905020	1955	44	008700	2111	6	6	6
205262	2007	180610061905020	1955	44	009830	2111	6	6	6
205263	1995	180610061905027	1982	44	005100	1125	7	8	7
205264	1996	180610061905027	1982	44	004600	1125	8	7	7
205265	1997	180610061905027	1982	44	004600	1125	8	7	7
205266	1998	180610061905027	1982	44	004600	1125	8	7	7
205267	1999	180610061905027	1982	44	004600	1125	8	7	7
205268	2000	180610061905027	1982	44	004400	1125	8	8	7
205269	2001	180610061905027	1982	44	006300	1125	8	8	7
205270	2002	180610061905027	1982	44	008200	1125	7	7	6
205271	2003	180610061905027	1982	44	007000	1125	7	7	6

Deterioration Models

a. To be classified as structurally deficient, a bridge must have:
   i. Rating of 4* or less for:
      1. deck (item 58*) OR
      2. superstructure (item 59*) OR
      3. substructure (item 60*) OR
      4. culvert (item 62*) OR
   ii. Rating of 2* or less for:
      1. structural evaluation (item 67*) OR
      2. waterway adequacy (item 71*)

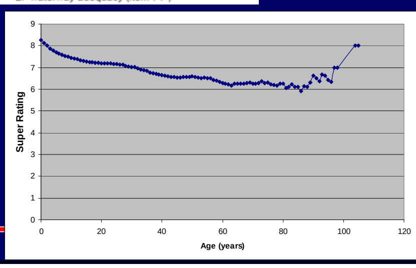
Item 58 On-System



Deterioration Models

a. To be classified as structurally deficient, a bridge must have:
   i. Rating of 4* or less for:
      1. deck (item 58*) OR
      2. superstructure (item 59*) OR
      3. substructure (item 60*) OR
      4. culvert (item 62*) OR
   ii. Rating of 2* or less for:
      1. structural evaluation (item 67*) OR
      2. waterway adequacy (item 71*)

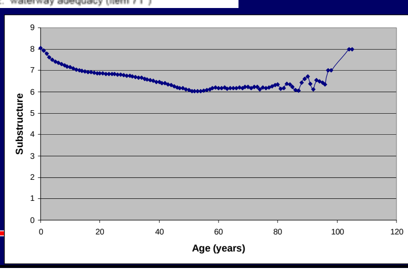
Item 59 On-System



Deterioration Models

a. To be classified as structurally deficient, a bridge must have:
   i. Rating of 4* or less for:
      1. deck (item 58*) OR
      2. superstructure (item 59*) OR
      3. substructure (item 60*) OR
      4. culvert (item 62*) OR
   ii. Rating of 2* or less for:
      1. structural evaluation (item 67*) OR
      2. waterway adequacy (item 71*)

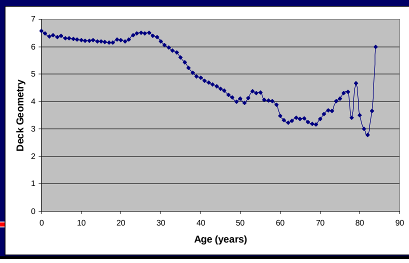
Item 60 On-System



Deterioration Models

b. To be classified as functionally obsolete, a bridge must have:
   i. Rating of 3* or less for:
      1. deck geometry (item 68*) OR
      2. underclearance (item 69*) OR
      3. approach roadway alignment (item 72*) OR
   ii. Rating of 3* for:
      1. structural evaluation (item 67*) OR
      2. waterway adequacy (item 71*)

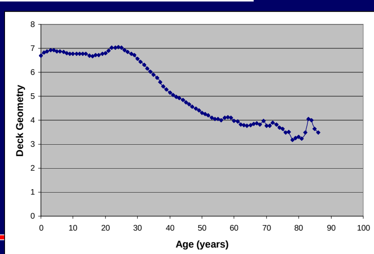
Item 68 On-System Urban



Deterioration Models

b. To be classified as functionally obsolete, a bridge must have:
   i. Rating of 3* or less for:
      1. deck geometry (item 68*) OR
      2. underclearance (item 69*) OR
      3. approach roadway alignment (item 72*) OR
   ii. Rating of 3* for:
      1. structural evaluation (item 67*) OR
      2. waterway adequacy (item 71*)

Item 68 On-System Rural



Future Developments

- Develop future needs for existing bridges
- Integrate with mobility analysis (expansion factors)

2030 Pavement Needs Assessment

1. What type of treatment and how often?
    - Existing State mileage;
    - Mobility Study added mileage.
2. Treatment costs
3. Analysis software status
4. Draft Pavement Needs Report Outline
5. 2030 Committee Q&A

2030 Pavement Needs Assessment

1. What type of treatment and how often?
    - Existing State mileage;
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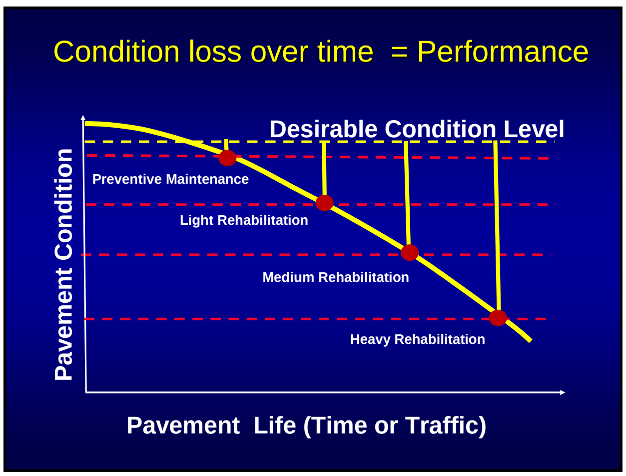
1. Do Nothing


2. Preventive Maintenance


3. Light Rehabilitation


4. Medium Rehabilitation


5. Heavy Rehab / Reconstruction


Condition loss over time = Performance
Desirable Condition Level
Preventive Maintenance
Light Rehabilitation
Medium Rehabilitation
Heavy Rehabilitation
Pavement Condition
Pavement Life (Time or Traffic)

2030 Pavement Needs Assessment

- Establish criteria that will trigger a given treatment level.
- Use PMIS data to develop performance trends by District.
- Predict future pavement condition.
- Identify treatments based on predicted Condition and trigger values.

Maintenance vs. Rehabilitation

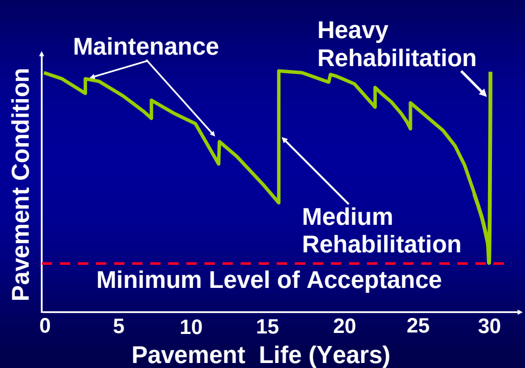


Table showing Example Treatment Costs Calcs.

District	Route	Lane-miles	Treatment	Trtmt Cost	Summary
Paris	IH 30	140.0	Nothing	$0	$0
Paris	IH 30	40.0	PM	$20,000	$8,000,000
Paris	IH 30	20.0	Light Rb	$80,000	$16,000,000
Paris	IH 30	20.0	Medium Rb	$200,000	$4,000,000
Paris	IH 30	20.0	Heavy Rb	$400,000	$8,000,000
		240.0	Total Need = $36,000,000		

2030 Pavement Needs Assessment

1. What type of treatment and how often?

   Existing State mileage;

   - Mobility Study added mileage.

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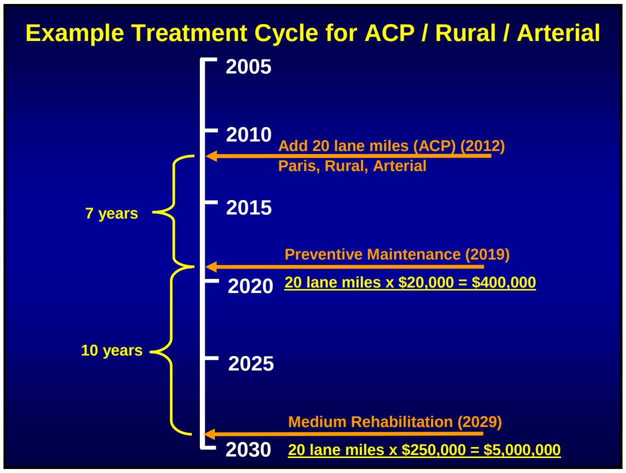
Added Lane Miles from the TTI Mobility Study

TxDOT District	Rural or Urban	Functional Class	Lane-miles (Year xxxx)
1	Rural	1-Highway	20
1	Rural	2-Arterial	100
1	Small Urban	16-Arterial	15
2	Urban	12-Freeway	200
2	Urban	14-Arterial	350
2	Rural	2-Arterial	20
3	Large Urban	14-Arterial	40
4	Large Urban	11-Interstate	15
4	Large Urban	16-Arterial	50
4	Rural	2-Arterial	30
etc			
etc			
etc			

2030 Pavement Needs Assessment

- Determine whether ACP or PCC pavement;
- Determine how to distribute added mileage by year.
- Apply treatments to added mileage based on a treatment cycle (inventory approach).
- Treatment cycle would depend on ACP or PCC, rural / urban, functional class and other factors.



2030 Pavement Needs Assessment

1. What type of treatment and how often?
   - Existing State mileage;
   - Mobility Study added mileage.
2. Treatment costs

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AGC Pavement Treatment Cost Spreadsheet

2030 Pavement Needs Assessment

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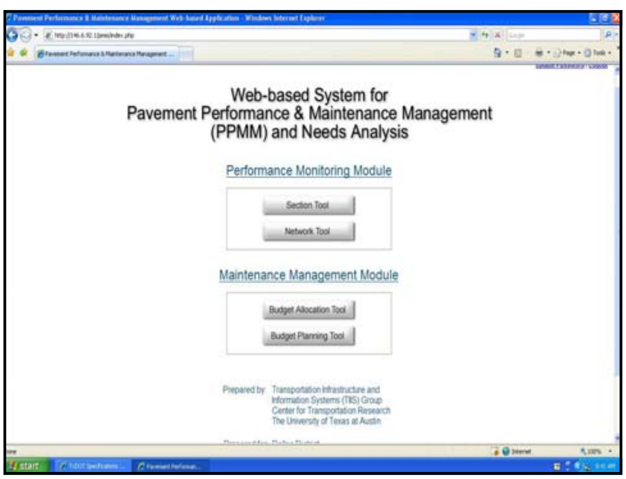

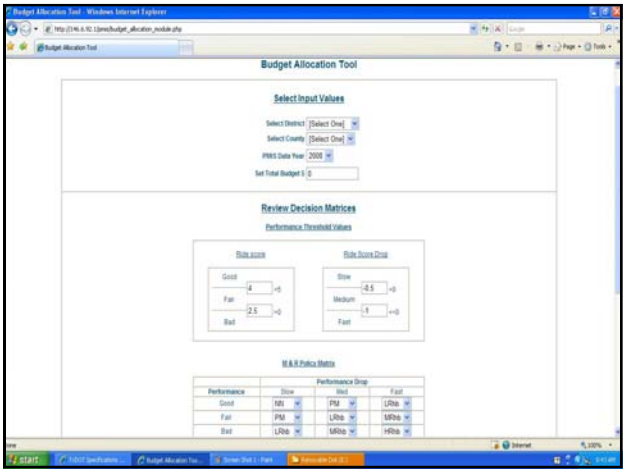
Budget Allocation Tool - Windows Internet Explorer
Budget Allocation Tool
Budget Allocation Tool
Select Input Values
Select District [Select One]
Select County [Select One]
PMIS Data Year 2008
Set Total Budget $ 0
Review Decision Matrices
Performance Threshold Values
Ride score
Ride Score Drop
Good
4
Fair
2.5
Bad
Slow
-0.5
Medium
-1
Fast
M & R Policy Matrix
Performance Drop
Performance
Slow
Med
Fast
Good
NN
PM
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PM
LRhb
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HRhb
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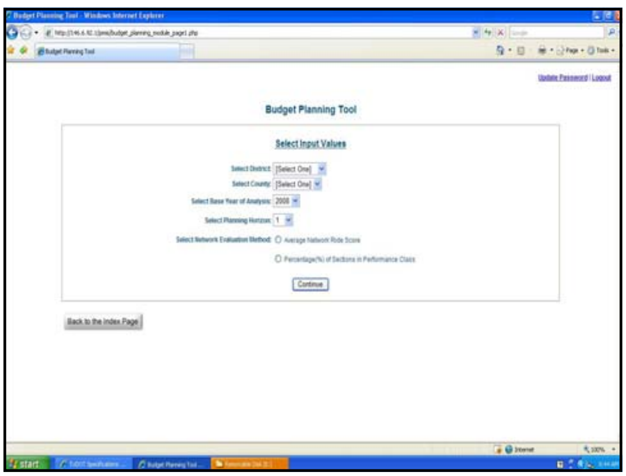
start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Budget Planning Tool
Update Password | Logout
Budget Planning Tool
Select Input Values
Select District: [Select One]
Select County: [Select One]
Select Base Year of Analysis: 2008
Select Planning Horizon: 1
Select Network Evaluation Method: Average Network Ride Score
Percentage(%) of Sections in Performance Class
Continue
Back to the Index Page
Internet
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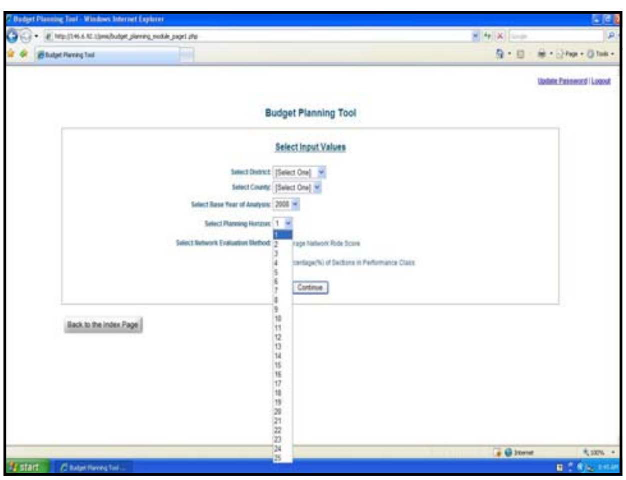
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Budget Planning Tool
Update Password | Logout
Budget Planning Tool
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Select County: [Select One]
Select Base Year of Analysis: 2008
Select Planning Horizon: 1
Select Network Evaluation Method:
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2030 Pavement Needs Assessment

1. What type of treatment and how often?
   - Existing State mileage;
   - Mobility Study added mileage.
2. Treatment costs
3. Analysis software status
4. Draft Pavement Needs Report Outline
5. 2030 Committee Q&A

2030 Pavement Needs Assessment

Draft Outline for Pavement Needs Estimate Report

1. Introduction and Statement of Objectives
2. Overview of TxDOT Pavement System
3. Pavement Condition Evaluation Methods
4. Pavement Treatment Levels and Triggers
   Existing TxDOT Pavement System
   Mobility Study – Added Mileage
5. Pavement Treatment costs

2030 Pavement Needs Assessment

Draft Outline for Pavement Needs Estimate Report

6. Determining Pavement Treatment Needs
   Existing TxDOT Pavement System
   Mobility Study – Added Mileage
7. Impact of different System Goals on Needs
8. Impact of limited funding on System Condition
9. Summary of 2030 Pavement Needs
10. Conclusions and Recommendations

2030 Pavement Needs Assessment

1. What type of treatment and how often?
   - Existing State mileage;
   - Mobility Study added mileage.
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Thank you!