Government & Public Affairs Division

Policy Research Paper

Moving Texas To The 21st Century:

A Report on Transportation Demand, Estimated Investment Needs, and Funding Options for Texas

Presented to
The Honorable Eliot Shapleigh
Texas Senate

Principal Authors:
Cambridge Systematics, Inc.
Dye Management Group, Inc.
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Texas Department of Transportation
125 East 11th Street
Austin, Texas 78701
512-463-6086
512-463-9389 fax
www.TxDOT.gov

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Moving Texas To The 21st Century

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Executive Summary

In December 2007, Texas State Senator Eliot Shapleigh asked the Texas Department of Transportation (TxDOT) to prepare a "moving Texas to the 21st century" report that "clearly lays out the facts and all options available to us to pay for progress." This report meets that request. TxDOT contracted with Cambridge Systematics, Inc. and Dye Management Group, Inc. to produce the information cited here.

The funding options presented in this report are not an exhaustive list. The analysis performed by Dye Management Group takes a simple approach to provide a starting point for further discussion of each funding option.

This analysis indicates that Texas should be investing more than $19 billion each year (on average) in the state's highways, transit, aviation, marine, rail, bicycle, and pedestrian systems to meet the anticipated growth in population, trade, and related traffic we expect to experience over the next 26 years. While access to information on current expenditures is limited in some cases, all levels of government in Texas are currently spending an estimated $11.0 billion each year, leaving a potential gap of some $8 billion per year unfilled.

How the state, local governments, and private sector will fill the gap depends on the combination of various funding or revenue options the Legislature approves and the public is willing to accept and invest in the state's transportation infrastructure. However, no matter how much revenue there is, the effectiveness of that revenue to help solve the transportation challenges of the state will depend greatly on the flexibility of those funding sources. Without changes to the structure and characteristics of existing federal and state transportation funding programs, even the addition of new revenue streams, is not likely to make a significant difference. As Texas leaders consider each potential new funding mechanism, they should evaluate how that mechanism enhances, impedes, or complicates the existing transportation funding structure. As our leaders identify the structural improvements needed and take the appropriate legislative steps to accomplish those changes, the state's ability and capacity to meet our transportation needs will grow.

Independent Needs Assessment and the 2030 Committee

While this report provides some general background for immediate policy discussions about transportation needs and possible funding options, it is not a comprehensive update of the state's mobility and maintenance needs. To accomplish that greater task, TxDOT hired a team from the Center for Transportation Research at the University of Texas at Austin and the Texas Transportation Institute at Texas A&M University. Their goal was to improve upon the previous analyses conducted by the department and the metropolitan planning organizations to develop

a range of needs estimates for FY 2009 to FY 2030 across all modes. To ensure that this update process proceeded with the utmost integrity and transparency, the needs assessment team reported to an advisory panel (known as the 2030 Committee) made up of business and community leaders from around the state. The committee issued its report on the state's multi-modal transportation needs by December 2008.

The 2030 Committee's *Texas Transportation Needs Report* concluded that meeting Texas' transportation needs between 2009 and 2030 will require $315 billion. The needs estimate focuses on the investment that will be necessary to maintain the pavements and bridges on Texas roadways; to prevent worsening traffic congestion in urban areas; and to ensure rural mobility and safety. The Committee based its estimates on several factors, including increased population growth and freight traffic between 2009 and 2030.

The Committee's needs assessment effort did not calculate available funding or identify funding solutions; instead, it simply quantified and described the need for infrastructure investment over the next 20+ years. The university team coordinated its work with local metropolitan planning organizations (MPOs).

The state's metropolitan planning organizations reviewed the needs assessment team's work and provided any necessary comments to ensure that accurate information was used to develop an updated estimate of the state's mobility infrastructure investment needs. TxDOT thanks the MPOs for their support and partnership in this important statewide effort.

The Committee presented an executive summary of its draft findings to the Texas Transportation Commission in December 2008 and posted the draft report on the 2030 Committee website for public comment from January 9 to January 31 prior to finalizing the document. On February 26, 2009, the Texas Transportation Commission adopted the 2030 Committee's report.

The 2030 Committee's work will help to ensure that the team produces the best possible information for the state to inform the public, our transportation policy leaders, and decision makers at the federal, state, regional, and local levels.

Moving Texas to the 21st Century Report

To supplement the 2030 Committee's efforts, the following report examines the key transportation issues facing Texas. **Section I** provides an assessment of the driving forces affecting transportation and the future priorities they create. **Section II** presents a preliminary estimate of investment needed to meet those demands (as a prelude to the more thorough, independent assessment results expected from the 2030 Committee process). **Section III** offers a snapshot of the current funding or expenditures being made at all levels of government in Texas in each of the major transportation modes, providing information that decision makers can use to discuss the gap in needed transportation investment. Finally, **Section IV** includes a baseline analysis of several but not all possible revenue options for the state to address these transportation infrastructure needs. The list of options presented here is not exhaustive, but it provides a starting point for continued discussions and more detailed analysis. Tables 1–4 on the following pages capture that key information.

Table 1: Major Transportation Demand Drivers

Factor	2005	2030
Population	22.5 million	31.8 million
Gross State Product	$832 billion	$1.7 trillion
Annual VMT (vehicle miles traveled on all state roadways)	234 billion	368 billion
Freight Shipments by Value	$1.3 trillion (2002)	$3.778 trillion

See Section I for source details.

Table 2: Total Statewide Transportation Investment Needs Estimates (2005-2030)

Mode	Average Annual Needs Estimate (2005-2030) ($ Millions)
Highways & Local Roads (Capital and Maintenance)	$15,928
Public Transportation (Capital)	$1,183
Freight Rail and Intermodal Freight (Capital)	$637
Marine (Capital)	$255
Bicycle and Pedestrian (Capital)	$29
Aviation (Capital)	
Commercial	$893
Noncommercial	$158
Total	**$19,083**

Source: Cambridge Systematics, Inc. Estimates of all needs were made in 2000 dollars and adjusted to 2003 dollars by applying Consumer Price Index inflation factors. More details are provided in Section II.

Table 3: Current Estimated Texas Transportation Expenditures By All Levels of Government

Mode	Annual Texas Expenditure Estimate ($ Millions)
Highways & Local Roads (Capital and Maintenance)	$10,005
Public Transportation (Capital)	$420
Freight Rail and Intermodal Freight (Capital)	Not Calculated
Marine (Capital)	$352
Bicycle and Pedestrian (Capital)	$19
Aviation (Capital)	
Commercial	$141
Noncommercial	$71
Total	**$11,008**

Source: Federal Highway Administration; Federal Aviation Administration; TxDOT. More details provided in Section III.

Table 4: Summary of Funding Options (not inclusive of all options, more details are provided in Section IV)

Revenue Mechanism	Description	Evaluation	Jurisdiction	Net New Revenue	Changes to Legislation	Approximate Yield (Dye)*	Approximate Yield (TxDOT est.)	Approximate Yield (LBB est.)
Indexed Fuel Tax	Fuel tax rate indexed to an inflation rate such as Consumer Price Index, Highway Cost Index; would protect fuel tax from erosion	Efficient Somewhat equitable Simple	Statewide	Yes	Section 163, Title 2	A 1% increase would yield $20 million/year	HB 962 (CPI-W on state tax): Avg. $69 million/yr; SB 165 (HCI on state & federal tax): $658 million for the State Highway Fund in 2009	HB 962 (CPI-W on state tax): $102 million for the State Highway Fund in 2009
Increased Motor Fuel Tax Rate	Fuel tax rate increased to a rate that would increase its purchasing power	Very efficient Somewhat equitable Very simple	Statewide	Yes	Section 163, Title 2	A 1¢ increase would yield $100 million/year	1 cent per gallon increase would yield $112 million to the State Highway Fund (based on 2007 receipts)	Not Calculated
VMT Charge to Replace Fuel Tax	User fee based on mileage; a VMT charge of 1.35¢/mile would equal the current state motor fuel tax	Very efficient Somewhat equitable Very complex	Statewide, Local	Yes, if increased	Section 163, Title 2	A 0.1¢/mile increase above current tax level would yield an additional $200 million/year	Not Calculated	Not Calculated
Increased Tolls	Texas currently collects $1.2 billion statewide and $1 billion in local areas in tolls	Somewhat efficient Very equitable Very simple	Statewide, Local	Yes	None	Increasing tolls by 10¢/transaction on all currently tolled facilities would yield an additional $50 million/year	Not Calculated	Not Calculated
Transportation Reinvestment Zones°	Cities or counties collect property taxes on the increased value of property in the zone to help pay for pass-through toll highway projects	Not efficient Equitable Simple	Local	Yes	None	Not Calculated	Varies by location, size of zone, and tax rate; entities with existing TRZs predict $14 million, $70 million, and $2.2 billion through 2030 for local projects	Not Calculated
Land Development Charges	Fees paid by developers to offset infrastructure costs	Not efficient Equitable Simple	Local	Yes	None if collected locally	About $75 million per year	Not Calculated	SB 1266: No significant state impact
Congestion Charges	Designed to reduce congestion in peak periods on specific facilities	Not efficient Somewhat equitable Complex	Local	Yes	New enabling legislation	Increasing tolls by 10¢/transaction on all currently tolled facilities would yield an additional $50 million/year	Not Calculated	Not Calculated
Increased State Sales Tax	Sales taxes currently are not directly linked to transportation	Very efficient Not equitable Very simple	Statewide	Yes	Section 151, Title 2	Each statewide 1% increase would yield about $1.3 billion/year	Not Calculated	Unknown

* For the purposes of this analysis, yield estimates are order of magnitude estimates and rounded. Calculations can be found in Appendix C of the report by Dye Management Group, Inc.

° Analysis developed by TxDOT

Table is continued to the next page.

Table 4: Summary of Funding Options (continued)

Revenue Mechanism	Description	Evaluation	Jurisdiction	Net New Revenue	Changes to Legislation	Approximate Yield (Dye)*	Approximate Yield (TxDOT est.)	Approximate Yield (LBB est.)
Local Option Sales Tax	Texas localities collect as local option taxes mostly for transit	Very efficient Not equitable Very simple	Local	Yes	Section 151, Title 2	Varies by jurisdiction dependent on volume of taxable sales.	HB 2084 and SB 257: The bill will help transit agencies with taxing authority	HB 2084 and SB 257: Could not be estimated
Container Fees	Levied on freight containers; typically fund freight infrastructure in and around levying port	Somewhat efficient Equitable Simple	Local	Yes	None if collected by RMA	A $30 per TEU container fee in ports of Houston and Galveston would yield $24 million/year	Not Calculated	Not Calculated
Carbon Taxes	User fee based on carbon emissions of fossil fuels; would carry out as an increased fuel tax	Very efficient Somewhat equitable Simple	Statewide	Yes	Section 163, Title 2	A 27¢/gallon gas tax increase would yield $1.7 billion/year	Not Calculated	Not Calculated
Proposition 12 Bonding Authority	General obligation bonds issued and repaid by the state	Limited efficiency Equitable Very simple	Statewide	No	Enabling legislation	No new revenues to the state; up to $5 billion toward transportation	Same	SB 1929: negative impact of ($1.5 billion) to GR Funds through FY 2009
Increased Vehicle Registration Fees: Statewide	State registration fees would be increased independently of county vehicle registration fees.	Very efficient Somewhat equitable Simple	Statewide	Yes	Section 502, Title 7	A $10 increase would yield $200 million/year	2009 estimated yield is $38 million/year	2009 estimated yield is $38 million/year
Increased Vehicle Registration Fees: Local	County registration fees would be increased independently of state vehicle registration fees.	Very efficient Somewhat equitable Simple	Local	Yes	Section 502.1725 of Transportation Code	Varies by county	Cameron County: $5 fee will generate approximately $1.2 million for calendar year 2008. Hidalgo County $10 fee will generate approximately $4.6 million for the 2008 calendar year **	Not Calculated

* For the purposes of this analysis, yield estimates are order of magnitude estimates and rounded. Calculations can be found in Appendix C of the report by Dye Management Group, Inc.

** Source: County Tax Assessor/Collector's offices.

I. The Demands On Texas Infrastructure

Two factors drive the need for the provision and funding of transportation infrastructure:

- Demographic and economic changes generating a strong demand for transportation infrastructure, and
- Industry trends affecting freight demand

A. Demographic and Economic Changes

A number of demographic and economic variables affect the demand on our transportation network.

Population

Texas is a large and rapidly growing state. Between 1990 and 2000, Texas had the eighth fastest growing state population in the U.S, growing by 22.8 percent and adding 3.8 million people during this time. This growth rate is more than 10 percent of the total U.S. population increase of 32.7 million people. In 2005, the Texas State Data Center reported that the state population was 22.5 million people. Using a net migration scenario of 0.5, the data center projects the population will increase by 41 percent to 31.8 million between 2005 and 2030.

This state population growth is concentrated in the cities most affected by significant congestion, mobility, and air quality problems. The 2000 census data shows more than 87 percent of Texans living in regions with urban area populations of at least 50,000 people and metropolitan populations of at least 100,000. Between 2000 and 2007, more than 96 percent of the state's population growth occurred in these areas and the forecast calls for future growth to be concentrated in the state's major metropolitan areas, particularly within the "Texas Triangle," (the Houston-Dallas-San Antonio corridor, including Austin) and the border counties.

Gross State Product

Economic prosperity has also affected the state's rapid growth. The Texas economy expanded by 80 percent from 1990 to 2005. According to Texas Comptroller data, the gross state product (GSP), a measure of state economic activity, grew from $462 billion to nearly $832 billion (in constant 2000 dollars) (Texas Comptroller of Public Accounts Data, Fall 2007 forecast).

This robust growth is expected to continue in the future with total GSP reaching nearly $1.7 trillion by 2030. Between 2005 and 2030, the highest growth rates are expected in the manufacturing sector (165 percent) and the professional/business sector (225 percent) (Texas Comptroller of Public Accounts Data, Fall 2007 forecast).

Growth in Household Income

Growth in household income has also accompanied this growth in GSP. Between 1989 and 1999, median household income in Texas grew by 13.9 percent (in constant 1999 dollars). Central Texas, in particular, experienced rapid income growth, driven by the high-technology boom of the 1990s.

Vehicle-Miles-Traveled

This economic prosperity has made the automobile more affordable, leading to increases in vehicle ownership and vehicle-miles-traveled (VMT). Between 2000 and 2005, the number of registered motor vehicles in Texas increased by 6.3 percent. By 2030, the number of registered vehicles is expected to jump to 35.5 million, an increase of almost 98 percent from 18 million in 2000.

Similarly, VMT on Texas roads continues to rise rapidly. In 2005, the average annual VMT on all state roadways (travel on city, county and state roads/highways) was 234.2 billion, a nine percent increase over the VMT in 2000. At that pace, Texas can expect a 70 percent increase in VMT to 368 billion annual VMT by 2030. (TxDOT Pocket Facts and CS calculations).

However, record gas prices and a surge in public transit ridership have shown that Americans are driving less in recent months. Americans drove 1.4 billion fewer highway miles in April 2008 than at the same time in 2007 and 400 million miles less than in March 2008. This is a decline of nearly 20 billion miles traveled this year and a drop of nearly 30 billion miles traveled since November 2007 (USDOT Traffic Volume Trends Report, April 2008).

In June 2008, U.S. Secretary of Transportation Mary Peters said "We're burning less fuel as energy costs change driving patterns, steer people toward more fuel-efficient vehicles, and encourage more to use transit. Which is exactly why we need a more effective funding source than the gas tax."

Past trends have shown Americans will continue to drive despite high gas prices, but will drive more fuel-efficient vehicles consuming less fuel. "History shows that we're going to continue to see congested roads while gas tax revenues decline even further," Peters said.

Impact on Transportation

Although the growth in population, income, and prosperity all place greater demands on the transportation system, roadway capacity enhancements have not kept pace. There are more than 300,000 centerline miles and 650,000 lane miles in the Texas roadway system, including interstates, U.S. highways, state highways, farm/ranch to market roads (FM roads), frontage roads, county roads, city streets, and toll roads. Between 1992 and 2006, however, VMT in Texas grew nearly 10 times faster than lane miles added to the system. During that period, while VMT went up by more than 50 percent, the number of lane miles grew by just 5.1 percent (FHWA Highway Statistics, 1992-2006).

As the growth in lane miles continues to lag behind the growth in VMT and highway demand outpaces highway capacity improvements, the congestion problem continues to get worse in the state's largest metropolitan areas. The 2007 Urban Mobility Report compiled by the Texas Transportation Institute showed congestion in nine Texas cities (Dallas/Fort Worth, Houston, San Antonio, Austin, El Paso, Corpus Christi, Laredo, Beaumont, and Brownsville) caused 342 billion hours of delay and led to 243 million gallons of wasted fuel consumption in 2005 (Texas Transportation Institute, 2007 Urban Mobility Report). Overall, travelers in these cities experienced a 260 percent increase in annual hours of delay between 1982 and 2005.

B. Industry Trends

Among the goods-dependent industries—agriculture, mining, construction, manufacturing, and trade/transportation/utilities—the manufacturing and trade/transportation/utilities have grown tremendously over the last 15 years (Texas Comptroller of Public Accounts Data, Fall 2007 forecast). This growth has transformed them into the two dominant goods-dependent industries in Texas. Combined, these industries contributed 78 percent of the goods-dependent industry GSP and 37 percent of the total Texas GSP in 2005. According to Texas Comptroller projections, as the agriculture and mining sectors see their GSP contributions decline, the manufacturing sector will increase by 165 percent by 2030 and contribute the highest economic output to state GSP.

Trade and Jobs

Over the last two decades, globalization has been expanding. But while U.S. demand has slowed recently, Texas has taken advantage of its geographic location, international connections, large seaports, and good distribution network to help its businesses find markets worldwide. It has quickly become a nexus for international trade, linking every corner of the globe.

In San Antonio, a plant for the Toyota Motor Corporation (Japan) builds Tundra full-sized pickups. Austin's Samsung Electronics Co. (South Korea) makes semiconductors and flash memory chips. The Dallas-Fort Worth metroplex serves as the U.S. base for several global telecommunications giants—Nortel Networks (Canada), Fujitsu Ltd. (Japan), and Nokia Inc. (Finland). Along the Texas Gulf Coast, the U.S. subsidiary of Air Liquide (France) produces industrial and medical gases including nitrogen, oxygen, and argon for various Texas companies. Other companies with a strong Texas presence include: IKEA (Sweden), BP (UK), Royal Dutch Shell Group (The Netherlands), and BASF (Germany).

One of the major reasons for Texas' success is its booming trade. Export data provides valuable information on how a state fares in an open global economy and for the last six years, Texas has led the U.S. in exports. According to the International Trade Administration (ITA), an agency within the U.S. Department of Commerce, Texas exported $168.2 billion worth of goods in 2007. California was a distant second among states, with $134.2 billion in exports (Texas Comptroller; ITA - *Industry, Trade, and the Economy: Data and Analysis*).

As analysts study the national and state-level effects of the movement of goods, services, and people across borders, one thing is clear: the more that companies expand and economies become more global, the more likely that workers' livelihoods will depend on foreign markets.

One of Texas' biggest assets is its work force—the people who provide the labor needed for strong job growth. In recent years, Texas has grown at twice the rate of rest of the country, giving the state an increasing share of U.S. employment (Federal Reserve Bank of Dallas, *Southwest Economy,* 2007).

In 2004, the Business Roundtable, an association of chief executives of top U.S. corporations, found that nearly 2.2 million Texas jobs were linked to international trade (Business Roundtable, *Trade and American Jobs*). Data from the ITA shows that export-related jobs account for 5.5 percent of all private-sector employment in Texas, compared to 4.5 percent for the nation as a whole. Twenty percent of Texas' manufacturing jobs depend on exports versus 17 percent nationwide (ITA - *Industry, Trade, and the Economy: Data and Analysis*).

- *According to the Federal Reserve Bank of Dallas, nearly 15 percent of Texas' economic output is related to exports, nearly twice as large a share as for the entire country.*
- *Data from the International Trade Administration (ITA) shows that Mexico, our closest international neighbor, is Texas' largest trading partner, accounting for nearly 33 percent of our exports in 2007 ($56 billion)—more than the total exports of all states except California, New York, and Washington.*
- *International demand also remained strong in 2007, particularly for Texas chemical products, agricultural products, and machinery.*
- *Texas exporters also have increasingly close ties with several thriving Asian economies, including Japan, China, South Korea, Taiwan, and Singapore.*

(Texas Comptroller, *Texas Ahead* 2008)

In 2007, the Texas economy added workers in all sectors at a faster rate than the rest of the country, with the state creating 31 percent of the nation's private non-agricultural jobs. In fact, Texas job growth was so strong that, throughout last year, many businesses surveyed said that their inability to find qualified talent was having a dampening effect on growth (Federal Reserve Bank of Dallas, *Southwest Economy*, 2007).

In the coming years, the trend toward globalization is not likely to fade. States will have to face the challenge of increased competition brought about by economic integration. At the same time, however, globalization will also open up new opportunities for states to generate more exports, create jobs, and ultimately boost worker incomes.

Texas must be ready. Transportation is a critical element in promoting economic development and access to jobs and alleviating the congestion that threatens our state with gridlock. Having a world-class transportation system that is convenient, reliable, and safe will determine how Texans live, work, and move around the state in the coming decades and beyond. It will be the keystone to the state's growing business opportunities and its thriving job market.

Impact on Transportation

Although all the goods-dependent industries rely most heavily on trucks, they use every mode of transport (rail, marine, and air), so as the manufacturing and trade/transportation/utilities sectors continue to grow, there will be an accompanying increased freight demand across all modes.

Since the implementation of the North American Free Trade Agreement (NAFTA) among the U.S., Mexico, and Canada in 1994, Texas has become the single most important infrastructure link between the U.S. and Mexico economies. As trade between the three countries has expanded, the freight traveling to or through Texas imposes a heavy burden on the Texas transportation system. In 2006, 68 percent of trucks and 91 percent of rail containers entering the U.S. from Mexico crossed the border through Texas (Bureau of Transportation Statistics, Border Crossing Data 2006). Laredo, Texas, the busiest U.S. port of entry from Mexico, processed more than 1.52 million trucks and 330,000 rail containers in 2006 (BTS, 2006).

According to the most recent estimates, NAFTA tonnage on Texas highways and railroads will increase by 207 percent through 2030 (2007 Texas NAFTA Study Update), while truck tonnage alone will grow by 251 percent and the number of trucks hauling NAFTA goods will jump by 263 percent. This translates into a 330 percent VMT increase by NAFTA trucks (Cambridge Systematics, Inc., Texas NAFTA Study Update, 2007).

- **Truck Freight –** Trucking is the primary mode used to haul freight to, from, and within Texas. In 2002, trucks moved almost 46 percent of all freight (985 million tons) and 66 percent by value ($866 billion). The Federal Highway Administration (FHWA) Freight Analysis Framework projections indicate that trucking's role in Texas will grow to carry almost

51 percent of freight by weight and 69 percent of freight by value by 2030.

• **Rail Freight –** More than 40 freight railroads currently span Texas connecting its seaports and international gateways. In 2002, rail moved almost 13 percent of freight by weight (225 million tons) and 5 percent of freight by value ($66 billion) to, from, and within Texas (see Table 5). The forecast for rail traffic is a 102 percent increase in rail tonnage and 195 percent increase in the number of rail units carrying NAFTA goods by 2030.

• **Marine Freight –** Marine transportation plays a smaller role in freight movement than truck and rail freight, serving almost 5 percent of total shipments by weight and 2 percent by value for shipments to, from, and through Texas in 2002 (see table on next page). The available data points to a decline by 2030 in the percentage of freight moved by water, but the 28 seaports in Texas currently move about 20 percent of the total U.S. tonnage of freight moved by water in 2005. According to the U.S. DOT, four Texas seaports—Houston, Beaumont, Corpus Christi, and Texas City—ranked among the top 10 U.S. ports in total tonnage in 2005 (USDOT Traffic Volume Trends Report, April 2008).

• **Air Freight –** Cargo movement by air is typically only used to ship high-value, time-sensitive goods, so air freight accounted for a small percentage of freight weight and freight by value in 2002 (see table on next page). By 2030, estimates call for only a small 2 percent increase. Two reasons for this are that trucks now offer competitive pricing/on-time delivery rates and air transportation still relies on trucks to transfer cargo from airports to/from the destination/origin.

Table 5: Freight Movement To, From, and Within Texas by Weight and Value: 2002 and 2030

	2002				2030			
	Within State	From State	To State	% of Total	Within State	From State	To State	% of Total
Shipments by Weight (in Millions of Tons)								
Truck	696.2	138.3	150.8	45.5%	1,363.7	312.3	309.9	50.8%
Rail	95.1	51.2	124.4	12.5%	173.2	78.2	230.3	12.3%
Water	54.9	22.3	28.8	4.9%	80.9	35.1	41.3	4.0%
Air, Air & Truck	0.1	0.1	0.1	0.0%	0.1	0.4	0.3	0.0%
Truck & Rail	0.8	1.7	3.3	0.3%	0.7	2.0	7.5	0.3%
Other Intermodal	7.6	1.5	3.5	0.6%	13.7	6.1	6.8	0.7%
Pipeline & Unknown	443.0	149.8	191.6	36.2%	737.9	227.8	278.2	31.8%
Total	**1,297.6**	**365.0**	**502.5**		**2,370.7**	**661.9**	**874.4**	
Shipments by Value (in Billions of Dollars)								
Truck	$389.71	$206.50	$270.27	66.4%	$1,065.90	$848.63	$700.49	69.2%
Rail	$11.72	$29.56	$24.43	5.0%	$16.74	$40.33	$47.84	2.8%
Water	$12.97	$5.08	$7.14	1.9%	$16.44	$8.36	$10.55	0.9%
Air, Air & Truck	$0.62	$10.81	$8.90	1.6%	$2.88	$56.45	$21.44	2.1%
Truck & Rail	$0.05	$0.97	$6.44	0.6%	$0.09	$1.42	$17.13	0.5%
Other Intermodal	$15.77	$46.87	$44.83	8.2%	$62.15	$292.06	$199.47	14.7%
Pipeline & Unknown	$99.10	$46.28	$67.02	16.3%	$176.92	$92.06	$101.60	9.8%
Total	**$529.93**	**$346.07**	**$429.03**		**$1,341.12**	**$1,339.31**	**$1,098.52**	

Source: Federal Highway Administration, Freight Analysis Framework 2.2 adjusted from 2035 to 2030 using an average annual growth factor.

II. Texas Mobility & Maintenance Needs

The following information is an excerpt from the report entitled ***Description of Current Texas Transportation Mobility and Maintenance Needs****, submitted to TxDOT by Cambridge Systematics, Inc., in June 2008.*

The demands that socioeconomic and industry trends place on the state's transportation system notwithstanding, existing infrastructure must still be maintained, new system capacity is still necessary, and the development and maintenance of intermodal connections remain important. Addressing these issues will require appropriate multimodal transportation planning and investment in capital and maintenance.

This section describes the multimodal capital and maintenance investment needs across Texas, including comments from state business and community leaders on just how vital continued investment is to the Texas economy and quality of life.

Cambridge Systematics (CS) based its calculations for future need on the Highway Economic Requirements System (HERS), a simulation model that CS developed to estimate the benefits and costs of highway investments on the federal-aid highway system—the 958,000 miles of roadways that serve most of our national freight traffic. HERS determines the most cost-effective investments to accommodate truck and auto traffic by evaluating several types of highway improvements for each highway segment (including pavement rehabilitation, roadway widening, and reconstruction). This information is used to generate estimates of highway needs spending (e.g., costs to state DOT and other transportation agencies to maintain the highway system) and highway user costs (e.g., costs in fuel consumption, travel time, etc.).

This needs assessment estimates the investment required to meet the growing demands on the state's transportation system over a 25-year period from 2005 to 2030 (Table 6).

Traditionally, transportation needs are identified by mode so this assessment offers a mode-by-mode summary of transportation investment needs. Because multimodal tradeoffs are increasingly influencing state and MPO investments, when one evaluates investments accross modes, considering needs on a multimodal basis encourages the most efficient use of the transportation system.

Table 6: Total Statewide Multimodal Transportation Needs for 2005 to 2030
(in Millions of 2003 Dollars)

Mode	Average Annual Needs Estimate (2005-2030) ($ Millions)
Highways & Local Roads (Capital and Maintenance)	$15,928
Public Transportation (Capital)	$1,183
Freight Rail and Intermodal Freight (Capital)	$637
Marine (Capital)	$255
Bicycle and Pedestrian (Capital)	$29
Aviation (Capital)	
Commercial	$893
Non-commercial	$158
Total	**$19,083**

Source: Cambridge Systematics, Inc. Estimates of all needs were made in 2000 dollars and adjusted to 2003 dollars by applying Consumer Price Index inflation factors.

Note: These figures are presented in 2003 dollars. As such, they do not account for inflation and only represent transportation investments that have tangible mobility benefits to the state.

This also recognizes that individual modes work together within the system to improve mobility. For example, meeting some of the highway needs may be achieved through targeted investments in public transportation. Similarly, combining capital and operations investments through multimodal corridors or system-level improvements could also provide solutions.

A. Highway and Local Roads Needs

The total highway need in Texas is estimated at $414 billion through 2030 (in 2003 dollars). This includes the funding required to build new infrastructure and maintain existing infrastructure. Total capital needs are $12.5 billion per year. Of this amount, $10.1 billion is estimated for TxDOT capital needs and $2.4 billion for infrastructure maintained by other entities. Table 7 shows the breakdown of the state's 26-year (2005 to 2030) highway needs.

The bases for this highway needs analysis are TxDOT's 1997 Highway Needs Assessment and the HERS model described earlier.

Meeting these needs would result in:

- A substantial decline in total hours of delay on Texas highways;
- A decrease in total user costs (travel time costs, vehicle operating costs, and accident costs) per mile of travel; and
- Improved pavement and bridge conditions.

Table 7: Average Annual Total Texas Highway and Local Roads Needs 2005 to 2030
(in Millions of 2003 Dollars)

Highway and Local Roads Needs Category	TxDOT's Highways and Local Roads	Other Agencies' Highways and Local Roads	Total for All Highways and Local Roads
Capital	$10,052	$2,409	$12,461
Maintenance	1,376	2,091	3,467
Total for All Highway and Local Roads Needs	**$11,428**	**$4,500**	**$15,928**

Source: Cambridge Systematics, Inc. and previous TxDOT Needs Assessments.

Note: These needs are not fiscally constrained and do not represent estimated expenditures. "Highways" is not a functional classification; in this table, the word refers to all controlled-access highways, roads, and streets. "Other agencies" refers to all other public-sector owners of roads and streets.

An explanatory word about maintenance needs: the maintenance estimate from the HERS model is based on TxDOT expenditure data, and is not a condition-based maintenance estimate. If TxDOT were to conduct a maintenance needs assessment, the work would not only be based on average annual maintenance expenditures, but on asset management-based determinations of condition, age, preventative maintenance cycles and replacement estimates for the pavements and bridges in TxDOT's 78,000 mile state highway system. In addition, the HERS model's capital needs estimate includes all projects that would qualify for capital program funding at the federal level. Thus, the capital needs shown in Table 7 includes many types of reconstruction or rehabilitation projects that TxDOT considers as maintenance projects (TxDOT includes these kinds of projects, eligible for federal reimbursement, as contracted maintenance) in its programming and financial reporting.

Table 8: Current Transit Demand and Forecasts by Type of Area in Texas

Passenger Trips (Millions)	2000	Forecast 2030	Forecast Percent Growth
MTAs (largest urban areas)	263.784	563.804	114%
Urbanized (other urban areas)	15.812	41.806	164%
Non-urbanized	4.448	9.414	112%
All Transit Systems	**284.044**	**615.024**	**117%**

Source: Forecasts are from Cambridge Systematics, Inc. Projections for elderly and disabled transportation providers are not available; ridership for these systems in 2000 was 3.816 million. If the growth rate (116 percent as estimated as a total for all Texas transit systems) continues through 2030, the expected total elderly and disabled ridership will be 8.242 million.

B. Public Transportation Needs

During 2002, the seven metropolitan transit authorities (MTAs) within Texas' major cities (El Paso, Austin, Dallas, Fort Worth, Houston, San Antonio, and Corpus Christi) provided 91 percent (about 252 million) of the total unlinked transit trips in the state. An unlinked trip is one trip on a single bus or other transit vehicle. Beyond these MTAs, there are 32 urbanized area transit systems in Texas, 40 non-urbanized area transit systems, and more than 300 transit providers serving special needs populations such as the elderly and disabled. As shown Table 8, transit use in Texas is expected to jump dramatically by 2030, with overall transit demand increasing by 117 percent.

Based on long-range MPO plans from the larger urban areas, CS estimates the total capital needs for all Texas public transportation systems between 2005 to 2030 will be $30.8 billion, or about $1.18 billion annually. MTA total needs would be $27.96 billion or about $1,075 million per year. Urbanized area transit systems will require about $993 million in capital investment between 2005 and 2030.

Expanding population, service areas, and customer bases means that non-urbanized area transit systems will need more than $902 million in capital investment between 2005 and 2030. This requires more than $38 million in annual funding. For elderly and disabled transit providers statewide, the funding requirements total more than $804 million between 2005 and 2030, an average of $30.9 million required annually.

C. Freight Rail and Intermodal Freight Needs

Total freight rail capital needs between 2005 and 2030 would be $637 million. Average annual estimates were based on approximate Texas percentages of estimated national needs. By category, the average annual freight rail needs are: short line infrastructure ($27 million); Class I infrastructure ($396 million); Class I non-infrastructure ($159 million); and safety ($55 million).

D. Marine Transport Needs

In 2003 dollars, Texas ports will require approximately $255 million per year for capital investment and $34 million per year for maintenance. In total, marine transport will need an estimated $7.5 billion investment between 2005 and 2030.

E. Bicycle and Pedestrian Needs

The estimate for bicycle and pedestrian needs between 2005 and 2030, including the cost of constructing bikeways, is $766 million. Of this amount, $604 million is needed to complete 2,596 miles of planned bikeways and $161 million is estimated for pedestrian-only projects. Each year, this would be a combined annual expenditure of $29.4 million for bicycle and pedestrian facilities.

These needs may expand significantly in the future because not all areas have yet developed their plans for bicycle and pedestrian improvements. While not all metropolitan areas have quantified their needs for these alternative modes, many cities are actively planning and implementing bicycle and pedestrian programs. For example, the Lubbock MPO data shows that the city of Lubbock has had an active bicycle planning program since 1994, and a transportation enhancement grant was used to develop over 60 miles of bike routes citywide.

Table 9: Average Annual Total Texas Commercial Aviation Capital Needs 2005 to 2030
(in Millions of 2003 Dollars)

Metropolitan Commercial Airport	Average Annual Needs	Total Estimated Capital Needs Through 2030
Dallas-Fort Worth International	$351.40	$9,136.41
George Bush Intercontinental	227.70	5,920.10
William P Hobby	83.89	2,181.09
Austin-Bergstrom International	97.38	2,531.99
Dallas Love Field	7.88	204.86
San Antonio International	28.63	744.46
El Paso International	7.30	189.72
Lubbock International	4.05	105.27
Midland International	2.78	72.33
Rio Grande Valley International	2.84	73.83
Total: Smaller Commercial Airports*	**$79.19**	**$2,059.02**
Total: All Commercial Airports	**$893.02**	**$23,218.57**

Source: Cambridge Systematics, Inc.

Note: Capital and incremental needs may not add exactly to totals due to rounding.

*Texas' smaller commercial airports (in order of annual passenger boardings): Amarillo International, Corpus Christi International, McAllen-Miller International, Killeen Municipal, Easterwood Field, East Texas Regional, Laredo International, Tyler Pounds Field, Brownsville/South Padre Island, Waco Regional, Abilene Regional, Sheppard AFB/Wichita Falls, San Angelo Regional/Mathis, Ellington Field, Victoria Regional, Texarkana Regional, and Southeast Texas Regional.

F. Aviation Needs

For the state's commercial airports, Table 9 shows that there are $23.2 billion in projected capital needs through 2030. This is based on information obtained from various commercial airports' master plans and extrapolated to 2030. Of this amount, about $17.2 billion is targeted for just Dallas-Fort Worth International Airport and the Houston airport system. Other airports

with large shares of the remaining needs include those serving Austin, San Antonio, and El Paso. The average annual total commercial airport needs requirement over the 2005 to 2030 period is $893 million per year.

For non-commercial airports, the needs estimates are based on the Texas Airport System Plan (TASP) analysis of needs. Average annual needs for the non-commercial airports between 2005 and 2030 is approximately $157.5 million per year. Therefore, total aviation capital needs through 2030 are $27.3 billion and, on an annual basis, $1.05 billion per year ($893 million for commercial and $157 million for non-commercial).

III. Current Texas Transportation Expenditures

In order to provide a basic understanding of the challenge in meeting the state's multi-modal transportation needs, we present a brief summary and table of the current Texas transportation expenditures by mode, based on publicly available information.

A. Highways and Local Roads

In 2005, local governments in Texas spent $2.9 billion on capital and maintenance for highways and local roads. State government highway disbursements for capital and maintenance purposes totaled $7.1 billion for 2005. The combined capital and maintenance expenditures for highways and local roads in Texas in 2005 were $10.0 billion. (FHWA Tables SF-2 and LGF-2, 2005 Highway Statistics Series) Note: State maintenance figures do not include expenditures for routine maintenance of $742 million for 2005 (TxDOT Maintenance Division, System Expenditures).

B. Public Transit

According to the Federal Highway Administration, transit operators in Texas spent $420 million in federal, state, and local funds for capital improvements in 2005. (FHWA Table MT-2A, 2005 Highway Statistics Series)

C. Rail Freight

Private railroad companies make the majority of rail freight expenditures, and they tend to consider much of that data proprietary. As a result, this report does not include any estimates of expenditures for rail freight infrastructure investments.

D. Marine

For Fiscal Years (FY) 2005 and 2006, TxDOT was appropriated $1.35 million dollars for acquiring dredged material disposal sites for the Gulf Intracoastal Waterway (GIWW). During 2006, the U.S. Army Corps of Engineers spent approximately $26,538,000 in federal funds on 100 percent federally contracted and funded projects to operate and maintain the structures and navigability of the Texas GIWW. In Texas, the GIWW is 423 miles long. In 2004, over 72 million short tons of cargo were moved on the Texas portion of the waterway with a commercial value of over $25 billion.

In 2005, Texas ports handled 11,549 deep-sea vessel calls, which equates to 19.5 percent of the nation's total maritime cargo. Texas' ten ports plan to spend an estimated $326 million in FY 2008 and another $241 million in FY 2009 on 67 needed capital improvement projects. (Texas Ports 2008-2009 Capital Program report, TxDOT's Port Authority Advisory Committee)

E. Bicycle and Pedestrian

Texas spent $18.6 million on bicycle and pedestrian related improvements in 2005. (FHWA Fiscal Management Information System)

F. Aviation

The Federal Airport Improvement Program (AIP) is the primary source of capital improvement funds for the Texas airport system. The AIP supports the planning and development of public-use airports, including general aviation, reliever, and commercial service airports. TxDOT administers the state block grant program for general aviation and reliever airports and distributed $55.2 million in federal AIP funds and $16.0 million in state funds to these airports for airport development projects. In addition, the Federal Aviation Administration (FAA) distributed $141.3 million directly to the state's primary/commercial airports. Total aviation capital spending in Texas for 2005 was $222.5 million. (TxDOT Aviation Division; FAA Office of Airports)

Total Texas Transportation Spending Estimate

Combined, annual Texas transportation spending is estimated at $11.0 billion as shown in Table 10.

Table 10: Total Texas Transportation Spending Estimate

Mode	Annual Texas Expenditure Estimate ($ Millions)
Highways and Local Roads (Capital and Maintenance)	$10,005
Public Transportation (Capital)	$420
Freight Rail and Intermodal Freight (Capital)	Not Calculated
Marine (Capital)	$352
Bicycle and Pedestrian (Capital)	$19
Aviation (Capital)	
Commercial	$141
Noncommercial	$71
Total	**$11,008**

Source: Federal Highway Administration, Federal Aviation Administration, TxDOT

IV. Funding Options

The following information is an excerpt from a report entitled ***Findings and Analysis: Texas Transportation Funding Challenge****, submitted to TxDOT by the Dye Management Group, Inc., in July 2008.*

The majority of transportation revenue needs in the foreseeable future will be met with traditional funding instruments. The amount of revenue collections and relative mix of options may shift to meet new funding requirements. The following section identifies transportation funding options and assesses each option's effectiveness by comparing options with evaluation criteria to define implications. The list of funding options included in this analysis is not exhaustive. In addition, the analysis performed by Dye Management Group may serve as a baseline for further discussion, with the option to pursue more detailed analysis of these and other funding options as the Legislature and other transportation leaders request.

This review defines an "option" as a single initiative that can be taken to raise additional revenues from a single source. Governments have the ability to accept some options and reject others, in effect making their own funding packages, so this review analyzes each individual funding option.

Some of these funding options are not being used at this time in Texas. Some may never be implemented, but variants of others could be considered in intermediate or longer-term time frames. Although all of the funding options listed below offer revenue potential, some of them also serve a dual function as a means of transportation demand management. For instance, the use of "pricing" on currently "unpriced" transportation infrastructure can send consumers certain signals that promote a more efficient use of the transportation system.

Evaluation Criteria

The evaluation criteria used in this study are based on three basic economic principles:

1. Efficiency – The capacity of the option to raise new funds over time, the utility and flexibility with which those new funds can be applied across different projects and jurisdictions; and their contributions, other than the funds raised, to government policy objectives.

2. Equity – The option's impact on economic competitiveness, its loss as viable revenue for other government programs, and its fairness across people and businesses in the state.

3. Simplicity – The public's ability to understand the option and the cost of its administration.

A. Indexed Motor Fuel Tax

The motor fuel tax conforms to what is known as the "benefits principle" in that users pay to support transportation system construction and maintenance of the system from which they derive a benefit, namely the ability to travel on it. Although not perfect, the fuel tax is a proxy for road use tied to mileage driven, vehicle weight, and vehicle technology.

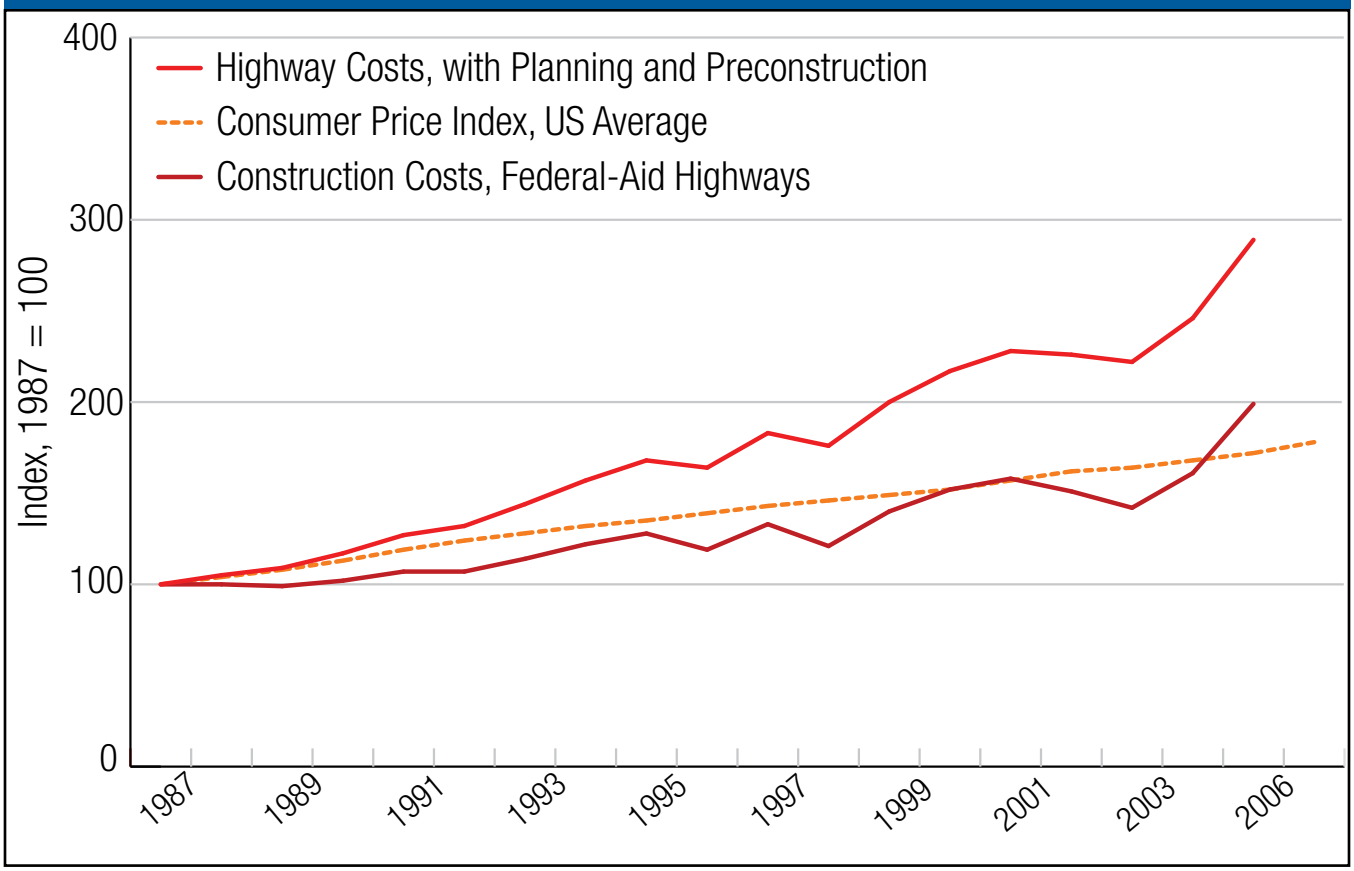
In Texas, the motor fuel tax is a fixed rate per gallon tax that is not indexed to inflation. As the major source of transportation funding, the purchasing power of the fuel tax has declined considerably over the last 20 years. The Texas motor fuel tax has remained unchanged since 1991 and in the years since then, increased fuel efficiencies and alternative fuels have cut into the revenue capacity of the tax.

Also, since 1991, the Consumer Price Index (CPI) has increased by about 60 percent while the costs of highway construction as reported by the U.S Federal Highway Administration (FHWA) have jumped by about 100 percent since 1987, as illustrated in the Graph 1. In the past, technology targeted horsepower rather than fuel efficiency so modest fuel efficiency gains in vehicle fleets were more than offset by VMT. But over the long-term, the breakthroughs in hybrid engines, fuel cells, and alternative fuels have reduced traditional fuel consumption enough to require a re-examination of fuel-based revenue collections.

Indexing the motor fuel tax to a measure of inflation, such as a highway construction cost index or the CPI, would increase the yield of the motor fuel tax and slow down the erosion of its purchasing power.

Graph 1 illustrates the impacts of inflation on TxDOT's business costs. As shown, "construction costs, federal aid highways" refers to increases in the unit costs of construction only: asphalt, steel, concrete, and labor. The line labeled "Highway costs, with planning and preconstruction" estimates the increases in the costs of

Graph 1: Cost Inflation in Highway Planning, Design, and Construction



Source: Adapted from Victoria Transport Policy Institute

building highways. These increases are not just in construction itself, but in the increasingly complex and lengthy technical and consultation processes required to plan, program, and design a highway.

Evaluation of an Increased Motor Fuel Tax

- **Efficient** – An indexed fuel tax, like any variation on the fuel tax, is efficient since it is applied across the broad tax base of motor fuel consumption. An indexed fuel tax, depending on the index, will grow at a rate roughly equal to the rate at which construction costs grow. The purchasing power of an indexed fuel tax would erode over time, however, as engine efficiency increases. Vehicles will travel more miles to the gallon, but higher motor fuel taxes will reduce VMT. If the fuel tax is indexed, each one percent increase in the tax would add almost $20 million per year to the State Highway Fund.

- **Somewhat equitable** – Fuel taxes are user fees that attempt to match the costs of driving the state highway system to the road users. But fuel taxes are also not equitable across locales, meaning that drivers in all locales pay fuel tax, but some areas benefit more than others. They are also not equitable across levels of income. Transportation is a basic need in Texas so lower income households would pay a higher proportional share of their income into the motor fuel tax. However, indexing the motor fuel tax would not put Texas at a competitive disadvantage with its neighbor states and constitutional protection would the chance that funds would be diverted to other uses.

- **Simple** – An indexed fuel tax would be simple to both understand and administer. The fuel tax is already in place as a user fee and drivers are accustomed to paying it. While a variable tax rate would require additional effort to administer, all the necessary tools already exist for collecting this tax. However, it would be complex to implement the motor fuel tax as a local option tax because it is collected at the point of wholesale.

B. Increased Motor Fuel Tax Rate

At 20 cents per gallon, the Texas motor fuel tax is near the national average state motor fuel tax. Combined with the 18.4 cents-per-gallon federal fuel tax, the fuel tax load on gasoline and gasohol in Texas is 38.4 cents per gallon. Even at that price, when converted into U.S. measures, Texans pay a comparatively low motor fuel tax rate compared to Canada ($1.25 per gallon); U.K, France, and Germany (about $4 per gallon); or Japan (about $3.50 per gallon).

Evaluation of an Increased Motor Fuel Tax Rate

- **Very efficient** – Each one cent per gallon increase in the fuel tax rate would immediately add about $100 million per year in revenue to the State Highway Fund. But these gains will diminish over time, however, as:
  - Engine efficiency increases and vehicles travel more miles to the gallon
  - Growth in VMT is diminished by the higher travel costs to which the increased taxes contribute
  - Use of alternative fuel costs increases
  - Highway construction costs increase over time.
- **Somewhat equitable** – Fuel taxes are user fees that match the costs of the state highway system to the drivers who use them. A high fuel tax rate may threaten the competitiveness of Texas fuel retailers in border regions. Higher fuel taxes do not benefit drivers equally across locales (though all locales pay the tax, some may benefit more than others) or income levels (lower income households would pay a higher proportion of income to the motor fuel tax.
- **Very simple** – An increased motor fuel tax rate is simple to understand and administer. Drivers already understand it is a user fee and they are accustomed to paying it. All the necessary tools already exist for collecting this tax, but it could not be implemented as a local option since it is collected at the point of wholesale.

C. VMT Charge to Replace Fuel Tax

The Vehicle Miles Traveled (VMT) tax is a user fee that, like the fuel tax, is tied to the benefits principle—drivers pay for each mile that they drive. The charge can vary by time of day and by location. Many transportation-related organizations, including the Transportation Research Board (TRB), the Association of American State Highway and Transportation Officials (AASHTO), and the National Cooperative Highway Research Program (NCHRP), have concluded that a mileage-based user fee is superior to the fuel tax. Pilot projects in states across the country are currently exploring VMT charges.

Over the past 35 years, the combination of increased fuel efficiency of gasoline and diesel engines and inflation has eroded the fuel tax effect as a user fee and reduced real motor fuel tax revenues.

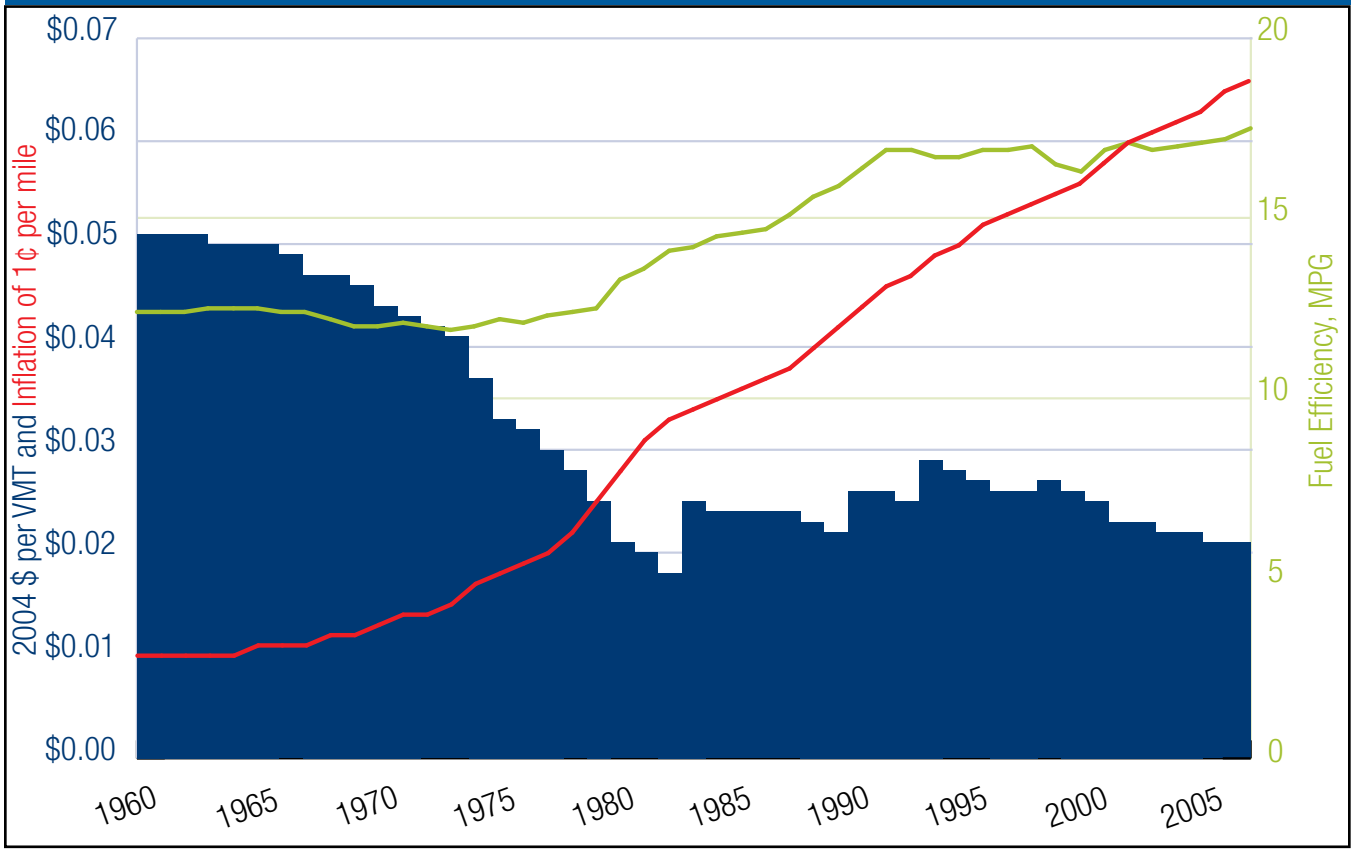
As shown in Graph 2, fuel efficiency (in green) and cost inflation (in red) have outstripped increases in nominal tax rates. Between 1960 and 2006, real motor fuel tax revenues (in blue), measured in constant 2004 dollars per vehicle mile, dropped from 5 cents in 1960 to just over 2 cents in 2006.

Some jurisdictions have already decided that more fuel-efficient engines have made fuel taxes a poor proxy for road user charges. They believe that a more direct road user charge is needed. Replacing motor fuel taxes with a charge per VMT would eliminate fuel efficiency's erosive effect on road user payments. The technology exists to implement a VMT tax using "smart" odometer readings, road-side scans of a device mounted to a vehicle or on-board global positioning system (GPS) units (now available in some new cars) that record vehicle movements.

Evaluation of VMT Charges to Replace Motor Fuel Tax Revenue

- **Very efficient** – In Texas, each additional 0.1 cent per mile above the current tax level would yield about $200 million annually for the State Highway Fund. Revenues will vary directly with VMT which are not volatile through economic cycles. VMT charges are immune to revenue erosion by increasing fuel efficiency; however, VMT charges are vulnerable to cost inflation. VMT revenues would also be attractive security for debt and if GPS units are used, VMT charges could be implemented as a local option.
- **Somewhat equitable** – VMT charges are a revenue source that is unlikely to be raised for purposes other than transportation, thus there is low opportunity cost to other government programs. VMT charges would not alter Texas' competitiveness with

Graph 2: Motor Fuel Revenues per VMT



Source data: FHWA Highway Statistics, U.S. Bureau of Labor Statistics, and Dye Management Group, Inc. calculation based on national data on environmental orders and legislative measures related to highway construction

neighboring states. A flat VMT charge is somewhat inequitable among different vehicle types because they do not match the impact of fuel taxes on large-engine vehicles that have a greater affect on roads and air quality. Similar to motor fuel taxes, VMT charges are inequitable across income levels in that those with lower incomes will pay a higher proportion of their incomes to VMT charges. VMT charges could be equitable across localities as they could vary by location.

- **Very complex** – A VMT charge system is new to the U.S. and likely to be understood as a substitute for motor fuel taxes. VMT charges are very complex to implement and administer. Implementation would take significant investment in administration, education, and new technologies. The most likely path toward nationwide implementation would be through a 20-year effort. VMT charges would be difficult to enforce in border areas.

D. Increased Tolls

In Texas and other jurisdictions, tolls are a pay-per-use fee levied on users of a particular route in addition to the system-wide user fees they may pay through motor fuel taxes and other charges. The route on which a toll is charged is typically:

- An alternative route that offers a higher quality of services (time savings, less traffic) over what is available on the regular road network
- An unusually expensive asset such as a bridge or tunnel that is part of the regular network

Changes to federal legislation during the 1990s eased prohibitions on the use of tolls on federally funded non-interstate highways. Today, tolls are widely used by states nationwide and in 2005, states collected $14.6 billion in tolls, nearly one-third as much as the $49.2 billion that all states collected in motor fuel taxes that same year. In Texas, the $1.2 billion collected by state and local

authorities roughly equals the funds available to the State Highway Fund from the state motor fuel tax.

In Texas, our tolls are generally under-priced with respect to what the market will bear. The fare policies of most state and local toll policies are to minimize tolls subject to sustaining and expanding their own systems. The North Texas Toll Authority (NTTA) has proposed formal tolling policies that acknowledge a current uniform toll rate of 10 cents per mile as sufficient to cover debt service and operating and maintenance costs. But a 2007 independent audit of transportation funding by Dye Management Group, Inc. estimated a willingness to pay about 16 cents per mile on existing Texas toll roads.

Evaluation of Increased Tolls

- **Somewhat efficient –** Tolls are a stable revenue source (across economic cycles) correlated to trips taken on a tolled system. Increased tolls on existing facilities are somewhat efficient, but that efficiency is limited by the current inventory of tolled facilities and the share of total trips they attract. Less than 10 percent of the trips in the eight largest Texas metro areas are tolled, and as stated previously, tolls in Texas are generally under-priced. A 10-cent increase per transaction would yield $50 million per year. Toll revenues from existing facilities are rarely more than are required to service the capital and operating costs and no dividends are available for additional assets outside of the toll system.

- **Very equitable –** Users who pay tolls can choose to pay to use the tolled facility or use an untolled alternative. Tolling does not put Texas at a competitive disadvantage as long as drivers have access to untolled alternatives. Toll revenues are unlikely to be diverted to other uses. Tolls maximize fairness across all incomes, types of users, and locations.

- **Very simple –** An increased toll rate is an established, clear user fee principle that is already successfully in place, simple to administer, and easily understood. As collection and enforcement systems are already in place, the administrative costs to increase tolls would be very low. Intelligent transportation system technology (ITS) that scans vehicles rather than making them stop at tollbooths is helping to reduce both costs and delays of toll facilities.

E. Transportation Reinvestment Zones

A Transportation Reinvestment Zone (TRZ) was created in the 80th Regular Legislature by Senators Eliot Shapleigh and Kim Brimer in Senate Bill 1266. A TRZ is a tax increment financing method that allows cities and counties to capture future gains in ad valorem taxes to finance road pro-jects. Using specific guidelines, the governing body for each city or county designates a specific area in its juris-diction as a TRZ to promote road projects that cultivate development or redevelopment of that area. Current law states that TRZ revenue can only be used in planned or executed pass-through toll agreements with TxDOT and also restricts its use on the State Highway System.

The increment in the TRZ is calculated by:

- Establishing the amount of property within the zone;

- Determining the amount of the ad valorem taxes levied and collected on the captured appraised value of real property within the zone;

- Establishing a base year for the ad valorem taxes levied and collected on the captured appraised value of real property within the zone; then

- Subtracting the tax increment base from the total appraised value of all taxable real property within the zone.

The increment is then deposited into a special fund to be used to pay for project(s).

As of 2009, the cities of El Paso and Forney as well as Hidalgo County have all authorized the creation of a TRZ. In the 81st Regular Legislature, Senators Pickett and Nichols have each filed a bill regarding TRZs. Senator Pickett's bill (HB 1810) would authorize a municipality or county to establish a TRZ for any transportation pro-ject. Senator Nichols' bill (SB 2378) would authorize that all or the portion specified by the municipality of the money deposited to a tax increment account must be used to fund the transportation project for which the zone was designated.

Evaluation of Transportation Reinvestment Zones

- **Not Efficient –** TRZs are not efficient as a primary revenue mechanism because of their focus on

specific lo-cations. Potential revenue depends on economic cycles so there is a high degree of unpredictability and risk with this option.

- **Equitable** – the property owners who pay the taxes pass the charges on to the consumers who benefit from the developed sites. Resulting revenues go into the targeted infrastructure fund that these consumers will re-quire for access to the sites. These taxes are a form of real estate tax that can divert funds from other local priorities, so there is no cost disadvantage to localities charging these taxes.

- **Simple** – these fees are both simple to understand and administer and there are already local systems in place to administer this type of tax.

F. Land Development Charges

Land development is often closely linked to the demand for transportation improvements on the state highway system as well as on county and municipal roads.

There are three major types of charges applied almost exclusively to new development and paid by land developers:

1. *Impact fees* – Fees paid as part of a permitting approval process to offset, partially or entirely, the costs of traffic capacity and safety improvements that the developed land will require. Also called "traffic impact fees" or "transportation improvement fees," they are typically levied on development with specific impacts on safety, operational performance, or the environment. Examples include:

   - Texas Council on Environmental Quality (TCEQ) assesses environmental impact fees at the district level in Texas.

   - TxDOT, TCEQ, and local partners conduct corridor-wide environmental impact studies through the Texas Environmental Resource Stewards (TERS) program. TERS assessments do not currently impose impact fees on development.

2 *Tax increment financing (TIF)* – Uses future gains in taxes to finance development. Increased land values around a transportation facility increase property tax revenues. This increase is called the "tax increment." TIF programs dedicate that increased revenue to finance debt issued to pay for the project. The revenues from impact fees and value capture programs are typically dedicated to transportation improvements that would serve the development. TIF and value capture create funding for local transportation projects that would otherwise be unaffordable. In 2007, Texas lawmakers enacted SB 1266 authorizing the creation of Transportation Reinvestment Zones. This legislation allows local areas to use tax increment financing to fund a project or to repay TxDOT funds under pass-through toll agreements.

3 *Value capture programs* – May require the creation of assessment districts through voter approval. Value capture programs can take the several forms:

- A transportation facility is built and the benefit to land owners from the improved access to their land often translates into increased values for their land. Revenues are generated through property taxes.

- When state-owned land surrounding a transportation facility is developed and the increased values are liquidated, the profits can pay some or all of the transportation improvement costs. Japanese railway companies use the significant profits from land sales near railway stations to finance infrastructure development.

- Ancillary real estate rights – The state leases the land, mineral, or air rights of a parcel of land adjacent to a transportation facility to a private interest, such as a cellular service or public utility. Ancillary real estate rights have presented problems in the past. In the 1990s, the prospect of ancillary income earned from leasing land rights to telecommunications companies was overestimated.

Evaluation of Land Development Charges

- **Not efficient** – Land development charges yield revenue that can be significant on a per-project basis but is unlikely to meet major project or program needs. They are not efficient because of the small number of developments to which they can be applied. If related to real estate values, impact fees would be well-insulated from loss of purchasing power due to cost increases but would vary significantly due to changes in the health of the economy.

As a result, they would not be a good debt security source. They are almost always leveraged at the local level. An example of the potential yield of an impact fee: in Texas, the value of non-residential building permits averages $7 billion per year and the land development charges would yield revenues about $75 million per year.

- **Equitable** – Since the developers who pay these charges pass the costs on to the consumers who benefit from the developed sites so land development charges are equitable. Land development revenues go into the developing infrastructure that these consumers will require for access to the sites. There is no cost disadvantage to localities that charge land development fees; however, they are a form of real estate tax that can divert funds from other local priorities.

- **Simple** – Land development charges are fees that are simple to understand and administer. Currently, 27 states (excluding Texas) have land development charge-enabling legislation. Permitting systems are already in place at the local level to administer land development charges, but implementation would require more legal involvement. Implementing a corridor-wide land development charge would require municipalities to agree to a common fee structure to avoid competition.

G. Congestion Charges

Congestion charges, also called "zone pricing" or "cordon pricing" involve applying variable fees or charges for the right to travel during peak periods in and/or around key locations.

They are designed to reduce congestion on an existing road network by increasing the costs of travel. Congestion charges are valuable as a demand management tool by providing incentives for users to change travel behaviors—using off-peak times, less congested routes, combining trips. A shift in even a small number of peak-hour trips can substantially reduce congestion.

Such charges operate very much like peak hour pricing on urban transit systems so users pay more to use transportation facilities at times of day when demand and traffic congestion is high. At less-congested times of day, prices are lower or free. The key is setting the price such that drivers account for the value of their travel time without overloading the fee-based lane(s).

Congestion charges are applied to a route, but are sometimes perceived as a toll applied to a destination. But two things set congestion charges apart from tolls:

1. Congestion charges are set to manage demand rather than recover costs; and

2. Governments do not provide any additional transportation capacity to those who pay the fee.

Congestion charges can be applied in several forms: as a cordon charge applied to the entire system, to specific geographic areas, to specific facilities, and at varying times, dates, and even rates dependent on congestion levels. Because of this, the yields from congestion charges can differ.

London, England has generated considerable worldwide interest with its congestion charge that assesses a £5 fee per trip (about $8) on every vehicle driven into the city. License plates are scanned electronically and vehicle owners billed later. The fee is an attempt to deal with the traffic congestion caused by a large numbers of vehicles in a tight urban space.

Texas cities have not yet arrived at London's critical threshold, but continued growth in the state's larger urban areas will likely lead to more serious congestion problems in the future. As these problems increase, some value pricing options might be considered.

Evaluation of Congestion Charges

- **Not efficient** – Congestion charges are not designed as a revenue generation tool. They manage demand by discouraging travel, thus limiting the revenue that can be collected. Plus, they are often limited to single lanes. Typically charged within an urban center, congestion charges are viable as a local option. They can be used across all types of projects but are not an established source of debt security.

- **Somewhat equitable** – Congestion charges are location-specific so users directly benefit, but lower income users will bear a greater proportion of the burden. But congestion charges are equitable across generations as they are not tied to additional infrastructure development. For example, on a congestion-priced highway, drivers are paying for their

current use, not for infrastructure developments that future generations would use. While those in the urban areas may understand the need for congestion charges, the majority of suburbanites who commute between suburbs (not into urban areas) may not.

- **Complex** – Administration is complex and expensive. High collection and compliance costs would require the adoption of new technologies and legislation.

H. Increased Sales Tax: Statewide

Sales taxes revenues, because of their size, should receive some attention as a potential source of transportation infrastructure funding, particularly in the state's larger counties that serve as regional commercial and employment centers. In 2006, collections on the 6.25 percent Texas retail sales tax were $18.3 billion, accounting for over half the state's total tax collections of $33.5 billion.

Evaluation of Increased Sales Taxes: Statewide

- **Very efficient** – Increasing the state sales tax is a very efficient way to raise revenues. A 1 percent state sales tax increase would generate $1.3 billion per year. Sales tax revenues are insulated from inflation but will grow less than VMT. Sales tax revenues are sensitive to economic cycles, as consumers respond to economic recessions by reducing their consumption of taxed goods. The sales tax can be used to secure debt and fund all types of projects.

- **Not equitable** – Sales taxes are not related to transportation use and therefore are not equitable across generations, users, income groups, and locations. Allocating sales taxes to transportation takes that away from other state programs and may adversely impact retailers near the state border. Lower income groups will bear a large share of any state sales tax increase.

- **Very simple** – An increased sales tax is simple to administer and is well understood as a general tax that supports a wide variety of government programs. Administrative systems are already in place for the collection and enforcement of sales taxes.

I. Increased Sales Tax: Local Option

In recent years, some states have accepted spending some portion of general sales tax receipts on transportation infrastructure, generally as local option taxes. Thus far, 23 states, including Texas, have authorized the use of local sales taxes for transportation funding.

Texas authorizes local governments, including transit authorities and special purpose districts (airport commissions and utility commissions) to add local option sales taxes of up to 2 percent to the basic state sales tax rate.

Local option sales taxes to fund transit authorities are in place in Austin, Corpus Christi, Dallas-Fort Worth, El Paso, Houston, Laredo, and San Antonio.

Where local option sales taxes have been used to fund transportation infrastructure, they have shown significant fiscal capacity. In California, the 20 so-called "self-help" counties, where local option sales taxes have been introduced to fund transportation projects, have generated revenue equal to the state's gasoline excise tax, about $2.5 billion in 2005.

Local sales tax increases are the most common sales taxes funding the transportation system and are used primarily to fund transit. These increases generally require direct local voter approval of specific project lists for a tax with a specific timeframe. A majority of states now have authorizing legislation for local option taxes. Local option taxes are already established in Texas so this evaluation focuses on an increase in general statewide sales taxes to fund the state highway system as a whole.

Evaluation of Increased Sales Taxes: Local Option

- **Very efficient** – Increasing the state sales tax is a very efficient way to raise revenues. Revenues from the sales tax are insulated from inflation but will grow less than VMT. Sales tax revenues are sensitive to economic cycles, as consumers respond to economic recessions by reducing their consumption of taxed goods. The sales tax can be used to secure debt and fund all types of projects.

- **Not equitable** – Sales taxes are not related to transportation use and therefore are not equitable across generations, users, income groups, and locations. Allocating sales taxes to transportation takes that away from other state programs and may have an adverse impact on retailers near the state border. Lower income groups will bear a large share of any state sales tax increase.

- **Very simple** – An increased sales tax is simple to administer and is well understood as a general tax that supports a wide variety of government programs. Administrative systems are already in place for the collection and enforcement of sales taxes.

J. Container Fees

Container fees are charges imposed on freight containers as they move through a port, rail yard, or other facility. They are most often used to fund rail and road capacity improvements into container port terminals. Container fees can be used for purposes other than infrastructure development. The ports of Los Angeles and Long Beach impose daytime surcharge fees on container movements to encourage shifts to nighttime operation.

Containers passing into and out of coastal ports impose significant costs on adjoining surface transportation infrastructure. State and federal governments play big roles in funding that infrastructure and responding to the capacity demands of these ports. Federal and state surface transportation programs pay for substantial improvements to road and rail access into U.S. ports. The U.S. Army Corps of Engineers plays a very large role in the funding and operation of port infrastructure, and U.S ports are permitted to issue private activity bonds through private sector consortia.

International importers and their shippers expect port authorities to make commensurate investments to ensure cost-efficient supply chains, but the importers/shippers continually reassess the viability of their transportation choices. Ships and containers are mobile and can be rerouted quickly to capture cost advantages. While shippers typically only commit themselves to short contracts of three years or less, ports must make long-term investments to build capacity ahead of demand.

Ports and their partners—mostly ship owners and railways—are reluctant to place information about their competitiveness in the public domain. As a part of a supply chain, ports are generally a smaller cost component than railways in the decisions of shippers. Rail rates and container line rates are generally not in the public domain. U.S. ports have been permitted to conceal competitive information since the 1999 passage of the Ocean Shipping Reform Act.

In 2006 and 2007, California debated a proposed $30 fee per inbound 20-foot equivalent (TEU) at the Long Beach and Los Angeles ports. The proposal divided the funds among transportation infrastructure adjoining the ports, transportation infrastructure within 300 miles of the ports, and air quality mitigation. Despite legislative passage, the governor vetoed the proposal.

Evaluation of Container Fees

- **Somewhat efficient** – A $30 per container fee levied on all containers entering the ports of Houston and Galveston would generate approximately $24 million per year. This revenue is highly dependent on economic cycles and very sensitive to price changes: a small shift in the relative costs of container handling in the highly competitive market for port services can result in substantial diversions of traffic to other ports. Container fees are viable exclusively as a local option; they should be collected by port authorities, and are therefore specific to port infrastructure.

- **Equitable** – Container fee revenues are unlikely to be diverted to projects other than those sanctioned by the ports and the shippers, but they would place the implementing ports at a significant cost disadvantage to all other ports. Only shippers using the ports would pay, and only they would benefit from improved infrastructure. These fees would drive up the cost of goods slightly, burdening lower income groups.

- **Simple** – Fee collection is simple and generally understood by the public. Fee collection systems are already in place in ports, but legislation would have to enable collection.

K. Carbon Taxes

Carbon taxes are environmental impact charges on the carbon dioxide (CO_2) emitted from burning fossil fuels. They are also user fees that would appear as an increase in the state motor fuel tax. Carbon taxes are typically part of environmental reforms packages, as they send a price signal to users directly related to their individual carbon emissions.

Carbon taxes on gasoline are currently used in several countries. Since 2007, Quebec has levied the 3.1 cents-per-gallon tax on energy companies—the first North American government to charge a carbon tax. In 2001,

the U.K. added a hydrocarbon surcharge to its fuel tax, the equivalent to about $3.70 per gallon. Some European countries, as well as British Columbia, charge per ton of CO_2 emitted.

Most carbon taxes are revenue-neutral. The tax collected in British Columbia is returned to taxpayers through income and business tax cuts. Countries like Sweden, whose carbon taxes are revenue-generating, use the revenues for environmental projects.

Evaluation of Carbon Taxes

- **Very efficient** – Implementing a carbon tax equivalent to British Columbia's in Texas would add 27.5 cents per gallon on top of the state motor fuel tax. Based on 2006 gasoline consumption in Texas, such a carbon tax would add $1.7 billion per year to the State Highway Fund. But like any other increase in the gas tax, its effectiveness will diminish over time as higher gas prices reduce vehicle-miles traveled, engine efficiency increases, the use of alternative fuels increases, and the costs of highway construction inflate over time.

- **Somewhat equitable** – As a fuel tax, carbon taxes are user fees that match the costs of the highway system to the users. Implementing a carbon tax would place Texas fuel retailers in border regions at a competitive disadvantage. A carbon tax would not be equitable across income groups; lower income households pay a higher proportion of their incomes toward fuel taxes. However, if, as in most jurisdictions, the carbon tax is implemented as revenue-neutral, it would be a progressive tax benefiting lower income groups. It could also be applied to environmental programs as in other jurisdictions.

- **Simple** – Carbon taxes are simple to implement. A carbon tax linked to fuel usage is generally understood by the public and all necessary administrative and compliance tools exist for collection. As the exact carbon content of fossil fuels is known, there would not be problems with documentation or measurement.

L. Proposition 12 Bonding Authority

In November 2007, Texas voters approved Proposition 12, authorizing the Texas Transportation Commission to issue up to $5 billion in general obligation bonds to fund transportation improvements. Once approved, bonds authorized under Proposition 12 are general obligations of the state. The state is required to repay the debt. Senate Joint Resolution 464, which articulated Proposition 12, did not specify any sources of new revenues to service the proposed debt.

TxDOT currently uses bonding as an innovative financing tool. Bond proceeds are typically used to accelerate projects by capitalizing them up front. Local jurisdictions also use general obligation bonds to fund projects.

The chief advantage of general obligation bonds is that they allow projects to be capitalized up-front. This finances the projects more quickly and avoids the problem of project budgets increasing over time in response to rising construction costs. Bonding also spreads the costs of developing infrastructure over time, ensuring an equitable distribution of payment over the life of the infrastructure.

The decision to issue general obligation bonds, however, must be balanced against long-term revenue sources. Bonds proceeds are not new revenues and must be repaid with interest, thus their repayment can take revenue away from future projects. As these Proposition 12 bonds become part of the state's general obligations, rather than TxDOT's, those future debt payments may cut into the future transportation budgets of other agencies.

Evaluation of Proposition 12 Bonding Authority

- **Limited efficiency** – General obligation bonds' efficiency varies with the amount of revenues collected. Proposition 12 bond monies are new revenues to TxDOT, but not to the state. Under Proposition 12, the State of Texas may issue up to $5 billion for highway improvements to be repaid by the state. These bonds are not applicable to local jurisdictions.

- **Equitable** – General obligation bonds match costs to benefits over time and costs to the entire system rather than specific locations. The issuance of Prop. 12 bonds could divert state funds from other uses. As the state repays these bonds from the general revenue fund, costs are not linked to transportation uses.

- **Simple** – General obligation bonds are simple to issue. As they are not new revenues, there are neither

collection costs nor enforcement issues. The issuance of debt is generally understood by the public as a means to finance infrastructure. Since Proposition 12 was approved in November 2007, the Texas Legislature must pass enabling legislation to allow bond issuance under Proposition 12.

M. Increased Vehicle Registration Fees: Statewide

Texas requires that most vehicle types are registered with the state and renewed annually. Texas charges a fee on all vehicle registrations and counties may also levy additional registration fees to pay for road system improvements.

Like most states, the Texas registration fee varies by the vehicle type and class of vehicle being registered. For passenger vehicle classifications, Texas varies the registration fee by the vehicle's age, so lower registration fees are assessed on older vehicles.

Currently, the Texas annual vehicle registration fee for a new passenger vehicle is $58 per year (Texas Transportation Code, Section 502.161). Each state has different fee structures so a state-by-state comparison of individual vehicles is difficult. However, an indication of how Texas vehicle registration fees compare to other states can be found by dividing the receipts from vehicle registrations by the number of registrations. The average Texas receipt for each vehicle registered was about $62 in 2006, below the national average of $67 per vehicle registration.

The $932 million collected in Fiscal Year 2006 by this and other state vehicle registration fees were deposited into the State Highway Fund. That same year, Texas disbursed about $58 million for vehicle registration and titling. This amounts to less than $3 per registration and reflects the division of registration between the state and the counties. Counties offer front-counter registration services, but the state supports the vehicle registration information system.

The potential does exist for voter resistance to increased vehicle registration fees. Thus far in 2008, an Iowa effort to raise its state vehicle registration fee was passed, but similar efforts in Idaho and Colorado have failed. Since 1998, Washington State has lowered its passenger vehicle registration fees three times in response to voter initiatives.

Evaluation of Increased Vehicle Registration Fees: Statewide

- **Very efficient** – Vehicle registration fees are applied broadly by vehicle ownership. Each $10 increase in motor vehicle registration fees should yield almost $200 million annually in additional revenues. Revenues should grow in proportion to vehicle registrations which, in times of high gas prices, may exceed the growth rate of motor fuel taxes as the average mileage driven with Texas-registered vehicles declines. Sustained periods of high fuel prices should bring higher vehicle registration revenues as Texans choose more fuel-efficient vehicles. Continuing inflation in construction costs will erode the purchasing power of vehicle registration fees.

- **Somewhat equitable** – Vehicle registration fees are only somewhat equitable. These fees are the same for all vehicles in a particular class regardless of mileage driven. Vehicle registration fees are a fixed user fee for access to the highway system. But these fees are not equitable across locales, meaning that drivers in all locales pay them, but some may benefit from the fees more than others. They are also not equitable across levels of income since they do not vary with the value of the vehicle, and through that, with income.

- **Simple** – An increased vehicle registration fee would be simple to administer. All of the necessary administrative and compliance tools exist for collection of vehicle registration fees.

N. Increased Vehicle Registration Fees: Local

Texas charges a fee on all vehicle registrations. Texas counties may also levy vehicle registration fees to pay for roadway improvements. While the section above dealt with a prospective increase in state registration fees, this section examines prospective increases in county fees.

County participation in vehicle registration in Texas is complex because of the conditions that govern the relationship between counties and the state in this area. Below is only a small portion of these conditions, many of which can found in the Texas Transportation Code, Section 502.

- Counties are required to collect state vehicle reg-

istration fees on behalf of the state.

- Counties split the receipts from state fees according to several formulas, retaining some for their road and bridge funds and remitting the balance to the state (Texas Transportation Code, Section 502.102).

- Counties may retain amounts equal to 5 percent of certain taxes and penalties (Texas Transportation Code, Section 502.1025)

- Counties may levy their own fees up to $10 per vehicle for their road and bridge improvements (Texas Transportation Code, Section 502.172) and up to $1.50 per vehicle for child safety programs (Texas Transportation Code, Section 502.173), but must remit 3 percent of those fees to the state as a contribution to the state's vehicle registration information system (Texas Transportation Code, Section 502.103).

- To make additional contributions toward the activities of a regional mobility authority, counties may request legislative authority to levy additional fees; that provision already exists for some southern border counties (Texas Transportation Code, Section 502.1725).

Currently, almost all Texas counties levy the $10 optional fee and more than 12 of those counties also levy the child safety fee. As local option contributions toward their county-based regional mobility authorities, Hidalgo County levies an additional $10 while Cameron County levies an additional $5. (Texas Department of Transportation, Schedule of Texas Registration Fees).

Evaluation of Increased Vehicle Registration Fees: Local

- **Very efficient –** Vehicle registration fees are applied broadly by vehicle ownership. Revenues should grow in proportion to vehicle registrations. In times high gas prices, as the average mileage driven for Texas-registered vehicles drops, vehicle registrations may exceed the growth rate of motor fuel taxes. Sustained periods of high fuel prices should bring higher vehicle registration revenues as Texans choose more fuel-efficient vehicles. Continuing inflation in construction costs will erode the purchasing power of vehicle registration fees.

- **Somewhat equitable –** Vehicle registration fees are the same for all vehicles in a particular class regardless of the mileage driven. Vehicle registration fees are a fixed user fee for access to the highway system, but they are not equitable across levels of income as they do not vary with the value of the vehicle, and through that, with income.

- **Simple –** An increased vehicle registration fee would be simple to administer. All of the necessary administrative and compliance tools exist for collection of vehicle registration fees.

Closing Observations

Over the past decade, the operating costs and construction and maintenance costs for the state's aging systems have been rising far faster than funding for transportation. As Texas' roads, bridges, public transit, and rail systems reach the end of their useful life, maintenance costs rise and major capital expenditures become necessary. Failure to address these needs will lead to greater deterioration in the state's transportation infrastructure and result in even greater costs in the future.

Texas' needs are not dissimilar to those of other states. Our transportation systems must have adequate and predictable funding, dedicated sources of revenue that will grow with inflation, and the ability to adopt new and innovative programs, statewide or regionally, alone or in partnership with private entities. A combination of approaches using innovative project delivery and financing programs and more flexible options for state and local decision makers, supported by traditional tax revenues, is likely the most feasible solution to offset the ongoing erosion of the purchasing power of the motor fuels tax.

In the end, there likely is no single answer that will resolve the fiscal woes of the state's transportation systems easily. The current transportation funding crisis presents an opportunity for state leaders to re-examine the state's transportation program, not only to resolve the financial concerns, but also to create transportation policy that is responsive to differing regional needs and that protects future transportation investments.

More Revenue Alone Won't Solve the Problem

In order to bring about positive, forward momentum in solving the current and future transportation challenges facing Texas, Texans must be willing to take different steps to get different, improved results. Many of the current state and federal transportation funding programs come with significant restrictions on how the limited available funds can be used. For example, the Texas Constitution dedicates all state motor fuels tax revenues and federal reimbursements to highways alone. The state cannot use these funds for any other mode, even if state and local leaders determine that a particular transportation solution might best be provided by another mode, such as transit. In addition, the federal highway program directs most of the available funding to the states through a set of specific, programmatic funding categories. The federal program structure further limits the state's ability to meet its transportation needs with a variety of transportation solutions appropriate to each region or situation. Finally, without broader, more flexible opportunities for the private sector to invest in and bring greater innovative project development to transportation, Texas will have fewer options in solving the transportation challenge to best serve Texans today and tomorrow.

If Texas leaders expect to change the state's capacity to address the Texas transportation challenge, they should recognize those limitations and take steps to overcome them. Without changes to the structure and characteristics of existing federal and state transportation funding programs, even the addition of new revenue streams is not likely to make a significant difference. As Texas leaders consider each potential new funding mechanism, they should evaluate how that mechanism enhances, impedes, or complicates the existing transportation funding structure. As our leaders identify the structural improvements needed and take the appropriate legislative steps to accomplish those changes, the state's ability and capacity to meet our transportation needs will grow. If we ignore the opportunity to make our existing funding programs more flexible, we may miss an important opportunity to shape the future of Texas.

So, What's Next?

As mentioned at the beginning of this report, the 2030 Committee and the state's leading research universities are undertaking an extensive, independent process to update the state's methodology for estimating the mobility and maintenance needs of the Texas transportation system. The 2030 Committee will produce its report, including its more refined estimate of needs, by the end of 2008.

In addition, the Texas MPO Association (TEMPO) is currently working with TxDOT to establish a group of MPOs and TxDOT representatives to agree on some reasonable assumptions and future funding scenarios to be used by everyone to develop the next round of updates to the regional and statewide plans. We hope to have these scenarios created by September 2008.

One of the forecasting tools under evaluation at TxDOT is an Excel program called J.A.C.K. This spreadsheet is

much like a business balance sheet, listing projected revenue and expenses. The program breaks down revenues into four basic categories: State Motor Fuel Taxes, State Vehicle Registration Fees, Federal Motor Fuel Taxes and Others. Roughly, state motor fuel taxes account for 35-40 percent of the total revenue, State vehicle registration fees account for roughly 10-20 percent, and federal motor fuel taxes bring in another 35-40 percent. The other fees and taxes account for a very small percentage of the total revenues. The spreadsheet documents a strong mathematical relationship between population and state motor fuel taxes and also between population and state vehicle registration fees. The analysis tool assumes that federal motor fuel taxes are further related mathematically to state motor fuel taxes in future years.

Motor fuel taxes and vehicle registration fees account for most of the projected revenue. J.A.C.K. allows for the development of an array of revenue scenarios by utilizing different population projections from the State Data Center at the University of Texas at San Antonio. Historically, the number of cars on the road, along with miles driven, relate strongly to population. However, in future years, this historical trend may change. There is a large probability that fuel efficiency will change dramatically as fuel costs and public awareness of tailpipe emissions both increase. J.A.C.K. accounts for future impacts of improved fuel efficiency through a simple entry. Other factors that the user can vary in J.A.C.K. include the rate of construction inflation, federal rate of return, tax and registration fee rates, indexing of the state motor fuel tax, and bond revenue backed by the motor fuel tax or backed by general fund revenue. In addition, J.A.C.K. allows the user to construct funding scenarios that reduce the rate of Fund 6 transfers to non-highway uses.

This program could provide TxDOT and other decision makers the ability to quickly and easily input different variables that influence the revenues and costs associated with building and maintaining the Texas highway system to develop a range of future funding scenarios. The variables that one can adjust in J.A.C.K. include population growth, inflation, fuel efficiency, federal rate of return, state and federal gas tax rates, vehicle registration fee increases, maintenance expenditure increases, bond issuances, and transfers from the State Highway Fund. Once we have common agreement on a set of reasonable assumptions, we can project reasonable expectations of funding.

Beyond the continuing work on these efforts, in the meantime, we hope that the information provided in this "Moving Texas" report will give Texas leaders and the public some of the key background information they need to consider some possible options for addressing the Texas transportation challenge.

In addition to our own staff research, TxDOT relied on the following analyses to prepare this "Moving Texas" report:

- ***Description of Current Texas Transportation Mobility and Maintenance Needs***, Cambridge Systematics, Inc., June 2008
- ***Findings and Analysis: Texas Transportation Funding Challenge***, Dye Management Group, Inc., July 2008

To obtain copies of these source reports, please contact John Sabala, Researcher, TxDOT Government & Public Affairs Division, at 512-936-9515.