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Texas Department of Transportation

Findings and Analysis

Texas Transportation Funding Challenge

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Texas Department of Transportation

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Executive Summary

TxDOT has identified a significant gap between transportation funding and needs over the next 25 years. Faced with the erosion of the state and federal motor fuel tax, limited growth in federal transportation funding, and increasing travel demands, Texas has a funding challenge. This challenge is further compounded by the limitations that TxDOT faces in using federal funds due to the laws governing their use.

Options for transportation funding were evaluated based on a set of accepted economic and public policy criteria:

- **Efficiency**
  - Capacity or yield of the option to raise new funds over time
  - Utility and flexibility with which those new funds can be applied across different projects and jurisdictions
- **Equity**
  - Impact on economic competitiveness
  - Loss as viable revenue for other government programs
  - Fairness across people and businesses in the state
- **Simplicity**
  - The public's ability to understand the option
  - Cost of administration

A summary of each funding option is shown in Exhibit ES-1. Following the table, each option and its implications are discussed in brief. For the purposes of this analysis, order of magnitude estimates of yield are provided that have been rounded. A detailed analysis of each option is presented in Section III, and all revenue calculations are presented in Appendix C.

Exhibit ES-1: Summary of Revenue Options

Revenue Mechanism	Description	Evaluation	Jurisdiction	Net New Revenue	Changes to Legislation	Approximate Yield
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
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
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
Increased Tolls	Toll authorities in Texas currently collect $1.2 billion statewide 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
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
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
Congestion Charges	Designed to reduce congestion in peak periods on specific facilities; can be implemented as a cordon charge; area wide; or variable by facility, time, or congestion level	Not efficient Somewhat equitable Complex	Local	Yes	New enabling legislation	Yield dependent on type of congestion charge

° Analysis developed by TxDOT

Increased Sales Tax: Statewide	Increase in the state sales tax rate	Very efficient Not equitable Very simple	Statewide	Yes	Section 151, Title 2	Each statewide 1% increase would yield about $1.3 billion/year
Increased Sales Tax: Local Option	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 volume of taxable sales
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 $23 million/year
Carbon Taxes	User fee based on carbon emissions of fossil fuels; would carry out as an increased fuel tax rate	Very efficient Somewhat equitable Simple	Statewide	Yes	Section 163, Title 2	A 27¢/gallon gas tax increase would yield $1.7 billion/year
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
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
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, Title 7	Varies by county

Indexed Fuel Tax

The Texas motor fuel tax is a fixed rate of 20¢ per gallon tax that has not changed since 1991. Inflation steadily erodes the purchasing power of this tax. Since 1991, the Consumer Price Index has increased about 60% and the Highway Cost Index has increased about 90%. Indexing the fuel tax to a rate of inflation protects its purchasing power. This tax is collected at the point of wholesale and best implemented statewide; it would be complex to implement locally.

Efficient

- If indexed to Consumer Price Index, each 1% increase in the fuel tax would approximately yield an additional $20 million per year
- Depending on index, will grow at a rate close or equal to highway construction cost inflation
- Stable to economic cycles, but is sensitive to reduced VMT and would erode with increased vehicle fuel efficiency over time

Somewhat equitable

- Equitable across users and generations
- Not equitable across locations, as collection is statewide but projects are local
- Somewhat regressive, as lower income groups pay a higher proportion of their incomes
- Low chance of diversion to non-transportation uses

Simple

- Understood user fee that drivers are accustomed to paying
- All necessary administrative and compliance tools exist
- No new technology or increased costs of compliance to users
- Section 163 (Motor Fuel Taxes), Title 2 (State Taxation) amendment required

A detailed analysis of this option is presented in Section III of the main report.

Increased Motor Fuel Tax Rate

Increasing the state motor fuel tax would provide immediate additional revenues to the State Highway Fund. Its purchasing power, however, would decline over time as construction costs inflate and vehicle fuel efficiency increases. This tax is collected at the point of wholesale and best implemented statewide; it would be complex to implement locally.

Very efficient

- Each 1¢/gal increase would approximately yield an additional $100 million per year
- Stable to economic cycles, sensitive to decreases in VMT
- Effectiveness will diminish steadily as vehicle efficiency and alternative fuel use increases and highway construction costs inflate
- Somewhat complex to implement as a local option tax

Somewhat equitable

- A large one-time increase will change Texas' competitive position with neighboring states
- Equitable across users and generations
- Somewhat regressive, as lower income groups pay a higher proportion of their incomes
- Low chance of diversion to non-transportation uses

Very simple

- Understood user fee that drivers are accustomed to paying
- All necessary administrative and compliance tools exist
- No new technology or increased costs of compliance to users
- Section 163 (Motor Fuel Taxes), Title 2 (State Taxation) amendment required

A detailed analysis of this option is presented in Section III of the main report.

VMT Charge to Replace Fuel Tax

A VMT charge is a user fee paid by drivers for each mile driven. Many transportation-related organizations have concluded that a mileage-based user fee is a superior alternative to the fuel tax. A VMT charge of 1.35¢/mile would equal the current state motor fuel tax; this charge would initially replace the motor fuel tax and would provide for current transportation projects. Increasing the VMT charge would provide net new revenues and could fund new transportation projects.

This option is best implemented statewide, as part of a national movement toward a VMT charge as a replacement to the motor fuels tax. If GPS technology is used, local jurisdictions could collect the tax.

Very efficient

- Each additional 0.1¢/mile would approximately yield an additional $200 million per year
- Stable, very sensitive to changes in VMT
- Vulnerable to inflation
- Can be used as a local option if GPS collection technology is used

Somewhat equitable

- Not equitable across users; a uniform VMT would not substitute for the increased fuel tax collection from vehicles with larger or less efficient engines
- Somewhat regressive; lower income groups pay a higher proportion of their incomes
- Equitable across generations and locations; if GPS technology is used, transportation improvements could be tied to infrastructure use
- Low chance of diversion to non-transportation uses

Very complex

- Understandable as a user fee
- High costs of implementation and compliance; would require drivers and the government to adopt expensive technologies
- Difficult to enforce in border areas; to be feasible, needs nationwide implementation
- Section 163 (Motor Fuel Taxes), Title 2 (State Taxation) amendment required

A detailed analysis of this option is presented in Section III of the main report.

Increased Tolls

Toll authorities in Texas collect $1.2 billion in tolls per year. Currently, less than 10% of the trips in Texas' eight largest metropolitan areas are tolled. Tolls in Texas are generally under-priced with respect to what the market would bear.

Tolls can be implemented statewide and/or by local toll authorities. Increased tolls would provide net new revenues to fund new transportation projects; however there is resistance to spending toll revenues on other facilities. No legislative changes are required to increase tolls.

Somewhat efficient

- Increasing tolls by 10¢/transaction on all currently tolled facilities would approximately yield an additional $50 million per year, considering price sensitivity
- Not indexed to costs, but initial toll rate schedules must account for full life cycle costs
- Stable but sensitive to price, since drivers usually have an alternative untolled route
- Often collected by local toll authorities
- Most toll revenues are spent only on the system on which they are collected and there is resistance to spending toll revenues on other systems

Very equitable

- Equitable across locations, generations, users, and income groups as long as drivers have an alternative untolled route
- Low chance of diversion to non-transportation uses

Very simple

- Well understood user fee in practice across Texas
- Tools for administration, compliance, and collection in place

A detailed analysis of this option is presented in Section III of the main report.

Transportation Reinvestment Zones

Note: Texas Department of Transportation staff developed this analysis following completion of the larger report at the request of Senator Eliot Shapleigh. Dye Management Group is not responsible for the information presented on this topic.

Created through enactment of S.B. 1266, by Senators Shapleigh and Brimer in the 80th Regular Legislature, a Transportation Reinvestment Zones (TRZ) is a method of tax increment financing created specifically to allow cities and counties to capture future gains in ad valorem taxes to finance road projects.

The governing body of a city or county determines a specific area within in its jurisdiction, under certain guidelines, as a TRZ to promote road projects that cultivates development or redevelopment of the area. Under current law, TRZ revenue can only be used in planned or executed pass-through toll agreements with TxDOT and is restricted to use on the State Highway System.

Not efficient

- Highly dependent on economic cycles

Equitable

- Can divert funds from other, non-transportation uses
- Equitable across users, locations, and generations as they are paid by property owners and users of the infrastructure

Simple

- Generally understood and supported by the public
- Administrative and collection processes are in place, but legal costs may increase
- Local governments are enabled by the state to levy land development fees, but the state is not enabled to do so

A more detailed analysis of this option is presented in Section III of the main report.

Land Development Charges

Land development charges are paid in the form of impact fees, tax increment financing (TIF), and value capture programs. These revenue options are viable locally on a per-project basis, and provide net new revenues. In Texas, local governments are enabled by the state to levy land development fees, but the state is not.

Not efficient

- Impact fees would yield $75 million per year, based on 1% of the estimated value of Texas' non-residential building permits
- Can contribute significantly on a per-project basis but will not meet major project needs
- Highly dependent on economic cycles

Equitable

- Can divert funds from other, non-transportation uses
- Equitable across users, locations, and generations as they are paid by developers and users of the infrastructure
- Developers pass on the costs to buyers, driving up the cost of real estate

Simple

- Generally understood and supported by the public
- Administrative and collection processes are in place, but legal costs may increase
- Local governments are enabled by the state to levy land development fees, but the state is not enabled to do so

A detailed analysis of this option is presented in Section III of the main report.

Congestion Charges

Congestion pricing involves increased tolling in a specific area and/or during peak hours. They are designed to reduce congestion, and not necessarily to produce additional revenues. These charges are urban center-specific and therefore viable chiefly as an option implemented by a toll authority. Congestion charges would provide net new revenues to fund new transportation projects; however, there may be resistance to spending toll revenues outside the tolled area. Congestion charges are in use in Europe, notably in London, where users are charged about $8 per trip to enter the central city.

Not efficient

- Tends to undermine the basis for tolls by discouraging trips into tolled area
- Stable but sensitive to price, since drivers usually have an alternative untolled route
- Very effective price signal to users
- Viable as a local option implemented by a toll authority

Somewhat equitable

- Could be diverted to non-transportation uses
- Not equitable across users or locations, as the charge is not tied to infrastructure costs and almost half of the trips in a metropolitan area are from one suburb to another
- Regressive; lower income groups pay a higher proportion of their incomes

Complex

- May be less understandable in low-density Texas; the public may not view an urban-centered congestion charge as the solution to the statewide congestion problem
- High costs of implementation of new technologies and administrative tools
- New legislation would be required to enable congestion charges

A detailed analysis of this option is presented in Section III of the main report.

Increased Sales Tax: Statewide

Sales tax revenues merit attention as a potential source of transportation infrastructure funding because of their size. In many states, retail sales taxes are the largest established tax base in the state. In Texas, collections on the state sales tax of $6^1/_4$% in 2006 were $18.3 billion, over half of the state's total tax collections of $33.5 billion.[1]

Very efficient

- Each 1% increase would yield about $1.3 billion per year, considering price sensitivity
- Stable, but will grow less than VMT and is sensitive to the amount of consumer goods sold
- Well-established in Texas as local option taxes, typically focused on transit

Not equitable

- Revenue collection not linked to transportation uses
- Revenue dedicated to transportation might be lost to other programs
- Possible negative impacts on retailers in border regions
- Not equitable across users, income groups, locations, or generations

Very simple

- Effective administration, compliance, and enforcement systems exist
- Local governments are empowered to fund transportation projects in Texas
- Section 151 (Limited Sale, Excise and Use Tax), Title 2 (State Taxation) amendment required

A detailed analysis of this option is presented in Section III of the main report.

[1] http://www.window.state.tx.us/taxbud/bre2008/html/table-a16.html

Increased Sales Tax: Local Option

Sales taxes dedicated to transportation are well-established in Texas as local option taxes and have historically been focused on transit. An increase in the state sales tax for transportation purposes would provide net new revenues. Local option sales taxes to fund transit authorities are in place in the Austin, Corpus Christi, Dallas-Fort Worth, El Paso, Houston, Laredo, and San Antonio metropolitan areas.

Very efficient

- Yield will vary based on dollar value of sales tax collected in jurisdiction
- Stable, but will grow less than VMT and is sensitive to the amount of consumer goods sold
- Well-established in Texas as local option taxes, typically focused on transit

Not equitable

- Revenue collection not linked to transportation uses
- Revenue dedicated to transportation will be lost to other programs
- Possible negative impacts on retailers in border regions
- Not equitable across users, income groups, locations, or generations

Very simple

- Effective administration, compliance, and enforcement systems exist
- Local governments are empowered to fund transportation projects in Texas
- Section 151 (Limited Sale, Excise and Use Tax), Title 2 (State Taxation) amendment required

A detailed analysis of this option is presented in Section III of the main report.

Container Fees

Container fees are charges imposed on freight containers as they move through a transportation facility and are most often used to fund rail and road capacity improvements into container port terminals. Container fees would provide net new revenues to fund new transportation projects; however the competitive situation of ports would require most revenues to be dedicated to freight infrastructure in and around the port. They are best assessed and collected by ports and/or Regional Mobility Authorities.

Somewhat efficient

- A fee of $30 per TEU on inbound containers through Houston and Galveston would yield about $24 million per year
- Very sensitive to economic cycles
- The competitive situation of ports would require most revenues to be dedicated to freight infrastructure in and around the port

Equitable

- If collected by a port authority, funds are unlikely to be diverted to non-transportation uses or uses outside of freight infrastructure in and around the port
- The ports would be at a cost disadvantage to other ports that do not charge container fees
- Equitable across users and locations
- Mildly regressive; a container fee will slightly increase the cost of goods

Simple

- Understood by the public if tied to relevant programs
- Low cost of administration and compliance
- Implementing container fees would not require new legislation if they are charged by Regional Mobility Authorities

A detailed analysis of this option is presented in Section III of the main report.

Carbon Taxes

Carbon taxes are environmental impact charges on the carbon dioxide (CO_2) emitted from burning fossil fuels, and are 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.

Most currently levied carbon taxes are revenue-neutral; for example, the tax collected in British Columbia is returned to taxpayers through income and business tax cuts. Those that are revenue-generating, like in Sweden, use carbon tax revenues for environmental projects.

Very efficient

- Would approximately yield an additional $1.7 billion a year if implemented at the level of British Columbia's carbon tax (27.5 cents per gallon of gas), considering long-run price sensitivity
- Stable to economic cycles, sensitive to decreases in VMT
- Effectiveness will diminish as highway construction costs inflate, vehicle efficiency increases, and alternative fuel use increases
- Somewhat complex to implement as a local option tax

Somewhat equitable

- A large increase in the motor fuel tax will change Texas' competitive position with neighboring states
- Equitable across users and generations
- Somewhat regressive, as lower income groups pay a higher proportion of their incomes
- Some chance of diversion to environmental programs, as in other jurisdictions

Simple

- Understood user fee
- All necessary administrative and compliance tools exist
- Few problems of documentation or measurement, as exact carbon outputs of fossil fuels are known

A detailed analysis of this option is presented in Section III of the main report.

Proposition 12 Bonding Authority

In November 2007, Texas voters approved Proposition 12, which authorized the Texas Transportation Commission to issue up to $5 billion in general obligation bonds to fund highway improvements. Once approved, bonds authorized under Proposition 12 are general obligations of the state, and the state is required to repay the debt. TxDOT currently uses bonding as an innovative financing tool.

Limited efficiency

- General obligation bonds are not new revenues to the State; however, they would be new revenues to TxDOT
- Applicable to projects funded through the State Highway Fund, pending enabling legislation
- Cannot be used to secure additional debt

Equitable

- Costs are spread over time
- If repaid by the state's general fund, not linked to transportation uses
- Not equitable across the system, as costs are equal system-wide but benefits may not be

Simple

- Enabling legislation necessary to approve bond issuance
- General obligation bonds for infrastructure are understood by the public

A detailed analysis of this option is presented in Section III of the main report.

Increased Vehicle Registration Fees: Statewide

Texas charges a fee on all vehicle registrations that varies according to the class of vehicle being registered. In addition, counties in Texas levy vehicle registration fees to pay for improvements to their road systems. Texas vehicle registration fees remitted to the State Highway Fund average about $62 per vehicle registration, lower than the U.S. average of about $67 per vehicle registration.

Very Efficient

- Each $10 increase in motor vehicle registration fees should yield about $200 million per year in additional revenues
- Revenues should grow in proportion to vehicle registrations which, in times of high fuel prices, may exceed the growth rate of motor fuel taxes as the average mileage driven with Texas-registered vehicles declines
- The purchasing power of vehicle registration fees will erode with continuing inflation

Somewhat Equitable

- Equitable across generations but fees are the same regardless of distances traveled and type of fuel used
- Not equitable across locations, as collection is statewide but projects are local
- Somewhat regressive, as lower income groups pay a higher proportion of their incomes
- Low chance of diversion to non-transportation uses

Simple

- All necessary administrative and compliance tools exist
- No new technology or increased costs of compliance to users
- Subchapter D (Registration Procedures and Fees), Section 502 (Registration of Vehicles), Title 7 (Transportation) would have to be amended

A detailed analysis of this option is presented in Section III of the main report.

Increased Vehicle Registration Fees: Local

Texas charges a fee on all vehicle registrations, which varies according to the class of vehicle being registered. In addition, counties in Texas may levy vehicle registration fees to pay for improvements to their road systems.

Very Efficient

- Each $10 increase in motor vehicle registration fees should yield different amounts in each county. Some examples are:
  - In Harris County: about $32 million per year
  - In Cameron and Hidalgo counties: about $6.5 million per year
  - In Howard County, about $270,000 per year
- Revenues should grow in proportion to vehicle registrations which, in times of high fuel prices, may exceed the growth rate of motor fuel taxes as the average mileage driven with Texas-registered vehicles declines
- The purchasing power of vehicle registration fees will erode with continuing inflation

Somewhat Equitable

- Equitable across generations but fees are the same regardless of distances traveled and fuel use
- Somewhat regressive, as lower income groups pay a higher proportion of their incomes
- Low chance of diversion to non-transportation uses

Simple

- All necessary administrative and compliance tools exist
- No new technology or increased costs of compliance to users
- Subchapter D (Registration Procedures and Fees), Section 502 (Registration of Vehicles), Title 7 (Transportation) would have to be amended

A detailed analysis of this option is presented in Section III of the main report.

Background and Approach

During the 2007 session of the Texas Legislature, a primary topic of debate was the size of the transportation needs of the state and how to fund those needs. TxDOT has identified a significant gap between transportation funding and needs over the next 25 years. Faced with the erosion of the state and federal motor fuel tax, limited growth in federal transportation funding, and increasing travel demands, Texas has a funding challenge.

This report presents the results of an analysis of various options for raising new revenue in Texas. The report is organized in four major sections:

- Section I. Background and Approach
- Section II. Options
- Section III. Detailed Analysis
- Appendix A: Diversions of Existing Revenues
- Appendix B: Borrowing
- Appendix C: Assumptions and Calculations

The various options are evaluated against commonly used economic and public policy criteria. A description of the evaluation criteria and comprehensive evaluations of each option are presented in the Detailed Analysis section. For the purposes of this analysis, yield estimates are rounded; calculations are available in Appendix C.

A. Background

While estimates of unfunded needs in Texas differ, they all point to a significant shortfall in funds from traditional sources of revenue; mainly, motor fuel taxes levied by Texas and the federal government.

An independent audit of transportation funding, completed for the Texas Department of Transportation by Dye Management Group, Inc. in July 2007, found that:

- Increasing fuel efficiency and the US government's operating deficit may further reduce TxDOT's traditional revenues by about $15 billion, in nominal terms, over the next 25 years relative to the historical trends in the 2004 Texas Metropolitan Mobility Plan
- The funding tools enabled by House Bill 3588 in 2003 and House Bill 2702 in 2005 may yield about $30 billion by 2030, of which about $12 billion was already included in TxDOT's 2004 forecast of $102 billion from traditional revenues

It is important to note that TxDOT's revenue from the federal trust fund comes with considerable legal restrictions governing its use. These restrictions limit TxDOT's ability to apply funds in the most effective way to meet transportation needs. Reform of the federal program is a necessary part of addressing The Texas Transportation Funding Challenge.

B. Approach

This analysis employs a conventional approach that is used often in public policy analysis: comparing options with evaluation criteria to define implications. The analysis:

- Identified transportation financing options for evaluation
- Analyzed each option based on a set of accepted economic criteria defined by efficiency, equity, and simplicity
- Focused on new and alternative revenue sources for transportation funding

This review defines an option as a single initiative that can be taken to raise additional revenues from a single source; because governments have the prerogative to accept some options and reject others, in effect making their own funding packages, this review analyzes these individual funding options.

A discussion of existing federal and state revenues collected from taxes and fees that are not currently available to TxDOT is provided in Appendix A. A discussion of applicable state and federal borrowings to finance transportation is provided in Appendix B.

1. Evaluation Criteria

The evaluation criteria used in this study are based on the three basic principles that have guided comparative tax analysis for the past thirty years:[2]

Efficiency, namely the capacity or yield 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.

Equity, defined for this analysis as 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.

Simplicity, defined as both the public's ability to understand the option and the cost of its administration.

From these high-level criteria flow more detailed criteria, shown in Exhibit I-1 on the next page in the order to which they are applied in the analyses.

[2] US Department of the Treasury (1977).

Detailed definitions of each criterion are available in Section III of this report.

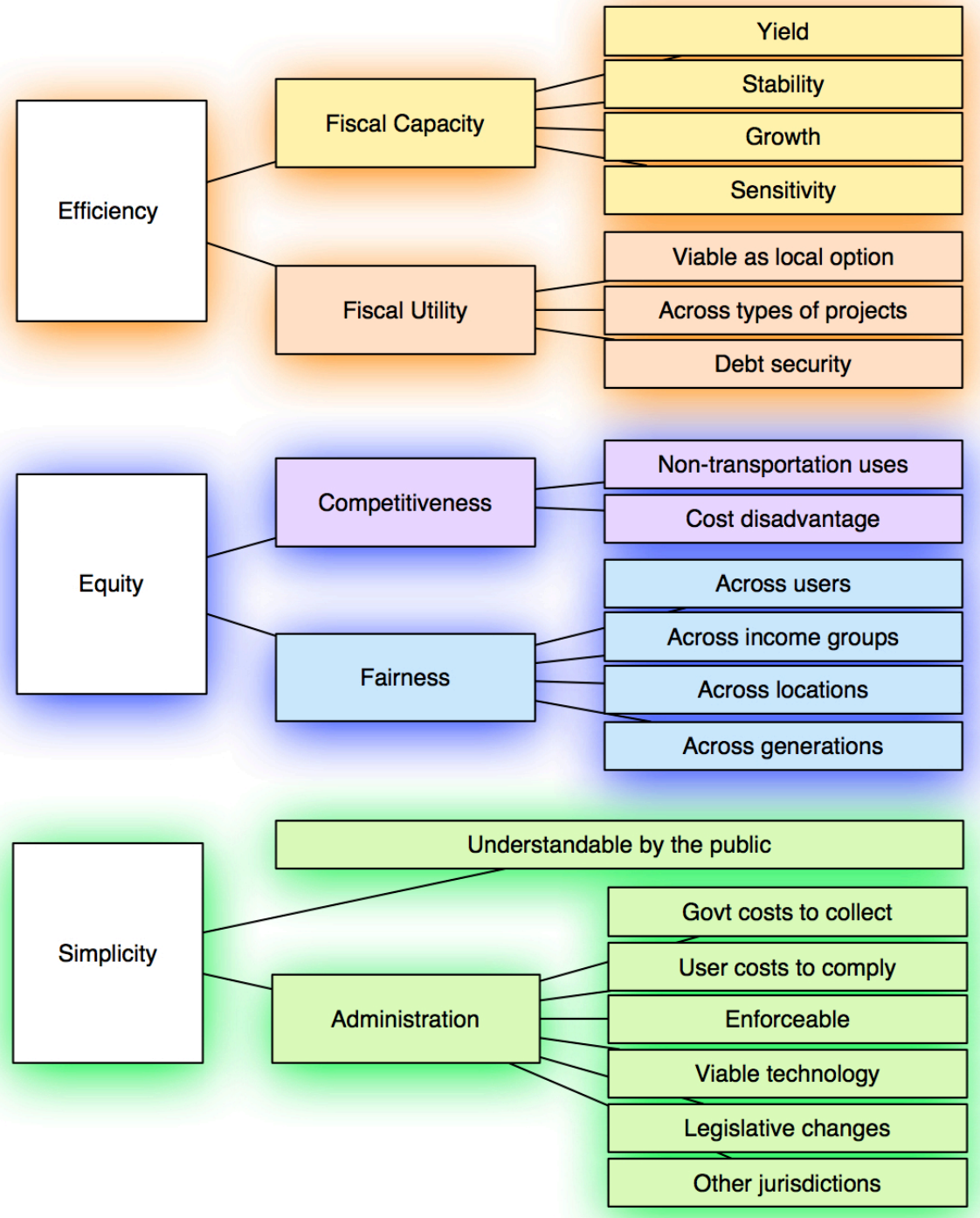
2. Implications

As each evaluation criterion is applied to each option, an implication for that option is defined. These implications are, generally, the costs and the benefits of each option as well as the requirements for implementation such as technology, statutory, jurisdictional responsibilities, and other dependencies.

In the next two sections, the implications for the options are presented in a narrative form, according to the three overall criteria of efficiency, equity, and simplicity. Tables in Section III of this report show the implications of each option according to the more detailed criteria that together make up efficiency, equity, and simplicity.

Some of the implications are preliminary estimates of yield. Revenue estimates were calculated and rounded for the purposes of this analysis. To make such estimates, several assumptions were required. These assumptions and calculations are provided in Appendix C.

Exhibit I-1: Evaluation Criteria



Options

In this section, the implications for each option are presented in a narrative form, according to the three overall criteria of efficiency, equity, and simplicity. More detailed analyses showing the implications of each option according to each of the specific criteria are shown in Section III.

1. Indexed Fuel Tax

The Texas 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 this tax has declined considerably in the past 20 years. In Texas, the state motor fuel tax rate has not changed since 1991; in the sixteen ensuing years, the Consumer Price Index has increased by about 60% and the costs of highway construction as reported by the US Federal Highway Administration (FHWA) have increased by about 90%, as illustrated in Exhibit II-1 below. Indexing the tax to a measure of inflation, such as a highway construction cost index or the Consumer Price Index, would increase the yield of the motor fuel tax and slow down the erosion of its purchasing power.

Exhibit II-1: Cost Inflation in Highway Planning, Design and Construction[3]

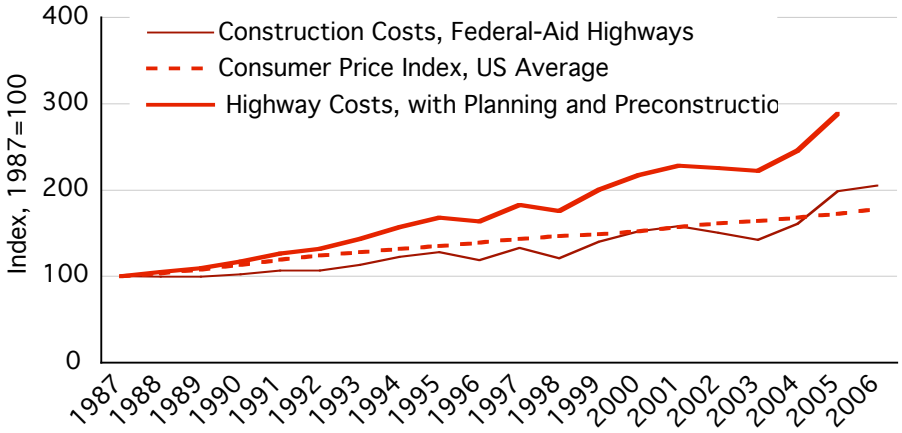


Exhibit II-1 above illustrates the impacts of inflation on TxDOT's business costs. In this exhibit, "construction costs, federal aid highways" refers to increases in the unit costs of construction only: asphalt, steel, concrete, and labor. "Highway costs, with planning and preconstruction" estimates the increases in the costs of building highways: not just in construction itself but in the increasingly complex and lengthy technical and consultation processes required to plan, program, and design a highway.

[3] Source data: FHWA Highway Statistics, US Bureau of Labor Statistics, and DMG calculation based on national data on environmental orders and legislative measures related to highway construction

Evaluation

Efficiency

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. Further, an indexed fuel tax will, depending on the index, grow at a rate close to or equal to the rate at which highway 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; higher fuel taxes will reduce vehicle-miles traveled. If the fuel tax is indexed, each one percent increase in the state motor fuel tax would approximately yield an additional $20 million per year in the State Highway Fund.

Equity

An indexed fuel tax is **somewhat equitable**. Fuel taxes are user fees and attempt to match the costs of the state highway system to the drivers who use it. However, they are not equitable across locales; drivers in all locales pay them, but some locales may benefit from them more than others. Nor are fuel taxes equitable across levels of income: since transportation is a basic need in Texas, lower income households would pay a higher proportion of their incomes into the motor fuel tax. Indexing the fuel tax would not put Texas at a competitive disadvantage to neighboring states, and with constitutional protection there is a low chance that funds could be diverted into other uses.

Simplicity

An indexed fuel tax would be **simple** to understand and administer. The fuel tax is an already understood user fee that drivers are accustomed to paying. All necessary administrative and compliance tools exist for collection of the fuel tax, although a variable tax rate would require additional effort to administer. As the fuel tax is collected at the point of wholesale, it is somewhat complex to implement as a local option tax.

2. Increased Motor Fuel Tax Rate

The Texas state tax on motor fuel, at 20¢ per gallon, is near the national average state motor fuel tax. Combined with the US federal fuel excise tax of 18.4¢ per gallon, there is a motor fuel tax load on gasoline and gasohol in highway use in Texas of 38.4¢ per gallon.

Converted into US measures, comparable fuel taxes in other jurisdictions are, approximately:

- Canada, about $1.25 per gallon, including a recently-introduced 30¢ per gallon carbon surtax[4]

[4] Government of British Columbia, 2008/09 Budget.

- United Kingdom, France and Germany, about $4 per gallon[5]
- Japan, about $3.50 per gallon[6]

By these comparators, motor fuel taxes paid by Texans are low.

Evaluation

Efficiency

Increasing the motor fuel tax rate would be **very efficient**, providing immediate additional revenues for the State Highway Fund of about $100 million per year for each one cent per gallon increase in the tax rate. Its effectiveness will diminish steadily, however, as:

- Engine efficiency increases and vehicles travel more miles to the gallon
- Growth in vehicle miles traveled is diminished by the higher costs of travel to which the increased taxes contribute
- Use of alternative fuels increases
- The costs of highway construction inflate over time

Equity

A higher motor fuel tax rate is **somewhat equitable**. Fuel taxes are user fees and match the costs of the state highway system to drivers who use it. A relatively high fuel tax may put Texas fuel retailers in border regions at a competitive disadvantage. They are not equitable across locales, however: drivers in all locales pay them, but some locales may benefit from them more than others. Nor are fuel taxes equitable across levels of income: since transportation is a basic need in Texas, lower income households would pay a higher proportion of their incomes into the motor fuel tax.

Simplicity

An increased motor fuel tax rate is **very simple** to understand and administer. The motor fuel tax is generally understood to be a user fee that drivers are accustomed to paying. All necessary administrative and compliance tools exist for collection of the fuel tax. As the fuel tax is collected at the point of wholesale, it is not particularly viable as a local option.

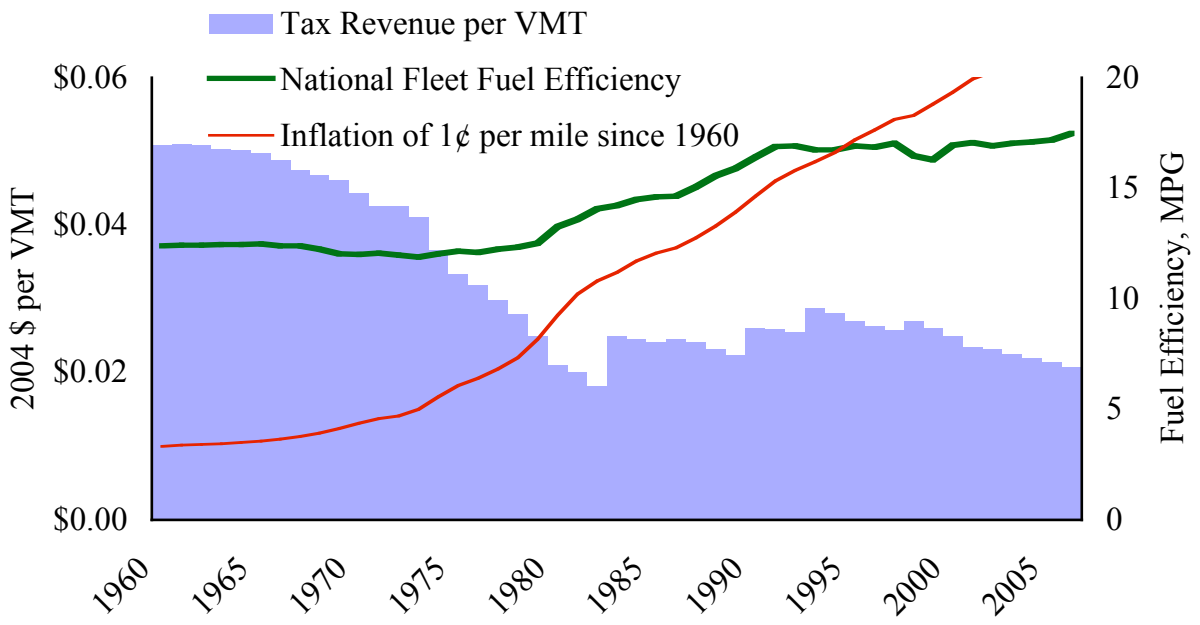
[5] US Federal Highway Administration (FHWA). "Motor Fuel Tax Rates for Selected Countries." *Monthly Motor Fuel Reported by States*. September 2007.
[6] Metschies (2005)

3. VMT Charge to Replace Fuel Tax

A Vehicle Miles Traveled (VMT) charge is a user fee paid by drivers 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), AASHTO, and the National Cooperative Highway Research Program (NCHRP), have concluded that a mileage-based user fee is a superior alternative to the fuel tax. VMT charges are currently being explored in pilot projects across the country.

As a user fee, motor fuel taxes have been eroded over the past 35 years by the increased fuel efficiency of gasoline and diesel engines, shown in green in Exhibit II-2 below, and cost inflation, shown in red, that has outstripped increases in nominal tax rates. The combination of these two eroding factors has reduced real motor fuel tax revenues, stated in constant 2004 dollars per vehicle mile and shown in blue in Exhibit II-2, from about 5¢ in 1960 to a little over 2¢ in 2006.

Exhibit II-2: Motor Fuel Revenues per VMT[7]



Officials in some jurisdictions have concluded that the increasing fuel efficiency of engines has made motor fuel taxes a poor proxy for road user charges and that a more direct levy of a road user charge is needed. If motor fuel taxes were replaced by a charge per vehicle-mile traveled, the erosive effect of fuel efficiency on road user payments would be eliminated.

[7] Adapted from Victoria Transport Policy Institute

VMT charges can be assessed through odometer readings, road-side scans of a device that is mounted on the vehicle or an on-board GPS that records vehicle movement.

Evaluation

Efficiency

VMT charges are **very efficient**. In Texas, each additional 0.1 cent per mile would yield about $200 million a year for the State Highway Fund. Revenues will vary directly with VMT which, in turn, are not volatile through economic cycles. A VMT charge is immune to erosions of revenue caused by increasing fuel efficiency; they are, however, vulnerable to cost inflation. VMT revenues would be attractive security for debt and, if Global Positioning System (GPS) units are used, VMT charges can be implemented as a local option.

Equity

VMT charges are **somewhat equitable**. They comprise a source of revenue that is unlikely to be raised for purposes other than funding transportation; thus they have a low opportunity cost to other government programs. VMT charges would not significantly alter Texas' competitive position with neighboring states. A flat VMT rate would not match the impact of fuel taxes on vehicles with larger engines, which typically have a greater impact on roads and air quality, and are thus somewhat inequitable among different vehicle types. As with motor fuel taxes, 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.

Simplicity

While a VMT fee system is novel in the United States, it is likely to be understood as a substitute for motor fuel taxes. VMT charges are **very complex** to implement and administer. Implementing the system would take a significant investment in administrative systems, education, and new technologies. It would be difficult to enforce VMT charges in border areas. The most likely path of implementation is a 20-year effort towards nationwide implementation.[8]

4. Increased Tolls

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

- An alternative route that offers a higher quality of services, including time savings, over what is available in the regular network of roads and highways

[8] AASHTO has concluded that in order for VMT charges to be viable, they would have to be implemented nationally.

- An unusually expensive asset, such as a bridge or a tunnel, that is part of the regular network

Tolls are widely used by state authorities; throughout the United States, they collected about $14.6 billion in tolls in 2005, almost $^{1}/_{3}$ as much as the $49.2 billion that all states collected from state motor fuel taxes in that year.[9] In Texas, the $1.2 billion collected by state and local authorities roughly equal the funds available to the State Highway Fund from the state motor fuel tax.

In Texas tolls are generally under-priced. The fare policies of most state and local toll authorities are to minimize tolls subject to sustaining and expanding their own systems. The North Texas Tollway Authority, for example, has proposed formal tolling policies that acknowledge a current uniform toll rate of about 10¢ per mile as sufficient to meet the bond indenture covenants to cover debt service coverage as well as operating and maintenance costs.[10] In contrast, the independent audit of transportation funding estimated a willingness to pay about 16¢ per mile on existing toll roads in Texas.[11]

Evaluation

Efficiency

Increased tolls on existing toll facilities in Texas are **somewhat efficient**, but that efficiency is limited by the current inventory of tolled facilities and the share of total trips that they attract. In Texas, less than 10% of trips in the eight largest metropolitan areas are tolled; an increase of ten cents per transaction would yield approximately $50 million per year. Revenues from tolls on existing facilities are rarely more than are required to service their capital and operating costs; and no dividends are available for additional assets outside of the tolled system. Tolls are a stable source of revenue that is correlated with trips taken on the tolled system and, therefore, fairly stable across economic cycles.

Equity

Tolls are **very equitable**: users who pay them usually have a choice between paying to use the tolled facility and enjoying its benefits, or using an untolled alternative. Toll revenues are very unlikely to be redirected to other uses. Tolling does not place Texas at a competitive disadvantage and, as long as drivers have access to alternatives, tolls maximize fairness across all groups: incomes, generations, types of users, and locations.

[9] FHWA Highway Statistics, Tables MF-1, SF-3B, and LGF-3B.
[10] North Texas Tollway Authority. The North Texas Tollway Authority's Evolving Tolling Philosophy: Briefing for the Trinity River Committee, City of Dallas. March 2006.
[11] Dye Management Group Inc. Independent Audit, Transportation Funding, July 2007.

Simplicity

An increased toll rate on existing toll facilities is **very simple** to administer. It is an established, clear, user fee principle successfully in place. To increase tolls, administrative costs would be very low, as collection and enforcement systems are already in place.

5. Transportation Reinvestment Zones

Note: Texas Department of Transportation staff developed this analysis following completion of the larger report at the request of Senator Eliot Shapleigh. Dye Management Group is not responsible for the information presented on this topic.

Created through enactment of S.B. 1266, by Senators Shapleigh and Brimer 80th Regular Legislature, a Transportation Reinvestment Zones (TRZ) is a method of tax increment financing created specifically to allow cities and counties to capture future gains in ad valorem taxes to finance road projects. The governing body of a city or county determines a specific area within in its jurisdiction, under certain guidelines, as a TRZ to promote road projects that cultivates development or redevelopment of the area. Under current law, TRZ revenue can only be used in planned or executed pass-through toll agreements with TxDOT and is restricted to use on the State Highway System.

For both a municipality and county establishing a TRZ, the increment 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 deposited into a special fund and used to fund project(s).

As of March, 2009 Texas' municipalities and counties have authorized the creation of three TRZs:

- The City of El Paso's TRZ will encompass approximately 115,000 acres, and is designed to expire when funding reaches $70 million or on December 31, 2025, whichever comes first. Collection of the revenues will begin in 2010 and will only impact the city portion of a property tax bill. The revenues will be used for projects like the Northwest Parkway, the completion of Loop 375 and other improvements on I-10. The 2008 city tax base was set up as the baseline for assessing increments over the duration of the TRZ. Tax revenue increments over and above the baseline 2008 value are assumed to be deposited in a Transportation Reinvestment Fund (TRF)

account for the life the TRZ. The 2008 tax rate for the City of El Paso of 0.671097 was held constant for the analysis period.

- The City of Forney's TRZ will encompass approximately 3,810 acres. Forney's TRZ has no explicit expiration date but can be terminated or continued by local option. If not specifically terminated, the TRZ will continue to provide funds for additional projects. The current revenue projection for Forney is approximately $14 million over a 30 year period. Collection of the revenues will begin in 2009, will only impact the city portion of a property tax bill, and will be used for projects along U.S. 80. The 2008 city tax base was set up as the baseline for assessing increments over the duration of the TRZ. Twenty percent of the city tax revenue increments over and above the baseline 2008 value are assumed to be deposited in a Transportation Reinvestment Fund (TRF) account for the life the TRZ. The 2008 tax rate for the City of Forney of 0.680535 was held constant for the analysis period.

- The County of Hidalgo's TRZ will encompass approximately 175,000 acres. Hidalgo's TRZ has no explicit expiration date but can be terminated or continued by local option. If not specifically terminated, the TRZ will continue to provide funds for additional projects. Hidalgo County Roadbuilders anticipates the Regional Mobility Authority could leverage future toll and TRZ revenues to increase local transportation spending by $2.2 billion between 2010 and 2030 to pay for the full RMA program. The 2008 county tax base was set up as the baseline for assessing increments over the duration of the TRZ. The 2009 tax rate for the County of Hidalgo of 0.5900 was held constant for the analysis period.

Two bills, H.B. 1810, by Pickett, and S.B. 2378 by Nichols, regarding TRZs have been filed during the 81st Regular Legislature.

As of April 7, 2009, H.B. 1810, by Pickett, was substituted in the House Transportation Committee, voted out of committee favorably, and sent to the House Calendars Committee. C.S.H.B. 1810 provides clarification relating to transportation reinvestment zones. Among other provisions, the bill authorizes a municipality or county to establish a transportation reinvestment zone for any transportation project.

As of April 7, 2009, S.B. 2378, by Nichols, was left pending in the Senate Transportation and Homeland Security Committee. The bill authorizes 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. The bill authorizes that any remaining money deposited to the tax increment account may be used for other transportation projects or for improvements in the zone.

Evaluation

Efficiency

Transportation Reinvestment Zones are **not efficient** as a primary revenue mechanism, as they are focused on specific locations. The potential revenue stream is highly dependent on economic cycles, lending this option a large degree of unpredictability and risk to the targeted project.

Equity

Transportation Reinvestment Zones are **equitable**, since the property owners who pay them pass the charges on to the consumers who benefit from the developed sites. The resulting revenues go into the targeted roadway infrastructure fund that these consumers will require for access to the sites. There is no cost disadvantage to localities charging these taxes; however, they are a form of real estate tax that can divert funds from other local priorities.

Simple

These taxes are **simple** to understand and administer. Systems are already in place at the local level to administer this type of ad valorem tax.

6. 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 land development charges: impact fees, tax increment financing, and value capture; they are almost exclusively applied to new development and paid by land developers.

Impact fees are 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. Many county and municipal governments throughout the United States impose them under different names, such as Traffic Impact Fees or Transportation Improvement Fees. Impact fees are typically levied on development with specific impacts on safety, operational performance, or the environment. For example, environmental impact fees in Texas are assessed at the district level by the Texas Council on Environmental Quality (TCEQ). TxDOT, along with TCEQ and local partners, conducts corridor-wide environmental impact studies through the Texas Environmental Resource Stewards (TERS) program. TERS assessments do not currently impose impact fees on development.

Tax increment financing (TIF) uses future gains in taxes to finance development. Increased land values around a transportation facility increases 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. 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 may otherwise be unaffordable. In 2007, Texas lawmakers enacted legislation to create Transportation Reinvestment Zones. This legislation, S.B. 1266, enables local areas to use tax increment financing to fund a project or to repay TxDOT funds under pass-through toll agreements.

Value capture programs take several forms, and may require the formation of assessment districts through voter approval. One form, in which revenues are generated through property taxes, occurs when a transportation facility is built, and the benefit that land owners realize with improved access to their land often translates into increased values for their land. Another form of value capture is when the state owns the land surrounding a transportation facility; when those lands are developed and those increased values are liquidated, the profits can pay some or all of the transportation improvement costs. Value capture programs are quite profitable for railway companies in Japan, which realize significant profits from land sales near railway stations to finance infrastructure development.

Another value capture program takes the form of ancillary real estate rights. These programs typically consist of the state leasing 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 challenges in the past; for example, the prospect of ancillary income earned from leasing land rights to telecommunications companies in the 1990s was overestimated.

Evaluation

Efficiency

Land development charges are **not efficient**. The revenue yielded by land development charges can be significant on a per-project basis but is unlikely to meet major project or program needs; they are not efficient due to the small number of developments to which they can be applied. Impact fees, if related to real estate values, 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 source of debt security. They are almost always leveraged at the local level. To illustrate the potential yield of an impact fee in Texas, where the value of non-residential building permits averages about $7 billion per year, land development charges would yield revenues of about $75 million per year.[12]

Equity

Land development charges are **equitable**, since the developers who pay them pass the charges on to the consumers who benefit from the developed sites. 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 charging land

[12] Texas A&M University, Real Estate Center

development fees; however, they are a form of real estate tax that can divert funds from other local priorities.

Simplicity

These fees are **simple** to understand and administer. Twenty-seven states currently have land development charge-enabling legislation. Systems, such as permitting, are already in place at the local level to administer land development charges, although implementation would require more legal involvement. The implementation of a corridor-wide land development charge would require municipalities to agree to a common fee structure in order to avoid competition.

7. Congestion Charges

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

Congestion pricing schemes are designed to reduce congestion on a road network by increasing the cost of travel and thus inhibiting the overall use of congested segments and nodes in the network. Road use charges provide incentives for users to shift some trips to off-peak times, to less congested routes, to other modes, or to cause some lower-valued trips to be combined with other trips or eliminated. A shift in a relatively small number of peak-period trips can lead to substantial reductions in overall congestion.

Congestion charges are sometimes perceived as tolls applied to a destination, rather than to a route. However, congestion charges differ from tolls in two important aspects: they are set to manage demand rather than to recover costs, and governments do not provide any additional transportation capacity to those who pay the fee.

Congestion charges can be applied in many forms, for example: as a cordon charge applied to the entire system, to specific geographic areas, to specific facilities, at varying times and dates, and at variable rates dependent on congestion levels. As such, congestion charges have varied yields.

Evaluation

Efficiency

Congestion pricing is **not efficient**; it is designed to discourage travel and thus limit the revenue that can be collected from it. Congestion charges are viable as a local option, as they are typically charged within an urban center. They can be used across all types of projects, but are not an established source of debt security.

Equity

Congestion charges are **somewhat equitable**. Since all users choosing to enter the congested zone do so for their own reasons, congestion charges do not change the balance among competing producers in any one industry. Since congestion pricing is location-specific, users directly benefit, but lower income users will bear a greater proportion of the burden. Since they are not tied to additional infrastructure development, congestion charges achieve maximum equity across generations. While they are understandable to the public for urban congestion, suburbanites – a majority commute between suburbs and not into an urban core – may not view congestion charges as a solution for congestion.

Simplicity

The administration of congestion charges is **complex** and expensive. They have high costs of collection and compliance and would require the adoption of new technologies and legislation.

8. Increased State Sales Tax: Statewide

Sales tax revenues merit attention as a potential source of transportation infrastructure funding because of their size. In many states, retail sales taxes are the largest established tax base in the state. In Texas, collections on the state sales tax of $6^1/_4$% in 2006 were $18.3 billion, over half of the state's total tax collections of $33.5 billion.[13]

Evaluation

Efficiency

Increasing the state sales tax is a **very efficient** way to raise revenues: a 1% increase in the state sales tax would generate $1.3 billion per year. 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 to fund all types of projects.

Equity

Increasing the sales tax to pay for highway improvements is **not equitable**. Sales taxes are not related to transportation use and therefore are not equitable across generational, user, income group, and location equity. Allocating sales tax room to transportation takes that room 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 increase in the state sales tax.

Simplicity

[13] http://www.window.state.tx.us/taxbud/bre2008/html/table-a16.html

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

9. Increased State Sales Tax: Local Option

Sales tax revenues merit attention as a potential source of transportation infrastructure funding because of their size. In many states, retail sales taxes are the largest established tax base in the state. Spending some portion of general sales tax receipts on transportation infrastructure has gained wide acceptance in recent years, generally as local option taxes: twenty-three 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 such as airport commissions and utility commissions, to add local option sales taxes of up to 2% to the basic state sales tax rate. The prevailing local option tax rates that local authorities in Texas have set are:

Exhibit II-3: Texas Local Option Tax Rates

City general revenues	$^1/_4$% to 2%
County general revenues	$^1/_2$% to 1$^1/_2$%
Transit authorities	$^1/_4$% to 1%
Special purpose districts	$^1/_8$% to 2%

Local option sales taxes to fund transit authorities are in place in the Austin, Corpus Christi, Dallas-Fort Worth, El Paso, Houston, Laredo and San Antonio areas.[14]

Where local option sales taxes have been used to fund transportation infrastructure, they have proved to have significant fiscal capacity. Local transportation authorities in 20 California counties, representing over 80% of the state's population, have introduced local transportation sales taxes (LTSTs) ranging from 1/4% to 1%, for transportation projects on local and state roads. In total, the optional sales taxes levied in these so-called "self help" counties have generated revenue equivalent to California's gasoline excise tax: about $2.5 billion in 2005.[15]

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. As local option sales taxes are

[14] http://cpa.state.tx.us/taxinfo/local/mta.html
[15] Hanak, Ellen and Kim Rueben, (2006) Funding Innovations for California Infrastructure: Promises and Pitfalls, USC Keston Institute for Infrastructure. Research Paper 06-01.

already established in Texas, this evaluation focuses upon an increase in general statewide sales taxes to fund the state highway system as a whole.

Evaluation

Efficiency

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.

Equity

Increasing the sales tax to pay for highway improvements is **not equitable**. Sales taxes are not related to transportation use and therefore are not equitable across generational, user, income group, and location equity. Allocating sales tax room to transportation takes that room 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 increase in the state sales tax.

Simplicity

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

10. 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.

As containers pass into and out of coastal ports, they 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 significant improvements to road and rail access into US ports, one of the largest examples being the Alameda rail expressway into Long Beach and Los Angeles. The US 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.

While international importers and their shippers expect port authorities to make commensurate investments to ensure the supply chains remain cost-efficient, they

themselves continually reassess the viability of transportation choices in their supply chains. The shippers' capital – ships and containers – is mobile and can be rerouted quickly to capture cost advantages. Typically, shippers will commit themselves to contracts of three years or less. Ports, on the other hand, must make long-term investments to build capacity ahead of demand.

Ports and their partners – the ship owners and the railways, mostly – 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 the rates charged by container lines, are generally not in the public domain. US ports have been permitted to conceal competitive information since the passage of the Ocean Shipping Reform Act by the United States Congress in 1999.

During 2006 and 2007, a proposal for a fee of $30 per inbound twenty-foot equivalent (TEU) at Long Beach and Los Angeles was extensively debated in California. The proposal dedicated the funds, $^1/_3$ to transportation infrastructure adjoining the ports, $^1/_3$ to other transportation infrastructure within 300 miles of the ports and $^1/_3$ to air quality mitigation measures. During the debate, the California Waterfront proposed public-private partnerships for transportation projects, funded by project-specific user fees, plus a privately administered fee of about $75 per TEU to modernize the fleet of diesel trucks used to move containers in and out of the ports.[16] The $30 per TEU proposal passed the floor of the California Legislature, only to be vetoed by the Governor.[17]

Evaluation

Efficiency

Container fees are **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.

Equity

Container fees are **equitable**. It is unlikely that revenues from container fees would be diverted to projects other than those sanctioned by the ports and the shippers that use them. Container fees 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

[16] Including the Association of American Railroads, the National Retail Federation, the Pacific Merchant Shipping Association, and the Retail Industry Leaders Association.
[17] SB 927. That fee would be in addition to an existing PierPass fee of $50 per TEU for passing through terminal gates during "peak hours".

goods slightly, a burden that would be of a slightly larger proportion to lower income groups.

Simplicity

Container fees are **simple** to collect. They are generally understandable to the public, as their recent implementation in California proves. Fee collection systems are already in place in ports, but legislation would have to enable collection.

11. Carbon Taxes

Carbon taxes are environmental impact charges on the carbon dioxide (CO_2) emitted from burning fossil fuels, and are 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 in place in several countries. In 2007, Quebec became the first North American government to charge a carbon tax. The tax, which is levied on energy companies, equates to 3.1 cents per gallon. The United Kingdom added a hydrocarbon surcharge to its fuel tax in 2001; the levy is about $3.70 per gallon.[18] Some European countries, as well as British Columbia, charge per ton of CO_2 emitted:

Exhibit II-4: Selected Carbon Tax Rates[19] (US Dollars)[20] per ton CO_2 emitted

British Columbia, Canada	$27.31
Denmark	$13.61
Finland	$22.13
Sweden	$150

Most currently levied carbon taxes are revenue-neutral; for example, the tax collected in British Columbia is returned to taxpayers through income and business tax cuts. Those that are revenue-generating, like Sweden, use carbon tax revenues for environmental projects.

Evaluation

Efficiency

Carbon taxes are **very efficient**. Implementing a carbon tax equivalent to British Columbia's would charge an additional 27.5 cents per gallon on top of the state motor fuel tax, which would yield an additional $1.7 billion per year to the State Highway Fund. Like any other increase in the gas tax, its effectiveness will diminish over time as higher gas prices will reduce vehicle-miles traveled, engine efficiency increases, the

[18] Carbon Tax Center, "Where Carbon is Taxed" March 30, 2008
[19] *Ibid.*
[20] Currency exchange rates accessed 5/16/2008

use of alternative fuels increases, and the costs of highway construction inflate over time.

Equity

Carbon taxes are **somewhat equitable**. As fuel taxes, carbon taxes are user fees that match the costs of the highway system to drivers who use it. 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 the carbon tax is implemented as revenue-neutral as in most jurisdictions that have implemented such taxes, it would be a progressive tax benefiting lower income groups. Could be applied to environmental programs, as in other jurisdictions.

Simplicity

These taxes are **simple** to implement. A carbon tax linked to fuel usage is generally understood by the public. All necessary administrative and compliance tools exist for collection of the fuel tax. As the exact carbon content of fossil fuels is known, there would be few problems of documentation or measurement.

12. Proposition 12 Bonding Authority

In November 2007, Texas voters approved Proposition 12, which authorized the Texas Transportation Commission to issue up to $5 billion in general obligation bonds to fund highway improvements. Once approved, bonds authorized under Proposition 12 are general obligations of the state, and the state is required to repay the debt. Senate Joint Resolution 64, 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, thereby avoiding the recent 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. Because bond proceeds are not new revenues and must be repaid with interest, their repayment can take revenues away from future projects. As Proposition 12-authorized bonds become part of the state's general obligations, not TxDOT's, those future debt payments may be at the expense of other agencies' future budgets.

Evaluation

Efficiency

General obligation bonds have **limited efficiency** that varies with the amount of revenues collected. Proposition 12 bond monies are not new revenues to the State, but are new revenues to TxDOT. 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.

Equity

General obligation bonds are **equitable**. They match costs to benefits over time and costs to the entire system rather than specific locations. The issuance of bonds under Proposition 12 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.

Simplicity

It is **simple** to issue general obligation bonds. As they are not new revenues, there are no costs to collect, nor is there an issue of enforcement. The issuance of debt is generally understood by the public as a means to finance infrastructure. Proposition 12 was approved in November 2007; the Legislature must pass enabling legislation to allow bond issuance under Proposition 12.

13. Increased Vehicle Registration Fees: Statewide

Texas requires that most types of vehicles are registered with the state and renewed each year. Vehicles are also registered as they are purchased, with the result that the number of registrations from annual renewals and purchases in Texas, about 21 million in 2006, exceeds the number of registered vehicles, about 17 million in 2006.

Texas charges a fee on all vehicle registrations. In addition, counties in Texas may levy vehicle registration fees to pay for improvements to their road systems. This section deals with a prospective increase in state registration fees; another section examines prospective increases in county fees as a source of local option revenue.

Texas follows the general practice of all U.S. states of charging state registration fees that vary by vehicle type or classification.

- Within the passenger vehicle classification, most states charge a flat fee:
  - Texas and several other states vary the registration fee for passenger vehicles by their age, such that registration fees are lower on older vehicles
  - Arizona, California, Iowa, Louisiana, Michigan and Minnesota tie passenger vehicle registration fees with the appraised value of the vehicle
  - Missouri varies its registration with the vehicle's horsepower

- In almost all states, fees for commercial vehicles are based on gross vehicle weight, with many states offering preferential rates for farm vehicles

At present, the Texas annual registration fee for a new passenger vehicle is $58 per year.[21]

This and other state vehicle registration fees raise about $932 million in fiscal 2006, which were deposited to the State Highway Fund. In the same year, about $58 million was disbursed by the state for vehicle registration and titling.[22] These costs are very low, less than $3 per registration; and reflect the division of registration between the state and the counties: counties offer front-counter registration services, while the state supports the vehicle registration information system.

Voters can be resistant to vehicle registration fees. Attempts made thus far in 2008 by other states to raise vehicle registration fees to bolster revenues for their state highway systems include:

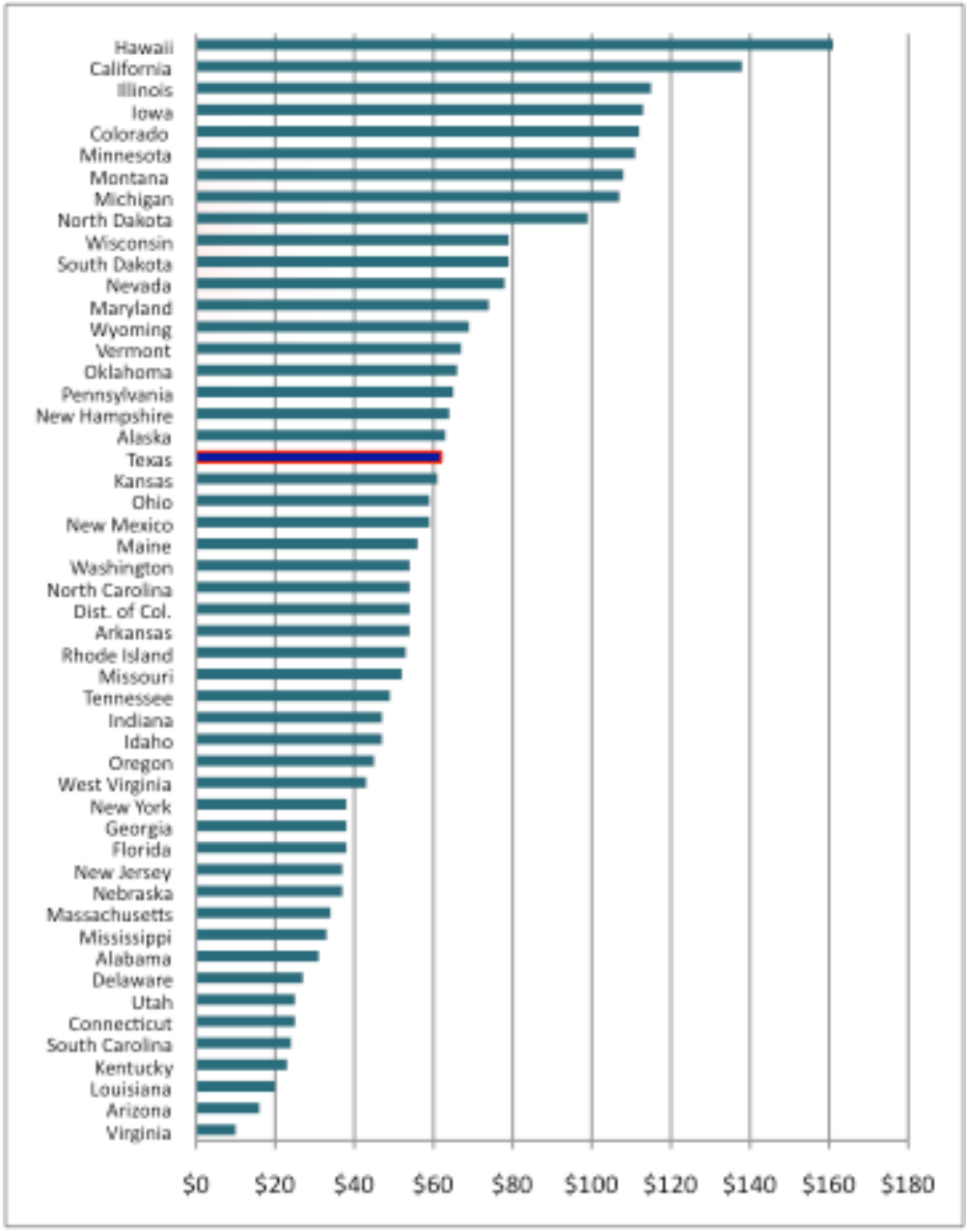
- Idaho: Increase state registration fees for personal vehicles to a flat rate of $150 annually, from between $24 and $48 based on a car's model year; FAILED
- Colorado: Increase state registration fees for personal vehicles by $100; FAILED
- Iowa: Increase minimum fee from $35 to $50; PASSED

Washington State has, since 1998, has responded to three voters' initiatives and referenda that have lowered passenger vehicle registration fees.

[21] Section 502.161, Texas Transportation Code.
[22] Texas Transportation Commission Minute Order 11073. October 2006.

Comparing fees for individual vehicles across U.S. states is made somewhat complicated by the different structures of these fees in each state. An indication of how Texas vehicle registration fees compares to other U.S. states is found in the receipts from vehicle registrations divided by the number of registrations: the average receipt for the registration of each vehicle in the state. Texas' average receipt for each vehicle registered was about $62 in 2006, lower than the U.S. average of $67 per vehicle that year.

Exhibit II-5: Average Annual Registration Receipts per Vehicle, 2006[23]



Evaluation

Efficiency

Vehicle registration fees are **very efficient**, since they are applied across the broad base of vehicle ownership. Each $10 increase in motor vehicle registration fees should yield about $200 million per year in additional revenues. Revenues should grow in proportion to vehicle registrations which, in times of high fuel prices, may exceed the growth rate of motor fuel taxes as the average mileage driven with Texas-registered vehicles declines. Sustained high fuel prices should increase vehicle registration revenues, as Texans opt for more fuel-efficient vehicles. The purchasing power of vehicle registration fees will erode with continuing inflation in construction costs.

Equity

Vehicle registration fees are only **somewhat equitable**, as vehicle registration fees are the same for all vehicles in a given vehicle class regardless of the mileage they are driven. As such, vehicle registration fees are a fixed user fee for access to the highway system. They are not equitable across locales; drivers in all locales pay them, but some locales may benefit from them more than others. Nor are they equitable across levels of income since they do not vary with the value of the vehicle and, through that, with income.

Simplicity

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

14. Increased Vehicle Registration Fees: Local

Texas charges a fee on all vehicle registrations. In addition, counties in Texas may levy vehicle registration fees to pay for improvements to their road systems. This section deals with a prospective increase in county registration fees; another section examines prospective increases in state fees.

County participation in vehicle registration in Texas is complex. The conditions below are only a small portion of the conditions that govern the relationships between counties and the state on vehicle registration.

- Counties are required to collect state vehicle registration fees on behalf of the state
- Counties split the receipts from state fees according to several formulae[24], retaining some for their road and bridge funds and remitting the balance to the state

[23] FHWA Highway Statistics, 2006. Estimated by dividing the total registration receipts of each state (Table MV 2) by the number of private vehicle registrations (Table MV-1).
[24] Section 502.102, Texas Transportation Code

- Counties may retain amounts equal to 5% of certain taxes and penalties[25]
- Counties may levy their own fees up to $10 per vehicle for their road and bridge improvements[26] and up to $1.50 per vehicle for child safety programs[27] but must remit 3% of those fees to the state as a contribution to the state's vehicle registration information system[28]
- To make additional contributions towards 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[29]

At present, almost all counties in Texas levy the $10 optional fee and over one dozen of those counties levy the child safety fee. As local option contributions toward their county-based regional mobility authorities, Hidalgo County levies an additional $10 and Cameron County and additional $5.[30]

Evaluation

Efficiency

Vehicle registration fees are **very efficient**, since they are applied across the broad base of vehicle ownership. Revenues should grow in proportion to vehicle registrations which, in times of high fuel prices, may exceed the growth rate of motor fuel taxes as the average mileage driven with Texas-registered vehicles declines. Sustained high fuel prices should increase vehicle registration revenues, as Texans opt for more fuel-efficient vehicles. The purchasing power of vehicle registration fees will erode with continuing inflation in construction costs.

Equity

Vehicle registration fees are only **somewhat equitable**, as vehicle registration fees are the same for all vehicles in a given vehicle class regardless of the mileage they are driven. As such, vehicle registration fees are a fixed user fee for access to the highway system. Vehicle registration fees are not equitable across levels of income since they do not vary with the value of the vehicle and, through that, with income.

Simplicity

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

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[25] Section 502.1025, Texas Transportation Code
[26] Section 502.172, Texas Transportation Code
[27] Section 502.173, Texas Transportation Code
[28] Section 502.103, Texas Transportation Code
[29] Section 502.1725, Texas Transportation Code
[30] Texas Department of Transportation. Schedule of Texas Registration Fees.

Detailed Analysis

A. Criteria

Exhibit III-1: Definitions of Specific Evaluation Criteria

Criterion	Definition
Yield	Annual $ of revenue at point of collection, before administrative and enforcement costs; per tax rate unit; for example, annual $ returned from 1¢/gallon of fuel tax. Generally, the potential of a revenue source to meet major project needs.
Stability	Variance in the annual totals of volumes or values on which the price unit is based; for example, gallons of fuel taxed.
Growth	Coefficients between year-over-year increase in yield and year-over-year increases in [1] VMT and [2] highway life cycle costs.
Sensitivity	Own-price elasticity; that is, % decrease in volume for each 1% increase in the reference price of the taxed good; for example, a 1% increase in fuel tax may cause a 0.3% reduction in the volume of gasoline sold, such that the increased yield of the tax increase is 0.7%.
Viable as local option	The measure could be enacted within a local jurisdiction as a substitute for or complement to other revenue measures.
Across types of projects	The extent to which the yield must be restricted to expenditures on certain types of surface transportation projects.
Debt security	The yield can be pledged as security against debt issued in a conventional form; for example, municipal bonds.
Price signal to users	Price (P) paid by users is equal to the marginal cost (MC); that is, the cost of one more unit of production. When P=MC, economic efficiencies in terms of the behavior of users and suppliers of surface transportation are possible.
Non-transportation uses	The opportunity cost to other government programs to which the yield could have been applied; for example, toll revenues have little opportunity cost as they are effectively dedicated to the tolled facilities but fuel taxes could be applied to other programs.
Cost disadvantage	The revenue measure results in a change of competitive rank for its payer; that is, that person or business loses completely the competitive advantage it once had over its closest competitor.
Across users	The amounts paid by different users; for example, different weights and sizes of their vehicles, are proportional to the costs that their use imposes on surface transportation systems.

Criterion	Definition
Across income groups	The amounts paid by different persons, users or non-users, are proportional to their personal income.
Across locations	The amounts paid by persons and business in one location on the surface transportation system are proportional to the direct benefits that they receive from their use of the system.
Across generations	Costs are matched to benefits across time; that is, the life-cycle cost of the surface transportation system is distributed across time in proportion to the direct benefits to its users.
Understood by public	The policy rationale for a revenue measure is comprehensible to the public. For example, in the United States, fuel taxes are easily understood to be transportation user charges, not carbon taxes.
Gov't costs to collect	Administrative and enforcement costs from the point of collection to the point of expenditure.
User cost to comply	Costs of compliance to the public, such as GPS equipment required for VMT charges.
Enforceable	Losses in yield due to evasion.
Viable technology	The extent to which the revenue measure relies upon technology that is not currently in universal use.
Legislative changes	Changes required in state, federal, or local legislation or regulations to enact the revenue measure.
Other jurisdictions	The administration of the revenue measure requires the co-operation of other jurisdictions, such as the current International Fuel Tax Agreement (IFTA).

B. Options

In the following tables, each funding option is evaluated against the criteria.

1. Indexed Fuel Tax

Exhibit III-2: Indexed Fuel Tax Evaluation

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	Approximately, each 1% increase in the state motor fuel tax rate would deposit an additional $20 million per year into the State Highway Fund. The amount of the increase would be tied to a cost inflation indicator and is expected to grow slowly over time. Large increases in funds to address current shortfalls would not be available.
Stability	Revenues are tied directly to the volume of taxable gallons sold, which does not vary significantly through economic cycles.
Growth	Over the next 20 years, the volume of taxable motor fuel sold is expected to grow more slowly than vehicle-miles traveled such that, by 2025, the increase in gallons sold may be about 20% less than the concurrent increase in VMT.
Sensitivity	A 10% increase in fuel tax is about equivalent to a 1% increase in the cost of gasoline and may cause a 0.25% reduction in the volume of gasoline sold, such that the increased yield of the tax increase is 9.75%.
Fiscal Utility	
Viable as local option	As the fuel tax is collected at the point of wholesale, any local option fuel tax index would be difficult to attribute to local retail locations.
Across types of projects	The state motor fuel tax may be applied across all projects that are eligible for funding from the State Highway Fund.
Debt security	The indexed portion of a fuel tax would not be very bondable as the amount of revenue depends on future changes in prices.
Equity	
Competitiveness	
Non-transportation uses	Motor fuel taxes could be applied to programs other than transportation programs but such instances, such as the diversion of motor fuel taxes in Texas into the education system, are rare.

Criterion	Evaluation
Cost disadvantage	At 20¢ per gallon, the Texas state motor fuel tax is very close to the US average. An increasing fuel tax in Texas will not change its competitive position with adjacent states, whose tax rates are: Arkansas, 21.7¢/gallon; Louisiana, 20¢/gallon; New Mexico, 18.88¢/gallon; and Oklahoma, 17¢/gallon.
Fairness	
Across users	Since the motor fuel tax is currently the principal user fee paid by vehicle operators, an increased rate across the board does not alter the current cross-subsidies among different vehicle types.
Across income groups	Since motor fuel is a basic good whose price elasticity is lower than the average price elasticity for all consumer goods, it is somewhat regressive. Lower income households pay a higher proportion of their income into motor fuel taxes.
Across locations	Fuel taxes are collected across the transportation system, not just in the locales where transportation services are improved. Users who may not receive additional benefits are required to contribute to improvements in other locales.
Across generations	Costs are matched to benefits across time, as highway users pay a steady stream of revenues over time as they use the highway system.
Simplicity	
Understandable by the public	In the United States, fuel taxes are generally understood to be transportation user charges and not confused with other purposes of fuel taxes, e.g. carbon taxes.
Administration	
Government costs to collect	Effective administrative and enforcement already exists to collect motor fuel taxes.
User costs to comply	Motor fuel taxes are collected at the point of wholesale, placing no additional costs of compliance on users.
Enforceable	Effective administrative and enforcement already exists to collect motor fuel taxes.
Viable technology	The additional taxes do not require new technology.
Legislative changes	Section 162 (*Motor Fuel Taxes*), Title 2 (*State Taxation*) would have to be amended.
Other jurisdictions	Other US states and Canadian provinces would have to be repeatedly and frequently advised of changes in the tax rate for the administration of the International Fuel Tax Agreement (IFTA).

2. Increased Motor Fuel Tax Rate

Exhibit III-3: Increased Motor Fuel Tax Rate

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	Approximately, each 1¢/gallon increase in the state motor fuel tax rate would deposit an additional $100 million per year into the State Highway Fund. The tax rate increase would take effect promptly and could yield significant additional revenues to address current deficiencies.
Stability	Revenues are tied directly to the volume of taxable gallons sold, which does not vary significantly through economic cycles.
Growth	Over the next 20 years, the volume of taxable motor fuel sold is expected to grow more slowly than vehicle-miles traveled such that, by 2025, the increase in gallons sold may be about 20% less than the concurrent increase in VMT. Also, expected price inflation would cut the purchasing power of the increased tax rate in half, i.e. by 100%, over the next 30 years.
Sensitivity	A 10% increase in fuel tax is about equivalent to a 1% increase in the cost of gasoline and may cause a 0.25% reduction in the volume of gasoline sold, such that the increased yield of the tax increase is 9.75%.
Fiscal Utility	
Viable as local option	As the fuel tax is collected at the point of wholesale, a local option fuel tax would be difficult to attribute to local retail locations.
Across types of projects	The state motor fuel tax may be applied across all projects that are eligible for funding from the State Highway Fund.
Debt security	A fixed-rate fuel tax, while not tied to the use of any one specified highway facility, is considered a stable source of funds for debt service payments.
Equity	
Competitiveness	
Non-transportation uses	It is unlikely that Texas motor fuel taxes could be applied to programs other than transportation and public education programs in the state.
Cost disadvantage	At 20¢ per gallon, the Texas state motor fuel tax is very close to the US average. A significant and immediate fuel tax in Texas will change its competitive position with adjacent states, whose tax rates are: Arkansas, 21.7¢/gallon; Louisiana, 20¢/gallon; New Mexico, 18.88¢/gallon; and Oklahoma, 17¢/gallon.
Fairness	

Criterion	Evaluation
Across users	Since the motor fuel tax is currently the principal user fee paid by vehicle operators, an increased rate across the board does not alter the current cross-subsidies among different vehicle types.
Across income groups	Since motor fuel is a basic good whose price elasticity is lower than the average price elasticity for all consumer goods, it is somewhat regressive. Lower income households pay a higher proportion of their income into motor fuel taxes.
Across locations	Fuel taxes are collected across the transportation system, not just in the locales where transportation services are improved. Users who may not receive additional benefits are required to contribute to improvements in other locales.
Across generations	Costs are matched to benefits across time, as highway users pay a steady stream of revenues over time as they use the highway system.
Simplicity	
Understandable by the public	In the United States, fuel taxes are generally understood to be transportation user charges and not confused with other purposes of fuel taxes, e.g. carbon taxes.
Administration	
Government costs to collect	Effective administrative and enforcement already exists to collect motor fuel taxes.
User costs to comply	Motor fuel taxes are collected at the point of wholesale, placing no additional costs of compliance on users.
Enforceable	Effective administrative and enforcement already exists to collect motor fuel taxes.
Viable technology	The additional taxes do not require new technology.
Legislative changes	Section 162 (*Motor Fuel Taxes*), Title 2 (*State Taxation*) would have to be amended.
Other jurisdictions	Other US states and Canadian provinces would have to be advised of changes in the tax rate for the administration of the International Fuel Tax Agreement (IFTA).

3. VMT Charge to Replace Fuel Tax

Exhibit III-4: VMT Charge to Replace Fuel Tax

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	All vehicles from which motor fuel taxes are currently collected would pay this charge. An amount equivalent to current state motor fuel tax revenues would be raised by a VMT charge of about 1.35¢/mile. Each additional 0.1¢/mile would raise about $200 million per year.
Stability	Revenues will vary directly with VMT, which are very stable through economic cycles and are directly related to the costs of providing the surface transportation system.
Growth	A VMT charge is immune from erosion due to increasing fuel efficiency; however, a fixed-rate VMT charge would still be vulnerable to inflation.
Sensitivity	A VMT charge that is near-equivalent to the current motor fuel tax is assumed to have the same price elasticity, i.e. 10% increase in the VMT charge adds 1% to the direct fuel and road charge costs of operating a vehicle and may cause a 0.25% reduction in the vehicle miles driven, such that the increased yield of the VMT charge increase is 9.75%.
Fiscal Utility	
Viable as local option	If the GPS collection technology is used, VMT charges can be varied across specific geographical areas; that is, different charges could apply to the vehicle depending where and when it was driven.
Across types of projects	As a VMT charge would replace the state motor fuel tax, VMT revenues may be applied across all projects that are eligible for funding from the State Highway Fund.
Debt security	Tied as it is to vehicle use, VMT revenues are likely to be considered an attractive form of security by lenders.
Equity	
Competitiveness	
Non-transportation uses	It is unlikely that Texas VMT charges would be applied to programs other than transportation and public education programs in the state.
Cost disadvantage	At rates up to about 1.5¢/mile, a VMT charge will not significantly alter the competitive position of Texans relative to the neighboring states.
Fairness	
Across users	A uniform VMT rate would eliminate the current premium paid by vehicle owners with larger or less efficient engines. Larger

Criterion	Evaluation
	engines are often associated with higher axle weights and, through them, higher wear and tear of pavements and bridge structures.
Across income groups	Since light vehicle transport is a basic good whose price elasticity is lower than the average price elasticity for all consumer goods, a VMT charge is somewhat regressive. Lower income households pay a higher proportion of their income into motor fuel taxes.
Across locations	If GPS collection technology is used then VMT charges could be tied to travel in locales and on highway assets that have been improved or expanded.
Across generations	Costs are matched to benefits across time, as highway users pay a steady stream of revenues over time as they use the highway system.
Simplicity	
Understandable by the public	There is less likelihood that a VMT charge would be misunderstood as anything other than a transportation user charge than there is of, for example, fuel taxes being misunderstood to be carbon taxes.
Administration	
Government costs to collect	VMT charges require new government technology to collect and would require political will and cooperation among many government entities.
User costs to comply	Vehicle owners would be required to add reader or GPS technology at a cost between $10 and $100 per vehicle.
Enforceable	In near-border areas, the implementation technology must be capable of differentiating between in-state and out-of-state vehicles.
Viable technology	The GPS technology is in early trial stages. AASHTO officials believe that implementation will require a lead time of about 20 years.
Legislative changes	Section 162 (*Motor Fuel Taxes*), Title 2 (*State Taxation*) would have to be amended.
Other jurisdictions	AASHTO officials believe that VMT charges would have to be adopted by all mainland states to be feasible. If they were so adopted, provisions would still have to be made for Canadian and Mexican vehicles traveling on US highways.

4. Increased Tolls

Exhibit III-5: Increase Tolls Evaluation

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	Tolls are charged only on tolled trips; in 2006, currently, less than 10% of the trips in Texas' 8 largest metropolitan areas are tolled. Toll revenues average about 75¢ per tolled trip; increasing tolls by 10¢ per transaction on all currently tolled facilities would yield additional revenues of about $50 million per year.
Stability	Tolls are directly related to trips taken, which are relatively constant across economic cycles.
Growth	Tolls are not indexed to costs, although the toll schedule set when a facility opens must take full life cycle costs into account. Tolls will increase with the number of trips on the tolled facility.
Sensitivity	Tolls are more sensitive to price than VMT charges or fuel taxes since tolled drivers usually have an alternative, untolled route. A price elasticity of 0.35 is assumed in the incremental revenue estimates above. The scope to increase tolls beyond drivers' willingness to pay is very limited: in current congestion conditions, raising tolls more than 50% over their current levels would meet an elasticity approaching 1, i.e. the revenue gains of each 1% increase in toll rates would be entirely offset by the revenue lost to a 1% decrease in traffic.
Fiscal Utility	
Viable as local option	Tolls are collected on specific facilities, often by local authorities.
Across types of projects	Generally, tolls are set to fund improvements to the toll system. Further, the local governance of toll authorities tends to resist any takings of dividends from a tolled system to fund other transportation assets.
Debt security	Most toll facilities are debt-financed with toll revenues pledged as security.
Equity	
Competitiveness	
Non-transportation uses	Toll revenue is very unlikely to be diverted away from their intended purpose of funding tolled transportation facilities.
Cost disadvantage	Since travelers generally have alternative, non-tolled route at their disposal, tolls do not force adverse changes in competitive position.
Fairness	
Across users	As long as travelers have the choice of an alternative, untolled

	route, tolls are equitable.
Across income groups	As long as travelers have the choice of an alternative, untolled route, tolls are equitable.
Across locations	As long as travelers have the choice of an alternative, untolled route, tolls are equitable.
Across generations	As long as travelers have the choice of an alternative, untolled route, tolls are equitable.
Simplicity	
Understandable by the public	The application of tolls to specific facilities is well-understood.
Administration	
Government costs to collect	In the United States, toll collection costs run in the order of 25¢ to 75¢ per trip.[31] CTRMA's estimated collection cost is about 30¢ per trip
User costs to comply	TxTags are currently provided free of charge to users. Bumper and motorcycle tags require refundable deposits.
Enforceable	Toll enforcement is well-established in Texas
Viable technology	Increased tolls can use existing technology.
Legislative changes	None required
Other jurisdictions	Co-operation with other jurisdictions not required.

[31] Washington State Department of Transportation. Comparative Analysis of Toll Facility Operational Costs. March 2007.

5. **Transportation Reinvestment Zones** (not evaluated here, but similar in impact to Land Development Charges discussed below)

6. Land Development Charges

Exhibit III-6: Land Development Charges Evaluation

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	Land development charges can contribute significantly on a per-project basis but will not meet major project needs. For example, long-established land development charges in Oregon have raised, over time, traffic impact fees about equal to 1% of the commercial value of all real estate development[32] because they apply to less than 5% of development projects. In Texas where the value of non-residential building permits averages about $7 billion per year[33], similar impact fees would yield revenues in the order of about $75 million per year.
Stability	The level of land development activity can be expected to change significantly through economic cycles. Over the last 20 years, the total annual value of nonresidential building permits in Texas has ranged from about $2 billion to almost $10 billion.
Growth	Historically, residential housing values grow at about 1.7 times the rate of growth of personal income. If impact fees are tied to land values, *ad valorem*, then the growth of land development fees over time could keep pace with the costs of surface transportation infrastructure development.
Sensitivity	Assuming margins on real estate development are about 18% before tax[34], an increase in the average fee from 1% to 2% would translate to reduction in margins from 18% to about 12% before tax.
Fiscal Utility	
Viable as local option	Used almost exclusively at the local level.
Across types of projects	As beneficiary charges, tax increment financing and value capture are project-specific.
Debt security	Lenders are likely to view this revenue stream as poor security, derived as it is from real estate development projects that are, for the most part, already highly leveraged.
Equity	
Competitiveness	
Non-transportation uses	A land development charge draws from the real estate tax base, traditionally the preserve of counties and municipalities. Communities could apply revenue generated from tax increment financing and value capture to other needed infrastructure or public needs.

[32] http://www.co.washington.or.us/deptmts/lut/cap_proj/tif.htm
[33] Texas A&M University, Real Estate Center
[34] E.g. Intrawest Corporation Annual Reports from 2002.

Criterion	Evaluation
Cost disadvantage	Land development charges would apply to specific projects and any developer of a specific would face the same fee. Thus no one developer is placed at a cost disadvantage relative to a competitor.
Fairness	
Across users	Project-specific fees are paid by the developers and users of the system element.
Across income groups	Developers pass on the costs of land development charges to buyers, driving up the cost of real estate.
Across locations	Project-specific fees are paid by the developers who will benefit from the developed project.
Across generations	Developers pass on the costs of land development to buyers, driving up the cost of real estate. These costs and benefits are generally amortized over the life of the development on the property, matching costs to the benefits of its use.
Simplicity	
Understandable by the public	The public generally understands and supports impact fees; currently 27 states have impact fee statutes.
Administration	
Government costs to collect	There are already systems in place (such as the permitting process) to collect fees from developers. Collecting governments would have to assess the associated costs of transportation improvements, using design standards issued by the Institute of Traffic Engineers, and separately account for the funds.
User costs to comply	There are already systems in place (such as the permitting process) to collect fees from developers. Developers would have to spend more time consulting with the government with respect to the assessed amounts of the fees.
Enforceable	The requirement to pay land development charges is usually linked to the approvals required for changes in land ownership or land use so fee evasion is not a significant threat. Impact fees have, however, been the subject of many lawsuits.
Viable technology	No new technology is required.
Legislative changes	Local governments need enabling legislation from their states to enact provisions in their subdivision ordinances that require payment by the developer or sub-divider of a parcel of land. Texas has such legislation in place: Chapter 395 *(Financing Capital Improvements Required by New Development in Municipalities, Counties and Certain other Local Governments),* Title 12 (*Planning and Development*). There are no provisions for the state to levy such fees in support of the state highway system, other than through established regional mobility authorities.
Other jurisdictions	County and municipal governments would have to agree to the imposition of these fees to fund state highway improvements.

7. Congestion Charges

Exhibit III-7: Congestion Charges Evaluation

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	In London, a charge of £8 (about $15) per day, on a previously non-tolled system, is levied on 30 million trips per year into London's central and western urban areas to raise about £250 million (about $500 million) per year.[35]
Stability	Congestion charges are directly related to trips taken, which are relatively constant across economic cycles.
Growth	Congestion charges are not indexed to costs, but will increase with the number of trips into the urban centre
Sensitivity	Congestion fees are more sensitive to price than VMT charges or fuel taxes since tolled drivers usually have an alternative, untolled route. This is consistent with the experience with urban ring road charges in Norway and the United Kingdom. [36]
Fiscal Utility	
Viable as local option	Congestion charges can be applied by local authorities to an urban center.
Across types of projects	Congestion charges are not collected to fund any specified increases to surface transportation capacity.
Debt security	The application of congestion charges in North America is still a novel concept, and lenders are not likely to give congestion charge revenues much latitude as debt security.
Equity	
Competitiveness	
Non-transportation uses	Congestion charges will likely be needed to fund the transit improvements required to provide an alternative mode of travel into and out of urban areas. They are not, however, tied to the funding of specific assets or improvements and thus could be diverted to uses other than transportation.

[35] Transport for London. 2006/07 Annual Report and Statement of Accounts.
[36] Various studies report traffic reduction of 5 percent in Oslo to 6 to 7 percent in Bergen (Nash, 13) to 22 percent reduction in inner city congestion in London during working hours (Cottingham, 5) Transport for London reports traffic reduction in the western area of London as 13%.

Criterion	Evaluation
Cost disadvantage	Congestion charges are not optional; any vehicle that passes over an urban ring boundary must pay them. From the premise that competing individuals and firms in any one market or industry will face the same costs to service the same customers, they will each face the same needs to take the same vehicle types across the boundary and their competitive positions will not change.
Fairness	
Across users	A congestion charge is not tied to infrastructure costs and need not reflect the high axle loads of commercial vehicles. All users that cross the boundary would have to pay the fee.
Across income groups	The congestion charge would be regressive as it would be the same across all income groups.
Across locations	The charge is incurred only by those who believe it is more than offset by the benefits of going downtown. However, almost half of the trips in a metropolitan area are from one suburban area to another; these drivers use the same urban freeway system but would not have to pay a congestion fee
Across generations	A congestion fee does not impose costs on future generations to the benefit of current generations since the fee is not tied to the costs of any additional infrastructure.
Simplicity	
Understandable by the public	Given the relatively low density of Texas' urban areas, and the congestion that is caused in urban areas by suburban and inter-urban traffic, the public may not view an urban-centered charge as a solution to the congestion problem.
Administration	
Government costs to collect	Congestion charges are collected in Europe with optical recognition software that reads license plates. This is a very expensive system: in 2006/07, London Transport spent about £130 million (about $250 million) to collect congestion charges from about 30 million trips: an average cost of about $8 per trip.
User costs to comply	Under the London collection system, users must take the time to purchase access to the central and western areas each day.
Enforceable	The costs of enforcement are included in the costs of collection above.
Viable technology	Additional technology, either new or existing TxTag technology, would have to be introduced into areas where congestion charges are to be collected.

Criterion	Evaluation
Legislative changes	A congestion fee falls outside the meaning of tolls in Chapter 228 *(State Highway Tolls Projects*) and the revenues payable to counties under Chapter 256 (*Funds and Taxes for County Roads*), so new legislation enabling a congestion fee would be required. A congestion fee, applying as it would to travel on municipal streets as well as state highways, poses a question of the State's authority to legislate such a fee without causing a conflict with Chapter 311 (*General Provisions Relating to Municipal Streets*).
Other jurisdictions	Given the legislative issues described above, a congestion fee would be best implemented by a Regional Mobility Authority, with the approval of the affected county and municipal governments.

8. Increased State Sales Tax: Statewide

Exhibit III-8: Increased State Sales Tax: Statewide

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	Each 1% increase in the state-wide sales tax would yield about $1.3 billion per year.
Stability	The consumption of goods is the most stable of all expenditures: it varies the least through economic cycles.
Growth	Sales tax revenues will grow with the prices of consumer goods that have, over the last two decades, equaled the average of increases in the costs of highway construction. Sales tax revenues will grow less than VMT, however, as growing developed economies tend to grow at faster rates then the consumption of goods through increases in the service sector.
Sensitivity	A general sales tax raises the cost of all consumer goods and some services. To accommodate increased prices of goods within a fixed income, consumers will reduce their consumption of untaxed services and reduce their savings rate. When faced with a generalized increase in the cost of goods, national economic statistics indicate that these combined effects lead to a price elasticity of about 0.6 for taxed goods.[37] This elasticity estimate is included in the estimate of revenues above.
Fiscal Utility	
Viable as local option	Yes, and is evaluated separately as a local option in this report.
Across types of projects	State sales tax revenues would, likely, be applied across all projects that are eligible for funding from the State Highway Fund.
Debt security	Sales tax receipts are acceptable as security on municipal debt; however, bond rating agencies are likely to consider any debt that is secured with state-wide sales tax revenues to be, or very much like, general obligation debt.
Equity	
Competitiveness	
Non-transportation uses	Since sales taxes are the principal source of revenue for all of the Texas government, sales tax room that is dedicated to transportation is a direct and equal opportunity that is lost to fund other programs.
Cost disadvantage	A sales tax increase is paid by consumers, not by producers, and will not put one producer at a disadvantage relative to another. There may be some negative impacts on the retailers of consumer goods in border areas.

[37] Möller, J. 2001. *Income and Price Elasticities in Different Sectors of the Economy: An Analysis of Structural Change for Germany, the UK and the USA.* In The Growth of Service Industries: The Paradox of Exploding Costs and Persistent Demand, 167–208, edited by T. ten Raa and R. Schettkat.

Criterion	Evaluation
Fairness	
Across users	There is no direct relationship between the benefits received from improved transportation services by their users and the amounts of sales tax paid by all consumers.
Across income groups	As household income increases, household spending tends to increase faster on services than on goods, and household savings rates grow. Low income households pay a high proportion of their income on taxable basic goods and they will bear a large share in any increase in the sales tax.
Across locations	Sales taxes are collected across the state, not just in the locales where transportation services are improved. Users who may not receive additional benefits are required to contribute to improvements in other locales.
Across generations	Since sale tax payments are not related to transportation use, there is no direct link between sales taxes paid by the current generation and the benefits enjoyed by current or future generations.
Simplicity	
Understandable by the public	In the United States, sales taxes are understood to be general taxes and an increased sales tax would likely require dedication to the State Highway Fund to achieve even some public understanding.
Administration	
Government costs to collect	Effective administrative and enforcement already exists to collect sales taxes.
User costs to comply	An increase on the sales tax rate imposes no additional compliance costs on consumers.
Enforceable	Effective administrative and enforcement already exists to collect sales taxes.
Viable technology	The additional taxes do not require new technology.
Legislative changes	Section 151 (*Limited Sale, Excise and Use Tax*), Title 2 (*State Taxation*) would have to be amended.
Other jurisdictions	Cooperation from other jurisdictions would not be required to increase the state sales tax rate.

9. Increased State Sales Tax: Local Option

Exhibit III-9: Increase in State Sales Tax Evaluation

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	Dependent on volume of taxable sales in applicable jurisdiction.
Stability	The consumption of goods is the most stable of all expenditures: it varies the least through economic cycles.
Growth	Sales tax revenues will grow with the prices of consumer goods that have, over the last two decades, equaled the average of increases in the costs of highway construction. Sales tax revenues will grow less than VMT, however, as growing developed economies tend to grow at faster rates then the consumption of goods through increases in the service sector.
Sensitivity	A general sales tax raises the cost of all consumer goods and some services. To accommodate increased prices of goods within a fixed income, consumers will reduce their consumption of untaxed services and reduce their savings rate. When faced with a generalized increase in the cost of goods, national economic statistics indicate that these combined effects lead to a price elasticity of about 0.6 for taxed goods.[38] This elasticity estimate is included in the estimate of revenues above.
Fiscal Utility	
Viable as local option	Sales taxes are well established in Texas as local option taxes.
Across types of projects	While local transportation-oriented sales taxes in Texas have been focused on transit, LTSTs in California support a large range of projects with a fairly even split between highways, local roads, and public transit. Recently, there has been a trend in California to provide more funding for new capital projects and less to operations and maintenance.
Debt security	Sales tax receipts are acceptable as security on municipal debt; however, bond rating agencies are likely to consider any debt that is secured with state-wide sales tax revenues to be, or very much like, general obligation debt.

[38] Möller, J. 2001. *Income and Price Elasticities in Different Sectors of the Economy: An Analysis of Structural Change for Germany, the UK and the USA*. In The Growth of Service Industries: The Paradox of Exploding Costs and Persistent Demand, 167–208, edited by T. ten Raa and R. Schettkat.

Criterion	Evaluation
Equity	
Competitiveness	
Non-transportation uses	Since sales taxes are the principal source of revenue for all of the Texas government, sales tax room that is dedicated to transportation is a direct and equal opportunity that is lost to fund other programs.
Cost disadvantage	A sales tax increase is paid by consumers, not by producers, and will not put one producer at a disadvantage relative to another. There may be some negative impacts on the retailers of consumer goods in border areas.
Fairness	
Across users	There is no direct relationship between the benefits received from improved transportation services by their users and the amounts of sales tax paid by all consumers.
Across income groups	As household income increases, household spending tends to increase faster on services than on goods, and household savings rates grow. Low income households pay a high proportion of their income on taxable basic goods and they will bear a large share in any increase in the sales tax.
Across locations	Sales taxes are collected across the state, not just in the locales where transportation services are improved. Users who may not receive additional benefits are required to contribute to improvements in other locales.
Across generations	Since sale tax payments are not related to transportation use, there is no direct link between sales taxes paid by the current generation and the benefits enjoyed by current or future generations.
Simplicity	
Understandable by the public	In the United States, sales taxes are understood to be general taxes and an increased sales tax would likely require dedication to the State Highway Fund to achieve even some public understanding.
Administration	
Government costs to collect	Effective administrative and enforcement already exists to collect sales taxes.
User costs to comply	An increase on the sales tax rate imposes no additional compliance costs on consumers.
Enforceable	Effective administrative and enforcement already exists to collect sales taxes.
Viable technology	The additional taxes do not require new technology.
Legislative changes	Section 151 (*Limited Sale, Excise and Use Tax*), Title 2 (*State Taxation*) would have to be amended.
Other jurisdictions	Cooperation from other jurisdictions would not be required to increase the state sales tax rate.

10. Container Fees

Exhibit III-10: Container Fees Evaluation

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	A fee of $30 per TEU on all inbound containers through Houston and Galveston would generate about $24 million per year.
Stability	Container traffic varies significantly with economic cycles and changing conditions in international trade, as well as the relative competitiveness among ports.
Growth	Container fees will not automatically grow with prices and costs, although they will grow with increased volumes of container traffic.
Sensitivity	Container traffic is relatively inelastic as along as fees charged above handling costs and duties are $30 per TEU or less. In that range, loss of traffic is expected to be about 10%. However, as fees approach $60 per TEU, they quickly become elastic. [39]
Fiscal Utility	
Viable as local option	Container fees could be assessed and collected by local authorities, with minimal additional administrative burden as containers are already counted and inspected by port authorities.
Across types of projects	The competitive situation of ports would likely call for a significant portion of the revenues to be dedicated to the movement of freight in the localities of the ports.
Debt security	Container fees would be viewed in the credit market as near-commercial revenues.
Equity	
Competitiveness	
Non-transportation uses	It is very unlikely that container fees represent a revenue stream that could be applied to other government programs besides transportation infrastructure.
Cost disadvantage	The ports of Houston and Galveston would be put at a cost disadvantage at the western, northern and eastern boundaries of their economic reach.
Fairness	
Across users	Only shippers using container movement services through the ports would pay the fee.
Across income groups	Ultimately, a container fee will manifest itself as a slight increase

[39] Leachman, R.C. Demand Elasticity for Containers in California Ports. September 2005. Southern California Association of Governments.

Criterion	Evaluation
	in the cost of imported merchandise. As low income families pay higher proportions of their income to pay for goods, this has a mildly regressive effect.
Across locations	Only shippers that use the ports would pay the fees associated with movements through those ports.
Across generations	Container fees impose costs on current shippers who will not necessarily use the port facilities that may be built with the proceeds of the fees.
Simplicity	
Understandable by the public	Container fees will be understood by the public if tied to relevant programs, as the debate in California over the past two years illustrates.
Administration	
Government costs to collect	The fees can be collected and remitted by port authorities as an addition to fees that they already pay.
User costs to comply	There is no compliance activity required from shippers.
Enforceable	Fees can be collected before the containers are released from the port.
Viable technology	No new technology is required.
Legislative changes	No changes to state legislation are required if the fees are charged by Regional Mobility Authorities. However, an RMA does not exist in the Houston Area at present.
Other jurisdictions	Some cooperation with US Customs may be required in the collection and remittance of fees.

11. Carbon Taxes

Exhibit III-11: Carbon Taxes Evaluation

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	A carbon tax equivalent to that imposed in British Columbia[40] is equivalent to a 27.5¢/gallon increased tax on gasoline, which would yield approximately an additional $1.7 billion.
Stability	Revenues are tied directly to the volume of taxable gallons sold, which does not vary significantly through economic cycles.
Growth	Revenues are tied directly to the volume of taxable gallons sold, which does not vary significantly through economic cycles.
Sensitivity	A 27.5¢/gallon increase in the fuel tax is equivalent to a 135% increase in the state motor fuel tax and may cause a reduction in the volume of gasoline sold.
Fiscal Utility	
Viable as local option	As the fuel tax is collected at the point of wholesale, a local option carbon tax would be difficult to attribute to local retail locations.
Across types of projects	The state motor fuel tax may be applied across all projects that are eligible for funding from the State Highway Fund. Carbon taxes have been used in other jurisdictions for environmental projects.
Debt security	The carbon tax-related portion of the fuel tax would not be very bondable as the amount of revenue depends on future changes in carbon emissions.
Equity	
Competitiveness	
Non-transportation uses	Motor fuel taxes could be applied to programs other than transportation programs. Carbon taxes have been used in other jurisdictions for environmental projects.
Cost disadvantage	At 20 cents per gallon, the Texas state motor fuel tax is very close to the US average. A significant and immediate fuel tax increase in Texas will change its competitive position with adjacent states, whose tax rates are: Arkansas, 21.7¢/gallon; Louisiana, 20¢/gallon; New Mexico, 18.88¢/gallon; and Oklahoma, 17¢/gallon.
Fairness	
Across users	Since the motor fuel tax is currently the principal user fee paid by vehicle operators, an increased rate across the board does not alter the current cross-subsidies among different fuel types.
Across income groups	Since motor fuel is a basic good whose price elasticity is lower than the average price elasticity for all consumer goods, it is somewhat regressive. Lower income households pay a higher proportion of their income into motor fuel taxes. Other jurisdictions have returned carbon tax receipts to taxpayers in the form of income and business tax cuts; some proposals advocate a per-person rebate, which would make the

[40] Carbon Tax Center, "Where Carbon is Taxed" March 30, 2008

Criterion	Evaluation
	tax slightly progressive.
Across locations	Fuel taxes are collected across the transportation system, not just in the locales where transportation services are improved. Users who may not receive additional benefits are required to contribute to improvements in other locales.
Across generations	Costs are matched to benefits over time, as highway users pay a steady stream of revenues over time as they use the highway system.
Simplicity	
Understandable by the public	In the United States, fuel taxes are generally understood to be transportation user charges. Carbon taxes have historically been used for other purposes like environmental programs, and may be misunderstood.
Administration	
Government costs to collect	There would be few problems of documentation or measurement of a carbon tax, as the carbon content of every fossil fuel is precisely known. Effective administrative and enforcement already exists to collect motor fuel taxes.
User costs to comply	Motor fuel taxes are collected at the point of wholesale, placing no additional costs of compliance on users.
Enforceable	Effective administrative and enforcement already exists to collect motor fuel taxes.
Viable technology	The additional taxes do not require new technology.
Legislative changes	Section 162 (*Motor Fuel Taxes*), Title 2 (*State Taxation*) would have to be amended.
Other jurisdictions	Other US states and Canadian provinces would have to be advised of changes in the tax rate for the administration of the International Fuel Tax Agreement (IFTA).

12. Proposition 12 Bonding Authority

Exhibit III-12: Proposition 12 Bonding Authority Evaluation

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	To TxDOT, yield varies by value of bonds issued, up to $5 billion. Proposition 12 authorizes no new revenues to the state, but the revenues are new to TxDOT.
Stability	Bond revenues are collected up front; the repayment is spread equally over time.
Growth	Proposition 12 authorizes up to $5 billion in general obligation bonds. The State of Texas is constrained in its ability to issue state-supported debt only up to 5% of uncommitted general revenue.
Sensitivity	Not applicable.
Fiscal Utility	
Viable as local option	Not applicable. A local government could issue its own general obligation bonds but, under Proposition 12, could not ask the State of Texas to issue debt whose covenants were more restricted than those of a statewide general obligation.
Across types of projects	Bond proceeds would be available across all projects that are eligible for the proceeds.
Debt security	None. Proceeds of debt cannot be used to secure additional debt.
Equity	
Competitiveness	
Non-transportation uses	Issuance of general obligation bonds for transportation could divert state funds from other uses if the revenues intended to service these bonds are unavailable.
Cost disadvantage	Bond issuance does not put Texas at a cost disadvantage to any other state.
Fairness	
Across users	As the obligation on Proposition 12 bonds is the State's, repayment is from the state's general revenue fund and is not linked to transportation system users.
Across income groups	As the obligation on Proposition 12 bonds is the State's, repayment is from the state's general revenue fund and is not linked to transportation system users.
Across locations	The costs of interest and repayment are the state's obligation and are therefore system-wide. Improvements may not be spread equally throughout the system.
Across generations	Costs are matched to benefits over time, as the state repays general obligation bonds over the life of the system.
Simplicity	
Understandable by the public	The issuance of debt is generally understood by the public as a financing mechanism for infrastructure.

Criterion	Evaluation
Administration	
Government costs to collect	Negligible. Bond monies are collected up front.
User costs to comply	There are no compliance costs to the system user.
Enforceable	Not applicable as no new revenues are involved.
Viable technology	Bond issuance does not require the adoption of new technology.
Legislative changes	The Texas Transportation Code was amended in November 2007 to allow issuance of general obligation bonds. Enabling legislation is necessary to issue the bonds.
Other jurisdictions	Cooperation from other jurisdictions would not be required to issue general obligation bonds.

13. Increased Vehicle Registration Fees: Statewide

Exhibit III-13: Increased Vehicle Registration Fees: Statewide

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	Approximately, a $10 increase in the annual state fee for vehicle registration would yield an additional $200 million per year into the State Highway Fund.
Stability	Revenues are tied directly to number of vehicles registered, which does vary through economic cycles.
Growth	Barring changes in driving patterns brought about by economic conditions and by an ageing population, the number of vehicle registrations should increase more than the increase in gallons of fuel sold and at a rate close to the concurrent increase in VMT.
Sensitivity	Since the average vehicle in Texas is driven about 12,000 miles per year (200 billion VMT divided by 17 million registered vehicles), a registration fee raised to as much as $100 represents only about 1% of the total annual average cost ($10,000) of operating (amortized purchase cost, registration, insurance, maintenance, fuel, etc.) a vehicle and therefore elasticity effects on vehicle operating costs are negligible.
Fiscal Utility	
Viable as local option	Yes, and is evaluated separately as a local option in this report.
Across types of projects	The state vehicle registration fees may be applied across all projects that are eligible for funding from the State Highway Fund.
Debt security	Vehicle registration fees are a well-proven and stable source of revenue; bond underwriters would readily accept a pledge of such revenues as security for debt.
Equity	
Competitiveness	
Non-transportation uses	In the United States, state vehicle registration fees are generally directed towards transportation expenditures on infrastructure and public safety.
Cost disadvantage	Vehicle registration receipts in Texas average to about $62 per vehicle per year, while the same receipts average to about $67 per vehicle across all 50 U.S. states. Even if Texas state registration fees were increased to a level above the US average, the higher fees are unlikely to dislocate residents from Texas into other states because the increases would be small relative to the costs of dislocation.
Fairness	
Across users	An increased rate across the board does not alter the current cross-subsidies among different vehicle types. However, a vehicle registration fee is inequitable among users of the same vehicle types since it does not change depending on the vehicle-miles traveled: for example, a car driven 10,000 miles per year attracts the same fee as a car driven 20,000 miles per year.

Criterion	Evaluation
Across income groups	Lower income households will pay a higher proportion of their income into an across-the-board increase in vehicle registration fees.
Across locations	State vehicle registration fees are collected across the transportation system, not just in the locales where transportation services are improved. Users who may not receive additional benefits are required to contribute to improvements in other locales.
Across generations	Costs are matched to benefits across time, as highway users pay annual fees over time while they use the highway system.
Simplicity	
Understandable by the public	In the United States, vehicle registration fees are generally understood to be what their name implies: a fee to cover government's cost of its vehicle registration system. Attempts in the United States to increase vehicle registration fees to include a proxy for road use fees have failed in the face of political resistance.
Administration	
Government costs to collect	No significant changes would be required to Texas' vehicle registration system.
User costs to comply	An increased vehicle registration fee would require no change in the means by which owners register their vehicles.
Enforceable	Effective administrative and enforcement already exists to collect vehicle registration fees.
Viable technology	Additional vehicle registration fees do not require new technology.
Legislative changes	Subchapter D (Registration Procedures and Fees), Section 502 (Registration of Vehicles), Title 7 (Transportation) would have to be amended.
Other jurisdictions	Texas would be required to notify other U.S. states and Canadian provinces of any increase in the registration fees for Texas vehicles with apportioned registration under the International Registration Plan.

14. Increased Vehicle Registration Fees: Local

Exhibit III-14: Increased Vehicle Registration Fees: Local

Criterion	Evaluation
Efficiency	
Fiscal Capacity	
Yield	Approximately, a $10 increase in the county vehicle registration fees would yield: In Harris County: about $32 million per year In Cameron and Hidalgo counties: about $6.5 million per year In Howard County, about $270,000 per year
Stability	Revenues are tied directly to number of vehicles registered, which does vary through economic cycles.
Growth	Barring changes in driving patterns brought about by economic conditions and by an ageing population, the number of vehicle registrations should increase more than the increase in gallons of fuel sold and at a rate close to the concurrent increase in VMT.
Sensitivity	Since the average vehicle in Texas is driven about 12,000 miles per year (200 billion VMT divided by 17 million registered vehicles), a registration fee raised to as much as $100 represents only about 1% of the total annual average cost ($10,000) of operating (amortized purchase cost, registration, insurance, maintenance, fuel, etc.) a vehicle and therefore elasticity effects on vehicle operating costs are negligible.
Fiscal Utility	
Viable as local option	Yes, as evaluated in this section.
Across types of projects	The State law allows county vehicle registration fees to be spent on county road maintenance and improvements funded from each county's road and bridge fund.
Debt security	Vehicle registration fees are a well-proven and stable source of revenue; bond underwriters would readily accept a pledge of such revenues as security for debt.
Equity	
Competitiveness	
Non-transportation uses	In the United States, state vehicle registration fees are generally directed towards transportation expenditures on infrastructure and public safety.
Cost disadvantage	All Texas counties currently charge registration fees between $10 and $11.50 per vehicle. Increasing these fees will have no appreciable effect on the competitiveness of counties relatively to each other.
Fairness	
Across users	An increased rate across the board does not alter the current cross-subsidies among different vehicle types. However, a vehicle registration fee is inequitable among users of the same vehicle types since it does not change depending on the vehicle-miles traveled: for example, a car driven 10,000 miles per year attracts the same fee as a car driven 20,000 miles per year.

Criterion	Evaluation
Across income groups	Lower income households will pay a higher proportion of their income into an across-the-board increase in vehicle registration fees.
Across locations	County-based fees must be spent in the county in which they were raised or, where they exist, be contributed to the regional mobility authority to which the county belongs.
Across generations	Costs are matched to benefits across time, as highway users pay annual fees over time while they use the highway system.
Simplicity	
Understandable by the public	In the United States, vehicle registration fees are generally understood to be what their name implies: a fee to cover government's cost of its vehicle registration system. Attempts in the United States to increase vehicle registration fees to include a proxy for road use fees have failed in the face of political resistance.
Administration	
Government costs to collect	No significant changes would be required to Texas' vehicle registration system.
User costs to comply	An increased vehicle registration fee would require no change in the means by which owners register their vehicles.
Enforceable	Effective administrative and enforcement already exists to collect vehicle registration fees.
Viable technology	Additional vehicle registration fees do not require new technology.
Legislative changes	Subchapter D (Registration Procedures and Fees), Section 502 (Registration of Vehicles), Title 7 (Transportation) would have to be amended.
Other jurisdictions	None.

A-Appendix A: Diversions of Existing Revenues

The main body of the report deals with the potentials of new revenue sources:

- Revenues that are not being collected from highway users or taxpayers now
- If they were, the collecting governments would have reasonable grounds on which to dedicate those revenues to surface transportation expenditures

This appendix deals with another class of surface transportation revenues: revenues that are currently collected from existing taxes and fees associated with surface transportation but are not available to TxDOT.[41] We consider such revenues, collected in the name of surface transportation funding but not available to TxDOT, to be diversions of revenues.

A. Diversions of Existing Federal Revenues

The U.S. Government collects several taxes and fees related to surface transportation to deposit into the federal Highway Trust Fund (HTF), the principal among them being federal excise taxes of 18.4¢ per gallon on gasoline and gasohol in highway use, 24.4 ¢ per gallon on diesel in highway use, and various rates on the sales of tires, trucks, and trailers.

A Texan who pays these federal taxes and fees might reasonably suppose that each dollar so collected in Texas is spent in Texas, that is, that the funds available to Texas under federal aid programs equal the HTF revenues collected in Texas. The extent to which funds authorized for Texas fall short of the HTF revenues collected in Texas we treat here as diverted revenues away from Texas. As estimated below, this diversion is about $500 million of the $3.4 billion of HTF revenues collected in Texas each year.

A Texan with a basic knowledge of the Federal Aid Highway Program might also reasonably suppose federal funds are made available through apportioned programs, in which state and local officials can decide which of their eligible projects should be funded. What federal funds are already earmarked to specific projects, thus denying state and local authorities any choice in setting priorities, we treat here as diverted apportionments. We estimate such diversions of funds into earmarked projects and other discretionary programs to total to $400 million per year.

Finally, a Texan might reasonably expect that, once the U.S. Government had apportioned funds to Texas, local authorities would be assured that the U.S. Government would honor those apportionments.

1. Diverted Federal Revenues

The current authorizing legislation for the Federal Aid Highway Program, SAFETEA-LU, and their predecessors have reflected a considerable redistributive effect among

[41] In more precise financial terms, these are all revenues collected from federal and state taxes and fees that are nominally dedicated to expenditures made from Texas Fund 006 but are not allocated to that fund.

the states and territories: "donor states," those with considerable fiscal power derived from their large economies and highway systems, see some of the HTF revenues collected within their borders apportioned to smaller "recipient states." In the redistributions implicit in SAFETEA-LU, Texas is the largest donor state in the nation, receiving highway and transit apportionments equal to about 85% of the HTF revenues collected within the state.

Exhibit A-1: Summary of Diverted Federal Revenues

	$ millions, 2005	
HTF Revenues Collected from Texans		
Leaking Underground Storage Tank Fund	16	
Mass Transit Account	417	
Highway Account	2,435	
Motor Fuel Excise Tax, all fuels		2,868
Federal Use Tax		132
Trucks and Trailers		339
Tires		46
		3,385
Texas Apportionments		
Federal Aid Highway Programs	1,746	
Highway Program Equity Bonus	824	
		2,571
Transit		337
		2,908
Diversion of Texas Revenues from Apportionments		477

2. Diverted Federal Apportionments: Special Federal-Aid Funding

SAFETEA-LU authorizes about $199 billion in federal aid highway spending nationwide between 2005 and 2009. About $168 billion of these funds are available through apportioned programs, that is, programs in which the amounts are distributed among states and major programs by formulae. While many of the formulae are controversial and, perhaps, different than what Texas policy-makers might like them to be, they provide a high level of assurance to the states of what federal funds will be made available[42] and they leave the states with large degrees of freedom to choose the specific projects in which their expenditures of state funds will be reimbursed by federal aid.

In 2005/06, about $2.571 billion was apportioned to Texas through these programs, about 8.2% of the $31.256 billion that was apportioned to all states and U.S. territories that year.

[42] The availability of funds is subject to obligation limitations, which can be rescinded. Such rescissions are described in a sub-section below.

This sub-section describes exceptions in SAFETEA-LU, through which the remaining $31 billion in nationwide federal aid authorizations are made available through programs that are not apportionment programs. As such, these other programs do not assure states that federal funds will be available to fund the eligible projects of their choosing. We consider the amounts allocated to those other programs to be diverted away from the state's highway improvement priorities, such that high-priority projects are displaced from Texas' Statewide Transportation Improvement Program (STIP). Our estimates of these diversions are summarized in the following table and described in the subsections below.

Exhibit A-2: Summary of Diverted Apportionments

	$ millions, 2005
High Priority Projects	136
Transportation Improvement Projects	42
Other Discretionary Programs	230
	408

a. Congressionally Designated Projects

With little explanation, SAFETEA-LU apportions or "earmarks" funds to specific projects, giving the states no flexibility to allocate those funds to other projects. These projects are divided, again with little explanation into "high priority projects" and "transportation improvement projects."[43]

(1) High Priority Projects

SAFETEA-LU authorizes a total of $2.97 billion annually, that is, about $14.85 billion over five years, for 5091 specified projects nation-wide, usually representing 80% of the estimated costs of these projects. Texas' share of high priority project authorizations is about $680 million, about 4.6% of the national total. In 2005/06, about $137 million was diverted from Texas' apportioned programs into apportionments for those high priority projects that are located in Texas. We consider that annual amount of about $137 million to be a diversion of federal aid funds.

(2) Transportation Improvement Projects

SAFETEA-LU authorizes a total of $2.55 billion over five years for 466 specified projects nationwide, representing between 10% and 25% of the estimated costs of those projects. None of these projects are located in Texas. In 2005/06, $511 million was apportioned for transportation

[43] In authorizing bills prior to SAFETEA-LU high priority projects and transportation improvement projects have been called demonstration projects and this term is still sometimes used.

improvement projects nationwide. Had these funds been distributed through apportioned programs, Texas would reasonably expect to receive about 8.2% of this national apportionment, or about $42 million in 2005/06. We treat this as a diversion of federal funds away from Texas.

b. Other Discretionary Programs

The other discretionary programs in SAFETEA-LU are those programs[44] in which funds are committed to projects through a competitive selection process. For these programs, FHWA solicits proposals from all states and selects projects from among those proposals that best meet selection criteria established in law, in regulation or by administrative orders. In practice, however, FHWA has little discretion as to which projects should be accepted; almost all of the funds appropriated to these programs are earmarked to specific projects by the U.S. Congress.

Of the $31 billion made available through SAFETEA-LU nationwide for non-apportioned programs $17 billion is dedicated to earmarks, leaving about $14 billion nationwide over five years for discretionary programs. If that same $14 billion were made available to the states through apportioned programs, Texas might reasonably expect to receive an additional apportionment of 8.2% of that amount, that is, $1.15 billion over five years or about $230 million per year. We consider that amount, $230 million annually, to be a diversion of federal funds.

c. Emergency Relief

SAFETEA-LU authorizes $100 million annually, nationwide, for repair or reconstruction of federal-aid highways that have suffered from natural disasters or catastrophes. We do not treat this as a diversion of funds as it is akin to a reserve for contingencies.

3. Diverted Federal Obligation Limitations: Rescissions

Rescissions are made necessary by looming cash shortfalls in the Highway Trust; they are but one of the means by which the U.S. Congress can address the expected shortfalls.

Nationwide, the known rescissions in the 2007 to 2009 period, including the 2009 rescission programmed into SAFETEA-LU, total to about $15.8 billion.

[44] Discretionary programs in SAFETEA-LU include the Discretionary Bridge Program, Corridor Planning and Development and Border Infrastructure (Corridors & Borders), Delta Region Transportation Development Program, Ferry Boats Program, Highways for LIFE, Innovative Bridge Research and Construction, Innovative Bridge Research and Deployment Program, National Historic Covered Bridge Program, ITS Deployment Program, Discretionary Interstate Maintenance Program, Public Lands Highways Program, Scenic Byways Program, Transportation and Community and System Preservation Program, the TIFIA Program, the Truck Parking Program and the Value Pricing Pilot Program.

Exhibit A-3: Rescissions of SAFETEA-LU Apportionments

$ millions	*National*	*National Annual Total*	*Texas*	*Texas Annual Total*
Department of Transportation Appropriations Act, 2006 FHWA Notice N 4510.578, 28 December 2005	(2,000)		(159)	
Department of Defense Appropriations Act, 2006 FHWA Notice N 4510.588, 21 March 2006	(1,143)		(91)	
Emergency Supplemental Appropriations Act, 2006 FHWA Notice N 4510.606, 5 July 2006	(702)	(3,845)	(55)	(305)
Continuing Appropriations Resolution, 2007 FHWA Notice N 4510.643, 19 March 2007	(3,472)		(289)	
U.S. Troop Readiness, Veterans Care, Katrina Recovery and Iraqi Accountability Appropriations Act. FHWA Notice N 4510.647, 29 June 2007	(871)	(4,343)	(72)	(361)
H.R. 3074*: 2008 Transportation, Housing and Urban Development Appropriations* Passed by U.S. Senate 12 September 2007.	(3,000)	(3,000)	(259)	(259)
Rescission scheduled in SAFETEA-LU for 30 September 2009 (impact on Texas is approximate)	(8,500)	(8,500)	(600)	(600)
Cumulative		(19,688)		(1,525)

Since the forecasts predict a HTF shortfall between $16 billion and $17 billion by 2009, another rescission in the 2009 federal appropriations process is likely. Texas can expect its share of that additional rescission to be at least $100 million, in which case the Texas share of all the rescissions under SAFETEA-LU would be about $1.7 billion or, on average, about $340 million per year over the five-year life of SAFETEA-LU.

B. Diversions of Existing State Revenues

Texas also collects taxes and fees that, nominally, are associated with the use of the state's surface transportation system. Some of the revenues collected from those taxes and fees are dedicated to state government programs other than surface transportation. Estimates of those revenues are provided in this section.

These revenues are not new revenues, in that they are already being collected from state taxpayers. Nor do they represent additional revenues for the state since they are already being expended on other state government programs; if they were dedicated to surface transportation then other new revenues would have to be raised in Texas to support those other programs.

The Texas Constitution requires that ¼ of the net receipts from the state's motor fuels taxes be expended on public education.[45] In FY 2006, the state collected $3.034 billion in state motor fuels taxes, of which $2.190 billion was deposited into the State Highway Fund (Fund 006), and $738 million was allocated to the Available School Fund.

Also, about $711 million was expended from the State Highway Fund in FY 2006 by agencies other than TxDOT for activities that, nominally, supported the state's surface transportation system.

Exhibit A-4: Disbursements from State Highway Fund to Other Agencies

	$, 2005/06
Department of Public Safety	564,477,8
Employees' Retirement System	67,631,0
Texas Education Agency	50,000,0
Health and Human Services Comission	10,000,0
Attorney General	8,080,03
Texas Transportation Institute	6,538,98
State Office of Administrative Hearings	3,781,64
Comptroller Judicial Section	617,86
Comptroller-Fiscal	560,22
	711,687,5

These disbursements to agencies amounted to about 8% of the $8.509 billion disbursed from Fund 006 in 2005/06.

[45] Article 8, Section 7-a.

Appendix B: Borrowing

Borrowing from the State Highway Fund does not yield new or additional revenues for transportation. Rather, the interest expense and other costs associated with borrowing reduce the revenues available to fund highway projects on a pay-as-you-go basis. Borrowing does, however, yield additional cash; useful in general for the acceleration of projects and useful in particular when, as now, future federal revenues are uncertain.

Texas has the necessary fiscal capacity to borrow more funds for highway projects[46]. There are several mechanisms, described below and classified according to the state or federal revenues that they require for security that can be implemented by the state through additional legislation to use more of that capacity than it has used to date.

A. On State Sources

Texas voters have approved the following measures since 2001 to allow highway-related debt in the forms of:

- Revenue bonds, which are secured by the revenues that were dedicated to the accounting entity created to manage these bonds, the Texas Mobility Fund (TMF), as approved by Texas voters in 2001 with Proposition 15. The state's Bond Review Board has approved up to $6.4 billion in TMF bonds. While work totaling $6.4 billion has been started, only $5.1 billion of bonds have been issued to fund the cash flow needs to date.
- State highway revenue bonds, which are secured by all of the revenues payable into the State Highway Fund (Fund 006). Proposition 14, approved by voters in 2003, allowed the issuance of such bonds and the Texas Legislature subsequently authorized issuance of up to $1 billion in these bonds annually, with an overall limit of $3 billion. In 2007, the Legislature doubled the aggregate limit for issuance such bonds to $6 billion and increased the annual issuance limit to $1.5 billion. About $2.8 billion of state highway revenue bonds have been issued.
- General obligation bonds, which are secured by the full faith and credit of the state. Texas voters approved Proposition 12 in November 2007, under which up to $5 billion in general obligation bonds may be issued to finance highway improvement projects.

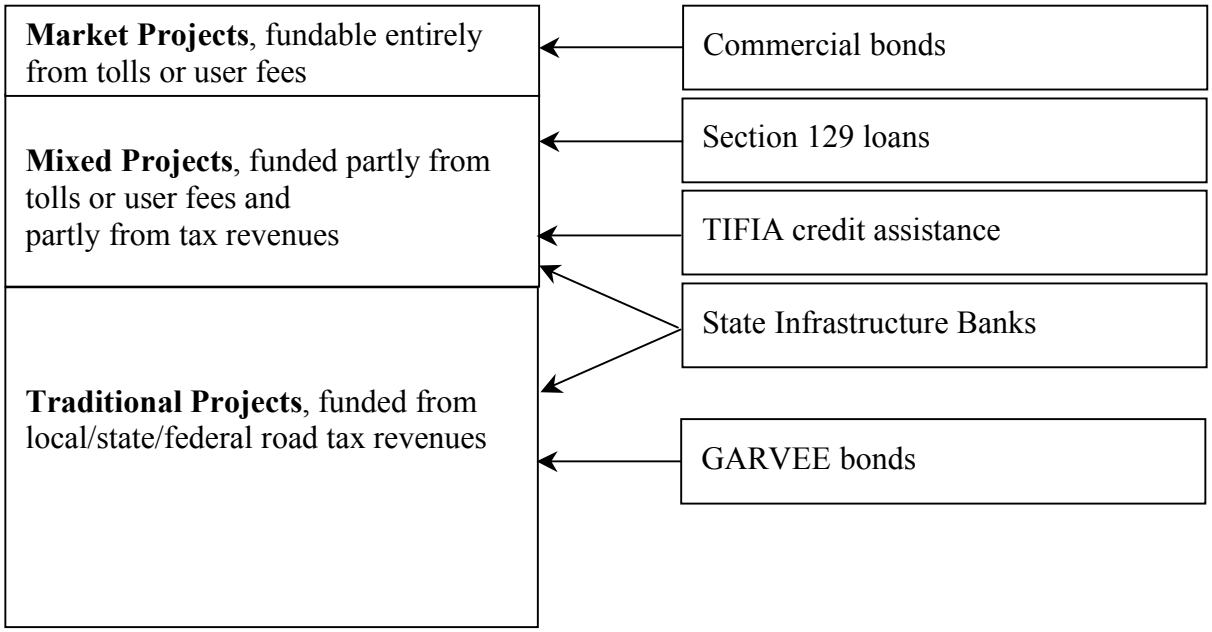
[46] See Dye Management Group Inc. Independent Performance Audit: Transportation Funding. July 2007.

B. On Federal Sources

FHWA offers several forms of debt instruments and credit assistance to state DOTs, as they fund their highway programs, all of them secured by federal aid apportionments that are due to the state.

The following diagram paraphrases the FHWA representation of how these debt instruments are best applied against projects, differentiated by how much of the revenue required to pay for these projects is paid by users, as opposed to taxpayers.

Exhibit B-1: Alignment of Innovative Financing Debt Instruments to Highway Projects



Appendix C: Bibliography and Assumptions

A. Funding Proposals Evaluated

We evaluated the following proposals:

- *Texas' Roadways – Texas' Future*, Texas Governor's Business Council, 2003
- *Shaping the Competitive Advantage of Texas Metropolitan Regions,* Texas Governor's Business Council, 2006
- *A Quiet C*risis in Transportation Finance: Options for Texas, Texas State Senate, 2006
- *Revenue Sources to Fund Transportation Needs,* American Association of State Highway and Transportation Officials (AASHTO), 2007
- *Transportation for Tomorrow,* National Surface Transportation Policy and Revenue Study Commission, 2007

B. Bibliography

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Prozzi, J. et al. *What We Know about Containerized Freight Movement in Texas.* Centre for Transportation Research, the University of Texas at Austin. FHWA/TX-04/0-4410-1. July 2003.

Texas State Data Center. http://txsdc.utsa.edu/tpepp/2006projections

Texas Transportation Institute, University Transportation Center for Mobility. *A Guide to Transportation Funding Options.*

C. Assumptions and Calculations

Following lists the data assumptions in this report.

Current Values

Texas highway system: 650,000 lane-miles[47]

Texas population: 23 million persons[48]

Texas vehicle-miles traveled: 200 billion per year[49]

Texas tolled trips: 700 million trips per year[50]

Taxable motor fuel sold in Texas: 15 billion gallons per year[51]

Motor fuel taxes paid into the State Highway Fund: $2.2 billion per year[52]

Retail sales in Texas subject to the state sales tax: $325 billion per year[53]

Container movements, Houston: 800,000 TEU, each way, per year[54]

Container movements, all other ports: 100,000 TEU, each way, per year[55]

Inflation rate on highway construction costs: 2.5% per year[56]

Consumer price index increases: 2.5% per year[57]

Annual average cost of operating a vehicle: $10,000[58]

Predictors of VMT

State population will be as forecast by the Texas Data Center

VMT by urban versus rural drivers remains as estimated in the 2001 National Household Travel Survey

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[47] FHWA Highway Statistics, Table HM 60
[48] Texas State Data Center
[49] FHWA Highway Statistics, Table VM 2
[50] TxDOT GBE Toll Revenue Model, 2007
[51] Texas Comptroller of Public Accounts, Fiscal Yea r 2004-2005
[52] *Ibid.*
[53] *Ibid.*
[54] Prozzi, J. et al. "What We Know about Containerized Freight Movement in Texas." Center for Transportation Research, the University of Texas at Austin. FHWA/TX-04/0-4410-1. July 2003
[55] *Ibid.*
[56] FHWA Highway Statistics, Table PT 201
[57] US Bureau of Labor Statistics
[58] Runzheimer International, Annual Vehicle Cost Update 2008

Relative share of VMT by age of driver remains as estimated in the 1994 Residential Transportation Energy Consumption Survey

Real US GDP will grow by 2.9% per year

Texas GDP will grow by 3.5% per year

Lane-miles grow as predicted by MPOs in their TMMPs. These were approximated with an exponential functional form of $y = Ae^t$, wherein y = the number of lane miles, A = 645,405, and t = 0.005x; therefore $y = 645{,}405e^{0.005x}$

Predictors of MPG

Mix of heavy vehicles, light trucks and passenger cars in Texas remains constant

National new car sales and light vehicle stock by technology type and class as forecast in Annual Energy Outlook for the West South Central region

National fuel efficiency improvements as forecast in Annual Energy Outlook: The EIA defaults assume that there will be approximately 10.5% efficiency gains over the next 25 years or equivalently a gain of 1.7 mpg

Ethanol is projected to increase at an average rate of 3.6 % per year until 2020

Value of Time and Elasticities

The average value of time of $10 per hour, estimated in Dallas in 2006, applies throughout the state

Short-run elasticity of VMT to fuel price is 0.3, long run is 0.5

Elasticity of tolled trips to toll price is 0.5 for cars and 0.1 for trucks

Tolls on existing facilities increase to the equivalent of 16¢ per mile

Current Values

	Harris County	*Hidalgo County*	*Howard County*	*Texas*
Population[59]	3.8 million	700,000	33,000	23 million
Vehicle Registrations[60]	3.2 million	440,000[61]	27,000	21 million[62]

[59] Texas State Data Center Estimate as of 1 July 2006.
[60] Texas Department of Transportation, 2006/07 City and County Statistics. http://www.dot.state.tx.us/apps/discos/
[61] Hidalgo County Monitor reports about 400,000 registered vehicles in the county. www.themonitor.com/onset?id=1113&template=article.html
[62] FHWA Highway Statistics, 2005, reports about 17 million registered private vehicles.

	Harris County	*Hidalgo County*	*Howard County*	*Texas*
Annual Taxable Sales[63]	$56 billion	$5 billion	$250 million	$325 billion
Average Per Capita Annual Income[64]	$42,000	$16,000	$24,000	$32,000

Calculations

Increase in State Motor Fuel Tax; Indexed State Motor Fuel Tax; Carbon Tax

A 1 cent per gallon increase at 15 billion gallons sold with an elasticity of .25 equals $112.5 million; rounded, the reported potential yield is $100 million. A 1% increase, equivalent to 0.2 cents per gallon at 15 billion gallons sold, has a potential yield of $20 million. A 27.5 cent per gallon increase, with a long-run elasticity of .5, would yield approximately $1.7 billion.

VMT Charge

A 0.1 cent per vehicle-mile charge at 200 billion vehicle-miles traveled equals $200 million potential yield.

Increased Tolls

A 10 cent per transaction increase in tolls on 700 million tolled trips with an elasticity of .35 equals $45.5 million; rounded, the reported potential yield is $50 million.

Land Development Charges

1% of $7 billion total non-residential building permits equals $70 million; to account for continued economic growth, the reported potential yield is $75 million.

Increased Sales Tax: Statewide and Local

Implementing a 1% sales tax on $325 billion total retail sales with an elasticity of 0.6 equals $1.3 billion.

Container Fees

$30 charge per container into Houston and Galveston (800,000 TEU each way per year) with an elasticity of .01 equals $24.3 million; rounded, the reported potential yield is $23 million.

Increased Vehicle Registration Fees: Statewide

[63] Texas Comptroller of Public Accounts. Texas Edge Economic Data for 2006.
[64] Texas Comptroller of Public Accounts. Texas Edge Economic Data for 2006.

Each $10 increase in state vehicle registration fee will yield about $200 million per year (21 million vehicle registrations) in additional revenues.

Increased Vehicle Registration Fees: Local

Each $10 increase in county vehicle registration fees will yield:

	Cameron County	*Harris County*	*Hidalgo County*	*Howard County*
Additional Annual Revenue	$2.5 million	$32 million	$4 million	$270,000