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Is Texas Ready for Mileage Fees?

A BRIEFING PAPER

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and the Federal Highway Administration
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Is Texas Ready for Mileage Fees? A Briefing Paper

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Mileage Fee



OR



Fuel Tax?

Is Texas Ready for Mileage Fees? A Briefing Paper

A Context for Change

According to the Transportation Research Board, government regulation and continued increases in fuel prices could cut fuel consumption in the United States by 20 percent by 2025. While good news for the environment, this does not bode well for tax revenues generated by gasoline sales. This fact—combined with increasingly fuel-efficient and alternative-fuel vehicles and the \$315 billion in funding needs for Texas transportation identified by the Texas 2030 Committee—demonstrates the inadequacy of the fuel tax as a viable long-term funding mechanism for maintaining and expanding highways in the Lone Star State.

What Is the Fuel Tax?

Federal and state fuel taxes are paid at the pump by consumers when they purchase fuel. The fuel tax is the primary funding mechanism for the maintenance and expansion of Texas' highway infrastructure. A type of "use fee," the tax is levied on the amount of fuel purchased by an individual. Each gallon of gasoline purchased generates the same amount of revenue regardless of price.

What's Wrong with the Fuel Tax?

Since the fuel tax is assessed on each gallon of gasoline sold, not actual roadway use, it is, at best, an indirect funding mechanism. As fuel consumption and fuel tax revenues drop and maintenance and construction needs increase, a funding crisis looms for Texas. If we want to continue enjoying the benefits of a well-maintained, well-developed highway system, we must consider changing how the current funding system works.

Is There an Alternative to the Fuel Tax?

One alternative funding mechanism is the "mileage fee." This is a fee assessed on every mile driven on the roadway by a vehicle, rather than on every gallon of fuel purchased. Thus, the fee's assessment more accurately reflects actual road use compared to the fuel tax.

As fuel tax revenues drop and maintenance and construction needs increase, a funding crisis looms for Texas. If we want to continue enjoying the benefits of a well-maintained, well-developed highway system, we must consider changing how the current funding system works.

Various local, state, and federal agencies have begun evaluating mileage fees as a replacement or supplemental funding mechanism. Implementing mileage fees would fundamentally change how road users pay for using the road network, as well as how maintenance and expansion of that network is funded. Thus, there are numerous issues and challenges facing proponents of this alternative.

The Texas Department of Transportation funded the Vehicle Mileage Fee Exploratory Study to begin assessing if and how mileage fees could be implemented in Texas.

Goals of the Mileage Fee Exploratory Study

In late 2009, recognizing the impending funding problems for state highways and in response to interest from elected officials, the Texas Department of Transportation (TxDOT) tasked TTI to explore whether a mileage fee system could address some of the major deficiencies in the fuel tax and to provide direction on potential policies.

This project conducted a preliminary evaluation of how mileage fees might be used as an alternative funding mechanism in Texas. Researchers interviewed stakeholders, technology experts, and the general public to gather feedback on the challenges and opportunities associated with implementing mileage fees in Texas (see Appendix A). Researchers also prepared a decision matrix (see Appendix B) that can aid policy makers in evaluating the various trade-offs in policy necessary to successfully implement a mileage-fee system.

In addition to conducting a literature review, the research team also solicited different perspectives on the issue from around the state. Researchers collected input from

- 13 transportation stakeholder groups representing a variety of interests,
- a nationwide panel of technology experts who reviewed public opinions about possible deployment options, and
- focus groups conducted with the general public in five communities of varying size and geography.

The project's findings and recommendations are presented in this briefing paper.

What Texans Think of Mileage Fees

As with any innovation, both challenges and opportunities exist when implementing mileage fees. The conclusions presented below are drawn from the project's focus groups, stakeholder interviews, and technology panel interactions.

Challenges: Public Acceptance Barriers

The three primary public acceptance barriers identified by the project are

- feasibility, in terms of protecting privacy, administrative cost, and enforcement,
- the need to adequately make the case for mileage fees, and
- fairness of implementation.

Feasibility

While those interviewed found mileage fees a logical and sustainable funding source, they also viewed mileage fees as impractical. One stakeholder used the

term “pie in the sky,” and that sentiment manifested in both the focus groups and stakeholder interviews.

Generally speaking, respondents reacted negatively to the notion of shifting fundamentally from a fuel-tax-based to a user-fee system. This attitude will prove hard to overcome when it comes to winning over the public. Thus, the political will to champion this approach might be difficult to come by as well. On the technical issue of implementation, participants thought simple odometer-reading-based systems were easy to evade and potentially onerous for the driver, while higher-tech options appear too complex to properly administer and just as difficult to enforce.

Do we need mileage fees? What Texans Think.

- It’s a good idea but it’ll never work.
- Fix the current system first. If that doesn’t work, then we’ll talk.
- We’re not sure how improved fuel efficiency impacts revenues from the fuel tax. If people are driving more, wouldn’t there be more money for transportation? So do we really need mileage fees?
- They’re using fuel tax money for things other than transportation? Recover that revenue first and see where we stand.
- I’m not sure I want to give any more money to the government...I don’t really trust them as it is.
- What about rural and low-income drivers? It seems like they would pay more than their fair share. How can we ensure the system is administered fairly?

The Case Hasn’t Been Adequately Made for Mileage Fees

Despite the logic of a fee-for-use system, the public doesn’t see a compelling reason for needing it at this time. While this reluctance is largely due to a lack of knowledge regarding the non-sustainability of the fuel tax as a funding mechanism, other factors (discussed in more detail below) contribute to this attitude.

- The public favors fixing the current funding mechanism before trying to develop an alternative.
- No consensus exists regarding how to address the impact of fuel efficiency on fuel tax revenue generation.
- Addressing “diversions” of fuel tax revenue to purposes other than funding transportation improvements is viewed as a more workable solution.
- Those surveyed voiced a strong undercurrent of distrust toward government in general.

The lack of a well-defined rationale for mileage fees has a common theme: in the public’s view, more immediate issues associated with funding transportation need addressing first. Policy makers should address longer-term issues, like alternative funding mechanisms, after the resolution of these short-term “easy fixes.”

Getting the public to think about the long term will pose a major challenge. For example, several focus group participants noted that they do not—and many could not—envision how transportation might look decades from now. In discussing the fuel efficiency of the U.S. auto fleet, for example, several comments mentioned the folly of trying to guess what the auto fleet will look like after 30 years. There were also



participants skeptical of long-term revenue projections, noting that anything can happen over time. Too many unknowns exist, they argued, to be able to form an opinion regarding how to proceed.

Fix the Current System First

Interviewees voiced the strong opinion that policy makers should fix the current funding system before looking for new sources of revenue. In essence, why build a new car when the one we have just needs a tune-up?

For example, while sales of electric vehicles might one day warrant mileage fees due to lost fuel tax revenue, respondents felt that we haven't yet reached that point: there are relatively few electric vehicles on the road, and hybrids can be expensive, meaning that not that many people drive them. Therefore, in the minds of most focus group participants, the best solution appears to be simply raising the fuel tax to cover near-term shortfalls. Participants did acknowledge, however, that the state currently suffers from a lack of political will to champion this option.

Addressing the Impact of Fuel Efficiency on Fuel-Tax Revenue

While participants recognized that increasing fuel efficiency can negatively impact fuel-tax revenues, no consensus was reached on how to address the issue. Interviewees recognized that continued increases in fuel efficiency will have a negative effect on fuel-tax revenues.

The current fuel tax system essentially subsidizes travel by highly fuel-efficient vehicles and electric vehicles, since they pay less in fuel taxes or none at all. Some respondents had no problem with this. However, a larger percentage of them felt that more revenue should be captured from these drivers. Thus, future mileage fee implementation efforts should incorporate outreach elements highlighting the relationship between fuel efficiency and fuel tax payments. These campaigns should illustrate how drivers are currently paying to use the roadway system and how mileage fees more accurately reflect actual usage.

Addressing "Diversions" of Fuel-Tax Revenues

Whatever the magnitude of actual dollars diverted, perceptions regarding how fuel-tax dollars are spent on non-transportation initiatives distract from the discussion of the long-term sustainability of the fuel tax. These perceptions will prove a major impediment when discussing the need for alternatives to the fuel tax. Focus group participants and stakeholders agreed on the need to address diversions before looking into fuel tax alternatives. Implicit in this argument is that any new revenues—whether from an increase in the fuel tax or the implementation of a mileage fee—must help fund transportation in order to maintain a high level of public acceptance of the policy.

Distrust in Government

The participants' general distrust in government poses a significant barrier to implementing new fee mechanisms. Many of the focus group sessions were characterized by this opinion, and several stakeholder interviews highlighted public perceptions about the inability of government to function efficiently.



The public assumes that inefficient government programs waste revenues currently collected, so it's hard to make the case for additional fees. Some focus group members indicated that imposing new fees would not address the real problems inherent in the system, such as politics driving funding decisions. Addressing public concerns over perceived fraud and wasteful government spending is essential to convincing the public of the need for transportation funding system reform.

How Can Such a Funding Mechanism Be Implemented Fairly?

Feedback from interviews indicates concerns regarding fairness toward a number of different user classes if mileage fees are implemented, especially regarding rural and low-income drivers.

Rural Drivers

In Texas the most prominent concerns relate to rural drivers. As a class, rural drivers generally drive farther for everyday, basic services. Because mileage fees are based on how much of the transportation network a driver uses, they appear to unduly burden these drivers. However, this belief is often rooted in a misunderstanding of how drivers currently pay for road usage. Many drivers, for example, don't know they already pay a fee per gallon (via the fuel tax) to drive; thus, they might already pay more than other drivers if they drive long distances on a regular basis. Getting the public to understand that the distance and type of vehicle they drive influence the amount they pay in taxes would help address the concern of inequity when implementing mileage fees.

One way to begin addressing these concerns is to engage the public in a broad-based discussion about what road-user fees are currently paid. Doing so will help place the mileage fee concept in context and dispel some of the myths surrounding user fees, which inform many of the equity-related concerns expressed by participants.

Lower-Income Drivers

Fairness toward lower-income drivers is also an issue. Take a mileage-fee system—implemented as part of the vehicle registration or inspection process, for example—that requires lump-sum payments. Requiring such payments could be unaffordable for lower-income drivers. As evidenced by the focus groups surveyed, merely presenting mileage fees as a replacement to the fuel tax (effectively burdening drivers to the same

The current fuel tax system essentially subsidizes travel by highly fuel-efficient vehicles and electric vehicles, since they pay less in fuel taxes or none at all.

extent as the current fuel tax system) does nothing to allay these concerns. Since public opposition to mileage fees often stems from a lack of knowledge of the current funding system, outreach programs aimed at making drivers—and in particular lower-income drivers—more aware of what they already pay for use of the roadway network would likely alleviate some concerns.

Addressing Public Acceptance Barriers

Based on feedback from participants, the public has three principal concerns regarding implementation of mileage fees:

- how to maintain driver privacy while supplying the data needed to make the system work;
- how such a system could be effectively administrated; and
- how to ensure the enforcement system is fair, equitable, and effective.

In Texas the most prominent concerns relate to rural drivers. As a class, rural drivers generally drive farther for everyday, basic services.

The technology panel discussion produced the fundamental premise that public policy design can significantly impact public concerns over specific technology applications. In other words, policy makers can troubleshoot most concerns by setting effective rules and policies before technologies are even discussed. Public policy will drive system development, and technology should not be a limiting factor in designing and deploying mileage fee systems. While the various technology options discussed in this research effort generate significant public acceptance issues, effective policy design can address most of them.

Technology demonstrations can, for example, address privacy issues. Drafting policies that specifically address what information is collected, how and for how long it's stored, and who has access to it will better safeguard driver privacy. Promoting those safeguards in an effective way can help shape public perceptions regarding how individual privacy is protected. Before developing any mileage fee system, a broad-based policy discussion related to public concerns (e.g., privacy, administration, and enforcement) must occur. Such discussions will ensure that any system deployed, and the technologies supporting that deployment, are designed to address public concerns from the outset.



Opportunities: Applications for Mileage Fees

Significant opportunities exist side by side with the challenges facing a potential state implementation of mileage fees:

- mileage fees could be viewed as a logical and sustainable solution to the funding crisis,
- the driving public could support a simple application of mileage fees, and
- support for these types of systems could increase if they are shown to be workable.

Mileage Fees: A Logical and Sustainable Solution

Interviewees generally saw mileage fees as a fair way of collecting road use fees. In several instances, focus group members brought up the user-fee concept as a means of addressing various issues with the fuel tax even before researchers introduced the concept. Many stakeholders indicated that directly charging for road use should be the preferred model for funding infrastructure development. Generally speaking, participants recognized that a continual increase in fuel efficiency will negatively affect future fuel tax revenues. There was also a general consensus that more revenues should be captured from those driving more fuel-efficient vehicles.

Simple Solutions Will Engender the Most Support

If mileage fees are in Texas' future, most participants supported a simple solution for implementation. Most popular in the near term is the odometer-reading-based system. It's easy to understand and could be implemented as part of an existing fee-payment system already familiar to drivers, such as motor vehicle registration and inspection fees.

Some discomfort exists regarding the potential technologies that would support mileage fees. Implementing technology-dependent systems on an optional basis will allow users to adopt the technology when they are comfortable with it, increasing the acceptability of the system. Large demonstrations of the technology will help to increase this comfort as potential users see how the technology operates and how the administrative systems supporting them will function.

Demonstrate Technologies to Show How They'd Work in Texas

Despite their appreciation for the mileage-fee concept in theory, the public doesn't see mileage fees as practical. Participants suggested that technological demonstrations could provide an opportunity to address several public acceptance issues. Such demonstrations would show that mileage fees can, in fact, be implemented and reliably generate revenue while more accurately reflecting roadway usage.

Outreach elements that highlight the relationship between fuel efficiency and fuel tax payments made on a per-mile basis should accompany mileage-fee demonstration projects. Besides illustrating the technical feasibility of mileage fees, these projects could show the public that implementing these systems will not drastically affect the status quo. This concept is key to long-term success for mileage fees. Transitioning to a fee-based system should occur gradually, in order to foster public and political acceptance. As acceptance grows, so grows support for the longer-term goal of fully implementing the new system.

Specifically, any demonstration should address the three primary concerns as highlighted by focus group participants.

Drafting policies that specifically address what information is collected, how and for how long it's stored, and who has access to it will better safeguard driver privacy.



Implementing technology-dependent systems on an optional basis will allow users to adopt the technology when they are comfortable with it.

- **Privacy** — Reassuring drivers that policies aimed at protecting their privacy will be put in place is essential. Highlighting these protections as functions of how the technologies work will help to dispel misconceptions about how the technologies might violate the public's privacy.
- **Administration** — Conducting realistic demonstrations, including taking into account issues associated with system administration, is key. For example, project administrators should consider issues associated with the up-front and ongoing maintenance costs of the proposed system when implementing a pilot project.
- **Enforcement** — Participants expressed a significant concern regarding whether or not mileage fees could be enforced. A system easy to evade will not have the support of the public. The public must have confidence in the fairness of the system; they must believe that it's being enforced fairly. Therefore, enforcement mechanisms should be tested in any demonstration. Just as importantly, any outreach activities associated with demonstration projects should promote the effectiveness and fairness of enforcement mechanisms.

How Other States Have Tested Mileage Fees

Other states, including Oregon and Washington, have implemented pilot studies of mileage fees. In Oregon, onboard units used global positioning system (GPS) technology to record mileage driven in specific zones. The units transmitted data to a billing center whenever drivers fueled their vehicles at participating service stations. (The Oregon approach essentially comprises Model 2 presented later in this paper.) Washington State deployed similar GPS-based units, but fee information was transmitted using cellular signals. These units calculated mileage traveled on specific roadways.

The University of Iowa is currently conducting a national evaluation of mileage fees that employs elements of both Oregon's and Washington's projects. Iowa's system uses onboard receivers that work with GPS satellite technology. As did Oregon, Iowa is using zone-based pricing, where mileage is accrued within pre-specified areas. The fee paid varies based on where the driver goes. Fee amounts are transmitted using cellular technology similar to Washington's approach. Iowa's study is being carried out in Austin, Texas; Boise, Idaho; San Diego, California; eastern Iowa; the Research Triangle area of North Carolina; and Baltimore, Maryland. The evaluation has been extended and will include six additional locations.

How Other States Have Addressed the Public's Concerns

In the Oregon study, researchers understood the importance of maintaining driver privacy. They developed their system to collect mileage based on travel within zones. The onboard units only collected data showing that a vehicle traveled within a certain zone. The system counted mileage within each zone; any mileage accrued outside of a charged zone was "free." The University of Iowa's system records minimal data for a finite time before erasing it. All charge calculations occur within the unit. It is impossible for the system, or the government for that matter, to track participants.

Acknowledging that drivers would prefer paying mileage fees as part of an existing bill, Oregon designed its fee payment as a fee added whenever a driver refuels his or her vehicle. Wireless technology at gas stations participating in the study would

detect the vehicles, read the charge information from the onboard unit, and apply the mileage fees to the driver's fuel purchase. This allowed for fuel taxes to be deducted from the purchase, meaning that participants were not "double taxed."

What We've Learned from Other States

- The mileage fee concept is viable and can be phased in alongside the fuel tax.
- Driver response to mileage fee implementation suggests that significant opportunities to reduce traffic congestion and raise revenue for investment exist.
- Driver privacy can be protected by limiting the type of data collected and how it's stored.
- Mileage fees could be implemented with minimal burden on business and relatively low implementation and administrative costs.
- Similar to cell phone billing, potential users would prefer to have an itemized bill so they can audit their travel.
- Acceptance of these types of systems grows as users become more familiar (and therefore more comfortable) with them.

Recommendations of the Research Team

This section recommends two specific implementation models aimed at effectively implementing mileage fees in Texas. System development should proceed from clearly established and prioritized goals and policies.

Policy Assumptions

Researchers found that public acceptance of mileage fees is vital to successfully implementing them. Addressing the three primary concerns of the public—privacy, administration, and enforcement—underlies the two models presented here.

- **Privacy** — The models minimize privacy concerns by maximizing individual driver privacy for those who desire it and providing options for those less concerned about it.
- **Administration** — The models use the lowest administrative cost options and rely heavily on existing institutional frameworks.
- **Enforcement** — By piggybacking mileage fees on existing fee systems (e.g., vehicle registration / inspection or fuel purchases), enforcement of mileage fees leverages system procedures for enforcement already in place.

While these three policies merit core consideration, policy makers should consider and evaluate a broader range of issues. To help with that process, the research team developed a decision matrix (see Appendix B). Some of the other issues that policy makers will need to address include

- **General revenue goals** — What are the revenue goals of the system? Is the goal of the system to merely augment and supplement existing revenues or to completely replace an existing revenue base (i.e., the fuel tax)?
- **Role of the private sector** — What role will private-sector entities play in the development and administration of the system?



In Oregon, onboard units used GPS technology to record mileage driven in specific zones.

- **System flexibility** — To what extent should the system accommodate changes in rate structure and jurisdictional boundaries?
- **Fee variability** — To what extent will fees vary between vehicles? Will rates vary based on time and location? The answer to these questions will depend greatly on the goals of the system.

The models below do not necessarily address these various policy issues because limited details exist on the potential cost for each model. This is largely due to the fact that questions regarding administration—specifically what actual state entities would be responsible for the various elements of the system and to what extent fees would be applied to the statewide vehicle fleet—remain unanswered.

Model 1: A Program Targeting Electric Vehicles

This scenario targets current non-user-fee-paying vehicles, representing about 0.1 percent of the entire statewide vehicle fleet. This approach would immediately gather revenue from vehicles not currently covered by the fuel tax and provide a model to use in potentially phasing standard passenger vehicles into the system. From a public acceptance standpoint, this model is perhaps the easiest to implement. In general, focus group participants favored charging electric vehicles for their use of the roadway system.



A Pilot Program Targeting Electric Vehicles Could Follow Either the Odometer Reading or GPS-based Implementation Model

Rationale for the Electric Vehicle Approach

There are approximately 1,000 total vehicle identification number (VIN)/make/model combinations each year. The Texas Department of Motor Vehicles (DMV) could identify hybrid and electric vehicles by setting aside a few dozen unique combinations in its database. Each model year, the DMV could add a new set of VIN/make/model combinations as the electric/hybrid vehicle fleet evolves.

A successful demonstration of this all-electric vehicle mileage-fee implementation model could lead to the adoption of a wider mileage fee system for all vehicles. Generalizing the system to all vehicles would likely require substantial expansion, though the costs to do so should prove relatively easy to calculate, especially since this implementation would lay the groundwork for a wider system. The initial phase, applied to all-electric vehicles, will serve the dual purpose of implementing a pilot system (allowing procedural kinks to be worked out) and providing a demonstration to the public regarding the efficacy of implementing a mileage fee system in Texas.

Fee Collection under This Model

During annual vehicle inspections, the fee would be assessed based on an odometer reading, which is already collected as part of the inspection process. Drivers would have the option to participate in a higher-tech alternative to the odometer-reading-based system (see “High-Tech Alternative to Annual Odometer Readings” below).

A flat fee would cover all mileage accrued since the last time the odometer reading was taken (i.e., last vehicle inspection). This means that all drivers participating in the low-tech solution would pay for mileage accrued outside of the state or other mileage that could be discounted under the high-tech solution (an incentive for adopting that solution). Drivers who do not want to pay for mileage accrued outside Texas will be required to adopt the high-tech solution, discussed in the next section.

One downside of the low-tech solution is the potentially large payment required annually at the vehicle inspection. Quarterly billing, similar to Internal Revenue Service quarterly estimated payments, could potentially relieve this burden. Under this option, drivers could make estimated payments on their mileage over the course of the year. As part of the inspection process, drivers would either pay the balance or have the overpaid amount credited to their next estimated payment.

One of the technology advisory panelists recommended pursuing legislation to

- make the Texas comptroller the lead agency for fee administration,
- permit the comptroller’s office to publicize highway-user fee rules for electric and hybrid vehicles, and
- coordinate comptroller’s office efforts with the Texas DMV and the Texas Department of Transportation.

High-Tech Alternative to Annual Odometer Readings

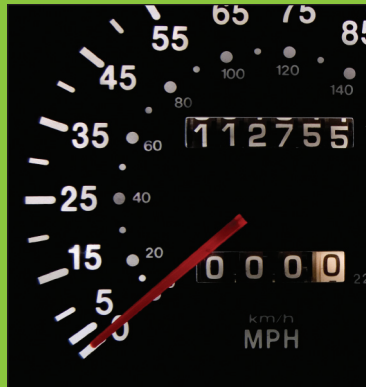
This alternative allows users to customize aftermarket units to track their roadway use. These units would use an “open architecture,” which maximizes the flexibility of the system for adaptation by allowing for numerous software applications and interfaces. In an open system, users can shop around and pick the technology they are most comfortable with. An open system’s flexibility also better accommodates new developments in technology.

Optimally, this technology would collect detailed time and travel location data and would most likely be GPS based. Based on participant feedback, drivers who don’t have significant privacy concerns are more likely to favor using this type of data for billing purposes. Tracking more detailed data would help minimize the chance that drivers could be overcharged and would enable them to monitor and adjust their travel so as to minimize fees paid. Being able to subtract out-of-state mileage and provide value-added services using this technology creates additional incentives for adopting the high-tech system. Examples of value-added services that private-sector partnerships might help provide include but aren’t limited to

- safety applications (e.g., in-vehicle signage, curve speed warning, road condition warnings);
- mobility applications (e.g., routing assistance, real-time traffic information); and
- personal applications (e.g., parking location and payment, pay-as-you-drive insurance).

What Concerns Texans about Mileage Fees

- **I’m concerned about my privacy. What data will be collected and how will they be used?**
- **How do I know the system will be administered efficiently? This seems to be a lot more complicated and expensive than the system we currently have.**
- **Can you really enforce this thing fairly? I need to know a reasonable effort will be made to catch evaders. I don’t want to pay a fee if others get away with not paying it.**



During annual vehicle inspections, the fee would be assessed based on an odometer reading, which is already collected as part of the inspection process.

Addressing the Public's Three Primary Concerns for Model 1

Privacy

Having a choice—in this case the choice between a low-tech system that charges for all mileage but does not collect location data or a high-tech system that differentiates mileage by collecting location data—should help to alleviate many privacy-related concerns. In the case of the high-tech solution, the driver's desire to capture more detailed data regarding driving habits trumps privacy concerns. However, the availability of a low-tech odometer reading system appeals to drivers for whom privacy is a central concern. The voluntary nature of this system, combined with the fact that new monitoring technology is not needed, appeals to these drivers.

Administration

Low-Tech Solution

The administrative cost of the low-tech solution depends on how much data must be shared between vehicle inspection entities and a coordinating (back) office. Since this option essentially piggybacks mileage fee collection on an existing process, the need for increased administrative costs should prove minimal. Only mileage records and fee amounts would need to be maintained, while a substantial enforcement and auditing entity would likely be unnecessary.

High-Tech Solution

Administrative costs of the high-tech option are difficult to project; thus, this aspect of the pilot implementation will be more experimental in nature. How a coordinating agency would handle back-office operations is a significant factor here. If the system relies on an open-systems architecture, then contracting private entities to manage driver data and payment could reduce these costs. Mileage fee payments could be added to payments for other services provided by each unit. There is also a strong potential for private-sector participation in the high-tech system, which could help lower administrative costs.

Enforcement

Low-Tech Solution

By piggybacking a mileage fee system on the existing inspection process via the low-tech solution, the state can leverage existing enforcement procedures. Enforcement of fees would occur concurrently with enforcement of vehicle inspections. For example, law enforcement will know that a driver has not paid his or her mileage fee whenever they encounter vehicles with an expired registration tag.

High-Tech Solution

The inspection process can also help enforcement under the high-tech solution. Units can maintain a log of all mileage, regardless of whether that mileage is used in assessing the fee. The entity performing the inspection would have access to that mileage total via the billing office. The entity can then check the mileage and assess a flat fee for any discrepancies between the electronic record of total mileage and the mileage as shown on the odometer.

In other words, drivers who choose the high-tech solution should activate their units if traveling out of state or otherwise accruing mileage to be discounted for some other reason. A demonstration of a state mileage fee system that involved a substantial assessment of enforcement capabilities by various state entities would undoubtedly prove beneficial.

Tax Policy Option

If state policy makers decide to implement a statewide mileage fee system, they'll also have to decide if the mileage fee system is a supplement to, or replacement for, the fuel tax. While replacing the fuel tax might seem preferable from a public relations standpoint (e.g., no "new tax" is introduced), implementing the mileage fee as a supplemental fee has advantages.

1. **No systems needed to address double taxation** — Drivers would continue paying fuel taxes. Since the phased-in mileage fee is an additional fee levied for road use, no new system would be needed for crediting fuel taxes paid.
2. **Annual payments likely to be small relative to fuel taxes paid** — As mentioned earlier, the general public will likely not respond well to an annual lump-sum payment approach to mileage fees. Since the mileage fee would initially be small relative to the fuel tax, annual payments would also likely be much lower than if the Legislature implemented the mileage fee as a replacement to the fuel tax.
3. **Incentives for fuel efficiency maintained, but electric vehicles still pay** — Drivers of electric vehicles would continue to enjoy substantial savings over traditional-fuel vehicles since they would be paying little to no fuel taxes. Having the mileage fee as a supplement to the fuel tax also gives legislators more subtle control over funding transportation in Texas. If they deem a funding increase necessary, legislators can either raise the fuel tax or adjust the mileage fee or both. This approach also reduces the inherent conflict between generating funding for roads (the more gasoline sold, the more revenue generated) and environmental policy (e.g., issues associated with mobile source emissions).

Administrative Options

Texas currently levies a 15-cent-per-gallon tax on liquefied fuels (LFs) used in vehicles. Prior to 1980, the tax was collected from the permitted fuel dealers and suppliers whenever drivers filled their tanks. Recently, Texas adopted the decal-based system, which allows drivers to self-report mileage. Researchers examined this existing mileage-based system as a possible mechanism upon which to build a future mileage fee system.

Piggybacking a mileage fee system on the state's current LF tax program is impractical because the LF program doesn't have a robust enforcement mechanism. (Administrative costs required for better oversight would outweigh revenues gained. However, automobile dealerships and fuel suppliers can be audited.) Since enforcement wouldn't be a deterrent, drivers would have substantial incentive to evade paying the fee. Thus, an odometer reading should be paired with state-mandated inspection or registration processes.

The Facts about Model 1

- **Targets non-user-fee-paying vehicles (e.g., electric / hybrid vehicles)**
- **Could serve as a model demonstration project for later implementation of a wider-based system**
- **Collects mileage fee during annual inspections**
- **Offers options for data gathering, trading off some measure of privacy for more detailed data reporting**
- **Offers options for fee payment, ranging from lump sum to quarterly**

**Enforcement of
fees would occur
concurrently with
enforcement of
vehicle inspections.**

The comptroller's office believes that any fee enacted as a replacement to the fuel tax, especially one assessed at the point of inspection or registration, would require legislation to address the allocation of revenues. Without such legislation, it's likely that any revenues generated under the new mileage fee system would be allocated directly to the General Fund and, from there, be subject to any and all associated allocation processes. There would be no guarantee that mileage fee funding would be used for transportation purposes.

Model 2: RFID Tag Reading at the Gas Pump

A second option would use radio frequency identification (RFID) tags and RFID reader equipment located at fueling stations in a pay-at-the-pump configuration. As mentioned earlier in the section "How Other States Have Tested Mile-Fees," the Oregon Department of Transportation has tested a pilot program with similar technology. Similar to toll tags currently in use, the vehicle would have an RFID tag containing its estimated fuel efficiency. (The tag could store other data as specified by the implementing agency.)

The system would work within a point-of-sale context tied to gasoline purchases. Whenever a driver refuels, the RFID reader located on the fuel pump detects the tag and reads the vehicle's estimated fuel efficiency. Using the amount of fuel purchased, a computer would estimate the number of miles driven. The appropriate mileage fee would then be added to the fuel purchase.

Privacy

Privacy concerns under this model would likely be minimal. No essential data are collected from the vehicle other than its estimated fuel efficiency. The inability of an RFID system to perform real-time location data gathering in the absence of an extensive, network-wide system of readers should reduce privacy concerns of drivers.



Administrative Costs

Of the two implementation models presented, this model could potentially require the least ongoing administrative and back-office billing costs. This model requires no extensive data system for the collection of mileage or the maintenance of billing records. Mileage assessment, charge computation, and charge communication all occur within the point of sale.

However, this system could require significant capital costs upon initial implementation. RFID readers would have to be placed on all gas pumps throughout the state. While the cost of this process is difficult to estimate, the effort could be significant. For example, the Oregon Department of Transportation estimated that statewide implementation of its similar model would cost about \$33 million.

It is not necessary to complete the entire installation of statewide readers all at once. In the absence of these readers, vehicles would continue to pay the fuel tax. To avoid paying the mileage fees, drivers would likely attempt to locate filling stations not yet equipped with RFID readers. This could impact local market sales. An increase in fuel taxes, or an initially low rate for mileage fees, could help mitigate this effect.

Enforcement

Vehicles must be outfitted with the appropriate RFID tag programmed with accurate fuel-efficiency data, or inequities could arise. For example, the driver of a vehicle with a tag incorrectly coded with a much lower fuel efficiency would pay less for mileage accrued, since his or her mileage would be consistently underestimated by the computational algorithm. Permanently embossing registration stickers or license plates with vehicle identification information would enable law enforcement officers to perform spot checks whenever stopping vehicles for infractions.

Where to from Here

Regardless of whether Texas adopts mileage fees, public education of Texans regarding the inherent value of the state's transportation network and how it's funded will help garner support for future improvements to the system. Drivers don't realize they're paying for highways every time they fill up at the pump. They don't know that those taxes maintain and improve their roadways. Policy makers will find that addressing the state's transportation funding shortfall—whatever form that takes—will prove all the more challenging if they attempt to sell that change to an ill-informed public. More often than not, better-informed consumers feel empowered to make better decisions.

Are Mileage Fees Right for Texas at This Time?

This research demonstrates that while pursuing mileage fees as a long-term source of revenue for Texas is logical and rational, no consensus exists as to whether such a transition could, or even should, occur. These types of fee systems have proven effective revenue collectors in U.S. pilot tests and European implementations when public concerns are adequately addressed. However, simply too many barriers prevent their immediate implementation in Texas.

The Facts about Model 2

- **Uses RFID tags programmed with the vehicle's estimated fuel efficiency**
- **Driver would pay mileage fee at the pump as a customized add-on to fuel purchases**
- **Low administrative costs**
- **Potential significant implementation costs**



Whenever a driver refuels, the RFID reader located on the fuel pump detects the tag and reads the vehicle's estimated fuel efficiency.

The public does not understand how the current fuel-tax-based funding system works. They view mileage fees as unworkable and unnecessary. Furthermore, in the public's view too many other, much simpler solutions have not yet been attempted. Initiating a broad dialogue about transportation funding and financing might not generate much support for the mileage fee concept, but it is likely to lead to a productive discussion about the realities facing the state highway system in the long term and help facilitate changes to the system that are acceptable to the public. The public also has concerns regarding the technologies needed to implement a mileage-fee system. They don't want to be forced to install equipment in their vehicles that could be used to track their movements. Demonstrations of the concept would help to show that there are numerous ways in which mileage fees could be implemented, from low tech to high tech solutions, and that privacy can be protected while keeping administrative costs relatively low and maintaining acceptable levels of enforcement.

The Need for a Solution

However the public feels about alternative funding mechanisms, the long-term trends are clear. The fuel tax alone cannot fund transportation needs in Texas as vehicle fuel efficiency increases and fuel consumption declines. While the state can rely on this system with tax increases and various forms of indexing, the public will question its fairness and equitability as disparities in fuel efficiency among vehicle types grow wider. Testing a more direct "user fee" approach can position the state for a more sustainable and equitable long-term transportation funding source.

If Texas pursues mileage fees, a technology-heavy system might not be necessary. Mileage fees can be collected relatively simply, without infringing on driver privacy. Any system will have to operate at a low cost. Involving the private sector is one way that the state could help lower administrative costs. Offering choices—on everything from how to calculate mileage to how to pay fees—will only increase acceptance.

Appendix A. Study Participants

Stakeholders Interviewed

Interviewee	Affiliation
John Esparza and Les Findeisen	Texas Motor Transportation Association
Christopher Evilia	Waco Metropolitan Planning Organization
John Fishero	Greater Tomball Area Chamber of Commerce
Barbara Holly	Tyler Metropolitan Planning Organization
Kyle Ingham and Gary Pitner	Panhandle Regional Planning Council
Mike Joyce and Tom Weakly	Owner Operator Independent Drivers Association
Dan Kessler	North Central Texas Council of Governments
Robert Martinez	Greater Irving-Las Colinas Chamber of Commerce
Gabe Sansing	Georgetown Transportation Enhancement Corporation
Dan Ronan	AAA-Texas/New Mexico
Paul Sugg	Texas Association of Counties;
Steve Stagner	Texas Council of Engineering Companies
Raymond Telles	Camino Real Regional Mobility Authority

Focus Group Sessions

Location	Date	Number of Participants
Yoakum	March 11, 2010	12
Laredo	April 7, 2010	10
Dallas	April 13, 2010	6
Corpus Christi	June 15, 2010	12
Abilene	June 8, 2010	4

Technology Panel

Name	Company/Organization	Area of Expertise
Robin Chase	Zipcar, GoLoco	Wireless technology applications
Jerry Dike	Jerry Dike and Associates	Texas Department of Motor Vehicles
Max Donath	University of Minnesota	Mechanical engineering
Bern Grush	Skymeter Corp.	Global navigation satellite system and GPS tolling systems
Christopher Hill	Mixon Hill	Transportation systems engineering
Richard Mudge	Delcan Corp.	Transportation policy, economics, and finance

Appendix B. Decision Matrix

How Will Policy Goals Be Attained?

Issue	Pre-Implementation Questions	Implementation Impacts	
Pricing	What sort of incentives/discounts will be offered?	Congestion pricing/road class varying fees	Reduced fees (fuel efficiency and weight based)
		System will require a road use assessment technology that generates detailed time and location data.	System will need to know certain vehicular characteristics.
Program Structure	How will the system be structured to address policy goals?	Private entity participation	“Opt-in” choice for participation
		This can lower administrative costs and build better trust with the public.	Parallel systems will have to be maintained for participants and non-participants.
Privacy	To what extent will privacy be safeguarded?	Maximum	Minimum
		Thick-client configuration for charge computation.	Thin-client configuration for auditing and more detailed pricing applications.
Revenue Allocation	To what extent will revenues need to be allocated to other jurisdictions?	Allocation required	Allocation not required
		Detailed time and location data are likely to be required.	Can consider low-tech options.
Revenue Goals	Is the fee a replacement for an existing revenue source or just supplemental?	Replacement	Supplement
		Parallel systems will have to be developed as the new system is phased in.	Could be built into existing fee collection systems.
System Flexibility	Is it expected that regular charges in fee structure and pricing boundaries will occur, and what is the desired flexibility?	Open Systems	Closed Systems
		Will provide a greater degree of flexibility than closed systems.	Less flexible but could increase enforceability of the system.



Performed in cooperation with the Texas Department of Transportation
and the Federal Highway Administration
<http://tti.tamu.edu/documents/0-6660-P1.pdf>