

A PRACTICAL APPROACH TO TRUCK VMT FEES

Including Some Financial Implications
and Possible Impacts on Traffic Congestion

EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

A truck-based VMT fee could replace existing truck highway user fees and offer a robust, long-term source of user-fee based revenues for highway investment. Data from the VMT system would make it possible to focus a portion of any net new funds on investments that would improve truck mobility. A truck-based VMT fee system has advantages over auto-based VMT fee proposals due to a proven low-cost technology and reduced concerns over privacy.

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A truck-based VMT fee system offers the potential to generate additional revenues, whether by reducing under payments (currently more than \$200 million a year for the state of New York and \$1-3 billion nationally) or by increasing truck-based revenues. VMT fee systems that rely on location-based technology also generate data that will improve truck-related planning.

This study examined the feasibility of using existing GPS-based technology to implement a truck VMT system that could replace existing truck fees and taxes in New York State. Using data from several New York-based truck fleets, a VMT fee system was designed around the technology already installed in the trucks. These systems were sufficient to determine routes with enough accuracy to assess fees.

Several sets of fee structures were tested – flat rates by type of truck, variable rates by type of road, and variable rates by time of day. Finally the fees were applied to recent historical data from the participating carriers. The carriers were interviewed to get their reactions to the system and the fee structures proposed in order to help assess the actions needed to generate broader acceptance among the motor carrier industry.

A preliminary assessment of the costs to implement a truck-based VMT fee system showed that collection costs would be higher than for motor fuel taxes (about one percent of collections), but significantly less than the costs to collect other transportation fees including registration fees and tolls, and less than the costs for the German truck toll system. A limited case study showed that varying rates by time of day (lower rates for off-peak periods) was unlikely to have a significant impact on congestion.

The project also analyzed indirect support for other broad national goals, including reduced energy consumption; reduced transportation costs in general (encourage use of higher level roads); improved safety (again, through use of higher level roads); reduced traffic congestion; help reduce GHG and other emissions; and support livability objectives. The scale of these other benefits depends on the specific nature of the fees that are charged.

Most impacts on the motor carrier industry are likely to be very small since shippers and receivers largely determine when and where truckers drive in order

Near real-time data on truck travel would help to identify when and where truck bottlenecks exist and to help measure their severity. This information could help target the investment of any additional funds that the VMT fee might generate. This is an important argument for equity and efficiency – spending should match the needs of those who provide the funding.

to make on-time deliveries and these forces are likely to outweigh modest shifts in operating costs. Some advocates of mileage-based fees have called for complex systems that are likely to contradict the goal of a simple system that does not create economic hardships for the motor carrier industry.

Truck-based VMT fees also offer other important benefits to the trucking industry and to the public sector. Near real-time data on truck travel would help to identify when and where truck bottlenecks exist and to help measure their severity. This information could help target the investment of any additional funds that the VMT fee might generate. This is an important argument for equity and efficiency – spending should match the needs of those who provide the funding. Data about trip origins and destinations and routes could support improved planning by the public sector.

BACKGROUND

Federal and state finance mechanisms no longer provide sufficient funds to meet the demands for surface transportation investment. The reasons for this problem are both political and economic. For example, the federal tax on motor fuels has not been increased since 1993, despite inflation and continual growth in demand for highway construction and maintenance. Most state motor fuel taxes have also lagged well behind inflation and demand.¹

Even aside from political issues, the future does not look encouraging, with new car fuel economy standards mandated to increase to 35.5 miles per gallon by 2016 (the so-called CAFE standards). Growth in electric and hybrid vehicles are expected to blossom in response to worries about higher oil prices and concerns over greenhouse gas emissions. The Obama Administration has also discussed a 62 mile per gallon standard for new cars by 2025. EPA is about to propose the first fuel economy standards for new trucks.

These pressures have increased interest in non-fuel sources of revenues for highway travel. Mileage-based fees – also called VMT fees – have become a popular topic among financial experts – and even some politicians. The National Surface Transportation Infrastructure Financing Commission reviewed the full range of financial options and recommended VMT fees as the most promising.² NCHRP has completed two reviews of VMT fees³, Oregon DOT has completed a test of technology⁴ and the University of Iowa is completing a two-year test deployment that includes technology and individual attitudes⁵.

¹ New York state has a two part tax on diesel: one part was last increased in 1972 and the second part varies each quarter based on inflation (the most recent change reduced the rate).

² National Surface Transportation Infrastructure Financing Commission, “Paying Our Way: A New Framework for Transportation Finance,” (February, 2009).
http://financecommission.dot.gov/Documents/NSTIF_Commission_Final_Report_Advance%20Copy_Feb09.pdf

³ RAND Corporation, “Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding,” National Academy of Sciences, (June, 2009), and “System Trials to Demonstrate Mileage-Base Road User Charges,” (October, 2010).

⁴ Whitty, J.M. “Oregon’s Mileage Fee Concept and Road User Fee Pilot Program: Final

The participating commercial vehicle operators stated that their goals included a desire to simplify the current tax system that is a concatenation of registrations, fuel taxes, mileage fees, tolls and interstate fees. The commercial carriers expressed support for consolidating the tax structure down to a single mileage based system.

In the US, automobiles have been the primary focus of VMT fees. In these studies individual privacy, equipment costs, operational costs and time-to-implement have been raised as major concerns. In contrast, a truck-based VMT fee avoids some of these problems since privacy is less of an issue and because a significant fraction of large trucks already have fleet management systems that include the basic technology needed to support a mileage tax – GPS for location and some form of wireless communication. The costs to operate and audit the system remain a concern given the low costs to collect motor fuel taxes.

Several European nations have implemented mileage-based fees for trucks (Germany, Switzerland, and the Czech Republic with similar systems being examined elsewhere in Europe). These European systems differ significantly from the approach described in this report. Their operating costs are high (though still lower than for most toll systems and US registration fees), they do not rely on off-the-shelf technology, and they often have secondary objectives (Germany, for example, was concerned about controlling unsafe and polluting vehicles from Eastern Europe).

PROJECT GOALS

This project seeks to examine whether or not a truck-based VMT fee offers a practical long-term base for transportation finance. The first goal was to show that existing technology, already widely in use by the motor carrier industry, could be used as the basis of a VMT fee system. The second goal was to show that a VMT fee system could be used to replace existing truck fees and taxes, thereby reducing administrative costs for both the private and public sector. The final goal was to engage the trucking and public sector communities in the design of the system to further understanding and to gain support for the concept.

An important part of the NY Truck VMT Fee Study was its focus on working closely with individual motor carriers. Several New York-based trucking firms provided data and advice to this study. This critical private-sector contribution provided practical feedback regarding the realities associated with the professional operation of truck fleets and the reactions these taxpayers have to a new way to finance highways. This support allowed the team to use detailed truck operating data to test alternative fee structures, rather than relying on assumptions and averages.

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Report. Oregon Department of Transportation, (November, 2007).

⁵ National Evaluation of a Mileage-Based Road User Charge study underway in Iowa, University of Iowa's Public Policy Center, <http://www.roaduserstudy.org/Default.aspx>

Existing GPS based technology worked to collect data on miles driven and determine the roads driven by the trucks with sufficient detail to support several optional fee structures...and VMT fees could replace existing fee and tax structures imposed on motor carriers.

FINDINGS

The first finding set the stage for the rest of the project - existing GPS based technology worked to collect the data and determine the routes driven by the trucks with sufficient detail to support several fee structures. Important issues still need to be dealt with prior to a full implementation including security/ tamperability of the equipment to protect the data, auditing procedures, consistency of GIS road mapping nationwide, and how best to equip fleets that do not presently have the equipment.

Second, VMT fees would work as a replacement for existing fee and tax structures imposed on motor carriers. Several alternative fee structures were developed that collected the same total dollar amount as expected from the current fees and taxes. The current system, however, results in significant under payments to the state of New York. There are two possible sources of this under payment. First, the State's mileage based fee collects less than half of the funds expected, generating a loss of more than \$150 million a year. This finding is consistent with previous studies.⁶ Much of this tax is self-reported and it is difficult to audit motor carriers located outside the state of New York.

Second, diesel payments appear to be low. This is harder to estimate, but if we assume that tractor trailers average 6.25 miles per gallon⁷, the under payment totals about \$90 million per year. This finding was not expected. There are two possible causes:

- First, under reporting by interstate truckers. Interstate truckers are required to report mileage each quarter to IFTA (International Fuel Tax Association). IFTA balances payments among the states based on miles driven in each state. Motor carriers, however, have an incentive to under report mileage in a high tax states (such as New York) and to over report miles in nearby relatively low tax states (such as New Jersey and Pennsylvania). These data are self-reported and it is not easy to audit the large number of independent drivers and small firms.
- Second, there are a number of ways to avoid diesel fees. Some involve using untaxed fuels such as home heating fuel or aviation fuel and some involve illegal acts. Estimates of these losses vary between \$1 and \$3 billion a year nationwide⁸.

⁶American Transportation Research Institute (ATRI), "New York State Ton-Mile Tax Analysis- Estimation of Untaxed Commercial Vehicle Miles Traveled," 2008.

<http://www.atri-online.org/research/results/economicanalysis/nytmtanalysisv9.pdf>

⁷Use of a lower miles per gallon number would increase the estimated loss. The fuel economy estimate is based on a study by Calmar Telematics using actual fuel use data by motor carriers in New York State.

⁸NCHRP Report 623: Identifying and Quantifying Rates of State Motor Fuel Tax Evasion. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_623.pdf

A strong public benefit is the availability of detailed data about truck movements that can support freight planning and analysis.

The significant level of revenue losses raises the option of setting VMT fees to equalize the current truck fees instead of merely matching current state revenues. This would increase funds for the state of New York by about \$250 million dollars a year with no increase in tax rates. Motor carriers who were already paying the correct amount of fees would see no change in their tax payments. Firms or individuals who avoided certain NY State truck taxes would see an increase. Alternatively the VMT fee could be set at a lower rate, but one that would still increase revenues for the state. This would reduce user fees for those truckers who were already making correct payments.

VMT fees could be applied to meet other goals. For example, a fee that varied by type of road with a higher fee placed on local roads would encourage trucks to use higher level roads that tend to be engineered to handle the weight of trucks. Rates that vary by time of day (lower during uncongested times) were found to have a small impact on overall congestion by themselves. Interestingly, the truckers preferred the base case – a flat fee for all roads for all times of day. They stressed the appeal of simplicity, despite the fact that each of the fleets in the study would have paid less under the more complicated fee structures.

The proposed VMT fee system uses low cost readily available technology, it provides more accurate data for assessing fees than any of the current systems, it would avoid the IFTA issue of funds not properly credited to each state, and it is relatively easy to report and audit. From a public sector perspective it will enhance the data collected, reduce inaccuracies and underreporting, and should streamline business practices.

All the participating truckers were interested in the concept and could see value as long as the new system was kept simple (preference for a single flat fee over fees that vary by class of roadway). They were also open to a system that generated additional funds but only as long as some or all of these additional funds were dedicated to highway investments. They also supported a VMT-fee based system for automobiles as one way to offset the shifts in equity caused by the rapid increases in fuel economy. Several of these firms have indicated a willingness to participate in a possible second phase on a voluntary basis.

Members of our public sector advisory panel were interested in the concept and supportive of further work. They see value in terms of possible additional funds for transportation but also were supportive of fees that would vary by type of roadway in order to encourage some traffic to avoid local roads in favor of higher level roads. There was also general support for off-peak discounts as one way to encourage trucks to shift the time of travel (rather than higher rates during peak hours), although most recognized that the absolute impact on congestion would be minor and may not even be noticeable in some cases. Another strong benefit from the system from the public sector's perspective is the availability of highly detailed current data about truck movements for freight planning and analysis.

Study Assumptions:

- *Design a system that is revenue-neutral*
- *Minimize costs for both the public and private sector*
- *Keep the set of proposed fees as simple as possible*

METHODOLOGY

The study analyzed truck travel in NY state, with detail by class of truck and class of roadway; analyzed current truck fees paid to the state of New York; and then examined detailed travel by three motor carriers in the state. The project also relied on interviews with managers from half a dozen NY-based motor carriers and interviews with public sector officials with knowledge of the topic.

The study built on several assumptions:

- Design a system that was revenue-neutral
 - All existing NY state truck taxes are assumed to be replaced by the truck-VMT fee
 - No increase in the overall payments by the trucking industry (although individual firms might pay less or more)
 - No decrease in the revenues generated by the state of New York from truck fees
 - Minimize costs, for both private and public sector
 - Rely on existing fleet management systems already in use by motor carriers
 - Identify cost-effective options for fleets that currently do not have an on-board management system
 - Seek to reduce the accounting costs and related administrative costs for motor carriers and the public sector
- Keep the set of proposed fees as simple as possible
 - Continue the current fee structure used by the NY Thruway – a de facto truck VMT fee system.

For simplicity, the project focused on tractor trailers, although data were collected for large single-unit trucks. Tractor trailers generate the most user fees under the current system, are most likely to be equipped with fleet management systems, and are important economically. The study examined three fee structures.

- Flat fee per mile – a single rate for all roads
 - 10.6 cents per mile for non-NY Thruway roads
 - 5.1 cents per mile for the NY Thruway – in order to recover diesel fees and registration fees.⁹ This would be in addition to the current Thruway fees.
- Fees that vary by class of roadway – with the goal to encourage trucks to use higher level roads as much as possible. These roads are safer and because they are more likely to have been built to handle larger, heavier vehicles, the long-term maintenance costs for NYSDOT should be lower as well.
 - 9 cents per mile for Interstates and other divided highways
 - 13 cents per mile for major arterials
 - 17 cents per mile for other arterials and local roads.

⁹ The NY Thruway waives payment of the NY state ton-mile tax.

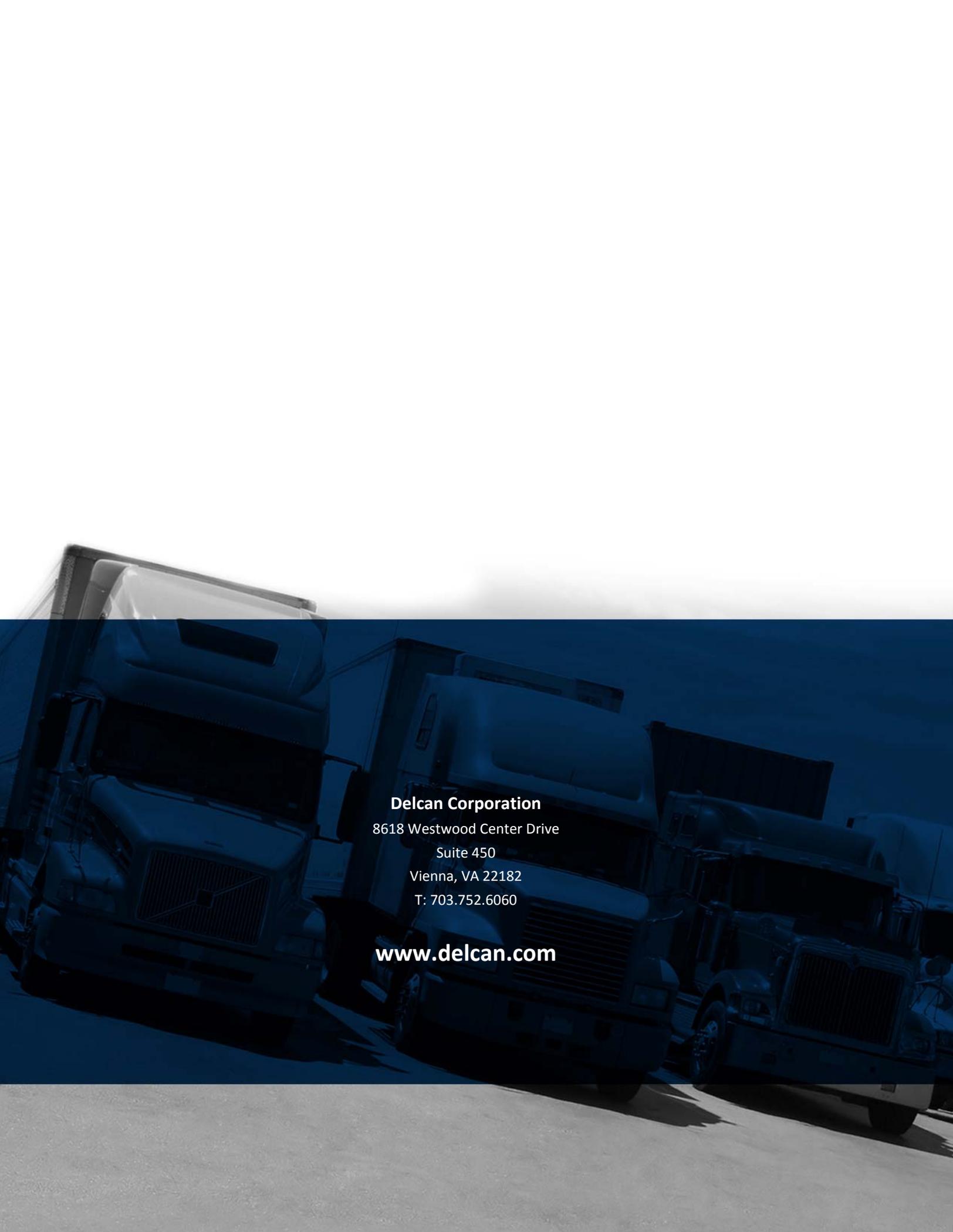
One possible next step would involve a voluntary system designed to confirm the technology, test software and auditing efforts, determine costs, and assess reaction of different types of truckers.

- Fees that offer an incentive to avoid peak-hour travel times. This reduced fees by 50 percent for travel between (8PM to 5 AM) for upstate cities (no specific analysis was prepared for the NY metropolitan area).

NEXT STEPS

Additional work is required before any effort to implement a truck-based VMT fee system. This project identified two possible next steps:

- Operate a voluntary system that would make it possible to develop required software, test auditing, procedures and develop a “real-world” measure of the costs to operate such a system. In sum, this effort would seek to establish procedures which may be attractive to both the public and the private sectors and encourage a near-term transition to a VMT-based highway finance system. In this system, motor carriers would operate under two tax systems — current law and a mileage based system. Each month a payment would be made based on the miles driven — a motor carrier would receive funds if the mileage fee cost less than the current system and would make a payment if the mileage-based fee cost more than the current mix of New York truck taxes. In effect, each firm would operate as if the VMT fee were the actual set of user fees.
- Examine the practicality of using the IFTA data to support a nationwide VMT fee system. Motor carriers already report these data so no additional costs would be imposed on motor carriers — and once fully implemented there would be tangible accounting savings since all current federal truck fees would be dropped (diesel fees, heavy vehicle use tax, excise taxes on tire sales and new truck sales). There would be additional auditing costs to ensure full reporting.



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