



LET'S TALK DOLLARS AND SENSE:

Florida's Case to Fund Infrastructure with Mileage-Based User Fees

In the Spring 2011 issue of the *Tollways* journal, Regan and Brown's article titled "Building the Case for Tolling the Interstates"², thoroughly researched and documented the history of the fuel tax, construction of the Interstate system, and the importance of toll pricing.

...OUR AGING NATIONAL TRANSPORTATION INFRA-STRUCTURE IS REACHING ITS PLANNED SERVICE LIFE AND IS IN DESPERATE NEED OF MAINTENANCE, REPAIR, AND IN SOME CASES, COMPLETE OVERHAUL.

Regan and Brown stated that most experts recognize that the current fuel taxing regime will not be sustainable in the long term because of increased fuel efficiencies and the growing concerns for energy and climate change. Meanwhile, our aging national transportation infrastructure is reaching its planned service life and is in desperate need of maintenance, repair, and in some cases, complete overhaul.

Fuel taxes, assessed on a per gallon basis, have been the major source of transportation funding for the past century. Despite increasing travel demand, aging infrastructure, soaring construction, operation and



maintenance costs, and improved fleet fuel economy, the federal fuel tax rates remained unchanged since 1993. Given the concerns over the future of highway funding, it is critical that a new roadway user charge based on the actual Vehicle Miles Traveled (VMT) is explored. Per mile fees are the fairest and most logical method to fund our crumbling roadways for all motorists, regardless of vehicle type or fuel efficiency.

Recent polling shows growing public support for tolling charges in lieu of tax increases.³

Charges based on VMT also provide motorists with better congestion management options and subsequently less pollution³, increased toll area safety

(i.e., policed areas), faster completion of crumbling roadways and bridges, and ultimately, a safer and more reliable national infrastructure. As the nation continues to develop economically, individuals and families need a safer system on which to remain connected to each other- in suburban and urban areas, and everything in between.

Successful VMT pilot projects in the Puget Sound Region (Seattle, WA and Portland, OR), and most recently at the national level by the University of Iowa³, have investigated the technological, institutional, operational, and other implementation concerns of a mileage-based charging system.

Balducci, et al.⁴ also summarizes the result of nationwide, mileage-based

BASED ON THE EUROPEAN PRICING EXPERIENCE, THE GRADUAL TRANSITION FROM THE GALLON-BASED FUEL TAX TO A DISTANCE-BASED CHARGE HAS PROVEN TO HAVE NOT ONLY TREMENDOUS TRANSPORTATION REVENUE BENEFITS, BUT ALSO MANY POSITIVE ENVIRONMENTAL AND INDIVIDUAL COST SAVINGS.

systems used in many European countries such as Germany, Czech Republic, Austria, and Poland.

Based on the European pricing experience, the gradual transition from the gallon-based fuel tax to a distance-based charge has proven to have not only tremendous transportation revenue benefits, but also many positive environmental and individual cost savings. Alleviating stagnant traffic reduces congestion — especially in urban areas — and lowers gas emissions, which is imperative for the health and wellness of individuals in nearby schools and businesses. Funding from VMT Charging systems would provide for a safer and faster Interstate system, discouraging drivers from seeking alternate and unfamiliar non-tolled roads and potentially damaging their vehicles, reducing vehicular maintenance costs.

This study aims to assess the financial impacts of the current fuel taxing regime, federal Corporate Average Fuel Economy (CAFE) standards, and the implementation of a mileage-based user fee for the state of Florida.

WHY FLORIDA?

Tolls have played an important role in providing transportation funding for the Sunshine State. The first U.S. toll road to open after President Eisenhower signed the Federal Aid Highway Act in 1956 was the 110-mile Bobtail Turnpike connecting Miami to Fort Pierce⁵. Since then, the capacity of Florida's toll roads has increased more than eight-fold. Toll revenues accounted for more than 10% of the state transportation receipts in FY2010/FY2011⁶. Today, with more than 6.5 million on board units, or electronic transponders, and free-flow tolling, Florida's major urban area motorists depend on safe,

reliable, and efficient travel through this expansive toll road system. With the successful introduction of High Occupancy Toll (HOT) lanes in south Florida (I-95 and the soon-to-be I-595 managed lane projects), and the planning of HOT lanes' rapid expansion to other urban areas, one can hope that Florida sets the standard in becoming the first state to fully adopt a VMT Charging system.

THE FINANCIAL MODEL

The most important parameter used in this financial assessment is the forecasted annual VMT, specifically for Florida's FY2015–2035. The first step of the analysis was to generate the state's annual VMT, and then develop a model to assess the financial impacts of CAFE standards in conjunction with a mileage-based charge, as an effective alternative to the current fuel tax.

VMT FORECAST

An aggregate uni-variant time series model was used to forecast the annual VMT for the analysis period. This model presents the dependent (VMT) to establish trends based on the behavior of the available historical data, and any statistical errors or stochastic variation that may occur. The historical VMT

(1966 to 2008) for the state of Florida was used for the time series model.

The generated VMT forecasts display a reasonable annual growth rate of approximately 1.4% for the period between 2011 and 2035. This growth rate is noticeably lower than the VMT annual growth rate, which was recorded as 2.3% over the course of the last 25 years⁷.

FINANCIAL MODEL AND INPUT PARAMETERS

A financial model was then developed to calculate the annual fuel revenues for the analysis period. Current fuel taxes (federal, state, and local) comprise the second set of entries to this model.

FLORIDA'S FUEL TAXES

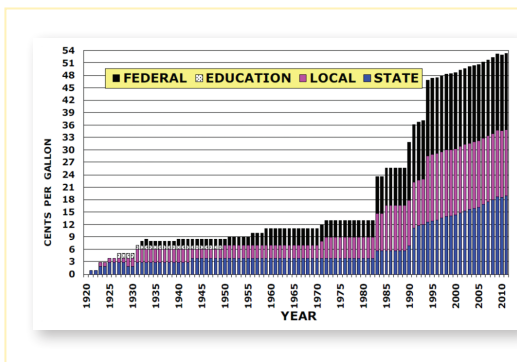
In 1990, the Florida legislature enacted the biggest transportation tax increase in the history of Florida's Department of Transportation (FDOT). Not only was the fuel tax raised (with annual increases based on the general Consumer Price Index, or CPI), and additional fuel excise tax levied, but other user fees (motor vehicle license, initial registration, motor vehicle title, and rental car) were imposed as well⁶.

Figure 1 (right) depicts historical fuel tax rates for Florida motorists⁶. The current federal gasoline and diesel tax rates are 18.4 and 24.4 cents per gallon, (CPG) respectively. The “Local Option” fuel taxes have generally reached their legal ceiling. It is clear from Figure 1, that state fuel tax rates (fuel tax and State Comprehensive Enhanced Transportation System Tax, or SCETS) are the only tax rates that have experienced an annual increase due to CPI pricing.

PER MILE EQUIVALENT OF CURRENT FUEL TAXES

Current fleet fuel efficiency, in terms of miles per gallon, for autos/light trucks and medium/heavy trucks, was to convert per gallon rates to the corresponding per mile rates. Autos/light trucks are defined as vehicles with gross weights less than 8,500 pounds, while medium/heavy trucks are defined with gross weights more than 8,500 pounds.

The 2010 estimate for national average fuel efficiency was measured at approximately 20.2 MPG⁸. This estimate pertains to passenger cars and light trucks, and was the metric used to convert per gallon tax rates to equivalent per mile tax rates. The same

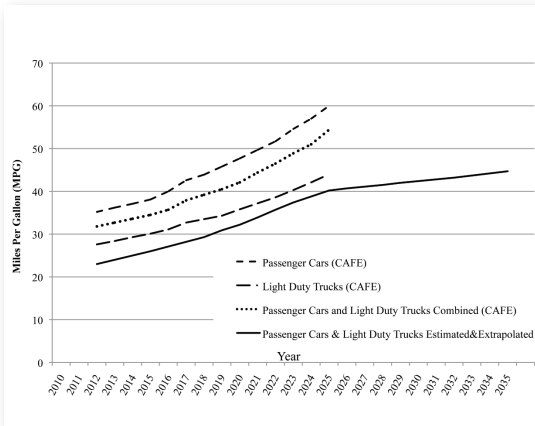


metric for heavy truck fuel efficiency was used to obtain the per mile equivalents for diesel, 5.1 MPG⁸.

Consistent with current state, local, and federal tax laws, federal and local fuel tax rates have been steady, to remain consistent with current state, local, and federal tax laws. But CPI determines state fuel taxes. CPI for all localities has grown at an annual average of 2.5% for the past 20 years. The aforementioned fuel tax rates and corresponding mileage-based user fees (where applicable) are indexed at this historic annual average of 2.5% in subsequent financial analyses.

FUTURE FUEL EFFICIENCIES (with CAFE)

CAFE standards received their first revision in more than 30 years, due to the Energy Independence and Security Act of 2007. This act required that auto



makers of passenger cars and light trucks increase their model year fleet gas mileage to 35 MPG by the year 2020.

On May 19, 2009, President Obama proposed a new national fuel economy program which adopted uniform standards to regulate both fuel economy and greenhouse gas emissions. It raised the MPG standards for 2012 through 2016 to an average of 35.5 MPG (39 MPG for passenger cars and 30 MPG for light trucks). More recently, on July 29, 2011, the President announced the new 2025 CAFE regulations that would begin taking effect in 2017. The new CAFE goals set a goal standard of 54.4 MPG for the model year fleet-wide average, 61 MPG for average passenger cars, and 44 MPG for light trucks by the year 2025⁸.

Then, in August 2011, and for the first time ever, the Obama Administration announced fuel efficiency standards for medium and heavy truck models 2014 through 2018; these standards are set to increase total fuel efficiency by 20%.

If the current CAFE standards for medium and heavy trucks (diesel fuel users) increase by 20% successfully, to reach the 2018 standard goal, the result is a jump from 5.1 MPG in 2010 to 6.1 MPG by 2018. To reach this conclusion, researchers used the 2011 Annual Energy Outlook of 0.4%, the Department of Energy's (DOE) efficiency forecast for the years 2019 through 2035⁹.

The dampened values of CAFE standards for 2015 through 2025, for autos and light trucks, were used in this financial model as well. It is worth noting that actual annual MPGs typically lack the CAFE standards for any given model year requirement. This is because the fleet mix average MPG is influenced by the older, less efficient models. The standards for 2015 through 2025 were thus lowered to reflect the analysis year and estimated stock averages, as depicted in Figure 2 (above). For the 2026 through 2035 projection,

an annual fuel efficiency increase of 1.0% was used⁹.

AUTO AND TRUCK VMT

In order to assess the tax contributions of autos and trucks based on fuel efficiency and tax rate, the annual VMTs must be examined further. This VMT breakdown will show the annual auto VMT and annual truck VMT. Trucks have, in fact, accounted for approximately 6.4% of Florida's total VMT during the past ten years⁷, a significant entry for this financial model.

COST OF COLLECTION/ADMINISTRATION

According to research, the estimated costs of the collection and administration for fuel taxes and VMT charges as a percentage of gross revenues are 1% and 15%, respectively⁴.

DISCOUNT RATE

Lastly, to bring the future year's revenue estimates to the base year (2015) to compare, a discount rate of 4% was used in the financial model.

FINANCIAL MODEL RUNS

Two model scenarios can be compared, based on the research findings:

- **Scenario #1 (Existing Regime):**
CAFE standards lay the foundation

for experts to mandate current per gallon fuel taxes, and the cost of the collection and administration of fuel taxes will remain at 1% of gross revenues.

- **Scenario #2 (Mileage Based User Fees, or VMT - Proposed System):**
CAFE standards lay the foundation for experts to mandate fuel efficiencies; however those efficiencies will determine fair and equivalent per-mile user charges (VMT). The cost of the collection and administration of the user charges will then clock in at 15% of gross revenues.

RESULTS

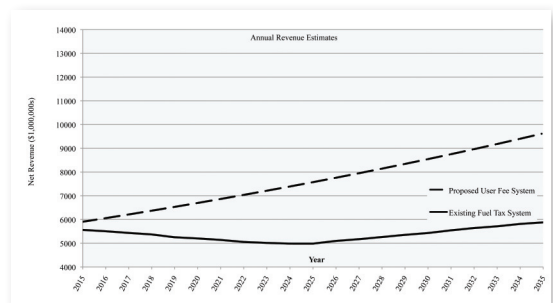


Figure 3 (above) depicts the financial model net annual revenues generated for the two scenarios above. Under the current regime, Scenario #1 shown as red curve, net revenues are estimated at \$5.6 and \$5.8 billion

for 2015 and 2035, respectively. Annual revenues continue to decrease through 2025, generally due to improved fuel efficiencies. There is a slight increase in annual revenues between 2025 and 2035, due to the annual increase in travel demand, CPI Florida taxes, and assumed tempered fuel efficiency improvements. The analysis period revenues are \$80.5 billion (expressed in 2015 dollars).

Under Scenario #2, the proposed system shown as a blue curve, net revenues are estimated at \$5.9 and \$9.6 billion, for 2015 and 2035, respectively. Annual revenue growths during the analysis period are due to increased travel demand and CPI Florida fuel fees. Improved fuel efficiencies are of little significance here. The analysis period revenues are \$112 billion (expressed in 2015 dollars).

Even with an increased collection/administration cost of 15%, a VMT charging system has the potential to generate (in 2015 dollars) \$30.5 billion *more* than the current fuel tax system.

CONCLUSION

Motor fuel taxes have been a significant portion of transportation

funding for the past century, but it's not enough. Due to *decades* of increased fuel efficiency standards and the lack of an increase in federal fuel taxes since 1993, as well as the ever-increasing need to repair and maintain our crumbling highway infrastructure, the balance of the HTF (Highway Trust Fund) has been plummeting.

Despite our efforts to plan, evaluate, and implement appropriate CAFE standards, and address our nation's energy concerns, vehicular safety, environmental issues, and national security objectives, we have failed to mitigate the revenue impacts to the HTF.

The financial analyses compared the CAFE revenue impacts for the state of Florida — if the current per-gallon fuel tax remains in place — and found that when compared to the proposed VMT charging system implementation, Florida is experiencing a significant loss of transportation revenue.

Does it not make sense (and dollars) then, that based on lessons learned from the three national pilot projects (Oregon, Puget Sound, and the University of Iowa), the success of the European nations' distance-based pricing implementation, and the

unsustainable future of the current fuel tax, that a pilot project for Florida may be successfully implemented?

Due to Florida's limited through-traffic (bordering Georgia and Alabama), the issue of fee evasion is minimized. With more than 43% of the 15 million registered vehicles already equipped with an on-board charge unit, and the rapid growth of cashless and video-tolling

technology, Florida's transition is already under way. The establishment of a mileage-based charge, which collects all other fees such as registration, annual renewals, titles, etc., can provide transportation efficiencies, save on costs, and help rebuild our HTF. This is a critical time for our nation to rebuild as *the* infrastructure foundation for the future.

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- 1 Atkins, professional engineers at the University of Central Florida. The views in this article are the authors' alone and are not necessarily shared either by Atkins or by collective engineers at the University of Central Florida.
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