

**LONG-TERM SOLVENCY OF THE HIGHWAY
TRUST FUND: LESSONS LEARNED FROM THE
SURFACE TRANSPORTATION SYSTEM FUND-
ING ALTERNATIVES PROGRAM AND OTHER
USER-BASED REVENUE SOLUTIONS, AND
HOW FUNDING UNCERTAINTY AFFECTS THE
HIGHWAY PROGRAMS**

HEARING

BEFORE THE

**COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS**

UNITED STATES SENATE

ONE HUNDRED SEVENTEENTH CONGRESS

FIRST SESSION

APRIL 14, 2021

Printed for the use of the Committee on Environment and Public Works



Available via the World Wide Web: <http://www.govinfo.gov>

U.S. GOVERNMENT PUBLISHING OFFICE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

ONE HUNDRED SEVENTEENTH CONGRESS

FIRST SESSION

THOMAS R. CARPER, Delaware, *Chairman*

BENJAMIN L. CARDIN, Maryland

BERNARD SANDERS, Vermont

SHELDON WHITEHOUSE, Rhode Island

JEFF MERKLEY, Oregon

EDWARD J. MARKEY, Massachusetts

TAMMY DUCKWORTH, Illinois

DEBBIE STABENOW, Michigan

MARK KELLY, Arizona

ALEX PADILLA, California

SHELLEY MOORE CAPITO, West Virginia,

Ranking Member

JAMES M. INHOFE, Oklahoma

KEVIN CRAMER, North Dakota

CYNTHIA M. LUMMIS, Wyoming

RICHARD SHELBY, Alabama

JOHN BOOZMAN, Arkansas

ROGER WICKER, Mississippi

DAN SULLIVAN, Alaska

JONI ERNST, Iowa

LINDSEY O. GRAHAM, South Carolina

MARY FRANCES REPKO, *Democratic Staff Director*

ADAM TOMLINSON, *Republican Staff Director*

C O N T E N T S

	Page
APRIL 14, 2021	
OPENING STATEMENTS	
Carper, Hon. Thomas R., U.S. Senator from the State of Delaware	1
Capito, Hon. Shelley Moore, U.S. Senator from the State of West Virginia	4
Lummis, Hon. Cynthia M., U.S. Senator from the State of Wyoming, prepared statement	95
WITNESSES	
Kile, Joseph, Ph.D., Director of Microeconomic Analysis, Congressional Budget Office	5
Prepared statement	8
Response to an additional question from Senator Carper	23
Basso, Jack, Chair, Mileage-Based User Fee Alliance	24
Prepared statement	26
Hendren, Patricia G., Ph.D., Executive Director, Eastern Transportation Coalition	44
Prepared statement	46
Poole, Robert, Director of Transportation Policy, Reason Foundation	50
Prepared statement	53
Shinkle, Douglas, Transportation Program Director, National Conference of State Legislatures	59
Prepared statement	62
Response to an additional question from Senator Inhofe	74
ADDITIONAL MATERIAL	
Letter to:	
U.S. Senator Charles Schumer et al. from NATSO et al., April 9, 2021	83
U.S. Representative Peter DeFazio et al. from the American Association of State Highway and Transportation Officials et al., April 13, 2021	103
Senators Carper and Capito from the Cato Institute, April 19, 2021	106
Senators Carper and Capito from the Bipartisan Policy Center, April 12, 2021	110
Senators Carper and Capito from the National Association of Manufacturers, April 28, 2021	113
Senators Carper and Capito from the National Stone, Sand & Gravel Association, April 14, 2021	115
Statement for the Record from the American Association of State Highway and Transportation Officials, April 14, 2021	117
A Practical Analysis of a National VMT Tax System, prepared by the American Transportation Research Institute, March 2021	125
Executive Summary, A Practical Analysis of a National VMT Tax System, prepared by the American Transportation Research Institute, March 2021 ..	177
Statement of the American Trucking Associations, April 14, 2021	178
VMT Talking Points, the American Trucking Associations	187
Statement of the American Truck Dealers, April 14, 2021	188
Statement for the Record, the International Bridge, Tunnel and Turnpike Association, April 14, 2021	189
Statement for the Record, the NAFA Fleet Management Association, April 14, 2021	193

IV

	Page
Road Usage Charge at the National-Scale: Recommendations for Building a Solid Foundation, Oregon Department of Transportation, April 19, 2021 ...	197
Written Statement, the State of Washington Transportation Commission, April 14, 2021	201

LONG-TERM SOLVENCY OF THE HIGHWAY TRUST FUND: LESSONS LEARNED FROM THE SURFACE TRANSPORTATION SYSTEM FUNDING ALTERNATIVES PROGRAM AND OTHER USER-BASED REVENUE SOLUTIONS, AND HOW FUNDING UNCERTAINTY AFFECTS THE HIGHWAY PROGRAMS

WEDNESDAY, APRIL 14, 2021

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The Committee, met, pursuant to notice, at 10:08 a.m. in room 406, Dirksen Senate Office Building, Hon. Thomas R. Carper (Chairman of the Committee) presiding.

Present: Senators Carper, Capito, Cardin, Whitehouse, Merkley, Kelly, Padilla, Inhofe, Cramer, Lummis, Sullivan, and Ernst.

**OPENING STATEMENT OF HON. THOMAS R. CARPER,
U.S. SENATOR FROM THE STATE OF DELAWARE**

Senator CARPER. I was just mentioning the longest title I have ever seen in a piece of legislation, and frankly, one of the most timely, and I think, interesting hearings that we are going to have in some time.

I mentioned that we hope and expect to have our water legislation out on the floor a week from now, and I think we are going to have a vote today on another nominee out of our Committee, the nomination of Brenda Mallory, who came out of Committee on a bipartisan vote.

She has been nominated to be the Chair of CEQ, and I understand that somebody told me earlier today that 13 past CEO and EPA appointees, 13 past Republican CEO and EPA appointees, including a former CEQ chair and four different Republican EPA administrators publicly praised and urged her confirmation. They include Bill Reilly, Christine Todd Whitman, Michael Leavitt, Steve Johnson, and James Kavanaugh.

She has also been endorsed by, I think, since last we met, by the U.S. Chamber of Commerce. I would ask that you all keep that in mind when we vote later today.

When I was new in the Senate, some of us, I knew when I got here, Jim Inhofe and I served together in the House. A couple of others had served, too, Chuck Schumer and I, Dick Durbin and I, a number of us had served together.

One of the people I didn't, and one of the main things I decided early to do in the Senate is to the folks I would never met, didn't serve with in the House, didn't serve with as Governor, I decided to just go have a cup of coffee with them in their offices. So I would ask one after the other, after the other, and make my rounds.

One of the last people I asked this was a guy who sat right behind me on the Senate floor named Ted Kennedy. I told him what I was doing, getting to know people I didn't know, and he said, "Why don't you come to my hideaway? We will have lunch together." I said, "Really?" and he said "Yes." Two weeks later, we were in his hideaway, and we had lunch together.

One of things I asked him then was, I said, "Why is it that all these Republicans, why do all these Republicans want to be your cosponsor on their big bills? Why is that?" He said these words. He said, "I am always willing to compromise on policy, never willing to compromise on principle." Think about it. Always willing to compromise on policy, never willing to compromise on principle.

So, I want to start this hearing thinking about, we are going to have to compromise on surface transportation legislation as we go along, with our colleagues on the Committee and the Senate and in the House and with the Administration. But there are some principles I hope we can agree on that we won't vary far away from, and one of those is that roads, highways, and bridges in this country are in bad shape. Something needs to be done about it, and we are among the most responsible people for making that happen.

The second principle is that climate change is real. We need to combat it; we need to adapt to it. We need to build back better. We need to focus on resilience with all the extreme weather that we are facing.

The third principle would be that things that are worth having are worth paying for. Some people describe me as a recovering Governor. I am also a recovering State treasurer. I was the treasurer of a State with the worst credit rating in the country when I was 29 years old, and I have always believed that things worth having are worth paying for.

The last principle I hope we can adhere to is those who use our roads and highways and bridges have the responsibility to help pay for them.

Now, there are, in my State, and I am not sure, but in your States, in my State, there are a number of major pay fors for roads, highways, bridges. Gas and diesel tax, vehicle registration, sales taxes when people buy vehicles, driver's licenses. The 800 pound gorilla forever has been the gas and diesel tax for decades. But I would add to that the times are changing.

I don't think Senator Stabenow is here yet, but about a dozen or so years ago, she and I were at the Detroit Auto Show. She was kind enough to introduce me to Mary Barra, who is, I think, just about to become CEO of GM.

One of the GM products that year was selected, I think, as a car of the year, it was a Chevrolet Volt. Chevrolet Volt, interestingly, was a hybrid. It got 38 miles on a charge. Thirty-eight miles on a charge, and after that, it was a traditional hybrid, you are on gasoline, but anyway, it was the car of the year.

That was then, and I went out during recess while we were on break with my oldest son. We went out to buy a vehicle to replace my 2001 Chrysler Town and Country minivan, which has almost 600,000 miles on it. We drove, among other things, a Chevrolet Volt. It gets 300 miles on a charge.

We also drove a Ford Mustang that gets over 300 miles on a charge. Ford is about to put out an F-150 pickup truck, all electric. I thought I would never see the day that we have an electric F-150 truck, but it is a top selling vehicle in the country, as you know.

GM says they are not going to be selling, building and selling any gas or diesel powered vehicles after 2035. They are going to phase them out. Ford is expected to match or better that.

Tesla, we drove some Teslas during the break. One of them is a Y model that gets 350 miles on a charge. There is another vehicle there that we took a look at that gets over 400 miles on a charge.

Not everybody's into electric. We have folks at Toyota, a whole division of their company that is called Mirai, that is Japanese for future. They are focused on fuel cells, hydrogen and fuel cells. The waste product that comes out of that combination is water that you can drink.

GM and Honda are partnering up on fuel cells as well, and there is a South Korean car company, Hyundai, that apparently has a whole division of their company that focuses on fuel cells. They use hydrogen, and they are expected to use a lot of it in the years to come.

Gas and diesel revenues, our traditional bread and butter for building roads, highways, bridges, maintain them, are not going to dry up and go away overnight. We are told that the average number of years a vehicle has on the road is about 15 years, so we are going to be using gas and diesel for some time, but by less going forward.

I think it was Stephen Stills, Buffalo Springfield, who once sang "something's happening here, just what it is, ain't exactly clear," but I think it is becoming clear what's going on. We have the opportunity to get ahead of it or to get behind it. We need to track the transportation bill, surface transportation bill, that enables us to get in front of what is happening here.

The question is, will the next generation of vehicles be built here, will they be designed here, manufactured here, sold here? Or will they be built other places around the world? Will they help us in the battle against climate change, or not?

Will we look this adversity in the face, climate change and all, and instead of just finding despair, find opportunity? My hope is that we will find opportunity, and that we will seize the day. Part of that is figuring out how to build the surface transportation system of the future, and the ways it affects resilience, climate change, and our needs to move ourselves and our goods around the country in cost effective, safe, and climate friendly ways.

With that, I would ask unanimous consent that my written statement be inserted for the record.

I welcome everybody again. This is, I think, an enormously important, enormously important hearing and will help us to see the future more clearly and be ready for it. Thank you.

Senator Capito.
[The prepared statement of Senator Carper was not received at time of print.]

**OPENING STATEMENT OF HON. SHELLEY MOORE CAPITO,
U.S. SENATOR FROM THE STATE OF WEST VIRGINIA**

Senator CAPITO. Thank you, Mr. Chairman, for calling this hearing today, and for your ongoing commitment to this bipartisan process for the surface transportation reauthorization bill.

I would also like to thank our witnesses for joining us here today. We look forward to hearing from you regarding the current status of the Highway Trust Fund and recommendations for funding and financing solutions to address the national transportation infrastructure needs of our Nation, many of which our Chairman just spoke about.

Passing a bipartisan surface transportation reauthorization bill continues to be my top priority as the Ranking Member in this Committee. Our Committee has a strong record of developing these bills in a bipartisan manner, and we are in the process of coming together once again to develop a bill that includes input from both parties and the stakeholder community.

From my perspective, this bill must enable long-term investment in our Nation's roads and bridges, but do so in a fiscally responsible manner, without partisan or lightning rod pay fors that could sink a bipartisan bill.

We need to give flexibility. I spent the last 2 weeks traveling my State, as many of us did, talking with our road and transportation sector. Flexibility is absolutely critical to our States and communities to address their unique transportation needs. The flat areas of Oklahoma are nothing like the mountains of West Virginia, so if you are going to try to put us both in the same bucket, it could be very constraining.

We need to keep the Federal interest focused on providing a connected network of roads and bridges to ensure that all communities and the economy can thrive, and also, safety is critical in our bridges.

We need to facilitate efficient delivery of projects so that we can improve the safety and resiliency of our surface transportation system, and we need to drive innovation. Innovation is critical to help pave the way for the systems of the future.

I am willing to work on all of these with all of my colleagues to get these goals into our bills. We need to have that give and take of the bipartisan process to produce legislation that can make it to the President's desk.

It will take work from all levels of government and the private sector to meet the Nation's transportation infrastructure needs, and we will have to take an all hands on deck approach.

The Highway Trust Fund, which is the source of funding for Federal surface transportation projects, is once again, as it has over the last several years, facing a shortfall. This shortfall must be addressed for us to move forward with the bill. We have to work together here to find this bipartisan, long-term solution for the trust fund shortfall. All of us who use our surface transportation system

should contribute to its upkeep and expansion. Today, that is not the case with all of the users.

We should consider the unique impacts on certain Americans, including those in rural areas and lower income individuals, and we should try to minimize administrative and cost burdens. We should also try to provide States and other non-Federal partners with options to use various financing tools.

This is not an easy problem to solve. I am willing to consider various solutions so that we can discuss how to pay for our Nation's infrastructure.

Since our Committee last met, President Biden has proposed a type of pay that I have cautioned against in the past. I am concerned about the effect that the tax increases proposed by the Administration will have on our Nation's growth, particularly coming out of this pandemic.

I look forward to hearing from our witnesses today on an array of solutions and innovative approaches to raise revenue for the transportation needs across the Nation that we can achieve together.

I am committed to working with all of my colleagues both here in the Committee and in the Senate in general and across the Capitol, and with the Administration to see that we can get there, where we need to be.

Thank you, Mr. Chairman, and I yield the balance of my time.

Senator CARPER. Senator Capito, thanks. Thank you very, very much.

I think now we will have the opportunity to meet and greet our witnesses. We are blessed with this panel today. I had a chance to meet in person a couple of them, so thanking those that are here today in person and those that are joining us virtually. We very much appreciate your participation.

I want to thank our staffs, both the minority and majority side for bringing together an excellent team of witnesses.

Let me start by introducing Joe Kile. Mr. Kile is the Director of Microeconomic Analysis at the Congressional Budget Office, CBO.

Mr. Kile, I ask of you, go ahead and please proceed with your statement at this time. Thank you.

STATEMENT OF JOSEPH KILE, PH.D., DIRECTOR OF MICRO-ECONOMIC ANALYSIS, CONGRESSIONAL BUDGET OFFICE

Mr. KILE. Thank you, and good morning, Chairman Carper, Ranking Member Capito, and members of the Committee. Thank you for inviting me to today's hearing.

I will briefly touch on three points. First is the status of the Highway Trust Fund. Second is some options for spending on our highways, and third is options for generating revenues for the trust fund.

For more than a decade, the Government has been spending more each year from the Highway Trust Fund than the revenues collected for it. Those revenues come mostly from taxes on gasoline and diesel fuel, as well as various taxes on heavy trucks. CBO estimates that the balances in both the Highway account and the Transit account of the trust fund will be exhausted in 2022.

The total shortfall over the next 10 years is projected to be \$195 billion in CBO's baseline estimates. If the trust fund balances were to be exhausted, the Federal Government would not be able to make payments to States on a timely basis. As a result, States would face challenges planning for transportation projects because of uncertainty about the amount or timing of payments from the treasury.

Turning to spending, the Federal Government spent \$47 billion on highways in 2019. Almost all of that was through grants from the trust fund to State and local governments for capital projects, that is, for building new roads and rebuilding existing ones. As you consider options for reauthorizing surface transportation, you face many choices about how much to spend. Let me illustrate just two of them.

If you want to maintain the current services and condition and performance of the highway system, the Government would need to spend at least \$55 billion per year over the next decade. Alternatively, if you want to fund all projects for which the benefits exceed the costs, the Government would need to spend at least \$71 billion per year. Of course, the amount of money spent needed to generate those benefits would depend on the quality of the projects selected.

Any increase in spending from the trust fund would require additional income to it. One approach would be to require users of the highway system to bear more of those costs. When people drive, they impose costs they do not pay for. Those costs include wear and tear on roads and bridges, delay from traffic congestion, and the harmful effects of exhaust emissions. The combination of taxes on fuel and mileage that makes users pay for more of those costs would make use of the system more efficient.

If you want to increase revenues by charging users of a system, you have various options. One option would be to increase the existing taxes on gasoline and diesel fuel. Those taxes have been unchanged since 1993. Increasing them by 15 cents per gallon, as an example, and then indexing them to inflation would raise \$26 billion of revenue for the trust fund in the first year, and that amount would gradually increase over time.

Another option would be to impose new taxes on users of the system. For instance, the Government could impose a tax on vehicle miles traveled. Some States already have similar VMT taxes on commercial trucks. CBO recently found that each 1 cent per mile of Federal tax would raise \$2.6 billion per year if it was levied on all commercial trucks and all roads.

It is important to note that implementing a new tax would require resolving several practical steps to assess and collect the tax, and implementing new taxes would probably be more costly to the Government than increasing existing ones. Some approaches would also potentially raise privacy concerns, especially if they were applied to personal vehicles.

New approaches to taxing highways could be assessed through demonstration projects. Such projects could evaluate different approaches to key components of a tax. For instance, projects might apply taxes differently depending on the type of vehicle or the type of road. They might apply taxes differently depending on the time

of day or the location of the travel, and they might assess or collect the tax in different ways.

An alternative to imposing the cost of increased spending on users would be to distribute those costs more broadly. Since 2008, the Federal Government has transferred over \$150 billion from the General Fund to the Treasury to the Highway Trust Fund. You could adopt that approach again. Compared with other options, such as increasing the gas tax, funding highways through broad based taxes would have the advantage of imposing a smaller burden on low income households relative to their income.

I will stop there, and I would be happy to answer any questions you might have.

Thank you.

[The prepared statement of Mr. Kile follows:]

Congressional Budget Office
Nonpartisan Analysis for the U.S. Congress



This document is embargoed until it is delivered at 10:00 a.m. (EDT) on April 14, 2021. The contents may not be published, transmitted, or otherwise communicated by any print, broadcast, or electronic media before that time.

TESTIMONY

Addressing the Long-Term Solvency of the Highway Trust Fund

Joseph Kile
Director of Microeconomic Analysis

Before the Committee on Environment and Public Works
United States Senate

APRIL 14 | 2021

Notes

Unless this testimony indicates otherwise, all years referred to are federal fiscal years, which run from October 1 to September 30 and are designated by the calendar year in which they end.

Dollar amounts are reported in nominal (current-year) dollars unless this testimony specifies otherwise. Where amounts are given in inflation-adjusted dollars, the Congressional Budget Office used the gross domestic product price index from the Bureau of Economic Analysis to convert them.

Numbers in the text may not add up to totals because of rounding.

Chairman Carper, Ranking Member Capito, and Members of the Committee, thank you for inviting me to today's hearing. I will discuss the status of the Highway Trust Fund, options for highway spending, and approaches to paying for that spending.

Summary

Federal spending on highways (or, synonymously, roads) totaled \$47 billion in 2019.¹ Most of those outlays were for grants to state and local governments to support their spending on capital projects. (Those governments typically spend roughly three times as much of their own funds on highways each year, not only on capital projects but also to operate and maintain roads.) That \$47 billion also included spending for federal programs that subsidize state and local governments' borrowing for highway projects; other subsidies for state and local borrowing are provided through the tax code.

Most federal spending for highways is paid for by revenues credited to the highway account of the Highway Trust Fund, largely from excise taxes on gasoline, diesel, and other motor fuels. For more than a decade, those revenues have fallen short of federal spending on highways, prompting transfers from the Treasury's general fund to the trust fund to make up the difference.

The Congressional Budget Office projects that balances in both the highway and transit accounts of the Highway Trust Fund will be exhausted in 2022. If the taxes that are currently credited to the trust fund remained in place and if funding for highway and transit programs increased annually at the rate of inflation, the shortfalls accumulated in the Highway Trust Fund's highway and mass transit accounts from 2022 to 2031 would total \$195 billion, according to CBO's baseline budget projections as of February 2021.²

1. That is the latest year for which detailed data are available about different types of spending for highways by the federal government and about the different types of excise tax revenue credited to the Highway Trust Fund.

2. See Congressional Budget Office, "Details About Baseline Projections for Selected Programs: Highway Trust Fund Accounts" (February 2021), www.cbo.gov/publication/51300. CBO's baseline budget projections incorporate the assumption that current laws generally do not change. Some of the taxes that are credited to the Highway Trust Fund are scheduled to expire on September 30, 2022, including the taxes on tires and all but 4.3 cents of the federal tax on motor fuels. However, under the rules governing baseline projections, these estimates reflect the assumption that all of the expiring taxes credited to the fund will continue to be collected after fiscal year 2022.

The current authorization for federal highway programs expires on September 30, 2021. As they consider reauthorization, policymakers have many decisions to make about federal highway programs, including how much to spend on them, how to direct that spending, and how to pay for those programs.

Federal Spending for Highways

As a share of total economic output, federal spending for highways has been relatively stable for several decades. Almost all of that spending is for capital projects rather than for operation and maintenance and is restricted to federal-aid highways, which consist of the Interstate Highway System and most other roads except for local roads. Federal highway funds are distributed to states on the basis of formulas that depend on how much states received in earlier years, so federal spending does not necessarily go to the projects that would produce the greatest net benefits.

Lawmakers have many options for determining the amount of money spent on highways, including these:

- **Maintain the current conditions and performance of the highway system.** Accomplishing that objective would require the federal government to spend at least \$55 billion per year, on average, CBO estimates using data from the Federal Highway Administration (FHWA)—more than \$3 billion more than the average annual spending in CBO's 10-year baseline projections. State and local governments would also need to increase their spending for federal-aid highways to meet that objective.
- **Fund all projects for which the expected benefits meet or exceed the costs.** In CBO's estimation, that option would require increasing federal spending to an average of at least \$71 billion per year—nearly 40 percent more than projected in CBO's baseline from 2022 to 2031. That estimate is based on analysis from FHWA and would be applicable only if state and local governments increased their spending for federal-aid highways proportionally.

Implementing either option would require identifying sources of funding for the additional spending.

Revenues Credited to the Highway Trust Fund

The Highway Trust Fund has two accounts—one for highways and the other for mass transit—to which certain fuel and other vehicle-related excise tax collections are credited. In CBO's February 2021 baseline

projections, revenues credited to the Highway Trust Fund in 2022 total \$43 billion, and outlays from the fund exceed revenues by about \$13 billion.

Policymakers have a number of options to increase the resources available in the Highway Trust Fund:

- **Increase the existing fuel taxes.** The tax on gasoline has been 18.4 cents per gallon, and the tax on diesel 24.4 cents per gallon, since October 1993. Increasing those taxes by 15 cents or 35 cents per gallon in October 2022 and adjusting them for inflation thereafter would raise \$291 billion or \$627 billion, respectively, more in revenues for the Highway Trust Fund from 2023 to 2031 than projected in CBO's February baseline. Increases of that amount would eliminate the fund's shortfall and provide \$95 billion or \$432 billion, respectively, for additional spending by 2031. However, those increases in fuel taxes would reduce taxable business and individual income, resulting in reductions in income and payroll tax receipts that would partially offset the increase in fuel tax receipts.
- **Institute new taxes.** Policymakers could institute new taxes on vehicle miles traveled (VMT) or on electric vehicles (EVs). One option would be to impose a VMT tax on commercial trucks. CBO has estimated, using data from 2017, that if such a tax was applied to all commercial trucks on all roads and all of the practical steps necessary to implement it were in place, each additional cent of tax would generate \$2.6 billion per year. The federal government's costs of implementing such a tax and ensuring compliance could, however, be substantial. A tax on EVs would probably not have a substantial effect on the trust fund's shortfall because the number of such vehicles remains small.
- **Transfer money from the Treasury's general fund.** Under this option, the federal government would, in effect, pay for a portion of highway spending in the same way that it funds other programs and activities.

Status of the Highway Trust Fund

The federal government's surface transportation programs are financed mostly through the Highway Trust Fund, an accounting mechanism in the federal budget that comprises two separate accounts, one for highways and one for mass transit. The trust fund records specific cash inflows from revenues collected through excise taxes on the sale of motor fuels, trucks and trailers, and truck

tires; taxes on the use of certain kinds of vehicles; and interest credited to the fund. The Highway Trust Fund also records cash outflows for spending on designated highway and mass transit programs, mostly in the form of grants to states and local governments.

In 2019, \$45 billion in revenues and interest were credited to the Highway Trust Fund; of that amount, \$39 billion went to the highway account and the remaining \$6 billion to the transit account. Most of those revenues came from taxes on gasoline and other motor fuels.

According to CBO's February baseline projections, if the excise taxes are continued at their current rates and current funding for highway and transit programs increases annually at the rate of inflation, the revenues and accumulated balances of the Highway Trust Fund will be insufficient to cover spending from either the highway account or the transit account, starting in 2022 (see Figure 1). In those projections, revenues and interest credited to the Highway Trust Fund in 2022 total \$43 billion, and outlays exceed revenues and interest earnings by about \$13 billion.

To cover the shortfalls recorded in the fund's accounts, lawmakers have enacted legislation that since 2008 has transferred more than \$150 billion—mostly from the Treasury's general fund—to the Highway Trust Fund. This year, lawmakers transferred \$14 billion from the general fund—more than \$10 billion to the highway account and \$3 billion to the transit account. Such intragovernmental transfers have allowed the fund to maintain a positive balance, but they have not changed the amount of receipts collected by the government.

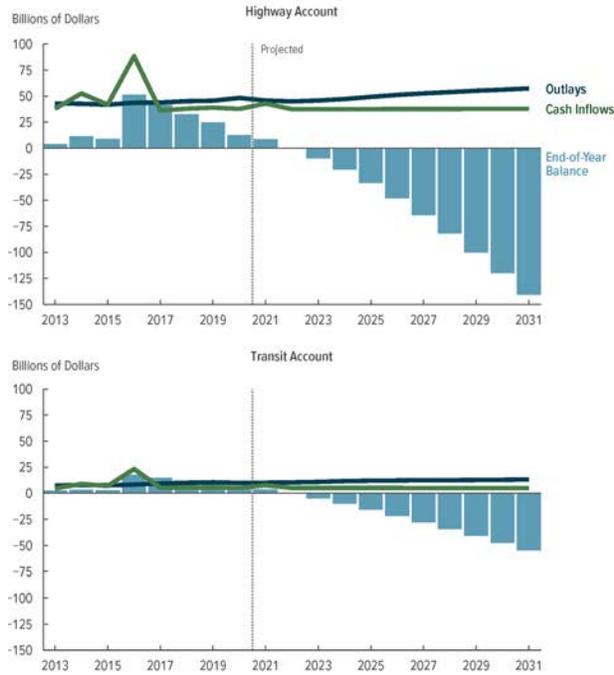
Spending for Highways

Almost all spending on highway infrastructure and transit projects in the United States is funded publicly. Although the private sector participates in building, operating, and maintaining projects, the federal government and state and local governments typically determine which projects to undertake and how much to spend on them.

In 2019, the most recent year for which data about highway spending by all levels of government are available, the federal government spent \$47 billion on highways—an amount equal to 0.23 percent of gross domestic product (GDP). Such spending's share of total economic output has, in general, been stable over the

Figure 1.

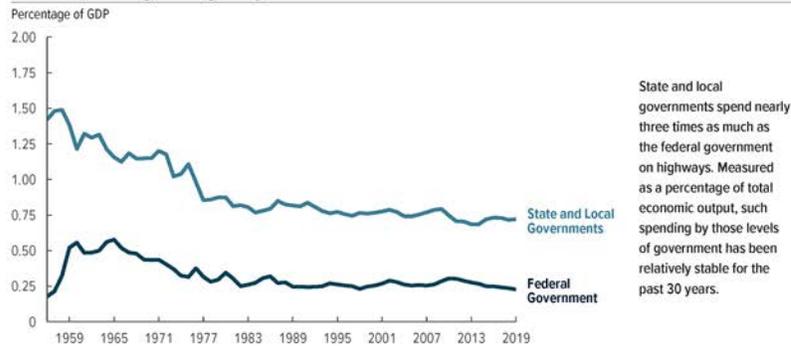
Annual Revenues, Outlays, and Balance of the Highway Trust Fund in CBO's February 2021 Baseline Projections



Outlays from the Highway Trust Fund have long exceeded the revenues credited to it from taxes, but intragovernmental transfers have ensured that the fund's two accounts maintained a positive balance. In CBO's projections, the balances of both the highway account and the transit account are exhausted in 2022.

Data source: Congressional Budget Office. See www.cbo.gov/publication/57110#data.
 See Congressional Budget Office, "Details About Baseline Projections for Selected Programs: Highway Trust Fund Accounts" (February 2021), www.cbo.gov/publication/51300.
 Cash inflows credited to the Highway Trust Fund include tax receipts, interest, and intragovernmental transfers.
 Some of the taxes that are credited to the Highway Trust Fund are scheduled to expire on September 30, 2022, including the excise taxes on tires for heavy trucks and all but 4.3 cents of the per-gallon federal tax on motor fuels (currently 24.4 cents per gallon on diesel fuel and 18.4 cents per gallon on gasoline and other fuels). However, in accordance with the rules governing baseline projections specified in the Balanced Budget and Emergency Deficit Control Act of 1985, the estimates shown here reflect the assumption that all the expiring taxes credited to the fund will continue to be collected after fiscal year 2022.
 Under current law, the Highway Trust Fund cannot incur negative balances. However, to accord with the rules governing such projections, CBO's baseline projections for surface transportation spending reflect the assumption that obligations incurred by programs funded by the Highway Trust Fund will be paid in full.

Figure 2.

Public Spending for Highways as a Share of GDP

Data source: Congressional Budget Office, using data from the Bureau of Economic Analysis, the Census Bureau, and the Office of Management and Budget. See www.cbo.gov/publication/57110#data.

GDP = gross domestic product.

past 30 years, though it is only half as large as it was in the 1960s, when construction of the Interstate highway system expanded (see Figure 2).

State and local governments spent more than three times as much as the federal government on highways in 2019—\$150 billion, or 0.72 percent of GDP. Like federal spending on highways, state and local governments' spending as a share of GDP peaked in the 1950s and 1960s, when it accounted for about twice the share it has in recent years.

Characteristics of Federal Funding for Highways

Two characteristics of the ways that the federal government typically spends on highways stand out. First, most federal highway funding takes the form of grants to state and local governments, which own most public roads in the United States and have broad discretion, with some constraints, to spend those federal funds. Second, federal spending on highways is almost entirely dedicated to capital projects that are intended to expand or rehabilitate eligible federal-aid highways.

In 2019, most of the \$47 billion that the federal government spent on highways took the form of grants to state and local governments. State and local governments own

almost all highways; federal agencies own less than 1 percent of public roads (typically, those in national parks and forests, on Indian reservations, or on other federally owned land).

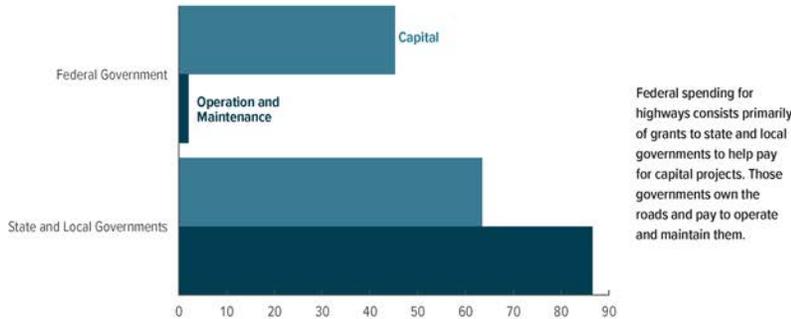
In general, state and local governments decide which projects to undertake and, as construction proceeds, receive reimbursements from the federal government for projects that meet federal eligibility criteria for various programs. Most federal highway programs set a cap on the portion of a project's total costs that a federal grant may cover—typically 80 percent. State and local governments must cover the remaining costs with nonfederal funds, such as tax revenues or proceeds from issuing municipal bonds.

Federal highway programs are dedicated almost entirely to capital projects rather than to the operation and maintenance of roads. In 2019, \$45 billion (or 96 percent) of federal spending for highways went to capital investment (see Figure 3). That spending includes outlays for the purchase of structures (such as new highways and bridges) and equipment as well as expenditures that improve or rehabilitate structures and equipment already in place. Such an allocation between capital and

Figure 3.

Spending for Highways, by Level of Government and Type of Spending, 2019

Billions of 2019 Dollars

Data source: Congressional Budget Office. See www.cbo.gov/publication/57110#data.

operation and maintenance has been typical of federal spending for highways since the 1950s.

Because the federal government does not generally own highways, the responsibility to operate and maintain them falls to state and local governments. Spending patterns reflect that: Operation and maintenance accounted for 58 percent of state and local governments' spending on highways, net of federal grants, in 2019. Operation and maintenance costs include the costs of providing necessary operating services (such as snow removal) and maintaining and repairing existing capital (such as filling potholes) as well as the costs of funding other highway-related programs (such as education about highway safety).

Unless additional funds are provided to the Highway Trust Fund (either through an increase in revenues credited to the fund or through additional transfers from general revenues), the disparity between the receipts credited to the fund and outlays from the fund will require the Department of Transportation (DOT) to delay its reimbursements to states for the costs of construction. CBO estimates that, starting in the first half of 2022, balances in the highway account of the trust fund will fall below the amount needed to reimburse states in a timely fashion for the bills presented to the fund. The

possibility of delays in payments from the federal government increases uncertainty among states when they plan transportation projects.

Distribution of Federal Funds to States

Under the most recent authorization for highway spending—the Fixing America's Surface Transportation (FAST) Act, which became law in 2015—more than 90 percent of federal highway assistance each year was designated for apportionment to states based on formulas. Formulas have long been used to distribute funds to states under various federal highway programs.³ In the past, those formulas accounted for a number of different factors, including the state's population, share of national highway lane miles, share of vehicle miles traveled, land area, rates of diesel fuel use, and tax payments to the Highway Trust Fund. Some formulas also included program-specific factors, such as air quality measures (for air congestion and air pollution programs) and fatalities (for safety programs).

3. For a historical overview of the use of formulas to apportion federal highway funding, see Robert S. Kirk, *The Highway Funding Formula: History and Current Status*, Report R45727, version 3 (Congressional Research Service, May 20, 2019), <https://go.usa.gov/sdbVlk>.

Starting in the 1980s, surface transportation authorization acts also included provisions that guaranteed that the amount of federal highway funding apportioned to each state would, at a minimum, equal a certain percentage of the federal highway taxes collected in that state. Most states received additional funds even if their apportionment would have been sufficient to meet the guarantee without them. Such provisions have made the formula factors less important in determining a state's share of funding.⁴

The two most recent federal highway authorization acts further departed from the factors included in earlier apportionment formulas. Enacted in 2012, the Moving Ahead for Progress in the 21st Century Act, or MAP-21, based each state's apportionment primarily on its share of total federal highway funding in 2012. Today, under the FAST Act, formula funds are apportioned among the states largely on the basis of each state's share of the apportioned funding in 2015, but if necessary, the apportioned amount is adjusted to ensure that each state receives at least 95 percent of the tax payments that are collected in that state for the highway account of the Highway Trust Fund.

Once a state's total apportionment has been set, that amount is divided (on the basis of the amounts and formulas set out in the FAST Act) among six different federal programs—the National Highway Performance Program, the Surface Transportation Block Grant Program, the Highway Safety Improvement Program, the Congestion Mitigation and Air Quality Improvement Program, the Metropolitan Planning Program, and the National Highway Freight Program. For many of those programs, after that initial apportionment, states have the flexibility to transfer up to half the funds apportioned to one program to the other programs.

4. Surface transportation authorization acts provide budget authority in the form of contract authority, which is the authority to obligate funds in advance of an appropriation act. States and other grantees are allocated that authority by DOT, which may legally obligate those federal funds for construction projects before an appropriation act is signed into law. The appropriations committees typically control the amount of contract authority that DOT can obligate in any one year because, in each year's appropriation bill, they include an obligation limitation—a limit on the obligations that can be made from contract authority that was previously provided in an authorization act. See Congressional Budget Office, *The Highway Trust Fund and the Treatment of Surface Transportation Programs in the Federal Budget* (June 2014), p. 10, www.cbo.gov/publication/45416.

Programs whose funding is not apportioned to states on the basis of a formula account for less than 10 percent of federal highway spending authorized by the FAST Act. A number of those programs nevertheless support highway spending by state and local governments. Some, such as the Nationally Significant Freight and Highway Projects program, provide grants to state and local governments, and others, such as the Transportation Infrastructure Finance and Innovation Act credit program, make loans to those governments to help finance transportation projects. In addition, a small share of federal highway spending pays for highway projects on federal lands.

Options for Determining Total Annual Spending Amounts

To construct its baseline projections for spending on highways from the Highway Trust Fund, CBO starts with the funding provided in the most recent appropriation law and adjusts that amount to reflect a combination of the projected changes in the GDP price index and in the employment cost index. However, lawmakers could choose to set annual spending levels for highway programs according to a number of different criteria. CBO analyzed two options that the Congress could pursue.

Set Spending to Maintain Current Highway

Conditions and Performance. On the basis of analysis from FHWA that examined the 2015–2034 period, CBO estimates that an annual average of \$98 billion in total federal and state spending would be needed over the 2022–2031 period to maintain highway conditions and performance on federal-aid highways—namely, pavement quality, bridge conditions, and travel delays—at their 2014 levels.⁵ If the federal government's share

5. See Federal Highway Administration and Federal Transit Administration, *Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, 23rd ed. (November 2019), www.fhwa.dot.gov/policy/23cpr/. The \$98 billion estimate is based on the sum of the \$59.5 billion reported in Exhibit 10-2 of the agencies' report for investments modeled in FHWA's Highway Economic Requirements System (HERS) and the \$10.4 billion reported in Exhibit 10-16 for investments modeled in the National Bridge Investment Analysis System (NBIAS). The resulting \$69.9 billion sum was adjusted upward to \$78.4 billion to account for the components and capital improvements not included in those models. That adjustment was based on an FHWA scenario in which highway conditions and performance would be improved; the HERS and NBIAS estimates account for 89 percent of the total investment in that scenario. CBO then used the GDP price index to adjust that \$78.4 billion in 2014 dollars to nominal dollars.

of capital spending on federal-aid highways remained 56 percent (the average share from 2004 to 2014), average annual federal spending from 2022 to 2031 would be \$55 billion, 22 percent more than capital spending in 2019.

Fund All Highway Projects for Which Benefits Exceed Costs.

Funding all projects for which benefits are expected to equal or exceed costs would require increasing annual spending well above recent amounts and the amounts in CBO's baseline projections. In its modeling of benefits, FHWA includes those for highway users, such as reductions in travel time, crashes, and vehicle operating costs; for government agencies, through lower maintenance costs and longer service lives for roadways; and for society as a whole, including reduced vehicle emissions. On the basis of analysis from FHWA that examined the 2015–2034 period, CBO estimates that the federal portion of the total average annual investment from 2022 to 2031 that would be required to implement all highway and bridge projects on federal-aid highways for which benefits are expected to meet or exceed costs is \$71 billion.⁶ That amount would represent an increase of more than 58 percent over the \$45 billion in outlays that the federal government made for highway capital in 2019. State and local governments would also have to increase spending on federal-aid highways to achieve the total level of investment modeled in the FHWA analysis. If those funds were spent only on projects whose benefits were estimated by FHWA to meet or exceed costs, the share of total vehicle miles traveled on federal-aid highways whose pavement was rated good or fair (as opposed to poor) would increase from 83 percent to 89 percent, and annual average travel delays per vehicle would be cut by about 9 hours.⁷

6. Ibid. The \$71 billion estimate is based on the \$102.7 billion (in 2014 dollars) in total annual spending on federal-aid highways such a scenario would require, as reported in Exhibit 7-7 of that report. CBO estimates that the federal government contributed 56 percent of capital spending on federal-aid highways from 2004 to 2014. It arrived at that estimate by comparing the federal government's share of capital spending on federal-aid highways for the years reported in Exhibit 2-8 of that report with total capital outlays for federal-aid highways reported for those years in Exhibit 2-15. To adjust that federal share (in 2014 dollars) to nominal dollars over the 2022–2031 period, CBO used the GDP price index as reported in Congressional Budget Office, "Budget and Economic Data: Historical Data and Economic Projections" (February 2021), www.cbo.gov/about/products/budget-economic-data.

7. FHWA valued travelers' time savings at \$12.30 per person-hour for personal travel and between \$27 and \$30 per person-hour

Estimates of net benefits that arise from benefit-cost analysis are uncertain, however. They rely on judgments about a variety of factors, including the value of benefits that are difficult to measure (such as the value of travelers' time and of vehicle maintenance costs avoided), the appropriate interest rate to use to discount future costs and benefits to present values, and how highways will be used in the future (for example, the number of vehicle miles traveled by passenger vehicles and trucks).

Options for Distributing Federal Highway Spending

For any given amount of spending for highways, the federal government can decide to spend or distribute those funds in different ways. Under the current system, in which federal funds are apportioned to states largely according to how those funds were distributed several years earlier, federal highway spending is not necessarily distributed in a way that reflects the use or condition of the highway system. Nor does such spending necessarily fund the highway projects that are expected to generate the largest net benefits.

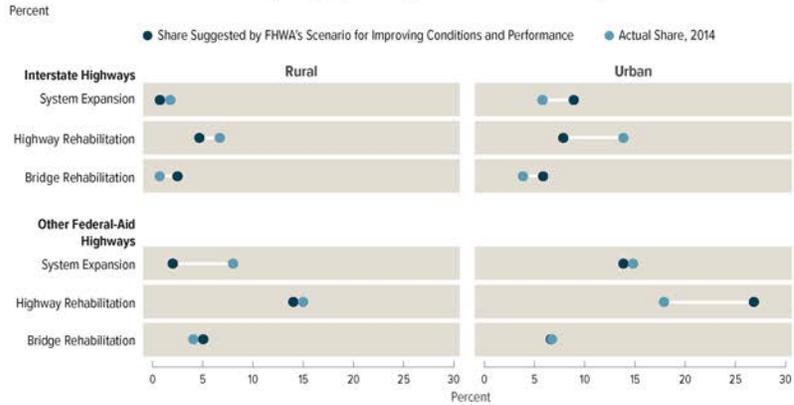
If more federal funds for highways were allocated to programs or projects whose benefits were expected to outweigh their costs, policymakers could boost the impact of highway spending on the economy. FHWA examined how spending on federal-aid highways in 2014 was allocated in both rural and urban areas among projects that either expanded the highway system or rehabilitated highways or bridges.⁸ The shares devoted to those two types of areas and types of projects were different from the shares that would be provided under the scenario modeled by FHWA in which all highway projects whose benefits equaled or exceeded their costs would be funded. In particular, a smaller share of spending would go to expanding the federal-aid highway system in rural areas under that scenario than actually went to such projects in 2014; in urban areas, a smaller share would be spent on rehabilitating Interstates, and a larger share would go to rehabilitating other federal-aid highways. In both rural

for business travel. See Federal Highway Administration and Federal Transit Administration, *Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, 23rd ed. (November 2019), p. 9-3, www.fhwa.dot.gov/policy/23cpt/.

8. See Federal Highway Administration and Federal Transit Administration, *Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, 23rd ed. (November 2019), www.fhwa.dot.gov/policy/23cpt/.

Figure 4.

Shares of Total Federal-Aid Highway Spending Used for Various Purposes



Data source: Congressional Budget Office, using data from the Federal Highway Administration. See www.cbo.gov/publication/57110#data. The shares suggested by FHWA's scenario in which highway conditions and performance would be improved are based on investment over the 2015–2034 period. Under that scenario, the share of spending going to system enhancements (safety enhancements, traffic control facilities, and environmental enhancements) would remain constant at the 2014 level, so that spending is excluded from this figure. For details on that scenario, see Federal Highway Administration and Federal Transit Administration, *Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, 23rd ed. (November 2019), www.fhwa.dot.gov/policy/23cpr/. FHWA = Federal Highway Administration.

and urban areas, a larger share of funding would go to rehabilitating bridges on Interstates (see Figure 4).

Another option lawmakers could choose is to provide more funding to programs that use benefit-cost analysis in selecting projects, such as the Better Utilizing Investments to Leverage Development (BUILD) program.⁹ Funding projects with the highest net economic benefits could realize most of the benefits of current highway spending at a lower cost or allow the same amount of spending to have a greater economic payoff.¹⁰ Another approach is to promote the use of benefit-cost analysis at the state and local levels, where most of the spending decisions are made.

9. The BUILD program replaced the Transportation Investment Generating Economic Recovery (TIGER) grant program in 2018.

10. See Congressional Budget Office, *Approaches to Making Highway Spending More Productive* (February 2016), p. 29, www.cbo.gov/publication/50150.

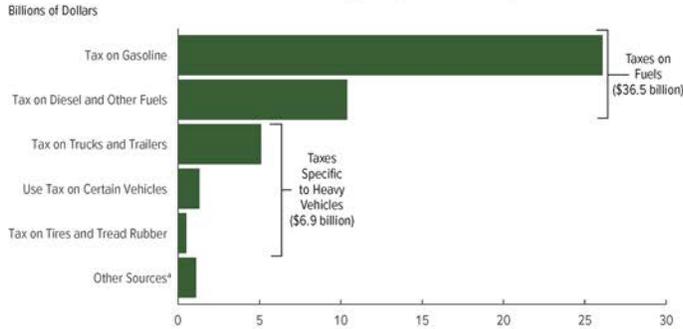
Benefit-cost analyses have some limitations, however. It is difficult to capture all of the benefits to the economy, and lawmakers may want to fund highway projects to achieve various objectives that are not accounted for in such analyses—increasing employment, increasing rural access to transportation networks, or addressing the impacts of highway infrastructure on different communities, for example. In addition, benefit-cost analysis on a project-by-project basis may miss important ways in which distinct components of the highway network affect one another. Also, implementing policies that emphasized such analysis would reduce state and local governments' discretion in how they use their federal funds.

Revenues Credited to the Highway Trust Fund

The federal government collects revenues for the Highway Trust Fund primarily from taxes on motor

Figure 5.

Sources of Revenues Credited to the Highway Trust Fund, 2019



Data source: Congressional Budget Office, using data from the Federal Highway Administration and the Internal Revenue Service. See www.cbo.gov/publication/57110#data.

a. Consists of \$0.8 billion in interest income, \$0.1 billion in civil penalties and fines, and \$0.1 billion in other income, primarily intragovernmental transfers—that is, funds transferred from other budgetary accounts to the Highway Trust Fund.

fuels. Lawmakers could increase revenues by raising those taxes or by instituting new ones.

Sources of Revenues

Of the revenues credited to the Highway Trust Fund in 2019, \$36 billion (or 82 percent) stemmed from excise taxes on gasoline, diesel, and other motor fuels (see Figure 5). Receipts from the tax of 18.4 cents per gallon on gasoline and ethanol-blended fuel contributed the largest amount—\$26 billion, or nearly 60 percent of the fund’s revenues. Receipts from the tax of 24.4 cents per gallon on diesel and other fuels totaled \$10 billion, or about one-quarter of the fund’s revenues. The taxes on gasoline and diesel fuel have been in place since 1993, and the rates have not been adjusted since then. All but 4.3 cents of the per-gallon federal tax on motor fuels are scheduled to expire on September 30, 2022.¹¹

If those taxes were extended at their current rates, revenues from gasoline and diesel taxes would decline at a rate of about 1 percent per year over the next 10 years,

11. In accordance with the rules governing baseline projections specified in the Balanced Budget and Emergency Deficit Control Act of 1985, CBO’s baseline revenue estimates reflect the assumption that all the expiring taxes credited to the fund will continue to be collected after fiscal year 2022.

CBO projects. Factors contributing to that projected decline include the rising fuel economy of vehicles and the slow rate of growth of the total number of miles traveled by vehicles.

Not all of the receipts from the excise taxes on motor fuels are dedicated to highway spending. A portion of those receipts—2.86 cents per gallon, which amounted to about \$6 billion in 2019—goes to the transit account of the Highway Trust Fund. In addition, 0.1 cent per gallon goes to the Environmental Protection Agency’s Leaking Underground Storage Tank Trust Fund, which supports programs run by state and local governments that prevent and clean up leaks from underground petroleum storage tanks.

Revenues from three other taxes, which are specific to heavy vehicles, are also credited to the Highway Trust Fund. The excise tax on trucks and trailers—equal to 12 percent of the sales price of tractors, trucks, and trailers that exceed certain weights—accounted for 12 percent of the trust fund’s revenues in 2019. A tax on the use of heavy vehicles (a \$100 to \$550 annual tax on trucks over 55,000 pounds) and an excise tax on certain tires for heavy trucks contributed smaller amounts to the

fund. (That excise tax on tires is scheduled to expire on September 30, 2022.)

In addition to those taxes, various fees and interest on invested balances, totaling about \$1 billion per year, are credited to the trust fund.

Options

Lawmakers have several options for increasing resources in the Highway Trust Fund. One option is to increase existing taxes on gasoline and diesel fuels. Alternatively, lawmakers could impose new taxes on vehicle miles traveled, on freight movement, or on electric vehicles. Finally, the Congress could make additional transfers from the Treasury's general fund to the Highway Trust Fund.

Increase Existing Fuel Taxes. CBO analyzed two options that would increase federal excise tax rates on gasoline and diesel fuel by 15 cents or 35 cents per gallon and adjust them to grow with inflation thereafter.

According to estimates by the staff of the Joint Committee on Taxation (JCT), increasing the tax rates on fuel by 15 cents in October 2022 and indexing them to the consumer price index thereafter would increase revenues to the Highway Trust Fund by \$26 billion in 2023. Over the 2023–2031 period, cumulative fuel-tax receipts credited to the Highway Trust Fund would exceed the amount in CBO's February baseline projections by \$291 billion. An increase of that amount would eliminate the projected cumulative shortfall in the Highway Trust Fund and provide an additional \$95 billion in revenues to the fund by 2031. Interest payments on any accumulated balances would further increase the resources available in the trust fund.

Increasing the tax rates on fuel by 35 cents in October 2022 and indexing them to the consumer price index thereafter would increase revenues to the Highway Trust Fund by \$60 billion in 2023. The cumulative fuel-tax receipts credited to the Highway Trust Fund over the 2023–2031 period would total an estimated \$627 billion more than the amount in CBO's February baseline projections.

However, those increases in fuel taxes would reduce other federal income and payroll tax receipts by decreasing taxable business and individual income. As a result, the net budgetary effects through 2031 would be smaller: deficit reductions of \$224 billion and \$485 billion, respectively.

Institute New Taxes. Another option is to impose new taxes that better align the taxes paid for using roads with the cost of building those roads. The most recent national study of how different types of vehicles contribute to the highway costs that federal programs pay for was published by FHWA in 2000. Passenger vehicles constituted the largest group of vehicles in use and were estimated to account for about 60 percent of federal highway costs in 2000, even though their estimated cost per mile of highway use was the lowest at 0.8 cents.

Costs attributed to trucks accounted for the remaining 40 percent of federal highway costs, but trucks provided about one-third of the Highway Trust Fund's revenues. For each mile they traveled in 2000, combination trucks (that is, tractors pulling one or more trailers) were estimated to impose a cost of 8.4 cents. For all trucks, the estimated cost per mile traveled ranged from 2.2 cents for the trucks carrying the lightest loads to 20.3 cents for those with the heaviest loads.¹²

More recently, some states have calculated cost shares for different types of vehicles that are similar to the estimates in the FHWA study. In 2019, Oregon estimated that light vehicles (mainly cars and other passenger vehicles) would account for about two-thirds of state highway costs in 2020 and heavy vehicles for about one-third.¹³ As the Oregon report noted, however, highway spending by state governments includes maintenance costs, such as snow removal and pothole patching, whereas federal spending does not.

In recent years, revenues credited to the Highway Trust Fund have declined. Because of improvements in fuel efficiency, drivers use less fuel and therefore pay less in fuel taxes to travel the same distance. Policymakers would have to make a number of decisions about how to design and implement new taxes in order to reach intended revenue targets and address highway users' equity and privacy concerns in the administration of those taxes.

12. See Federal Highway Administration, *Addendum to the 1997 Federal Highway Cost Allocation Study Final Report* (May 2000), Tables 4 and 6, www.fhwa.dot.gov/policy/hcas/addendum.cfm.

13. See Oregon Department of Administrative Services, Office of Economic Analysis, *Highway Cost Allocation Study, 2019–2021 Biennium* (prepared by ECONorthwest, 2019), www.oregon.gov/das/OEA/Pages/hcas.aspx.

Table 1.

Estimated Annual Revenues From a VMT Tax of 5 Cents per Mile If One Had Been in Place in 2017

Billions of 2017 Dollars

	All Trucks	Combination Trucks ^a
All Roads	12.8	8.0
Interstates and Arterial Roads	10.1	7.0
Interstates	5.3	4.2

Data source: Congressional Budget Office. See www.cbo.gov/publication/57110#data.

VMT = vehicle miles traveled.

a. Tractors pulling one or more trailers.

Impose a VMT Tax. Instituting a tax on vehicle miles traveled would charge all vehicles for their highway use regardless of the vehicle's fuel efficiency or energy source, but doing so would present several challenges. A VMT tax would be more costly to administer than the current excise taxes on fuels. In addition, such a tax would raise privacy concerns if calculating and collecting the tax required the government to track people's movement and use of vehicles. Apart from those challenges, a VMT tax has implications for equity that are similar to those of fuel taxes—namely, the burden, relative to income, is greatest for lower-income households because the money paid in taxes for highway use would constitute a larger share of their total income than of higher-income households' total income.

Limiting a VMT tax to only commercial trucks would raise fewer of those concerns. Because many trucking companies already track their vehicles, implementing a VMT tax on only commercial trucks would require overcoming fewer administrative and privacy hurdles than implementing such a tax on all vehicles would.

To establish a truck VMT tax, lawmakers would have to consider three sets of questions:

- Which types of trucks would be subject to the tax, and travel on which roads would be subject to the tax?
- What would the rates be for different trucks and for different roads?
- How would the tax be assessed, and how would payments be made?

Establishing and operating a program to collect a VMT tax on commercial trucks would entail not only costs to set up the program, including capital costs for new equipment, but also ongoing administrative and enforcement costs that are likely to be higher than the costs to administer fuel taxes. Whereas gasoline and diesel taxes can be administered at low cost because they are collected from a small number of firms (the taxes are assessed at roughly 1,300 fuel distribution terminals nationwide, and the number of distinct firms is smaller), a VMT tax would be collected from truck owners and thus would have a larger share of its gross revenues offset by implementation costs.¹⁴

In a 2019 analysis, CBO considered the effects on revenues of several possible formulations of a VMT tax on commercial vehicles.¹⁵ One example suggested that if a 5 cent tax per mile traveled by trucks had been in place in 2017, it would have generated between \$4 billion and \$13 billion in revenues that year, depending on the types of trucks and roads that the tax applied to. If a per-mile tax was applied to all commercial trucks on all roads, each additional cent of tax would generate \$2.6 billion. Taxing all trucks, including box and large pickup trucks, would raise more revenues than taxing only combination trucks. Similarly, revenues would be greater if the tax applied to travel on all public roads than they would be if it applied only to travel on Interstates or on Interstates and arterial roads (see Table 1).

Those estimated revenues do not include any offset to account for reduced revenues from income and payroll taxes. Such an offset, which CBO and JCT employ when estimating the effects of legislative proposals that would raise excise tax revenues, would vary over time, depending on tax rates and economic projections. In calendar year 2021, the offset is 21 percent.¹⁶

More recently, JCT has estimated the change in federal revenues that would result from imposing a new excise

14. Internal Revenue Service, "Terminal Control Number (TCN)/ Terminal Locations Directory" (accessed September 10, 2019), <https://go.usa.gov/xV5PB>.

15. See Congressional Budget Office, *Issues and Options for a Tax on Vehicle Miles Traveled by Commercial Trucks* (October 2019), www.cbo.gov/publication/55688.

16. Joint Committee on Taxation, *Updated Income and Payroll Tax Offsets to Changes in Excise Tax Revenues for 2021–2031*, JCT-11-21 (February 23, 2021), www.jct.gov/publications/2021/jex-11-21/.

tax of 30 cents per mile on freight transport by heavy trucks, starting January 1, 2022. Such a tax, applied only to certain heavy trucks while carrying freight, would increase net revenues to the federal government by \$33 billion in 2023, the first full year it would be in place. From 2022 through 2031, federal revenues would increase by \$337 billion.

Those estimates, which are net of reductions in income and payroll tax receipts that would partially offset the increase in excise taxes, reflect an assumption that an effective administrative framework is in place when the tax goes into effect. That would be challenging, however. Such a framework would require that an electronic device that was either acquired by taxpayers or built into vehicles by manufacturers be used to track miles. Furthermore, the information logged by the device would need to be securely and accurately transmitted to the Internal Revenue Service (IRS), and an independent verification system would be required for successful collection of the tax. If the IRS did not have an effective and automated way to match individual trucks and railcars to particular taxpayers and verify that the miles reported were accurate, some taxpayers might underreport their mileage or fail to report any mileage at all. If effective electronic data matching was not implemented, discrepancies would only be caught by auditing, which requires significant resources. At present, those systems do not exist, and their development would take both time and government resources.

Furthermore, the number of taxpayers and vehicles subject to the tax would be substantial. Many of those taxpayers would have no prior excise tax filing requirement and no experience with the excise tax system. As a result, the IRS would need to undertake significant outreach to educate them about the new tax and the recordkeeping it would require. The amount of revenues collected from a tax on vehicle miles depends greatly on the extent of compliance, and JCT's estimate should be viewed as entirely conceptual, because it does not take into account those factors.

Institute a Fee on Electric Vehicles. Under current law, drivers of EVs pay little or no federal or state fuel taxes. (EVs include plug-in hybrid vehicles, which combine a gasoline engine with a battery-powered electric motor that can be recharged by plugging it into an external electricity source, as well as all-electric vehicles, which run solely on battery power.) In 2019, more than

1.5 million plug-in electric cars and light trucks were on the road—a number that represents 0.6 percent of the stock of light-duty vehicles.¹⁷

Many states have begun charging owners of EVs an annual fee, typically in the range of \$50 to \$200. If in 2019 the federal government had charged an annual EV fee of \$100—comparable to the average amount that drivers of light-duty vehicles would have paid in federal fuel taxes in 2017—it would have raised about \$150 million, CBO estimates, using data from the U.S. Energy Information Administration.¹⁸

Transfer General Revenues. Since 2008, lawmakers have transferred more than \$150 billion from general revenues to the Highway Trust Fund. Most recently, in October 2020, the Continuing Appropriations Act, 2021 and Other Extensions Act (Public Law 116-159) authorized a transfer of \$10 billion to the highway account and \$3 billion to the transit account. Further transfers could supplement the revenues collected from the excise taxes dedicated to highway and transit programs. In CBO's 10-year baseline projections, outlays from the highway account exceed accumulated balances and annual cash inflows in 2022, and so do outlays from the transit account. In the highway account, the cumulative shortfall over the 2022–2031 period is projected to be \$141 billion; the cumulative shortfall in the transit account over the 2022–2031 period is projected to be \$55 billion.

Using general revenues to fund federal highway spending on an ongoing basis would have the effect of decoupling spending from the user charges that pay for that spending, but that approach has two advantages. First, if taxes were increased to pay for highway programs, the incremental costs of collection would be negligible because income taxes and other broad-based taxes are already in place. In addition, compared with several of the other options for increasing the amounts credited to the Highway Trust Fund, funding highways through broad-based taxes would have the advantage of not imposing a larger burden, relative to income, on lower-income households.

17. U.S. Energy Information Administration, *Annual Energy Outlook 2020* (January 2020), Table 39, www.eia.gov/outlooks/archive/aeo20/.

18. U.S. Energy Information Administration, *Monthly Energy Review* (September 2019), Table 1.8, www.eia.gov/totalenergy/data/monthly/previous.php.

Funding highway programs with general revenues instead of taxes on highway users would also have some disadvantages. If spending on other programs was reduced to pay for highway programs, the benefits of highway investments would be at least partially offset by a reduction in the benefits that would have been provided by that other spending. If, instead, lawmakers chose to pay for highway programs by taking on additional debt, such a policy would tend to slow the economy in the long term by reducing the amount of money available for private investment.¹⁹ Finally, if highway spending was less connected to highway-use taxes, users would have a reduced incentive to drive less or to conserve fuel, and any gains in fairness and efficiency from a system in which users pay for the benefits they receive would be reduced or eliminated.

19. See Congressional Budget Office, *The Macroeconomic and Budgetary Effects of Federal Investment* (June 2016), www.cbo.gov/publication/51628.

This testimony updates information in Congressional Budget Office, *Reauthorizing Federal Highway Programs: Issues and Options* (May 2020), www.cbo.gov/publication/56346. The testimony was prepared by Sheila Campbell with guidance from Joseph Kile and with contributions from John McClelland, Nathan Musick, Tess Prendergast, Robert Reese, Joshua Shakin, Chad Shirley, and Jeffrey Werling. In keeping with CBO's mandate to provide objective, impartial analysis, neither the report nor the testimony makes any recommendations.

The testimony was reviewed by Phillip L. Swagel, Jeffrey Kling, and Robert Sunshine. Benjamin Plotinsky was the editor, and Casey Labrack was the graphics editor. An electronic version is available on CBO's website at www.cbo.gov/publication/57110.



On April 14, 2021, the Senate Committee on Environment and Public Works convened a hearing at which Joseph Kile, the Congressional Budget Office's Director of Microeconomic Analysis, testified on approaches to addressing the long-term solvency of the Highway Trust Fund.¹ After the hearing, Chairman Carper submitted a question for the record. This document provides CBO's answer. It is available at www.cbo.gov/publication/57190.

Chairman Carper's Question About an Annual Fee on Electric Vehicles

Question. There is a lot of interest in having EV drivers contribute to the Highway Trust Fund. Given that currently only about 1% of the vehicle fleet is electric, if Congress were to levy an annual fee on EVs in an amount that is approximately commensurate with the amount paid in gasoline tax by an average driver of a light duty passenger vehicle with a gasoline engine, how much revenue would that be expected to raise over the next five years, and what percent of the anticipated shortfall in the Highway Trust Fund would that equate to?

Answer. In 2019, total gasoline taxes paid for each light-duty vehicle—a category mainly composed of cars and other passenger vehicles—averaged about \$100. If the Congress imposed an annual fee of \$100, starting in October 2021, on all light-duty electric vehicles (both all-electric vehicles, which run solely on battery power, and plug-in hybrid electric vehicles), the revenues generated by that fee would total about \$1.1 billion from fiscal years 2022 through 2026. That amount would equal 1.6 percent of the Highway Trust Fund's cumulative

1. Testimony of Joseph Kile, Director of Microeconomic Analysis, Congressional Budget Office, before the Senate Committee on Environment and Public Works, *Addressing the Long-Term Solvency of the Highway Trust Fund* (April 14, 2021), www.cbo.gov/publication/57110.

shortfall over that five-year period, according to CBO's baseline budget projections as of February 2021.² If the fee was not applied to plug-in hybrids, the amount of money collected would be smaller, and operators of those vehicles would not have to pay both the fee and gasoline taxes.

To prepare those estimates, CBO relied on the Energy Information Administration's projections of the number of light-duty electric vehicles and on the Federal Highway Administration's estimates of fuel consumption by light-duty vehicles.³ CBO's estimate of revenues from a fee on electric vehicles does not account for the fact that imposing such a fee would reduce taxable business and individual income, resulting in decreases in income and payroll tax receipts that would not affect the Highway Trust Fund but would, in the overall budget, partially offset the amount of money collected from the new fee.⁴ In addition, the estimate does not account for the cost of the administrative and auditing systems that would have to be in place once the fee went into effect. The development of such a framework would take time and funding. Outreach to owners of electric vehicles would be necessary as well.

2. Congressional Budget Office, "Details About Baseline Projections for Selected Programs: Highway Trust Fund Accounts" (February 2021), www.cbo.gov/publication/51300.

3. U.S. Energy Information Administration, *Annual Energy Outlook 2021* (February 2021), Table 39, www.eia.gov/outlooks/aeo/; and Federal Highway Administration, Office of Highway Policy Information, "Highway Statistics 2019" (November 2020), Table VM-1, <https://go.usa.gov/xHdwq>.

4. See Congressional Budget Office, *The Role of the 25 Percent Revenue Offset in Estimating the Budgetary Effects of Legislation* (January 2009), www.cbo.gov/publication/20110; and Joint Committee on Taxation, *Updated Income and Payroll Tax Offsets to Changes in Excise Tax Revenues for 2021–2031*, JCX-11-21 (February 23, 2021), www.jct.gov/publications/2021/jcx-11-21/.

Senator CARPER. Thank you, Mr. Kile. You have given us a lot to think about in a very short period of time.

Our next witness is Jack Basso.

Jack, nice to see you up on the screen. Chair of the Mileage-Based User Fee Alliance, a nonprofit dealing with all aspects of mileage-based user fees, Mr. Basso. Thanks for all your work over the years. It is great to have been able to work with you in many venues.

Thank you for joining us today, and you are recognized to present your testimony. Thank you, Jack.

**STATEMENT OF JACK BASSO,
CHAIR, MILEAGE-BASED USER FEE ALLIANCE**

Mr. BASSO. Thank you, Mr. Chairman, and members of the Committee for holding this hearing on the subject of mileage-based user fees and the Highway Trust Fund alternatives. I am the Chair of the Board of the Mileage-Based User Fee Alliance.

First, I want to recognize the recent proposal from the Biden administration giving priority to drastically increased infrastructure investment. There is a great need for action, we all agree, I think. In my testimony, I highlight the extent of the needs and look forward to finding ways to fund those needs using a variety of creditable sources.

We at the Alliance have been working to provide education, research, understanding new ways to collect revenue for surface transportation investment. Since 2008, as has been mentioned, revenue to the trust fund has dramatically fallen short.

Thirteen years ago, Congress created two commissions to make recommendations as to alternatives to pay for trust funded programs. They both concluded that mileage-based user fees would be one of the most effective ways to do that.

A total of 20 States over the past 5 years, with the assistance of the Federal STSFA program, have launched major tests, a variety of pilots, designed to examine the feasibility of conducting mileage-based user fee tests and support the needs, were conducted. A great deal has been learned from them. Let me just highlight a few.

First of all, the largest scale personalized public outreach effort in the country, 300,000 individuals and businesses were surveyed in Hawaii, and 50 percent of the surveyors responded, yielding a wealth of data on public preferences for road user charges. Washington State allowed a year long pilot of GPS and non-GPS alternatives and gathered a great deal of facts for the participants.

Oregon was the first program in the U.S. in 6 years ago to expand its knowledge in inter-operability of many of the items for existing programs. California advanced a 5,000 vehicle pilot that expands the knowledge of rural, tribal, and equity concerns. Minnesota's pilot funding allows for demonstrate the use of broad technologies in mobility areas.

I submitted testimony that includes additional information, but for the sake of time, I pulled these few samples. Dr. Hendren will talk, I know, about the Eastern Coalition and their activities.

I know that the U.S. is not alone in moving to a mileage-based user fee. New Zealand, Germany, and Australia have been advancing programs and pilots of their own for that purpose.

At this point, the next step to test the approach to a national pilot. We also strongly believe that additional funds should be made available to the State pilots, clearly to preserve the use of pay principle, and the need to make changes in our system. MBUFA recognizes the urgency to develop and implement sustainable funding, and we stand by ready to be of assistance and help with a 50 State system pilot.

The next step is to synthesize what the States learned in order to identify the most promising alternatives essential to a national system. As America expands its electric vehicles fleet, there is a need to be able to collect road user charges, and the need will become self-evident.

There is a question of equity, and the pilots, all of them, include analyses of equity issues and what might be done. The Alliance has provided the Committee with a number of considerations that we believe will enhance such a national pilot.

In conclusion, we wish to be supportive of Congress in its efforts to advance investment in surface transportation infrastructure.

Thank you.

[The prepared statement of Mr. Basso follows:]

**TESTIMONY OF PETER J. BASSO
CHAIRMAN, MILEAGE-BASED USER FEE ALLIANCE**

**BEFORE THE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
HEARING ON THE
LONG-TERM SOLVENCY OF THE HIGHWAY TRUST FUND: LESSONS LEARNED FROM THE
SURFACE TRANSPORTATION SYSTEM FUNDING ALTERNATIVES PROGRAM**

April 14, 2021

Good morning Chairman Carper, Ranking Member Capito and members of the committee. I am pleased to appear before you today to discuss the accomplishments of the Surface Transportation System Funding Alternatives System (STSFA) grant program and what we are learning about mileage-based user systems as an alternative financing mechanism for the Highway Trust Fund.

This hearing comes at a critical time. Since 2008, the Highway Trust Fund has faced a revenue shortfall which has required billions in transfers from the General Fund. The STSFA program was created in direct recognition that an alternative mechanism is needed. This is a problem that is not going to solve itself. It will require leadership, vision, and courage.

WHY MILEAGE-BASED FEES

Ten years ago, I helped launch the Mileage-Based User Fee Alliance, MBUFA, as an organization to bring together government, business, academic, and transportation policy leaders to conduct education and outreach on the potential for mileage-based user fees as an alternative for future funding and improved performance of the U.S. transportation system. As many of you on the committee know, much of my career has been focused on transportation finance, from my time as Chief Financial Officer at the U.S. Department of Transportation, to my time as AASHTO's Chief Operating Officer and Director of the AASHTO Center for Program and Project Finance. It was from that long focus on transportation financing that it became clear to me that the existing finance system for the Highway Trust Fund was falling behind the investment needs of the nation's infrastructure—a trend which was only going to get worse because of the transition to highly fuel efficient and electric vehicles. I believed when we started MBUFA and am even more convinced now, based on what we have learned from 5 years of STSFA pilots in the states, is that adoption of a mileage-based fee system is the best option for a sustainable funding mechanism for the Highway Trust Fund.

As members of this committee know better than most, the need for significant investment in the nation's surface transportation network is tremendous. The American Society of Civil Engineers regularly issues a report card on rating the state of the country's infrastructure. Roads received a "D" with more than \$785 billion in repairs identified. The need is widely recognized in the public and on Capitol Hill. We have all heard the phrase that infrastructure is

a bipartisan issue and I believe it is true that the need for a comprehensive, well maintained national network of roads and bridges for the efficient movement of people and commerce is a broadly supported goal. The devil, as we all know, has been in the details, namely how that network is financed, both to meet new transportation needs and to keep the existing system in a state of good repair. That is where the rubber meets the road and our bipartisan support for the concept of infrastructure gets lost.

Our surface transportation system has been financed by a user pay system, highly reliant on the federal fuel tax. For many years, that proved to be a highly effective and efficient funding mechanism. But since 1993, when it was last increased, it has been set at 18.4 cents/gallon. Back then the average price of gasoline was approximately \$1.17. Today the average price of gas is \$2.87/gallon, and we know that it fluctuates significantly. Yet, because the gas tax is not indexed, it has not been able to keep up as a revenue source for the Highway Trust Fund.

I don't present this as an argument to raise the gas tax. While that could be a short term, transitional solution, I fully understand the challenge and the politics. Frankly, it is that impasse on what to do with the gas tax in the face of the problem of keeping the Highway Trust Fund solvent that led Congress thirteen years ago to create two commissions to make recommendations on alternatives to pay for the Highway Trust Fund. Both concluded that a mileage-based system was the best long term, sustainable approach.

SUCCESS OF THE STSFA PROGRAM

Five years ago, due to the leadership and wisdom of the Environment and Public Works Committee, Congress authorized the STSFA grant program as part of the FAST Act. Specifically, the bill authorized \$95 million for a grant program to states, "to demonstrate user-based alternative revenue mechanisms that utilize a user fee structure to maintain the long term solvency of the Highway Trust Fund."

Since then:

- Fourteen states across the country were awarded grants for 37 projects. Awards went to: Delaware, Oregon, Washington, Minnesota, Missouri, Colorado, New Hampshire, Hawaii, California, Utah, Wyoming, Kansas, Ohio and Texas.
- Two regional pilots, one led by Delaware and the Eastern Transportation Coalition which is testing the implementation paths for mileage-based user fees in the DC metro area and seven states (Delaware, Maryland, Maine, North Carolina, New Jersey, Pennsylvania, and Virginia) and the other, led by Oregon and the Western Road User Coalition (RUC West), has begun to consider international issues and includes British Columbia as a participant.
- Two states, Oregon and Utah, have established actual MBUF programs and a third, Virginia, is planning to launch one in the next year.

- We have seen mileage-based systems being developed and operated internationally
 - Australia is doing a national pilot focused on heavy vehicles
 - New Zealand, which has operated a mileage-based system for all diesel powered vehicles since the 1970s is considering expanding to a wider set of vehicles
 - Germany, like several other European countries, has a road charging program for heavy vehicles
 - The European Union is piloting MBUF systems in many of the member countries

The states have learned through trial and error how to design trials, the importance of public engagement and communication, and the complexities of standing up a new system. The pilots are showing the technical viability of a mileage-based system and are generating valuable and sometimes surprising data on the specific questions outlined in the FAST Act including:

- Implementation, interoperability and public acceptance
- Protection of personal privacy
- Use of third party vendors
- Concerns about equity between urban and rural drivers, income groups and geographic areas
- Technology
- Data Security: and
- Cost

Mr. Chairman, since Dr. Hendren can best share the accomplishments of the Eastern Transportation Coalition pilot, we have reached out to several of our members in the Midwest and Western United States, who have participated in this program, to highlight the breadth of the STSFA grant program's accomplishments, what was piloted and why their work has been so valuable. Let me share some of their lessons learned:

Hawaii – Hawaii DOT is appreciative of the federal government's STSFA program that provided RUC research funding at this critical time. This program enabled us to undertake a personalized statewide public outreach and to demonstrate this potential option of a road usage charge in Hawaii with interested participants. This enabled Hawaii to have an important conversation with the public, participants, policymakers and other varied stakeholders regarding equity and sustainability of transportation funding not only now only now, but into the future as well.

Hawaii conducted the largest scale personalized public outreach effort in the country, reaching over 300,000 households and businesses across the state, with customized direct-mail explaining what drivers currently pay in gas taxes compared to what they could potentially pay under a per-mile charge. Nearly 15% responded to surveys, generating a wealth of data on public preferences for road user charges (RUC) in Hawaii. Hawaii demonstrated the feasibility

of using the state's existing annual car safety check inspection and registration process to assess a per-mile charge. However, a full-scale program would require some enhancements but could be done at a lower cost than some of the other RUC demonstrations to date. And lastly, a large majority of Hawaii drivers prefer to report miles drive at safety check, a process they are already familiar with.

Washington -The STSFA program enabled Washington State to engage thousands of drivers directly in an immersive, year-long road usage charge (RUC) pilot experience which featured testing both GPS and non-GPS options for how to report miles in a RUC system, and gathered extensive feedback from pilot participants. The pilot was the focal point of a public conversation that took place with the general public, key stakeholders, implementing agencies, lawmakers, and the media about how mileage-based-user funding could be carried out, its impacts, and how it can advance fairness and equity for all drivers. This critical work has directly informed ongoing road funding policy discussions in the state legislature as efforts are underway to advance a state RUC program based upon the pilot's findings. Among the lessons learned from the Washington State pilot:

- Nine years of research, pilot testing, and policy development in Washington State have shown that distance-based charging is a viable successor to the motor fuel tax, preserving the user-pay principle in a fair and sustainable way for all drivers.
- Washington addresses privacy concerns by offering drivers non-GPS mileage collection options, along with strong legal provisions on privacy and data protection.
- Washington has determined the financial impact of RUC on drivers, is not determined by how far you drive, but rather by your car's mpg – drivers of low mpg vehicles will generally see a reduction in taxes under RUC, particularly benefitting rural and low income drivers.

Oregon – OreGO was the first operational program for light duty vehicles in the country. It has been operating for almost 6 years with net revenues going into the state highway fund. Oregon has had a weight mile program for heavy vehicles since the 1940s. The privacy provisions in the enabling legislation were negotiated with the ACLU of Oregon at the time the legislation was passed in 2013 and remain in place. It continues to evolve based on lessons learned through operations, input from the public and its account managers, partnerships on pilots and other work it is doing with RUC West.

The STSFA grants received by Oregon DOT allowed us to improve our program, such as by evaluating new technologies, exploring different compliance options, engaging in public education, and evaluating whether it could be a platform for local area pricing. For RUC West, the grants allowed the member states to explore interoperability, examine the interface between autonomous vehicles and road usage charging, and develop clearinghouse requirements to enable data sharing with other jurisdictions. The sessions hosted by FHWA to share lessons learned have been beneficial because they provide networking opportunities for states and coalitions that received STSFA grants.

Minnesota – The aim of Minnesota’s project is to demonstrate that onboard embedded telematics in shared-mobility fleets and automated vehicles can be used to efficiently and effectively collect distance based fees. Fleet managers (such as shared mobility providers) already use telematics for their logistics, making administrative costs and fee remittance easier than traditional mileage-based fee collection approaches. Minnesota sees this approach as both incremental and scalable. Incremental in that we can keep the gas tax in place where appropriate. Scalable in that telematics are already used by fleet managers and will continue to become standard on vehicles

The STSFA provided a useful medium for the public private partnership with shared mobility fleet managers at the core of this demonstration. The grants allowed us to evaluate different pricing strategies and explore potential impacts on other priorities such as mobility, equity, and fairness. It allowed Minnesota to generate an engaged stakeholder education and outreach process for the future of transportation funding leading to direct applications in state legislative proposals for future mileage-based user fees.

California – California used state funds to complete one of the largest pilots yet with over 5,000 participants logging 37 million miles, proving the general feasibility of the system and garnering a very high level of acceptance of the concept by participants. Through the STSFA program, California continues to study issues related to user experience; interoperability between states; impacts to rural, tribal, and disadvantaged communities; and gathering input from the public. In California’s experience, pilots have two equally important goals – testing technical systems and educating the public and decision makers about road charge. Supporting education in states and growth of technical expertise will continue to necessitate the STSFA program as more states engage in studying road charge systems.

PROGRESSION TO A NATIONAL SYSTEM

We recognize the urgency to develop and implement a sustainable funding alternative for the Highway Trust Fund to the present fuel tax and the STSFA pilots are showing that an MBUF can fill that need. Unfortunately, what we have also learned is that there is no off-the-shelf system which Congress can plug-in and use to stand up a 50 state system. Not every state is prepared to embrace this alternative and there are questions that need to be explored and answered at a national level in concert with the ongoing work led by the states. Those include revenue collection, interoperability, and international issues involving cross border transportation. The next critical step is to synthesize what states are learning in order to identify and test mechanisms and processes essential to a viable national system.

What states have learned to date in the development of state pilots and what MBUF strongly recommends, is the creation of an advisory commission to review the work of the states and identify the steps forward toward a national system. This commission must have milestones and timelines to ensure that the transition to this alternative revenue system keeps driving forward so that Congress and the country are in a position to finally be able to make that transition within the near future.

Two years ago, MBUFA prepared a document, *Guidelines for a National Mileage-Based User Fee Trial*, which pulled together the collective thinking of members who had first-hand experience designing, implementing, and operating MBUF pilots. The purpose was to advise Congress on lessons learned and issues to consider in the development of a national MBUF system. MBUFA's members continue to endorse the considerations and recommendations of our Guidelines which I have included as a supplement to my testimony.

EQUITY FOR ALL VEHICLES

Mr. Chairman, before I conclude, I want to touch on what I believe to be a misperception and not a lesson learned regarding mileage-based fees. The argument is that MBUF fees unfairly add cost to electric vehicles purchase prices and operations while making it cheaper to operate gas fueled vehicles. In other words, switching from what might be considered a carbon tax on gasoline consumption to a system which charges equally regardless of fuel, will be a disincentive to electric vehicle manufacture and adoption. If gas powered, less fuel efficient vehicles only drove very short distances, this might make sense. However, data from the pilots has shown that larger, less fuel efficient vehicles are often driven in rural areas where they also drive long distances. Whatever savings are realized from no longer paying fuel taxes is balanced by the per mile charge for their longer trips.

What has been missed are the fundamental reasons for adopting a mileage based system, namely the user pays principal, which historically has been the bedrock principal of road financing in the United States, and equity, drivers should be fairly assessed for the cost of building and maintaining the roads they use.

The driving concern behind the need to invest in the development of alternative financing options, like the STSFA program, is the recognition that we are at the front end of a transformational event in the design of personal and commercial transportation vehicles -- the transition to highly fuel efficient and electric vehicles. Yet, our user pays based financing system is no longer viable in its current form, requiring Congress to repeatedly draw from the general fund to close the gap. The problem is that our current revenue generating model is predicated on consumption of fuel not on road use. Road use is still high, but fuel consumption habits are poised to shrink dramatically due to highly efficient and electric vehicles. Today, less than one percent of cars are electric vehicles, and it is projected that 25% of new car sales will be electric in 2035. General Motors has announced its goal to introduce 30 new models of electric cars by 2025 and to only sell zero emission cars and trucks by 2035.

The equity question is whether it is fair to require that only gasoline and diesel fueled vehicles pay for the road while electric vehicles travel free? The goal of a mileage-based fee is not to punish vehicle classes but put in place the framework for a user pays financing system which is equitable and sustainable. What we are seeing now in some states, like Utah, is an early step in implementing a mileage-fee system by starting with electric car use to both develop the system and establish fuel fairness. Rather than wait until ten years from now when electric vehicles

will compose a larger percentage of road use and implementation will be harder, the user pays principal is being reinforced now. Success will lead to inclusion of other vehicle types.

The lesson is that mileage-based fees are being piloted to address one specific public policy problem: the need to generate sufficient revenue to build and maintain our nation's network of roads and bridges. Vehicles will continue to need a well maintained transportation network. Reducing fossil fuel consumption does not conflict with adoption of a mileage-based system. It is the reason for it.

Mileage-fees are not the only lever which government can use to reward or incentivize use of more fuel efficient vehicles automobiles. In fact, it is an inefficient lever. Direct investment like President Biden's infrastructure plan which includes \$174 billion to accelerate the adoption of electric vehicles by including investments in 500,000 charging stations, \$100 billion in rebates to electric car buyers as well as investments in electric transit vehicles and school buses is a more efficient approach.

CONCLUSION

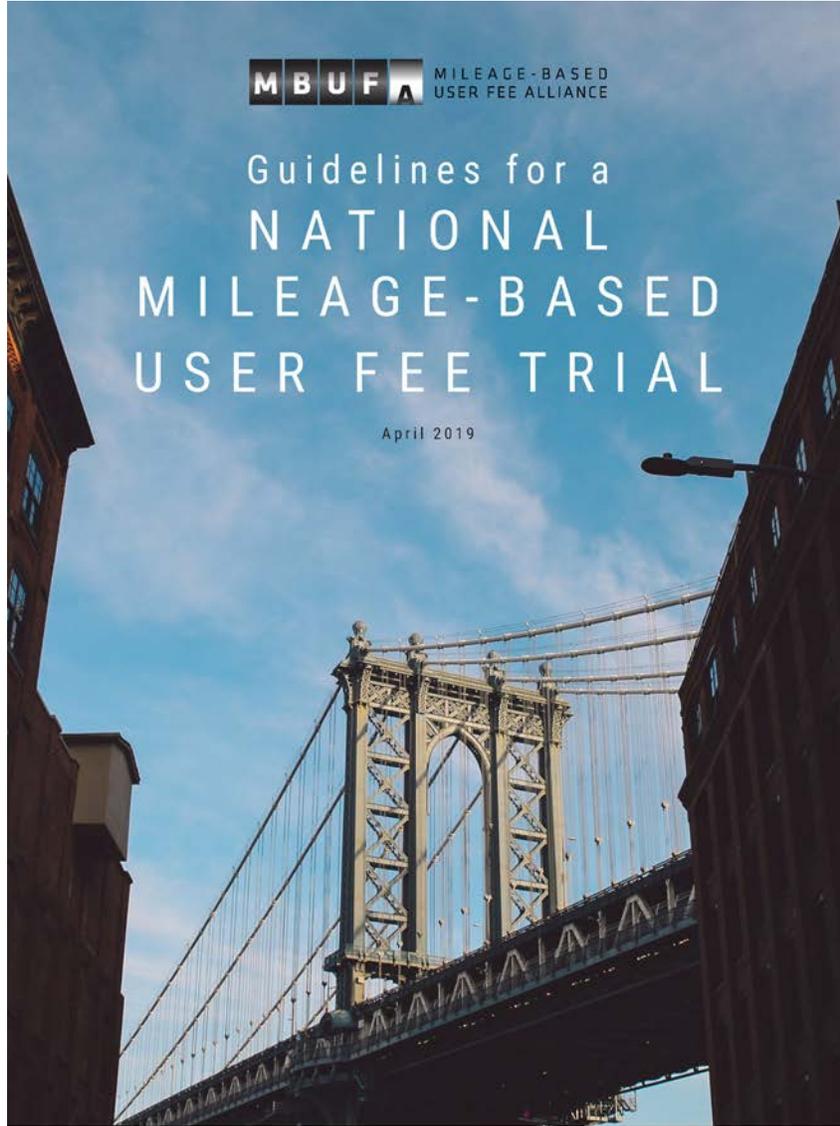
Mr. Chairman, I again want to express not just my appreciation for being able to testify this morning on an issue of such enormous importance to our country, but also for the leadership and bipartisan approach the members of this committee have brought to this issue. The federal gas tax of one cent per gallon was first imposed in 1932 when Herbert Hoover was President. Almost ninety years later, the world has changed considerably. The need for people and commerce to move quickly and efficiently has grown exponentially. Technology has revolutionized the way we live and work and made possible a new generation of vehicles powered by electric and hybrid fuels which were imaginable by our grandparents. It has also made possible an alternative financing system to the gas tax.

Switching to a user pays system based on actual road use as opposed to fuel consumed not only makes sense, but because of the STSFA grant program and investment by the states, it is showing itself to be a viable alternative. The growth in number of states piloting programs and the lessons being learned are building the foundation for a national system.

This work is not done. The states have more testing to do which will be essential to the transition from the gas tax to a national system. From what is being learned by the states we can start to look at key questions and issues which will be critical to progressing to adoption of a national system. Just as the committee showed foresight in creating the STSFA grant program, it will need to be creative and thoughtful in laying out the path forward that needs to include guidelines and milestones to ensure continued progress to a national system.

At this point, we believe the next step is to test this approach through a national trial. We also strongly believe that additional funds should be made available for state pilots. Clearly to

preserve the user pays principle, we need to make changes to accommodate the growing mix of the vehicle fleet.



Guidelines for a National Mileage-Based User Fee Trial

A national Mileage-Based User Fee (MBUF) system (also referred to as a Road Usage Charge (RUC)) could serve as an alternative federal revenue system to fund the national system. The funding provided by Congress to create the Surface Transportation System Funding Alternatives (STSFAs) program within the Federal Highway Administration (FHWA) was a critical first step. It placed states in an incubator role, conducting critical research and testing to inform a national policy and program. Congress is the direct beneficiary of this work and based upon the years of study by states, there are some critical lessons to be applied to the development of national policy on RUC.

To this end, below are the key guidelines we offer for moving an MBUF trial forward on a national level:

1. **Conducting an MBUF trial is a very important step** in advancing MBUF on a national level. But the complexity, cost, and preparations of a trial cannot be underestimated both in terms of time and funding needed to successfully execute.
2. **Establishing a clear purpose and intent for a national MBUF trial is a must for Congress to do.** What information or issues is the trial intended to address? Once this is known, public outreach can be anchored to a clear position and direction.
3. **Establishing an advisory body of national experts to guide the advancement a national MBUF trial is key.** This body should be convened by a supporting organization and charged with the detailed work required for advancing a trial, including research, design, development, and deployment.



4. **Educating the public on the "problem"** is a critical, ongoing effort that must begin as early as possible, continue during a trial, and after the trial is complete. It is imperative that the public understand the limits of the fuel tax and why MBUF is being considered as an alternative.
5. **Setting forth national guidelines for states**, while the national effort gets underway, would be very valuable for states that are implementing MBUF today. Such guidelines will help ensure a level of interoperability and consistency between states, absent a national program. The federal governing body could advise on these guidelines.
6. **Establishing national standards for data** will enable interoperability between states and the federal government. It is imperative that data standards include data security standards to protect personal information. The federal governing body could advise on these guidelines.

These six guidelines are the result of review and input by MBUFA's most knowledgeable government and private sector practitioners who have or are working directly on MBUF tests and programs. More detail on the guidelines is provided on the following pages.



Section 1: The Guidelines

1. Conducting an MBUF Trial

An MBUF trial will be critical to advancing a national MBUF policy and potential program. To conduct a trial, it is important to not underestimate the level of complexity, cost, and preparation that will be needed to successfully launch a national trial. Providing sufficient time to allow for technical development, recruitment, implementation, operations, evaluation, and reporting; sufficient funding to provide an actual, robust user fee experience for a statistically meaningful number of participants; and adequate staffing will be critical to delivering a positive and informative result.

The basic expectation of any trial should be to:

- Give consumers a direct experience with MBUF;
- Promote awareness and understanding of challenges with the gas tax and why MBUF is being considered;
- Ascertain public opinion before, during and after a trial;
- Leverage state-level research on MBUF; and
- Determine the challenges with a national MBUF, and identify the policy, structural and funding needs to carry it out

2. Establishing a Clear Purpose & Intent for a National MBUF Trial

This is a must for Congress to do – it establishes the “Northern Star” for the project, clearly identifying what information or issues to be addressed in the trial. For example: Is MBUF feasible nationally? What are the estimated costs to administer? Transition strategies or a road map for future implementation? The Congressional intent surrounding the trial and MBUF in general, should further clarify the role of MBUF and thoughts around the relationship of a possible future MBUF versus the current federal fuel taxes.

A clear purpose and intent from Congress will be critical to the public outreach and education on this entire topic. Without it, the trial could risk early failure by enabling and empowering inaccurate speculation as to what the MBUF trial is, and is not intended to be, and do. This possibility could likely distract from the merits of the trial and thus, undermine its success and overall results.

3. Governance and Decision-Making

Establishing an advisory body made up of experts from around the country to guide and advance a national MBUF trial will be key to its success. The body should be convened by a supporting organization or federal agency and should be required to make periodic reports to Congress on their progress, findings and recommendations as they advance their work. Given the complexity and extensive detail that must be managed to prepare and launch a national trial, due diligence must be given to the tasks of determining a detailed scope, schedule, and needed budget for a trial.

To this end, the advisory body should be charged with the detailed work associated with advancing and implementing a national MBUF trial including:

- Research, design, development, and deployment of a national trial (see detailed list below)
- Oversight of the trial once launched
- Serve as the source of inquiry
- Oversee and guide national communications, public education and outreach efforts
- Seek independent evaluation of the trial
- Periodic reports to Congress on the body's progress and report out on needs and adjustments as they become known.

The kinds of detailed work the advisory body should undertake and advise Congress on related to its trial research, design, development, and deployment responsibilities include (see Section 2 for more detail):

- Detailed trial design using a system engineering process
- Rate setting considerations
- Recruitment of participants, with the intent of achieving a diverse and geographically balanced participant pool from across the country.
- Whether and how to provide incentives for participation
- Communications plan
- Privacy & data security matters
- Standards and certifications
- Revenue collection
- Compliance & enforcement
- Organizational structures for a possible future federal program
- Evaluations of the trial
- Reporting requirements



4. Public Education

Educating the public on the "problem statement" is a critical, ongoing effort that must begin as early as possible, continue along with a trial, and continue after the trial is complete. It is imperative that the public understand the limits of fuel taxes and why MBUF is being considered as an alternative, as well as addressing the challenges with both the gas tax and MBUF. The advisory body should lead and oversee the development and execution of a robust communications and outreach plan featuring extensive public engagement with participants, stakeholders and citizens, working with and supported by an identified federal agency or organization.

5. Setting Forth National Guidance for States

While a national effort gets underway, Congress could greatly assist states that are implementing, or nearing implementation of MBUF programs today, with the issuance of national standards. This guidance should take into consideration the possibility that some states will opt in and others will not. Such national standards would ensure a level of interoperability and consistency between states, absent a national MBUF program. The advisory body could work with states and advise Congress on the specifics of such guidelines.

6. Establishing National Standards for Data

Setting forth a national standard will enable interoperability between states and the federal government. It is imperative that data standards consider the possibility of opt in and opt out states and include data security standards to protect personal information. For example, as new vehicles come onto the market, they should be capable of sending basic data about the miles driven, the location of those miles, and the fuel used to travel those miles because this is the basis for calculating mileage-based user fees. Congress could direct these guidelines.

As Congress advances this effort, and once the advisory body is established, a range of organizations should be consulted throughout the process to provide input on the vision, strategy and policy development. Consulting organizations could also provide support and assistance with agency and legislative engagement. Such organizations could include, but not be limited to: state DOTs & DMVs, Transportation Commissions, AASHTO, I-95 Corridor Coalition and RUC West, fleet managers, trucking associations, AAA, IBTTA, AAMVA, SAE, contractors and technology vendors.





Section 2: Details for Consideration

Characteristics of Trial

While the details of a trial are complex and need to be sorted out via the advisory body discussed above, there are some basic characteristics of a national trial that should be considered. Below is our initial thinking, noting there are many factors that could necessitate modification:

- **Participation.** A diverse, multi-state cross section of vehicles (e.g., heavy, light, electric) and participant types with targeted thought leaders, stakeholders, legislators, advocates, researchers and media
- **Size.** A statistically significant number of participants as determined by the advisory body
- **Scope.** Evaluate how a system could be configured that leverages existing state/regional trials with a national approach
- **Breadth.** The trial should consider component approach (component one focuses on trial technology and archi-

- texture and getting participants invested; component two focuses on customer experience, collection and enforcement issues; component three focuses on understanding costs and other key policy issues) with a target of participants from 50 states
- **Duration.** The participant trial should be 6 to 12 months in duration. It should provide adequate time in advance to accommodate system design, development and recruitment of participants and additional time after the pilot to allow for evaluation.
 - **Data and Revenue Collection.** The trial should define the basic billing, collection, auditing systems and standards to provide sufficient flexibility for industry to develop innovative solutions and a clearinghouse for data and accounts. Revenue collection options are:
 - ▷ Real money (Assess and collect a MBUF, refund gas tax and distribute user fee dollars), or
 - ▷ Mock invoice (Calculate and provide invoice/sales receipt, but no MBUF fee is physically collected and allocated), or
 - ▷ Hybrid (some real money participants, some mock invoice participants), or
 - ▷ Offsets, rebates or refunds of existing taxes
 - **Trial System Administration.** The trial administration options include: 1) Government-agency only; 2) Private sector in open system, open market; and 3) Combination of the two.
 - **System design considerations** (all the following may apply). The trial should define, develop, and test mechanisms to preserve privacy to the extent practicable.
 - ▷ Reporting options (a mix of):
 - ◆ Location awareness and non-location awareness
 - ▷ Factory-installed vehicle telematics
 - ◆ Motorist-choice from off-the-shelf to market-provided options
 - ◆ Manual (odometer)
 - ▷ System Engineering Process
 - ◆ The trial should apply a system engineering process (create a Concept of Operations, Requirements Document, Interface Control Document, and test based on those documents)
 - **Standards and certifications.** The federal government should identify national standards and a certification process for technologies, data generation, collection and transmission and business systems.

Critical Issues

To advance a national trial, there are many critical issue areas that will need to be addressed and included in the overall effort. The information below expands upon the list outlined under the Governance and Decision-making guideline indicating the detailed work the advisory body should undertake:

- **Communications.** The communications effort should cover the entire nation and include participating states during preparation, operations and reporting. It should engage the public and use proactive communications with the objective of responding to anticipated speculations and misinformation. The communications effort should include:
 - ▷ A robust public education and outreach effort;
 - ▷ Extensive public engagement with participants, stakeholders and citizens inviting inputs into preparatory design and policy reports;
 - ▷ Compile public feedback and opinion issues from the national trial participants.

Guidelines for a National
Mileage-Based User Fee Trial

- **Rate setting considerations.** Congress must consider rate setting or grant the authority to an identified body. The key questions are:
 - ▷ Revenue neutrality vs. raising revenue
 - ▷ Distance-based rate structure vs. multiple rates for axle, weight, and/or configuration
 - ▷ Basis for rate setting
- **Recruitment of participants.** Recruitment has proven to be always challenging. Congress should consider including incentives for participation, including a mandate or offset of other taxes.
- **Privacy and Data Security.** These issues remain a sleeping giant. State trials have generally been able to manage these issues by:
 - ▷ Providing participants with choices in method or technology that give them control over data on their location
 - ▷ Establishing clear legal privacy protections for participants and data security measures
 - ▷ Having third parties manage technology and data for location as option.
 - ▷ Certifying vendors and requiring compliance with business requirements in order to protect privacy and provide data security
- **Compliance.** The trial should contemplate and test compliance, (enforcement has not been thoroughly demonstrated in state trials). Results should be auditable.
- **Evaluation.** An extensive 3rd party evaluation is necessary for public acceptance and system improvement. The evaluation should:
 - ▷ Include public acceptance measures (surveys, focus groups, summary of interactive communications, participant feedback).
 - ▷ Assess implementation and operations, technological functionality, integrity and readiness of the system, data privacy and security, effectiveness, public perception and acceptance, system security, data accuracy, geographical equity, cost of collection and scalability.
 - ▷ Be conducted by a group selected by the advisory committee.
- **Reporting.** The reporting on the trials should be extensive. Sufficient time for reporting should be included in the project schedule. Technical and policy reports should be delivered to Congress and released to the nation. The advisory committee should make recommendations to Congress when feasible and if possible before the next reauthorization bill.

Senator CARPER. Thank you, Mr. Basso.

I would now like to recognize Dr. Patricia Hendren, the Executive Director of the Eastern Transportation Council.

Welcome to our Committee, Dr. Hendren, and you are recognized. Please present your testimony. Thank you.

STATEMENT OF PATRICIA G. HENDREN, PH.D., EXECUTIVE DIRECTOR, EASTERN TRANSPORTATION COALITION

Ms. HENDREN. Chairman Carper, Ranking Member Capito, and members of the Committee, it is an honor to speak to you today about how we can bring a sustainable funding model to our transportation system.

My name is Dr. Patricia Hendren, and I am the Executive Director of the Eastern Transportation Coalition, a partnership of 17 States and Washington, DC. For more than 25 years, the Coalition has brought together transportation agencies to push innovation and bring solutions to the Eastern Seaboard.

As part of the Surface Transportation System Funding Alternative Grant Program, we have been investigating the viability of a mileage-based usage fee, or MBUF. The cornerstone of the coalition's work is multi-State pilots, real world data analysis, and connecting directly to the drivers to figure out the feasibility of replacing the fuel tax with a distance-based approach.

We are talking about MBUF today because we have lost the connection between how much a driver uses the road and how much they pay for it. The concept of a user fee was introduced with Oregon's State fuel tax in 1919. The premise was simple: The more you drove, the more fuel you purchased, and the more you contributed to roads and bridges.

Over the last 100 years, our vehicles have changed dramatically, with vehicles going farther on less fuel and some vehicles using no fuel at all. Though this has been great for our wallets and the environment, the long-term sustainability of the fuel tax is in jeopardy. Our work, as well as pilots and programs around the country, have shown that a mileage-based user fee is a viable alternative.

The Coalition has conducted five demonstration pilots: Three multi-State passenger pilots, a multi-State truck pilot, and a national truck pilot. We have taken the study of user fees from theory to practice to show how MBUF would function in an actual operating environment and how fuel tax could transition to MBUF over time.

Our research shows that an MBUF implementation strategy must address four key elements. First, public education.

By and large, the public does not realize that we are facing a transportation funding problem. About two-thirds of people we surveyed thought funding was increasing or staying the same, while in fact, it is decreasing. To start a conversation about transportation funding with the public, our work has shown it is essential to first connect quality of life benefits, such as safe routes to schools, work, and recreation, to a strong transportation system.

To move forward with a new, sustainable funding approach, we are looking for Federal leadership on a national education campaign to expand knowledge about the importance of transportation and the need for change.

Second, privacy. In all of our pilots, participants expressed early concerns about privacy. However, these concerns fell significantly over the course of the pilot, as people experienced MBUF firsthand. For example, in our recent passenger vehicle pilot, participants who ranked privacy as a high concern dropped from 49 percent down to 15 percent. Our findings, which are consistent with pilots performed around the country, highlight the value of continuing State and multi-State pilots as a means to address the public's very real privacy concerns.

Third, our Nation is made of urban, suburban, and vast rural areas. To understand what a shift to MBUF would mean for different communities, we conducted an in depth analysis using State data that showed rural drivers will generally pay slightly less with MBUF than they currently do under the fuel tax. In other words, rural drivers often fare better with MBUF.

A key aspect of MBUF exploration needs to be the expansion of this type of analysis to better understand how a change in how we fund transportation would impact individual households, as well as different socioeconomic groups.

Finally, the motor carrier industry. As heavy users and payers, truckers must be included in any transportation funding exploration. Our national and multi-State truck pilots brought truckers directly into the MBUF conversation, and showed that using the same MBUF approach for cars and trucks or even the same approach for all trucks can end up penalizing fuel efficient trucks and lead to other unintended consequences. A viable MBUF system must reflect the complexity of the trucking industry and understand that trucks are not big cars.

We believe any future transportation funding model must address all users and build on the work done to date with the trucking industry.

In conclusion, changing from a 100 year old fuel tax system to something new will not be easy. At the Coalition, we have designed our multi-State work to show how MBUF affects actual drivers across a variety of real world environments and to bring forth insights about how MBUF would work on a national scale.

All the work that we have done has been made possible by the grant program that this Committee had the wisdom to create as part of the FAST Act. Thank you for your leadership.

Continuing to work together, I am confident that we can find a permanent solution that sustainably funds our highways and bridges and keeps our country moving and thriving.

Thank you.

[The prepared statement of Ms. Hendren follows:]



TESTIMONY OF:

Patricia Hendren, Ph.D.,

Executive Director, The Eastern Transportation Coalition

REGARDING

**Long-term Solvency of the Highway Trust Fund: Lessons
Learned from the Surface Transportation System Funding
Alternatives Program and Other User-based Revenue Solutions,
and How Funding Uncertainty Affects the Highway Programs**

BEFORE THE

**Committee on Environment and Public Works
of the United States Senate**

ON

Wednesday, April 14, 2021

The Eastern Transportation Coalition
5000 College Avenue, Suite 2200
College Park, MD 20742
www.tetcoalition.org
phendren@tetcoalition.org

*For more information about our research findings, visit:
www.tetcoalitionmbuf.org/findings*

The Importance of the Transportation System

Chairman Carper, Ranking Member Capito, and Members of the Committee: Thank you for the opportunity to testify today. It is an honor to speak with you about how we can bring a sustainable funding model to our transportation system.

We depend on America's highways and bridges to take us to work and school, to provide access to opportunities, and to transport the goods and services our economy needs to thrive. Well maintained transportation infrastructure ensures we get to where we need to go safely. This past year has underscored the necessity of a strong transportation network even more. Without our highways and bridges, we could not keep our grocery stores stocked, have packages delivered to our front doors, or receive the vaccines that will rein in the COVID-19 pandemic.

Unfortunately, the fuel tax model we currently use to fund this transportation system isn't working. I believe that using real-world data is essential to finding a solution that will.

The Eastern Transportation Coalition's Work

My name is Dr. Patricia Hendren and I'm the Executive Director of the Eastern Transportation Coalition (the Coalition), a partnership of 17 states and Washington, D.C. For more than 25 years, the Coalition has brought together transportation agencies to push innovation and bring solutions to the Eastern Seaboard.

As part of the Surface Transportation System Funding Alternatives grant program, we have been investigating the viability of a mileage-based user fee (MBUF). This distance-based approach is also referred to as a road user charge (RUC) or a vehicle miles travelled (VMT) fee. The cornerstone of our work is multistate pilots, real-world data analysis, and connecting directly with drivers to figure out the feasibility of replacing the fuel tax with a distance-based approach.

We are talking about MBUF today because we have lost the connection between how much a driver uses the road and how much they pay for it. The concept of a user fee was introduced with Oregon's implementation of its state fuel tax in 1919, followed thereafter with fuel tax implementation in the remaining states, and continued with the introduction of the federal fuel tax in 1933. The premise was simple: the more you drove, the more fuel you purchased, and the more you contributed to roads and bridges.

Over the last hundred years, our vehicles have changed dramatically and we have been fortunate to see advancements in fuel efficiency, with vehicles going farther on less fuel and some vehicles not paying for fuel at all. Though this has been great for our wallets and the environment, it has presented a challenge for our roads. As drivers purchase less fuel, the long-term sustainability of the fuel tax system is in jeopardy.

Our work, as well as other pilots and programs across the country, has shown a **mileage-based user fee is a viable alternative**. It would also be a return to the user-based funding mechanism envisioned when the fuel tax was first implemented.

The Coalition has conducted five demonstration pilots, including three multistate passenger vehicle pilots, a multistate truck pilot, and a national truck pilot. These pilots have included over 1,300 passenger vehicles from 14 Eastern states and D.C., as well as 270 trucks. Importantly, our work takes the study of user fees from theory to practice to show how MBUF would function in an actual operating environment and how the fuel tax could transition to MBUF over time.

Our research shows that a successful MBUF implementation strategy must address public education, privacy concerns, the effect on different places and socioeconomic groups, and the unique complexities of the trucking industry.

Public Education

First, addressing public education is key to implementation. By and large, the general public doesn't realize we have an urgent transportation funding problem. About two-thirds of people we surveyed thought funding was stable or increasing, even though it's actually decreasing. Because of this, policymakers may find it challenging to discuss new funding mechanisms without first alerting people to the inability of the fuel tax to keep up with road maintenance needs.

To start a conversation about transportation funding with the public, our work has shown it is essential to first connect quality-of-life benefits – like safe routes to school, work, and recreation – to a strong transportation system.

Additionally, the “pay for what you use” concept resonates broadly. Fifty-eight percent of respondents in our general public surveys said “pay for what you use” would be a reason to support MBUF – an indication that they may be open to an MBUF model.

In collaboration with state efforts, we need federal leadership on a national education campaign to expand the public's knowledge about the importance of transportation and the need for sustainable funding.

Privacy

Second, our data shows that privacy concerns drop when people experience the MBUF concept firsthand and when strong privacy practices are included. In all of our pilots, participants expressed early concerns about privacy and reporting accuracy. These concerns fell significantly over the course of the pilots. For example, in our 2020-2021 multistate passenger vehicle pilot, participants who ranked privacy as a high concern dropped from 49% to 15%. The decrease in privacy concerns can be linked to participants' firsthand interaction with MBUF technology, a deeper understanding of how MBUF works, and having mileage reporting options to choose from as part of the pilot.

Our findings, which are consistent with pilots performed around the country, highlight the value of continuing state- and multistate-led pilots as a means to address the public's very real privacy concerns.

Drivers in Various Geographies

Third, our nation is made of urban, suburban, and vast rural areas – each of which must be considered in any new funding model. For example, we conducted an in-depth analysis of state-specific data that showed rural drivers will generally pay slightly less with MBUF than they do currently with the fuel tax. In other words, rural drivers often fare better with MBUF.

A key aspect of MBUF exploration needs to be the expansion of state-level data analysis to better understand how a change in transportation funding affects individual households as well as different socioeconomic groups.

Bringing Trucks to the Table

Finally, as heavy users and payers, truckers must be brought to the table in transportation funding discussions. Motor carriers help drive the nation's economy, transporting 67% of total domestic freight by weight. We recognize that the trucking industry has concerns about MBUF, given that trucks are heavily regulated, face a range of transportation fees, and have a complicated operating environment.

Our national and multistate truck pilots show that using the same per-mile rate-setting approach for cars and trucks – or even the same approach for all trucks – can end up penalizing fuel-efficient trucks or lead to other unintentional effects. Any rate-setting method should reflect the complexity of the trucking industry and understand that trucks are not big cars.

The Coalition's work with the trucking industry indicates the need for a transparent rate-setting method that is consistently implemented. Notably, senior leadership from the nation's motor carrier associations have publicly expressed support for the Coalition's data-driven work and methodical approach.

We believe any future transportation funding model must address all users and build on the work done to date with the trucking industry.

Conclusion

The Coalition's research has been made possible by the Surface Transportation System Funding Alternatives grant program, which this Committee had the wisdom to create as part of the Fixing America's Surface Transportation (FAST) Act in 2015 in order to add real-world data to the conversation around MBUF. Thank you for your leadership.

Changing from a one-hundred-year-old system to something new will not be easy. However, the research shows an MBUF model is viable. Collaboratively, we can answer remaining questions and implement sustainable transportation funding.

At the Coalition, we have designed our multistate work to address issues, such as regional governance, that will be key to a national approach. The multistate nature of our work has brought key insights about how MBUF would work on a national scale. To figure out a clear path forward, additional research is needed at the state and multistate level to continue testing how MBUF affects actual drivers across a variety of real-world environments. A national approach can build upon this state work and focus on federal-specific issues like system specifications, privacy and data security standards, and a federal MBUF structure.

As we consider the future of transportation funding, we need a balanced strategy that includes the following:

- Federal leadership on a national education campaign to deepen public knowledge about the importance of transportation and sustainable funding
- Multistate- and state-led pilots that address privacy concerns by giving the public greater experience with MBUF technology choices
- Additional state-level data analysis to understand how potential transportation funding changes affect individual households and socioeconomic groups
- A solution that addresses all users, including passenger vehicles and motor carriers

With federal and state governments working together, we can find a permanent solution that sustainably funds our highways and bridges and keeps our country moving and thriving.

Senator CARPER. Dr. Hendren, thank you very much.

Now, we are going to turn to Robert Poole of the Reason Foundation.

Mr. Poole, please proceed with your testimony when you are ready.

Mr. Poole, you are recognized.

**STATEMENT OF ROBERT POOLE, DIRECTOR OF
TRANSPORTATION POLICY, REASON FOUNDATION**

Mr. POOLE. Thank you, Chairman Carper, Ranking Member Capito. Are you hearing me?

Senator CARPER. Loud and clear.

Mr. POOLE. Very good, thank you.

And members, thanks very much for inviting me today.

I have been doing transportation policy research for more than three decades and have served on a number of committees of the Transportation Research Board. One of the most important of those was in 2005. It was the first serious national look at the long-term viability of fuel taxes, and our report, published in 2006, concluded that they would not be sustainable for the 21st century.

About 5 years later, Congress, as I think Jack Basso mentioned, appointed the Infrastructure Financing Commission. My colleague at Reason, Adrian Moore, served on that. It clearly, after evaluating about 15 alternatives, concluded that charging per mile driven rather than per gallon consumed was the most viable alternative going forward.

In my testimony, I suggest four ideas for dealing with the sustainability of the trust fund.

First of all, I suggest—the Congressional Research Service suggested in a very recent bulletin, one short-term fix for the trust fund would be to restore the original user pays, users benefit principle that started, as Dr. Hendren mentioned, with Oregon's first gas tax in 1919, and that is to put all the money raised from highway users toward the highway program.

That would almost cover the amount that is currently being spent each year on the highways. That would, of course, mean shifting the non-highway programs to the general fund, and doing this openly, rather than through subterfuge, in effect, of finding general fund money and putting it into the trust fund and then taking it out again. Avoid the middleman, and do it straightforwardly, which reflects the large general fund commitments planned in the Administration's American Jobs Plan.

My second point is that many needed transportation megaprojects, projects on a billion dollar scale or more, are not going to be accommodated by a short-term fix for the trust fund, nor in the Administration's plan. There is just simply not enough money there to rebuild the interstate highways and replace many of the major billion dollar scale bridges that need replacement.

There is an alternate way to bring in private capital, which could be very, very important for these kinds of projects specifically. The interstate highway reconstruction that was called for in the big TRB report that Congress asked for estimated \$1 trillion over the next 20 years. I think that estimate is low, both in terms of cost and in timeframe. But a lot of those projects really need to be done,

and hedge funds and other institutional investors would love to invest in long-term revenue generating infrastructure.

So Congress could open the door, as I suggested in the recent Wall Street Journal piece, to this kind of private investment, but making two changes with virtually no budgetary impact. One would be to expand the current tax exempt private activity bond program, which has exhausted its \$15 billion original cap, make that much larger.

Second, make sure that the language makes it clear that these can be financing not only new capacity, which is the focus of the original program, but to fix existing infrastructure that needs to be rebuilt and modernized. That is not at all clear in the current legislative language, and that needs to be made clear.

The other change would be to expand a small Federal pilot program that allows only three States to each rebuild one interstate using toll finance. There are a number of States that are really studying this, that Congress could expand that to all 50 States and allow any State that chooses to participate to rebuild all of their interstates, which would make much better sense than simply singling out one, which would be politically very difficult.

Third, I certainly agree with the need. The Reason Foundation is a charter founding member of the Mileage-Based Users Fee Alliance. I second the comments that our previous witnesses have made about the need for more pilot projects, particularly multi-State pilot projects and more projects getting involved, long haul truckers, which travel interstate. There are lots of different issues that need to be addressed.

We have learned a lot from the existing pilots, but most States have not participated in a pilot. As Dr. Hendren pointed out, the actual participation of people, including, in many cases, State legislators, has a powerful educational impact, which we are not going to get a national per mile system until we get public support across all 50 States in my view. That is critically important.

Also, institutions, what institutions are going to be needed to play key roles? Departments of motor vehicles, perhaps, the International Fuel Tax Agreement among truckers; there are things that need to be explored in a lot more detail than the current pilots have done.

I want to close with one sort of more philosophical point, and that is there seems to be a growing idea that there is a conflict between well funded and somewhat expanded highway system and the need to combat climate change. I want to call your attention to the long-term nature of both of these problems.

The transition to electricity is going to proceed at a much faster pace, it appears, given the commitments of auto companies, the Federal Government, and many State governments. At the same time, rebuilding the interstate highway system is not going to happen overnight. If some corridors, particularly truck heavy corridors need more lanes, you are talking about a long-term prospect here of maybe 15 years before the first major rebuilding can be completed, if the designs were there today, and probably 30 years until the whole systems are rebuilt and modernized.

During this time period, we are going to be electrifying transportation, so the idea that we shouldn't let VMT, vehicle miles of trav-

el, expand because of climate change, I think is a very short sighted view. Long-term future is going to require more capacity for trucks. Autonomous vehicles are likely to take market share away from short haul flying and onto highways, so we need to think all of these problems long-term together.

That concludes my testimony, and I am happy to answer questions when the time comes.

[The prepared statement of Mr. Poole follows:]

The Long-Term Solvency of the Highway Trust Fund

Testimony of
Robert W. Poole, Jr.
Director of Transportation Policy, Reason Foundation

Before the
Senate Committee on Environment and Public Works
April 14, 2021

My name is Robert Poole, Director of Transportation Policy at Reason Foundation. I have been researching and writing about transportation policy for the past three decades. I'm an emeritus member of the Transportation Research Board's Congestion Pricing Committee and its Managed Lane Committee. I have advised the U.S. Department of Transportation, FHWA, FTA, and nearly a dozen state DOTs over the years. My latest book is *Rethinking America's Highways*, published by the University of Chicago Press in 2018.

On the subject of the Highway Trust Fund, I served as a member of TRB Special Committee 285 in 2005. We produced "The Fuel Tax and Alternatives for Transportation Funding," which was the first national study to suggest that per-gallon fuel taxes were not sustainable for the 21st century.¹ Three years later my Reason colleague Adrian Moore was a member of the National Surface Transportation Infrastructure Financing Commission (created via the SAFETEA-LU reauthorization), which built on the TRB report, assessed many alternatives, and concluded that per-mile charges would be the best long-term replacement for per-gallon fuel taxes.² Reason Foundation was one of the founding members of the Mileage-Based User Fee Alliance (MBUFA).

In my testimony I will present four suggestions:

1. A short-term fix for the Highway Trust Fund, that would be compatible with the President's infrastructure and jobs proposal;
2. The role that private capital from public pension funds, insurance companies, and infrastructure funds could play in financing some of the needed rebuilding and modernization of U.S. infrastructure, and policy changes that could open the door for such investment;
3. Needed next steps toward getting mileage-based user fees ready for prime time; and,
4. Some thoughts on highways and climate change.

Fixing the Highway Trust Fund This Year

Over the past 13 years, Congress has allocated \$157 billion of general fund money to close the gaps between the Highway Trust Fund's user-tax revenue and the amounts Congress decided to spend on transportation from the Trust Fund. Increasing the federal highway user tax rates has become radioactive to both Democratic and Republican White Houses and members of Congress. President Biden himself rejected an increase in fuel taxes because of his pledge not to increase "taxes" on people making less than \$400,000. To him, as to most American motorists and taxpayers, the federal gas tax is now "just another tax."

¹ Committee for the Study of the Long-Term Viability of Fuel Taxes for Transportation Finance, *The Fuel Tax and Alternatives for Transportation Funding*, Special Report 285, Transportation Research Board, 2006

² National Surface Transportation Infrastructure Financing Commission, *Paying Our Way: A New Framework for Transportation Finance*, February 2009

How did we get to this place? When Congress created the current federal fuel taxes and the Highway Trust Fund in 1956, it made a promise to motorists and truckers: these funds—unlike the smaller previous federal gas tax—would be held in trust to pay for building the new Interstate Highway System. They were pure user taxes, on the principle of users-pay/users-benefit. Once the Interstate system was largely completed, however, Congress began expanding the scope of what the Trust Fund could be used for. Eventually, it evolved into a general transportation trust fund, paying even for sidewalks and bike paths, as well as urban transit.³ About 25% of the spending no longer goes for highways. I think that is a primary reason why federal fuel taxes are no longer seen as user fees but simply as “yet another tax.”

There is a simple way to fix this in the upcoming reauthorization. In a recent report, the Congressional Research Service points out that nearly all the gap between Trust Fund revenue and Trust Fund spending is due to the non-highway programs.⁴ For FY 2022, it would take just \$2.2 billion more in highway user revenues to cover all likely highway spending from the Trust Fund. Transit, Amtrak, and other worthwhile programs could be paid for out of general revenues, as the President is proposing on a large scale. My expectation is that restoring the users-pay/users-benefit nature of the Trust Fund would lead to greater willingness by highway users to consider paying more for highways, if they were clearly getting more in return. This approach has won the support of a number of think tanks and at least two former Secretaries of Transportation.⁵

Tapping Private Capital for Infrastructure Improvements Beyond the Trust Fund

Public pension funds and insurance companies have long-term obligations to their beneficiaries, so they are increasingly seeking long-term investments that generate revenue. Some kinds of infrastructure generate their own revenues—such as airports, seaports, toll roads, and utilities. Nearly all these (except electric and gas utilities) are owned by state or local governments. It is not possible to invest equity in them. On the other hand, if their long-term stewardship is transferred to investor-owned companies, pension funds and others can invest equity in those companies. What I’m referring to here is long-term public-private partnerships (P3s) for major infrastructure. These can be used to finance, build, and operate *brand-new* infrastructure like the express toll lanes in northern Virginia or to refurbish and modernize *existing* infrastructure such as the Indiana Toll Road and the San Juan International Airport. About 50 U.S. public pension funds own the long-term P3 company that is managing and improving the Indiana Toll Road.

Most pension funds don’t invest in individual projects, due to the risks of putting all their eggs in one basket. (As an individual investor, I am likewise risk-averse and invest almost entirely in conservative mutual funds.) Hence, most pension funds that invest in

³ Robert W. Poole, Jr. and Adrian T. Moore, “Restoring Trust in the Highway Trust Fund,” Reason Foundation, August 2010

⁴ Robert S. Kirk and William J. Mallett, “Reauthorizing Highway and Public Transit Funding Programs,” Congressional Research Service, March 1, 2021

⁵ Letter to Congress, Competitive Enterprise Institute, et al., April 7, 2021
https://cei.org/coalition_letters/cei-leads-highway-coalition-letter-in-support-of-mileage-based-user-fees

infrastructure allocate sums of money to one or several of the hundred or more infrastructure investment funds, which build portfolios that include both new and existing infrastructure.

The majority of U.S. public pension funds have significant unfunded liabilities. They are seeking conservative investments that can help to increase the overall rate of return on their assets, so as to reduce their unfunded liabilities. They would like to invest more in the United States, but the large majority of P3 projects are in Europe, Asia, and Latin America. In the transportation field, my database finds only six rebuild/modernization P3s and 32 new-capacity P3s in the USA since 1995.⁶ The pace has picked up in the past 15 years, but there is still a dearth of U.S. projects in which our pension funds can invest equity.

Nearly all the transportation infrastructure we're talking about, including highways and bridges, is owned by state and local governments, and a growing number have P3 laws. But Congress could open the door to many more actual P3 projects by making modest changes in two federal policies. In SAFETEA-LU, Congress authorized \$15 billion in tax-exempt Private Activity Bonds (PABs) primarily to facilitate P3s in surface transportation. As of the start of this year, 98% of that \$15 billion has been used.⁷ That cap should at least be doubled, if not done away with; there is no federal cap on tax-exempt municipal bonds. But the language of the law should also be clarified to ensure that PABs can be used to finance the rebuilding and modernization of existing transportation assets, consistent with Build Back Better, rather than just to build new capacity.

The other change concerns tolling. A growing number of state DOTs have recognized that their Interstate highways are wearing out, and many of its major bridges and interchanges need replacing. The Transportation Research Board in a 2018 report commissioned by Congress, estimated the cost of this reconstruction and modernization as approximately \$1 trillion over several decades. A detailed Reason Foundation study found that the large majority of states have enough Interstate traffic to make toll-financed reconstruction feasible.⁸ This could be done by state toll agencies and investor-financed companies under long-term P3 agreements.

In 1998's TEA-21 reauthorization, Congress created a pilot program under which three states could each rebuild one Interstate financed by tolls. But politically, no state wants to single out just one Interstate to be rebuilt and charge tolls. What a growing number of states (including Indiana, Michigan, and Wisconsin) have been studying is a long-term strategy of rebuilding their entire aging Interstate system using toll finance—but that is not currently permitted by federal law. What is needed is the option for every state to use

⁶ Robert W. Poole, Jr., "Annual Privatization Report: Transportation Finance," Table 8, Reason Foundation, May 2020

⁷ Build America Bureau, "Private Activity Bonds," April 2, 2021
(<https://transportation.gov/buildamerica/financing/private-activity-bonds-pabs/private-activity-bonds>)

⁸ Robert W. Poole, Jr., "Interstate 2.0: Modernizing the Interstate Highway System with Toll Financing," Reason Foundation, September 2013

this approach, if it adopts a modest set of customer-friendly tolling policies. Reason Foundation has suggested what those policies might be.

Beginning the Transition from Per-Gallon Taxes to Per-Mile Charges

It is becoming obvious that per-gallon gasoline and diesel taxes are not a viable highway funding source for the future. Ed Regan, a distinguished traffic and revenue expert at CDM Smith, has just completed a set of three scenarios on how rapidly the revenue from gasoline and diesel taxes may decline between now and 2050.⁹ Depending on how stringent future federal fuel economy standards are and how fast electric vehicles enter the fleet, federal gas tax revenues could be down 50% by 2050, with similar decreases for state fuel taxes. I think those may be under-estimates, if the Biden Administration's aggressive electric vehicle efforts are fully implemented.

Congress has had the foresight over the past decade to help fund a growing number of state and regional pilot projects to test mileage-based user fees (MBUFs); these are generally called road user charges (RUCs) on the West Coast. The transportation community has learned a great deal from these pilot projects. They have found that motorists welcome a choice of ways to record and report their miles of travel. Motorists are also very protective of their privacy, so they want strong safeguards in any permanent MBUF program. While most of the public does not see the need to transition from per-gallon taxes to per-mile charges, those who take part in pilot projects are generally more supportive.

The pilot projects have all stressed one key principle that helps gain customer acceptance: that per-mile charges will *replace*, rather than supplement, gas taxes. There is a great deal of concern and suspicion that MBUFs will actually be imposed in addition to gas taxes, becoming "yet another tax."

The trucking industry has participated in several state pilot projects and at least one multi-state project carried out by the Eastern Transportation Coalition. These trucking pilots have demonstrated that trucking is more complicated than personal vehicles, but also that there are one or more organizational arrangements serving trucking that could also play a role in handling per-mile truck charges. Officially, the main national trucking organization is still skeptical about the need for, and the potential cost of, switching from per-gallon taxes to per-mile charges.¹⁰ So in my view, it would be a mistake, politically, to start the conversion process with the trucking industry.

A key question still being debated is whether the transition should be bottom-up (starting with first-mover states) or top-down (starting with the federal government). Given the current array of unknowns about methods, and the lack of currently available technologies at very low unit costs, it would be premature at either the state or federal level—in the next few years—to replace either a state gas tax or the federal gas tax with a

⁹ Edward J. Regan, "The Motor Fuel Tax: Running Out of Gas," CDM Smith, March 15, 2021

¹⁰ Jeffrey Short and Dan Murray, "A Practical Analysis of a National VMT Tax System," American Transportation Research Institute, March 2021. Available on request from TruckingResearch.org.

per-mile charge. We do not yet know how to do this on a very large scale at an affordable cost. And we do not yet have a level of public (and industry) support that this is what we need to do. For most states and the national program, there is still much to be learned via trials to devise the best way forward.

My recommendations for Congress on this are as follows. First, continue to support pilot projects, especially multi-state and regional projects and projects with the trucking industry. Second, focus research on the role that existing organizations could play in regional and national MBUF systems, including state departments of motor vehicles (DMVs) and the International Fuel Tax Agreement (IFTA) for trucking. And third, in envisioning a future federal MBUF to replace federal fuel taxes, consider making it a true highway user fee, on the users-pay/users-benefit principle I discussed above as a short-term fix for the Highway Trust Fund.

In the meantime, increased use of tolling and P3s for major projects such as replacing billion-dollar bridges and interchanges and rebuilding corridors on the Interstate system can take some of the load off the Trust Fund.

The False Conflict Between Highways and Climate Policy

There is a growing consensus that because cars and trucks emit CO₂, highways should not be expanded, and public policy should aim at reducing vehicle miles of travel (VMT). In a static world, this would make sense. But what does a long-term view suggest?

By 2050, when we might have completed reconstruction and modernization of the Interstate highways, more than half of the vehicle fleet (cars and trucks both) could well be zero-emission electric vehicles.¹¹ And Level 4 autonomous vehicles will be mainstreamed for both cars and trucks. So CO₂ emissions will be on a sharply downward track. At the same time, vehicle autonomy will make truck platoons feasible, with (at most) one driver for several trucks, making trucks more competitive with railroads. Likewise, autonomous personal vehicles will take market share from airlines for short and medium haul routes.¹² Other things equal, these changes will likely require more highway capacity than current projections suggest. But this will be okay, because vehicular CO₂ emissions will be well on their way to being a thing of the past.

Rather than seeking to reduce future VMT, we would be well-advised to plan for it, assuming that public policy continues major efforts to electrify transportation.

This concludes my testimony. I would be happy to answer questions, both now and any follow-up questions by email.

¹¹ Ibid.

¹² Kenneth A. Perrine, Kara M. Kockelman, and Yantao Huang, "Anticipating Long-Distance Travel Shifts Due to Self-Driving Vehicles," presented at the 97th Annual Meeting of the Transportation Research Board, January 2018

Senator CARPER. Thanks a whole lot, Mr. Poole. You have given us a lot to think about here.

Our final witness for this morning's panel is Douglas Shinkle. Mr. Shinkle is the Transportation Program Director within the Environment, Energy, and Transportation Program, the National Conference of State Legislatures.

Mr. Shinkle, thank you for joining us this morning. You are recognized at this time to present your testimony. Please, go ahead.

STATEMENT OF DOUGLAS SHINKLE, TRANSPORTATION PROGRAM DIRECTOR, NATIONAL CONFERENCE OF STATE LEGISLATURES

Mr. SHINKLE. Chairman Carper, Ranking Member Capito, and distinguished members of the Senate Environment and Public Works Committee, my name is Douglas Shinkle, and I am the Transportation Program Director at the National Conference of State Legislatures, NCSL.

NCSL is the bipartisan organization representing the 50 State legislatures and the legislatures of our Nation's commonwealths, territories, possessions, and the District of Columbia. Our mission is to strengthen the institution of the legislatures, provide connections between the States, and serve as the voice of State legislatures in the Federal Government.

Mr. Chairman and Ranking Member, I would like to take this opportunity to thank you and the Committee for your leadership on the important issue of transportation funding and financing, not just with today's hearing, but also on the Committee's work on surface transportation reauthorization.

As the previous witnesses have mentioned, revenue flowing into the Highway Trust Fund has proven to be insufficient to support surface transportation programs. As such, since the FAST Act, States across the Nation have worked to research, develop, and deploy new funding mechanisms to meet their own transportation funding needs.

We very much thank Congress for the Surface Transportation System Funding Alternative Program, STSFA, which was established in the FAST Act, and we do urge Congress to build upon that and support a new user fee, formula-based transportation funding mechanism to provide the much needed investment in the Nation's transportation infrastructure.

I am going to spend a little bit of time just going over some of the most common and notable State transportation revenue options, with a focus on user-based revenue sources. I will just briefly touch on gas taxes, since I think we all have a good sense of how those work and what they look like. I will note, since 2013, 30 States and the District of Columbia have enacted legislation to increase gas taxes. Those gas tax increases have ranged from 2 to 23 cents. Twenty-two States and the District of Columbia have a variable rate gas tax that adjusts, to some degree, with inflation or prices without regular legislative action.

Let me talk about electric vehicle fees a little bit, because that is something that is certainly on the mind of State legislatures at the moment. That is one widely adopted policy approach to address funding shortfalls related to the declining gas tax revenues is to

apply a separate, additional registration fee for plug in, electric, or hybrid vehicles. In fact, 28 States have such a fee for electric vehicles, and of those 14 States also assess that slightly lower fee on plug in hybrid vehicles. These fees range from \$50 to \$225 per year, and the fee revenue is most often directed toward a State transportation fund. However, at least three States allocate some fee revenue to support EV charging.

Additionally, at least five States structure the additional registration fees to grow over time by tying them to the consumer price index or another inflation related metric. Along the same lines, States have also been enhancing registration fees for traditional passenger vehicles.

Since 2017, at least 12 States have enacted legislation to enhance registration fees for traditional vehicles. California and Utah are among States that recently have indexed their registration fee to CPI, so it will be increasing over time and doesn't necessarily have to go back and be adjusted constantly by the legislature.

With the kind of growing ubiquity of transportation network company services, such as Uber and Lyft, States and local governments have been looking at how to kind of address the impact of those services. At least 11 States and Washington, DC, have enacted laws creating additional fees for transportation network company rides and fares. Most of these States use these fees to administer TNC regulatory oversight. At least four States, Georgia, Maryland, Massachusetts, and New York, as well as DC, use some of the fees to in part support transportation projects in their State.

Let's talk a little bit about road user charges, RUC. I am going to refer to it commonly as that. Dr. Hendren and Jack and Bob all kind of weighed in on that to a certain extent.

States have been on the forefront of studying road user charging since the early 2000s, when Oregon first started looking into it, and many States are currently exploring RUC systems. Many of these efforts have been supported by the Federal Government via the STSFA Grant Program, Surface Transportation System Funding Alternatives. Fourteen States have been awarded STSFA Grants, although when you kind of calculate the Eastern Transportation Coalition and then RUC West, the reach of the number of States involved, in some ways, is even higher than that.

It is worth noting that there are two operational RUC programs in the country today. Oregon and Utah both have them. Oregon's has been around for a few years, I think since 2016, now. Utah has just started recently. They are both voluntary and both created at the behest of their State legislatures. Oregon's program is open to any vehicle over 20 miles per gallon, while Utah's is currently open only to electric and hybrid vehicles.

Virginia's RUC program will go live in the summer of 2022. Oregon, Utah, and soon Virginia will allow drivers of plug in, hybrid, and electric vehicles to not pay the full enhanced registration fees if they participated in a State RUC program.

There has been a lot of legislative interest in this in 2019 and 2020. At least 19 States considered 34 pieces of legislation addressing RUC. Of those, seven States enacted eight pieces of legislation. Thus far, in 2021, there are 12 States considering RUC related legislation.

I realize I am short on time. I just want to quickly talk about public-private partnerships. There has been some discussion about kind of access to capital and using the free market to kind of help build some of these, especially big projects. Thirty-eight States, Puerto Rico, and DC statutorily operate P3s for the transportation sector. State enabling statutes range from project specific to limited authority based on project size to broad comprehensive frameworks for P3 agreements.

The most common type of transportation P3 tends to be a tolled facility, but P3s don't necessarily equal tolls, and tolls don't necessarily equal P3s. In other words, owners of the road, a State DOT or a local government, could build a job the old fashioned way or have a private contractor do the design build, and then the DOT can charge the tolls themselves.

States have undertaken non-toll P3 projects with their private partners, such as bundling bridges in Pennsylvania and transit projects in Maryland. Colorado, Louisiana, and Virginia are some of the States known for having a robust P3 State structure and project portfolio.

So, with that, I want to wrap up and just say we applaud Congress for taking this initial step to examine potential methods to ensure sufficient and stable long-term Federal transportation funding and encourage continued outreach to States to develop and shared long-term vision for funding and financing surface transportation systems that will enhance the Nation's prosperity and quality of life for all Americans.

Thank you very much for having me.

[The prepared statement of Mr. Shinkle follows:]



TESTIMONY OF
DOUGLAS SHINKLE
Transportation Program Director
National Conference of State Legislatures

REGARDING
“Long-term Solvency of the Highway Trust Fund: Lessons Learned from the Surface
Transportation System Funding Alternatives Program and Other User-based Revenue Solutions,
and How Funding Uncertainty Affects the Highway Programs.”

BEFORE THE
ENVIRONMENT AND PUBLIC WORKS COMMITTEE
UNITED STATES SENATE

APRIL 14, 2021

444 North Capitol Street, N.W., Suite 515, Washington, D.C. 20001
Tel: 202-624-5400 | Fax: 202-737-1069

Chairman Carper, Ranking Member Capito, and distinguished members of the Senate Environment and Public Works Committee, my name is Douglas Shinkle, transportation program director at the National Conference of State Legislatures (NCSL), the bipartisan organization representing the 50 state legislatures and the legislatures of our nation's commonwealths, territories, possessions, and the District of Columbia. NCSL's mission is to strengthen the institution of the legislatures, provide connections between the states and serve as the voice of state legislatures in the American federal system of government.

Mr. Chairman and Ranking Member, I would like to take this opportunity to thank you and the committee for your leadership on the important issue of transportation funding and financing, not just with today's hearing, but also on the committee's work on surface transportation reauthorization.

As we all know, with improved fuel efficiency, increased use of electric and hybrid vehicles, and a slow growth in vehicles miles traveled, revenue flowing into the Highway Trust Fund (HTF) via the motor fuel tax has proven to be insufficient to support surface transportation programs. As of March 1, 2021, the Congressional Budget Office [has estimated](#), based on current trajectories, that the HTF has sufficient balances to cover expected outlays until summer 2022. Unless additional revenues or transfers are authorized, the HTF could diminish to the point that the U.S. Department of Transportation may have to delay payments to states for completed work. Late payments or reduced federal transportation spending to accommodate for the shortfall, is not an option for states.

Since the last major federal surface transportation reauthorization—the Fixing America's Surface Transportation (FAST) Act—in 2015, states across the nation have worked to research, develop, and deploy new funding mechanisms to increase their transportation revenues. With both the Surface Transportation System Funding Alternatives Program established in the FAST Act, and their own resources, states have been innovative in their efforts. We thank Congress for that program, but also recognize that more federal funding is needed to bolster new efforts to capture all system users and provide sufficient formula-based funding.

As Congress examines alternative funding mechanisms, NCSL urges you to prioritize formula-based funding. This would ensure that funds are distributed in a predictable and stable manner to all states and territories. Formula funding also allows for efficient project and multi-year program delivery wherein transportation needs, and projects are identified by states, metropolitan planning organizations, and local elected officials for funding prioritization. States are best aware of the transportation needs within their boundaries. Congress must not drive away from a user-fee, formula based national transportation funding stream.

We applaud Congress for taking the initial step of examining potential methods to ensure sufficient and stable long-term transportation funding and encourage continued outreach to and consultation with states to develop a shared, long-term vision for funding and financing surface transportation systems that will enhance the nation's prosperity and quality of life for all Americans.

I would now like to take this opportunity to provide the committee an overview of state activity.

State Transportation Funding & Financing Overview

State transportation funding shortfalls have been in a near constant state of crisis for more than a decade. To account for rising costs of road construction and maintenance with diminishing fuel tax

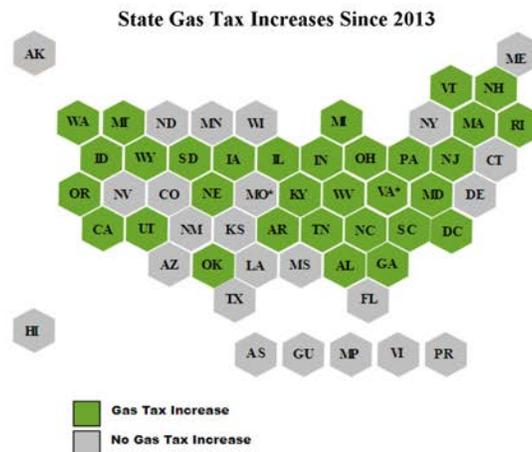
revenues over the last few years, state legislatures have introduced and enacted several approaches to fund and finance transportation, raising billions for the construction, operation, and maintenance of transportation infrastructure.

States have enacted and implemented increased gas taxes, indexed those gas taxes to an economic indicator such as CPI, created new tolling programs, enhanced vehicle registration fees and undertaken efforts to “lock-box” transportation revenues solely for transportation purposes. States are also pioneering new approaches to fund and finance needed transportation investment, such as studying and creating road user charging programs, enacting fees on electric and hybrid vehicles, charging fees for transportation network company rides, enhancing vehicle registration fees, and utilizing public-private partnerships for large transportation capital projects.

Motor Fuel Tax – Unit and Variable

In most states the motor fuel tax, commonly known as the gas tax, is a unit tax, paid based on the number of gallons purchased rather than a percentage of the final purchase price and therefore revenue is directly tied to how much gasoline is purchased. With new vehicle fuel economy continuing to rise and the growth in vehicle miles traveled leveling off, fuel consumption and therefore traditional revenue has stagnated and is not keeping up with transportation funding needs of states. The COVID-19 pandemic has not aided the problem either, with the U.S Department of Transportation’s Federal Highway Administration’s December 2020 Traffic Volume Trends report showing an estimating a 13.2% decrease in cumulative vehicle miles traveled for 2020, a decline of over 400 billion vehicle miles from 2019.

Many states have either considered or enacted legislation to raise, or reform, their fuel tax revenues in the past decade. Since 2013, 31 states and the District of Columbia have enacted legislation to increase gas taxes. Missouri voters’ decision to override the legislation on Election Day 2018 resulted in only 30 states implementing these increases.



Source : <https://www.ncsl.org/research/transportation/2013-and-2014-legislative-actions-likely-to-change-gas-taxes.aspx>

So far in 2021, legislation to increase or index a state fuel tax has been introduced in at least 15 states—Alaska, Arizona, Arkansas, Hawaii, Illinois, Kentucky, Minnesota, Mississippi, Missouri, Nebraska, New Mexico, North Dakota, Texas, Washington, and Wyoming.

Legislation in Alaska, Illinois, New Mexico, and Wyoming would increase state fuel tax rates, while legislation in Arizona, Arkansas, Hawaii, Indiana, Kentucky, Michigan, Minnesota, Mississippi, Nebraska, Texas and Washington would also index state fuel tax rates to annual changes in the Consumer Price Index (CPI) or the National Highway Construction Cost Index.

In 2020, one state—Virginia—and the District of Columbia, increased gas taxes. The bill in Virginia raised the gas tax 10 cents over a two-year period. Virginia also expanded the “wholesale fuel” tax, which previously only applied to portions along Interstate Highway 81 and changed the formula from a percentage basis to a fixed cents-per-gallon (CPG) rate adjusted to annual changes in the CPI. In July 2020, the D.C. Council approved an increase to its motor fuel tax rate, calling it the “Motor Vehicle Fuel Tax Amendment Act of 2020.” This increase will total 10.3 CPG by October 2021. Additionally, the rate will be annually adjusted based on the greater of the annual change in the CPI or zero thereafter.

In 2019, five states—Alabama, Arkansas, Illinois, Ohio, and Virginia—enacted gas tax increases, although Virginia's only applied to a portion of the state.

In 2018, Missouri and Oklahoma enacted legislation to increase their motor fuel taxes. However, Missouri’s increase was subject to voter approval due to constitutional limitations on revenue increases. Proposition D failed at the ballot box in November 2018, overriding the legislature’s desire to increase the state’s motor fuel tax.

In 2017, seven states—California, Indiana, Montana, South Carolina, Oregon, Tennessee, and West Virginia—passed legislation to increase fuel taxes. Additionally, Utah enacted measures to accelerate the motor fuel tax indexing provisions implemented in the state’s 2015 fuel tax legislation, likely leading to a fuel tax increase in subsequent years.

New Jersey was the only state to enact legislation to increase state fuel taxes in 2016, following a much more active 2015 in which eight states—Georgia, Idaho, Iowa, Michigan, Nebraska, South Dakota, Utah, and Washington—passed legislation to increase fuel taxes, and two more states—Kentucky and North Carolina—altered the structure of their taxes in order to limit decreasing revenues.

In 2014, lawmakers in Michigan (later overturned by voters), New Hampshire and Rhode Island enacted fuel tax legislation, and in 2013, six states—Maryland, Massachusetts, Pennsylvania, Vermont, Virginia, and Wyoming—and D.C., did the same. No state legislature approved an increase to fuel taxes in 2010, 2011 or 2012. Additional details are available at [NCSL’s Transportation Funding and Finance Legislation Database](#).

At the time of this testimony, 22 states and the District of Columbia have indexed or variable-rate gas taxes that adjust, to some degree, with inflation or prices without regular legislative action.

Examples of variable-rate gas taxes used by states include:

- A percentage tax on either the [wholesale or “rack” price of gasoline](#)—the price at which refineries sell their gas to clients. Proponents argue that this structure will allow for increased tax revenues as inflation causes gas prices to increase. Conversely, states will also experience decreased revenues as gas prices drop, and the volatile price of oil can create problems for long-term revenue forecasting.
 - In 2015, Kentucky and North Carolina adjusted their percentage-based gas taxes in response to dramatic decreases in revenues due to falling gas prices.
- Statutory provisions to automatically adjust a CPG tax to the consumer price index (CPI) (Florida, Maryland, North Carolina and Rhode Island).
- Tying the gas tax to a state’s inflation (California and Michigan). For example, in California, beginning July 1, 2020, the gas tax is adjusted according to the state CPI. The first increase was based on the CPI increase from Nov. 1, 2017, to Nov. 1, 2019, and subsequent adjustments will occur annually and be added to the associated rate for that year. The amount of the increase is the percentage equal to the increase in the California CPI, which is calculated by the state Department of Finance and rounded to the nearest one-tenth of 1 cent (1 CPG).
- Linking the gas tax to other metrics, such as population (North Carolina) or appropriation decisions (Nebraska).
- In 2020, Virginia, as mentioned above, expanded its wholesale fuel tax to apply statewide and also changed the formula from a percentage basis to a fixed CPG rate adjusted to annual changes in the CPI.
- Hawaii, Illinois and Indiana apply the state’s general sales tax to gasoline and therefore revenues are affected by prices.
- Georgia became the first state, in 2015, to enact legislation linking its gas tax to the efficiency standards of motor vehicles, potentially alleviating any lost revenue because of more fuel-efficient cars.
- Nevada’s gas tax is not indexed statewide, but the gas taxes in Clark and Washoe counties are indexed. The Nevada Legislature allowed voters by county to decide whether to index their gas taxes, with Clark and Washoe counties being the only ones to choose to index.

For a full list of states who have variable tax rates see below:

State	Gas Tax Structure	Year of Last Increase
Alabama	Tax indexed annually to the National Highway Construction Cost.	2019
Arkansas	Tax based on the average wholesale price of gas and diesel, with a floor (prevents the tax from dropping if the 12-month average wholesale price of fuel is less than the previous year), and a ceiling (limits the increase to no more than .1 CPG).	2019
California	Tax varies with inflation.	2020 (per 2017 legislation)
Connecticut	Tax varies with gas prices.	2013
Florida	Tax varies with CPI.	2015
Georgia	Tax varies with vehicle fuel-efficiency and CPI.	2015
Hawaii	Variable rate only because general sales tax applies to	**

	gas.	
Illinois	Tax varies with CPI.	
Indiana	Tax varies with inflation and general sales tax applies to gas.	2017
Kentucky	Tax varies with gas prices.	2015
Maryland	Tax varies with gas prices and CPI.	2013
Michigan	Tax varies with inflation.	2022 (per 2015 legislation)
Nebraska	Tax varies with gas prices and appropriation decisions.	2016
New Jersey	Tax varies with gas prices and revenue collection.	2016
New York	Tax varies with gas prices.	2013
North Carolina	Tax varies with population and CPI.	2015
Pennsylvania	Tax varies with gas prices.	2015
Rhode Island	Tax varies with CPI.	2015
Utah	Tax varies with gas prices and CPI.	2015
Vermont	Tax varies with gas prices.	2015
Virginia	Tax varies with CPI.	2020
West Virginia	Tax varies with gas prices.	2017
D.C.	Tax varies with CPI.	2020

Source: <https://www.ncsl.org/research/transportation/variable-rate-gas-taxes.aspx>

Enhanced Vehicle Registration Fees

Since 2017, at least 12 states—Arizona, California, Connecticut, Illinois, Indiana, Oregon, South Carolina, Tennessee, Utah, West Virginia, Wisconsin and Wyoming—have enacted legislation to enhance registration fees for passenger vehicles. Increases have ranged from \$5 in Connecticut, to \$15 in Indiana, to \$21.50 in West Virginia, to \$32 in Arizona and up to \$250 in South Carolina for an initial registration.

Examples of states which have enhanced registration fees since 2017 include:

- In California, between \$25 and \$175 based on a vehicle's value. A portion of this registration fee is adjusted to the CPI.
- Arizona established a [Public Safety Fee](#) of \$32 to support public safety and Highway Patrol operations.
- Wisconsin's registration fee increased by \$10 in 2019.
- In Oregon, vehicles with a 0-19 mpg rating pay \$18, vehicles with a 20-39 mpg rating pay \$23 and vehicles with a rating of 40 mpg or more pay \$33. These fees increase in January 2022 to \$20 for vehicles with a 0-19 mpg rating, \$25 for vehicles with a 20-39 mpg rating and to \$35 for vehicles with a 40-mpg rating or more.
- Illinois raised its registration fee by \$50 for passenger vehicles.
- Utah's registration fee increased by \$46.50 in 2019, \$69.75 in 2020 and \$93 in 2021. Registration fees are also indexed to the CPI.

Electric and Hybrid Vehicle Fees

Electric vehicle sales represent less than 2% of all light-duty car sales in the United States, but as sales increase, some states are concerned increased electric vehicle adoption will lower gasoline tax revenues. Because electric vehicles do not require gasoline to operate, they do not contribute to the upkeep of highways through a traditional gas tax. One growing policy trend to address funding

shortfalls is applying a separate registration fee for certain plug-in hybrid or electric vehicles. These fees come in addition to standard motor vehicle registration fees and proponents argue that the fees bring equity among drivers by ensuring all drivers pay for using roadways.

States with Fees on Plug-In Hybrid and/or Electric Vehicles



Source : <https://www.ncsl.org/research/energy/new-fees-on-hybrid-and-electric-vehicles.aspx>

Twenty-eight states have laws requiring a special registration fee for plug-in electric vehicles. Of those, 14 states also assess a slightly lower fee on plug-in hybrid vehicles. The fees range from \$50 per year in Colorado and Hawaii to as much as \$225 for a plug-in electric vehicle in Washington. Ten states—Alabama, Arkansas, Hawaii, Illinois, Iowa, Kansas, North Dakota, Ohio, Washington and Wyoming—enacted laws in 2019 amending or adding new fees for plug-in electric and some plug-in hybrid vehicles, more than any previous year.

Revenue from these additional fees is most often directed toward a state transportation fund. However, a few states also allocate some fee revenue to support electric vehicle infrastructure. For example, Alabama allocates \$50 of its \$200 fee for new electric vehicle infrastructure and Washington added an additional \$75 fee in 2019 to support charging stations. Colorado dedicates \$20 of the \$50 EV fee to the Electric Vehicle Grand Fund to support charging stations.

At least five states—California, Indiana, Michigan, Mississippi and Utah—structure the additional registration fees to grow over time by tying the fees to the consumer price index or another inflation-related metric. These states are striving to avoid the declining purchasing power of gas taxes due to years of fixed-rate structures.

Many state legislatures consider measures each session to add electric vehicle fees or amend existing legislation. This state policy action will likely continue to be a priority as state legislators examine ways to maintain funding for transportation infrastructure.

Transportation Network Company Fees

At least 11 states—Alabama, California, Connecticut, Georgia, Maryland, Massachusetts, Nevada, New York, New Jersey, Pennsylvania and South Carolina—and Washington, D.C., have enacted laws creating additional fees for Transportation Network Companies (TNCs) such as Uber and Lyft. The fees or taxes are charged per-ride or based on the fares. While most of these states use the fees to provide regulatory oversight of TNCs, at least 4 states—Georgia, Maryland, Massachusetts, New York—and D.C. use the fees in part to support transportation projects.

For example:

- Georgia enacted legislation in 2020 to impose a TNC excise tax of 50 cents per trip and 25 cents per trip for shared rides. The tax is adjusted to annual changes in the CPI during the preceding year. Each TNC company is required to submit a quarterly report that includes the number of trips provided by county of origin and destination. The law also states that revenues generated from the excise tax shall be appropriated to a transit provider and used exclusively for transit projects. According to the state Department of Audits and Accounts, the tax is expected to generate between \$4.4 million and \$13 million in its first full year, likely increasing in subsequent years.
- Maryland's TNC law authorizes a county or municipality to impose an assessment on TNC trips that originate within the county or municipality. The assessment fee may not exceed 25 cents per trip. From the assessments and revenues imposed by counties and municipalities, the state comptroller shall distribute each quarter the amount necessary to administer the assessments to an administrative cost account. The amount distributed to the administrative cost account may not exceed 5% of the revenue from the assessments and other revenue. The comptroller shall distribute the remaining revenue to the county or municipality that is the source of the revenue. Maryland's Montgomery County has created an assessment fee to fund a Transportation Services Improvement Fund to improve the delivery of accessible taxicab services and transportation options for senior citizens and persons of limited income.
- Massachusetts created a 20-cent fee on all TNC rides, with 50% of funds distributed to the cities and towns where the TNC ride originated, to address the impact of transportation network services on municipal roads, bridges and other transportation infrastructure or any other public purpose substantially related to the operation of transportation network services in the city or town including the state complete streets program and other programs that support alternative modes of transportation. Another 25% of fee revenue goes to the Commonwealth Transportation Fund, and the remaining 25% of fees goes to the Massachusetts Development Finance Agency to provide financial assistance to small businesses operating in the taxicab.
- The New York legislature imposed fees on ride-hailing and taxi service within New York City in the congestion zone of lower Manhattan below 96th Street. Uber, Lyft and other transportation network services will be charged \$2.75 charge per ride, taxis will be charged \$2.50 a ride and group ride services like Via and uberPOOL will be charged \$0.75 per customer. The revenue raised will be used to help fund subway repair and

improvements, providing an expected \$400 million per year going forward for the Metropolitan Transportation Agency.

Road User Charges/ Mileage-Based User Fees

Since the early 2000s, states have been at the forefront of discussions to explore possible replacements for the motor fuel tax, and given pressures on the tax, states are actively exploring other options, including piloting road user charge (RUC) systems. Also known as Vehicle Miles Traveled (VMT) charges or Mileage-Based User Fees (MBUF), this funding mechanism seeks to more closely link transportation taxes to the actual use of the roadways by a driver by charging drivers based on miles driven, instead of gallons of fuel consumed.

These efforts have been supported by the federal government through the federal Surface Transportation System Funding Alternatives (STSFA) grant program. Fourteen states have received STSFA grant awards to date—California, Colorado, Delaware (on behalf of the Eastern Transportation Coalition), Hawaii, Kansas, Minnesota, Missouri, New Hampshire, Ohio, Oregon (overseeing two grants including one to the Oregon Department of Transportation and the other to *RUC West*, which consists of Arizona, California, Colorado, Idaho, Hawaii, Montana, Nevada, Oklahoma, Oregon, Utah and Washington), Texas, Utah, Washington and Wyoming. Most of these grants have been to study and pilot RUC programs or similar concepts.

In 2019 and 2020, at least 19 states—Hawaii, Idaho, Illinois, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nevada, New Mexico, New York, Oregon, Texas, Utah, Vermont, Virginia and Washington—considered 34 pieces of legislation addressing RUC. Of those, at least seven states—Maine, Nevada, New Mexico, Oregon, Utah, Virginia and Washington—enacted eight pieces of legislation.

Notable RUC laws were enacted in Oregon, Utah and Virginia in 2020.

- Utah required the Utah DOT to establish a RUC program, that went live Jan. 1, 2020, and began enrolling drivers in January 2020. The Utah DOT must annually report and submit a plan to enroll all vehicles by Dec. 31, 2031. The [Utah Road Usage Charge Program](#) is currently open only to electric and hybrid vehicle owners.
- Virginia required the Virginia Department of Motor Vehicles to establish a voluntary RUC program. Eligible participants include owners of electric vehicles, alternative fuel vehicles or a fuel-efficient vehicle subject to a Highway Use Fee. Additionally, owners of other fuel-efficient vehicles, defined as vehicles with a combined fuel economy of at least 25 MPG, may enroll. The Virginia program is slated to go live in the summer of 2022.
- Oregon modified its RUC program (OReGO) by increasing the minimum fuel economy to 20 mpg to participate and exempted vehicles achieving at least 40 mpg from additional registration fees. The RUC program participant cap was also removed, and the per-mile rate was set to 5% of the per-gallon license tax.

Oregon and Utah have the nation's first operational RUC programs, both created at the behest of their state legislatures. A quick comparison of the two programs is below:



- **Created by Utah’s Legislature:** SB 136 (2018) and SB 72 (2019) established a voluntary RUC program.
- **Effective Date:** Utah began collecting electric vehicle fees in 2019 and the RUC program went live in Jan. 2020.
- **Eligible Vehicles:** Full electric vehicles, plug-in hybrid vehicles and gasoline hybrid vehicles.
- **Payment and Vendor Options:** One firm—DriveSync—offers reporting and payment services.
- **Other Provisions:**
 - An electric vehicle owner pays a \$120 fee. Owners who enroll in the RUC program, however, pay 1.5 cents per mile in lieu of this fee.
 - RUC participants can never be charged more than the annual registration fee and receive monthly invoices.
 - Vehicle owners with privacy concerns may opt for short-term data retention or pay a flat fee. Three mileage reporting choices.



- **Created by Oregon’s Legislature:** SB 810 (2013) directed ODOT to establish the nation’s first fully operational RUC program.
- **Effective Date:** Named OReGO, the RUC program went live in July 2015.
- **Eligible Vehicles:** Any vehicle achieving at least 20 mpg.
- **Payment and Vendor Options:** Three firms—Azuga, Emovis and ODOT—offer reporting and payment services.
- **Other Provisions:**
 - Vehicles achieving at least 40 mpg, as well as electric vehicles, are exempt from paying supplemental fees by enrolling (\$33 for vehicles with fuel efficiency at or above 40 mpg and \$110 for electric vehicles).
 - The per-mile rate is set at 5% of the per-gallon license tax (currently 1.8 cents per mile).
 - ODOT is also consulting with new vehicle dealers to determine the most effective methods, at the point of sale, to encourage participation.

Notably, vehicle owners have the option to forgo paying the electric vehicle and alternative fuel vehicle fees by enrolling in the Oregon and Utah RUC programs. Vehicle owners in Virginia will also have the same option when their RUC program becomes operational in 2022.

So far in 2021, 12 states—California, Connecticut, Minnesota, Missouri, New York, Oklahoma, Oregon, Tennessee, Utah, Vermont, Washington, and Wyoming—have introduced legislation concerning RUC. One of Utah’s bills was enacted, creating the RUC Program Special Revenue Fund, and requiring RUC revenues to be used for the costs of administering the RUC program and for state transportation purposes.

To learn more about state RUC programs and policies, see [NCSL’s State Road User Charge Pilot Results and Legislative Action](#).

broad comprehensive enabling statutes creating new P3 authority in a state to minor or substantial tweaks to existing state P3 authority.

In April 2020, [New Jersey's Department of the Treasury \(Treasury\)](#) adopted [regulations](#) designed to support the implementation of a broad enabling [P3 law](#) approved by lawmakers in 2018. Previously, only state and community colleges were permitted to enter into P3 agreements. Highway projects must include an expenditure of at least \$100 million in public funds or any expenditure solely in private funds. Additionally, the law allows up to eight P3 highway projects to be advanced at any given time. Authority to enter into P3 agreements was also extended to the N.J. Transit Authority. The law directs the Treasury with [reviewing and approving](#) P3s.

The Arkansas and Kentucky legislatures created broad enabling legislation for P3 projects in 2017 and 2016, respectively.

Next Steps

Mr. Chairman and Ranking Member, I thank you for this opportunity to testify before the Committee on this important topic, and NCSL looks forward to working with Congress and the U.S. Department of Transportation to examine state transportation funding trends, and exploring new, innovative user-fee, formula-based transportation funding and financing mechanisms to provide much needed investment in the nation's transportation infrastructure.

NCSL Contacts:

Douglas Shinkle, Transportation Program Director (douglas.shinkle@ncsl.org)

Kristen Hildreth, Sr. Policy Specialist – State Federal Relations (kristen.hildreth@ncsl.org)

Senate Committee on Environment and Public Works
Hearing entitled, “Long-term Solvency of the Highway Trust Fund: Lessons Learned from the Surface Transportation System Funding Alternatives Program and Other User-based Revenue Solutions, and How Funding Uncertainty Affects the Highway Programs.”
April 14, 2021
Questions for the Record for Douglas Shinkle

Senator Inhofe:

1. Mr. Shinkle, I am glad to see 28 States have passed laws requiring special registration fees for electric vehicles (EVs) to help pay for their fair-share of roadway improvements. Although EV sales only represent less than 2% of all light-duty car sales in the U.S., States and the Federal government should be concerned that increasing EV adoption will lower gasoline tax revenues, especially as the Biden Administration makes the transition from internal combustion engine to EV a national priority. The Federal-Aid Highway Program is currently built on a user-pays, user-benefits model and capturing a growing segment of the driving public that does not currently pay to maintain our roads is a top priority of mine in any upcoming surface transportation bill.

In Oklahoma, the State Senate just passed a bill that would levy a three-cent tax per kilowatt hour to charge an electric vehicle as well as charge registration fees for EVs based on the vehicle weight and type. This money would then be directly apportioned to a road and bridge improvement fund to support State and county roadway projects.

- a. How have the 28 States used these special registration fees after they’ve been collected? Are the fees solely used for transportation projects?

The fees are predominantly used for transportation projects. Revenue for these additional fees is most often directed toward a state transportation fund. However, there is growing interest from state legislatures to invest revenue back into electric vehicle adoption and charging infrastructure. Currently, three states also allocate some fee revenue to support electric vehicles. Alabama’s HB 2 (enacted in 2019) requires \$50 of the \$200 fee on plug-in electric vehicles to be used to pay for new electric vehicle infrastructure. Washington added an additional \$75 fee in 2019 to support charging stations. Colorado dedicates \$20 of the \$50 EV fee to the Electric Vehicle Grand Fund to support charging stations.

- b. Have these States tied the fees to grow by an inflation-related metric?

At least five states—California, Indiana, Michigan, Mississippi and Utah—structure the additional registration fees to grow over time by tying the fees to the consumer price index or another inflation-related metric. These states are striving to avoid the declining purchasing power of gas taxes due to years of fixed-rate structures.

- **California** - Effective January 2021 and every year after, the fee will increase in accordance with the consumer price index.
 - **Indiana** - The fee is indexed to the same inflation mechanism as the motor fuel tax, which includes using the annual change in the Consumer Price Index and the Indiana Personal Income index.
 - **Michigan** - Indexes its EV fees based on the motor vehicle fuel tax. Each 1 cent fuel tax increase above 19 cents increases the battery electric vehicle (BEV) annual fee by \$5 and the plug-in hybrid electric vehicle (PHEV) annual fee by \$2.50.
 - **Mississippi** - Beginning July 1, 2021, fees will be indexed to inflation.
 - **Utah** - Beginning Jan. 1, 2022, fees will be indexed to the consumer price index.
- c. Have individuals in these 28 States viewed the special fees as a disincentive to EV ownership? Or are these fees viewed fairly as bringing equity among drivers?

These fees come in addition to standard motor vehicle registration fees and proponents argue that the fees bring equity among drivers by ensuring all drivers pay for using roadways. The states that have passed special fees have primarily cited lost revenue from gas taxes and bringing equity among drivers as a primer driver of the legislation. There has been pushback to these EV fees, with opponents arguing such fees disincentivize the purchase of EVs and thus negatively impact efforts to reduce emissions from transportation. Several organizations have published recent reports questioning whether EV fees are the best solution, including a [2019 report](#) from Consumer Reports and a [2020 report](#) published by the Sierra Club, Plug In America, FORTH, and the Electrification Coalition.

State legislative efforts to create road user charging (RUC) programs has also been done specifically with equity in mind, to more closely link fees to the use of roadways. The RUC programs in Oregon and Utah both allow electric vehicle owners to forego paying the enhanced EV registration fee if they enroll in their state's RUC programs. Virginia electric vehicle owners will have a similar option when their program becomes operational in summer of 2022.

Senator CARPER. Mr. Shinkle, thank you, and thanks to all of our witnesses. I don't know about the rest of my colleagues here and joining us virtually, but I think this is fascinating stuff.

I am sitting here thinking about Dwight Eisenhower and his leadership, which got us started on the interstate highway system. Transformational for our country.

We are on the cusp of another transformational change in the way we not just build our roads, highways, and bridges, build back better, also in the face of climate change and do so at a time when we are trying to figure out how to pay for this stuff and in ways that make sense and are acceptable politically and just make good common sense economically, too.

Mary Frances Repko has given me, our staff has just given me a list of names here in order of recognition, and this may change a little as people pop up virtually. I am going to lead off, followed by Senator Capito, Senator Cardin, Senator Inhofe, and if he returns, Senator Whitehouse, Senator Cramer, and Senator Lummis.

I will just start off, if I could.

First question is, where do you agree? Where do our witnesses agree? Pick a major point or two where you think there is consensus among the witnesses who are here testifying today, and tell us, where do you agree? Just be very brief. Take a minute, no more than a minute for each of you.

Mr. Kile, where is there consensus? Where is the common ground? Go ahead.

Mr. KILE. I think the thing where there is agreement at this point is that there is a shortfall in the trust fund in the coming years. Most of the other panelists have spoken of policy choices. They are all representing particular positions.

CBO does not have a particular position on what the Congress ought to do, and so I will basically stay silent on other areas of agreement or disagreement. My testimony mainly focused on options for you and your colleagues.

Senator CARPER. All right, thank you.

Mr. Basso, Jack, where do you see areas of agreement amongst the five witnesses? Go ahead.

Mr. BASSO. Thank you, Mr. Chairman. I see a minimum of three areas. No. 1, action has to be taken if we are going to be successful in implementing a major and futuristic transportation infrastructure investment program.

Second, that the gas tax, and you know better than I do the political reasons why we can't just raise the gas tax, would prove that.

The second point is that two commissions and a lot of other study has suggested that per mile costs and travel as a billing cycle is a way to accomplish this and take into account the changing mix of the fleet. Electric vehicles will become far more prominent in the near future than we would have thought 10 years ago.

I think the last thing is that a national pilot is definitely necessary if the Federal Government is going to engage in this activity, and I think we will, and to accomplish what we can learn and deal with all the attendant issues.

Thank you, Mr. Chairman.

Senator CARPER. Thank you, Mr. Basso.

Dr. Hendren, where do you see areas of agreement, consensus, amongst the five witnesses, please?

Ms. HENDREN. Chairman, I am going to go back to your comments in your opening remarks about not compromising on principle. I think what we keep hearing is the need to get back to the user pay principle, and that came up in everyone's comments.

So I would really focus on that as a big reason why we are here, and the concept of pay for what you use, it resonates. It resonates with the public; it resonates within this room, and outside this room. So that is encouraging, that we can have this transformational change for the future.

What I see is Federal leadership, again, thanks to this Committee to have that grant program that has built momentum, and that momentum has been remarkable in the last 4 years.

But I do think having continued State level work is going to be important, again, kind of getting that groundswell of understanding in combination with that Federal leadership and a national education campaign about the importance of transportation. That is why we are all here today, and the need for change. So that is where I see we really are all in lockstep on this topic.

Senator CARPER. Great. Thanks, Dr. Hendren.

Dr. Kile, where is the agreement? Where do you see the consensus, please?

Mr. KILE. Did you mean to call on me?

Senator CARPER. No. I have gotten out of line here.

Mr. Poole, yes, thanks very much.

Mr. Poole.

Mr. POOLE. There we go. I am on now?

Senator CARPER. Yes, you are. Go right ahead.

Mr. POOLE. I think we all are in agreement, apart from CBO, that we need to replace per gallon fuel taxes with per mile charges, in some form or another. Second, I think we all agree that we need to invest more in our transportation system, for sure, and that the Federal Government has a continued role to play in research and development on the idea of how do we implement per mile charges in a way that is going to work and be affordable and politically acceptable.

I think we all agree that the user pay principle is very important. I think I am the only one that stressed users pay, users benefit as the second aspect of that, but I think there is a remarkable amount of consensus here. Thanks.

Senator CARPER. Yes. Thank you very much.

Going to our last witness, Mr. Shinkle, please.

Mr. SHINKLE. Yes, it is nice when we can all agree on this. It is one of the fun things about working on transportation.

I would agree. I mean, I think States certainly are aware of the pressures associated with increasing fuel efficiency and more electric vehicles. So they have been already feeling this and trying to grapple with this.

So if the Highway Trust Fund is in trouble, States realize that and they are looking for new solutions. It is good that we all acknowledge that there is an issue.

I do really agree that user fees are something that NCSL continues to support. As Bob alluded to, they also lead to a better sys-

tem and outcomes in terms of, you are linking, you are using something that can have positive impacts on congestion, what have you.

And then continue to engage with the States, this is so appreciated, bringing in NCSL on all these folks that are doing things out at State and regional, local governments. Continue to hopefully give States some seed money so States can continue to innovate and try different things and try to make sure that we are talking with the public. Because I do really think that any change is really going to need public buy in, clearly. A lot of times, having local and State elected officials that are closer on the ground is a good way to kind of seed those efforts and grow trust. Yes, there is a lot of areas of agreement, I think.

Senator CARPER. That is great. Mr. Shinkle, thank you. Thanks to all of you.

I will just say, the National Governors Association is multi-faceted, but one of the entities within the NGA is something called Center for Best Practices. It is a clearinghouse for good ideas.

I think of the States as laboratories of democracy. Many of us have held State offices as well, and you know this, and we can learn from the States, what they are doing well, and maybe not so well.

All right, Senator Capito, please.

Senator CAPITO. Thank you, Mr. Chairman. I just want to start out briefly.

We have heard a lot about VMTs and a lot of different acronyms that are used, but I think we understand what the concept of that is.

I want to go back to Dr. Kile just quickly for a clarification question. You mentioned that if the VMT was put into effect at 1 cent per mile, it would generate \$2.6 billion. But previously you had mentioned that over 10 years, the shortfall is \$195 billion. So, we have a big gap here.

My question is, back to Mr. Shinkle, in some of the States' pilot studies, is a 1 cent per mile, is that a marker that is been used for success here? Because it is not going to generate enough to hit our shortfall at all.

So Mr. Shinkle, I want to ask you that, about the 1 cent per mile. I also want to ask you, there are concerns on privacy. We haven't really heard much pushback on that, and maybe those issues have been sort of laid to rest through some of these State pilot studies. Mr. Shinkle, could you address the privacy issue as well?

Mr. SHINKLE. Yes, thank you, Ranking Member Capito. With regard to the mileage charge, let me look real quick. I believe in Utah, it is 1.5 cents a mile and in Oregon, it is 1.8 cents a mile, so somewhere in that range. Most of what the States I have seen talking about it, of course, those are the only two operational programs that are actually charging, so that gives you some sense. Most of the range that I have seen is somewhere in that range, and somewhere in between 1 to 2 cents, so I would say that is a fairly kind of accurate starting point.

With regard to privacy, I think you are definitely absolutely correct that that is going to be one of the big things for the public, kind of perception-wise, to get through is how to address this. Some

of the things States have done, I think, are really interesting, so maybe a couple examples.

Oregon, when they established their program back in 2013, they did work with the ACLU while they were developing that program, and that helps kind of get some buy in there.

A lot of the public feedback that the States that are doing the RUC programs or pilots has found that the more familiar with the drivers become with the systems, the more they have less of an issue with the privacy concerns. I am not saying that necessarily addresses all of them.

Another piece is offering options. That is something that California, and I would say Washington and some of these States are doing a lot of work on, digging and studying and looking at like, 10 different payment options. Some of those are like, for example, there are 15 States that do annual or biannual in person vehicle inspections, essentially. So those 15 States, you theoretically could just do an odometer reading very easily within existing State structures and law, and just have an odometer reading, and you are in and out, and there is no impact on your privacy.

Now, the flipside or the downside of that is that if you travel out of State, or you live on a large private ranch, where you drive a lot of miles on private roads, you are going to get charged for those miles. So the tradeoff is that having that location information is always going to be really helpful to ensure that you are being accurately charged and being charged as little as possible.

Some of the other things that States can do is that, certainly, I know Oregon and California and Utah have all done things around kind of disaggregating the location information. I know in Oregon they are only allowed to keep that location data for 30 days, and law enforcement has to have a warrant to access it. So there are a lot of things that need to be done.

I think States have taken good steps. I also do think this needs leadership at the local, State, and Federal level to continue to talk about this and to try and talk about the challenge that we don't have enough transportation funding.

So those are kind of some of my thoughts. Thank you for the question.

Senator CAPITO. Thank you. Thank you for your insight there.

Mr. Poole, in your statement, you mentioned that if all of the money that was generated from the gas tax was put toward the surface transportation bill, that it would be much closer to meeting the shortfall. Are you referring to the fact that funds from that gas tax are moved over to transit? Is that what you were alluding to?

Mr. Poole.

Mr. POOLE. Yes, I understand the question. What I was referring to is, if you look at the total amount of revenue from the highway user taxes going into the trust fund, versus the amount spent, there is only a \$2 billion a year gap right now, according to CRS, between the spending on highways and the revenue from highway users.

Almost all the shortfall is all the non-highway programs. So closing that \$2 billion gap would take a very slow increase in a user tax, which might be more acceptable to highway users if they knew that all the money that they put in was going to be spent to better

highways. The rest could be simply paid for out of the general fund, all the non-highway portions.

That would be my suggestion for a short-term fix. It is not going to solve the long-term problem, but it would make the Highway Trust Fund itself solvent.

Senator CAPITO. OK. Thank you.

Senator CARPER. All right.

Senator Cardin. Senator Cardin, to our witnesses, Senator Cardin serves as the Chair of the Transportation Infrastructure Subcommittee of this Committee and does a great job, and his wing person, wingman, on that is someone who has chaired this Committee before, Jim Inhofe. They are a good team.

Senator Cardin.

Senator CARDIN. Mr. Chairman, first of all, thank you, and I want to thank all of our witnesses. This panel has been extremely informative.

I sort of share the Chairman and Ranking Member's view that we are looking for revenues that can get bipartisan support and we can move forward as a Congress. We all recognize we have a shortfall, so I find this panel to be very helpful.

Senator Capito, as I understand it, the 1 cent per mile estimate is based upon commercial traffic, which is where the pilots are all headed right now. But as our witnesses have pointed out, if you are looking at replacing the existing gasoline tax, which gives us a lot greater need for revenues, we would be looking at a broader mileage user fee. It would create additional issues that would have to be resolved before we could get to that point.

So in one respect, we are looking at the mileage-based user fees to get us out of the current hole. If we are looking at the long-term impact, then we really do need to have other questions answered before we can do that.

One is federalism. How do you impose a national user fee based upon mileage and work with our States, because they use the gasoline as a revenue source? And how do we sort of bring this together under federalism and the interstate use of our transportation system?

I want to sort of challenge on two parts as we move forward, and maybe I will start with Dr. Hendren on this first, and that is, how do you answer the question, if we move toward a mileage-based user fee at the national level, low and middle income families being overly burdened? How do you deal with the fuel efficiency issues, which is one of our major objectives in all of our policies, is to increase the efficiencies of our transportation system?

Ms. HENDREN. Senator, thank you for the question.

I think starting with the first one about the impact that this potential shift from the fuel tax to a distance-based approach could have on different geographic areas as well as socioeconomic groups is work that still needs to be done. I think a really important place that we need to start that conversation is where we are today with the fuel tax is a regressive tax.

What we found, for example, in looking at rural communities versus urban and suburban, is that a lot of rural communities are paying more today under a fuel tax approach. With a shift to a distance-based approach, they would pay slightly less.

Senator CARDIN. I understand that more work needs to be done. I really do understand that.

Ms. HENDREN. OK.

Senator CARDIN. We are impatient right now, because we have got to act. So if we are going to act in this Congress to do a transformational improvement on our infrastructure, and we need to have revenues, but we don't want to adversely impact on middle and low income, what do we do?

Ms. HENDREN. I think the benefit of a distance-based approach versus a fuel tax is you have more policy levers. So, the way you set your rate, I think, is the answer to the question. You can have one rate that is the same for everyone. You can also look at rates that would vary based on where you live, income level, type of vehicle; there are a lot of options.

Again, that is a benefit of this kind of more transformational way of funding transportation. So I think that is the way to move forward there.

Senator CARDIN. How about on the energy efficiency issues? One of the points that was raised was that those who use electric vehicles, yes, they are very much impacting on our transportation system, but they are also a benefit in regards to the impact on our environment, so how do we weigh that issue?

Ms. HENDREN. I think what we have seen so far is EV owners are actually very willing to be part of a distance-based approach. If you look at the Oregon program, a volunteer program, almost a third of those volunteers are EV owners, so that shows you the choice to be an EV owner is about the environment. They do also want to have roads to drive on, so those issues are not at odds with EV owners.

Senator CARDIN. I guess I don't understand a voluntary program. They voluntarily agree to pay money?

Ms. HENDREN. You can either pay a registration fee or a cap amount, or you can do the voluntary program. So if you are an EV owner, you are not going to be paying fuel tax today, so if you opt into the program, you will be paying more.

Senator CARDIN. But wouldn't you make the judgment based upon what you think you are paying less money to the government? Wouldn't that be the decision?

Ms. HENDREN. Exactly.

Senator CARDIN. That doesn't necessarily reward energy efficiency.

Ms. HENDREN. It doesn't. But I think the reason I am bringing that up is, there is a concern that moving forward, the distance-based approach will hurt the sale of EV, hurt that transformation of our fleet. So what we are seeing out there in these demonstration pilots is that is not true in the programs.

Senator CARDIN. If I wanted to transfer to an electric vehicle, and I do lots of driving, but I am prepared to do that, I am prepared to charge where I need, the charging stations, pay for the battery support that I need, how does this system benefit that decision I am making to help the environment?

Ms. HENDREN. The way we have it now, is you would be paying a majority of your operating costs for an EV is that charging. They

are not paying for fuel tax, which is what we have been using to fund our roads and bridges.

So if the question is, what is the motivation for the EV owner, it is to support the roads and bridges on which they drive, so you are correct. If they are like, that is not cost effective for me, they could choose not to.

But what we are finding is a very openness to be part of the solution to have those roads and bridges to drive on. But I think your point about fuel efficiency, that is where our real challenge is right now, as far as the revenue loss from these much more fuel efficient vehicles.

So I look at Virginia's program as a real example of how to address that revenue loss from fuel efficiency. We have kind of two issues, and they kind of get merged, so I think looking at fuel efficient vehicles and looking at EVs, and this approach can address both of those types.

Senator CARDIN. You are absolutely right. The revenue loss is the environmental gain. You have to weigh it.

Thank you, Mr. Chairman.

Senator CARPER. Really good questions. One of the issues that Senator Cardin raised was actually addressed in part at a hearing yesterday. He and I sit next to each other on the Finance Committee, as well. He finds it hard to get rid of me.

Our witness yesterday was Commissioner Rettig, the Commissioner of the IRS. One of the issues that I raised with him is for the concern on raising a gas tax, user tax, user fees, our concern is how do we help make sure that lower income families, at risk families, don't end up bearing an inordinate amount of burden?

And I asked him too, this question, for the record, I said why don't you see if there is some way that we can provide through the tax system a rebate of some kind to go to families whose income is maybe below the median average in the country to help make them whole with some assumptions on how much gas and diesel they use? So, we will see.

OK, Senator Inhofe, you are up, please.

Senator INHOFE. Thank you, Mr. Chairman. Last hearing, I entered into the record an effort to protect the ban on Government controlled interstate rest areas. I know that some of our witnesses, I understand that Mr. Poole probably disagrees with this position, but it is one that we felt pretty strongly about.

I want to enter into the record this time, it is a similar letter. It is signed by stakeholders that we all know, such as the National League of Cities, the National Restaurant Association, Energy Marketers of America, and a lot of others, which talks about the value of the private sector investment across the Nation's highway network. I think the rest stops would give the Government, if they were Government controlled, an unfair monopoly. So this letter is one that covers that, and I want to have that as a part of the record.

Senator CARPER. Without objection.

[The referenced information follows:]



April 9, 2021

The Honorable Charles Schumer
Majority Leader
U.S. Senate
Washington, DC 20510

The Honorable Mitch McConnell
Minority Leader
U.S. Senate
Washington, DC 20510

The Honorable Thomas Carper
Chairman
Committee on Environment and Public Works
U.S. Senate
Washington, DC 20510

The Honorable Shelley Moore Capito
Ranking Member
Committee on Environment and Public Works
U.S. Senate
Washington, DC 20510

Dear Majority Leader Schumer, Minority Leader McConnell, Chairman Carper, Ranking Member Capito:

The below signed organizations – representing hundreds of thousands of mostly small businesses, as well as American cities and localities and blind entrepreneurs – urge you to protect the longstanding ban on commercializing Interstate rest areas as you consider legislation to incentivize investments in America’s infrastructure and reauthorize surface transportation programs.

We are eager to collaborate with you on transportation policies that will facilitate long-term, sustainable investment for infrastructure without harming existing off-highway businesses and that spurs improvement for the transportation sector. We urge you to reject proposals to carve out any exceptions to the commercialization ban that would allow state departments of transportation to compete against the private sector by selling food and fuel, including electric vehicle charging, or other commercial services at Interstate rest areas.

Like many across the nation, America's cities, restaurants, hotels, travel plazas, fuel retailers, convenience stores and blind merchants have been economically harmed by the COVID-19 pandemic. The private sector's ability to operate in a competitive and robust marketplace ensures its ability to provide jobs, generate critical tax revenues and further enhance investments in alternative fuels.

When Congress created the Interstate Highway System in 1956, Congress and community leaders feared that local businesses, jobs, and tax bases would shrink as motorists and truck drivers bypassed their cities and towns. For this reason, Congress prohibited new Interstate System rest areas from offering commercial services, such as food and convenience items. Since then, businesses have clustered near the Interstates at the interchanges to provide these services to Interstate travelers. Given how many businesses are located off of Interstate exits, it is one of the most competitive business environments in the country.

Today, our roads and bridges are in dire need of improvement, and the diverse group of organizations that have signed this letter all strongly support increased investment in our nation's infrastructure. Infrastructure has long been considered an economic driver and a job creator. As the nation continues to grapple with the economic devastation caused by the COVID-19 pandemic, now, more than ever, policies must incentivize such investment while creating jobs and refraining from undercutting important policy priorities that affect various sectors of the economy.

- **Commercialized Rest Areas Will Hurt Private Businesses**

While at first glance rest area commercialization seems like an easy and convenient way to generate revenue, the fact is it will jeopardize private businesses, especially with respect to small businesses, that for the last 60 years have operated under the current law and established locations at the highway exits. Due to their advantageous locations, state-owned commercial rest areas would establish virtual monopolies on the sale of services to highway travelers. Commercial activity will be diverted from off-highway communities to on-Interstate locations, redirecting tax revenue from localities to state capitals.

Commercializing rest areas will not generate "new" revenue. It would simply *transfer* sales away from the current competitive environment off highway exits to the business contractor that pays the largest amount to rent the location on the shoulder of the highway. When the government competes with private business in this way, it results in a monopoly, undermining the free market and raising prices for consumers.

- **Commercialized Rest Areas Undermine Cities and Towns**

U.S. cities are projected to lose \$360 billion of revenue through 2022 because of the economic damage caused by the COVID-19 pandemic, and communities have lost significant travel and tourism related revenue. Commercializing rest areas or putting significant public resources into electric charging infrastructure that would pull traffic away from companies that have invested in towns with access to the Interstate would further destroy the property tax base of local governments and put many out of business.

In many rural communities located near Interstates, gas stations, restaurants, convenience stores, truckstops, and hotels represent the largest local taxpayers, contributing more than \$22.5 billion in state and local taxes. These funds help support schools, police and fire departments and other vital public services.

Commercializing rest areas would further destroy the property tax base of local governments and put out of business many companies that have invested in creating a business model based on access to the Interstate. The damage to thousands of local businesses means the cities and towns that rely on those businesses for tax revenues will be further challenged to make up a substantial budgetary shortfall.

- **Commercialized Rest Areas Hurt Consumers**

Prices are significantly higher at existing state-owned commercial rest areas than off-highway competitors because the state, contractor, and leasing vendor all take a piece of product sales. Additionally, the lack of viable competition will eliminate any downward pressure on prices. This stands in stark contrast to exit-based businesses, which operate in one of the most competitive environments in the United States, often competing with multiple other entities in close proximity to one another.

- **Commercialized Rest Areas Threaten the Livelihood of Blind Merchants**

Businesses that are owned by blind entrepreneurs currently enjoy a priority for installing and operating vending machines at Interstate rest areas. Many blind business owners throughout the country rely on this opportunity to earn a living, support their families, and realize the American dream. If commercial rest areas are allowed, these entrepreneurs would be out of work virtually overnight.

- **Commercialized Rest Areas Discourage Investment in Alternative Fuels**

Our associations support investment in a full range of fueling options for consumers including electricity as well as other alternatives to petroleum-based fuels. We believe the best way to achieve this, however, is to use tax, funding and other policies to incentivize private, off-highway retailers to invest in these technologies. Making available electric vehicle charging stations or other alternative fuels is a commercial service. Congress prohibited states from offering commercial services at Interstate rest areas specifically so that private sector entities would grow and provide those services to travelers. Installing electric vehicle charging infrastructure therefore on the federal Interstate rights-of-way would require overturning the rest area commercialization ban that has been in place for more than 60 years. As with any other product, our position on offering electric vehicle charging or other alternative fuels at Interstate rest areas reflects our desire to facilitate an environment where private businesses that are not located within the right-of-way are encouraged to make these investments. In fact, many off-highway fuel retailers and other businesses have invested significant resources in alternative fuels such as electric vehicle charging infrastructure, biofuels, and natural gas. If such alternative fuels were made available at rest areas on the Interstate right-of-way, it would discourage the private sector and these off-highway businesses from making such investments and ultimately hinder growth in these alternative fuels.

- **Commercial Rest Areas Constrict Truck Parking Capacity**

Commercial rest areas diminish truck parking capacity, threatening a Congressional objective to increase truck parking availability nationwide. Private truckstops and travel plazas located at the Interstate exits provide 90 percent of all truck parking in the United States, mostly free of charge, and need a healthy business climate to operate and expand. When states are permitted to provide commercial services at their rest areas, private businesses either go out of business or, at the least, will not invest in expanded facilities. This will result in a net loss in truck parking capacity.

In conclusion, commercializing Interstate rest areas would create far more problems than it will solve. States and local communities will suffer when exit-based businesses and the jobs they support have to cut workers and potentially close; hard-working business owners will lose out on a significant portion of their customer bases; blind entrepreneurs will be out of work; and truck drivers will have a harder time finding a safe place to rest.

We strongly urge you to oppose efforts to commercialize Interstate rest areas.

Sincerely,

NATSO, Representing America's Travel Centers and Truckstops
Asian American Hotel Owners Association
Energy Marketers of America
Franchise Business Services
International Franchise Association
National Association of Convenience Stores
National Automatic Merchandising Association
National Federation of the Blind
National Franchise Association
National League of Cities
National Restaurant Association
National Retail Federation
National Tank Truck Carriers
Natural Gas Vehicles for America
Society of Independent Gasoline Marketers of America

Senator INHOFE. It is kind of interesting. Ben Cardin and I were both elected in the same year, 1986, and we have been dealing with this all these highway bills ever since that time. So we have a lot of seniority on these issues.

One of the interesting things I always like to point out to my friends and witnesses at such hearings is this: Most of them are too young to remember this, but I remember one of the biggest problems we had in the Highway Trust Fund is we had too much surplus, and so everyone's trying to rob the surplus.

One of the worst offenders of that was Bill Clinton. He actually took—I can't remember how many billion dollars was out of that. It took me about 2 years to get it all back in, anticipating that we would have the problems that we are having today.

One of the unique things about this is, this is a program that everyone agrees with. I can remember a lot of the Republicans who were running for President a few years ago were trying to each one be the most conservative, more conservative.

One of our people who went back actually was one of the candidates from, I shouldn't say this, but from Kentucky. He got up there, and all the transportation people jumped all over him. You are running for President, and we don't want—and he said, oh, I wasn't talking about transportation.

See, we have that benefit that people all fall into agreement that we want to have that system. So anyway, I was glad, this is the first time that I have heard that all of our witnesses came in agreement knowing that there should be a user pay concept.

I have been saying this when it was very unpopular to say this, and now I think it is more popular than it was at that time, so I think we are making some headway in this area. I would like to make sure that there is no one here—what we all agree is, we do need a long-term highway bill to give the States the certainty and predictability. I would assume, if there are any of our five witnesses who don't agree with that, say so now. Because I believe that is a concept that we all agree on.

I think also the fact that we are now looking at something on the electric vehicles on paying their fair share, and I just rejoice in the fact that people are talking about that now, and it is popular, and it is very fair.

Now, Mr. Shinkle, I understand that nearly 30 States have passed electric vehicle fees to help pay for the road. I would like to have you elaborate a little bit on, have these revenues been used to invest in roads and bridges? Has it been successful? We are looking at this right now in our State of Oklahoma, and so I would like to have you explore that a little bit on what has been workable in the past.

Mr. SHINKLE. Yes, thank you for that question, Senator Inhofe. Twenty-eight States have enacted fees on electric vehicles and 14 on hybrid vehicles. That money is, except for three States, that money is pretty much going into transportation projects.

Sometimes transportation projects are a little more broadly defined to include a little bit of electric charging stations and things like that. Generally, for the most part, that money is going into the State fund that pays for transportation there. Given that no State, I don't believe, has more than 2 percent or I think even at the most

of their personal vehicle fleets that are electric vehicles, the amount of money thus far isn't really substantial.

Now, that is going to start to change, and it is going to become more important. I think every year it is going to become more important, frankly, especially within 5 to 10 years as that kind of bridge until we do figure out if we are moving to a RUC or what are we going to do.

But the short answer is there is not necessarily a lot of money there, it is really more of an equity kind of concern at this point. If there is a group of vehicle owners, in many cases, which tend to be but not always are higher income that weren't paying to be part of the system at a time when the system needs more money in.

So that was a lot of the rationale behind that. I am happy to provide more information on how the States have exactly been spending that money in the follow up testimony, but it is mostly for State transportation projects, maintenance, and operation, what have you.

Senator INHOFE. For the record, any elaboration on that you can get, that would be very helpful to us. I think this hearing has been very helpful.

The question that we get, one of the differences between witnesses and people sitting at this table is, you guys don't have to run for election. The first thing when we hear a VMT system or one of these other systems, the first thing that comes to me is the questions that people are always asked when we talk about this publicly, the only question they have is, how much is it going to cost me?

Anyone have a good idea on a good answer for that question? No, I didn't think so.

All right, thank you very much, Mr. Chairman.

Senator CARPER. I would just say to my colleague, as you know, I have talked to a lot of Governors and a lot of State legislators, and I know you have too, but those who have in the last decade, not in the last 5 or 6 years, who supported increases in traditional user fees in their States have actually been more electable rather than less. It is pretty amazing.

I think next is Sheldon.

Senator Whitehouse, please.

Senator WHITEHOUSE. Thank you, Chairman.

Thank you to all the witnesses.

I want to pick up on the same topic that we have been talking about, which is how we get electric vehicles to pay a fair share of the use of the road. But I come at it from a slightly different perspective, because I have this Consumer Reports information here that shows the number of States in which what is charged electric vehicles is higher than what is charged internal combustion engine vehicles.

In some cases, it is not a huge difference. It is 40 percent more, 20 percent more, 36 percent more. But in some cases, it is nearly triple. The expectation of Consumer Reports is that these are going to continue to trend upwards with electric vehicles being charged as much as four times what an internal combustion engine vehicle is charged.

So I think that as we address this issue, and we address it from an equity point of view, it is going to be important, looking at whatever kind of a highway funding program we put in to make sure that this is not being used as a mechanism to suppress to development of electric vehicles. It is hard for me to see a reason why it should be more.

I don't know if any witness can identify a manner in which an electric vehicle is harder on the highways and bridges than an internal combustion engine powered vehicle. If these were great big trucks that had extra weight—my Governor, who is now Secretary of Commerce, Governor Raimondo, put an extra toll for trucks coming through Rhode Island. It worked out; I mean, the truckers didn't love it, but it worked out pretty well in terms of convenience because of EZ Pass, which makes tolling so easy.

I understood that they do put a lot more wear and tear on the roads than a regular passenger vehicle. But an electric vehicle, I think, is pretty equivalent to an internal combustion engine vehicle in terms of the wear and tear it puts on the roads.

So it doesn't make sense to me why these States, many of which have significant fossil fuel investment in them and fossil fuel activity in the legislature would be charging a higher fee against electric vehicles than they do internal combustion engines, unless they were actually trying to suppress electric vehicles so that we could continue to burn more gasoline and continue to pump carbon dioxide into our atmosphere and continue to pollute, and obviously none of that is a very good thing.

So, I hope as we try to solve this, Mr. Chairman, we will keep in mind that it really would not be appropriate for States to use this predicament that we have right now to pick winners and losers as between electric and internal combustion engine vehicles. There is no statement of what the purpose is in any of this, so we will look into it further.

But my surmise would be based on the location of the States and the lack of any apparent justification for charging electric vehicles more than that this has something to do with trying to suppress the growth of electric vehicles. I don't think that is a winners and losers contest that we should be in, and it is not a contest that I think we should allow the States to get into because of all the other collateral costs of suppressing the growth of electric vehicles.

So, that is what I wanted to mention today. We have done highway work in really strong bipartisan fashion before, and I think it really is important that we take care of our roads and bridges and the traditional infrastructure for automobile transport.

But I will be extremely concerned about any proposal that we adopt that allows for this kind of selective choosing of winners and losers and deliberate suppression of consumer choice toward electric vehicles, particularly if we discover that the fossil fuel industry has had its hand in the politics of any of these places and getting those fees to be jacked up to where it costs more to own an electric vehicle than it does to own an internal combustion engine vehicle.

With that, I am happy to yield back the rest of my time, and I look forward to working with everybody to get a good bipartisan bill going on this and continue to develop our infrastructure.

Senator CARPER. I think we all share that view; that is good.

One of the things that I mentioned earlier, as Senator Whitehouse said, during the break, one of my sons came home from California, and we just went out and drove all kinds of vehicles. I will say this: Those electric vehicles are a lot of fun. They are just a hoot. They have got a lot of torque. He and I both felt like kids at the end; he still is.

All right. I think next is Senator Cramer, please.

Senator CRAMER. Thank you, Mr. Chairman.

Thanks to all the witnesses, and I agree with a lot of what has been said, largely over the fact that we are unified in the goal. The details will kill us, eventually, probably.

In the meantime, I do think there is a lot of common ground.

Certainly, Mr. Chairman, to your opening statement, I remain committed to principle while having an open mind to the policies that will get us where we need to get, and I think we are off to a good start right here.

I would like to say, Senator Whitehouse raised an important point, and it is hard to know what any individual or group of States might be doing. Maybe we can get an answer to that in a little bit. But I think a lot of those fees are registration fees. When you break it down to the use fee, it is probably less, not more.

The other thing I would mention, in some of the studies I have seen, at least to this point, the California, UC Davis study showed that 30 percent of the people who drive an electric vehicle make over \$150,000 a year, and the next 50,000, from \$100,000 to a \$150,000 a year make up another 20 percent. Earlier, we were talking about some of the socializing, what I call social engineering here, with regard to it not hurting people at the lower income level.

Well, electric vehicles so far seem to be driven by people at the higher income level. I don't know that that is relevant, but I think as we are discussing all these things, it is worth noting.

Also, I appreciated, Doctor, your reference earlier in answer, I think it was to Senator Cardin. There is nothing, no tax hardly more regressive than the gas tax itself. So the idea that a user fee for electric vehicles is going to be worse for lower income people than the gas taxes would be hard, I would be hard pressed to see that. We could design it that way, I would hope we would avoid that.

So there is a lot of opportunity here to bring equity to all of the structures, and that would be, hopefully, the goal.

Also, with regard to that, and I want to get to some of the things that Senator Cardin was talking about when he talked about gas fueled vehicles. Obviously gas fueled vehicles emit greenhouse gases, CO₂. But nothing in the fuel tax, to this point, is designed to address any of that. It is not a punitive tax. It may look punitive sometimes, but there is not a carbon tax added on to it.

So when we start talking about, I think, Ben's parting comment was the loss of the gas tax is the environment's gain; well, that is true. That is a true statement. We are building roads and bridges and maintaining them; we can't do it with less money. We are trying to find a way to get more money in an equitable fashion.

So I just want to make sure we keep the main thing the main thing when we are talking about transportation infrastructure, and

some of the other things, being important, don't get us off the rails here.

I do want to ask Mr. Shinkle a question, because obviously, the focus of this hearing is on the revenue side. But it also addresses, in the description of course, a reference to funding consistency, or sustainability, or funding uncertainty.

In the White House's rollout last week, they talked about changing the formula, the Press Secretary referenced a different formula, a grant formula, rather than the traditional formula.

Mr. Shinkle, I would like to know what States might feel about a different type of program. Just as an example, the INFRA Grant Program has existed for over 5 years. In my State, we have never received one. In the big, wide open west, I don't feel like setting aside 400 miles of gravel to hook up our interstates. I don't think that would serve very well.

So just a question, Mr. Shinkle, about the commitment to funding certainty by trading the traditional formula for a competitive bidding process, as per the Press Secretary in the White House.

Mr. SHINKLE. I will probably have to be a little bit careful about what I say. I think that I would have to know more about that exact proposal.

But I would say that States are pretty comfortable with existing formulas that are in place to transfer money from the Highway Trust Fund to the States. Anything that would deviate from that and reduce the flexibility for States to be kind of nimble in their States to respond to infrastructure challenges out there is something they might be skeptical of. Otherwise I am afraid I can't answer in any more depth than that, but I could look into that some more with my team, and we can get back to you with a more detailed answer.

Senator CRAMER. Thank you.

As my time has run out, Mr. Chairman, just again, thank you for a very good hearing, a very good start to this discussion, really the second one. I am keeping my mind open, because I think there is a lot of opportunity.

By the way, I think we ought to go big. I really do. I want to aim high. This is a moment, and this is an opportunity, and I think there is an opportunity to do exactly that with these people.

Senator CARPER. Aim high, there is more room up there. That is good.

I said to Adam, who's staff director for the minority, and to Mary Frances, and Rebecca Higgins, I am very pleased with this hearing. I think it is an extraordinary hearing with extraordinary opportunity.

I think next up is Senator Kelly, who has somehow slipped in here, and we are going to yield to him next, and then Senator Lummis, you are next.

Senator KELLY. Thank you, Mr. Chairman.

Dr. Hendren, in your testimony, you discussed the importance of taking into account drivers in different geographies when considering options to address the Highway Trust Fund shortfall. In particular, you discussed rural communities where driving far distances is often needed for basic necessities like going to work or visiting grocery stores or accessing health care.

As a result, Arizonans, the State that I represent, living in rural communities often pay for gasoline more often, making them more impacted by a gas tax increase. As Congress considers solutions to fund the Highway Trust Fund, are there any proposals out there which are less costly for residents of rural areas than the gas tax?

Ms. HENDREN. Senator, I think you hit the key point directly on target, which is currently, rural communities are paying more in fuel tax, given the distances they need to drive to get their daily life activities done, as well as the vehicles in which they are driving.

So I think that is the place we need to start, is exactly your comments. If we look forward at a transformational way to have a sustainable funding source, the analysis that we have done so far using State data shows the shift to a distance-based fee will result in slightly less payment for rural communities. So that is a start.

I think how we look and design the rates of that future user-based system need to take into account the different ways people use our roads. So I think that is an opportunity that we have at this new way going forward.

Senator KELLY. What kind of research has been done on user-based fees to date?

Ms. HENDREN. Sure. So, what we recently did in several States on the eastern seaboard, is we basically took States and we divided them into different communities and how people move. You have rural communities, you have mixed communities that look rural but are going into the cities, and then you look at what type of vehicles they have, look at how many miles they drive. Then we looked today in fuel tax versus tomorrow in a distance-based fee.

So, doing that data specific, data driven analysis has enabled me to go to rural legislatures in North Carolina who are very concerned about this idea for their constituents and say, this is what the data is showing us. I am a data person, so that is where I like to start, because it starts the conversation. When you put the numbers in front of people, it makes them say, OK, maybe the way I thought today was isn't exactly as I thought, so let's talk about tomorrow together. That is the work we have started to do.

Senator KELLY. I appreciate you looking and going to the data. That is near and dear to my heart. Thank you.

Mr. Kile, I have got a couple more minutes here. I want to ask you about how the coronavirus pandemic has affected fuel consumption and gas tax revenues. The Arizona Department of Transportation recently reported that year over year, State fuel tax revenues were down 13 percent in 2020 compared to 2019, which in turn, has affected funding for many surface transportation projects in Arizona.

Some of this decline was likely due to the initial stay at home orders last spring, but long-term telework and virtual schooling have kept drivers off the roads. I am concerned that if these trends continue, the stress placed on the Highway Trust Fund could be more significant than expected.

Mr. Kile, in your testimony, you indicated that it would require about \$195 billion, I believe, in general fund revenue to cover the Highway Trust Fund shortfall over the next 10 years. Did those calculations take into account these long-term trends that seem to

be out there, which were accelerated by the pandemic, more telework, fewer in person activities, which in turn results in fewer Americans on the roadways?

Mr. KILE. I think the long run effects of the pandemic and perhaps changes in lifestyle that might occur are still being sorted out. There was obviously a reduction in driving over the course of the last year, relative to recent history.

I know for the trust fund itself, they are still working out exactly the implications of the last year for revenues to that fund, and we would have to get back to you with specifics. We would be happy to do that. But I believe that that is actually not entirely sorted out by IRS.

In terms of longer run trends, it really does depend on what happens to mileage in the future and the number of vehicle miles in the future, and then also the fuel efficiency or the fuel economy of the vehicles driving those miles.

Senator KELLY. Well, thank you, Dr. Kile, and thank you, Mr. Chairman.

Senator CARPER. Thank you, Senator Kelly.

And now the moment we have all been waiting for, Senator Lummis.

Senator LUMMIS. Well, thank you, Mr. Chairman. It is a great hearing. Thank you for doing it.

Mr. Kile, we know that not all vehicle miles traveled have the same wear and tear on the roads. We haven't had a cost allocation study since 1997. Can you talk about the type of information that Congress needs to get from a more recent study?

Mr. KILE. The cost allocation study is, in fact, quite old, as you noted. I think the basic points about the cost from past cost allocation studies have been that the cost of passenger vehicles is mostly felt through congestion in larger urban areas, and then through the environmental externalities from gasoline consumption. For heavy trucks, it is mostly based on pavement damage from those trucks. I think it would be enormously helpful for the policy community if there were a more recent cost allocation study.

Senator LUMMIS. Thank you.

Should there be, Ms. Hendren, should there be some sort of a congestion pricing or some other mechanism that could reflect those differences?

Mr. KILE. Well, whether there should or should not is a decision obviously for you and your colleagues. Under the current system, though, consumers don't basically see the costs of their contributions to congestion. We all sit in congested highways, but the users don't bear those costs that they impose on other people.

Senator LUMMIS. Ms. Hendren, have you seen any formula that reflects congestion pricing?

Ms. HENDREN. The work that we are doing in our demonstration pilots, we are exploring if this technology of a user-based fee could also be used as a congestion mitigation approach. The view that we have is our cars are changing, as Senator Carper said, the times are a-changing, our cars are changing, our drivers are changing. So as we change the way that we potentially fund transportation, what other concerns do we have?

So, what we have seen so far, we did a proof of concept looking at cordon pricing around a city to say, could the technology of a distance-based fee handle bringing in different variable prices on time of day or location? And it looks like the technology can, so we need to do more work there. Again, the idea is how can we simplify how people pay for transportation? How can we look at collecting that revenue in a cost efficient manner?

So, we are using the grants, again, that this Committee put in place to really kick the tires on this concept. We have some preliminary finding. I am happy to submit more of our findings when we are finished with them to this Committee, but we have a little more exploration to do there.

Senator LUMMIS. Thank you. We would love to see that when it is available.

Mr. Poole, I was really pleased to see you advocated for removing the mass transit account from the Highway Trust Fund in your testimony. Is there a user fee model out there that we could apply to mass transportation so highway users are not subsidizing mass transportation, and thereby removing adequate funding from highways and bridges?

Mr. POOLE. Thank you, Senator. The problem is that the costs of operating and building and operating and maintaining our transportation system are vastly higher than the amount of revenue that gets generated from passenger fees. In the research community, one idea that is looked at a lot is something called value capture, real estate value capture.

For example, in a major city like New York or in Washington, DC, where you have subway stations, you can actually measure that there is significant increases in the land value of being located within proximity to those stations. But yet that value is captured by the real estate owners, not by the transit system.

By contrast, the systems developed and operated in Hong Kong and Tokyo and other major cities in Japan have built in value capture as part of the funding and financing mechanism. So the problem is since we haven't done that, and most of these facilities are already built, it is difficult politically to all of a sudden say, well, you guys have benefited from real estate value increases. Now we are going to take some of it. But that is a mechanism that actually would generate revenue if we could figure out a way to do it. It is fairly, pretty substantial revenue on an ongoing basis.

Senator LUMMIS. Thank you for that.

For any of you, has anyone ever looked at a user fee tax on tires? I know that there is some tax on tires for commercial vehicles, but what about passenger vehicles? A user fee on tires, it could be assessed either at the point of sale or earlier in the manufacturing process. That would capture electric vehicles as well as gas vehicles.

Does anyone have any information on that kind of a concept? Has anybody studied that?

Senator CARPER. Dr. Kile, do you have any thoughts on that? I am pretty sure there is a Federal tax excised on what trucks, large trucks pay on tires, I think. Dr. Kile, is that true?

Mr. KILE. Yes, there is a tax, a Federal truck tire tax for commercial vehicles. We have not looked at that for passenger vehicles.

Senator LUMMIS. Thank you, Mr. Chairman. I yield back.
[The prepared statement of Senator Lummis follows:]

STATEMENT OF HON. CYNTHIA M. LUMMIS,
U.S. SENATOR FROM THE STATE OF WYOMING

I appreciate the opportunity to weigh in on the important topic of infrastructure funding.

Finding a long-term, reliable funding source for the Highway Trust Fund must be the top priority as we work on an infrastructure bill. Right now, it is a trust fund that we can't actually trust. Congress just passed a \$2 trillion relief bill that will be paid for by future generations. I do not want to further burden them with paying for the infrastructure we are using today.

I am also concerned about suggestions that Congress could use corporate taxes or even a carbon tax to fund infrastructure. These proposals take us further and further away from a user fee model.

User fees have different qualities than general taxes, primarily that the user is able to see the direct benefits of those fees. The idea that the people and entities using our roads should be the ones paying for them should not be a controversial idea.

We must simply find a way to pay for our roads and bridges rather than relying on General Fund transfers; that is what we have done since 2008. We have to make the tough decisions now so that our children and grandchildren don't pay the consequences.

Senator CARPER. All right. Senator Lummis, thanks for those questions.

Senator Capito.

Senator CAPITO. Thank you, and thank all of you for being here and just—I have a couple comments, and then a quick question.

I think it has been really interesting to see how innovative States have been through pilot projects with the road user fees or the mileage-based user fees. I think that this is something that it seems like we have bipartisan very large interest in this, and it is something that we ought to really consider as we are moving forward. I am encouraged by that.

I would like to, and I am a little puzzled, because I think the Secretary of Transportation in his public statements has not only removed the gas tax increase from a possible revenue source, but also the vehicle miles traveled idea and concept as, they kind of took that off the table rather rapidly, which I was sort of surprised about. So we will have to circle back with that.

One of the things that I think we don't talk enough about, and I am not really sure, obviously, what we are looking here for is enough revenues to meet our needs and to meet not just the needs now, but the needs of the future.

Mr. Shinkle, you talked about public-private partnerships, and that some of that was tolling. We know tolling is very unpopular in a lot of areas of all of our States and is difficult for State leaders to move forward.

What other ideas, how else can we bring the private sector into this? Obviously, they are the beneficiary, whether you are a car manufacturer, tire manufacturer, refinery, all kinds of different electrical and technical parts of an automobile or a truck. How else can we bring the private sector dollars into this to help us match our public dollar investment? Do you have any other ideas on that? It is a big question.

Mr. Shinkle.

Mr. SHINKLE. Yes, Senator Capito, thanks for that. I do, and I think, along the lines of P3s and I think it is pretty fair to characterize that public-private partnerships, P3s, are perhaps underutilized in the United States, certainly compared to our comparative Canada, United Kingdom, Europe, et cetera, even Latin American countries. Some of that is kind of a lack of statutory and certainty and having the correct process set up.

Now, having said that, a lot of States have done a lot of great things with regard to P3s, and they have been successful with a lot of projects and delivering projects that have been on time and for less money, and with all of the kind of efficiencies in intellectual and physical capital that the free market and companies have that a State DOT or a State doesn't necessarily have. So I do really think there is a role there for private companies to play in some way.

I think that probably asking someone from industry is the way to get the best answer. But they need some more regulatory, statutory certainty. They need some idea that if we submit a bid, and it goes through, and it is accepted, then this project is going to go forward.

But as you alluded to, especially when it comes to tolling, that starts getting really difficult. You have to make sure that you have the public buy in, or else you are going to have this conflation of tolls constantly with P3s, and that makes it difficult.

Now, having said that, there are examples of where you can do P3s, you can have a large project. I think a good example is in Pennsylvania. They are doing 500-plus bridges, smaller bridges. They bundled them together. You bundle a bunch of similar-ish projects together, and by doing that, you achieve a scale.

That doesn't involve any tolls, it is just that, you know, it is easier for a private company, perhaps, to replace, repair those 500-some bridges than to have the State DOT do it. They can do it quicker and more efficiently, and you have them bid.

I believe in Pennsylvania, they are using money from their bonding to pay for that. So that is an example of a P3 without a toll.

There are other examples out there. There are transit P3s, and a lot of these are just based on availability payments, which essentially means that you did the job correctly, that the asset is working correctly, and you are meeting these certain metrics. So I think there is a lot there.

I think, along the lines of what Mr. Poole said, too, about, and this isn't necessarily about private, but having just access to capital, too, and things like TIFIA, and having access to capital is important to States, especially for some of these trickier projects. So those are kind of some of my thoughts.

Senator CAPITO. Thank you. Yes, I think one of the things that you are alluding to here, which is a little off topic for what we are doing here, but regulatory certainty and efficiency in the regulatory process has got to be a part of this bill. I think that we reached some consensus on that in our last bill 2 years ago that we passed unanimously out of this Committee. But that would certainly help us as we move forward.

I would say anecdotally, the State of West Virginia uses something called GARVEE Bonds, and don't ask me what they stand

for, but what they are are basically using future revenues, guarantees of future revenues to pay for the construction of the highway of today. That is where we have to give this long-term certainty to our Governors and to our road builders and to our users that, in 5 years, you are going to have this amount of money. So you can then sort of pre-fund as you move forward in anticipation of funds coming in later.

So thank you all very much.

Thank you, Mr. Chair.

Senator CARPER. Senator Padilla is trying to do double duty. He is at two hearings he is in line to ask questions in both of them at the same time, so he is asking questions at another hearing, and when he wraps up there, he is going to join us virtually.

In the meantime, I would like to ask a question of Dr. Kile. I want to give you an opportunity to discuss the estimate of revenues that a 1 cent VMT fee would raise compared to the annual shortfall in the Highway Trust Fund in response to the question that was raised, I think earlier, by Senator Capito.

Dr. Kile.

Mr. KILE. So, one of the options that you have is to assess a vehicle miles traveled tax. I think that was just, looking at the State setting for the moment, the shortfall in the trust fund over the next 10 years is \$195 billion. That is a 10 year number.

The illustrative number on vehicle miles traveled taxes is \$1.6 billion a year, and that is for a VMT tax that would be imposed on commercial trucks on all roads, all commercial trucks. That is strictly an example both in terms of the base of the tax, the number of vehicles that would be taxed, as well as the amount. All of those are choice variables for the Congress if you go down that road.

Maybe the only other thing I would say about VMT taxes is that implementing them would take a fair bit of work relative to what we currently have. There are a lot of implementation details that would need to be worked out.

Senator CARPER. OK, thanks.

A couple of comments I might make while we are waiting for Senator Padilla to join us. I oftentimes, my colleagues and I oftentimes come to work on the train. A guy named Biden, he and I used to train-pool together, and even every now and then he still takes the train.

I used to be on the Amtrak Board when I was Governor. I served on the Amtrak Board for 4 years, and we never seemed to be able to raise at the fare box, for Amtrak, money to pay both for operating costs and capital costs in the northeast corridor. I might be mistaken on this, but I don't think I am.

March, a year ago, just before we fell into the pandemic, that February or March, may have been the first month since Amtrak was created back in the 1970s where, at the fare box, they were able to pay for, because of ridership growth, they were able to pay for the operating costs in the northeast corridor, and I believe, the capital costs, as well. Ridership was about a quarter of a million people per week, and that was an all time record.

The idea of saying that we are not going to use any money, and we don't use moneys, as I recall, we don't use money out of the

Highway Trust Fund to help underwrite the costs of interstate passenger rail service. We do use about 20 percent of the moneys for transit.

Folks who ride transit around our country, whether it is Delaware, West Virginia, California, Des Moines, those are folks who are not going to be using the roads, highways, bridges. As someone once shared with me, folks were not riding the train if they weren't taking transit. If they were driving the cars in the northeast corridor, we would have to build a bunch of extra lanes of I-95. So there is an argument for both sides, and I will just leave that where it is.

I want to ask our witnesses, any final quick points that you want to make?

Dr. Kile, any last closing word? Maybe a question you were not asked that you want to answer, Dr. Kile, real quickly. Thank you.

Mr. KILE. I would be happy to answer anything that you have, but I think I covered the main points that I intended to cover in my oral statement.

Senator CARPER. All right, thanks a lot.

Jack Basso. Jack, thanks so much for joining us, Mr. Basso, whom I called Jack, for years.

Mr. BASSO. Thank you, Senator. I think just one point that we really do need to address, getting both State and national pilots going, and we are going to need additional funding, which I know you have in the EPW bill, so that is my only additive comment. We really need to move. Thank you.

Senator CARPER. All right. Thank you, sir.

Next, Dr. Hendren, please. Maybe one last point you would like to make, or remake.

Ms. HENDREN. Thank you. So, I think the topic that hasn't come up as much today relates to motor carriers. I think again, as heavy users and payers of our transportation system, we really need to look at our trucking industry separately from our passenger vehicles as we go forward on a sustainable transportation funding approach.

You all are very aware how diverse and complex and heavily regulated the trucking industry is. I think at the Coalition, we have done a very good job of bringing them to the table, to the conversation. But I am concerned if we move forward with a user-based approach, it does need to address all users, versus singling out one of our users on the road. So that comment, I just wanted to make sure I had made it clearly.

Senator CARPER. I appreciate your making that point. The conversations we have had with the trucking industry, there is great willingness to pay their fair share. They are some of the strongest supporters for making sure that the users pay.

Let's see, Mr. Poole, Robert Poole.

Mr. POOLE. Thank you, Senator. I would like to second the comment from Dr. Hendren, and caution very seriously against singling out the trucking industry to be the place to start. It is really, as their findings have found, it is more complex in a lot of ways than passenger cars.

The trucking industry, while participating commendably in some of these new pilot programs, has also just published a big report

making the most pessimistic possible assumptions about a truck mileage-based user—well, mileage-based user fees in general.

So there is a lot of persuading still needed and experience needed with the trucking industry. The worst thing that policy could do it to single them out and start saying, we are going to make the trucking industry go first, because that would create a backlash that I think would be very, very damaging.

Senator CARPER. Thank you, sir.

Mr. Shinkle. Then I am going to recognize Senator Padilla on Webex.

Mr. Shinkle, please.

Mr. SHINKLE. Thank you, Chairman Carper.

Two things I would just reiterate that States do appreciate having formulas for funding certainty. So that is one thing to mention. And then I think just continue to partner and ask for the States to participate.

This conversation is great. There are a lot of incredible insights that are coming from the Surface Transportation System Funding Alternatives Grant Program, a lot of different things in States. I think it does work to the advantage of us as a country at this point, that States are kind of experimenting with slightly different ways of doing things, working with the public, looking at different payment options, and just playing around with what a RUC might look like, as well as collaborating with their neighboring States to figure out about travel going across States.

So just continuing to partner with States, and even more robust funding for STSFA would be nice. I think that is all I would say.

Senator CARPER. All right, thanks, Mr. Shinkle.

Now, let me recognize Senator Padilla.

Senator Padilla, thanks for hanging in there and joining us. You might be the last Senator to ask a question. Go ahead, Senator.

Senator PADILLA. Thank you, Mr. Chair. I will try to be brief. I know it has been a long, very substantive hearing. I just appreciate the opportunity to raise a couple of points.

The first, for Mr. Kile. Mr. Kile, in your written testimony, you heeded how a road charge system could create a greater burden relative to income for lower income households. What are some ways that Congress could address concerns of equity in exploring these alternative funding mechanisms and formulas? And we welcome Dr. Hendren's thoughts on the same matter.

Mr. KILE. Sir, you are correct to note that a road use charge that was uniform would impose larger costs relative to income on lower income households. In that way, the characteristics of that, I think, are probably similar to the characteristics of the gasoline tax.

As for options, that is really something that I would need to leave to you and your colleagues for ways to ameliorate the effects of that on low income households.

Ms. HENDREN. To add on to my colleague's statements there, I think the key part is today, the fuel tax approach is a regressive tax, as you are aware. So as we move forward, we do have the opportunity of the user-based fee to change how we fund transportation and to be smarter about that.

So I think it is an incredible opportunity that is kind of at our feet that we can grab hold of, and we can make sure that we go

forward in a way that doesn't put a higher percentage of household costs on our lower income households for transportation. Transportation to me is how we create opportunity in our country, so how can we make sure how we pay for it continues to open up those doors of opportunity.

Senator PADILLA. Thank you both. A lot of work to do to address that.

The next and final question is for Mr. Shinkle. In your written testimony, you noted how the Surface Transportation System Funding Alternatives Program has helped 14 States to explore road usage charge systems. Additionally, 12 States have introduced legislation related to road usage charge so far this year.

In addition to funding, how else can the Federal Government best support States as they continue their critical work to study and pilot road usage charge programs and similar concepts?

Mr. SHINKLE. That is a great question. I think, first of all, having a hearing, and thank you very much, Senator Padilla, for the question. I think, first of all, just holding hearings like this and including the voices of stakeholders from the States.

I think it would be great to hear from, obviously, Dr. Hendren is here representing the Eastern Transportation Coalition, but perhaps hearing from Oregon and Utah, the States that have the actual operational RUC programs. Your home State of California is doing a lot of really incredible and interesting research, and has been really piloting and looking at a lot of different payment options, which I think will be important to consider.

Washington is doing a lot of interesting stuff; Hawaii was alluded to before. So maybe hearing from some of those States would be another advantageous thing to hear a little bit more about exactly what they are doing, because they can really get into the weeds of exactly what they are doing and what kind of RUC systems they are trying to potentially build.

Senator PADILLA. Thank you, and thank you for the response. We have got a lot more work to do, a lot more data to gather.

Thank you, Mr. Chairman.

Senator CARPER. Thanks, Senator Padilla.

Well, I think while you were trying to do double duty with the other hearing you are participating in, I mentioned that the States are laboratories of democracy, and they give us the opportunity to find out what works and do more of that, and frankly find out what doesn't work and do maybe less of that.

Anybody else, any of our other colleagues out there on Webex or virtually somewhere would like to participate?

OK. I want to again, thank our witnesses. We had both sides, both minority and majority sides of our staffs were responsible for putting together our witnesses today. I just want to say, I think you all hit a home run with runners on base, and we thank each of you for testifying.

Almost every day, every week at least, when I am on the platform waiting to catch the train to come down here to go to work, somebody will say to me, I wouldn't want your job for all the tea in China. They say that, and I say really? They would say, yes. And I said, actually, yes, I feel lucky to do what I do. If you think about the opportunities before us here on this Committee, we have

the opportunity to provide leadership for the Senate, and I think for the Congress, in dealing with some of our toughest challenges.

One is this pandemic, how to get out of it, how to get our health better and to get through this. We face the challenge of an economy; it is the worst economy we have had since the Great Depression. I think it is getting better, but we still have a long way to go.

We have a surface transportation system that is in bad shape, and we can do better than this, and we need to do better than this.

We can actually sort of address all of those, and climate change, terrible adverse weather, extreme weather, that is not getting a whole lot better for us. It is getting a lot worse over time.

So we have to opportunity to address all of those, all of those. Not all the responsibility lies in this Committee, but a good deal. We have the opportunity, again, to provide some of the leadership that is needed.

Our tradition in this Committee is to work across the aisle to work together, and we do that pretty well. We will have the opportunity to demonstrate that next week when our water infrastructure legislation before the full Senate, reported unanimously out of this Committee last month, and we hope it will move along nicely.

We are going to take a fair amount of additional input in hearings, and just informal conversations over the next month and a half. Hopefully before Memorial Day, we will report out a surface transportation bill, and we will do it unanimously, and in a way that will help make sure that we fund the development and improvement of our surface transportation system in a sustainable way and with the kind of resilience that we need, and provide for beginning to build the kind of infrastructure that a lot of us are calling for, including the President, to build corridors of charging stations and fueling stations, because those vehicles are coming.

I will close with the words of Mary Barra from about a year ago, the CEO of—not even a year ago, this may be 3 or 4 months ago, when we were talking about the future of electric vehicles, and she said, I am all in on electric. She said that is where the future is. She said, we have done about as much as we can to improve the internal combustion engine, and we are not going to be able to take a whole lot more. The future is with electric.

I would hasten to add it is not just electric with batteries, but I think the idea of hydrogen, green hydrogen, and doing that in conjunction with fuel cells and creating electricity and water as a waste product. There is great future in that, and a lot of hope and jobs that can be created from it, not just in building the corridors, but actually building the vehicles that will use those corridors and reduce the threat of climate change to our country and to our planet.

I love to quote Albert Einstein, and my favorite Einstein is “In adversity lies opportunity.” Lots of adversity here, but also plenty of opportunity.

Another, since we are talking a lot about cars, I just recalled a quote from Henry Ford, who was the father of the Model T. Henry Ford used to say, “If you think you can, or you think you can’t, you are right.” If you think you can, or you think you can’t, you are

right. I think we can, and I am really encouraged by the input we have received from our witnesses today.

I very much appreciate the work of our staff in bringing this together today, for all of our colleagues who have participated today. This is, for me, encouraging, and I hope for others, as well.

I have a couple of unanimous consent requests. Can't leave here without asking unanimous consent to submit for the record a report on the economic impact of public transportation investments from the American Public Transportation Association. The report describes the way that transit benefits both transit users as well as road users, who benefit from reduced traffic congestion and traffic safety benefits.

I have actually alluded to this already, but let's make it unanimous consent request as well.

Also, I ask unanimous consent to submit a letter signed by 31 transportation stakeholder organizations on the need for a long-term solution to keep the Highway Trust Fund solvent and in support of inclusion of a nationwide program to test out vehicle miles traveled, VMTs, in our next bill. Additionally, several other associations and States that have led pilot programs have shared letters of support and findings from their work. I ask unanimous consent to submit those materials as well.

[The referenced information follows:]

April 13, 2021

The Honorable Peter DeFazio, Chair, House Transportation and Infrastructure Committee

The Honorable Sam Graves, Ranking Member, House Transportation and Infrastructure
Committee

The Honorable Thomas R. Carper, Chair, Senate Environment and Public Works Committee

The Honorable Shelley Moore Capito, Ranking Member, Senate Environment and Public Works
Committee

Dear Chairs DeFazio and Carper, and Ranking Members Graves and Capito:

As your committees begin work to reauthorize surface transportation programs, we write in support of creating a comprehensive national vehicle miles traveled (VMT) implementation program.

The long-term need to transition away from motor fuel taxes as the foundation of the Highway Trust Fund (HTF) continues to grow. Motor fuel tax receipts are not keeping pace as vehicles become more fuel-efficient and use of new electric vehicles surges. This decline in motor fuel tax receipts will continue. So far this century, Congress has chosen to provide regular General Fund and other transfers to keep the HTF solvent. Since 2008, such transfers have totaled \$158 billion. Congress must consider a long-term solution to ensure HTF viability and the future health of our surface transportation system, and to maintain the user fee principle upon which the HTF is founded. A VMT or mileage-based user fee to replace all current motor fuel taxes and fees is that solution.

In 2015, the *Fixing America's Surface Transportation* (FAST) Act established the Surface Transportation System Funding Alternatives (STSFA) Program to provide grants to states or groups of states to demonstrate user-based alternative revenue mechanisms that utilize a user fee structure to maintain the long-term solvency of the Highway Trust Fund.

Since its creation in 2016, the STSFA grant program has provided \$73.7 million to 37 projects in states across the nation. It funds projects that test the design, implementation, and acceptance of user-based systems, such as a vehicle mileage-based user fee. Grants also support outreach by transportation officials to help the public understand these new revenue collection methods. We support the continuation of this program to fund critical work happening in states across the nation.

These pilots provide valuable lessons learned and identify several important factors to consider for implementing a national VMT program. It is now time for Congress to leverage the progress made to-date and create a comprehensive national VMT implementation program.

A national implementation program should work in cooperation with the public and private sector to address national implementation issues, such as standards for data collection, user equity, interoperability, administrative structure and costs, and public acceptance. Once these issues are resolved and recommendations for moving forward are made, a system must be tested

in an interoperable, national setting. The United States Postal Service and other federal and state fleets provide an ideal testbed for consideration for a national VMT program.

American ingenuity and innovation stand ready to meet these challenges. Congress has an extraordinary opportunity to create and test a much-needed long-term replacement for the user fees that we currently rely on to build our roads and bridges.

We look forward to working with you and your staff to ensure a comprehensive national VMT implementation program in the upcoming surface reauthorization.

Sincerely,

American Association of State Highway and Transportation Officials

American Council of Engineering Companies

AECOM

American Institute of Steel Construction/National Steel Bridge Alliance

American Public Transportation Association

American Road and Transportation Builders Association

American Short Line and Regional Railroad Association

Association of American Railroads

Association of Equipment Manufacturers

Associated General Contractors of America

Bipartisan Policy Center Action

CRH

Cubic Corporation

Eno Center for Transportation

Governor's Highway Safety Association

Institute of Transportation Engineers

International Bridge, Tunnel and Turnpike Association

International Union of Operating Engineers

ITS America

Jacobs

Laborers International Union of North America

Maryland Transportation Builders and Materials Association

National Asphalt Pavement Association

National Association of County Engineers

National Ready Mix Concrete Association

National Stone, Sand, and Gravel Association

Portland Cement Association

Transurban

UPS

United States Chamber of Commerce

WSP USA



April 19, 2021

The Honorable Thomas Carper
 Chairman
 Committee on Environment and Public Works
 United States Senate
 Washington, DC 20510

The Honorable Shelley Moore Capito
 Ranking Member
 Committee on Environment and Public Works
 United States Senate
 Washington, DC 20510

Dear Chairman Carper, Ranking Member Capito, and Members of the Committee:

I am an economist, transportation policy analyst, and senior fellow with the Cato Institute. On April 14, this committee heard testimony from several witnesses on the long-term solvency of the Highway Trust Fund. Most of those witnesses talked about substituting mileage-based user fees for gasoline taxes as a source of revenues for the fund. While I support mileage-based user fees, the source of revenues does not get to the heart of why the Trust Fund has been threatened with insolvency in recent years.

When Congress created the Highway Trust Fund in 1956, it modeled it after a *fiduciary trust*. A fiduciary trust has a *settlor* who creates the trust; a *trustee* or trustees who manage the trust; a *beneficiary* or beneficiaries who benefit from the trust; and a *corpus* that provides the value of or revenues to the trust. In this case, Congress was the settlor, the state highway departments were the trustees, highway users were the beneficiaries, and highway user fees were the corpus.

Congress was wise to make user fees the corpus and highway users the beneficiaries as user fees have numerous advantages over tax dollars when funding transportation.

- User fees provide valuable signals to both users and providers about the costs and values of various routes and types of highways.
- Limiting the corpus to user fees gives the trustees incentives to be efficient and disincentives to plan grandiose projects that have little value.
- Infrastructure that is funded by user fees is better maintained than infrastructure funded out of tax dollars because the trustees know that their revenue streams depend on providing a sound user experience. Most of our “crumbling infrastructure” is infrastructure funded out of tax dollars rather than user fees.
- User fees are more equitable and socially just because users only have to pay for what they use and not for what someone else uses.

Gasoline taxes have historically been the predominant user fee because in the pre-electronic age they were less expensive to collect than tolls. The advent of electronic collection methods has highlighted several drawbacks to using gasoline excise taxes as a user fee.

- Unlike most other taxes, excise taxes do not automatically adjust for inflation.
- Fuel taxes also fail to adjust for the increasing fuel-efficiency of the nation’s motor vehicle fleet.
- Fuel taxes are mostly collected by the federal and state governments, yet cities and counties own 75 percent of the roads in this country and rely on property taxes or other general funds to maintain those roads.
- Finally, fuel taxes do nothing to relieve traffic congestion.

Cato Institute • 1000 Massachusetts Ave., N.W. • Washington, D.C. 20001 • (202) 842-0200
 Fax: (202) 842-3490 • www.cato.org

All of these problems can be fixed by replacing fuel taxes with mileage-based user fees. But none of these problems relate to why the Highway Trust Fund has been threatened with insolvency in recent years, and without addressing that real issue, simply replacing fuel taxes with mileage-based user fees will not make the Trust Fund solvent.

The real problem is that past sessions of Congress have repeatedly violated the “trust” in trust fund. These violations began in 1973 when Congress allowed cities to cancel planned interstate freeways and use the Trust Fund monies that would have been spent on those freeways for transit capital improvements instead.

Much of the funds from cancelled freeways went to the construction of new light-rail lines. Light rail is an obsolete technology whose only “virtue” is that it is expensive enough to consume all of the federal dollars that would have gone to freeway construction so that opponents of those freeways would not be accused of “losing” federal dollars for their cities. In other words, cities like Portland built light rail not because it was efficient but because it was expensive. In the same amount of space, buses can move more people per hour, faster, more safely, and to more destinations for far less money than light rail.

Congress systematized this violation of trust towards the beneficiaries of the Highway Trust Fund in 1982 when it allocated a share of highway user fees to public transit. Transit had rapidly declined after World War II, but in 1982, the transit industry was optimistic that, with a little government support, it could once again become a key part of urban transportation systems. Thanks to the 1970s gasoline crises, the number of transit trips taken by the average urban resident had grown by 20 percent between 1972 and 1980.

This optimism proved unfounded, however. Despite hundreds of billions of dollars of subsidies, the average urban resident took 28 percent fewer transit trips in 2019 than in 1980. This decline is partly due to the transit subsidies, which have made transit agencies more beholden to political interests than to transit rider needs; with more than three out of four of their dollars coming from taxes rather than transit fares, transit agencies are more interested in pleasing special-interest groups than in increasing transit ridership.

The 1982 transportation reauthorization bill also contained the first surface transportation earmarks. Transportation earmarks did not increase the amount of money going to any particular state; instead, they merely reallocated how funds going to the states would be spent.

Congress requires the states to write long-term transportation plans and short-term transportation improvement programs to ensure that federal funds are spent on state transportation projects as cost-effectively as possible. Earmarks overturned the results of those planning efforts, requiring that money be spent on projects that state transportation plans had concluded were inefficient and of low priority.

The number of earmarks in the six-year reauthorization acts grew from 10 in 1982 to more than 7,000 in 2005. Many of these earmarks had only the remotest relationship to transportation, instead funding museums, national park visitor centers, and painting a fish on the side of a jet airliner.

With the 2005 reauthorization bill, known as SAFETEA-LU, came another violation of trust. Up until that point, Congress had never appropriated more out of the Highway Trust Fund than was going into the fund from taxes on fuel, motor vehicles, and tires. In 2005, to ensure that all of the earmarks would be fully funded, SAFETEA-LU mandated that the full amounts authorized by the law (which were based on forecasts of revenues into the Trust Fund) be appropriated each year even if revenues to the trust fund were insufficient to cover those appropriations.

When the 2008 financial crisis hit, revenues fell below forecast levels, and starting that year Congress was forced to appropriate an average of \$10 billion a year to the Trust Fund to keep it from running out of money. The 2015 FAST Act systematized this by transferring \$70 billion—an average of \$14 billion a year for the five-year reauthorization—to the Trust Fund.

Some people suggest that such appropriations out of general funds simply made the highway portion of the Highway Trust Fund whole after several decades of diversions of highway user fees to transit and other non-highway activities. In a larger sense, however, the transfer of general funds to the Highway Trust Fund is as much a violation of trust as is the transfer of highway user fees to transit. By making transportation agencies responsive to political criteria rather than user needs, such transfers weaken the links that user fees create between transportation providers and users.

According to *National Transportation Statistics*, published by the Bureau of Transportation Statistics, highways move more than 85 percent of all passenger-miles and nearly 40 percent of all ton-miles of freight in this country. Public transit moves only about 1 percent of passenger-miles and no freight; Amtrak moves 0.1 percent of passenger-miles and almost no freight. Yet President Biden's proposed American Jobs Plan allocates roughly equal amounts of money to highways, transit, and Amtrak, showing that, whatever the other virtues of this plan, political priorities can often be very different from actual user needs.

The most important step Congress must take to restore the long-term solvency of the Highway Trust Fund is to restore the trust in Trust Fund. That means ending the diversion of highway user fees to transit and other non-highway programs. It means no more earmarks. And it means ending the practice of spending more out of the Trust Fund than is going into the Trust Fund from user fees.

Given these changes, what should be the role of the federal government in transitioning from using fuel taxes as a primary source for highway funding to mileage-based user fees? The federal government had a distinct cost advantage over state and local governments in collecting fuel taxes since it could collect those taxes directly from oil refineries and importers rather than individual gasoline stations. No such advantage exists for mileage-based user fees. While Congress can and should continue to encourage the states to switch from fuel taxes to mileage-based user fees, there is no reason for Congress to impose a national mileage-based user fee.

The increased electrification of the nation's motor vehicle fleet will steadily weaken the value of a fuel tax as a highway user fee. Congress should therefore phase out the federal fuel tax and allow state and local governments to completely finance their highways, roads, and streets out of mileage-based user fees.

Some people argue that the federal government should continue to play a role in state highway finance so that the highways of thinly populated states, such as Alaska and Wyoming, can be subsidized by highway users of more densely populated states, such as California and New York. In fact, such cross-subsidies are no longer needed if they ever were needed. New highways are needed mainly in fast-growing regions and that growth means that the new roads should be able to pay for themselves out of user fees.

Heavy truck traffic over such roads as Interstate 90 in South Dakota and Interstate 80 in Wyoming will provide sufficient funds to keep those roads in well-maintained condition. Some little-used roads may need to be changed from pavement to gravel to reduce maintenance costs, but such roads would mainly be used by local traffic, not interstate traffic, and thus should be funded locally anyway.

In the short run, then, Congress should make the Highway Trust Fund solvent by ending earmarks and transfers out of and into that fund for or from non-highway programs. In the long run, Congress should plan to phase out the federal Highway Trust Fund and allow state and local governments to take over highway finance.

Yours truly,

A handwritten signature in black ink, appearing to read "Randal O'Toole". The signature is fluid and cursive, with the first name "Randal" being the most prominent part.

Randal O'Toole
Senior Fellow
Cato Institute



April 12, 2021

The Honorable Tom Carper
Chairman
Committee on Environment and Public Works
410 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Shelley Moore Capito
Ranking Member
Committee on Environment and Public Works
456 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Carper and Ranking Member Capito,

The federal Highway Trust Fund, which supports the construction and maintenance of our nation's highways and transit systems, is facing a cash flow crisis. While raising transportation user fees may be politically unpopular, relying predominately on a static gas tax is not an equitable or sustainable long-term solution.

In January 2020, the Bipartisan Policy Center released a report, "[A Roadmap to the Last Gas Tax Increase](#)," with former Reps. Bill Shuster (R-PA) and Joe Crowley (D-NY).¹ The report outlined the most politically viable, fiscally responsible, and bipartisan solutions to pay for the next federal surface transportation reauthorization bill and best meet our nation's transportation needs for the next decade and beyond. Importantly, we recognize that revenue is outside of the committee's jurisdiction. However, you have a critical role in shaping this debate, building support for the user-pays principle that underlies highway spending, and preparing for the transition to a new and a more sustainable source of revenue.

To that end, we applaud the committee for [hosting a hearing](#) to explore the long-term solvency of the Highway Trust Fund and, in advance, we wish to highlight four key recommendations from our work on this important issue:

Increase fuel user fees one last time and index them to inflation.

A static gas tax, unadjusted to keep pace with inflation, can meet fewer infrastructure needs over time and puts increasing pressure on Congress to find offsets in the budget or deficit-spend—the latter being fiscally irresponsible given the exploding federal debt. In total, Congress must find nearly \$200 billion in the budget to cover projected Highway Trust Fund revenue shortfalls over the next 10 years. To boost federal transportation funding, finally tackle deferred maintenance, sustainably pay for needed investments, and buy time to transition to a user fee based on vehicle miles traveled, fuel user fees should be increased by at least 15 cents and indexed to inflation. This is the only short-term option that will adequately cover all near-term needs and maintain the user-pay principle embedded in the current system. To avoid negatively impacting consumers and the economy as we continue to fight and recover

¹ Bipartisan Policy Center, "A Roadmap to One Last Gas Tax Increase," January 2020. Available at : <https://bipartisanpolicy.org/report/a-roadmap-for-the-last-gas-tax-increase/>.



from the COVID-19 pandemic, such an increase could be scheduled to phase in only when economic growth picks up.²

Strengthen the user-pay, user-benefit model.

The Highway Trust Fund provides for a nexus between who pays and who benefits from the fund, though it does not follow a direct 1:1 user-pay, user-benefit model. Starting in 1970, just 14 years after the creation of the trust fund, Congress began expanding the list of eligible projects to include transit projects, despite only collecting revenue from a variety of vehicle-related taxes. Policymakers should seek to ensure that those who benefit from HTF spending are contributing something. To that end, Congress could:

- Roughly synchronize spending with user tax/fee receipts;
- Periodically analyze all HTF user taxes and fees to ensure costs are fairly allocated to different classes of system users;
- Ensure more beneficiaries of the HTF pay into it by, for example, reinstating the diesel tax for passenger trains, eliminating reduced user fees on fuel intercity and local buses, and levying a modest user fee on bicycle tires; and
- Support electric vehicle ownership while ensuring that their drivers contribute to the HTF.

Given rising electric vehicle ownership, its impact on HTF revenues, and concerns about our changing climate, harmonizing support for electric vehicle ownership with a system of dedicated highway spending that is dependent on a user-paid gas tax is among the most critical challenges to strengthening the user-pay, user-benefit model. We believe there is bipartisan appetite for policies that improve the electric vehicle tax credit's targeting and effectiveness, stimulate more market demand, get the most fuel-inefficient vehicles off our roads, and find a way to ensure the drivers of electric and hybrid vehicles contribute to the HTF.

While federal income tax credits have resulted in a 29% increase in electric vehicle sales, research has shown that 70% of the credits were obtained by households—typically with higher incomes—that would have bought an EV without the credits.³ Therefore, reform should entail:

- Limiting the tax credit for electric vehicle purchases to low- and middle-class taxpayers;
- Expanding the credit with any projected savings from limiting credit eligibility; and
- Enacting either a modest national fee on electric vehicle purchases or an electric vehicle battery tax to ensure these drivers are contributing revenue to the HTF, which supports the continued upkeep and modernization of our nation's critical transportation systems.

Prepare for the transition to user fee based on vehicle miles traveled.

With rising ownership of electric and more fuel-efficient vehicles, transitioning from gas taxes to a user charge based on miles traveled for all vehicles will be fundamental to sustaining the user-pay, user-

² For context, from its highest point since 2019 to its lowest, the retail price a gallon of gas has fluctuated by \$1.13, according to the U.S. Energy Information Administration: <https://www.eia.gov/petroleum/gasdiesel/>.

³ Jianwei Xing, Benjamin Leard, and Shanjun Li, "What Does an Electric Vehicle Replace?" April 2019. Available at: <https://www.nber.org/papers/w25771>.



benefit system. The Federal Highway Administration's Surface Transportation System Funding Alternatives (STSFA) has already begun administering \$95 million in competitive grants to test new ways to finance highway and bridge projects. With support from STSFA grants, a few state-led pilots have been able to begin experimenting with such a replacement. The upcoming surface transportation reauthorization should dramatically expand the STSFA grant program and mandate that each state DOT develops and begins testing a plan to implement a VMT user fee. State DOTs should be required to employ the best practices derived from existing pilots, relying on extensive public outreach, the use of separate and non-governmental vendors, and a variety of data reporting options for drivers with strict privacy policies. The committee should further consider options to launch a nationwide VMT pilot.

Restore congressionally directed spending with safeguards.

Clear communication with the public about the benefits of adequate funding is key for public support behind raising revenue to repair, replace, and upgrade infrastructure. To that end, restoring congressionally directed spending in a more effective, transparent, and accountable system would help to increase the ability of members in Congress to take on tough issues that are critical to the national interest, like increasing the gas tax. By affording members of Congress the opportunity to secure funding for the highest priority transportation needs in their districts or states, congressionally directed spending would make lawmakers more invested in the process, engage them in the hard work of governing a polarized and divided country, and give them a tangible benefit to show to constituents who are asked to pay more.

Once again, thank you for your leadership in addressing the challenges our nation faces. We are grateful for the opportunity to provide our input on bipartisan policies to fund our highways and transit systems. We look forward to working together.

Sincerely,

Michele Nellenbach
Vice President of Strategic Initiatives
Bipartisan Policy Center

Andy Winkler
Associate Director
Bipartisan Policy Center

CC: Members of the U.S. Senate Committee on Environment and Public Works



Robyn M. Boerstling
 Vice President
 Infrastructure, Innovation and Human Resources Policy

April 28, 2021

The Honorable Tom Carper
 Chairman
 Senate Committee on Environment
 and Public Works
 410 Dirksen Senate Office Building
 Washington, D.C. 20510

The Honorable Shelley Moore Capito
 Ranking Member
 Senate Committee on Environment
 and Public Works
 456 Dirksen Senate Office Building
 Washington, D.C. 20510

Dear Chairman Carper and Ranking Member Capito,

The National Association of Manufacturers (NAM), the largest manufacturing association in the United States representing manufacturers in every industrial sector and in all 50 states, appreciates your ongoing leadership and efforts to address much-needed investment in the nation's highway funding programs as part of the broader debate about federal infrastructure policy. We believe it is imperative to advance infrastructure legislation this year, and to find bipartisan solutions to funding mechanisms that will not imperil the continued growth of American businesses.

It is well-documented that the nation's infrastructure systems are in dire need of robust federal investment. Manufacturers have long advocated for policies that identify new funding resources for these projects, and for the enhancement of federal programs that will promote private investment into our nation's roads, bridges, airports, water infrastructure and other physical systems that allow for the free flow of American commerce and economic growth. The NAM's Building to Win plan highlights many of the areas where investment is needed and offers funding and financing options for policymakers to consider as sources of future revenue. The funding proposals in Building to Win, which include opportunities for public and private investment into the nation's infrastructure, would not require detrimental new tax burdens that could lead to diminishing competitiveness for American manufacturers. NAM members are proud to employ hundreds of thousands of American workers, and as the manufacturing industry prospers, so too do the local communities in which these companies are rooted.

We hope that you will continue to review alternative funding options for infrastructure investment and consider reforms to user fee programs that can still successfully generate infrastructure revenue. We would also note that following the passage of the Tax Cuts and Jobs Act in 2017, manufacturers responded by hiring more workers, increasing wages and investing more in their business. Notably:

- In 2018, manufacturers added 263,000 new jobs. That was the best year for job creation in manufacturing in 21 years.
- In 2018, manufacturing wages increased 3% and continued going up—by 2.8% in 2019 and by 3% in 2020. Those were the fastest rates of annual growth since 2003.
- Manufacturing capital spending grew by 4.5% and 5.7% in 2018 and 2019, respectively.
- Overall, manufacturing production grew 2.7% in 2018, with December 2018 being the best month for manufacturing output since May 2008.

Leading Innovation. Creating Opportunity. Pursuing Progress.

Any shift to a less-competitive tax code, as part of the effort to fund infrastructure legislation, would have the opposite effect. A recent NAM-commissioned analysis by economists from Rice University found that adopting tax policy changes such as increasing the corporate tax rate and raising the tax burden on pass-through businesses (which includes many small and medium manufacturers) would cost the United States 1 million jobs in the two years after enactment and result in an average loss of 600,000 jobs each year over the next decade. Moreover, wages, investment and GDP would all decline. These tax changes would run counter to the productive benefit of renewing federal infrastructure investment for the betterment of the nation.

The recent hearing on the solvency of the Highway Trust Fund, and the public consideration of alternative financing options, represents an important step forward for Congressional consideration of bold infrastructure policy, and NAM members are encouraged to see progress this year. Manufacturers stand ready to support your efforts related to innovative funding concepts and look forward to working with you as you advance infrastructure policy that funds our nation's surface transportation programs and addresses the vital investment our infrastructure systems require for long-term American economic prosperity.

Sincerely,



Leading Innovation. Creating Opportunity. Pursuing Progress.



April 14, 2021

The Honorable Tom Carper
 Chairman of the Senate Committee on
 Environment and Public Works
 513 Hart Senate Office Building
 Washington DC, 20510

The Honorable Shelley Moore Capito
 Ranking Member of the Senate Committee
 Environment and Public Works
 172 Russell Senate House Office Building
 Washington DC, 20510

Dear Chairman Carper and Ranking Member Capito,

On behalf of the National Stone, Sand & Gravel Association (NSSGA) and the aggregates industry we represent, we welcome today's hearing titled *Long-term Solvency of the Highway Trust Fund: Lessons Learned from the Surface Transportation System Funding Alternatives Program and Other User-based Revenue Solutions, and How Funding Uncertainty Affects the Highway Programs*. As you well know, the Highway Trust Fund (HTF) is dependent on outdated and insufficient user fees, and absent proactive solutions and new revenue models, the HTF will be financially insolvent in the very near future. NSSGA welcomes this critical dialogue on how we collect future revenues and fund our national infrastructure network for decades to come. NSSGA supports these efforts and hopes today's hearing will spur meaningful action.

NSSGA is the leading advocate and resource for the aggregates industry, who provide the critical raw materials found in virtually every surface transportation project; roads, highways, bridges, runways, pipelines and much more. Our membership represents more than 90 percent of the crushed stone and 70 percent of the sand and gravel produced annually in the United States. Our member companies work closely with State Departments of Transportation agencies regarding material procurement for their local public works projects and our products are one of the first items forecasted given its position at the top of the construction supply chain. Thus, financial certainty and maintaining a financially solvent HTF is key and must be tackled in tandem with whatever surface transportation reauthorization package this committee puts forward.

NSSGA is a vocal supporter of incorporating all revenue options to sustain the HTF and create financial certainty for a robust, multi-year surface transportation reauthorization. One of the most direct injections of funds would be raising and indexing the federal gas tax, a position NSSGA strongly supports, yet has not occurred since 1993. Raising the federal gas tax is the most efficient user fee and easiest to implement, as it requires virtually no additional infrastructure to raise. Given the rapid improvements on fuel efficiencies, gas tax receipts will only continue to decline and at a minimum, the federal gas tax should be indexed to increase in the coming years.

Though immediate gas tax increases will go a long way towards improving the HTF's revenue models, it cannot be the preferred revenue stream the next decade. Given the proliferation of electric vehicles and non-combustion engine drivetrains on our roadways, NSSGA supports incorporating these new technologies into the HTF. Capturing these emerging markets now will be key as demand will continue to rise, as roughly 1/4th of new vehicle sales will be electric by 2035 and 40% of all cars on the road will



be electric.¹ Beyond traditional revenue models, NSSGA also support efforts to study, create national pilots and ultimately revenue options like vehicle-miles-traveled (VMTs). VMTs appear to be a leading candidate to alleviate the dependency on gas tax receipts and is a model that can incorporate all engine drivetrains, as well as personal and commercial vehicles alike.

Lastly, NSSGA also supports utilizing public-private partnerships (P3s) where appropriate and leveraging bonding measures as other viable tools. Ultimately Congress must maintain flexibility and avoid a narrow on focus on one user fee over another, as the HTF will need to be evolve from its traditional model capture and incorporate the new technologies, driving habits and emerging vehicle markets we currently see on our roads and highways.

NSSGA appreciates the committee's work addressing the financial needs and dated revenue models of the Highway Trust Fund and identify user fees necessary to facilitate a transformative surface transportation reauthorization package. We offer our industry as a resource as ideas and dialogue on this critical policy continue to grow. Thank you for your time and we look forward to partnering with your offices as we work to improve our nation's infrastructure network.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael W. Johnson".

Michael W. Johnson
President and CEO
National Stone, Sand and Gravel Association

cc: Senate Environment & Public Works Committee Members

¹ <https://www.nytimes.com/interactive/2021/03/10/climate/electric-vehicle-fleet-turnover.html>



STATEMENT FOR THE RECORD FROM THE
American Association of State Highway and Transportation
Officials

REGARDING

**Long-term Solvency of the Highway Trust Fund:
Lessons Learned from the Surface Transportation
System Funding Alternatives Program and Other
User-based Revenue Solutions, and How Funding
Uncertainty Affects the Highway Programs**

BEFORE THE

**Committee on Environment and Public Works of the
United States Senate**

ON

Wednesday, April 14, 2021

American Association of State Highway and Transportation Officials
555 12th St NW, Suite 1000
Washington, D.C., 20004
202-624-5800
www.transportation.org
info@aaashto.org

INTRODUCTION

The American Association of State Highway and Transportation Officials (AASHTO) appreciates the opportunity to submit this Statement for the Record to the Senate Environment and Public Works Committee (Committee). As the association that represents the transportation departments of all 50 States, Washington, DC, and Puerto Rico, AASHTO provides the perspective of the nation's state departments of transportation (state DOTs) on important policy matters such as long-term solvency of the Highway Trust Fund and impacts to state departments of transportation if the federal government is unable to be a stable partner in the funding process.

AASHTO and its members are grateful to this Committee and Congress for your support of state DOTs during the ongoing COVID-19 pandemic. The roughly \$10 billion made available last year to state DOTs as part of the December COVID relief package has proven to be invaluable. With this funding, state DOTs have been able to continue operating and providing important transportation services throughout the country.

In addition, we appreciate the work of this Committee in ensuring a fully-funded one-year extension of the Fixing America's Surface Transportation Act (FAST Act). This extension gives Congress time to continue to develop and pass reauthorization legislation that will provide the policy framework for the coming years.

NEED FOR A LONG-TERM FUNDING SOLUTION FOR THE HIGHWAY TRUST FUND

In 2019, AASHTO's Board of Directors passed a resolution that asked Congress to consider these core principles when considering a solution to the Highway Trust Fund shortfall: funding should be derived from system use and the need for connectivity; funding should be dedicated to highway and public transit transportation improvements; and funding should be sufficient to support permanent growth in federal transportation investment.

If Congress wants to prevent dramatic funding cuts to state DOTs, transit agencies and other transportation partners, the time necessary to collect revenue from any option becomes critical. Collection of new revenue would have to occur prior to FY2022. Alternatively, Congress could authorize another General Fund transfer. In other words, the time to implement any funding option has to be considered. If the implementation will take months or years, that has to be taken into account. Short of raising current taxes or fees—which have the administrative, collection and oversight processes already in place—many funding options can take significant time to put into place.

IMPACTS OF FUNDING UNCERTAINTY ON STATE DEPARTMENTS OF TRANSPORTATION

According to recently released baseline projections from the Congressional Budget Office, in order to simply maintain the current Highway Trust Fund (HTF) spending levels adjusted for inflation after the current extension of the Fixing America's Surface Transportation (FAST) Act, Congress will need to identify \$74.8 billion in additional revenues for a five-year bill through 2026; \$97.2 billion would be needed to support a six-year bill through 2027 for both the highway and transit accounts.

We in the transportation industry do everything in our power to deliver needed priority projects as quickly as possible, but due to the nature of large capital programs, including an extensive regulatory process, many of the projects take several years to complete. The lack of stable, predictable funding from the HTF makes it nearly impossible for state DOTs to plan for large projects that need a reliable flow of funding over multiple years. And these projects are what connect people, enhance quality of life, and stimulate economic growth in each community where they are built.

States have answered the call to action for increasing transportation investments, with more than two-thirds of all states having successfully enacted transportation revenue packages over the past decade. It should be noted that federal transportation funding does not displace or discourage state and local investment. In fact, as evidenced by significant transportation infrastructure investment needs, further strengthening and reaffirmation of the federally-assisted, state-implemented foundation of the national program is even more critical now than in the past.

Fortunately, infrastructure investment has been one of the top national policy agenda items the last few years, even if significant action is yet to be taken. This year is no different, with the recent release of the outline of the American Jobs Plan by the Biden Administration.

We believe this truly is a unique window of opportunity to ensure the continued quality of life and economic vitality that make America a nation we are proud to call home. To do this, the situation demands bold action to invest in our transportation infrastructure at the appropriate level to guarantee the success of our nation's future.

THE ROLE OF STATE DEPARTMENTS OF TRANSPORTATION IN SURFACE TRANSPORTATION SYSTEM FUNDING ALTERNATIVES PROGRAM

The current mechanism for funding our country's surface transportation needs is based predominately on a per gallon fuel tax. There has been no increase in the federal gasoline tax of 18.4 cents per gallon since 1993. With improvements over the last few decades in fuel efficiency, the expected rise in alternative fuel vehicles, the loss of purchasing power of the gas tax, and the ever growing costs of maintaining our transportation network, there is

recognition that our current funding model is not sustainable in the long term to keep pace with system needs.

Since Oregon launched a self-funded pilot program in 2007, states have been exploring the feasibility of replacing the fuel tax with a model under which drivers are assessed a fee based on the distance they drive rather than the amount of gasoline their vehicle consumes. Many terms are used for this type of system including vehicle miles traveled (VMT) fee, mileage-based user fee (MBUF), and road user charge (RUC).

The Federal Role

Recognizing the need for further demonstration of road user charge models, in 2015 Congress established the Surface Transportation Systems Funding Alternatives (STSFA) Program in the Fixing America’s Surface Transportation (FAST) Act. Since its creation, the STSFA Program has awarded \$73.7 million to 37 pilot projects to demonstrate user-based alternative revenue mechanisms.

State Pilots

A number of states have launched pilot programs with assistance from the STSFA program. In addition, there are multi-state, regional pilots under way on the East Coast (under the Eastern Transportation Coalition) and within a coalition of Western States known as RUC West. Each state pilot has taken a slightly different approach with their in attempt to address the unique needs and challenges in their state. Findings and lessons learned from the state pilots will help inform the next steps for a mileage-based system.

California	Over 5,000 vehicle pilot with multiple reporting and fee collection methods, included 55 heavy commercial vehicles; Exploration of emerging technologies and services such as Usage-Based Insurance, Transportation Network Companies, global positioning system technology, and Autonomous Vehicles
Colorado	Four-month pilot with 150 vehicles, offered three mileage reporting options; focus on agricultural and rural communities
Hawaii	36-month research and demonstration project with odometer readings collected during annual vehicle safety checks; Testing of digital mapping data

Kansas/Minnesota	Impacts of RUC implementation in the Midwest with focus on rural and agricultural populations and commercial freight and supply chain operators
Minnesota	Demonstration of the feasibility of distance based user fees through the shared mobility model, such as Mobility-as-a-Service (MaaS) providers
Missouri	Deployment of innovative strategies such as a vehicle registration fee along with other user-based charges
New Hampshire	Exploration of road user charges levied in conjunction with vehicle registration fees
Ohio	Large-scale outreach program geared toward educating the public about RUC
Oregon	Voluntary road usage charge program in place (OreGo); vehicle owners may opt into the program at the time of their annual registration renewal in lieu of paying a flat vehicle registration fee; Road usage charging in a connected vehicle ecosystem
Texas	Demonstration of feasibility and technological capability of utilizing smartphone technology to understand travel patterns and the development of an accounting framework
Utah	Voluntary RUC system for electric vehicles began in January 2020; Integration of road user charges and express lane tolling; Road usage charge local overlay
Washington	2,000 vehicle, year-long pilot tested a mock pay-per mile system with four mileage reporting options
Wyoming	Truck mileage user fee pilot
Eastern Transportation Coalition (formerly known as I-95 Corridor Coalition) Delaware as lead (Maryland, Maine, North Carolina, New Jersey, Pennsylvania, Virginia)	Use of mileage-based user fees in a multi-state region, addressing the requirements for implementation, interoperability, public acceptance; Multi-state truck pilot; Demonstrate and test paths for mileage-

	based user fee in DC metro area and other states
RUC West (Arizona, California, Colorado, Idaho, Hawaii, Montana, Nevada, Oklahoma, Oregon, Utah, Washington)	11 Western States participating; Exploration of Road Usage Charge and Automated Vehicles at the state and in a regional interoperable system

As this Committee and Congress consider transitioning from the federal fuel excise tax to a road usage charging system, below are some key guidelines that should inform a national RUC program:

- **Education/Public Awareness:** There is a lack of understanding among the public about why the fuel tax will not be a sustainable funding mechanism for the long term. A concerted effort to explain why a RUC is being considered as an alternative must be part of a national program.
- **Urban and Rural Equity:** A key concern raised regarding a RUC system is that it would unfairly impact rural drivers. A national RUC program should gather enough data from both urban and rural drivers to be able to explore this issue more fully.
- **Interstate Operability:** There is a need to demonstrate how a RUC model might work across multiple states with different priorities and commitments made with motor fuel tax revenue.
- **Commercial Vehicles:** Payment of motor fuel taxes for commercial vehicles that travel in multiple states are governed under the International Fuel Tax Agreement (IFTA), a system created to simplify the current fuel tax system where states have different fuel tax rates. There may be applicable lessons from IFTA to a RUC system for passenger vehicles and a national RUC program should examine them.
- **Data Standards:** There are a number of data standards that will need to be set in order for a RUC system to work nationwide (vehicle telematics that can report road usage, for example). A national RUC program should recommend necessary data standards.
- **Privacy:** A national RUC program should proactively address data privacy concerns
- **Implementation/Administrative Costs:** A national RUC program should examine ways to minimize inconvenience to the public both in terms of revenue collection and distribution platforms. A national program should also explore the development of a “right fit” fee structure that addresses different categories of users: light and heavy users, users who travel across state lines, and both urban and rural users.

CONCLUSION

The current trajectory of the HTF—the backbone of federal surface transportation program—is simply unsustainable, as it will have insufficient resources to meet current federal investment levels beyond FY 2021.

Congress can take the action now to address the projected annual shortfalls by boosting much-needed revenues. Whichever revenue tools are utilized, AASHTO looks forward to assisting you and the rest of your Senate colleagues in finding and implementing a viable set of revenue solutions that will renew our national heritage of investment in our country and our future through transportation.

Thank you for the opportunity to provide the perspective of the nation's state DOTs.

APPENDIX: MATRIX OF SURFACE TRANSPORTATION REVENUE OPTIONS

Existing Highway Trust Fund Funding Mechanisms	Illustrative Rate or Percentage Increase	Definition of Mechanism/Increase	\$ in Billions	
			Assumed 2018 Yield*	Total Forecast Yield 2019-2023
Existing HTF Funding Mechanisms				
Diesel Excise Tax	20.0¢	¢/gal increase in current rate	\$8.8	\$42.2
Gasoline Excise Tax	15.0¢	¢/gal increase in current rate	\$21.8	\$102.1
Motor Fuel Tax Indexing of Current Rate to CPI (Diesel)	--	¢/gal excise tax		\$3.7
Motor Fuel Tax Indexing of Current Rate to CPI (Gas)	--	¢/gal excise tax		\$8.8
Truck and Trailer Sales Tax	20.0%	increase in current revenues, structure not defined	\$0.6	\$4.2
Truck Tire Tax	20.0%	increase in current revenues, structure not defined	\$0.1	\$0.5
Heavy Vehicle Use Tax	20.0%	increase in current revenues, structure not defined	\$0.2	\$1.2
Other Existing Taxes				
Minerals Related Receipts	25.0%	increase in/reallocation of current revenues, structure not defined	\$0.6	\$3.4
Harbor Maintenance Tax	25.0%	increase in/reallocation of current revenues, structure not defined	\$0.4	\$1.9
Customs Revenues	5.0%	increase in/reallocation of current revenues, structure not defined	\$1.9	\$10.3
Income Tax - Personal	0.5%	increase in/reallocation of current revenues, structure not defined	\$5.3	\$28.4
Income Tax - Business	1.0%	increase in/reallocation of current revenues, structure not defined	\$1.7	\$8.9
License and Registration Fees				
Drivers License Surcharge	\$5.00	dollar assessed annually	\$1.1	\$6.1
Registration Fee (Electric Light Duty Vehicles)	\$100.00	dollar assessed annually	\$0.0	\$0.2
Registration Fee (Hybrid Light Duty Vehicles)	\$50.00	dollar assessed annually	\$0.2	\$1.3
Registration Fee (Light Duty Vehicles)	\$5.00	dollar assessed annually	\$1.3	\$6.8
Registration Fee (Trucks)	\$100.00	dollar assessed annually	\$1.2	\$6.3
Registration Fee (All vehicles)	\$5.00	dollar assessed annually	\$1.3	\$7.1
Weight and Distance Based Fees				
Freight Charge—Ton (Truck Only)	10.0¢	¢/ton of domestic shipments	\$1.1	\$5.8
Freight Charge—Ton (All Modes)	10.0¢	¢/ton of domestic shipments	\$1.3	\$7.1
Freight Charge—Ton-Mile (Truck Only)	0.5¢	¢/ton-mile of domestic shipments	\$10.1	\$54.2
Freight Charge - Ton-Mile (All Modes)	0.5¢	¢/ton-mile of domestic shipments	\$21.6	\$115.9
Transit Passenger Miles Traveled Fee	1.0¢	¢/passenger mile traveled on all transit modes	\$0.6	\$3.2
Vehicle Miles Traveled Fee (Light Duty Vehicles)	1.0¢	¢/LDV vehicle mile traveled on all roads	\$29.1	\$155.7
Vehicle Miles Traveled Fee (Trucks)	1.0¢	¢/truck vehicle mile traveled on all roads	\$2.9	\$15.7
Vehicle Miles Traveled Fee (All Vehicles)	1.0¢	¢/vehicle mile traveled on all roads	\$32.0	\$171.5
Sales Taxes on Transportation Related Economic Activity				
Freight Bill - Truck Only	0.5%	percent of gross freight revenues (primary shipments only)	\$3.8	\$20.2
Freight Bill - All Modes	0.5%	percent of gross freight revenues (primary shipments only)	\$4.6	\$24.8
Sales Tax on New Light Duty Vehicles	1.0%	percent of sales	\$2.8	\$14.9
Sales Tax on New and Used Light Duty Vehicles	1.0%	percent of sales	\$4.2	\$22.4
Sales Tax on Auto-related Parts & Services	1.0%	percent of sales	\$2.7	\$14.4
Sales Tax on Diesel	2.0%	percent of sales (excluding excise taxes)	\$1.5	\$7.9
Sales Tax on Gas	2.0%	percent of sales (excluding excise taxes)	\$5.2	\$28.0
Tire Tax (Light Duty Vehicles)	1.0%	of sales of LDV tires	\$0.3	\$1.4
Sales Tax on Bicycles	1.0%	percent of sales	\$0.1	\$0.3
Other Excise Taxes				
Container Tax	\$15.00	dollar per TEU	\$0.7	\$4.0
Imported Oil Tax	\$2.50	dollar/barrel	\$4.5	\$23.9

* Assumed yield in 2018 or the latest year data is available.

A Practical Analysis of a National VMT Tax System

March 2021



Prepared by the American Transportation Research Institute



A Practical Analysis of a National VMT Tax System

March 2021

Jeffrey Short

Vice President

American Transportation Research Institute

Atlanta, GA

Dan Murray

Senior Vice President

American Transportation Research Institute

St. Paul, MN



950 N. Glebe Road, Suite 210

Arlington, Virginia 22203

TruckingResearch.org

ATRI BOARD OF DIRECTORS

Judy McReynolds

Chairman of the ATRI Board
Chairman, President and Chief
Executive Officer
ArcBest Corporation
Fort Smith, AR

Andrew Boyle

Co-President
Boyle Transportation
Billerica, MA

Hugh Ekberg

President and CEO
CRST International
Cedar Rapids, IA

Darren D. Hawkins

Chief Executive Officer
Yellow
Overland Park, KS

Derek Leathers

President and CEO
Werner Enterprises
Omaha, NE

Robert E. Low

President and Founder
Prime Inc.
Springfield, MO

Rich McArdle

President
UPS Freight
Richmond, VA

Benjamin J. McLean

Chief Executive Officer
Ruan Transportation Management
Systems
Des Moines, IA

Dennis Nash

Executive Chairman of the Board
Kenan Advantage Group
North Canton, OH

Brenda Neville

President and CEO
Iowa Motor Truck Association
Des Moines, IA

James D. Reed

President and CEO
USA Truck
Van Buren, AR

John A. Smith

President and CEO-Elect
FedEx Ground
Moon Township, PA

Rebecca Brewster

President and COO
ATRI
Atlanta, GA

Chris Spear

President and CEO
American Trucking Associations
Arlington, VA

ATRI RESEARCH ADVISORY COMMITTEE

**Shawn R. Brown, RAC
Chairman**
Vice President of Safety
Cargo Transporters

Michael Ahart
VP, Regulatory Affairs
Omnitracs LLC

Ben Banks
Vice President, Operations
TCW, Inc.

Hayden Cardiff
CEO and Founder
Idelic

Joe Darby
Director, Safety & Risk Control,
Transportation & Logistics
Practice
Aon

Bob Elkins
Senior Vice President, Industry
Vertical Operations
Ruan Transportation
Management

Gary Falldin
Vice President of Safety,
Security and Driver Onboarding
Dart Transit

Melanie Feeley
Vice President, General
Business Manager
K-Limited Carrier, Ltd

James P. Fields
Chief Operating Officer
Pitt-Ohio, LLC

Rickey Fitzgerald
Manager, Freight and
Multimodal Operations
Florida Department of
Transportation

Steven Garrish
Vice President of Safety
CRST International, Inc.

Rob Haddock
Group Director, Planning and
Logistics
Coca-Cola North America

Kevin Lhotak
President
Reliable Transportation
Specialists

Mike Ludwick
Chief Administrative Officer
Bison Transport

Steve Olson
President and Chief
Underwriting Officer
Great West Casualty Company

Clay Porter
Attorney
Porter, Rennie, Woodard,
Kendall, LLP

Abigail Potter
Manager, Safety and
Occupational Health Policy
American Trucking Associations

Jeremy Reymier
Founder and CEO
DriverReach

Rob Rhea
Senior Vice President and
General Counsel
FedEx Freight

Marc Rogers
President and CEO
UniGroup

Amanda Schuier
Senior Vice President
Quality Transport

Joe Sculley
President
Motor Transport Association of
Connecticut

Shelly Seaton
Vice President of Loss
Prevention
Landstar

Charles Simpson
Vice President, Strategic
Intelligence
U.S. Xpress

Russ Simpson
America's Road Team Captain
Yellow

Monique Stinson
Computational Scientist
Argonne National Laboratory

Daniel Studdard
Principal Planner,
Transportation Access and
Mobility Division
Atlanta Regional Commission

Jay Thompson
Chief
Arkansas Highway Police

Randy Vernon
Chief Executive Officer
Big G Express

Doug Voss
Arkansas Highway
Commission Endowed Chair
University of Central Arkansas

Tom Weakley
Director of Operations
Owner-Operator Independent
Drivers Association
Foundation

John Whittington
Vice President, Legislative
Affairs
Grammer Logistics

Shawn Yadon
Chief Executive Officer
California Trucking
Association



TABLE OF CONTENTS

ACRONYMS	6
INTRODUCTION	7
Problem Statement	7
Research Goals	8
VMT TAX BACKGROUND	9
Motivations for Switching from a Fuels Tax to a VMT Tax	9
Policy Goals of a VMT Tax	11
VMT Technology Options	12
VMT System Requirements	15
VMT Tax System Costs	15
User Concerns	20
State and Local VMT Tax Research Programs	23
ANALYSIS OF A NATIONAL VMT TAX SYSTEM	27
Understanding the Scale of a National VMT Tax System	27
VMT Rate Types and Rate Setting	30
Rules for Revenue Sources and Allocation	31
Cost Analysis of GPS-Enabled VMT Tax Systems	33
Estimated Deployment Requirements	35
Collection and Administrative Costs	36
Compliance and Enforcement Costs	41
DESIGNING A NATIONAL VMT TAX SYSTEM FRAMEWORK	43
CONCLUSIONS	46
APPENDIX A: EXAMPLE OF TERMS OF SERVICE	49

TABLES AND FIGURES

Figure 1: Federal Fuel Tax Revenue 20 Year Trends.....	11
Table 1: Technology Options	13
Figure 2: U.S. Fleet by Vehicle Type.....	27
Figure 3: All VMT by Vehicle Type.....	28
Figure 4: U.S. Lane-Miles of Roadway and U.S. Vehicle Miles Traveled	29
Table 2: Fuel Tax Revenue Allocation by Road Type	29
Table 3: Annual Vehicle Miles Traveled Per Lane-Mile.....	30
Figure 5: Pass-Through Scenario – Linndale, Ohio.....	33
Table 4: Calculating a Truck VMT Fee Using Car Data.....	36
Table 5: Cost to Collect \$33.5 billion in Gross Revenue	37
Table 6: Total VMT Revenue to Maintain Existing Highway Trust Fund Spending Levels	37
Table 7: Collection Costs and Revenue Levels with 40% Collection Cost	38
Table 8: Collection Costs and Revenue Levels with 10% Collection Cost	38
Table 9: Annual Administrative Costs for Collection of \$35 billion in Federal VMT Revenue	40
Table 10: Loss of Revenue on 10 Toll Systems	41
Table 11: Calculating the Estimated Cost of Enforcement	42



ACRONYMS

AAA	American Automobile Association
ATRI	American Transportation Research Institute
BEVs	Battery Electric Vehicles
BLS	Bureau of Labor Statistics
CAFE	Corporate Average Fuel Economy
CAM	Commercial Account Manager
CBO	Congressional Budget Office
CPM	Cost-per-Mile
CRS	Congressional Research Services
DMV	Division of Motor Vehicles
DOF	Department of Finance
DOT	Department of Transportation
DSRC	Dedicated Short-Range Communications
ECM	Engine Control Modules
EEI	Edison Electric Institute
EPA	Environmental Protection Agency
EV	Electric Vehicle
FCC	Federal Communications Commission
FHWA	Federal Highway Administration
GAO	Government Accountability Office
GPS	Global Positioning System
HOT	High Occupancy Toll
HTF	Highway Trust Fund
IFTA	International Fuel Tax Agreement
IRS	Internal Revenue Service
IT	Information Technology
MBUF	Mileage-Based User Fee
MPG	Miles-per-Gallon
NAS	National Academies of Sciences
NHCCI	National Highway Construction Cost Index
NYC	New York City
OBD	Onboard Device
OBU	Onboard Unit
OEM	Original Equipment Manufacturer
ODOT	Oregon Department of Transportation
RAC	Research Advisory Committee
RFID	Radio Frequency Identification
RUC	Road User Charge
UHF	Ultra High Frequency
VMT	Vehicle Miles Traveled
WLAN	Wireless Local Area Network

1. Introduction

Problem Statement

The Highway Trust Fund (HTF) is the primary source of federal funding used by state governments to maintain and improve U.S. surface transportation infrastructure. The majority of annual federal HTF revenues, which typically total nearly \$40 billion, derive from a per-gallon federal excise tax on motor fuels used to power automobiles and trucks. In part, this tax acts as a road user fee, with larger vehicles (e.g. Class 8 tractor-trailers with low miles-per-gallon [MPG]) paying substantially more per mile for use than smaller vehicles (e.g. compact cars with very high MPG).

The current federal fuel tax rates of 18.4 cents (gasoline) and 24.4 cents (diesel) were last increased in 1993. Though fuel consumption has increased since 1993 along with HTF revenues, the HTF now annually faces a shortfall. These shortfalls are due, in part, to normal inflation, which was more than 79 percent from 1993 to 2020.¹ While annual HTF revenues have increased since 1993, the funds raised have still fallen short of transportation funding needs simply because the buying power of 18.4 and 24.4 cents per gallon has decreased. There has been no indexing of the per-gallon tax rate to counteract the effects of inflation.

Another factor is improvements in the fuel efficiency of the U.S. fleet. The average car and truck manufactured in recent years can travel farther on a gallon of fuel than vehicles from the early 1990s.² Likewise, an increasing number of electric vehicles are slowly replacing gasoline- and diesel-powered cars and trucks, and these vehicles do not pay any federal motor fuels taxes.³

Surface transportation spending has continued to fall far short of what is needed.⁴ In response to HTF shortfalls, Congress has periodically made large transfers from the general fund to fill transportation funding gaps.⁵ The U.S. Congress has not however opted to raise the fuel tax. Many members of Congress are reluctant to raise fuel taxes since such actions will noticeably increase the cost of fuel for nearly all constituents in the short-term. Additionally, some members of Congress have publicly committed to "no new taxes."

As a result of the myriad fuel tax issues outlined above, the Congressional Budget Office (CBO) found in 2019 that the HTF will be exhausted by 2022.⁶

¹ U.S. Bureau of Labor Statistics. Databases, Tables & Calculators by Subject. Available Online:

<https://www.bls.gov/data/>

² United States Environmental Protection Agency. (January 26, 2021). "Automotive Trends Report."

<https://www.epa.gov/automotive-trends/highlights-automotive-trends-report#main-content>

³ Rudman, Kristin. (November 30, 2018). "EEI Celebrates 1 Million Electric Vehicles on U.S. Roads." Edison Electric Institute.

<https://www.eei.org/resourcesandmedia/newsroom/Pages/Press%20Releases/EEI%20Celebrates%201%20Million%20Electric%20Vehicles%20on%20U-S-%20Roads.aspx>

⁴ For example, "to achieve a state of good repair, USDOT's 2015 Conditions and Performance Report estimates highway and bridge needs at \$836 billion and transit needs at \$90 billion, which would require significant additional investment."

AASHTO. (December 17, 2019). "2020 AASHTO Legislative Action Agenda." <https://policy.transportation.org/wp-content/uploads/sites/59/2020/02/2020-AASHTO-Legislative-Action-Agenda-FINAL-2019-12-17.pdf>

⁵ Kirk, Robert and William Mallett. (May 11, 2020). "Funding and Financing Highways and Public Transportation." Congressional Research Service. <https://fas.org/sqp/crs/misc/R45350.pdf>

⁶ Beider, Perry, and David Austin. (October 2019). "Issues and Options for a Tax on Vehicle Miles Traveled by Commercial Trucks." Congressional Budget Office. <https://www.cbo.gov/publication/55688>



The political aversion to tax increases by many U.S. congressmen has led to a discussion of alternatives to the fuel tax, often through mechanisms that are coined as "user fees." It should be noted that while the excise tax on motor fuels is traditionally viewed as a tax, it does resemble a user fee in many ways. While the fuel is directly purchased and consumed by the road user, the revenue from the tax portion of the fuel cost is deposited in the HTF for distribution to a larger network of roadways and facilities.

It should also be noted that a separate transportation revenue collection approach, tolling, is typically categorized as a user fee since it is a charge to access a specific road facility. That said, some entities that impose tolls (e.g. the state of Rhode Island) have argued that tolls are a form of taxation.⁷

Beyond fuel taxes and tolling, and in parallel with the advancement of vehicle tracking technologies, the concept of a per-mile road user charge or tax has been discussed in recent years. A system for levying a per-mile charge on drivers is known by many names:

- Vehicle Miles Traveled (VMT) Tax/Fee
- Road User Charge (RUC)
- Mileage-Based User Fee (MBUF)

Such a system would enable the federal government and potentially other levels of government to charge drivers or vehicle owners for each mile driven. This research will informally refer to the concept as a "VMT tax," which is the term used in the Congressional Budget Office's 2019 report. Though the research team did elect to use the term VMT tax in this report, that should not be construed as a final determination on whether the VMT tax is a tax, a fee or a hybrid of the two.

On a national scale, a VMT tax system would likely be applied to all vehicles operating in the country. That said, the VMT tax concept is of particular concern to the trucking industry; in February 2020 several U.S. Senators proposed a VMT tax exclusively on trucks as a means for raising revenue for surface transportation infrastructure.⁸ In response, the American Transportation Research Institute (ATRI) Research Advisory Committee (RAC) voted in March 2020 to proceed with a thorough cost-benefit study of the VMT tax concept.⁹

Research Goals

The goal of this research is to explore the requirements, costs and benefits of a national system for collecting revenue based on miles driven in the U.S. This report is presented in five parts that cover: 1) a detailed discussion of VMT tax definitions and descriptions; 2) the technical and administrative requirements of a functioning system for collecting federal revenue through a VMT tax; 3) an assessment of the costs of such a system; 4) a framework for the design of a national VMT tax system; and 5) a summary of the research findings.

⁷ Lamb, Eleanor. (December 6, 2019). "Trucking Scores a Win in Rhode Island Tolls Case." Transport Topics. <https://www.ttnews.com/articles/trucking-scores-win-rhode-island-tolls-case>

⁸ Courtney, Shaun. (February 25, 2020). "Trucking Groups Resist New Mileage Tax Proposal to Fund Highways." Bloomberg Government. <https://about.bqgov.com/news/trucking-groups-resist-new-mileage-tax-proposal-to-fund-highways/>

⁹ ATRI's RAC is comprised of industry stakeholders representing motor carriers, trucking industry suppliers, labor and driver groups, law enforcement, federal government, and academics. The RAC is charged with annually recommending a research agenda for the Institute.

2. VMT Tax Background

Motivations for Switching from a Fuels Tax to a VMT Tax

Taxes on motor fuels both at the federal and state level are currently the primary revenue source for the nation's roadway infrastructure. The fuel tax has been the primary user-pays approach to funding roadways at the federal level for nearly 90 years, and it is likely to remain a key source of revenue for some time. While the fuel tax is critical to transportation funding, past research has found that "fuel tax receipts, measured in real dollars per mile of travel, have fallen precipitously over recent decades, leaving insufficient revenue to maintain, let alone expand, the road network."¹⁰

The literature offers several key reasons why fuel tax receipts per mile of travel have fallen.

Weak Governance that does not Address Inflation. An increase in the federal fuel tax requires legislative action. This has not happened since 1993 – more than a quarter century ago. The federal fuel tax is a per-gallon charge and does not take into account the price of fuel. Therefore, fuel taxes "must be periodically raised to offset the effects of inflation and improved fuel economy, and elected officials have grown increasingly reluctant to take on this unpopular task in recent decades."¹¹ Without a net increase or an adjustment for inflation, the only means to increase revenues is with increased fuel consumption, which has in fact occurred. From 2003 to 2019, annual gallons of fuel consumed in the U.S. increased by 9.2 percent.¹² This has helped offset the impact of inflation as seen through the National Highway Construction Cost Index (NHCCI), which was 88.2 percent from December 2003 to December 2019 compared to 39.4 percent between December 2003 and December 2019 for regular inflation.¹³ That said, every dollar of revenue collected in December 2019 had the buying power of only 53 cents in 2003 using the NHCCI (or 72 cents in December of 2003 when looking at regular inflation).¹⁴

Fuel Economy Improvements. Much of the literature reviewed for this report cites fuel economy improvements in the U.S. vehicle fleet as a reason for adopting a VMT tax. As an example, the Government Accountability Office (GAO) states that Corporate Average Fuel Economy (CAFE) standards require cars and trucks to increase fuel economy to 54.5 MPG by 2025, which is more than double the MPG that was required in 2000.¹⁵ These higher standards will in part be met by increased use of hybrid electric vehicles. While vehicle manufacturers have improved fuel economy as measured by Environmental Protection Agency (EPA) standards, the U.S. fleet overall has not greatly altered its consumption of fuel per mile. To put this in perspective, in 2000 the U.S. fleet consumed 5.93 gallons of fuel per 100 miles driven; by

¹⁰ National Academies of Sciences, Engineering, and Medicine. (2009). "Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding." Washington, DC: The National Academies Press. <https://doi.org/10.17226/23018>.

¹¹ National Academies of Sciences, Engineering, and Medicine. (2009). "Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding." Washington, DC: The National Academies Press. <https://doi.org/10.17226/23018>.

¹² U.S. Department of Transportation Federal Highway Administration. (December 24, 2020). "Motor-Fuel Volume Taxed – 2019." Table MF – 2. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/mf2.cfm>

¹³ U.S. Department of Transportation Federal Highway Administration. "National Highway Construction Cost Index (NHCCI)." <https://explore.dot.gov/views/NHInflationDashboard/NHCCI> Date Accessed: March 8, 2021.

¹⁴ U.S. Bureau of Labor Statistics. CPI Inflation Calculator. Available Online: https://www.bls.gov/data/inflation_calculator.htm

¹⁵ United States Government Accountability Office (GAO). (December 2012). "Pilot Program Could Help Determine the Viability for Certain Vehicles." <https://www.gao.gov/assets/660/650863.pdf>



2019 that figure was only down to 5.75 gallons of fuel per 100 miles driven.^{16 17} This could be explained, in part, by the congestion that has resulted from increasing annual VMT on a static supply of urban infrastructure.

Electric Vehicles. In the past decade approximately one million battery electric vehicles (BEVs) have been sold in the U.S.¹⁸ The literature finds that electric vehicles, along with hybrid-electric vehicles, “represent a significant violation of the user-pays-and-benefits principle since a substantial part of their propulsion is powered by electricity and thus not subject to fuel taxes.”¹⁹ By their very nature, BEVs do not pay the fuel tax. Presently, with 272 million private vehicles registered in the U.S., the purely electric BEV segment makes up less than half a percent of the total U.S. fleet. This is a small figure, but there are predictions for large-scale growth in electric vehicle sales in the coming decades. The Edison Electric Institute (EEI) anticipates 18.7 million BEVs by 2030.²⁰ This figure would still be less than seven percent of the current U.S. vehicle fleet. The 18.7 million BEVs face a separate challenge as well – EEI anticipates 9.6 million charge ports must be deployed to support these vehicles – which is roughly one charge port for every two BEVs. This is far fewer than the 96,356 estimated public charging ports available in 2020.²¹

¹⁶ U.S. Department of Transportation Federal Highway Administration. (December 24, 2020). “Highway Statistics Series: Annual Vehicle Distance Traveled in Miles and Related Data – 2019.” Table VM – 1.

<https://www.fhwa.dot.gov/policyinformation/statistics/2019/vm1.cfm>

¹⁷ U.S. Department of Transportation Federal Highway Administration. (January 8, 2021). “Highway Statistics Series: Motor-Fuel Volume Taxed – 2019.” Table MF – 2. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/mf2.cfm>

¹⁸ Office of Energy Efficiency & Renewable Energy. (September 28, 2020). “FOTW #1153, September 28, 2020. Cumulative Plug-In Vehicle Sales in the United States Reach 1.6 Million Units.”

<https://www.energy.gov/eere/vehicles/articles/fotw-1153-september-28-2020-cumulative-plug-vehicle-sales-united-states-reach>

¹⁹ Coyle, David. et al. (August 2011). “From Fuel Taxes to Mileage-Based User Fees: Rationale, Technology, and Transitional Issues.” University of Minnesota.

<https://conservancy.umn.edu/bitstream/handle/11299/112579/CTS%2011-16.pdf>

²⁰ Rudman, Kristin. (November 30, 2018). “EEI Celebrates 1 Million Electric Vehicles on U.S. Roads.” Edison Electric Institute.

<https://www.eei.org/resourcesandmedia/newsroom/Pages/Press%20Releases/EEI%20Celebrates%201%20Million%20Electric%20Vehicles%20on%20U-S-%20Roads.aspx>

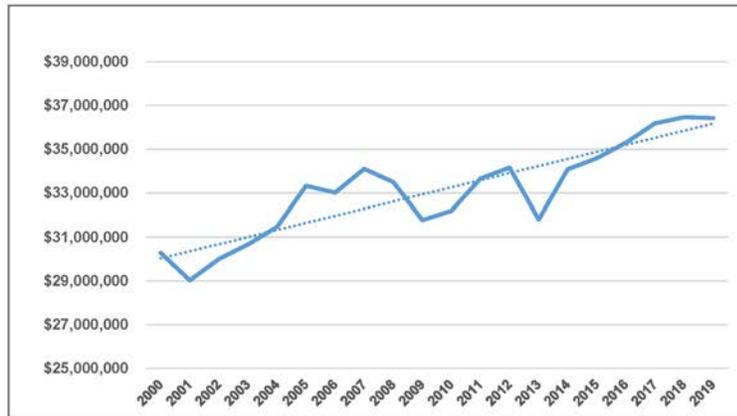
²¹ McDonald, Loren. “Charging Stats.” <https://evadoption.com/ev-charging-stations-statistics/#:~:text=As%20of%20December%2031%2C%202017,average%20of%202.75%20stations%2Foutlets>. Date Accessed: February 25, 2021.

Policy Goals of a VMT Tax

The literature generally focuses on one clear and ubiquitous policy goal of a VMT tax, which is to generate transportation revenue. According to the literature, however, many additional goals could be met through a VMT tax and its supporting technology. A 2009 National Academies of Sciences (NAS) report suggested that a VMT tax would allow policy makers to tackle "challenging transportation policy goals, such as reducing traffic congestion or harmful pollutant emissions."²² Additionally, the idea of revenue apportionment at the state and local level has been discussed.²³

Revenue for Transportation Spending. As referenced throughout the literature, there is evidence that policy-makers and transportation agencies are concerned about the long-term buying power of fuel taxes if they remain at static rates. Infrastructure investment needs continue to increase, making revenue generation the leading politically palatable goal of a VMT tax. It is important to note that, while tax rates remain static, fuel economy has improved and electric vehicles are becoming more common, federal fuel tax revenues have been growing. Across the past two decades, annual fuel tax revenues have increased approximately 20 percent as show in Figure 1.²⁴

Figure 1: Federal Fuel Tax Revenue 20 Year Trends



²² National Academies of Sciences, Engineering, and Medicine. (2009). "Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding." Washington, DC: The National Academies Press.

²³ Sorensen, Paul, Liisa Ecola, and Martin Wachs. "Mileage-Based User Fees for Transportation Funding: A Primer for State and Local Decision Makers." Santa Monica, Calif.: RAND Corporation, TL-104, 2012. As of February 16, 2021: <https://www.rand.org/pubs/tools/TL104.html>

²⁴ U.S. Department of Transportation Federal Highway Administration. (January 22, 2021). "Highway Statistics Series: Status of Highway Trust Fund." Table FE – 210. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/fe210.cfm>



This is the result of growth in vehicle travel, though each vehicle, on average, is paying less into the trust fund due to improved fuel economy.

Transportation Demand Management. The literature suggests that, much like congestion pricing, a variable VMT tax could be employed to decrease demand for road use by increasing the cost-per-mile (CPM) charge for a given location and/or during certain time-periods. Decreasing demand through a variable pricing schema would, according to the literature, "accomplish other social objectives such as reducing the amount of driving, reducing energy usage, reducing greenhouse gas emissions, and reducing congestion through pricing."²⁵ While these strategies typically shift vehicles to other roads or time periods (which does not create a net benefit for social engineering goals), it has been suggested that pricing could shift drivers to other modes such as transit.²⁶ It should be noted that most employees are not in charge of their own work schedules; thus, pricing schemes that force commuters to pay rush-hour charges become inflationary to the users as they pay an additional tax for no increase in travel benefits. Such pricing strategies are not possible through a fuel tax, and transportation demand management practices raise social equity issues whereby certain road users would be "priced-out" of driving during certain times and in certain locations.

Revenue Apportionment. A third policy goal found in the literature is to attribute or apportion revenues to specific roadways. A VMT tax system that employs Global Positioning System (GPS) technology, for instance, could "increase transparency with regard to roadway use costs and how funds collected for that use are spent."²⁷ It is even suggested that a federal system could also be used by multiple jurisdictions, allowing for "simultaneous collection and apportionment of federal, state, and even local VMT fees."²⁸ Thus, if a roadway had more VMT usage, that roadway might receive more revenue or revenue equivalent to what it raised. This would generate different formulas for state and local distribution than are presently used under the federal fuel tax formula.

VMT Technology Options

A wide range of possible technologies exist for implementing a VMT tax system, based on references found in the literature. While there are relatively low-tech options available, most researchers "envision the use of sophisticated in-vehicle metering equipment, which might be phased in with new vehicle purchases."²⁹ The use of the more sophisticated technologies would be necessary for meeting those policy goals that go beyond basic revenue collection, and would be required to ensure compliance. Table 1 shows high-level categories of commonly referenced Information Technology (IT) platforms for VMT deployment, as referenced in the literature. While many different configurations of hardware, software and communications platforms are conceivable, these systems are the most practical and are each described in more detail below Table 1.

²⁵ Baker, Richard. (March, 2014). "Vehicle Miles Traveled (VMT) Fees." Texas A&M Transportation Institute. <https://tti.tamu.edu/tti-publication/vehicle-miles-traveled-vmt-fees/>

²⁶ National Academies of Sciences, Engineering, and Medicine (2010). "System Trials to Demonstrate Mileage-Based Road Use Charges." Washington, DC: The National Academies Press. <https://doi.org/10.17226/22910>

²⁷ Baker, Richard. (March, 2014). "Vehicle Miles Traveled (VMT) Fees." Texas A&M Transportation Institute. <https://tti.tamu.edu/tti-publication/vehicle-miles-traveled-vmt-fees/>

²⁸ National Academies of Sciences, Engineering, and Medicine. (2009). "Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding." Washington, DC: The National Academies Press. <https://doi.org/10.17226/23018>

²⁹ Ibid.

Table 1: Technology Options

Hardware	Software	Communication Protocol	Functionality	Geographic Tracking Capabilities
Odometer	N/A	Manual / Self-Report	Simple mileage tracking	None with existing vehicle models
Smartphone	VMT-specific applications	GPS; Terrestrial (cellular network); Bluetooth – short-range	Mileage management and reporting; possibly by roadway type and time	State, other jurisdictions, time-of-day, potential route level
Radio Frequency Identification (RFID) tag (active & passive) and gantry/reader systems	VMT-specific applications	Ultra High Frequency (UHF) – short-range	Simple mileage tracking to full functionality – depending on back-room system design	Limited to reader station network
Aftermarket: <i>Customized Device / Onboard Device</i>	Customized software	Terrestrial (cellular network); Bluetooth, RFID Wi-Fi, Dedicated Short-Range Communications (DSRC). GPS optional	Simple mileage tracking to full functionality – depending on GPS and/or client- and back-room systems	State, other jurisdictions, potential route level
Original Equipment Manufacturer (OEM)-Installed: <i>Vehicle / Onboard Computer w/ GPS</i>	Open source; OEM-proprietary	Terrestrial (cellular network) / Wi-Fi / DSRC	Simple mileage tracking to full functionality – depending on client-based data management	State, other jurisdictions, time-of-day, potential route level

Odometer. The odometer option is the least technologically sophisticated and least expensive to implement and administer.³⁰ A vehicle owner would simply report mileage annually, for instance, possibly through state inspections or through federal tax returns.³¹ This option would have no geographic tracking capabilities unless location was reported by the driver. The odometer option is similar to the approach once favored for state fuel tax reciprocity in the

³⁰ Congress of the United States Congressional Budget Office. (October 2019). "Issues and Options for a Tax on Vehicle Miles Traveled by Commercial Trucks." <https://www.cbo.gov/system/files/2019/10/55688-CBO-VMT-Tax.pdf>
³¹ Ecola, Liisa, et al. (2011). "Moving Toward Vehicle Miles of Travel Fees to Replace Fuel Taxes: Assessing the Path Forward." RAND Corporation. https://www.rand.org/pubs/research_briefs/RB9576.html



trucking industry, through the International Fuel Tax Agreement (IFTA), by carriers that do not have telematics.³²

RFID Tag. RFID tags can be both active and passive, and can carry a limited amount of data. Using UHF communication, RFID tags have communication ranges from 10 feet (passive) to 300 feet (active), but all rely exclusively on local readers or gantries. As there is limited data storage on tags, the full functionality needs of a VMT system would require additional back-room data processing. The need for a static reader network also makes an "open road" VMT network unfeasible.

Smartphone. The smartphone option would utilize a custom VMT application to track and communicate mileage via cellular network.³³ Such a system would require that users have a smartphone, and would require that the smartphone was functioning in the vehicle when mileage was accrued. This method does have the potential for GPS-level tracking. While a smartphone could technically do the full-function processing on the device, the digitized road network database needed to vary charges by road type essentially requires that back-room processing is used. In terms of compliance, simply turning off Location-Based Services, or the smartphone itself could create large mileage data gaps.

Customized Device/Onboard Aftermarket Unit. An aftermarket VMT unit is a customized device that plugs into the Onboard Diagnostics (OBD) port of a vehicle in order to track miles. The device may have one or more capabilities including:^{34 35}

1. GPS tracking capabilities
 - a. Route level and potential latitude/longitude geographical capabilities
2. Wireless cellular capabilities
 - a. Communicate mileage data, and
 - b. Geographical tracking capabilities, although road type and jurisdiction data would not be resident.
3. RFID capabilities are possible, but data storage limitations, and line-of-sight and interference issues are possible based on the OBD location.
 - a. High cost to implement due to reader/gantry infrastructure requirements, limiting the scale of the road network.
4. DSRC has limitations similar to RFID. Data transmissions are limited in scale and distance, and existing DSRC devices do not interconnect with vehicle components that manage VMT-related data. Finally, the transceiver network requirements would be as, or more extensive, than would RFID systems.

OEM Installed. An OEM-installed telematics system on new model vehicles would allow for all of the above aftermarket unit functionality but would not require an aftermarket installation and would also ensure that there are no integration issues. As noted above, for full functionality, the system would require GPS as well as robust data processing either onboard or back-room. A

³² Congress of the United States Congressional Budget Office. (October 2019). "Issues and Options for a Tax on Vehicle Miles Traveled by Commercial Trucks." <https://www.cbo.gov/system/files/2019-10/55688-CBO-VMT-Tax.pdf>

³³ Ibid.

³⁴ Sorensen, Paul, Liisa Ecola, and Martin Wachs. "Mileage-Based User Fees for Transportation Funding: A Primer for State and Local Decision Makers." Santa Monica, Calif.: RAND Corporation, TL-104, 2012. As of February 16, 2021: https://www.rand.org/pubs/tools/TL_104.html

³⁵ Congress of the United States Congressional Budget Office. (October 2019). "Issues and Options for a Tax on Vehicle Miles Traveled by Commercial Trucks." <https://www.cbo.gov/system/files/2019-10/55688-CBO-VMT-Tax.pdf>

third-party account and transaction service would need to be developed and managed in near-real-time.

VMT System Requirements

Based on the multiple objectives and requirements of a national VMT system proffered in the literature by policy-makers and VMT champions such as the Oregon Department of Transportation (ODOT), this research presumes that the system will require the following elements.

GPS – standard or high-resolution. A national VMT tax system will require travel details and granularity that exceed what can be generated by odometers and engine control modules (ECM). In nearly all instances, roadway type and location is a critical element of road use charging by facility. For instance, the road use data must separate federal interstate roads from adjoining county frontage roads. If a national VMT system were used to manage High-Occupancy Toll (HOT) lanes, then the granularity would need to be at the lane-level.

Vehicle Connectivity. Since VMT tracking dongles do need to be associated with a specific car during vehicle operations, a plug-in dongle with data, storage and cellular capabilities is the most efficient method for linking vehicles, miles traveled and specific account information.

Terrestrial/Cellular Connectivity. As will be discussed later in this report, pre-1996 vehicles would not be equipped to utilize wireless dongles. Furthermore, a percentage of the U.S. population does not have internet, banking products and/or credit cards. However, to be efficient, a national system will require electronic transactions and wireless connectivity. While it is essential that the system rely on wireless connectivity, many wireless technologies will be unfeasible. The implementation scale for installing and maintaining local Bluetooth transceivers would be cost-prohibitive. Wireless Local Area Network (WLAN) and other networks would create considerable privacy and security issues. The lowest cost, most ubiquitous solution would be to utilize existing cellular networks – as this is the primary method used in the few limited VMT tests presently underway.

VMT Tax System Costs

Collecting and allocating transportation revenue from system users is the central objective of most use-based collection systems, including fuel taxes, tolling and a VMT tax.

There are many costs associated with collecting transportation revenue that are ultimately borne by road users, and some revenue collection mechanisms are far more efficient than others. For example, federal fuel taxes have a very low (0.2%) collection cost because revenues are collected directly from a limited number of large fuel terminal operators (e.g. Exxon and Chevron).³⁶ These costs are very low because of the small number of transactions that must be made. A review of the Internal Revenue Service (IRS) January 2021 list of active terminals that must report fuel transfer volumes suggests that fewer than 270 companies own the active terminals that are found at approximately 1,323 locations; these terminal operators are

³⁶ Peters, Jonathan and Jonathan Kramer. (Summer 2003). "The Inefficiency of Toll Collection as a Means of Taxation: Evidence from the Garden State Parkway." *Transportation Quarterly*, Vol. 57 No. 3. <https://tollfreeinterstates.com/sites/default/files/The%20Inefficiency%20of%20Toll%20Collection%20as%20a%20Means%20of%20Taxation.pdf>



ultimately the companies responsible for transferring fuel tax to the IRS.^{37 38} Tolls are relatively costly to administer and collect, and 15 to 30 percent collection costs are common.^{39 40}

It is not known what the full costs of collecting a national VMT tax would be, but the literature does make a first attempt at outlining the costs. It is clear that, as noted in one NAS report, “there are no ‘low cost’ options that can be easily verified and enforced.”⁴¹ The administrative reality of a VMT tax system is:

- It is far more complicated to track and collect money from several hundred million vehicles than collecting the fuel tax from several hundred large fuel providers; and
- Collecting revenue from a remote user group is far more complex than collecting at the point of service, as is done by tolling.

ODOT currently has the most advanced VMT tax program in the U.S. Operating under the name OReGO, the program contracts with private sector third-parties to collect and process the VMT tax revenue. In exchange, third-party companies are authorized to keep 40 percent of the gross per-mile payment to cover costs and presumably some level of profit.⁴² In doing so, however, the technology companies must bear many of the following costs associated with a comprehensive VMT program.

Deployment Costs. Deployment costs are those related to developing and implementing a viable program. There are several groups of deployment costs depending on the technology architecture. For the aftermarket technology approach, the literature suggests that the “two greatest obstacles to near-term implementation ... are the high cost of retrofitting the existing fleet with the needed technology, and overcoming current public concerns regarding privacy.”⁴³ The following categories cover most of the startup costs for a national VMT program.

- **Public Information.** The public will need to be educated and trained on how a VMT tax program works and why such a program is needed. Public acceptance and willingness to participate is a key step to the implementation process, and acceptance by as many as 230 million U.S. vehicle drivers is critical.⁴⁴
- **Technology Deployment.** The system requirements for tracking and reporting mileage vary based on the choice of technologies used. There are numerous system designs,

³⁷ Internal Revenue Service. (February 12, 2021). “Approved Terminals 01/31/2021.” https://www.irs.gov/pub/irs-ut/tcn_db.pdf

³⁸ Cornell Law School: Legal Information Institute (LII). “26 CFR 48.4081-2 – Taxable Fuel; Tax on Removal at a Terminal Rack.” <https://www.law.cornell.edu/cfr/text/26/48.4081-2> Date Accessed: March 8, 2021.

³⁹ Short, Jeffrey. (May 2007). “Defining the Legacy for Users: Understanding the Strategies and Implications for Highway Funding.” The American Transportation Research Institute (ATRI). Alexandria, VA.

⁴⁰ Short, Jeffrey; Jonathan Peters. (January 2020). “A Financial Analysis of Toll System Revenue: Who Pays & Who Benefits.” American Transportation Research Institute (ATRI). Arlington, VA.

⁴¹ National Academies of Sciences, Engineering, and Medicine. (2009). “Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding.” Washington, DC: The National Academies Press. <https://doi.org/10.17226/23018>

⁴² “California Road Charge Pilot Program.” (2017). California State Transportation Agency. <https://dot.ca.gov/-/media/dot-media/programs/road-charge/documents/rcpp-final-report-a11y.pdf>

⁴³ National Academies of Sciences, Engineering, and Medicine. (2009). “Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding.” Washington, DC: The National Academies Press. <https://doi.org/10.17226/23018>

⁴⁴ Wagner, Isabel. (December 16, 2020). “Number of Licensed Drivers – United States 1990 – 2018.” <https://www.statista.com/statistics/191653/number-of-licensed-drivers-in-the-us-since-1988/>

and the technologies associated with each design will require hardware and/or software installation, after-market installations and maintenance, or installed as standard equipment in new vehicles.

- **Account and Financial Management.** An IT infrastructure will be needed to allow up to 230 million new users to create accounts, transfer revenue, and register 272 million vehicles.⁴⁵ Additionally, the Federal Communications Commission (FCC) reports that 44 million households lack a standard broadband connection due possibly to their financial situation or due to a lack of access.⁴⁶ For those who do not have internet access or electronic payment options, a secondary mail-in program will be required.

Collection and Administrative Costs. Collection, administrative and other associated costs will accrue as part of a VMT tax program's day-to-day operations. Several organizations, both public and private, may be involved in these operations. The central function of these organizations will be tracking, billing, account management and collecting payment. For example, in the OReGO program, the state DOT has a management office and staff that oversees the private sector contracts, evaluates both the program and the contractors, and manages the financial transactions managed by the contractors. Separately, the contractors have redundant departments and staff that manage the users, technologies and user revenue.

The Congressional Research Service (CRS) juxtaposed and compared fuel tax costs with VMT tax costs as follows:

"One of the advantages of the federal motor fuels tax is that nearly all of the revenue is collected ... when the fuel is removed from the refinery or tank farm. This has been the case since 1986, when the U.S. Treasury shifted its collection of the gas tax to the refinery or 'rack' to reduce tax administration problems and curb fuel tax evasion. The federal government has no need to assess taxes at 111,000 gasoline stations or charge millions of vehicle owners individually. Tax administration costs are generally estimated to be less than one cent per dollar of revenue. The road user charge would reverse this by taking a small and simple tax administration problem and making it large. A mileage-based road user charge that encompasses all private vehicles could require as many as 256 million points of collection."⁴⁷

Thus, it is rational to assume that administrative costs will be far greater for a VMT tax system than the existing fuel tax system.

⁴⁵ Ibid.

⁴⁶ Shelton, Chris and Angela Sieffer. (October 28, 2020). "Many Americans Still Don't Have Internet Access – Congress Should Help." <https://thehill.com/opinion/technology/523179-many-americans-still-dont-have-internet-access-congress-should-help>

⁴⁷ Kirk, Robert; Marc Levinson. (June 22, 2016). "Mileage-Based Road User Charges." Congressional Research Service. <https://fas.org/sqp/crs/misc/R44540.pdf>

Case Study Analogies: Collection and Administrative Costs. Evidence of what the administrative and collection costs will be vary greatly, ranging in the literature from 5 percent to 40 percent.

Costs Based on E-Z Pass. A first analysis of possible administrative costs as a percentage of revenue is found in a CRS report. CRS bases its cost estimates of 7 to 12 percent of revenue based on electronic collection systems used by the toll industry. CRS states, "The New Hampshire Turnpike system reported that its E-Z Pass processing fees were 7.3% of total E-Z Pass revenues in FY2015. Fees charged by banks for processing transactions and enforcement costs are not included in that percentage. While a federal system based on equipping all vehicles with standardized OBUs with GPS technology could bring the costs down eventually, the cost of operating the system seems likely to be above 5% of revenue under the best of circumstances."⁴⁸ The CRS example, however, likens E-Z Pass at specific locations within a closed system to a national system of open-road mileage tracking, but there are many exponential differences from an EZ Pass-like system, including the geographic scale, data tracking and processing requirements, enforcement and the total amount of revenue collected. Tolls charge far higher rates per mile than any proposed VMT tax system – with higher revenues the cost of collection as a percentage can be lowered.

CRS found that additional credit card and bank fees would be necessary. Looking again at the E-Z pass experience, the report found that in Washington State "credit card fees paid on collections by toll facilities were equal to 3.45% of adjusted gross revenue" and that "bank and credit card fees were 2.7% of [New Hampshire's] electronic E-Z Pass Revenues."⁴⁹

Costs Based on OReGo Program. As mentioned previously, OReGO is the one functioning statewide VMT tax system in the U.S., though it applies to only a small volunteer group of Oregon's driving population. The literature states that "OReGO created a nascent, regulated, open commercial market for mileage measurement and account management services. OReGO established a 'market rate' of [third-party] compensation for account management services, currently 40 percent of gross revenue collected for up to 5,000 volunteer vehicles, with expectations that the rate will decline to under 10 percent as the number of vehicles increases to the hundreds of thousands."⁵⁰

Other Estimates. Finally, Gordon and Peters find that a conceptual New York State VMT charge system would have collection costs of 17.87 percent of revenue.⁵¹

⁴⁸ Kirk, Robert; Marc Levinson. (June 22, 2016). "Mileage-Based Road User Charges." Congressional Research Service. <https://fas.org/sgp/crs/misc/R44540.pdf>

⁴⁹ Ibid.

⁵⁰ "California Road Charge Pilot Program." (2017). California State Transportation Agency. <https://dot.ca.gov/-/media/dot-media/programs/road-charge/documents/rcpp-final-report-a11y.pdf>

⁵¹ Peters, J. R., & Gordon, C. (2009). "Analysis of Alternative Funding Sources." University Transportation Research Center.

Compliance and Enforcement Costs. An intended benefit of the federal government moving to a limited number of federal fuel taxpayers in the 1908s was to dramatically reduce fuel tax evasion.⁵² However, a VMT tax model counters these efforts to curb evasion, moving payment from an estimated 270 companies to more than 272 million vehicles.⁵³ To put this in perspective, for each federal fuel taxpayer there would be one million vehicles that would be tracked and billed – a 1:1,000,000 ratio. With such a large number of vehicles to track, there will be individuals who opt to evade a VMT tax, and others that are simply unable to pay or comply with the VMT tax due to their circumstances.

Obviously, widespread evasion would undermine the entire VMT tax system, as it would the fuel tax system. The simple perception that many users are cheating the system could lead to significant resentment among law-abiding citizens. Thus a VMT tax system will need to:

- **Ensure Mandatory Participation.** Those who do not track their miles are evading their responsibility to pay for road miles driven. A method for identifying illegal behavior will be needed. Noncompliance and evasion could come in the form of non-participation, device tampering, or manipulating data to impact locations or variable pricing models. The necessary enforcement may be reliant on state or local police enforcement, as is done with proof of license, registration and insurance. For those not complying, fines and judicial system action will be required. In either case, motorists will need some form of active compliance certification – a concept that does not yet exist anywhere in the U.S. Without a certification system, cars that do not use active VMT tracking technologies are invisible black holes in the system.
- **Collect Delinquent Payments.** To ensure compliance, strict terms-of-service agreements between road users and VMT tax administrators will be required with a clear process for addressing those who do not pay. For non-payers, a legal process will be needed for collecting monies owed, with the potential for civil or criminal prosecution. The associated costs to law enforcement and the judicial system are unknown but must be calculated and accrued. An example of the costs of collecting unpaid bills can be found through the example of New York City (NYC) parking.⁵⁴ The NYC Department of Finance (DOF) pays outside collection agencies to collect on summons of less than \$350. The DOF uses two collection agencies, a primary collection agency and a secondary collection agency if the primary is unsuccessful. From 2016 through 2018, the DOF paid commissions of \$5.5 million to its primary collection agency to collect \$114 million. During that same period, the DOF paid \$2.6 million in commissions to its secondary collection agency for \$36 million in collections. Combined, NYC's collection efforts – costing over \$8 million – only achieved a 53.8 percent recovery rate with \$106.9 million in parking tickets uncollected from 2016 to 2018.

⁵² United States Government Accountability Office (GAO). (May 1992). "Tax Administration: Status of Efforts to Curb Motor Fuel Tax Evasion." <https://www.gao.gov/assets/ggd-92-67.pdf>

⁵³ Internal Revenue Service. (June 11, 2020). "Excise Summary Terminal Activity Reporting System (ExSTARS)." <https://www.irs.gov/businesses/small-businesses-self-employed/excise-summary-terminal-activity-reporting-system-exstars>

⁵⁴ Kim, Tina, et al. (December 2019). "New York City Department of Finance: Selected Aspects of Parking Violations Operations to Collect Fines and Fees." Office of the New York State Comptroller. <https://www.osc.state.ny.us/files/state-agencies/audits/pdf/sqa-2020-17n8.pdf>



In the case of U.S. toll authorities, CRS finds that there is “a ‘leakage rate’ – the share of transactions for which payment is not received – of 5 to 10 percent.”⁵⁵ Arguably this figure is likely to be much higher on a system that covers all roads in the U.S., and not just a single toll facility. This uncollected revenue would not be available for infrastructure investment.

User Concerns

Legitimate systems of taxation are those where compliance is high. When there is significant cheating or a sense of unfairness, tax systems begin to break down and those following the rules no longer buy into them. Previous research presented evidence that “if a public feels increasingly over time that taxes are unfairly imposed, it will be increasingly likely to evade paying these taxes.”⁵⁶

Considering this, it is clear that taxpayer perceptions are key to a successful VMT tax system. The following are general guidelines to address potential taxpayer concerns. There are many user concerns discussed throughout the literature. Though user concerns often are secondary considerations to VMT tax system planning, there are many issues that could undermine the viability of a VMT tax including:

- Lack of Full Participation
- General Public Perceptions
- Perceptions of Fairness
- Privacy Concerns
- Bypassing the Democratic Process

Lack of Full Participation. The burden of paying for roadways should not fall on a single segment of road users. The current fuel tax spreads the cost of roads across both personal and commercial vehicles, and is able to differentiate costs based on vehicle weight and fuel economy. It has been suggested by some that commercial vehicles, particularly tractor-semitrailers, should bear much or all of the cost through a VMT tax, which is the practice in some parts of Europe. To counter this argument, as will be described later in this report, trucks represent a minority of registered vehicles and vehicles miles traveled. Secondly, trucking operations utilize a limited amount the total U.S. system of roadways, focused mainly on interstate highways. Following the user-pays principle, roadways that do not have truck travel would not receive funding from trucks.

General Public Perceptions. A meta-study of focus groups, public opinion surveys and media articles found little public support for a VMT tax system. Across 33 survey questions that queried respondent support for a VMT tax, mean support was found to be 24 percent.⁵⁷ A separate set of 23 questions that specifically asked whether the motor fuels tax should be replaced with mileage charges was also analyzed – the researchers found that 23 percent of respondents were supportive of VMT tax concepts.⁵⁸

⁵⁵ Kirk, Robert; Marc Levinson. (June 22, 2016). “Mileage-Based Road User Charges.” Congressional Research Service. <https://fas.org/sgp/crs/misc/R44540.pdf>

⁵⁶ Etzioni, Amitai. “Tax Evasion and Perceptions of Tax Fairness: A Research Note.” April 1986. The Journal of Applied Behavioral Science, 22(2). 177-185.

⁵⁷ National Academies of Sciences, Engineering, and Medicine (2016). “Public Perception of Mileage-Based User Fees.” Washington, DC: The National Academies Press. <https://doi.org/10.17226/23401>.

⁵⁸ Ibid.

Perceptions of Fairness. Baker et al. conducted a survey to gauge public acceptance among urban and rural residents in northeast Texas.⁵⁹ Rural residents were largely dissatisfied with this new tax method, expressing concern that rural locations already receive inadequate funding for road maintenance and repairs. Additionally, rural residents noted that they must drive farther distances on average than urban residents to purchase necessities – creating an inflationary effect on goods purchased in rural areas.

Privacy Concerns. Privacy concerns were described as one of the largest impediments to implementing a VMT tax.⁶⁰ In 2016, the U.S. GAO found that “mileage fees for passenger vehicles ... continue to face significant public concerns relating to privacy as well as cost challenges. Privacy concerns are particularly acute when GPS units are used to track the location of passenger vehicles.”⁶¹ GPS technology is necessary, however, to employ many of the aforementioned policy goals, and to employ some level of enforceability. Separately, CBO also found that GPS utilization created privacy concerns among drivers, which would likely be the greatest barrier to acceptance of a VMT tax.^{62,63}

- Privacy in the OReGO Program. One potential remedy to alleviate privacy concerns is enabling a dynamic choice-of-technology model, which would permit users to select the recording device they feel most comfortable with. Oregon launched a study to assess technology preferences among drivers, with nine percent of participants favoring the most secure technology that omitted location and time from reports, while 60 percent of participants preferred detailed statements – thus preferring VMT tax accuracy over privacy concerns.

Implementing a flat fee mileage system that is geographically agnostic might address many GPS and satellite-related privacy concerns. This strategy, however, could not distinguish mileage by roadway type or by miles driven in specific local and state jurisdictions.⁶⁴

One Commercial Account Manager (CAM) contractor for the pay-per-mile OReGO program requires individuals to exempt themselves from several state personal privacy protections when they sign up for an account. The privacy policy of this CAM contractor states that “Personally Identifiable Information” and “Personal Information,” as defined by the state of Oregon, are categories of information that are collected, and potentially disseminated to certain parties, in order to manage each RUC account.

⁵⁹ Baker, Richard., et al. (October 31, 2008). “Feasibility of Mileage-based User Fees: Application in Rural/Small Urban Areas of Northeast Texas.” University Transportation Center for Mobility, Department of Transportation. https://utcm.tti.tamu.edu/publications/final_reports/Goodin_08-11-06.pdf

⁶⁰ Zupan, Jeffrey. et al. (June 2012). “Mileage-Based User Fees: Prospects and Challenges Final Report.” Regional Plan Association. <https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C-10-22-21144%20Mileage%20Based%20User%20Fees%20Final%20Report%2029June12.pdf>

⁶¹ United States Government Accountability Office. (December 2012). “Pilot Program Could Help Determine the Viability for Certain Vehicles.” <https://www.gao.gov/assets/660/650863.pdf>

⁶² Congress of the United States Congressional Budget Office. (October 2019). “Issues and Options for a Tax on Vehicle Miles Traveled by Commercial Trucks.” <https://www.cbo.gov/system/files/2019-10/55688-CBO-VMT-Tax.pdf>

⁶³ Baker, Richard. (March, 2014). “Vehicle Miles Traveled (VMT) Fees.” Texas A&M Transportation Institute. <https://tti.tamu.edu/tti-publication/vehicle-miles-traveled-vmt-fees/>

⁶⁴ Baker, Richard., et al. (October 31, 2008). “Feasibility of Mileage-based User Fees: Application in Rural/Small Urban Areas of Northeast Texas.” University Transportation Center for Mobility, Department of Transportation. https://utcm.tti.tamu.edu/publications/final_reports/Goodin_08-11-06.pdf



In the state of Oregon "Personally Identifiable Information" is defined very generally to include "any information that identifies or describes a person." "Personal Information," as defined by Oregon, consists of a much more extensive and intrusive list of identifiable information, including social security number, medical records, health insurance policy number, passport number, financial information and other forms of identification. While the privacy policy of this CAM contractor does not explicitly indicate the collection or use of such sensitive information as medical records, passport number, etc., that information is part of the larger category of "Personal Information" that could be collected by the service provider.⁶⁵

The privacy policy does specify that Oregon State laws and statutes govern what private information can be collected, how the data is used and protected, and how the data is potentially disclosed and ultimately destroyed.⁶⁶ However, by signing up for the RUC account through this CAM contractor, OReGO participants are choosing to relinquish their travel pattern data, "Personal Information" and financial information (for billing purposes) in order to voluntarily participate in the OReGO program. See Appendix A for a detailed description of the Terms of Service.

Bypassing the Democratic Process. One of the major concerns of VMT systems, aside from privacy issues, is that they may bypass legislative and formal public participation processes.

For example, one well-known mechanism for quickly raising funds is *privatization*. The end goal of privatizing roadways is to quickly generate positive cash flow for transportation investments by entering into long-term roadway lease agreements with private sector firms. A number of the U.S. lease agreements for publicly owned roadways undermined public transparency when they were negotiated in private, with the final legally binding contracts being classified as confidential.⁶⁷ In several instances in the U.S., those same private sector firms later filed bankruptcy, potentially leaving the public sector agency with the original maintenance costs and management burdens.⁶⁸ It is conceivable that a more transparent negotiating and contracting process could have generated more financially viable agreements for both signatories.

Even with lease agreements, public sector risk still exists through contractual loopholes. In 2008, flooding in Indiana required an evacuation using the privatized Indiana Toll Road. Tolls were waived for citizens who had to evacuate, however the state of Indiana had to reimburse the private toll road operator nearly \$450,000 for excused tolls during the evacuation.⁶⁹

⁶⁵ Emovis. "Privacy Policy: RUC User Data Retention and Privacy Policy." Date Accessed: February 17, 2021.

<https://orego.emovis.us/privacy-policy/>

⁶⁶ Ibid.

⁶⁷ Buxbaum, Jeffrey and Iris Ortiz. (June 2007). "Protecting the Public Interest: The Role of Long-Term Concession Agreements for Providing Transportation Infrastructure." USC Keston Institute for Public Finance and Infrastructure Policy. https://www.inthepublicinterest.org/wp-content/uploads/Protecting_Public_Interest_Long_Term_Concessions.pdf

⁶⁸ Fitzgerald, Patrick. (May 20, 2015). "Indiana Toll Road Exits Bankruptcy Protection." The Wall Street Journal.

<https://www.wsj.com/articles/indiana-toll-road-exits-bankruptcy-protection-1432907793#>

⁶⁹ Dannin, Ellen. (Winter 2011). "Crumbling Infrastructure, Crumbling Democracy: Infrastructure Privatization Contracts and Their Effects on State and Local Governance." *Northwestern Journal of Law & Social Policy* Volume 6, Issue 1. <https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1061&context=njls>

As former Penn State professor Ellen Dannin noted, "language commonly found in infrastructure privatization contracts shifts substantial risk – and cost – to the public while also limiting the state and local governments' ability to make policy decisions."⁷⁰

Another even more problematic issue is reclassifying VMT revenue as a "fee," rather than a tax, to avoid public processes such as legislative approvals and/or mandated public referendums. Multiple VMT advocates, including ODOT, are juxtaposing and equating VMT programs with open-road tolling.⁷¹ Since most tolling proponents describe tolls as fees, designating a VMT charge as a fee may legally bypass any state laws or regulations relating to taxation.

Almost all states require unicameral or bicameral approvals for fuel tax increases, and more than a dozen U.S. states require or utilize public referendums to raise fuel taxes.⁷² In other instances, state constitutions include clauses for managing fuel taxes. For instance, Minnesota's constitution requires that all fuel tax revenue be dedicated to the state's road and bridge network.⁷³

If VMT charges are reclassified by states or other jurisdictions as administrative fees, many public processes, taxation management tools, and even revenue dedication for transportation could be endangered.

State and Local VMT Tax Research Programs

There have been a very limited number of state-level pilot studies, including one Oregon pilot that has transitioned into a functioning program that allows up to 5,000 participants.

Washington State released a report in 2020 outlining steps for transitioning from the gas tax to a VMT tax.⁷⁴ The year-long pilot program involved four different technology options that participants could choose from:

- Odometer Reading – manually capture mileage; pay tax quarterly; smartphone needed for taking photos.
- Smartphone Application called Mile-Mapper – pay tax quarterly; iPhone required.
- Plug-in Device with GPS – pay monthly; vehicle newer than model year 1996; some electric vehicles.
- Plug-in Device, no GPS – pay monthly; vehicle newer than model year 1996.

A pre-pay method, known as a Mileage Permit, was also offered and required drivers to pre-pay for a set of miles (1,000, 5,000 or 10,000 miles). Participants were surveyed about their

⁷⁰ Dannin, Ellen. (Winter 2011). "Crumbling Infrastructure, Crumbling Democracy: Infrastructure Privatization Contracts and Their Effects on State and Local Governance." *Northwestern Journal of Law & Social Policy* Volume 6, Issue 1.

<https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1061&context=njls>

⁷¹ Bock, Maureen. (February 16, 2021). Presentation at WA State Transportation Commission.

<https://wstc.wa.gov/wp-content/uploads/2021/02/2021-0216-BF2-ODOT-RUC-Update-OReGO.pdf>

⁷² National Conference of State Legislatures (NCSL). (August 12, 2020). "Recent Legislative Actions Likely to Change Gas Taxes." <https://www.ncsl.org/research/transportation/2013-and-2014-legislative-actions-likely-to-change-gas-taxes.aspx>

⁷³ Minnesota Legislator. "Minnesota Statutes 2020: 239.7511 Gas Tax Sign on Petroleum Dispenser."

<https://www.revisor.mn.gov/statutes/cite/239.7511/pdf> Date Accessed: March 8, 2021.

⁷⁴ WA RUC. "Washington Road Usage Charge Pilot Project & Assessment." <https://waroadusagecharge.org/> Date Accessed: February 18, 2021.



experience during the pilot study and had the opportunity to provide feedback during focus group sessions.

The **California Road Charge Pilot Program** completed in 2017. The program tested six mileage-recording methods, and consisted of mostly private vehicles (87%), but also included heavy commercial vehicles (1%) and light commercial vehicles (5%).⁷⁵

Minnesota completed a pilot test in 2012 that relied on smartphones to collect and transmit mileage data collected by participants. Participants who traveled in the Twin Cities region and those who traveled during the morning and evening rush hours in the same region paid varying fee rates during the pilot test.⁷⁶

The **Eastern Transportation Coalition** (formerly, I-95 Corridor Coalition), a consortium of seventeen eastern U.S. states, has been conducting MBUF pilot programs with passenger vehicles and large trucks. A 2019 pilot study⁷⁷ included 889 passenger vehicle participants and included the following areas of interest:

- Out-of-state mileage handling;
- Impacts of current tolling with the MBUF;
- Additional benefits to encourage participation, such as engine reports, driver behavior scores, etc.;
- Trucking operations across multiple states.

At the end of 2018 and into 2019 a truck-only MBUF was launched by the Eastern Transportation Coalition that consisted of 55 trucks. The purpose of this study was to understand current trucking industry reporting requirements and how the implementation of a MBUF would impact trucking regulations. Both pilot studies are expected to include upcoming study phases to expand participation numbers and add participating states.⁷⁸

The **Oregon Road User Fee** Task force was created in 2001 by the Oregon Legislature to research and develop methods to collect revenue for Oregon roadways with a core motivation to replace the state fuel tax. The one-year pilot study of the selected fuel tax alternative – a “mileage-based fee” – was launched in April 2006 with 285 vehicles, consisting of 299 total volunteers and two Portland service stations. Devices installed in each participating vehicle recorded the number of miles driven in the study area zones and the date and time.

Within the field test area, geographic zones were established to test the technological feasibility of collecting miles per zone in the event of a variable pricing model. When participants refueled at the participating custom-equipped service stations, the in-vehicle device electronically communicated the number of miles a vehicle drove in each zone to the point of sale system installed at the fueling station to assess the mileage-based fee.⁷⁹

⁷⁵ “California Road Charge Pilot Program.” (2017). California State Transportation Agency. <https://dot.ca.gov/-/media/dot-media/programs/road-charge/documents/rcpp-final-report-a11y.pdf>

⁷⁶ Kirk, Robert; Marc Levinson. (June 22, 2016). “Mileage-Based Road User Charges.” Congressional Research Service. <https://fas.org/sgp/crs/misc/R44540.pdf>

⁷⁷ “I-95 Corridor Coalition Mileage-Based User Fee – 2019 Pilot Results.” (2019). The I-95 Corridor Coalition. <https://tetcoalitionmbuf.org/wp-content/uploads/2020/07/2019-Coalition-Passenger-Pilot-Factsheet.pdf>

⁷⁸ Ibid.

⁷⁹ Whitty, James. (November 2007). “Oregon’s Mileage Fee Concept and Road User Fee Pilot Program Final Report.” Oregon Department of Transportation. https://www.myorego.org/wp-content/uploads/2017/07/RUFPP_finalreport.pdf

The first half of the study established driving habits for all participants and required drivers to refuel at the participating service stations at least twice a month. During this first stage, miles were recorded and the gas tax continued to be paid by participants. The second half of the study period divided participants into three groups:

- Vehicle Miles Traveled Group – paying 1.2 cents per mile;
- Rush Hour Group – paying 10 cents per mile for driving during morning or evening rush hours;
- Small Control Group – continued paying the gas tax while also having their miles recorded.

While participants never actually paid the mileage fee during the pilot test, the fee was deducted from endowment accounts ODOT created for each vehicle.⁸⁰ Participants were rewarded with monetary compensation when they were able to meet certain participation milestones throughout the one-year pilot program. Once a milestone was completed by the required date, participants received a total of \$300 by the end of the pilot program. In addition, pre-paid gasoline vouchers to use at the two participating service stations in the amount of \$40 were offered to participants who completed equipment installation within two weeks of their training. The \$40 vouchers were used throughout the study in order to compensate participants when any issues with equipment arose or to encourage participation in events related to the program.⁸¹

Applying the critiques from the first pilot study, another small (88 volunteers) pilot program occurred from November 2012 to March 2013. This program provided participants four options for mileage compilation: with a GPS device; with a non-GPS device; a smartphone option; or a flat-fee payment option (no mileage reporting). Unlike the first pilot test, program volunteers came from three states; Oregon, Nevada and Washington. With the exception of the flat-fee option, once volunteers chose their mileage reporting method, a device was mailed to participants to self-install in the vehicle. A rate of \$0.0156 per mile was assessed in a monthly bill for participants in Oregon. The state of Oregon deemed this test a success and Oregon Senate Bill 810 was signed into law to solidify a mileage-based tax.⁸²

In 2013, ODOT established OReGO, a volunteer program to test mileage fee charging with a provided plug-in device. After recruitment and certification of private sector account managers and enrollment of volunteer vehicles, the OReGO program went live on July 1, 2015. Within the first 18 months, 1,307 vehicles (1,111 volunteers) were enrolled in the program. All vehicles enrolled were required to be newer than model year 1996 to accommodate the provided plug-in device. To cover costs of the OReGO program and limit the size of the operations team, a maximum of 5,000 vehicles was set forth by Senate Bill 810. The program also limits the number of participating vehicles based on fuel efficiency. Vehicles with a fuel economy of 17 MPG are limited to 1,500 vehicles. The same limit applies to the number of vehicles with a fuel economy of 17 MPG to 22 MPG. The quantity of vehicles with 22 MPG or more in fuel economy are not limited in the OReGO program, so long as the total number of enrolled vehicles does not exceed 5,000.

⁸⁰ Ibid.

⁸¹ Ibid.

⁸² Jones, Kathryn and Maureen Bock. (April 2017). "Oregon's Road Usage Charge: The OReGO Program Final Report." Oregon Department of Transportation. https://www.oregon.gov/ODOT/Programs/RUF/IP-Road%20Usage%20Evaluation%20Book%20WEB_4-26.pdf



The OReGO program is ongoing and still accepting participants. The program allows volunteers to choose their account manager, device (with or without GPS tracking), and billing options. While the gas tax is still in place, if program participants refuel, the fuel tax is credited to their OReGO account and a mileage fee is assessed instead. Unlike the previous two pilot studies, the OReGO program is a tax system and must abide by all Oregon State Treasury tax laws.

3. Analysis of a National VMT Tax System

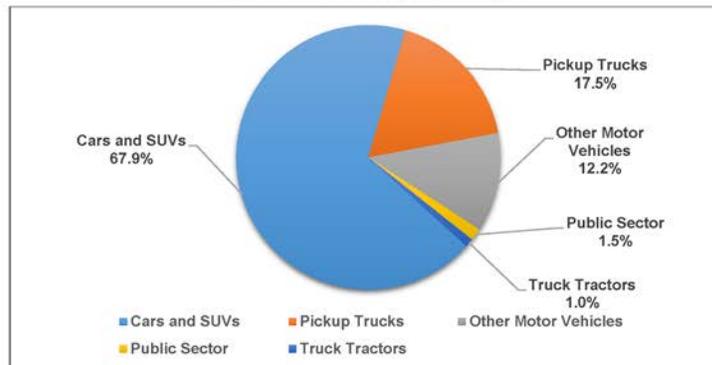
To conduct a thorough VMT cost analysis for a national system, numerous inputs and metrics must be obtained and incorporated. For instance, total vehicle registrations and vehicle miles traveled form the denominator of most of the cost metrics. To assess VMT tax equity issues, rural versus urban miles and vehicle miles traveled must be differentiated and incorporated to the formulas. For cost calculations, the research team acquired a range of hardware, software and transactions costs.

Fortunately, many of the necessary inputs are available in public databases; in particular, the Federal Highway Administration (FHWA) Highway Statistics datasets possess most metrics needed for the national cost calculations. Other cost-related metrics were obtained from publicly available documents.

Understanding the Scale of a National VMT Tax System

VMT Tax User Base. There are 276.4 million registered motor vehicles in the U.S.⁸³ For the most part, these vehicles are owned by the private sector (272.4 million) while 4 million are publicly owned. As shown in Figure 2, the majority of the U.S. fleet is made up of private cars and SUVs (187.7 million vehicles, or 67.9%). This is followed by pickups (17.5%) and other motor vehicles such as straight trucks, buses, vans and motorcycles (12.2%). Approximately one percent (1%) or 2.7 million vehicles are truck-tractors that are owned and operated by the trucking industry.⁸⁴ Thus, efforts to apply the VMT tax to only one vehicle type, such as large trucks, would apply to a small subsection of the overall vehicle population.

Figure 2: U.S. Fleet by Vehicle Type



⁸³ U.S. Department of Transportation Federal Highway Administration. (December 9, 2020). "Highway Statistics Series: State Motor-Vehicle Registrations - 2019." *Table MV - 1*. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/mv1.cfm>

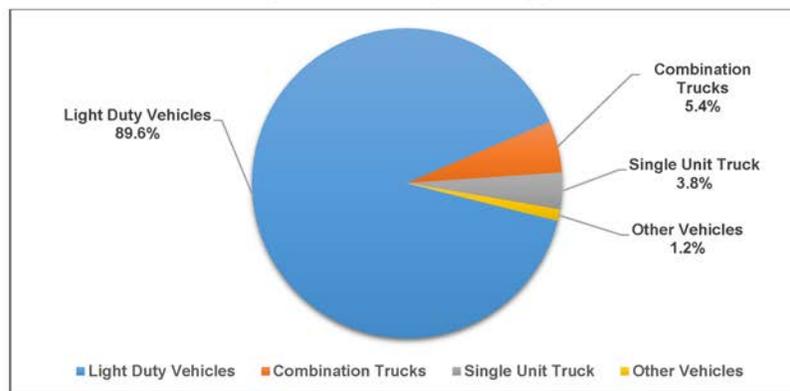
⁸⁴ U.S. Department of Transportation Federal Highway Administration. (December 9, 2020). "Highway Statistics Series: Truck and Truck-Tractor Registrations." *Table MV - 9*. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/mv9.cfm>



Documenting Vehicle Miles Traveled. Vehicle miles traveled statistics produced by FHWA establish how many potentially taxable miles are accrued each year by all registered vehicles.⁸⁵

In 2019 there were 3.26 trillion vehicle miles traveled in the U.S. If each of these miles were charged one cent per mile, the funds raised would be \$32.6 billion. The vast majority of these miles were driven by light duty vehicles such as cars and SUVs (89.6%). While tractor-trailers only comprise one percent of the U.S. fleet, they accrue more than five percent of the miles driven, as shown in Figure 3.

Figure 3: All VMT by Vehicle Type



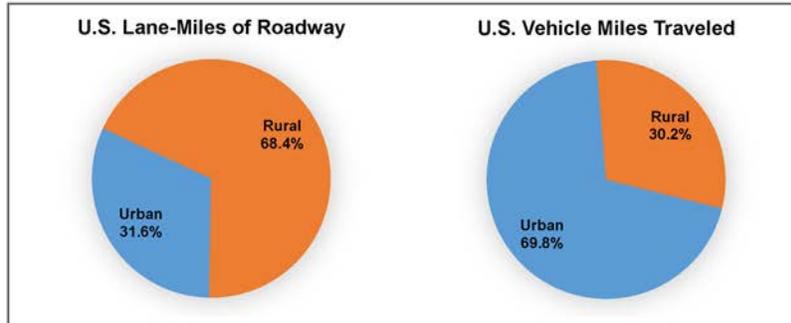
Understanding Rural versus Urban VMT. Figure 4 documents that most lane-miles of roadway in the U.S. are in rural areas while most of the driving, as measured in VMT, occurs on urban roadways.

⁸⁵ U.S. Department of Transportation Federal Highway Administration. (December 9, 2020). "Highway Statistics Series: State Motor-Vehicle Registrations - 2019." Table MV - 1. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/mv1.cfm>

⁸⁶ U.S. Department of Transportation Federal Highway Administration. (December 9, 2020). "Highway Statistics Series: Truck and Truck-Tractor Registrations." Table MV - 9. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/mv9.cfm>

⁸⁷ U.S. Department of Transportation Federal Highway Administration. (December 24, 2020). "Highway Statistics Series: Annual Vehicle Distance Traveled in Miles and Related Data - 2019." Table VM - 1. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/vm1.cfm>

Figure 4: U.S. Lane-Miles of Roadway and U.S. Vehicle Miles Traveled



This fact highlights why most congestion occurs in urban areas, where demand for roadways is high and supply is low. It is also a key indicator of where VMT funds would be sourced; the majority of the money raised by a flat VMT tax would derive from urban areas, and those urban areas have relatively short segments of infrastructure compared with rural areas.

FHWA also produces statistics on fuel tax revenue allocation by road type; for those roadways that are designated rural or urban, FHWA indicates that nearly \$17 billion are allocated to rural locations and \$22.8 billion are allocated to urban (Table 2).⁸⁸

Table 2: Fuel Tax Revenue Allocation by Road Type

	Federal Spending	% Allocation	Annual VMT	Spending Per VMT	Lane Miles
Rural	\$16,995,571,000	42.6%	983,852,586,120	\$0.017	6,005,113
Urban	\$22,866,576,000	57.4%	2,277,919,076,721	\$0.009	2,780,284
All	\$39,862,147,000	100.0%	3,261,771,662,841		8,785,397

Presently, the federal government allocates nearly twice as much funding for rural miles traveled versus urban roadways (\$0.017 vs \$0.009). Assuming similar fuel economies exist in rural and urban settings, it is clear that urban drivers currently subsidize rural roadways.

Table 3 shows the difference between urban and rural mileage as a measurement of annual VMT per-lane miles. The numbers indicate that, on average, each urban lane-mile would accrue five times more annual VMT than rural lane-miles, and based on a flat VMT tax, urban miles would generate five times more revenue.

⁸⁸ U.S. Department of Transportation Federal Highway Administration. (March 01, 2021). "Highway Statistics Series: Obligation of Federal Funds by Functional Class" Table FA-4C. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/fa4c.cfm>



Table 3: Annual Vehicle Miles Traveled Per Lane-Mile

	Annual VMT per Lane-Mile
Urban	819,312
Rural	163,836

A VMT tax is philosophically and literally a direct pay-per-mile-of-use system, similar to a toll road. In principle at least, tolls collected from toll users are meant to maintain the tolled facility. Based on this premise, the majority of VMT tax revenue would be derived from users of urban roadways – even though the number of urban road miles are fewer than those of rural road miles. That said, rural drivers will have to travel farther than urban drivers for similar purposes (e.g. work commutes, grocery stores, medical appointments) than would urban drivers. This is clearly seen in the accumulation of VMT by network type. According to the AAA Foundation’s American Driving Survey from 2014 to 2015, a rural driver drives an average of 13,029 miles annually, and a driver residing in an urban area drives an average of 10,576 miles annually.⁸⁹

VMT Rate Types and Rate Setting

Rate Types. As with any tax or fee, rates will have to be set – either administratively after a new law is passed, or through a legislative process. Rates would, in theory, be set at a level that will meet revenue goals and investment needs at the present time and in the future. There are two main models for per-mile rates; flat and variable.

- **Flat Rate.** A flat rate VMT tax has several advantages, but is generally not able to meet certain social or environmental policy objectives that go beyond revenue generation. A flat tax is simple and straightforward – a single charge would be assessed on each mile driven on the entire U.S. transportation system. The flat rate could vary by vehicle type – but the rate would not change based on road facility, jurisdiction, time-of-day or level of congestion. A flat rate could likely be deployed using many of the technologies previously discussed.
- **Variable Rates.** If the stated goal of a VMT tax goes beyond revenue collection, then a variable rate is necessary. Variable rates, as the name implies, would be different across the entire transportation system and could be adjusted for numerous travel and non-travel objectives. This variable rate option could allow state and local jurisdictions to set customized rates in addition to the federal VMT tax, and could allow the federal government to vary rates as well. Variable rates would enable governments to send price signals to drivers for the purposes of congestion pricing, modal diversion, or to decrease demand when air quality is poor. Governments could use the VMT tax system as a tool to adjust demand based on time-of-day and day-of-week.

From a user perspective, such variability could be confusing, and it is unclear how price signals would be channeled to drivers. A worst-case scenario would have drivers not receiving the price signals, and unknowingly accruing expenses that they did not intend

⁸⁹ Triplett, Tim, Rob Santos, et al. (September 2016). “American Driving Survey: 2014 – 2015.” AAA Foundation for Traffic Safety. Washington, DC. <https://aaafoundation.org/wp-content/uploads/2017/12/AmericanDrivingSurvey2015.pdf>

or could not afford. There is also an inflationary impact associated with congestion pricing in that few employees can unilaterally decide to change their work hours, resulting in higher travel cost for no requisite travel benefit. Finally, a variable rate would require precise GPS-level tracking technology.

- **Hybrid Approach that Mirrors the Fuel Tax.** A hybrid approach could be employed to follow current fuel tax rates at the state level. A flat federal rate could be utilized, while state rates could vary by state, though each state would have its own flat rate. The per-mile charge would be clearly defined at state boundaries, and there would be no variability based on time or below state-level boundaries. Such an approach would be somewhat similar to the IFTA system of fuel tax reciprocity found in the U.S. trucking industry. Like the variable rate approach, this option would require GPS-level tracking technology.

Rate Setting. Similar to the fuel tax and public utility rates, rate setting and adjusting could be conducted numerous ways. While most states require a legislative process, multiple states require public referendums.⁹⁰ If the VMT charge is defined as a fee, rather than a tax, some states may conclude that the VMT rates can be decided by a state agency and/or DOT commissioner. Regardless of the authorizing body, the literature is clear that “setting and adjusting of the road user charge rates ... would likely face as much opposition as increasing the motor fuels taxes.”⁹¹ Rates would likely consider: 1) revenue needs; 2) implementation, collection, evasion and enforcement costs; and 3) “lost” revenue associated with non-compliant users and non-taxed government vehicles. It is possible that in a variable rate system, a fourth factor would be rates that are meant to modify behavior through charges – similar to so-called “sin taxes” on cigarettes and alcohol. Congestion pricing and air quality pricing programs would essentially become social engineering tools for managing society’s demand for a good (in this case, consumption of miles driven that have specific negative characteristics).

Rules for Revenue Sources and Allocation

If the VMT system were similar to the federal fuels tax (i.e. the core focus is revenue generation with a flat rate), it will likely be distributed using current federal formulas. This may or may not also be the case for state revenues and disbursements.

Along with a federal VMT tax, other revenue options include state and local VMT taxes. Complications arise, however, when considering the transparency of a GPS-enabled VMT tax system. Each state and local jurisdiction will have precise visibility into how much revenue was generated within its boundaries. With such technology, it is possible even to see the origins and destinations of a vehicle’s trip, and to assess the revenue potential of specific roadways.

The Potential Impact of a Local VMT Tax on the National System. An early principle of the OReGO project was to give “local government control of local revenue sources,” asserting that “the state should not appropriate revenue sources that are traditionally and primarily the province of local governments.”⁹² Additionally, OReGO demonstrated that “different pricing

⁹⁰ BallotPedia. “Transportation on the Ballot.” https://ballotpedia.org/Transportation_on_the_ballot Date Accessed: February 26, 2021.

⁹¹ Kirk, Robert; Marc Levinson. (June 22, 2016). “Mileage-Based Road User Charges.” Congressional Research Service. <https://fas.org/sqp/crs/misc/R44540.pdf>

⁹² Whitty, James. (November 2007). “Oregon’s Mileage Fee Concept and Road User Fee Pilot Program Final Report.” Oregon Department of Transportation. https://www.myorego.org/wp-content/uploads/2017/07/RUFPP_finalreport.pdf



zones could be established electronically and the assigned fees could be charged for driving in each zone, even at particular times of day” – which demonstrated that a mileage fee program could support the “collection of local revenues and other ‘zone-oriented’ features.”⁹³ Thus, it was demonstrated through a VMT tax program that local governments could have more power over the nation’s transportation system in terms of collecting and spending revenue. In all of these cases, there is no over-arching requirement that the funds relate in any manner to the roadway or vehicle volumes. If state and federal fuel tax allocations are any indicator, it is likely that non-roadway programs would receive VMT funds. This, of course, violates the user-pays principle.

According to the latest Census of Governments, there were 90,106 local units of governments in the U.S.⁹⁴ Of those, approximately 38,000 are counties, municipalities and townships, all of which presumably each have a small piece of the 4.1 million miles of U.S. roadway within their purview.⁹⁵ Additionally, there are another 38,000 special district governments that may also have jurisdiction over roadways. Compared with one federal government and fifty state governments, this is a tremendous number of potential VMT authorities that could theoretically participate in a VMT tax program. Local-level coordination of VMT charges, revenue collection, revenue allocation and spending oversight would be exceedingly complex. Nevertheless, the VMT tax program would accrue substantial program cost increases to manage all the new transactions.

Sourcing revenue for miles driven within local jurisdictional boundaries would likely be attractive to local governments. Not only could such a system help generate revenue and balance budgets, it could also steer residents toward local policy goals such as increased use of transit or bicycle lanes. Additionally, in many situations a local VMT tax could be focused on roads that are heavily used by non-residents (who do not vote in local elections). In fact, a local option VMT tax could target non-resident drivers who simply pass through a jurisdiction to get from point A to point B. In theory, assuming no controls exist for charging for travel within a jurisdictional boundary, this would be a likely scenario, and one that could be particularly onerous to interstate travel and commerce.

This “pass-through” scenario would have some similarities to small-town speed traps like one found in Linndale, Ohio. The Linndale police department targeted out-of-town drivers on a quarter-mile stretch of Interstate to collect significant revenues (\$400,000 annually) through fines.⁹⁶ Figure 5 illustrates the geographic relationship of the town to the roadway.

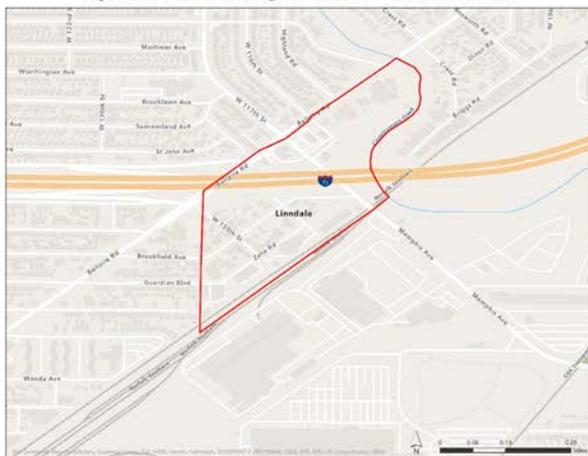
⁹³ Ibid.

⁹⁴ United States Census Bureau. (2017). “2017 Census of Governments – Organization.” <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>

⁹⁵ U.S. Department of Transportation Federal Highway Administration. (December 1, 2020). “Highway Statistics Series: Public Road Mileage, Lane-Miles, and VMT.” *Table VMT – 421C*. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/vmt421c.cfm>

⁹⁶ Ross, Jeffrey. (February 26, 2013). “Notorious Ohio Speed Trap Takes a Hit as State Laws Change.” <https://www.autoblog.com/2013/02/26/notorious-ohio-speed-trap-takes-a-hit-as-state-laws-change-w-vi/>

Figure 5: Pass-Through Scenario – Linndale, Ohio





federal government and for state governments. Such a system would allow for the replacement of fuel taxes at both levels of government, and would be efficient in that 50 separate state VMT systems can piggyback on the same technologies used by the federal VMT program. It also assumes that political pressure to vary rates and modify driver behaviors is strong enough to warrant technologies that can differentiate roadways and day-periods. Thus, this analysis assumes a single efficient platform using terrestrial communications, GPS and system interoperability is used for tracking and taxing vehicle miles.

The technologies reviewed earlier in this report were next considered within the cost analysis, and one approach was selected as being the most practical, and cost-effective.

Exclusion of Odometer Method. Upon review of the technology options analyzed, it is clear that a system based on odometers would be fraught with administrative complexity, evasion and noncompliance. Self-reporting would not be accurate unless there was substantial documentation and enforcement, both which come with sizeable costs. Thus it is not a reasonable option for deploying a nationwide VMT tax system and its costs were not analyzed.

Exclusion of Smartphone Method. A smartphone system would be able to track miles accurately, but it is unclear how to ensure the phone is with the appropriate driver while driving. Drivers accidentally forgetting their phones (or lost/stolen/damaged phones) would cause significant revenue leakage and noncompliance. Additionally, smartphones are not ubiquitous in the U.S. Nearly 20 percent of Americans do not own a smartphone, and of people 65 and older, nearly 50 percent do not have a smartphone.⁹⁷ This segment of the population would each have to spend hundreds of dollars on a smartphone, and become adept in how to use VMT tracking apps. Therefore, this method was also excluded from the analysis

Exclusion of Roadway Sensors and Cameras. A nationwide system based on electronic toll collection technologies (e.g. E-Z Pass) would not be able to capture the majority of VMT accrued in the U.S. The technology is viable for tolling a bridge or small segment of roadway, but could not monitor the more than 4.1 million miles of U.S. roadway. To tax the full surface transportation system in this manner would come with a cost that far exceeds the revenue potential. Thus it was excluded from the cost analysis as well.

Based on the rationale above, it can be assumed that no combined state and federal VMT tax system would be feasible without some level of onboard GPS tracking capability.

Onboard GPS Tracking Technology. A nationwide VMT tax system that replaces the federal fuel tax (and has the additional ability to replace state fuel taxes) would need to have several attributes that can only be met with onboard vehicle tracking technology. First, the system must have the ability to identify the granular location of a vehicle as it moves along the transportation system, particularly the state boundaries in which vehicle miles are accrued. Second, for efficiency and accuracy, the system needs to be vehicle-based and have no reliance on a costly and extensive network of roadway sensors or cameras. Finally, while evasion is inevitable, the system would have to ensure a high degree of compliance.

As established earlier, there are three core cost areas for a VMT tax system; deployment, administration and compliance.

⁹⁷ Pew Research Center. (June 12, 2019). "Mobile Fact Sheet." <https://www.pewresearch.org/internet/fact-sheet/mobile/>

Estimated Deployment Requirements

Deployment requirements are the components need to implement a national VMT tax program. These include deploying the necessary technologies to more than 272 million private vehicles in the U.S. and, equally important, educating the public on the new program to ensure compliance and acceptance. Other additional activities include setting up federal and state departments to oversee deployment and contract management. To understand the full impact of these costs it is necessary to consider this category in terms of per-vehicle costs.

Educating the Public. The driving public will have to be educated on the details of the new program, why it is important and necessary, and how to comply with the program. For many tech-savvy drivers, this process will be straightforward. For others it may take longer.

A VMT tax system would be a significant change for U.S. drivers. Federal and state governments will have to educate drivers on why the shift from a fuel tax is important, what the funds will be used for, and how to properly comply. Likewise, those who will enforce the law will also require training. Some driver technical training will also fall on the government, unless this is built into the third-party management contracts (e.g. how to install a device into the OBD, how to set up a payment account, where to return defective devices). There are no programs similar to this that have been deployed in the U.S.

Technology Costs. There are two types of technology approaches, with the first being an aftermarket device for the U.S. fleet. The insurance industry has been using safety monitoring devices for more than a decade that plug into the OBD port, collect information such as miles driven, and report the information to the insurance company via cellular networks. Some estimates for the device, often called a dongle, have been in the \$100 - \$300 range.⁹⁸

There are multiple versions of such a device for sale on the internet. After plugging the device into the OBD, it generates driving event reports based on engine and GPS data, and transfers tamper-proof information over a cellular network (cellular costs are a separate monthly fee).⁹⁹ Of the devices currently available, one of the lowest costs was \$67 per unit, although it is not certain that it would meet all future requirements for an aftermarket VMT device. It is possible that device costs could be brought down due to manufacturing efficiencies (272 million devices would likely be needed).

If a cost of \$50 per device were realized due to economies of scale, the cost for national deployment would be approximately \$13.6 billion. It should be noted that such a device could only be used in vehicles manufactured in 1996 or later, when the OBD-II specifications became mandatory for new vehicles in the U.S. These costs have been annualized over five years to reflect a realistic time period for rolling out the program. Since the devices have typical 5-year lifespans, this also reflects a realistic ongoing annual cost for replacement and repair.

The OReGo program shipped dongles to each user's home address. ATRI's cost calculation analysis does not include device packaging and shipping costs to either residential addresses or DMV offices. If the packaging and shipping costs were as little as \$5.00 per dongle, initial shipping costs for 272 million dongles would be approximately \$1.36 billion.

⁹⁸ Dr. Dataman. (November 20, 2018). "Telematics in Auto Insurance." <https://towardsdatascience.com/telematics-in-auto-insurance-a886a03b5a88>

⁹⁹ Bouncie Website: Features. Available Online at <https://www.bouncie.com> Date Accessed: March 8, 2021.



Collection and Administrative Costs

One model for administering a VMT tax program, as utilized by the OReGO program, is to: 1) charge a flat rate to drivers (in the case of OReGO it is \$0.018 per-mile); and 2) assign all critical duties of the program (e.g. tracking the charges and collecting revenue) to a CAM. In exchange for administering the program, the Oregon third-party CAM is allowed to charge a 40 percent administrative fee on top of the collected revenue. For example, if \$1.00 per mile is needed by transportation agencies for infrastructure investment, the road user will be charged approximately \$1.67 per mile so that the 40 percent fee is covered.

In the following analysis the research team takes steps to better understand the implication of a 40 percent administrative fee for managing a VMT program.

Cost Analysis Step One: Calculating a Truck VMT Fee Using Car Data. The first step of this analysis was to determine an appropriate per-mile charge for trucks that: 1) maintains the current per mile fuel tax ratio between cars and trucks; and 2) assumes the car VMT charge is 1.8 cents per mile. This was necessary because the OReGO program does not charge trucks. It was determined that if cars pay \$0.018 per mile, trucks would pay \$0.090 cents per mile.

To reach this 1 to 5 ratio, the following steps were taken and are shown in Table 4:

1. The 2019 FHWA Highway Statistics for car and truck VMT were first divided by a well-accepted average MPG for cars and trucks of 24.5 and 6.5, respectively.
2. This calculation resulted in a gallons-of-fuel-consumed estimate for cars and trucks; it was assumed that cars consumed gallons of gasoline and trucks consumed gallons of diesel.
3. Gallons of fuel consumed was next multiplied by the federal fuel tax for gasoline and diesel respectively to produce a separate federal fuel taxes paid estimate for cars and trucks.
4. Federal Fuel Tax Paid was divided by 2019 VMT to get a cents-per-mile paid conversion.
5. The result is a 1 to 5 ratio for cars to trucks.
6. Following this ratio – if cars pay \$0.018 per mile, trucks would pay \$0.090 cents per mile.

Table 4: Calculating a Truck VMT Fee Using Car Data

Vehicle Type	Avg MPG	2019 VMT	Gallons of Fuel Consumed	Federal Fuel Tax per Gallon	Federal Fuel Tax Paid (Gallons * Fuel Tax)	Federal Fuel Tax Cents per Mile	Cents Per Mile Ratio
Car	24.5	2,961,721,254,307	120,886,581,808	\$0.184	\$22,243,131,053	\$0.0075	1
Truck	6.5	300,050,408,534	46,161,601,313	\$0.244	\$11,263,430,720	\$0.0375	5
Total					\$33,506,561,773		

Cost Analysis Step Two: The Cost of Collecting \$33.5 Billion in Gross Revenue. Next, the research team identified the “net revenue for transportation” – in theory the net funds available exclusively for infrastructure investment, based on the existing federal fuel tax gross revenues. In Table 5, note that: 1) \$33.5 billion gross revenue is collected for each tax method; 2) the 0.2 percent fuel tax administrative cost is subtracted from the gross revenue for the fuel tax; and 3) the 40 percent administrative cost is subtracted from the gross revenue. The results are shown in Table 5.

Table 5: Cost to Collect \$33.5 billion in Gross Revenue

Tax Method	Gross Revenue Collected	Cost to Collect (% of Gross)	Collection Cost	Net Revenue for Transportation
Existing Federal Fuel Tax	\$33,506,561,773	0.20%	\$67,013,124	\$33,439,548,650
VMT Tax with 40% Overhead	\$33,506,561,773	40.00%	\$13,402,624,709	\$20,103,937,064

Cost Analysis Step Three: Total VMT Revenue Needed to Maintain Existing HTF Spending Levels. Next, the research team identified the amount of gross VMT revenue that must be collected if net HTF revenue is fixed at \$33.5 billion, as shown in Table 6.

Table 6: Total VMT Revenue to Maintain Existing Highway Trust Fund Spending Levels

Tax Method	Gross Revenue Collected	Cost to Collect (% of Gross)	Collection Cost	Net Revenue for Transportation
Existing Federal Fuel Tax	\$33,573,709,191	0.20%	\$67,147,418	\$33,506,561,773
VMT Tax with 40% Overhead	\$55,844,269,622	40.00%	\$22,337,707,849	\$33,506,561,773

Cost Analysis Step Four: Collection Costs, and Revenue Levels Separated by Vehicle Type. Finally, the \$0.018 per mile charge for cars and \$0.090 per mile charge for trucks was tested to see the results for a hypothetical federal VMT program, based on the OReGo administrative costs of 40 percent of gross revenue. Table 7 shows that a per-mile VMT charge at these rates would generate \$48.1 billion in net revenue for transportation, but would cost \$32.1 billion to collect, requiring a total VMT gross revenue charge to users of \$80.32 billion.



Table 7: Collection Costs and Revenue Levels with 40% Collection Cost

Vehicle Type	2019 VMT	VMT Charge (Cost per Mile)	Gross Revenue	Collection Cost (40% of Gross)	Net Revenue for Transportation
Car	2,961,721,254,307	\$0.018	\$53,310,982,578	\$21,324,393,031	\$31,986,589,547
Truck	300,050,408,534	\$0.090	\$27,004,536,768	\$10,801,814,707	\$16,202,722,061
Total			\$80,315,519,346	\$32,126,207,738	\$48,189,311,607

Cost Analysis Step Five: Results with a 10 percent Collection Cost. It is uncertain if a 10 percent collection cost for a national open-road VMT program is feasible. Based on the OReGO goal to reduce admin costs to 10 percent by way of the economies of scale reached through an expanded program, the research team ran an identical financial analysis using the 10 percent admin cost. Table 8 shows both gross and net revenue for transportation at the same VMT fee levels used in table 7, but with 10 percent admin costs, rather than 40 percent. The result is a significant increase in net revenue available for transportation investment – doubling from the original federal fuel tax revenue of \$33.5 billion (Table 5) to \$72.2 billion in the new 10 percent admin scenario. Nevertheless, administrative costs are still \$8 billion annually. This lower 10 percent admin cost is more than 55 times higher than the \$70 million it would cost to collect \$72.2 billion at the existing federal fuel tax collection cost rate of 0.2 percent.

Table 8: Collection Costs and Revenue Levels with 10% Collection Cost

Vehicle Type	2019 VMT	VMT Charge (Cost per Mile)	Gross Revenue	Collection Cost (10% of Gross)	Net Revenue for Transportation
Car	2,961,721,254,307	\$0.018	\$53,310,982,578	\$5,331,098,258	\$47,979,884,320
Truck	300,050,408,534	\$0.090	\$27,004,536,768	\$2,700,453,677	\$24,304,083,091
Total			\$80,315,519,346	\$8,031,551,935	\$72,283,967,411

Reasonable Cost Test. This analysis tests how reasonable the 40 percent collection and administrative costs are using market pricing for critical components of the VMT program. To determine the real-world cost of collecting a hypothetical \$35 billion in HTF revenue, this analysis dissected several critical cost components of revenue collection including:

- VMT Hardware;
- Data Communication;
- Customer Account Management; and
- Credit Card Transactions.

These four cost areas are assumed to be absorbed by the third-party CAM as part of their admin cost burden.

- **VMT Hardware Costs.** Presumably, a third-party CAM would ship the technology – in this case a dongle that plugs into the OBD port – and cover that cost through the administrative fee. At a conservative \$50 per device this would require a \$13.6 billion up-front hardware investment. Considering, hypothetically, that the devices would last five years, this cost could be annualized to \$2.72 billion each year. Additional shipping costs for the 272 million dongles would likely exceed \$1 billion.
- **Data Communication Fees.** Data would be transferred from the dongle over a cellular network. These costs would be part of the service provided by the third-party CAM, and would be covered by the current commercial cellular data costs of \$8 to \$20 per month. Since this is a very large program, however, it could be estimated that cellular services could be negotiated to perhaps \$4 per month, or \$48 per year. This lower, more conservative figure is approximately \$13 billion annually for the U.S. fleet.
- **Account Administration.** Third-party CAMs will require vehicle owners to set up user accounts. Administration of these accounts will require, at the very least, sophisticated large-scale data management systems with IT redundancy, account connectivity using a secured web interface, and a financial transaction system for billing. The research team obtained account management costs from a variety of account management firms, and several not-for-profit organizations, and generated per-account management calculations. Applying the lowest external account management fee of \$15.95 annually per account – based on an analysis of VISA’s network transaction information – the total VMT account management budget would be \$4.3 billion annually.¹⁰⁰
- **Transaction Fees.** Merchants are charged a processing fee when customers pay for goods or services with a credit card. The fees charged by a credit card company can be “between approximately 1.3 percent and 3.4 percent of each credit card transaction.”¹⁰¹ In a system where third-party CAMs collect and manage VMT tax revenues, the CAM would reasonably be defined as a merchant by credit card companies. The processing fees are determined by each credit card company and are often based on the merchant category code (which in this case would likely be Bridge and Road Fees, Tolls [4748]). An example of the rate charged by a credit card company might be 2.10 percent of the charge plus \$0.10 per transactions.¹⁰² Assuming \$35 billion in revenue and 12 monthly transactions per vehicle in the U.S., transaction fees would reach more than \$1 billion annually.

¹⁰⁰ Credit card services have overhead costs associated with managing accounts. VISA reported almost \$8 billion in operating expenses for FY 2019. With an estimated 500 million accounts in 2019, this would lead to an estimated operating cost per account of \$15.95. However, this does not fully encapsulate the cost associated with account management, as banks and other financial entities incur operating costs through partnerships with credit card companies.

Visa. (November 2019). “Annual Report 2019.” https://s1.q4cdn.com/050606653/files/doc_financials/2019/ar/Visa-Inc-Fiscal-2019-Annual-Report.pdf

Dwyer, Ben. (April 6, 2020). “Credit Card Processing: How it Works.” <https://www.cardfellow.com/blog/how-credit-card-processing-works/>

¹⁰¹ Daly, Lyle. (July 8, 2020). “Average Credit Card Processing Fees and Costs in 2020.” <https://www.fool.com/the-ascent/research/average-credit-card-processing-fees-costs-america/>

¹⁰² Florida Department of Financial Services: Treasury Division. (October 2012). “MasterCard Interchange Programs and Rate Schedule.” http://ftreasury.org/treasury/cash_management/pdf/MasterCard%20Interchange%20Rates.pdf



Based on the summation of these figures, the annual cost to collect \$35 billion would be \$21.2 billion, as shown in Table 9. This 61 percent administrative cost of the gross revenue is considerably more excessive and egregious than the 40 percent fee applied in Oregon.

Table 9: Annual Administrative Costs for Collection of \$35 billion in Federal VMT Revenue

Cost Category	Cost per Vehicle	Total Cost
Technology Cost Annualized over 5 Years	\$10.00	\$2,724,024,780
Cellular Transaction Costs	\$48.00	\$13,075,318,944
Account Management	\$15.95	\$4,344,819,524
Transaction Fees (2.1% plus \$0.10 per transaction)	\$3.90	\$1,061,882,974
TOTAL	\$77.85	\$21,206,046,222

If, hypothetically, these costs were halved through negotiations with technology and data transfer manufacturers/vendors or general efficiencies, the cost of \$10.6 billion would still be far too great for the collection of \$35 billion annually, and is far greater than the approximate \$70 million in estimated federal fuel tax collection costs. It should be noted that these costs also leave out any direct CAM fees and operating margins that would certainly be applied by a private sector CAM.

Adding State Tax Collections Improves the Math. Economies of scale would occur if state fuel taxes are replaced and state VMT charges are collected through the existing federal VMT tax system described above. Annually, approximately \$50 billion in motor fuel taxes are collected through state fuel taxes.¹⁰³ Combined with federal revenue of \$35 billion, the total collection of state and federal revenue through a single VMT tax system would be \$85 billion. While certain variable costs such as transaction fees would increase, many of the other cost centers, such as hardware, are fixed, thus reducing the relative percentage of administration costs. Transaction fee costs would double due to the increase in charges (and assuming the number of transactions between the CAM and the credit card company remained the same) with the addition of state taxes, but overall, admin costs as a percentage of gross revenue would drop to roughly 26 percent.

Identifying the National VMT Tax System Operator. Tracking vehicles and charging taxes based on mileage for every vehicle in the U.S. is not something a government – or any private sector firm – has tried before. With the ongoing trend of increased government contracting, it is very likely a private sector entity or entities will be contracted to create such a system.

There are companies that are likely positioning themselves to deliver this type of service to governments. The OReGO program has several private sector CAMs including Emovis, which according to its website has capabilities that include in-vehicle tracking for VMT charging, but also has back-office capabilities that include billing, financial reconciliation and customer

¹⁰³ U.S. Department of Transportation Federal Highway Administration. (January 6, 2021). "Highway Statistics 2019: State Motor Fuel Tax Receipts (1963 – 2019)." Table MF – 201. <https://www.fhwa.dot.gov/policyinformation/statistics/2019/mf201.cfm>

management. Emovis is not a small, stand-alone startup company; it is a subsidiary of Abertis, a much larger establishment “dedicated to designing, implementing and managing technology and information services for electronic tolling.”¹⁰⁴ Abertis Infraestructuras, S.A., based in Madrid, Spain, is a global toll road operator, and is a subsidiary of Atlantia. Atlantia SpA, which is based in Rome, Italy, is a holding company that “through its subsidiaries, engages in the construction and operation of motorways, airports and transport infrastructure, parking areas, and intermodal systems worldwide.”¹⁰⁵ Prior to the pandemic, Atlantia had \$12.6 billion in total revenue for 2019 and just under 30,000 employees. A large company like this, experienced in worldwide road tolling and VMT system management through its subsidiary Emovis, would be a very likely candidate to act as a third-party CAM for a national VMT tax system. In addition, credit card companies also have the IT infrastructure and capital to operate such systems.

Other Considerations: A VMT Program Could End Tolling Double Taxation. With the possibility of identifying VMT by roadway, a VMT tax system would end the double taxation issues (paying a toll and paying a fuel tax) related to toll roads. The unintended consequence would be a significant gap in federal revenues. Applying the \$0.018 CPM (for cars) and \$0.090 CPM (for trucks) charges discussed earlier, it is possible that several billion dollars in revenue could be excluded from the Highway Trust Fund if double taxation on tollways were ended. Table 10 illustrates the impact of excluding VMT accrued on 10 large toll systems from being charged a VMT tax.¹⁰⁶

Table 10: Loss of Revenue on 10 Toll Systems

	Car	Truck	Total
VMT	31,597,640,808	4,952,960,342	36,550,601,150
VMT Tax Rate	\$0.018 CPM	\$0.090 CPM	-
Revenue Loss	\$568,757,534	\$445,766,430	\$1,014,523,965

Compliance and Enforcement Costs

With more than 272 million vehicles in the U.S., enforcement will be challenging. While there are those who will actively avoid paying a VMT tax by choice, there will be others who simply are not able, for a variety of reasons, to participate in such a program. Regarding the ability of lawful users to participate in a VMT tax program, however, CRS found that:

- 7.7 percent of U.S. households have no bank account.
- An additional 20 percent are “underbanked” – i.e. rely on the services of “postal money orders, payday loans, pawn shop loans or auto title loans.”
- 30 percent of consumers have no credit card.
- 20 percent of consumers have no debit card.

¹⁰⁴ Emovis. (December 2, 2020). “Emovis, Wins New Innovative Traffic Management Projects in Puerto Rico and Qatar.” <https://www.emovis.com/news/emovis-wins-new-innovative-traffic-management-projects-in-puerto-rico-and-qatar/>

¹⁰⁵ Atlantia SpA (ATL.MI). Available Online <https://finance.yahoo.com/quote/ATL.MI/profile?p=ATL.MI> Date Accessed: March 8, 2021.

¹⁰⁶ The toll systems analyzed were: BATA, Central Florida, Harris County, Illinois Tollway, Maine Tollway, MDTA, North Texas, NJTP, Ohio Turnpike, Kansas Turnpike.



CRS concludes that "unbanked and underbanked road users would not be easily brought into a charging system based on electronic payments."¹⁰⁷ A cash payment/mail alternative would have significantly higher costs and likely evasion rates, however.

This creates both administrative and enforcement complexities. To generate estimates of enforcement and compliance costs, an estimate of annual number of vehicle account "issues" (i.e. non-payments, delinquencies, non-participation, etc.) was developed using the average number of credit card delinquencies from 2003 through 2020.¹⁰⁸ Assuming a similar number for the VMT tax, there would be nearly 26 million vehicles in the U.S. annually that have enforcement/compliance issues as shown in Table 11. It was assumed that each compliance/enforcement issue would require up to 8 hours of labor among those tasked with compliance, including program managers, courts, DMVs, collection agencies and others that might help resolve the case. This assumption results in more than 205 million annual labor hours ensuring that people comply with a VMT program. At an average hourly direct compensation of a civilian worker (which is \$38.26 according to the Bureau of Labor Statistics [BLS]),¹⁰⁹ the total annual cost of compliance and enforcement would be \$7.87 billion.

Table 11: Calculating the Estimated Cost of Enforcement

Line 1	Total Number of Vehicles in the U.S.	272,402,478
Line 2	If 9.44% of vehicle have compliance Issues, total number of compliance issue cases annually	25,714,794
Line 3	Average hours spent by police, courts, DMVs, collection agencies to resolve cases	8
Line 4	Total Compliance Hours Annually (Line 2 * Line 3)	205,718,352
Line 5	BLS Average Total Hourly Compensation, Civilian Worker	\$38.26
Line 6	Annual Cost (Line 4 * Line 5)	\$7,870,784,148

¹⁰⁷ Kirk, Robert; Marc Levinson. (June 22, 2016). "Mileage-Based Road User Charges." Congressional Research Service. <https://fas.org/sgp/crs/misc/R44540.pdf>

¹⁰⁸ The 9.44% figure is based on percent of balance 90+ days delinquent for credit cards, average of quarterly figures from 2003-2020.

Federal Reserve Bank of New York. "Center for Microeconomic Data: Data Bank." <https://www.newyorkfed.org/microeconomics/databank.html> Date Accessed: March 8, 2021.

¹⁰⁹ U.S. Bureau of Labor Statistics. (September 17, 2020). "Economic News Release." <https://www.bls.gov/news.release/ecec.t01.htm>

4. Designing a National VMT Tax System Framework

Based on the research above, development of a national VMT tax system would require consideration of challenges in each of the following areas:

- System Design
- Program Implementation
- Program Governance
- Compliance and Enforcement

The tables below describe at a high-level the Opportunities and Obstacles in designing that framework with potential actions to address some of the challenges.

System Design. The most feasible and cost-effective architecture for a national VMT tax program is one based on cellular/terrestrial communications utilizing onboard dongles to monitor vehicle miles traveled.	
Opportunities	Obstacles
Cellular communications are generally ubiquitous in the U.S., with more than 349,000 cell towers providing 98.2 percent of geographic coverage.	There are urban canyons, cellular dead spots, and zones of electronic interference that can hinder or drop wireless data transfers. While 4G LTE networks utilize encryption, there are limited instances where cellular data has been hacked or compromised.
Dongles that plug directly into OBD sockets ensure that relevant VMT data accurately generates from the participating user's vehicle.	Dongle prices vary, but most relevant models are priced at \$50 and above and have a limited lifespan.
Dongles have the capacity to generate and process a range of relevant VMT data, and transmit it using cellular networks.	The estimated cost to provide dongles to 272 million vehicles is approximately \$13.6 billion. Vehicles manufactured before 1996 cannot use the dongle/OBD device, requiring a separate program.
Dongles are at a technology level where replacement is not costly, and would not require repairs.	In general, dongles are secure, but there have been tests confirming that dongle/OBD cyberattacks could stop or accelerate a vehicle remotely (using Bluetooth). It is unclear how VMT tax program compliance and enforcement will be managed when the dongle is broken or removed from the vehicle. If multiple dongles and related software are utilized, interoperability issues can arise.
Recommendations	
The federal government must develop technical standards, specifications and performance requirements for all hardware associated with the VMT tax program.	
Federal legislation must be developed to require all jurisdictions involved in VMT tax activities to utilize the federal VMT technology platform, and develop Terms of Service for all VMT tax parties that control data usage, access to and protection of personal information.	



Program Implementation and Administration. A feasible program will likely rely on one or more contracts with third-party vendors to develop and manage most aspects of a national VMT tax program.	
Opportunities	Obstacles
Many private sector firms have the technical capabilities and IT resources to manage large-scale technology-based programs.	Private sector firms have added profit margins, typically in the double-digit range. For example, the OReGO contractor charges 40 percent of all revenue collected.
Allowing many firms into the marketplace creates a competitive landscape, and could bring collection costs down.	If multiple vendor contracts are utilized, conflicting service requirements could arise, unless state and federal program specifications and performance requirements are put in place.
With a large demand and increased production of dongles for a national VMT tax program, the price of dongles may decrease per unit as manufacturers achieve economies of scale.	Up-front hardware and implementation costs will exceed \$13 billion, likely requiring federal financial assistance to the contractor(s).
Recommendations	
Create a national program for highly qualified third-party CAMs that fosters competition as a means to lower administrative costs.	

Program Governance: Federal leadership is critical to ensure a single VMT tax program standard that enables seamless travel across the U.S. transportation system.	
Opportunities	Obstacles
In the coming years/decades, the federal government could lead a smooth and coordinated rollout of a viable replacement for the fuel tax.	States are very much ahead of the federal government in setting standards and practices with regards to VMT taxes, and one even has an operational program in place.
The federal government could ensure that VMT tax revenue is dedicated to surface transportation.	States and local governments may have different financial and social objectives.
The federal government could ensure that VMT tax program complexity is minimized.	States are currently researching and testing local option taxes and variable rates.
Recommendations	
It is essential that strong federal oversight and congressional enabling legislation is developed. Federal pre-emption is needed to ensure uniformity of VMT tax system design, hardware and software, and system performance standards across all 50 states.	
A fixed-rate VMT tax system at the federal level could flow down to the state level, eventually replacing the fuel taxes for both. When states use the existing federal system, additional costs of collection are limited, thus promoting efficiency. Variable rates at or below the state however should be prohibited so as not to undermine the overall goals of revenue generation and system simplicity.	
The federal government must develop regulations that minimize vendor administration costs and excessive operating margins, thus ensuring that the primary program objective of transportation infrastructure investment is maximized. Democratic and legislative processes must provide oversight; at no point should rates or rules be set by the private sector in this endeavor.	

<p>Compliance and Enforcement. A successful program will require universal participation; to accomplish this the system must be easy to participate in and enforcement must be manageable.</p>	
Opportunities	Obstacles
<p>If the cost per mile is reasonable, compliance is simplified, and the penalties for noncompliance are severe enough, most people will participate.</p>	<p>Based on publicly available data sources for other similar tax/fee-related programs, a VMT tax program could expect evasion rates between 5% – 10% of expected revenue. Applied to existing annual HTF collections, this would equate to \$7.87 billion in uncollected revenue.</p>
<p>Technology could improve to ensure compliance, especially with future model year vehicles.</p>	<p>At the present time, there is no known solution or approach for identifying evasion for the VMT tax system being proposed in this research.</p>
<p>Compliance becomes more difficult with complexity. If the VMT tax program is simple and straightforward (one rate nationally, and one rate within each state, for instance) then acceptable compliance rates could be easy to achieve. If there is complexity and confusion (e.g. thousands of local option taxes) drivers will want to avoid participation in the program.</p>	<p>State and local enforcement agencies could inspect vehicles for dongles plugged into OBDs, but that does not validate that the dongle is transmitting data or that the user is connected to a financial account and transaction. Because the vehicle is being tracked, not the driver, certifying people through a driver's license endorsement does not resolve the issue.</p>
Recommendations	
<p>Limit the number of revenue recipients to the federal government and the 50 state governments.</p>	
<p>Through federal leadership, develop a simple and efficient VMT tax system with the singular goal of funding the transportation system.</p>	
<p>Encourage technology providers to develop systems that allow for unobtrusive inspection and that prevent manipulation of mileage recording.</p>	



5. Conclusions

As described in this report, there are myriad approaches to designing, developing, managing and enforcing a national VMT tax system, and all come with complex challenges. While a VMT tax program is technologically feasible today, very few of the pressing non-technology issues have been researched and addressed. Ideally, a successful user-pays program would see the vast majority of the collected VMT revenue go directly into the transportation system, rather than to administrative tasks, hardware, transaction costs or even outside of surface transportation in support of other modes.

Most advocates of VMT systems argue that users are underpaying for the roadways on which they travel. Since most of ATRI's financial analyses and cost calculations in this research use existing fuel tax rates and revenue levels, the findings reflect very conservative costs. Most infrastructure needs assessments propose dramatic increases in transportation investments, so it is safe to assume that most jurisdictions would utilize a VMT program to substantially increase revenue streams from roadway users.

In addition, a literal interpretation of the user-pays mantra in a VMT program creates many new challenges as described below.

- Some believe that roadway users should not have to pay for the roads they do not use.
- Rural roads, with fewer users, could receive less funding, regardless of their strategic role in connectivity.
- Travelers who do use rural roadways for longer trips will pay more for the same services and connectivity than their urban counterparts.
- Urban users could argue for more transportation revenue, but will not likely see improvements in travel times – due to limited opportunities to increase roadway capacity.

Based on the data and information developed in this research, there are multiple challenges that must be overcome before a sustainable path forward for a national VMT tax program is available.

National VMT Tax Program Realities
A VMT tax program will move fuel tax revenue collection from fewer than 300 federal taxpayers to 272 million vehicle accounts.
As noted in the research, millions of vehicles and/or households will be unable to participate in a national VMT tax program, due to obsolete vehicles, and/or inaccessibility to bank accounts, internet transactions and/or cellular coverage.
The most realistic technology approach would involve an onboard device, or dongle. While dongle prices vary, most relevant models are priced at \$50 and above.
The estimated cost to provide dongles to 272 million vehicles is approximately \$13.6 billion . Vehicles manufactured before 1996 cannot use a dongle/OBD device, requiring a separate program.
The OReGo Program shipped dongles to each user's home address. This ATRI cost analysis does not include device packaging and shipping costs to either residential addresses or Department of Motor Vehicle (DMV) offices. If the packaging and shipping costs were as little as \$5.00 per dongle, initial shipping costs for 272 million dongles would be approximately \$1.36 billion .

National VMT Tax Program Realities
To include all road users, a secondary VMT account/payment system must be developed for vehicles/households that are not able to participate in the primary VMT system. The design and costs of such a program are unknown, but are likely considerable.
Collection costs of 40 percent for a federal VMT tax would be 300 times more expensive than collection costs for the federal motor fuels tax. The administrative cost to collect federal highway revenue will increase from 0.2 percent of federal fuel tax revenue collected, and 1 to 2 percent for state fuel tax administration, to 40 percent based on the existing Oregon VMT program administrative cost. If a long-term goal of dropping admin costs to 10 percent is realized in a national VMT tax program, it will still require \$8 billion annually to manage the program.
Based on public data from other programs and industries, it is estimated that evasion and noncompliance with the program will exceed \$7.87 billion annually . Until a nearly 100 percent effective enforcement program is developed, this nearly \$7.9 billion loss will either reduce infrastructure investment or could be added to the costs borne by compliant VMT taxpayers.
Presently, there is no clear mechanism for ensuring and enforcing compliance. When a vehicle dongle is missing, broken or deliberately tampered with, the vehicle becomes an invisible black hole among compliant vehicles.
Based on existing credit card transaction fees, VMT financial transaction costs will be \$4.3 billion annually .
If variable rates are used for congestion pricing and other social engineering objectives, it will be nearly impossible to utilize the VMT technologies to notify users of changing rates. Physical signage will be needed, based on the VMT system design proposed herein, and based on the OReGo system used today.
A VMT tax program will be based on road use, not road mileage. The result is that urban systems will generate far more revenue than rural systems – although rural roadways possess far more miles and provide strategic connectivity between urban centers.
According to the latest Census of Governments, there were 90,000+ local units of government in the U.S. Of those, approximately 38,000 are counties, municipalities and townships, all of which presumably would each have a small piece of the 4.1 million miles of U.S. roadway within their purview. It would be extremely complex to include these units of government in a VMT tax program.
The sophistication and granularity of the proposed VMT tracking technologies will allow for the elimination of “double taxation” payments associated with paying tolls on toll roads and concurrently consuming taxed fuels. Eliminating fuel taxes or VMT charges while using toll roads will create a new budget hole in the HTF of several billion dollars.



Beyond these technical and programmatic findings of a VMT tax program, numerous tangential issues remain, particularly public acceptance. Based on survey research, a federal VMT tax program concept is strongly disliked, and as road users learn the full scale and cost of a national VMT tax program, anecdotal research described herein indicates that the issues and dislikes will increase, rather than decrease.

For example, taxpayers today do not "see" the state and federal fuel taxes that are embedded in fuel prices, and they most definitely do not directly pay fuel taxes. This reality will change dramatically with a VMT tax program, particularly when the VMT fees are increased to meet infrastructure investment needs. Regardless of politics and income, it is rare for taxpayers to request considerably higher taxes (or fees).

Consequently, a critically needed VMT Tax Public Education Plan **must convince** people that the system will be:

- **Fair.** Compliance must be ubiquitous; cheating must be prosecuted.
- **Unintrusive.** Privacy must be insured and the data must not be used for any secondary purposes. The goal of the system is to pay for roadways, not track individuals, or overtly control human behavior.
- **Cost-efficient.** Administrative costs must be relatively minimal; on par with existing fuel tax efficiencies as that is the primary promise of technology utilization. Anything more will be viewed as inflationary and wasteful.

APPENDIX A: Example of Terms of Service¹¹⁰**WHAT INFORMATION DO WE COLLECT, AND WHAT DO WE USE IT FOR?**

A. The information we collect, and the purposes for which we use it, include the following:

1. Road Usage Charge (RUC) user's name, company, residential address, mailing address, telephone number and e-mail address—used for identifying and communicating with the RUC user concerning his/her account.
2. License plate number, vehicle identification number, weight of the vehicle, odometer reading—used to identify the RUC user's vehicle with his or her RUC account, and, verify his eligibility to the program.
3. RUC user's travel pattern data—used to determine the amounts chargeable to the RUC user under the RUC Program, and, when aggregated with other users' travel pattern data, to analyze usage of the system as a whole.
4. RUC user's messages sent to emovis – used to respond to RUC user inquiries and questions.

PERSONAL INFORMATION

"Personal Information" is defined by the Oregon Consumer Identity Theft Protection Act (Oregon Revised Statutes Sec. 646A.600 and following), as:

A. the combination of an individual's first name or first initial with his or her last name, plus any of the data listed below, unless such data have been encrypted (without the encryption code being acquired by an intruder along with the data):

1. Social Security number;
2. Driver license number or state identification card number issued by the Department of Transportation;
3. Passport number or other United States issued identification number;
4. Financial account number, credit or debit card number, in combination with any required security code, access code or password that would permit access to a consumer's financial account;
5. Physical measurements used to authenticate identity as part of a transaction;
6. Health insurance information; or
7. Medical history.

B. The information described in Paragraph A above, without the consumer's first name or first initial and last name, if

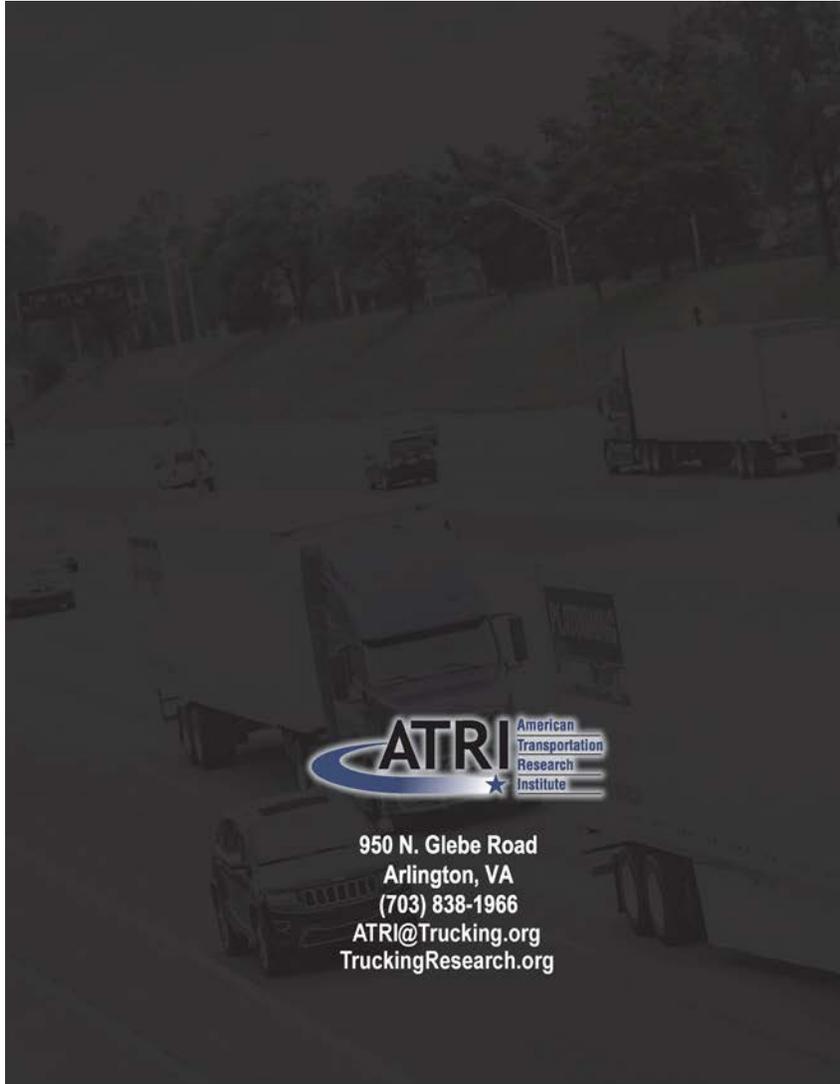
1. Encryption or other methods have failed to render the data unusable by an unauthorized third party and
2. The data would enable a person to commit data theft against the consumer.

¹¹⁰ Emovis. "Privacy Policy: RUC User Data Retention and Privacy Policy." Date Accessed: February 17, 2021. <https://orego.emovis.us/privacy-policy/>



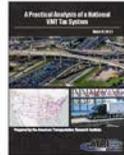
Personal Information under the Oregon Consumer Identity Theft Protection Act does not include information in a federal, state or local government record, other than a Social Security number, that is lawfully made available to the public.

We are required to report to our customers immediately if we discover or are notified that any of their Personal Information held in our computer network has been breached. Such notice may be delayed, however, if a federal, state or local law enforcement agency requests a delay because it has determined that reporting the breach immediately would impede a criminal investigation. RUC users may instruct us to "freeze" their Personal Information, that is, to refrain from providing any of their Personal Information to credit reporting agencies.



A Practical Analysis of a National VMT Tax System

New research from the American Transportation Research Institute details the costs of deploying and operating a national vehicle miles traveled (VMT) tax. This study was identified as a top research priority by ATRI's Research Advisory Committee in 2020.



ATRI's research identified myriad approaches to designing, developing, managing and enforcing a national VMT tax system, and all come with complex challenges. While a VMT tax program is technologically feasible today, very few of the pressing non-technology issues have been researched and addressed. Ideally, a successful user-pays program would see the vast majority of the collected VMT revenue go directly into the transportation system, rather than to administrative tasks, hardware, transaction costs or even outside of surface transportation in support of other modes.

Most advocates of VMT systems argue that users are underpaying for the roadways on which they travel. Since most of ATRI's financial analyses and cost calculations utilize existing fuel tax rates and revenue levels, the findings reflect very conservative costs. Most infrastructure needs assessments propose dramatic increases in transportation investments, so it is safe to assume that most jurisdictions would utilize a VMT program to substantially increase revenue streams from roadway users.

In addition, a literal interpretation of the user-pays mantra in a VMT program creates many new challenges as described below.

- Some believe that roadway users should not have to pay for the roads they do not use.
- Rural roads, with fewer users, could receive less funding, regardless of their strategic role in connectivity.
- Travelers who do use rural roadways for longer trips will pay more for the same services and connectivity than their urban counterparts.
- Urban users could argue for more transportation revenue, but will not likely see improvements in travel times – due to limited opportunities to increase roadway capacity.

American Transportation Research Institute
For more information and to order the full report, visit www.TruckingResearch.org.



NATIONAL VMT TAX PROGRAM REALITIES



A VMT tax program will move fuel tax revenue collection from fewer than **300** federal taxpayers to **272 million** vehicle accounts



Millions of vehicles and/or households will be unable to participate in a national VMT tax program, due to obsolete vehicles, and/or inaccessibility to bank accounts, internet transactions and/or cellular coverage



The estimated cost to provide dongles to **272 million vehicles** is approximately **\$13.6 billion**



Collection costs of **40%** for a federal VMT tax would be **300 times more expensive** than collection costs for the federal motor fuels tax



Evasion and noncompliance with the program will exceed **\$7.87 billion** annually



VMT financial transaction costs will be **\$4.3 billion** annually



Urban systems will generate far more revenue than rural systems – although rural roadways possess far more miles and provide strategic connectivity between urban centers



Consequently, a critically needed VMT Tax Public Education Plan must convince people that the system will be:



Fair. Compliance must be ubiquitous; cheating must be prosecuted.



Unintrusive. Privacy must be insured and the data must not be used for any secondary purposes. The goal of the system is to pay for roadways, not track individuals, or overtly control human behavior.



Cost-efficient. Administrative costs must be relatively minimal; on par with existing fuel tax efficiencies as that is the primary promise of technology utilization. Anything more will be viewed as inflationary and wasteful.



Statement of

The American Trucking Associations

Before the

**Committee on Environment and Public Works
United States Senate**

Hearing on

*Long-term Solvency of the Highway Trust Fund: Lessons
Learned from the Surface Transportation System Funding
Alternatives Program and Other User-based Revenue
Solutions, and How Funding Uncertainty Affects the
Highway Programs*

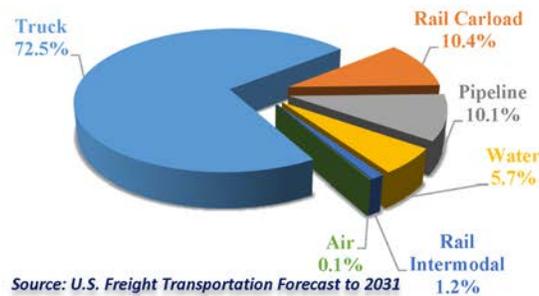
April 14, 2021

Chairman Carper, Ranking Member Capito, and members of the Committee, thank you for providing the American Trucking Associations (ATA) with the opportunity to provide testimony for the hearing record. ATA is an 87-year old federation and the largest national trade organization representing the trucking industry, with affiliates in all 50 states. ATA's membership encompasses over 34,000 motor carriers and suppliers directly and through affiliated organizations. Our association represents every sector of the industry, from Less-than-Truckload to Truckload, agriculture and livestock to auto haulers and movers, and from the large motor carriers to the owner-operator and mom-and-pop one truck operations. In fact, 80 percent of our membership is comprised of small-sized carriers, and only two percent of ATA's membership would be classified as large carriers.

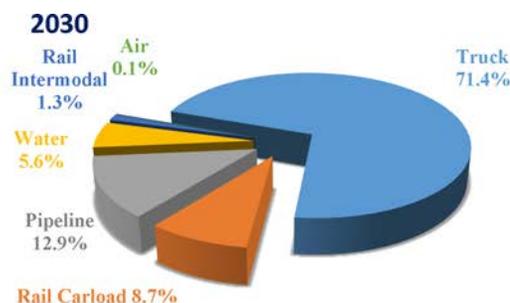
In 2019 the trucking industry moved 73 percent of the nation's freight tonnage, and over the next decade will be tasked with moving 2.4 billion more tons of freight than it does today, while continuing to deliver the vast majority of goods.¹ Trucks will continue to be the dominant freight transportation mode for the foreseeable future. The highway system is the trucking industry's workplace, and a failure to adequately fund highway infrastructure will inevitably increase the cost of living for all Americans and make U.S. businesses less competitive.

Distribution of Tonnage by Mode: 2019 vs 2031

2019



¹ Freight Transportation Forecast 2020 to 2031. American Trucking Associations, 2020.



Source: U.S. Freight Transportation Forecast to 2031

The trucking industry is also a major source of employment, with nearly eight million people employed in trucking-related activities, including 3.6 million truck drivers². Furthermore, the trucking industry is a lynchpin of the United States' economy. In 2017 trucks moved \$10.4 trillion worth of goods, representing more than half of U.S. gross domestic product³.

A well-maintained, reliable and efficient network of highways is crucial to the delivery of the nation's freight – both international and domestic – and vital to our country's economic and social well-being. However, the road system is rapidly deteriorating, and costs the average motorist nearly \$1,600 a year in higher maintenance and congestion expenses.⁴ Highway congestion also adds nearly \$75 billion to the cost of freight transportation each year.⁵ In 2016, truck drivers sat in traffic for nearly 1.2 billion hours, equivalent to more than 425,000 drivers sitting idle for a year.⁶ This caused the trucking industry to consume an additional 6.87 billion gallons of fuel in 2016, representing approximately 13% of the industry's fuel consumption, and resulting in 67.3 million metric tons of excess carbon dioxide (CO₂) emissions.⁷ Mr. Chairman, the large investments the private sector trucking industry has made over the last three decades to significantly reduce emissions – to the point that today's trucks emit up to 60 times fewer emissions than trucks manufactured in the 1980s – have been decimated by a lack of public sector commitment to build the highway infrastructure capacity necessary to accommodate growing traffic.

Congestion serves as a brake on economic growth and job creation nationwide. Mr. Chairman, a first-world economy cannot survive a third-world infrastructure system. As such, the federal government has a Constitutional responsibility to ensure that the resources are available to address this self-imposed and completely solvable situation.

² American Trucking Associations, *American Trucking Trends 2020*.

³ U.S. Census Bureau Commodity Flow Survey, 2017.

⁴ *Bumpy Road Ahead: America's Roughest Rides and Strategies to make our Roads Smoother*, The Road Information Program, Oct. 2018; *2015 Urban Mobility Scorecard*. Texas Transportation Institute, Aug. 2015.

⁵ *Cost of Congestion to the Trucking Industry: 2018 Update*. American Transportation Research Institute, Oct. 2018.

⁶ *Ibid.*

⁷ *Fixing the 12% Case Study: Atlanta, GA*. American Transportation Research Institute, Feb. 2019.

A report⁸ by the Transportation Research Board (TRB) requested by Congress focused specifically on the current state and future needs of the Interstate Highway System. This critical network connects us together and reaps immeasurable economic and national security benefits for the United States. Most importantly, because Interstates are far safer than surface roads, since 1967 its construction has prevented nearly a quarter million people from losing their lives in vehicular crashes.⁹ The Interstate Highway System accounts for about one-quarter of all miles traveled by light-duty vehicles and 40 percent of miles traveled by trucks.¹⁰ The TRB report estimates that conservatively, the state and federal investment necessary to address the Interstate system's maintenance and capacity needs will have to double or triple over today's expenditures in the next 20 years.¹¹

Mr. Chairman, while Congress last year injected revenue into the Highway Trust Fund (HTF) to prevent its collapse, this was just a temporary patch, and by next year additional revenue will be required to prevent its insolvency. The recent pattern of shoring up the HTF without providing the long-term stability that transportation planners need is troubling, and very inefficient. Furthermore, according to the American Society of Civil Engineers, the U.S. spends just over half of what is necessary to address surface transportation needs.¹² As the investment gap continues to grow, so too will the number of deficient bridges, miles of roads in poor condition, number of highway bottlenecks and, most critically, the number of crashes and fatalities attributable to inadequate roadways. We hope you will act with the urgency and expediency that this moment requires.

FUTURE REVENUE SOURCES

While ATA considers an increase in the fuel tax to be the best and most immediate means for improving our nation's roads and bridges, we also recognize that due to improvements in fuel efficiency and the development of new technologies that avoid the need to purchase fossil fuel altogether, the fuel tax is likely to be a diminishing source of revenue for surface transportation improvements over the long term. We, therefore, encourage Congress, in consultation with the Executive Branch, state and local partners and the private sector, to continue to work toward identifying future revenue sources.

ATA encourages Congress to include in the surface transportation reauthorization bill a plan to bolster and, if necessary, ultimately replace current highway funding mechanisms with new, more sustainable revenue sources. We recommend a ten-year strategy that could include creation of a blue-ribbon commission to explore the results of pilot programs already completed or underway, with recommendations for Congress to consider as it eventually transitions away from the fuel tax.

Vehicle Miles Traveled Tax

⁸ *Renewing the National Commitment to the Interstate Highway System: A Foundation for the Future (2018)*. Transportation Research Board, National Academy of Sciences.

⁹ *Ibid.*, p. 2-18

¹⁰ *Ibid.*, p. 2-10.

¹¹ *Ibid.*, p. 5-5

¹² *2021 Report Card for America's Infrastructure*. American Society of Civil Engineers.

While a Vehicle Miles Traveled (VMT) tax might ultimately be the favored approach, as many have suggested, full implementation faces significant hurdles. Such a tax would have to be collected from millions of taxpayers – all those driving vehicles in the taxing jurisdiction. Indeed, there are over 276 million registered vehicles in the United States, and nearly all would need an account under a VMT tax system.¹³

The traditional fuel tax is an inexpensive tax to administer; a VMT tax, in comparison, would not be. A recent report by the American Transportation Research Institute (ATRI) estimated that the capital cost of implementing a VMT tax could be as high as \$13.6 billion, and administrative costs could consume 10 to 20 percent of revenue.¹⁴ As for the recorders now outfitted on commercial trucks, federal regulatory requirements for these devices are designed to ensure an accurate record of hours driven, not the number of miles driven. Nor do the requirements provide an ability to broadcast data to taxing authorities. Furthermore, most commercial vehicles are not required to be equipped with recorders. They are not, as currently configured, adaptable for taxing purposes.

How about equity? Although it appears on the surface that a VMT tax would treat alike all those traveling a given distance, the prospect of widespread evasion of the tax means that those who choose to pay it or can't avoid it, are penalized with having to pay the share of those who don't. Indeed, the ATRI study estimated evasion at nearly \$8 billion per year.¹⁵ Moreover, while under a fuel tax regime low-mileage vehicles that emit relatively more greenhouse gases are taxed more heavily, under a VMT tax, gas-guzzlers and low- or zero-emission vehicles are taxed alike. Furthermore, rural drivers, who pay less in fuel tax per mile compared with urban drivers due to less congestion, will pay the same rate per mile under a VMT tax, even though the relative costs they impose on the system are lower. While it is possible to charge different rates for different vehicle types, or vehicles operating in different locations, this adds cost, complexity and more opportunity for fraud. In addition, charging lower fees for more fuel-efficient vehicles may be regressive, since alternative fuel vehicles are generally more expensive.

Beyond the technical issues, there are many policy considerations that will have to be worked out. For example:

1. Tax rates will depend in part on the amount of net revenue necessary to achieve the stated infrastructure funding goals. This will include capital and administrative costs, which are likely to far exceed current user fees. Another consideration is rate differentiation between vehicle types, e.g. charging more for a high-polluting vehicle or for heavy vehicles that increase maintenance costs. However, these are complex questions that could have unintended consequences, and the more complexity added, the greater the cost and potential for evasion.
2. It is also important to establish which levels of government can apply the tax. From the trucking industry's perspective, a single, national tax is highly preferable. Multiple billing

¹³ Federal Highway Administration, *Highway Statistics 2019*, Table VM-1.

¹⁴ American Transportation Research Institute. *A Practical Analysis of a National VMT Tax System*, March 2021.

¹⁵ *Ibid.*

and technology systems would be an administrative nightmare for the hundreds of thousands of motor carriers operating across jurisdictions. Another concern is that multiple government entities would layer taxes on top of one another, creating a fee structure that is far too expensive.

3. Concerns about privacy are significant political obstacles to implementation of a VMT tax. Implementing a simple odometer tax would overcome these concerns, but it would also prevent differential pricing, limit the ability to fairly distribute revenue among jurisdictions and be difficult to enforce. Furthermore, data security must be assured. Cybersecurity threats to vehicles are already a challenge, and the additional capabilities necessary for a telematics-based VMT tax could exacerbate these concerns.

These are just some of the challenges we have identified; there are many more hurdles to implementation that are known and likely many others that are currently unknown. This is why rushing into a VMT tax system is unwise. We would be especially opposed to a truck-only VMT tax, or another scheme that unfairly targets only the trucking industry. ATA would oppose any reauthorization legislation that attempts to extract revenue only from trucks.

ATA supports a robust research and testing regime for VMT taxes. It should also be noted that most experts – and even ardent advocates – of VMT taxes believe that they are at least a decade away from full implementation.¹⁶ Failing to provide interim funding for surface transportation while these solutions are developed would be highly irresponsible. However, a fuel tax increase could be paired with a plan to transition to a new revenue source, perhaps with the assistance of a blue-ribbon commission that reports its findings to the committee prior to the expiration of the next surface transportation bill.

Interstate Highway Tolling

Interstate tolls are highly inefficient compared with many other funding options. On average, toll collection takes 16 cents out of every dollar paid, compared to a penny in administrative costs for collecting state fuel taxes and 0.2% for the federal fuel tax.¹⁷ Furthermore, the diversion of traffic to alternative routes created by tolls causes needless safety, congestion, environmental and quality of life problems.

Forcing states to resort to tolls by starving them of federal funds is far more regressive than the \$2.00 a week motorists would pay under our proposal. One needs to only look to I-66 in Northern Virginia, where before the impacts of the pandemic on traffic demand, tolls averaged more than \$12.00 per roundtrip and could sometimes exceed \$46.00, to understand the potential impacts on lower- or middle-income Americans. To put this into perspective, even if motorists only paid the average toll, the cost of a 10-mile trip over an eight day period on I-66 would be equivalent to their cost for an entire year under ATA's BAF proposal for all roads and bridges.

¹⁶ For example, this was universally acknowledged by witnesses during a March 7, 2018 House Transportation & Infrastructure hearing on long-term surface transportation funding.

¹⁷ American Transportation Research Institute. *A Framework for Infrastructure Funding*, Nov. 2017 and American Transportation Research Institute. *A Financial Analysis of Toll System Revenue: Who Pays & Who Benefits*, Jan. 2020.

For these reasons ATA opposes tolls on existing Interstates. Federal law governing tolls on existing Interstates should be revised to ensure that the public interest is taken into account, that the negative impacts of diversion and other consequences of tolling are accounted for and minimized, and that tolling authority and the use of revenue derived from tolls are limited.

While restrictions on the authority to toll Interstate highways have been imposed since the inception of the Interstate Highway System in 1956, over the years a patchwork of exceptions has been created. Federal law governing where, how and under what circumstances a state may toll existing, general-purpose lanes of the Interstate system is now a confusing, contradictory mess that serves neither transportation agencies nor highway users very well.

Currently, there are three options for states to toll existing general purpose lanes on the Interstate System:

- Tolling a replacement or reconstructed bridge or tunnel;
- The Interstate System Reconstruction & Rehabilitation Pilot Program, which allows up to three states to toll a single Interstate highway; and
- The Value Pricing Pilot Program, which allows up to 15 jurisdictions (generally states) to toll an unlimited number of Interstate miles as part of a demonstration of the concept of congestion pricing.

While ATA will continue to oppose all attempts to toll existing Interstates unless a viable toll-free option is available, we recognize that some in Congress would like to maintain some level of tolling flexibility. We believe it is important to have a tolling regime that is easily understood and is tied to federal policy considerations that take into account fairness and equity for highway users, safety, interstate commerce and the environment, as well as states' desire to use tolls as a tool to address congestion and fill their transportation funding gaps. Therefore, ATA proposes replacing the current three above options with the following:

States may toll existing, general purpose lanes of the Interstate System if they meet the following criteria through application to the Secretary of Transportation:

- Congestion Pricing - States must demonstrate that the pricing of highways (not the projects funded by tolls) by itself significantly alleviates congestion and improves air quality in a highway corridor, including on alternative routes.
- Bridge/Tunnel reconstruction or replacement - Eligible projects are those with a total project cost of at least \$2 billion. These are single facility costs, not network costs.

General requirements for all Interstate tolls:

- A state must conduct an Environmental Impact Statement for each project. When conducting an EIS for a network of tolls, an EIS must determine the effects of both individual toll locations and the collective network effects of a proposal.
- Revenue generated by the tolls can only be used first for financing costs and project costs related to the facility. Excess revenue can be used for Title 23 eligible highway or transit projects that directly benefit the users of the tolled facility. This requirement should apply

to existing tolls on Interstate highways as well. Revenue from the lease or sale of an Interstate toll facility should also be subject to this requirement.

- The maximum toll rate for any vehicle class may not exceed any other toll rate by more than five times.
- Any toll discounts must be offered to all users, regardless of residency or the state a transponder was purchased from. This requirement should apply to existing tolls on Interstate highways as well.
- At a minimum, the State's application, either through an EIS or separate documentation, should demonstrate the following:
 - There is a net congestion reduction, taking into consideration mobility on both the tolled route and any routes to which traffic diverts. There is also a net reduction in vehicle emissions on these routes.
 - The number and severity of crashes is not likely to increase.
 - If additional maintenance or capacity improvements on diversion routes are anticipated, the state must document these improvements and include a plan to implement them within a reasonable timeframe.
 - Environmental justice impacts of tolls and mitigation measures.
 - A cost-benefit analysis that includes the impacts of tolls on roadside businesses, commercial vehicle operators, and the impacts on businesses and consumers affected by tolls, both inside and outside the states where the tolls are located.
 - A determination with regard to whether the location of tolls or the toll rate structure discriminates against interstate commerce.
 - The state is required to submit a report to the Secretary every five years with an analysis of the above, and the Secretary is to determine whether the state continues to meet the requirements.

THE BUILD AMERICA FUND: A PATHWAY TO NATIONWIDE HIGHWAY IMPROVEMENTS

ATA's proposed solution to the highway funding crisis is the Build America Fund. The BAF would be supported with a new 20 cent per gallon fee built into the price of transportation fuels collected at the terminal rack, to be phased in over four years. The fee will be indexed to both inflation and improvements in fuel efficiency, with a five percent annual cap. We estimate that the fee will generate nearly \$340 billion over the first 10 years. It will cost the average passenger vehicle driver just over \$100 per year once fully phased in.¹⁸

We also support a new fee on hybrid and electric vehicles, which underpay for their use of the highway system or do not contribute at all. We look forward to working with the committee to identify the best approach to achieve that goal.

The fuel tax is the most immediate, cost-efficient and conservative mechanism currently available for funding surface transportation projects and programs. Collection costs are just 0.2 percent of revenue.¹⁹ There is a perception that the fuel tax is no longer a viable revenue source

¹⁸ Federal Highway Administration, *Highway Statistics 2019*, Table VM-1. Average light-duty vehicle consumed 518 gallons of fuel.

¹⁹ American Transportation Research Institute. *A Framework for Infrastructure Funding*, Nov. 2017.

due to the availability of electric vehicles and improvements in vehicle fuel efficiency. This notion is belied by the facts. In 2019 Americans consumed more on-road fuel than in any year previous.²⁰ Furthermore, according to the Congressional Budget Office's latest estimates, annual revenue from fuel taxes will drop by just \$1.1 billion over the next decade.²¹ A modest increase in the fuel tax, or a new fee on alternative fuel vehicles, can easily recover these lost revenues.

Mr. Chairman, thank you once more for the opportunity to submit comments. ATA looks forward to working with the committee to develop robust, long-term solutions to address the highway funding investment gap.

²⁰ Federal Highway Administration. *Highway Statistics*.

²¹ Congressional Budget Office, *Budget and Economic Outlook: 2021-2031*, Feb. 2020.

***Outstanding Questions and Concerns Regarding a
National Vehicle Miles Traveled Program***

Top 3 reasons why a national Vehicle Miles Traveled (VMT) program is not yet ready for full implementation:

1. Collection costs
2. Significant evasion
3. Privacy concerns

Collection Costs

- Collection costs range from 5%-40%. However, a more realistic estimate is probably in the 10%-20% range.
- Even the most optimistic estimates suggest that costs will far surpass fuel tax collection costs of less than 1%.
- With a 10% collection cost, annual administrative costs are around \$8 billion.

Evasion

- Compliance is a major challenge. Even a federal system will likely have to rely on state or local enforcement agencies to prevent significant evasion.
- Some sort of compliance monitoring system, along with a penalty/fine structure, will be needed to prevent evasion.
- Additionally, a judicial system to prosecute evaders will likely be needed. This will have a cost, and based on existing examples of fee collection system noncompliance, even with enforcement systems in place, loss of revenue due to evasion could be significant.

Privacy

- Privacy is a significant concern, and vendor contracts could force motorists to provide personal information that may not be necessary for fee collection.
- Vehicle tracking by a government agency may raise Fourth Amendment concerns regarding an individual's right to privacy.
- A synthesis study of public opinion surveys on VMT fees found that around 70% of respondents indicated that privacy is a major concern.

Other Considerations

- Mean support for a VMT tax across multiple public opinion surveys was 24%.
- The ability of local jurisdictions to impose a VMT tax raises concerns that revenue generated could be used for general purposes rather than transportation improvements that benefit those who pay the fee.
- Technology costs for an aftermarket GPS system could be around \$15 billion for the in-vehicle devices.
- The ATRI report concludes that "Based on the data and information developed in this research, there are multiple challenges that must be overcome before a sustainable path forward for a national VMT tax program is available."



Written Statement of the American Truck Dealers
Submitted for the Hearing Record

"Long-term Solvency of the Highway Trust Fund: Lessons Learned from the Surface Transportation System Funding Alternatives Program and Other User-based Revenue Solutions, and How Funding Uncertainty Affects the Highway Programs"

U.S. Senate Committee on Environment and Public Works
April 14, 2021

Chairman Carper and Ranking Member Capito – the American Truck Dealers (ATD) thank you for the opportunity to address the burdensome impact of the federal excise tax (FET) on fleet turnover in the heavy-duty truck industry. ATD, a division of the National Automobile Dealers Association, represents over 1,700 franchised commercial truck dealerships who employ more than 122,000 people nationwide. As Congress considers comprehensive infrastructure legislation and modernizing the Highway Trust Fund (HTF), we urge the Committee to repeal and replace the 12% FET on the retail sale of most new heavy-duty trucks and trailers, which is the most inconsistent funding source to the HTF, and delays the replacement of older, less environmentally clean and less fuel-efficient trucks.

The FET is archaic. The FET on heavy-duty trucks was first imposed in 1917 to help pay for World War I. The FET is the highest excise tax on a percentage basis that Congress levies on a product, often adding as much as \$22,000 to the price of a new heavy-duty truck. It is imposed on top of the nearly \$40,000 in recent federal emissions and fuel-economy regulatory mandates, which makes it harder for small businesses to afford a new truck.

The FET helps keep older trucks on the road longer. More than half of the Class 8 trucks on the road are over 10 years old. Repealing the FET would help modernize the truck fleet by incentivizing the purchase of new trucks with the latest emission-reduction technology and crash avoidance advancements. While new commercial trucks and trailers are as clean and green as they have ever been, they are not reaching the road fast enough to fully reap the benefits of these new technologies, due in part to the FET.

The FET is an inconsistent revenue source for the HTF. The FET has been the most inconsistent source of revenue to the HTF over the past 20 years. Because FET revenue is dependent on volatile annual truck sales, the tax has contributed to the overall instability of the HTF. To establish long-term stability for the HTF, the FET should be replaced with a more consistent revenue source. Modernize the Truck Fleet, a large nationwide industry coalition which ATD leads, supports repeal of the FET and is working to identify viable funding options to replace this burdensome tax with an equitable revenue mechanism.

The FET delays environmental benefits. FET repeal would benefit the environment by replacing older trucks with cleaner, safer and more fuel-efficient trucks. Due to recent environmental mandates coupled with industry innovation, new trucks have made significant reductions in particulate matter (PM) and nitrogen oxide (NOx) emissions. According to the EPA, heavy-duty trucks manufactured in 2010 and after reduced their PM levels by 90%. However, these environmental gains can be realized more quickly if impediments to heavy-duty fleet turnover, such as the FET, are removed.

The FET needs to be repealed and replaced. Mr. Chairman and Ranking Member, repealing the FET and replacing it with a more consistent revenue source would spur new truck sales and protect the 1.3 million U.S. manufacturing, supplier, dealership and heavy-duty trucking and trailer-related jobs.

Thank you for your consideration, and we look forward to working with the Committee to help modernize America's truck fleet and reform the Highway Trust Fund.



STATEMENT FOR THE RECORD

International Bridge, Tunnel and Turnpike Association

REGARDING

**Long-term Solvency of the Highway Trust Fund: Lessons Learned from
the Surface Transportation System Funding Alternatives Program and
Other User-based Revenue Solutions, and How Funding Uncertainty
Affects the Highway Programs**

BEFORE THE

U.S. Senate Committee on Environment and Public Works

ON

April 14, 2021

INTERNATIONAL BRIDGE, TUNNEL AND TURNPIKE ASSOCIATION

WWW.IBTTA.ORG

For more information, please contact
Patrick D. Jones
Executive Director and CEO
International Bridge, Tunnel and Turnpike Association
pjones@ibtta.org

On behalf of the International Bridge, Tunnel and Turnpike Association (IBTTA), we are pleased to submit this Statement for the Record to the U.S. Senate Committee on Environment and Public Works (Committee).

IBTTA is the worldwide association for the owners and operators of toll facilities and the businesses that serve the industry. Our mission is to advance transportation solutions through tolling and road pricing. Founded in 1932, IBTTA represents 131 toll operators in 34 states that operate 355 distinct toll facilities with more than 6,500 centerline miles. In 2019, these organizations processed 8.3 billion transactions, representing more than \$22 billion in toll revenue for investment and funding of transportation facilities and operations. IBTTA also has hundreds of members in more than 20 countries on six continents.

We commend you, Chairman Carper, Ranking Member Capito, and members of the Committee for focusing your attention on the solvency of the Highway Trust Fund and surface transportation funding alternatives.

THE FUEL TAX IS NOT SUSTAINABLE AS A FUNDING SOURCE FOR HIGHWAYS

We all know – and have known for many years – that the fuel tax’s days are numbered. The federal fuel tax has not been increased since 1993. And since that time, the fuel tax has lost more than half its purchasing power because of inflation. In addition, greater vehicle fuel efficiency of gas-powered engines and the growing transition to hybrid and electric vehicles and other alternative fuels have diminished the sustainability of the motor fuels tax as a revenue source. Since 2008, Congress has transferred more than \$150 billion in general revenues to the Highway Trust Fund to maintain its solvency.

RECOMMENDATIONS IN BRIEF

As the Committee looks toward alternative revenue sources for the federal surface transportation programs, IBTTA recommends the following actions which we describe in more detail in the text that follows:

- (1) Advance a national road-use charging (RUC) pilot.**
 - a) Review the findings of state-based RUC pilots for lessons to apply to the federal pilot.**
 - b) Create a governance board of key stakeholders to oversee the national pilot.**
 - c) Include toll operators and their suppliers as partners in carrying out the national pilot.**
- (2) Continue the user-pays principle of highway funding and finance; and**
- (3) Give states the ability to use tolling to rebuild their Interstate highways – as a complement to the Federal program.**

1 – ADVANCE A NATIONAL ROAD-USE CHARGING PILOT

Recognizing that the fuel tax is not a sustainable funding source for the Highway Trust Fund in the long-term, IBTTA supports decisive action to begin a national road-use charging pilot program based on distance traveled on all roads.

We commend Congress for the commitment to fund state and regional pilots of road-use charging (RUC) over the past ten years under the Surface Transportation System Funding Alternatives Program. While we have learned a great deal from these state-based pilot programs, there is much more to be learned from undertaking a national RUC pilot program.

Those in charge of planning the national RUC pilot should review the findings of the completed state and regional pilots to leverage tools and methods that may be adaptable at a national scale. The national pilot should establish technical and functional requirements that will govern data collection, data protection, and payment processes. Very importantly, the national pilot program should closely examine the interactions with ongoing state RUC programs, tolling, pricing, and other state revenue programs.

Congress should create a governance board to manage the national RUC pilot and develop recommendations. The multi-disciplinary governance board should include representatives from USDOT, a national research body, highway users, and highway operators. In addition, Congress should assemble an advisory commission to provide input from many disciplines and fields including technical, financial, legal, business, operational and policy experts.

Engaging a wide range of participants in the development of a national RUC pilot will help nurture public acceptance of this new highway funding mechanism. In addition, by offering choices in how to engage and pay for future transportation charges, individuals can select alternatives that match their risk tolerance, technology adoption comfort, and privacy preferences.

As you consider when and how to implement a national RUC pilot, we hope you will seriously consider the exceptional capabilities of the worldwide tolling industry. IBTTA toll operator members and the vendors, consultants, and integrators that support them have been extremely successful in collecting road, bridge, and tunnel tolls for a very long time. Our members can apply this same expertise to the successful development, planning, deployment, and operation of state-based and nationwide road-use charging systems.

2 – CONTINUE THE USER-PAYS PRINCIPLE OF HIGHWAY FUNDING AND FINANCE

Historically, we have paid for our highways through fuel taxes and tolls. As the nation considers alternatives to motor fuel taxes, Congress should continue to embrace the user pays system. The user-pay principle creates a value proposition for transportation consumers by helping to shape how, when, and where they decide to travel.

3 – GIVE STATES THE ABILITY TO USE TOLLING TO REBUILD THEIR INTERSTATE HIGHWAYS – AS A COMPLEMENT TO THE FEDERAL PROGRAM

IBTTA supports Congress in its efforts to provide for the solvency of the Highway Trust Fund. In addition, we encourage Congress to expand the ability of states to use toll financing as one of the methods to help rebuild their Interstate highways. Giving states additional flexibility to use tolling can expand transportation funding without burdening the Highway Trust Fund.

Today's modern toll agencies are extremely productive and efficient in their ability to generate revenues to support their operations and investment needs, while also creating value for customers through high service levels, safety, reliability, and mobility options. In addition, toll roads, tunnels and bridges are among the safest in the world precisely because their operators invest in regular maintenance and capital improvements.

In the last decade, we have seen a resurgence in toll financing to support new construction and reconstruction projects led by state, county, and local governments. These include both traditional tolling projects to build or maintain a road and priced managed lanes to manage congestion, promote equity, and reduce the negative impacts on climate. The appeal of tolling is that it offers an option, subject to local review and approval, that does not depend on raising taxes or other funding sources to build, operate, and maintain vital transportation infrastructure. In addition, tolls establish a direct connection between the use of the road and payment for that use.

In 2018, at the direction of Congress, the Transportation Research Board (TRB) published a study entitled *Renewing the National Commitment to the Interstate Highway System: A Foundation for the Future*. That study contains two important recommendations on tolling. First, "Congress should prepare for the need to employ new federal and state funding mechanisms, such as the imposition of tolls or per-mile charges on users of the Interstate Highway System." Secondly, "Congress should lift the ban on tolling of existing general-purpose Interstate Highways."

In addition to these recommendations, the TRB study says, "**The majority of public opinion polls show majority support for tolls compared with other alternatives such as higher fuel taxes, and support grows with familiarity with toll roads, when funds collected are dedicated to specific highway improvements, and as an alternative to other forms of taxes to support highways.**" (TRB, p. 181). (Emphasis added).

CONCLUSION

This is a key moment in American history that will test our ability to be agile and resilient. As we emerge from a pandemic and an economic downturn, we have a remarkable opportunity to reimagine the way we pay for transportation infrastructure. Change can be extremely hard but it can be much easier if we envision the outcomes we seek to achieve: a more resilient and sustainable transportation system that seeks to advance economic opportunity and equity for all Americans. We look forward to working with the Committee, the Congress, and the Administration to achieve these outcomes. Thank you for the opportunity to submit this Statement for the Record.

Reference

TRB. 2019. Transportation Research Board Special Report 329. *Renewing the National Commitment to the Interstate Highway System: A Foundation for the Future*. The National Academies Press, Washington, D.C. <https://www.nap.edu/resource/25334/interstate/>



*Fleet Solutions
for Fleet Professionals*

**Statement for the Record
NAFA Fleet Management Association**

for the

**United States Senate Committee on
Environment and Public Works**

***Hearing: Long-term Solvency of the Highway Trust
Fund: Lessons Learned from the Surface
Transportation System Funding Alternatives Program
and Other User-based Revenue Solutions, and How
Funding Uncertainty Affects the Highway Programs.***

April 14, 2021

**Bill Schankel
Chief Executive Officer
NAFA Fleet Management Association**

Chair Carper, Ranking Member Capito, and members of the Committee, thank you for providing the opportunity to submit a statement for the record of the hearing entitled “Long-term Solvency of the Highway Trust Fund: Lessons Learned from the Surface Transportation System Funding Alternatives Program and Other User-based Revenue Solutions, and How Funding Uncertainty Affects the Highway Programs”.

NAFA Fleet Management Association (NAFA) appreciates the Committee on Environment and Public Works’ efforts to examine the current state of our nation’s infrastructure and discuss methods of federal involvement to bring about infrastructure improvements and funding stability.

NAFA has more than 2,000 individual fleet manager members from corporations, universities, government agencies (federal, state, and local), utilities, and other entities that use vehicles in their operations. NAFA members control more than 4.2 million vehicles and manage assets in excess of \$92 billion. These vehicles travel more than 84 billion miles each year.

The fleets managed by NAFA’s Members run the gamut from light- to heavy-duty vehicles. Depending on the employer’s mission, these fleets may be contained to one specific geographic area, dispersed among multiple regions or states, or be in multiple countries. In addition, NAFA is supported by more than 1,000 associate members who represent companies that support fleet managers in their jobs. These include vehicle manufacturers, leasing companies, aftermarket equipment suppliers, telematics firms, service providers, etc.

Comments

NAFA shares your concern about the current state of U.S. infrastructure, especially regarding the future challenges of funding the maintenance, repair, and expansion of our nation’s highway system. The Highway Trust Fund (HTF) has faced repeated projected funding shortfalls due to its reliance on revenues from the federal motor fuel excise tax. These past shortfalls are underscored by the Congressional Budget Office’s recent report predicting the HTF’s highway account’s insolvency in 2022¹.

NAFA recognizes that transfers from the U.S. Treasury’s general fund may be the most practical method to resolve the near-term solvency issues facing the HTF. However, NAFA believes that innovative alternative funding solutions are also necessary to provide for the long-term stability of the HTF.

¹ Congressional Budget Office. (February 2021). *Highway Trust Fund Accounts—CBO’s February 2021 Baseline*. Retrieved from <https://www.cbo.gov/system/files/2021-02/51300-2021-02-highwaytrustfund.pdf>

Establishing a national vehicle-miles-traveled (VMT) pilot program to test alternative user-based funding mechanisms would provide invaluable insights into the feasibility of a national VMT fee as an alternative to the federal motor fuels excise tax. As you know, the federal-level VMT pilot program concept has been included in several past legislative proposals but has yet to be realized.

While a VMT fee may be a part of the long-term changes needed in the HTF's funding structure, there are still hurdles regarding equity, payment evasion, technology, administration, and public acceptance that could be addressed using the results generated from the federal pilot program. NAFA believes a federal pilot program is a necessary first step for determining whether a VMT fee is a viable future funding solution.

NAFA offers the following comments regarding the potential structure and implementation of a federal VMT pilot program.

Federal VMT Pilot Program Scale & Participation – A representative cross-section of vehicles must be recruited to participate in the program. Nonfreight commercial/government fleet participants are one key sector of roadway users, alongside the motor freight community and, most importantly, the motoring public. These roadway user classifications should be well represented in a federal pilot program. Congress should consider incentives or other benefits that may be needed to encourage pilot participation.

VMT Fee Rate Setting Processes & Equivalency to Current User Fees – Pilot program fee rates should be set at levels that would be revenue-neutral to current excise taxes based on average driver mileage and other relevant metrics. Imposing a rate-setting scheme that increases tax burdens will disincentivize organizational and individual pilot participation.

Data Collection Systems & Costs Associated with a Federal VMT Pilot Program – The program should be open to the spectrum of technologies available for VMT data collection. Permitting a multitude of data collection technologies in the pilot will help determine which mechanisms are most effective in achieving the goals of a future VMT program. Giving participants a choice in how they transmit VMT data will attract a larger pool of participants. This will help ensure that the results of a pilot program are representative of the nation's fleet.

Fleets generate highly detailed and granular-level data, which could be extremely useful in a federal VMT pilot program. However, collecting and analyzing this data does come at a cost to fleets who often rely on third-party vendors as partners in their business operations.

Accounting for Varied Driving Environments – A federal VMT pilot program should be structured to consider the varied driving environments U.S. drivers encounter – urban, suburban, and rural. A mile driven on a rural road should not be regarded as equivalent to a mile driven on an urban road, and NAFA believes VMT fee rates should be adjusted accordingly. Provisions should be included in a federal pilot program to allow a segment of the study participants who utilize more advanced VMT tracking systems to pay variable VMT fee rates based on location or road congestion levels.

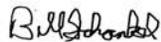
Conclusion

NAFA appreciates your leadership in ensuring the maintenance and improvement of the country's infrastructure by looking forward at the future of funding highway programs. The interstate highway system enables the free flow of goods and people across the nation. The country's crumbling roadway system not only endangers the safety of drivers but imposes a significant economic burden by slowing the flow of goods and services throughout the country. The cost of inaction on infrastructure only grows greater by the day, so we look forward to Congress seizing this window of opportunity to act on behalf of the American people.

While there have been discussions regarding a near-term imposition of a federal VMT tax on certain commercial vehicles weighing over 10,000 lbs., NAFA urges caution and does not support these proposals. There are numerous unresolved issues related to implementing such a tax, and pushing ahead before a federal-level evidence base is established threatens to create a half-baked system.

Thank you again for your consideration of this critical issue. If you or your staff have any questions or need additional information, please feel free to contact me or Patrick O'Connor, NAFA's U.S. Legislative Counsel, at 703/351-6222 or patoconnor@kentoconnor.com.

Sincerely,



Bill Schankel
Chief Executive Officer
NAFA Fleet Management Association



Road Usage Charge at the National-Scale:
Recommendations for Building a Solid Foundation

Testimony Before the
Committee on Environment and Public Works

United States Senate

April 19, 2021

Travis Brouwer
Assistant Director for Revenue, Finance, and Compliance
Oregon Department of Transportation

Chairman Carper, Ranking Member Capito, and Honorable Members of the United States Senate Committee on Environment and Public Works:

As transportation infrastructure costs rise, and fuel tax revenues decline due to the adoption of more fuel-efficient vehicles, we are compelled to find a new way to provide sustainable funding for our transportation infrastructure needs by ensuring all drivers pay their fair share, regardless of the type of vehicle driven.

For over ten years, states and coalitions have used state funding and federal Surface Transportation System Funding Alternatives (STSFA) grants to conduct pilot testing of road usage charging (RUC), also known as mile-based user fees (MBUF) or vehicle miles traveled (VMT) fees. Two states (Oregon and Utah) have established operational RUC programs, with Virginia coming on-line in 2022. Oregon and Utah have both used these funding mechanisms to enhance their existing programs.

Oregon has been operating a fully functional RUC program for nearly six years. Based on our experience, the concept is proven and the revenue collection works. We recommend that the next step toward a national pilot is to develop foundation-building protocols to foster wider acceptance and adoption of the road usage charge as the eventual replacement for the gas tax. To ensure the success of a national pilot, we must first:

1. **Establish a RUC national advisory committee:** A steering committee with a federal focus could address key issues and barriers to developing a national road usage charge program. This committee could be charged with setting requirements related to standards, data sharing, rate setting methods, etc. Committee membership should include states that have led RUC testing and research, privacy and data security experts, tax administrators, and other stakeholders.
2. **Develop national standards for telematics:** For road usage charge systems to be interoperable between governments (federal, state, and local), there must be a consistent, predictable way to receive fuel usage and miles traveled data directly from vehicles. Oregon's current system using vehicle OBD-II port devices to collect mileage data may become obsolete as connected vehicles can provide the necessary data. Establishing federal data sharing standards will allow governments at all levels to use standardized information to fairly apportion costs for miles driven.
3. **Support and fund a national education campaign to raise the national conversation on RUC:** One of the most important challenges of moving toward a road usage charge system will be effective public education. It will be important to develop national educational materials to drive public knowledge and acceptance that road usage charge is an equitable way to pay for highways. This campaign should also address issues related to privacy, electric vehicle adoption, and equity. This campaign could be developed alongside state leaders so that materials can be adapted to each state.
4. **Build on the successes of current programs:** The Surface Transportation System Funding Alternatives Program has funded a wide-variety of important road usage charge programs in a number of states. However, the 50/50 non-federal matching rate has discouraged many states from applying for funding, and it has limited the project scope

of many successful applicants. By decreasing the non-federal matching rate to 20 percent, more states will adopt pilots and spread the technical knowledge. The program should also facilitate the sharing of lessons learned between states. FHWA has worked to facilitate this, but as programs are being developed, it will require greater effort to share lessons learned.

5. **Establish minimum requirements that states must adopt in implementing RUC programs at the state level:** Requirements should address, but not be limited to the following:
 - Data standards for collecting and processing vehicle data.
 - Data ownership and permissible uses, which may include use of aggregated and anonymized data for educational and research purposes.
 - Open architecture standards to enable greater interoperability.
 - Retention standards that balance protection of personally identifiable information with auditability.
 - A standard framework that enables interoperability and reconciliation processes between states related to intrastate, interstate, and international travel.

In Oregon, we have spent the past fifteen years testing the Road Usage Charge mechanism as the replacement for our fuel taxes. We believe it is the fairest, most equitable, and most forward-thinking way of paying for use of the transportation system in the future. We believe the RUC can better fund our transportation system while also giving our customers choice, by protecting their privacy, and by ensuring a positive user experience.

We also have a wealth of experience dealing with arguments such as those related to privacy and equity. We have addressed the topic of whether RUC discourages electric vehicle adoption and believe that RUC is a way of squaring our commitment to reducing greenhouse gas emissions with our need for sustainable transportation funding. We have dealt with the issue of whether this is a burden for rural versus urban drivers.

In Oregon's program, there are several privacy protections such as account managers having 30 days after account settlement to destroy the data unless the RUC participant opts to allow the account manager to retain it for things like research. Oregon receives only anonymized and aggregated data from account managers. Oregon also provides that the data is not accessible to law enforcement absent a warrant. These are statutory protections for a participant's privacy interest. Similar protections are not available when someone's driving behavior is recorded by other recording devices, such as red-light cameras, CCTV cameras, dash cameras, or even Ring doorbells. The privacy protections built into the enabling legislation for Oregon's program were strong enough that the American Civil Liberties Union of Oregon supported the bill at passage in 2013.

In 2017, Oregon State University examined the impact of a road usage charge on rural and urban populations.¹ It found that if all drivers were on a road usage charge system, rural drivers would likely see a slight decrease in costs while urban drivers would see a slight increase. This is because rural drivers do drive longer distances for things like shopping but take fewer trips; urban drivers drive shorter distances but take more frequent trips. So on average, both groups drive about the same number of miles each year. Rural drivers tend to drive less efficient vehicles so they are paying more in fuel tax than urban drivers pay if they are driving efficient vehicles. Oregon is currently in the process of contracting for an equity study that would examine both fuel tax and road usage charge through several lenses: cost responsibility between vehicle classes, tax equity (both horizontal and vertical), and social equity that will include rural-urban as part of the demographic impact analysis.

We have implemented an award-winning communication strategy built on stakeholder input. We are excited about assisting in making RUC a reliable, sustainable funding mechanism for the future as more vehicles, in all weight classes, increase their efficiency and move away from traditional fuels. We want to be able to continue to keep our roads and bridges in good repair for all vehicles – whether passenger cars or heavy trucks, powered by electricity or fossil fuels. However, to do that, we need a sustainable funding solution and our years of experience support a finding that RUC can be that solution.

We are excited about the prospect of federal leadership through a national pilot. In order for a pilot to be successful, we have to lay a solid foundation first. Taking the steps outlined above will help ensure the success of an eventual national pilot – one that will address key questions of technological interoperability, privacy protection, and public acceptance.

Chairman Carper, Ranking Member Capito, and members of the committee, thank you for holding this important hearing and for accepting this written testimony. Should you or your staff have any questions or concerns, I would be happy to discuss these issues further.

¹ McMullen, B., Ph.D., & Wang, H., Ph.D. (2016). *Road Usage Charge Economic Analysis, Final Report* (Rep. No. SPR 774). Corvallis, OR: Oregon State University.
doi:https://www.oregon.gov/odot/Programs/ResearchDocuments/SPR774_RoadUsageCharge_Final.pdf



State of Washington

TRANSPORTATION COMMISSION

PO Box 47308, Olympia WA 98504-7308 • 2404 Chandler Court SW, Suite 270, Olympia WA 98502
 (360) 705-7070 • Fax (360) 705-6802 • transc@wstc.wa.gov • <https://www.wstc.wa.gov>

April 14, 2021

Honorable Members of the United States Senate Committee on Environment and Public Works:

As transportation infrastructure costs rise, and fuel tax revenues face decline due to the adoption of electric and more fuel-efficient vehicles, we are compelled as a nation to find a new and sustainable way to fund our transportation infrastructure needs so that all drivers pay their fair share, regardless of the type of vehicle driven.

For over ten years, states and coalitions have utilized state funding and federal STSFA grant funding to conduct pilot testing of Road Usage Charging (RUC), including Washington State who has been researching and testing RUC since 2012. Two states (Oregon and Utah) have established operational RUC programs, with Virginia coming on-line in 2022.

The result of these combined efforts is that states have built extensive knowledge through their experience related to RUC programs and policies. Many states, including Washington State, are currently engaged in active legislative discussions that may result in additional RUC programs starting at the state level. Leveraging the learnings of active and contemplative states would benefit the development of a national effort.

As you consider transportation reauthorization and future sustainable revenue sources, there are five key steps we recommend Congress consider moving forward as soon as possible, which will greatly aid states and the nation in the advancement of a national RUC effort.

1. **Establish a RUC National Advisory Committee made up of at a minimum, states who have led RUC testing and research, industry leaders, privacy and data security experts, and other stakeholders.** The committee should be charged with guidance responsibilities including:
 - Advising on the scope, scale, purpose, and timing of a national RUC pilot, with the above assessment informing this work.
 - Conducting a comprehensive assessment of a potential national RUC system, considering how to ensure such a program remains compatible with state systems.
 - Assessing operational, technical, policy, and funding implications of a national RUC system.
 - Advising on the approach and timing of a national educational effort aimed at facilitating the national conversation on RUC, and the funding challenges transportation faces long-term under the gas tax.

2. **Establish minimum standards that states must adopt in implementing RUC programs at the state level.** Standards should address, but not be limited to the following:
 - Collection and processing of vehicle data, including ownership and permissible uses, which may include use of aggregated and anonymized data for educational and research purposes.
 - Open architecture to enable greater interoperability.
 - Data retention that balances protection of personally identifiable information with auditability.
 - A framework that enables interoperability and reconciliation processes between states related to intrastate, interstate, and international travel.
3. **Re-authorize and fund the STSFA federal grant program, and in addition to current provisions, allow states to apply the grant funding towards implementation and start-up costs of RUC programs at the state level.** Such financial assistance will greatly aid states in developing and expanding new RUC programs, which incur the greatest financial burden at the start, when programs are typically small-scale start-ups.
4. **During the reauthorization process, actively engage states who have received grants under the STSFA program, and any other states that have conducted RUC pilots, as well as states who have established programs.** The engagement could be to invite those states to provide reports to Congress and present findings and outcomes of their work, and key insights into considerations around RUC in the context of a possible future national RUC system.
5. **Support and fund a national education campaign to generate a national conversation on RUC in partnership with states.** Work with state RUC leaders and the RUC National Advisory Committee (*referred to under #1 of this document*) to develop a campaign that can be adapted to each state to meet their needs.

We thank you for the opportunity to share these thoughts with you and appreciate your serious consideration of them. If you have questions or would like further information, please feel free to contact me anytime via email at griffir@wstc.wa.gov or by phone at 360-701-7172.

Sincerely,
Reema Griffith, Executive Director
Washington State Transportation Commission

Senator CARPER. Let me just turn to my right. Adam, anything else? We are good to go?

Mary Frances Repko, majority staff director? Oh yes, thank you, Mary. OK.

For some final housekeeping, Senators will be allowed to submit questions for the record through close of business on April 28th. We will compile those questions and send them to our witnesses. We would ask for you to respond to them by May 12th, if at all possible.

Anything else?

All right, I think we are good to go.

Thanks, everyone; it was a great hearing.

It is time to vote.

Thanks.

[Whereupon, at 12:07 p.m., the hearing was adjourned.]

