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Leveling the Playing Field in Transportation Funding: An Overview on the Road Usage Fee Concept

"A more efficient system for a more efficient vehicle."

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Leveling the Playing Field in Transportation Funding: An Overview on the Road Usage Fee Concept

SUMMARY

The current system of generating revenue for infrastructure funding through state and federal gas tax is no longer keeping pace with the ever-growing use of high-mileage, hybrid, and alternative fuel vehicles. Largely based on fuel taxes, the existing method has created an unfair precedent in which some motorists are paying more toward road maintenance while others pay little to nothing. Current law allows electric vehicles in particular to fall through the cracks in regard to fuel taxes. Some states are addressing this imbalance by requiring additional registration fees ranging from $30 to $100 for electric vehicles. While this helps reduce the inequity between electric and gasoline vehicles, it fails to address the issue of hybrid and high mileage vehicles, which are becoming more prevalent every year.

In New Hampshire, a concept called the Road Usage Fee was proposed in 2016 and 2017 to address these shortfalls in road maintenance funding. This concept offers a flexible formula based on fuel efficiency (MPG) and vehicle miles traveled (VMT) to help generate revenue. The Road Usage Fee ensures that all owners, regardless of fuel efficiency, will be contributing a fair and equal rate toward the maintenance of roads and bridges. This system also allows for this level of funding to remain consistent even as more New Hampshire drivers shift toward eco-friendly vehicles. The popularity of high-mileage and alternative fuel vehicles is continuously growing, therefore, the sooner this formula is implemented, the easier the transition will be for consumers.

A Changing Market

A large portion of funding for state roads and bridges comes from revenue generated by fuel taxes, such as the federal and state gas tax. As hybrid and electric vehicles continue to grow in popularity, and as more environmentally conscious citizens consume less gasoline, revenue from individual users continues to decline. Not only has this decrease in revenue had effects on transportation funds, but it sets an unfair precedent in which some motorists are paying little to nothing toward road maintenance while others carry the brunt of the cost.

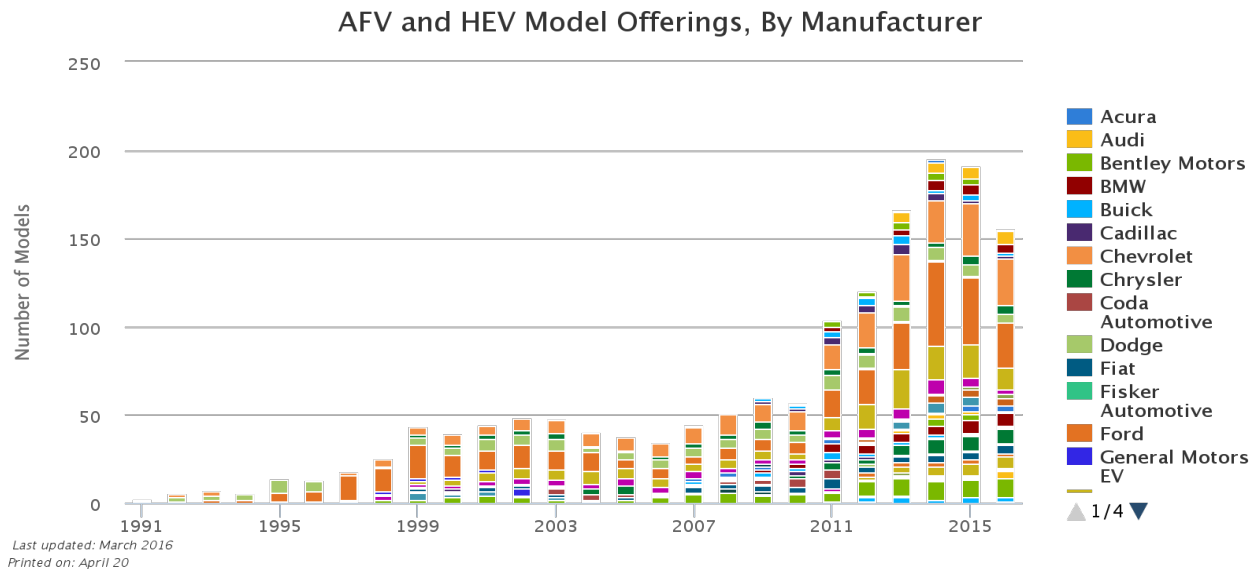
Twenty years ago, the average miles per gallon (MPG) variance in gasoline or diesel vehicles was usually 10 to 15. Today the average gasoline or diesel vehicle can vary some 35 to 40 MPGs. Additionally, many hybrid vehicles use gasoline and electricity to increase their mileage, while fully electric or hydrogen vehicles don't use gasoline or diesel at all.

The data in the chart below has been acquired from the U.S. Department of Energy and shows the difference in MPG between electric and gasoline vehicles. Note that each vehicle has three different MPG numbers: one for city, one for highway, and one combined.

Vehicle	**2016 Honda Accord (Automatic)**  Gasoline Vehicle	**2016 smart for two electric drive coupe (Automatic)**  Electric Vehicle
EPA Fuel Economy 1 Gallon of gasoline = 33.7 kWh	**Regular Gasoline** **29** MPG 26 34 combined city/highway city highway 3.4 gal/100mi Gasoline 499 miles Total Range	**Electricity** **107** MPGe 122 93 combined city/highway city highway 32 kWh/100 mi Electricity 68 miles Total Range

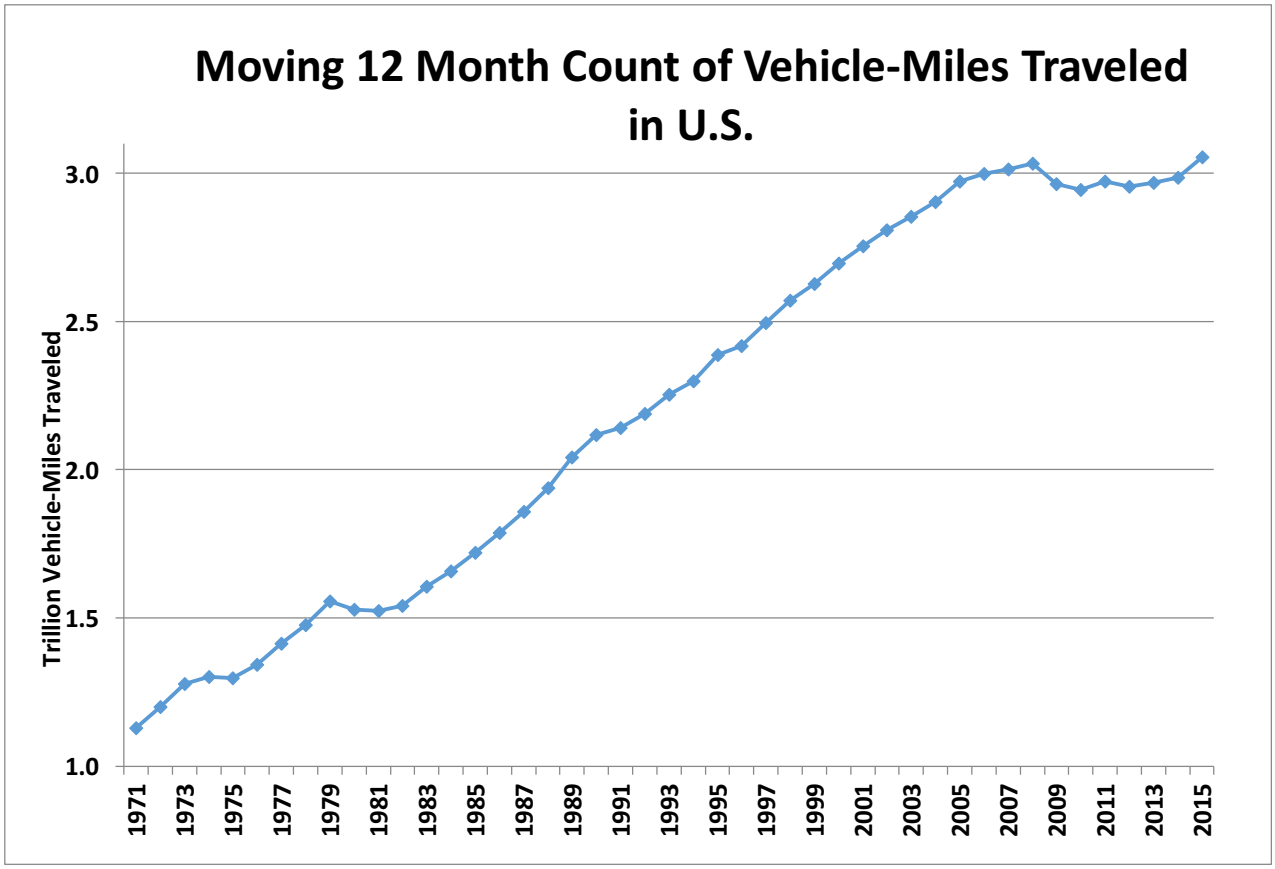
www.fueleconomy.gov

The chart below, prepared by the Alternative Fuels Data Center (AFDC), shows how quickly this shift in the manufacture of alternative fuel vehicles has been progressing.



As the number of electric and hybrid vehicles on the road continues to grow, so too does the number of miles traveled. The AFDC chart on the next page indicates that miles traveled in the U.S. have steadily risen by approximately 2 billion since the 1970s. It's clear that while roads are being used more than ever, fewer and fewer dollars are going toward road construction and maintenance. The Federal gas tax was last changed in 1994 and since then, vehicle miles traveled (VMT) have gone up nationwide from 2.25 trillion to 3 trillion per year – a 33% increase.

www.afdc.energy.gov/data/



Fully electric cars, such as the Tesla cars, have access to charging stations and pay little to nothing in gas taxes. However, Teslas weigh significantly more than the average car. The 2015 Tesla model S P85D weighs 4,647 lbs, with batteries alone weighing 1200 lbs. These cars, while better for the environment, still add their share of wear and tear to the roads.

The adverse effects of our current system are being felt on the federal level as well. Lawmakers are scrambling for solutions to the dwindling Federal Highway Trust Fund. The past decade alone saw thirty-six extensions and patches to the trust fund. In 2015, a five-year plan called the FAST Act finally passed Congress, which borrowed money from the general fund to make up for the lack of highway fund revenue. However, there is concern that when the program ends in 2020, the Federal Highway Trust Fund will be facing an even larger deficit. If improvements are not made soon, highway infrastructure will need to be paid by other taxes to cover general fund appropriations in Washington or local funds in each state.

VEHICLE MILES TRAVELED

Many states including New Hampshire have considered taxing vehicle miles traveled (VMT). The idea has many supporters, including a coalition that studies the benefits and advocates for the implementation of a VMT system. The AAA website summarizes the concept well:

> Under a VMT tax system, vehicles would be equipped with technology capable of logging the number of miles traveled. Various levels of sophistication are being tested. The technology could allow for multiple levels of taxation (federal, state, local) and enhanced pricing systems (drivers could be charged by time of day, level of congestion, type of road, etc.). The variable pricing ability enabled by a VMT system is considered a key benefit by some and a source for concern by others. Pricing could be established to help combat congestion, pollution, or excessive road wear. Total charges could be calculated and paid either at the gas pump or via a monthly bill.
>
> The two national transportation commissions authorized by SAFETEA-LU recommended transitioning to a VMT system for the long-term, beginning the transition to such a system in the next ten to fifteen years. A VMT fee pilot project was completed last year in Oregon and the University of Iowa is currently field testing a system in six states: California, Idaho, Iowa, Maryland, North Carolina and Texas. The Oregon pilot demonstrated that the use of technology to charge drivers by the mile is viable, but underscored that a variety of technical, administrative and public concerns would need to be overcome before it could be implemented statewide, or at the national level, including consumer privacy concerns, communications standards between the vehicle and service infrastructure, auto manufacturer supported specifications and testing, tax collection and revenue distribution. Also, an upcoming study by the National Academy of Sciences is expected to conclude there are limited deployment options in the next few years.

While taxing VMT could be a highly accurate and effective system, it's difficult to implement. For starters, it would take upwards of 15 years to fully integrate, so it isn't an immediate fix. States would still have to rely on the current system of tolls and gas taxes for that period of time. Also, pilot tests have shown technical challenges with devices, as well as privacy concerns from drivers. Purchasing these tracking devices and increasing staff are some of the many costs a participating state would have to consider.

A NEW APPROACH: THE ROAD USAGE FEE

In 2016, New Hampshire Representative Norm Major proposed the Road Usage Fee (RUF) with the purpose of creating a fair system in which owners of hybrid, high mileage, or alternative fuel vehicles would pay the same amount toward the highway fund as the rest of New Hampshire's motorists. The bill establishes an annual fee based on the equivalent miles per gallon of each vehicle that would be paid at the time of registration.

The bill mandated a fee for vehicles with an MPG rating over 20 that travels 13,500 miles per year. Vehicles that are rated at an MPG lower than 20 would be exempt from the fee, as would mopeds, motorcycles, and vehicles made before 1984. The higher a vehicle's MPG rate, the higher the Road Usage Fee, with $149.85 as the maximum fee for those vehicles rated 51+ MPG

or fully electric. According to the proposal, fees would be collected based on MPG increments of five, as shown in the following chart.

MPG Range	Estimated Road Toll	Road Usage Fee Under This Bill
20 or less	$149.85	$0.00
20-25	$119.88	$29.97
26-30	$99.90	$49.95
31-35	$85.63	$64.22
34-40	$74.93	$74.93
41-45	$66.60	$83.25
46-50	$59.94	$89.91
51+ or No Gas	$0	$149.85

Breaking Down the Formula
The basic formula for determining the fee would be as follows:
(avg. VMT / avg. MPG) x gas tax = RUF

Thus the formula for New Hampshire would read like this:
(13,500 / 20) x 22.2 = $149.85

A NH driver traveling 13,500 miles at 20 MPG would purchase approximately 675 gallons of fuel per year. That total multiplied by the 22.2 cent state gas tax equals $149.85. This would be the RUF for drivers of alternative fuel vehicles who currently pay nothing toward the state highway fund.

The Public Works Committee had a number of questions regarding the formula, so in 2016 it sent the proposed legislation to interim study. In 2017, the legislation was proposed again but with some modifications. The 2017 version changed the average VMT from 13,500 to 12,500, and changed the base from 20 MPG to 22.5 MPG, resulting in lower fees.

MPG Range	Average MPG	Gallons Per Year	Road Toll	Road Usage Fee
22.5 or Less	22.5	555.6	$123.33	**$0.00**
22.5 - 25	24	520.8	$115.63	**$7.70**
26 - 30	28	446.4	$99.11	**$24.22**
31 - 35	33	378.8	$84.09	**$39.24**
36 - 40	38	328.9	$73.03	**$50.30**
41 - 45	43	290.7	$64.53	**$58.80**
46 - 50	48	260.4	$57.81	**$65.52**
51 or More	60	208.3	$46.25	**$77.08**
No Fuel	N/A		$0.00	**$123.33**

The New Hampshire Ways & Means Committee passed the modified version by a vote of 20-1. The House of Representatives, however, tabled the legislation for the year, but it could be revisited in the next session.

ROAD USAGE FEE OPTIONS FOR FUTURE PROPOSALS

While the RUF as proposed by Representative Major could help bring balance to the system, a way to minimize its impact would be to base the fee on 24 MPG instead of 22 MPG and reduce the average VMT. This is based on the latest statistics from the EPA, which showed that the 2015 model-year vehicles sold averaged 24.8 miles per gallon.

The U.S Department of Transportation prepared a chart (below) averaging miles per driver by age and gender, with the national average ranging from 10,000 to 16,500 miles.

Average Annual Miles per Driver by Age Group

Age	Male	Female	Total
16-19	8,206	6,873	7,624
20-34	17,976	12,004	15,098
35-54	18,858	11,464	15,291
55-64	15,589	7,780	11,972
65+	10,304	4,785	7,646
Average	16,550	10,142	13,476

U.S. Department of Transportation Federal Highway Administration

Taking this into account, there are two options:

1. Base the average VMT on the lowest average (10,000 miles)
2. Select an average lower than previous legislation but higher than the first option (12,000 miles)

The combination of these two modifications to the formula lowers the fee for electric or alternative vehicles compared to the original formula. To simply the formula even further, we recommend reducing the number of categories for calculation to four.

Breaking Down the Formula for These Alternatives
The basic formula for determining the fee would be as follows:
(avg. VMT / avg. MPG) x gas tax = RUF

Thus the formula for New Hampshire would read like this:
Option 1 (10,000 / 24) x 22.2 = $92.50
Option 2 (12,000 / 24) x 22.2 = $111.00

A NH driver traveling 10,000 miles at 24 MPG would purchase approximately 416.6 gallons of fuel per year. That total multiplied by the 22.2 cent state gas tax equals $92.50. This would be the Road Usage Fee for drivers of alternative fuel vehicles who currently pay nothing toward the state highway fund.

Option 1 – 10,000 Average Annual Miles

MPG Range	Average MPG	Gallons Per Year	Road Toll	Road Usage Fee
24 or Less	24	416.66	$92.50	**$0.00**
25 - 34	30	333.33	$74.00	**$18.50**
35 - 44	40	250.0	$55.50	**$37.00**
45 - 54	50	200.0	$44.40	**$48.10**
55 or more	80	125.00	$27.75	**$64.75**
No Fuel	N/A		$0.00	**$92.50**

Option 2 – 12,000 Average Annual Miles

MPG Range	Average MPG	Gallons Per Year	Road Toll	Road Usage Fee
24 or Less	24	500.0	$111.00	**$0.00**
25 - 34	30	400.0	$88.80	**$22.20**
35 - 44	40	300.0	$66.60	**$44.40**
45 - 54	50	200.0	$53.28	**$57.72**
55 or more	80	150.0	$33.30	**$77.70**
No Fuel	N/A		$0.00	**$111.00**

According to data provided in the original legislation, there are 500,000 current registered vehicles in New Hampshire that are rated over 30 MPG. National data suggests that it is hard to predict the percentage of vehicles in each of these mileage categories because the state registration systems don't take into consideration a vehicle's mileage rating. The EPA reported that in October of 2016, the average fuel economy for 2015 model year vehicles was 24.8 MPG. So, fifty percent of the vehicles sold in the 2015 model year got 25 MPG or more, while the average age of vehicles on the road reported nationally for 2016 was 11.6 years, according to Statista.com. Based on these two factors, more than half of all vehicles in New Hampshire would be rated less than 25 MPG. This shows that the original bill estimating 50% getting 30 MPG was most likely incorrect.

In August of 2017, the New Hampshire Department of Safety specified that there are currently 1,583,625 registered vehicles in NH. Excluding motorcycles, mopeds, government registrations, and trucks over 10,000 lbs., 1,232,114 vehicles are potentially subject to a Road Usage Fee. Of those vehicles, 1,097 are electric.

If 65% of all registered vehicles in New Hampshire get less than 25 MPG, that would leave 35% of all vehicles subject to the Road Usage fee. Assuming slightly more than half of those get between 25 and 34 MPG (20%), that leaves 15% in the last three categories. If implemented, the estimated revenue from this rebalance in MPG would be $12 to $15 million per year. This amount would grow as auto manufacturers continue to raise the average MPG each model year. Estimates are included in the chart below.

Option 1 – 10,000 Average Annual Miles based on 1,232,114 estimated vehicles

MPG Range	Road Usage Fee	Vehicles	Highway Fund
24 or Less	**$0.00**	800,874 (65%)	**$0.00**
25 - 34	**$18.50**	246,422 (20%)	**$4,558,807**
35 - 44	**$37.00**	123,211 (10%)	**$4,558,807**
45 - 54	**$48.10**	36,963 (3%)	**$1,777,920**
55 or more	**$64.75**	23,545 (>2%)	**$1,524,538**
No Fuel	**$92.50**	1,097(<1%)	**$101,472**

Total Revenue - $12,521,544

Option 2 – 12,000 Average Annual Miles

MPG Range	Road Usage Fee	Vehicles	Highway Fund
24 or Less	**$0.00**	800,874 (65%)	**$0.00**
25 - 34	**$22.20**	246,422 (20%)	**$5,470,568**
35 - 44	**$44.40**	123,211 (10%)	**$5,470,568**
45 - 54	**$57.72**	36,963 (3%)	**$2,133,504**
55 or more	**$77.70**	23,545 (>2%)	**$1,829,446**
No Fuel	**$111.00**	1,097(<1%)	**$121,767**

Total Revenue - $15,025,853

CONCLUSION: A BETTER SYSTEM FOR A CLEANER ERA

It is important to encourage the use of high-mileage and alternative fuel vehicles. They promote a cleaner, safer environment for everyone. But it is important for the state economy that owners of these vehicles share the cost of road and bridge maintenance. Roads cannot be improved without a balanced, sustainable system. As motor vehicles become more advanced and efficient, so too should the system for infrastructure funding. The Road Usage Fee is a modern, practical approach and possibly the fairest one to date. This method would also protect the state if and when all vehicles become hybrid or electric in the future. Additionally, the alternative options offered in this booklet will help make the implementation of a Road Usage Fee smoother for both the state and the motorist.