

"The right to criticize government is also an obligation to know what you're talking about." Lent Upson, First Director of the Citizens Research Council

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Road Usage Charging is a Fraught Strategy to Fund Michigan's Roads

In a Nutshell

- As vehicles become increasingly efficient and electrified, fuel taxes are no longer creating enough revenue to keep up with transportation funding needs.
- An alternative to fuel taxes is Road Usage Charging (RUC), a per-mile fee. Michigan has signaled interest in implementing a RUC pilot program to explore the feasibility of increasing road funding.
- Multiple RUC pilots have been conducted in the U.S. over the past 20 years. Research and analysis suggests that there are significant barriers to implementing RUC, especially at a state level. Michigan should evaluate potential costs and benefits of pursuing RUC policy before dedicating resources to a pilot program.

Michigan's road agencies have recently received an influx of increased funding from new state and federal programs. However, forecasts suggest that long-term revenue trends will not be enough to keep up with funding needs. One big issue is that fuel taxes have long been a primary contributor to road funding. As cars become increasingly efficient and electrified, fuel tax revenue is stagnating and dedicated road funding is declining.

Michigan transportation stakeholders are searching for new ways to fund roads. The concept of a road usage charge (RUC) is gaining traction as a primary candidate. However, research suggests that there are several complications to implementing a RUC program.

Defining RUC

A road usage charge (RUC) is a fee charged based on the number of miles traveled. Until recently, these charges were commonly referred to as <u>vehicle-miles-traveled (VMT)</u> fees or <u>mileage fees</u>. These fees may be implemented in addition to, or as an alternative to, fuel taxes. This revenue can then be applied to maintaining and operating transportation systems.

RUC is somewhat like tolling, as both charge for use of a road. The core difference is that RUC charges are usually applied over an entire road network, while tolls are facility-specific and not necessarily mileage based. (A few European countries have implemented VMT fees only on certain highways. This is considered RUC and not tolling because the fees are applied per mile and only to heavy vehicles that do the most damage to the roads.)

Current Context

Historically, road and bridge construction and maintenance has been funded primarily with fuel taxes collected at the federal and state level. For a variety of reasons, fuel taxes are becoming <u>increasingly insufficient</u> to maintain acceptable levels of road funding. Alternative revenue sources are sought to maintain funding.

Michigan's transportation program is estimated to be running a <u>substantial deficit</u> that will not meet current or future road maintenance needs (despite recent increases in state and federal infrastructure funding). Regardless, the Whitmer Administration has signaled that it will <u>not seek</u> <u>to increase fuel taxes</u>. <u>Michigan</u> and many other states have begun investigating alternatives to supplement or replace fuel tax revenues.

Brief History

<u>New Zealand</u> implemented the first RUC program in 1978. Today, New Zealand's RUC program applies to all diesel vehicles and any vehicle weighing over 7,700 pounds. Electric vehicles are currently <u>exempted</u>, as to encourage adoption.

<u>In Europe</u>, Germany, Austria, and Switzerland have implemented and evolved RUC programs. These fees apply only to heavy commercial vehicles. Only Switzerland imposes RUC on all public roads. Austria and Germany apply the weight-mileage charge only to select highways.

In the United States, the <u>Federal Highway Administration (FHWA)</u> first addressed RUC in a <u>1998</u> <u>highway cost allocation study</u>. FHWA found that heavy trucks imposed more than twice as much damage to highway pavements as they paid into the highway fund via fuel taxes, and subsequently discussed weight-mileage-based methods of capturing more revenue from these vehicles.

The <u>2005 federal transportation funding bill</u> established a <u>National Surface Transportation</u> <u>Infrastructure Financing Commission</u> to "consider alternative approaches to generating revenues for the Highway Trust Fund." <u>The resulting report</u> dedicated a chapter to tolling and mileage-based user fees.

RUC pilot programs hit the road in 2005 with efforts in <u>Iowa</u>, <u>Oregon</u>, and <u>Washington</u>. The <u>2015</u> <u>federal FAST Act</u> dedicated <u>\$95 million in grant funding</u>. Under that program, <u>numerous states</u> <u>have initiated or participated</u> in some kind of RUC research or pilot. Most of these were not pursued beyond the research period but have contributed to an <u>extensive body of literature</u> detailing lessons learned and barriers to adoption. States that have participated in the Surface Transportation System Funding Alternatives Program, investigating the potential of RUC.



In 2021, the <u>Infrastructure Investment and Jobs Act</u> re-established RUC-related grants with the FHWA Strategic Innovation for Revenue Collection program (Section 13001). This program supports state pilot projects with \$75 million in grant funding. These grants will cover up to 80 percent of the costs of running a RUC pilot.

As of January 2023, only Oregon and Utah have institutionalized RUC programs as part of their highway funding program.

<u>Oregon</u> began studying RUC in 2001 when its legislature established a <u>Road User Fee Task Force</u>. After conducting pilot programs in 2006-07 and 2012-13, the state launched <u>OReGO</u>, the RUC program that persists today. A recent <u>state audit</u> of OReGO found multiple administrative errors, though the program has only about 800 participants.

<u>Utah</u> began investigating RUC in the early 2000s. In 2019, its legislature directed the Utah Department of Transportation to implement a RUC program. As of May 2022, Utah had just over 4,000 vehicles enrolled in the program. After <u>recent legislative updates</u>, Utah's <u>RUC program</u> is available only to battery electric vehicles.

Multi-state Coalitions

Oregon has determined that the long-term survival of its RUC program "is clearly dependent on the adoption of RUC in other states." As such, Oregon became the lead state in RUC West (now

RUC America), a coalition of states working to pool resources and achieve interoperability. On the east coast, the Eastern Transportation Coalition is pursuing a similar coordinating role.

RUC in Michigan

Michigan does not have a history of researching RUC. A functional RUC program in Michigan would require legislative direction. While RUC is typically presented as a usage charge or fee, it legally may be defined as a tax or toll. Michigan law restricts what kinds of taxes and <u>tolls</u> can be implemented.

Before designating resources for a RUC pilot, Michigan should first parse existing research literature to determine what questions about RUC remain unanswered. As illustrated here, there have been dozens of <u>RUC pilots</u> conducted already, generating thousands of pages of findings. Most answerable questions already have research-based answers.

If a RUC pilot cannot be <u>designed to answer outstanding questions</u>, it may not be worth pursuing. While federal funding is available, the state would be required to cover at least 20 percent of the costs. And there is no guarantee that Michigan would be awarded a federal grant.

Policy Considerations

Ideally, a Michigan RUC pilot would be results-oriented, non-redundant, and conceptually feasible. It should also be structured such that it could scale into a permanent funding mechanism that supplements or replaces conventional fuel taxes. Success on these measures requires addressing multiple policy considerations.

Policy Goals

The design of a RUC program should reflect specific policy goals. If the primary goal of RUC is revenue generation, policymakers should develop reasonable forecasts and understanding for revenue goals and how best to distribute that burden. Will the RUC be designed to yield tax revenue from vehicles not paying fuel taxes? To tax commercial vehicles? Or to serve other purposes?

Fee Structure

Many RUC programs use a basic per-mile fee, simply as a mechanism to capture revenue alternative to fuel taxes. But RUC data could potentially provide all sorts of vehicle/place/time data to pursue other policy goals. For example, large vehicles could be charged higher rates in urban areas, drivers could be charged more for exceeding speed limits, congestion charging could be implemented, and so on.

For RUC programs to be self-sustaining, enough revenue will have to be collected to administer the program. RUC programs can impose a substantial administrative cost burden. The hypothetical administrative burden for a mandatory RUC program in the U.S. is "<u>unknown but likely to be substantial</u>."

Privacy Requirements

The design of any RUC program should clearly determine what data can and should be collected. This is necessary not only for legal, political, and <u>ethical reasons</u>, but because the rest of the program – from fee structures to technologies implemented – must be built around the data schema, which is limited by privacy requirements.

At a minimum, RUC would require knowing how many miles a vehicle travels in a given period. To implement a state-specific RUC, miles would also have to be geofenced for the state. Even this level of data imposes <u>privacy concerns</u>.

Existing RUC pilots and programs are partially insulated from data privacy issues by being voluntary. Nevertheless, Oregon <u>worked with the ACLU</u> when designing the data privacy policy for OReGO. Any mandatory RUC program would have to be designed very carefully to protect users' privacy rights.

Vehicles Included

A threshold decision related to any RUC program is determining to what vehicles the fee will apply. More vehicle types covered by the RUC program may impose additional complications and costs. The original use-case for RUC is <u>heavy-duty commercial vehicles</u> that impose large amounts of damage to roadway pavement. Commercial vehicles are also a convenient application because most already have <u>embedded telematics</u> and privacy issues are less constraining.

In the U.S., RUC has mostly been applied to personal light vehicles, especially electric and highefficiency vehicles that do not pay fuel taxes. Another consideration is what model years to include. Newer vehicles have more data availability and access options, possibly including working with carmakers to pull data directly from <u>embedded telematics</u> (connected car systems).

User Responsibilities

Pilot programs in the U.S. are voluntary, thus self-select for vehicle owners who are willing to accept certain novel responsibilities. Those responsibilities, at minimum, require paying the mileage fee, either by establishing a pre-funded account, or submitting payments periodically. Users may also bear some responsibility for data submission. Ideally, user responsibilities should be minimal and in line with those required in the payment of conventional fuel taxes.

Technology and Data Standards

Technology is not a barrier to RUC adoption, but there are choices that must be made. RUC programs can use a wide variety of platforms and technologies. Some low-tech approaches require users to manually report their mileage (e.g., by taking a photo of their dashboard).

A common method is to provide users with an on-board diagnostic (OBD) dongle, (a small device that plugs into a vehicle diagnostic port). The data collected by the devices, and method of transmission off the devices can vary. They may or may not include features like GPS, bluetooth connectivity, and cellular connectivity. A common method of collecting RUC vehicle data is a connected device that plugs-in to a vehicle's on-board diagnostic (OBD) port.



Source: <u>RUC West</u> (RUC America)

A full-scale RUC program should minimize such time and cost burdens as manual reporting and distribution of data collection devices to drivers. Many new vehicles have telematics (connected vehicle) systems that can be used to collect this data from the vehicle without any additional hardware or action required from the user. In this case, the RUC program administrator would partner with automakers to acquire the necessary data from the car.

RUC programs should be designed around data structures that are accurate and adaptable to future technologies and policies. Open-source platforms allow for easier portability, extensibility, and are resistant to vendor lock-in.

Finally, RUC programs cannot overlook cybersecurity issues to protect from theft of vehicles as well as user's data.

Socioeconomic Implications

The United States is the most car-dependent nation on Earth. An overhaul of taxes and fees associated with vehicle travel will have immense socioeconomic implications. RUC program planning should attempt to identify and obviate potential issues. For example, most RUC pilots work either by having users pre-load an account, or periodically invoicing drivers for miles already traveled. In a nation where over <u>60 percent of individuals live paycheck-to-paycheck</u>, acquiring debt by traveling for daily needs may lead to <u>debilitating debt spirals</u>.

In the near term, this issue could be mitigated by limiting RUC program to new electric vehicles, as <u>EV drivers are predominantly wealthy</u>. However, in the longer term, electric vehicles will be adopted by drivers of lower income/wealth categories. RUC programs in Europe avoid this issue by applying only to heavy commercial vehicles.

<u>New Zealand</u> is the only place where private light vehicles (diesel only) are subject to a mandatory RUC charge. In this case, <u>compliance</u> is based on the honor system and enforcement is minimal.

Conclusion

It is difficult to conceive of a U.S. state-based RUC system that can operate with reasonable efficiency. It is also unclear what could be learned that hasn't been addressed through previous and ongoing pilots. Rather than duplicate previous efforts, Michigan would be wise to thinkthrough possible implementations and determine if a pilot program is worth pursuing.

A comprehensive 2009 federal report concluded that for RUC to be achievable, the "[U.S. Congress] will need to address interoperability concerns quickly, lest states or regions implement equipment and technologies that will be incompatible and not easily retrofitted to any future national VMT-based charge technologies." Any Michigan-based RUC program would risk being rendered redundant or obsolete by future federal activity. Previous Michigan efforts to adopt emergent technologies have resulted in millions of dollars of stranded assets.

The federal government is moving on this. The 2021 Infrastructure Investment and Jobs Act created the National Motor Vehicle Per-mile User Fee Pilot. This program will establish "per-mile user fees for passenger motor vehicles, light trucks, and medium- and heavy-duty trucks, which amount may vary between vehicle types and weight classes to reflect estimated impacts on infrastructure, safety, congestion, the environment, or other related social impacts." Any institutionalized federal RUC program will likely grow out of this pilot program. Michigan may be prudent to track and support this federal effort, as opposed to self-funding independent research.

ABOUT THE AUTHOR

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Eric joined the Citizens Research Council in 2022 as an expert in civil infrastructure policy. Previous to his position with the Research Council, Eric spent nearly ten years as a transportation systems analyst, focusing on the policy implications of emerging technologies such as autonomous vehicles, connected vehicles, and intelligent transportation systems. Eric has been a Michigan-licensed professional engineer (PE) since 2012. As a practicing engineer, Eric has design and project experience across multiple domains, including highways, airfields, telecommunications, and watershed management. Eric received his Bachelor's degree in civil engineering from Michigan State University in 2006. Eric also holds Masters degrees in environmental engineering and urban/regional planning, both from the University of Michigan.

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