Moving to Our Future:

Pricing Options for ***Equitable Mobility***

PBOT
PORTLAND BUREAU OF TRANSPORTATION

Road User Charges: Background Memo

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Prepared for the Pricing Options for Equitable Mobility project by PBOT's Policy, Innovation and Regional Collaboration Team to inform Community Task Force discussions

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BACKGROUND

What is a Road Usage Charge (RUC)?

A road usage charge (RUC) is a per-mile fee levied on road users. A RUC is a fee charged for road use where revenue is collected based on distance traveled. RUCs are sometimes referred to as vehicle miles travelled (VMT) fees. Depending on how a RUC is structured, it may also be used as a tool to manage demand and congestion, encourage fuel or vehicle efficiency, and provide a more equitable fee structure for transportation funding.

Why Consider a Road Usage Charge (RUC)?

As vehicles become more fuel efficient (or electrified), revenues from fuel taxes will decline. As a result, some states are looking for an alternative to fuel taxes which are a key funding source for the construction and maintenance of state and local roads. RUCs can either be designed as "Flat" where all vehicles are charged the same per-mile fee, or can be "Variable" with different per-mile fees charged based on vehicle efficiency, driver income, location or time of day when miles are driven, or other factors. In most cases, state departments of transportation are considering RUCs as a tool to raise transportation revenues, as opposed to other charging mechanisms like tolls or cordons that are used to manage demand and congestion.

Unlike tolls or cordons, RUCs could be implemented throughout a transportation system, rather than in a specific corridor or geographic area. RUCs offer a unique opportunity to both become a primary source for funding the transportation system and incorporate price signals to meet goals around climate, mobility, and equity.

This memo provides a high-level introduction to road user charges to inform conversations by the Pricing Options for Equitable Mobility (POEM) Task Force. It is the fourth such memo, following similar reviews of parking pricing, highway tolling, and cordons.

Key Questions for Pricing Options for Equitable Mobility (POEM) Task Force

It would take many years to develop and implement a RUC program. The Oregon Department of Transportation (ODOT) is leading the development of a state-level RUC program. Portland could also implement a local RUC in the future, most likely tied to an already existing state level RUC. At this stage, the POEM Task Force is charged with considering *if and how* Road User Charges as a pricing strategy could advance equitable mobility, as well as advising the City of Portland on what to consider if exploring a City-led RUC or working with the state on a state-led RUC. Specific questions for Task Force discussion include:

- *What opportunities do RUCs offer for **advancing equitable mobility**, as defined in the Equitable Mobility Framework? What potential **risks** might it present for equitable mobility?*
- *How are these opportunities and risks **similar or different to other pricing typologies** we've reviewed?*
- *What **key questions** would need to be explored to further evaluate RUCs **impact on equitable mobility**?*

Oregon Context

Oregon has been a leader in transportation funding innovation. In 1919, Oregon passed the nation's first per-gallon fuel tax and used the revenue for early road building projects. By 1932, every state and the federal government had a gas tax, which became the primary funding source for the modern transportation network. However, the federal gas tax of $0.18 per gallon has not been increased since 1993 and is not indexed to inflation, meaning its purchasing power or ("real value" in current dollars) is a fraction of what it was in 1993.[1] In addition to the federal fuel tax, Oregon charges drivers a fuel tax of $0.36 per gallon. Oregon's fuel tax is assessed at the pump on all types of vehicle fuels (gas, diesel, biodiesel). As fuel efficiency increases, tax revenues per mile driven will decrease.

Oregon began exploring alternative ways of funding the state's transportation system by establishing a Road User Fee Task Force (RUFTF) in 2001. ODOT conducted two Road User Charge pilots, in 2006 and 2012.[2] In 2015, Oregon launched OReGO, the first pay-per-mile program for personal vehicles in the country.

OReGO is a voluntary mileage-based fee system. Drivers choose between devices that collect location data using GPS and devices that only report the number of miles traveled. OReGO has privacy protections in place to protect Personally Identifiable Information (PII) and limit location sharing information. The current OReGO charge is $0.018 per mile with revenues going to the State Highway Fund, which pays for construction and maintenance of roadways in the state. Since OReGO participants still pay fuel taxes at the pump, participants receive a credit for state fuel taxes paid.[3]

The current rates for OReGO are set so all vehicles pay the same per-mile rate, stabilizing the revenues available for road construction and maintenance. The program design follows a "user pays principle," which ensures that all road users pay the same amount in taxes for each mile driven.[4] However, it also removes any incentive to drive more efficient vehicles, which is at odds with other state and local climate goals.

The Road User Fee Task Force is expected to seek legislation during the 2021 state legislative session intended to bring all highly fuel-efficient passenger vehicles (greater than 30 mpg) into the Road User Charge program for model years 2027 and beyond.[5] Draft legislation is also expected to recognize the need for further study and consideration of how to better align the program with state climate and equity goals.

Portland Context

As of 2020, Portland does not have a RUC in place; however, the City Council-adopted 2015 Climate Action Plan calls for the City of Portland to "support adoption of a road usage and fuel efficiency charge as a long-term replacement for declining gas tax revenue."[6]
Portland does have a local $0.10 fuels tax collected on top of the statewide fuel tax.

ODOT is currently working on a pilot program to test the feasibility of multiple, overlapping rates for RUCs. This would allow for a future where individual jurisdictions could have additional charges beyond the state RUC fee, similar to existing state and local fuel taxes.

RUC DESIGN

Tailoring RUCs To Meet Policy Objectives

To date most RUC initiatives in the U.S. have a primary goal of creating a transportation funding stream to replace the fuel tax. However, a RUC fee structure could be designed to address specific goals. For example, if the goal of the program is to reduce emissions, the fee structure could be designed to be responsive to fuel efficiency.

Pricing variables can be applied alone or in combination to achieve multiple outcomes. Options for variable fee structures that can be overlaid with RUCs include vehicle characteristics, location, time, and income (Table 1). The variables in Table 1 have not all been proven to work as part of a RUC program, but could be considered. As with other pricing policies, RUC design can vary significantly, and it will be critical for implementing jurisdictions to identify and communicate clear objectives for a RUC policy.

Table 1 | **Road Usage Charge Pricing Variables**

Pricing Variables	Who Might Pay More	Who Might Pay Less
Time	Drivers of trips during peak times on peak days (e.g., morning & evening weekday rush hours, especially when transit is readily available)	Drivers of trips during non-peak times on non-peak days
Location	Drivers of trips in designated and/or congested areas	Drivers of trips in designated and/or less congested areas
Vehicle Fuel Efficiency or Vehicle Use Efficiency	Drivers of trips in lower-fuel efficiency vehicles Drivers of trips without other passengers	Drivers of trips in higher-fuel efficiency vehicles Drivers of trips with multiple passengers
Driver Income, Disability or Residential Geography*	Higher-income drivers	Lower-income drivers Drivers with disabilities Drivers based in a certain geography could receive a lower rate.

** Note: While the Equitable Mobility Framework charges POEM to lead with race, it is not yet clear how a pricing system could provide discounts based on race.*

RUC Implementation & Technology

As states begin to pilot RUC programs, they are using a variety of higher- and lower-tech methods for mileage recording and payment. Some states have options for people to pre-pay for a certain time period or for a set number of miles. Programs include options for monitoring vehicle miles based on odometer readings or using in-vehicle equipment to record specific miles driven, either with or without location data. Equipment can range from in-vehicle telematics, smartphone apps, and plug-in devices for the vehicle's on-board diagnostics (OBD) data port. Some variable RUC strategies would require reporting methods that include location or trip data, and/or vehicle fuel efficiency.[7]

As discussed in prior memos about potential pricing policies, there are many issues to consider when evaluating Road User Charge technologies:[8]

- Privacy and data security
- Cost of implementation
- Administration inaccuracies and leakage
- Disproportionate burdens of enforcement
- Accessibility concerns for unbanked or others who may not have access and the potential burdens of means testing

Equitable Mobility Considerations

The Equitable Mobility Framework developed by the POEM Task Force is designed to inform decision-making and guide policy analysis around pricing strategies.[9] For each of the pricing typologies to be considered through this process, the POEM Task Force will use the Framework to analyze if and how it might influence equitable mobility within a transportation system. Specifically, the group will look at considerations related to outcomes of the pricing typology, design and implementation, and how revenue may be reinvested into complementary strategies.

Given conversations around using RUCs as a replacement for the fuel tax, there is value in considering these pricing mechanism side-by-side and comparing their potential impacts and ability to affect equitable mobility indicators as defined in the above-referenced framework.

The effectiveness and impacts of fuel taxes, Flat rate RUCs, and Variable RUCs depend on the prices associated with each. Generally, the following apply:

- **Fuel Tax**: Fuel taxes are inherently responsive to fuel efficiency, climate, and air quality. A vehicle that uses more fuel emits more carbon and other polluting gases and pays more in taxes. Higher fuel prices can help to encourage drivers to choose more fuel-efficient vehicles or may reduce VMT in less fuel-efficient vehicles. Fuel taxes are not means-tested, so people pay the same amount regardless of income, making them inherently regressive. To the degree that lower-income people may drive older, less fuel-efficient vehicles, fuel taxes may have an even more significant burden on lower-income drivers. At the same time, encouraging less climate and air pollution and less VMT may provide other benefits as identified in the Equitable Mobility Framework.
- **Flat RUC**: Flat-rate RUCs charge all users of the transportation system the same amount, at all times of day, in all areas, regardless of congestion conditions, vehicle efficiency, or driver characteristics. By charging equally for every mile driven regardless of fuel type, congestion

conditions or location, Flat RUCs don't encourage vehicle and trip-making efficiency, negatively impacting climate and air quality. Without means-based discounts, Flat RUCs, like fuel taxes, are inherently regressive; they cost those with lower incomes proportionately more than those with higher incomes.

- **Variable RUC**: Variable RUCs vary charges based on one or more criteria (see above) to achieve or address specific goals. Variable RUCs, especially those that are means-based, can reduce charges for low income drivers. The extent and distribution of transportation system, climate, and equity benefits depends on the program's design around these variables.

Price, Affordability, & Behavior Change

The price at which any of these fees is set determines impacts and effectiveness. For example, a fee that is set too low may not change behavior; a fee that is too high may have significant equity implications. Conversely, a fee that has many discounts, caps, and exemptions may have limited effect on driver behavior and fail to generate targeted levels of revenue for transportation projects.

The following sections aim to further explore the intersection of pricing and the Equitable Mobility Framework outcomes of interest for the RUC pricing mechanism.

Moving People & Goods

- Vehicle Miles Traveled (VMT) Reduction: Depending on the rates, fuel taxes and Flat RUCs may both encourage a shift away from driving. Variable RUCs, with higher rates in more congested places or times, may be even more effective at **reducing VMT** and encouraging shifts to other modes, carpooling or bundling trips. Because RUCs require payment separate from the cost of fuel, even a Flat RUC may more directly show drivers how they are charged more the more they drive and could potentially encourage drivers to reduce VMT. Reducing VMT, in turn, has benefits for **system efficiency**, **air quality**, **climate** and **safety**.

- Reliability & Connectivity Improvements: Variable RUCs, with price signals aimed at reducing demand at certain times or places, may also provide the most benefit to helping maintain free-flowing conditions, particularly during peak congested times. This can make **travel times more consistent and reliable**, helping drivers and transit riders alike plan their journey and **connect to more jobs and places** within a reasonable travel time.

- Affordability: Fuel taxes, Flat RUCs and Variable RUCs all impact the affordability of driving. A Variable RUC **with means-tested rates would be most sensitive to affordability considerations.** An underpriced system may be more affordable to drivers, but users may pay in other ways, such as more time spent in traffic or with climate and air quality impacts. Implementors need to evaluate the relative impact and burden of a fuels tax and RUC price on household transportation costs, while balancing design elements focused on other outcome considerations.

Sustainability & Health

- Climate, Air Quality and Health: In general, if a desired outcome is to lower emissions (by either encouraging less driving and a shift to higher-efficiency and electric vehicles, then fuel taxes and

Variable RUCs, with rates designed to incentivize lower emissions vehicles or other modes, are likely to be most effective. While both **decreasing carbon and air pollution** and also encouraging more active forms of transportation bring **health benefits**, considerations of health must also expand to include social determinants of health, which recognizes the important role of **economic stability in health and well-being**.[10] Recognizing overly burdensome transportation costs may strain household finances, especially low-income households, and such economic instability may have negative health impacts.

Safety

- Traffic and Personal Safety: There is a correlation between reduced VMT and reduced traffic crashes.[11] Therefore, a fuel tax, Flat RUC, or Variable RUC, may all help to improve **traffic safety** if they are effective at **reducing VMT**. There is not a clear nexus between RUC and personal safety, although there is the potential for revenue to be reinvested in ways that help to improve personal safety.

- Diversion: Other forms of pricing, most notably tolling, may lead to diversion to nearby transportation facilities and have the potential to decrease the safety of these facilities. Flat RUCs could present less of a diversion concern if they are spread over a wide area. A Variable RUC system where some facilities have higher rates than others, may bring similar diversion dynamics, which will need to be specifically analyzed by any implementing jurisdiction.

Economic Opportunity

- Job Creation, Working Conditions, and a Connected, Thriving, Local Economy: As with most pricing policies, the potential for a well-designed RUC to reduce vehicle miles travelled, can help to improve increase **access to jobs and opportunity.** There are not clear connections to job creation and working conditions, although there is the opportunity for job creation associated with RUC implementation as well as job creation from RUC revenue reinvestment projects. A Variable RUC, with increased rates in central business districts, would also need to be evaluated for economic impacts to local businesses and their employees.

Revenue Reinvestment and Complementary Strategies

Revenues from a fuel tax or RUC are closely tied to the pricing structure of the program. In general, as vehicle fuel efficiency continues to increase, a statically priced fuel tax will generate less revenue over time, unless driving continues to increase. There are trade-offs to consider between outcome goals and revenue generation: a RUC designed to encourage reduced VMT could also result in declining revenues over time.

As discussed in previous pricing strategy memos, Oregon Constitutional restrictions require that:

> *"…use of revenue from taxes on motor vehicle use and fuel […] shall be used exclusively* ***for the construction, reconstruction, improvement, repair, maintenance, operation and use of public highways, roads, streets and roadside rest areas in this state****" (Article IX Section 3a).*[15]

ODOT interprets RUCs to fall within these restrictions. As RUCs are being considered as the potential primary future funding source for transportation, the revenue reinvestment needs are enormous. There

is a large existing backlog of unfunded transportation maintenance and improvement projects. In general, revenue reinvestment from any transportation funding system mechanism should apply a climate, efficiency and equity lens to ensure projects and programs that receive funding are addressing system inequities, climate change, and mobility needs. If a potential Variable RUC increases prices specifically aimed at reducing VMT in congested times and places, it will be even more critical to invest revenue in ways that provide alternative travel options to driving alone.

CASE STUDIES

RUCs have been exclusively state-led efforts to this point. Cities may face challenges requiring GPS and/or mileage tracking and enforcement of RUC requirements on out-of-jurisdiction drivers. As a result, it is expected that many RUCs will be led at the state level. However, once a state RUC is permanently established, it may be possible for local jurisdictions to add additional RUC layers, similarly to the state and local fuels taxes that currently exist.

RUC West

RUC West is a consortium that convenes Western state transportation officials to study feasibility, evaluate implementation, and share best practices, ideas, and information on RUCs (Eastern states have undertaken similar work through a consortium of states known as the I-95 Corridor Coalition). Oregon joined RUC West in 2013, two years prior to launching its OReGO pilot in 2015.[12] To connect the independent efforts of individual states, RUC West is developing and testing a regional RUC system that would operate across multiple states. Of the 14 RUC West member states, 11 are participating in the RUC West Regional System Definition and Pilot Planning Project.[13] California and Oregon, contiguous states with two of the more robust RUC pilots currently in place, are participating in the RUC West regional pilot demonstration to test systems for sharing mileage data and allocating funds based on mileage driven in each state.

The RUC West Pilot Project is partially funded through a federal grant from the Fixing America's Surface Transportation Act (FAST Act).[14] The FAST Act, passed in 2015, created a new grant funding source to fund projects that explore funding alternatives to the gas tax.

Status of RUC policies in RUC West states in 2020 are as follows:

Tier 1: **States with Policy Enacted to Implement RUC Programs**

- Oregon
- Utah

Tier 2: **States Testing RUC Pilot Programs**

- California
- Colorado
- Hawaii
- Washington

Tier 3: **States Researching RUC**

- Alaska
- Arizona
- Idaho
- Montana
- Nebraska
- Nevada
- New Mexico
- North Dakota
- Oklahoma
- Texas
- Wyoming

RUC West Website: https://www.rucwest.org/

Utah

Utah's Road Usage Charge is designed to charge road users a fee based on number of miles driven, instead of gallons of fuel consumed. The program is being explored as a potential replacement for the gas tax as a source for transportation funding. Currently enrollment in the RUC program is voluntary and limited to alternative fuel vehicles.[15]

Alternative fuel vehicle owners in Utah have two options, intended to capture some of their impact to the road system:

1. **Pay Higher Alternative Vehicle Registration Fees:** Higher registration fees for alternative fuel vehicles are intended to capture some of their impact to the road system since alternative fuel vehicles contribute little or no gas tax revenue as compared to conventional vehicle owners. For 2020, alternative fuel vehicle registration fees range from $15 for Gas Hybrids to $90 for Electric Vehicles.
2. **Pay per-mile in the RUC Program:** Alternative fuel vehicles can instead choose to enroll in the RUC program, which waives the annual registration fee for alternative fuel vehicles and instead charges drivers $0.015 (1.5 cents) per mile *up to* the additional flat registration fee amount.

Under the current program structure, which ensures RUC participants are not charged more than they would be under existing alternative vehicle registration fees, alternative vehicle drivers are incentivized to sign up for the RUC because, depending on the number of miles they drive, they may pay less under the RUC than they would under the registration fees associated with the fuel tax.[16]

RUC Program Features[17]

- **Focus on alternative fuel vehicles** (including full electric vehicles, plug-in hybrids vehicles and gasoline hybrid vehicles)
- **Flat RUC** fee structure
- **Annual RUC cap** tied to flat registration fee amount
- Integration of RUC enrollment and adherence with DMV registration process

California

In 2016, California carried out a road charge pilot study to test the feasibility of funding road and highway repairs based on how many miles a driver travels instead of how much gas they purchase.[18] The California Road Charge Pilot Program ran for nine months, enrolling more than 5,000 vehicles from across the state, reporting over 37 million miles driven, through six different reporting and recording methods, ranging from manual to highly technical methods with optional location-based services.[i]

Starting in 2021, California is carrying out a Four Phase Demonstration, designed to test how road usage charges can work with four technologies: usage-based insurance, transportation network companies, electric vehicle charging stations/pay-at-the-pump systems, and autonomous vehicles:[19]

- **Usage-Based Insurance**: As part of the auto insurance industry attempting to harness new technologies and provide better service to customers, some insurers now offer potential lower insurance rates if customers share more detailed driving information, including the number of miles driven. This phase is designed to demonstrate how the State can partner with insurance companies to serve as account managers that can easily, accurately, and securely calculate and collect RUCs. (Timeline: February-June 2021)
- **Transportation Network Companies (TNCs):** As trip costs using transportation network companies are calculated on the basis of mileage, this demonstration phase is designed to test how RUCs can be calculated at the same time as trip costs and seeks to explore the viability of collecting RUCs using existing technology in real-time TNC vehicles and applications. (Timeline: March-June 2021)
- **Pay-at-the-Pump/Electric Vehicle Charging**: The purpose of this test is to determine if drivers can pay RUCs when they fill up at the gas station and how a RUC could be collected at an electric vehicle charging station. (Timeline: January-June 2021)
- **Autonomous Vehicles (AVs)**: Technology built-in to autonomous vehicles includes means to collect and analyze VMT. The purpose of this phase is to work with autonomous vehicle operators to demonstrate how to collect vehicle and occupancy data from autonomous vehicles for a RUC system. (Timeline: April-June 2021)

California is also conducting research on the impacts of RUCs on low-income individuals, specifically to measure awareness of transportation funding in California, gauge perceptions of and reaction to potential road charges, and identify privacy concerns related to how information may be gathered as part of RUC implementation.[20]

[i] For more information on the results of California's Road Charge Pilot Program, see California State Transportation Agency & Caltrans. 2017. "California Road Charge Pilot Program: 2017 Final Report- Senate Bill 1077." https://caroadcharge.com/media/htbpngos/rcpp-final-report-a11y.pdf.

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