SFTP 2050: STRATEGIC TOPIC PAPER

Road User Charge (RUC)

Introduction

In the United States, highway and road repairs and maintenance have historically been funded through gas tax revenues. Now levied at both the federal and state levels, gas taxes in the United States were first introduced in Oregon in 1919 "for the repair of the damage done to said highways by such vehicles, machines and engines traveling thereon."[1] Gas taxes were meant to capture revenues to pay for maintenance of roads that gas-powered vehicles were driving on. They are easy to administer, and the cost of the tax is "hidden" in the consumer's overall cost of purchasing gas at the pump. Every state had a gas tax in place by the time the federal government put a federal gas tax in place in 1932.

Over time, taxing gasoline has become a less efficient way to recoup the maintenance costs of this country's roads. As the fleet of personal and commercial vehicles becomes more fuel efficient, drivers are purchasing less gas per mile driven while impacts on streets and highways remain consistent. The federal gas tax was increased to 18.4 cents per gallon in 1993 and is not indexed to inflation, which has increased by 77% since then, significantly diminishing the purchase power of the gas tax. At the state level, California's legislature passed Senate Bill 1 (SB 1), the Road Repair and Accountability Act, in 2017, increasing the state's gas tax by 12 cents and indexing it to inflation. However, due to increasing fuel efficiencies, revenues from the current gas tax model will continue to decrease. **California and the country cannot rely primarily on the gas tax to fund the maintenance and operations of vital transportation systems.**

A road user charge (RUC), also referred to as a vehicle-miles traveled (VMT fee), or simply a road charge, is a direct user fee where drivers are charged a per-mile fee to be invested back into the transportation system. Governments across the country and in Europe have become increasingly interested in the potential for a RUC as a more sustainable revenue source to replace or supplement the existing gas tax model. With new technologies allowing more accurate tracking of driving behavior, RUCs can more directly identify where roadway usage is taking place, charge drivers accordingly, and direct revenues to impacted locations. Furthermore, given the RUCs can also be tailored to include other policies, such as discounts or incentive programs for low-income drivers, or time-of-day or geographic-based congestion charges.

This white paper provides an overview of recent RUC pilot programs and ongoing collaborations in the United States and explores some of the policy questions that should be explored before the implementation of a RUC.

1 https://time.com/4803516/gas-tax-history/

National Context

Due to the declining purchase power of the federal gas tax, the United States Congress has had to transfer funds from other sources into the Highway Trust Fund to maintain solvency. In an acknowledgment of the gas tax structural issue, the Fixing America's Surface Transportation Act, or "FAST Act" of 2015, authorized the U.S. Department of Transportation (US DOT) to establish the Surface Transportation System Funding Alternatives (STSFA) Program. The STSFA program provides $15 million in fiscal year (FY) 2016 and $20 million in each of FYs 2017 through 2020, and intends to fund state-led demonstration projects that assess the design, acceptance, and implementation of a "user-based alternative revenue mechanism."

The US DOT has awarded three STSFA grants to the California Department of Transportation (Caltrans). In FYs 2016 and 2017, Caltrans received $750,000 and $1.75 million in funding to test a road user charge (RUC) pay-at-the-pump or charging station program. In FY 2018, USDOT provided Caltrans with a grant of $2.03 million to explore integrating the RUC program with emerging technologies and services, such as Usage-Based Insurance (UBI), Transportation Network Companies (TNCs), and Autonomous Vehicles (AVs).

The FAST Act expired in September 2020, and as of early November 2020 Congress was still working on proposals for a surface transportation reauthorization bill. The House Transportation Committee has proposed a $494 billion, five-year bill, including expanding existing state pilot programs to test RUC collection mechanisms. It would provide nearly double the funding from the FAST Act and would create a new, nationwide VMT pilot program. It remains to be seen what will emerge from the Federal legislative process.

Regional Context

Founded in 2013, RUC West is a consortium of 16 state transportation organizations that are working together to study the viability of per-mile charging. The consortium provides a platform for sharing best practices and research between participating states. RUC West member states are organized into three tiers based on their current progress towards advancing RUC in their jurisdiction. Tier 1 states (Oregon and Utah) have enacted policies to implement RUC programs. Tier 2 states (California, Colorado, Hawaii, and Washington) are piloting RUC programs. Tier 3 states (Arizona, Idaho,

Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Texas, and Wyoming) are researching RUC.[1]

RUC West has already funded 18 projects related to the feasibility and evaluation of road usage charging. Eleven of the member states, one of which was California, participated in the RUC West Regional System Definition and Pilot Planning Project, which is partially funded by the FAST Act. Beginning in 2018, this pilot developed and tested a RUC system that operates across multiple states. The final project deliverable was a white paper titled Steps Forward: Vendor Perspectives. Other current projects of RUC West include the Oregon User Charge program, My OReGo; the California Road Charge Pilot Program; the Colorado Department of Transportation Road User Charge Program; the Hawaii Road Usage Charge Demonstration; and the Washington State Road Usage Charge Pilot Program. The Washington and Oregon programs are summarized below.

WASHINGTON

The Washington State Transportation Commission (WSTC) conducted the Washington Road Usage Charge (WA RUC) Pilot Project in 2018-2019, to explore the potential of a gas tax replacement to fund the state's roads and bridges. In December 2019, the WSTC adopted recommendations on how the state can begin to transition toward a RUC system and away from the state gas tax. The WSTC recommended:

- A slow and gradual approach to introducing road usage charging, including a start-up phase focused on vehicles that pay little or no gas tax (ie plug-in electric and hybrid vehicles) and with additional testing using state-owned vehicles
- Implementation of privacy protection measures specific to a RUC system
- Restriction of revenues to highway-related expenditures through a state constitutional amendment
- Maintenance of funding levels for non-highway programs that currently receive gas tax revenues through the transition period
- Continued research on key topics such as potential equity impacts, mileage reporting options and rate-setting, maximizing compliance, and in collaboration with other states, approaches to reducing administrative and operational costs and efficient application across borders

1 https://www.rucwest.org/resources/

The WSTC report was submitted to the state legislature, the governor and the Federal Highway Administration in early 2020[1]. The state legislature and governor will ultimately decide whether a RUC will be implemented in Washington.

OREGON

Oregon launched a voluntary, statewide RUC program in 2015 after completing pilot programs in 2007 and 2012. The program, known as OReGO, assesses a per-mile charge to participating drivers, who track miles driven and fuel consumption via a vehicle data port dongle. Program participants pay 1.8 cents per mile on Oregon roads, and receive a credit for fuel tax they pay (up to and not exceeding the road charges paid). The state's gas tax is 36 cents per gallon and the program is limited to vehicles that get at least 20 miles per gallon (the break-even point for the program)[2].

Despite this incentive, only 1,600 had signed up for OReGO as of November 2019, with only 600 as active participants. The state increased registration fees effective in 2020, and included an additional incentive for participation in the OReGO program. The state's vehicle registration fees are based on miles-per-gallon thresholds, with vehicles with higher mileage rates (more fuel efficient vehicles) paying higher fees. However, high-mileage vehicle (i.e. 40 mpg or above) drivers enrolled in OReGO receive a 50% discount on registration fees. Plug-in electric vehicles receive an even steeper discount over 70% off standard registration fees.[3] It is too soon to know whether this new incentive is attracting new program participants.

California's Road Charge Pilot Program

Prior to participation in the RUC West pilot, California ran a statewide RUC Pilot Program in 2016, with five thousand participants over a 9-month period. The program was authorized in 2014, with Senate Bill (SB) 1077 (DeSaulnier) directing the California Transportation Agency (CalSTA) to implement a pilot program to identify and evaluate issues related to the potential implementation of an RUC program in California. The bill also established a Road Usage Charge Technical Advisory Committee (Road Charge TAC), to make recommendations on the design of the pilot program. The intent of SB 1007 was to explore the viability of replacing the state gas tax with a RUC.

The Road Charge TAC met over the course of a year, and in December 2015 delivered their Road Charge Pilot Design Recommendations Report to CalSTA for

1 https://waroadusagecharge.org/

2 https://www.myorego.org/how-it-works/

3 https://www.governing.com/news/headlines/Oregon-to-Introduce-New-Car-Fees-as-Gas-Tax-Is-Phased-Out.html

implementation. Their recommendations for the development and implementation of the RUC pilot program were organized by four principles:

- **Feasibility:** the viability of recording and reporting of vehicle miles traveled for a statewide road charge system
- **Complexity:** the degree of difficulty of implementing a statewide road charge system
- **Security:** ensuring the safeguarding of personally identifiable information and data in a statewide road charge system
- **Acceptability:** surveying the acceptability of a road charge as an alternative to the gas tax[1]

The Road Charge TAC also identified additional policy areas that should be considered for additional research and evaluation after the completion of the pilot program[2].

Beginning in 2016, under the direction of CalSTA, the California Department of Transportation (Caltrans) oversaw the pilot RUC program based on the recommendations from the Road Charge TAC. The pilot program launched on July 1, 2016, beginning with 3,000 participating vehicles and growing to 5,000 in August. Caltrans recruited participants from a broad range of demographic categories, with an emphasis on geographic diversity. Participants drove passenger vehicles, agency and business fleets, and commercial trucks. Caltrans established a revenue neutral per mile charge of 1.8 cents but ultimately did not collect the fee assessed, as the pilot was informational. Pilot participants were able to choose from multiple mileage reporting methods and reporting technologies. By offering different options, Caltrans was later able to compare effectiveness while also encouraging innovation from suppliers. Both manual and automated reporting methods were available. Manual methods included time and mileage permits and odometer verifications. Automated methods used devices, either with or without GPS, to track miles driven. Reporting technologies included plug-in devices (i.e. Progressive Snapshot), smartphones, in-vehicle telematics (i.e. OnStar) and specialized commercial meters.

Though Caltrans focused on miles driven by Californians in state for the pilot, the agency ran a three-month simulation of interoperability with Oregon's OReGO RUC system as well. Only participants who used a reporting method with GPS were able to discount out-state and other nontaxable miles from their total. Only six drivers from out of state participated in the pilot.

1 https://dot.ca.gov/-/media/dot-media/programs/road-charge/documents/rcpp-final-report-a11y.pdf

2 https://catc.ca.gov/-/media/ctc-media/documents/ctc-reports/other-reports/201512-road-charge-pilot-design-recc-a11y.pdf

The California RUC pilot program concluded in December 2016 with the California Road Charge Pilot Program 2017 Final Report[1]. The pilot program successfully demonstrated the feasibility of a statewide RUC program, and surfaced valuable observations during the development, implementation, and evaluation of the pilot. For example:

- The pilot was successful in studying the viability of using multiple mileage recording and reporting options, including manual and automated methods, and demonstrated the viability of using third-party vendors.
- Privacy and data security provisions were implemented with no breaches or complications.
- In post-pilot surveys, 85% of participants expressed overall satisfaction with the pilot. 73% said that a RUC is more equitable than the gas tax, an increase from 66% before the pilot, and 61% said that they were more aware of the amount they pay for road maintenance.

The program final report also identified significant questions and issues that remain before a program could be implemented more widely and with full, paid participation. The final report recommends additional research and testing including:

- Investigating a pay-at-the-pump option for the road charge system, which could replicate current user experience and potentially reduce administrative costs and garner greater public acceptance. Caltrans conducted research on this option from 2017-18, summarized in a report to the legislature[2] which recommends a pilot demonstration to provide an initial proof-of-concept. This pilot has not yet taken place.
- Testing the flow of revenues, since the RUC pilot only simulated an invoicing/payment process. A number of state agencies/ departments could be involved, and additional testing and evaluation of that process would identify potential for improvement in full implementation. From a broader organizational perspective, many agencies and departments would be impacted by a potential transition from the gas tax to a road charge, and that process would require careful consideration and coordination to be successful.

1 https://dot.ca.gov/-/media/dot-media/programs/road-charge/documents/rcpp-final-report-a11y.pdf

2 https://dot.ca.gov/-/media/dot-media/programs/legislative-affairs/documents/road-charge-pay-at-the-pump-research-rept-to-leg-a11y.pdf

- Engaging a wide range of stakeholders to align evolving technologies with the RUC program framework. This would include working with auto manufacturers on in-vehicle telematics, and developing technical standards to allow for easier mileage information collection but still permit innovation.

In 2018, Senate Bill 1328 (Beall) extended the operations of the Road Charge TAC until January 1, 2023. The group has met periodically since then, primarily tracking national level activities and the work of other members of RUC West. At present, with the passage of 2017's SB 1 (Beall), and given the economic downturn at the beginning of 2020, there is not a large political push to accelerate the implementation of a RUC in California, but behind the scenes research and collaboration across states continues.

What would it take to implement here?

California is still in the research and testing phase for a RUC, with multiple outstanding questions remaining. In 2017, the Pilot Program Final Report stated that 2025 would be the earliest that any RUC program could be broadly implemented in California. Implementation of a full RUC program in California would require state authorizing legislation to establish the taxation authority and designate an administering agency. After their pilot programs, the state Departments of Transportation from Oregon and Washington both recommended a slow, incremental phasing-in process for this transition.

A statewide (or larger) RUC program provides an opportunity to layer in local programs at the city, county or regional level. Small scale RUC programs outside of the state or Federal context are infeasible due to administrative costs and the amount of travel across county lines. San Francisco would benefit greatly if allowed to layer local programs into a statewide program. These programs could do more than collect revenues, and be designed to advance local policy priorities, such as time-of-day or vehicle occupancy-based pricing, described further in the next section.

Policy Considerations

For the California pilot program described above, the primary policy goal was to test the viability of replacing state gas tax revenues with RUC revenues. The rate was established to approximate a system that would generate as many revenues as the state gas tax did at the time, without any variation across vehicle or trip type. However, **one of the significant benefits of an RUC program is that it can implement pricing based on the costs imposed on the system**, more directly than the gas tax. The most

efficient way to address externalities is to incorporate them into the prices people pay. To do this comprehensively for the transportation system, an RUC program could be designed to address a number of externalities of driving with varied rates for drivers based on a variety of factors. This has the added benefit of sending a more accurate signal about the cost of driving to drivers, who may be incentivized to drive less.[1]

Listed below are some of the ways that an RUC program could help advance local, regional and state goals:

- **Roadway wear and tear:** this is commonly thought of as the primary intent of a RUC. The RUC rate should be set to cover the costs of roadway maintenance at a minimum, but should not be limited to these expenses.


Economic Vitality


Safety and Livability

- **Traffic fatalities and serious injuries:** In 2018, over 36,000 people were killed in traffic crashes.[2] Safety programs have helped reduce fatalities over the past 40 years, but in general, the rate of traffic deaths and serious injuries tracks with traffic volumes. The RUC program should capture costs incurred from these crashes and invest revenues in safer bicycle and pedestrian infrastructure to help move us toward zero traffic fatalities.

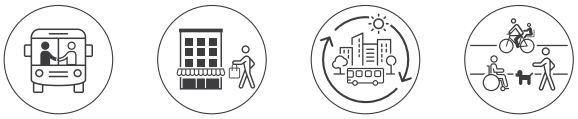

Safety and Livability


Environmental Sustainability

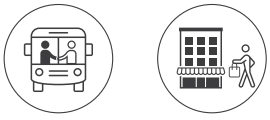
1 https://itif.org/publications/2019/04/22/policymakers-guide-road-user-charges

2 https://www.nhtsa.gov/traffic-deaths-2018

- **Traffic congestion:** High traffic volumes lead to high levels of traffic congestion, creating an economic cost on businesses. Public transit buses and streetcars, which move people more efficiently than single-occupancy vehicles, are also caught that traffic. Cities or regions may be interested in including a congestion charge as part of the RUC charging drivers a per-mile surcharge for driving in crowded downtown areas during peak hours. Revenues captured through a congestion charge should be spent on projects such as increased transit service and improved bicycle and pedestrian infrastructure which would give drivers better alternative options to driving during peak times. Another way to reduce congestion could be to charge lower rates to vehicles with higher passenger occupancy, such as carpools, vanpools or transit vehicles.



- **Social and economic inequities:** The built environment in the United States largely requires people to drive between their homes, jobs, schools, errands, and other points of interest. This imposes significant costs to households. In many metropolitan areas, lower-income households are being displaced out of well-connected, centrally located urban neighborhoods into suburbs far from employment and educational opportunities. To help mitigate the social and economic impacts of this car-centric built environment, drivers of different incomes could be charged different rates to help mitigate the impacts of the RUC on low-income households. Alternatively, there may be an opportunity to integrate incentive programs, such as offering RUC credits for transit trips taken, into the RUC program.



- **Air emissions:** The transportation sector generates the largest share of greenhouse gas emissions at 28% in 2018, primarily from burning fossil fuel.[1] The RUC program could set lower rates for all-electric or hybrid vehicles, which produce fewer (or no) emissions per mile. However, it may be more efficient to use a gas tax to capture the air emissions costs incurred by gas-powered vehicles, since that is an existing, easy to administer tax with a direct nexus to vehicle emissions.

Environmental Sustainability

- **Impacts to industry:** There have been concern raised by rural interests that the RUC could impose additional costs on the agricultural sector. There may be a desire to continue subsidizing certain industries through lower rates. Conversely, there may be a push to disincentivize other industries through higher rates, such as transportation network companies that have been shown to have significant impacts on congestion in cities like San Francisco.

Economic Vitality

While there were no exemptions or surcharges built into the California RUC pilot program, the RUC Technical Advisory Committee did acknowledge that for a full-scale RUC program, additional consideration would need to be given to other policy issues. The California pilot also did not collect actual revenues, and in the final report, the question of how to use road charge revenues was touched upon, but deferred as a policy question, noting that the current gas tax funds a myriad of uses, and that the road charge could either follow a similar use pattern or could fund minor to major reforms to how investments are made. The Oregon and Washington pilot programs discussed here also looked at RUC as an opportunity to replace gas taxes, developing the RUC independently from consideration of revenue expenditures to avoid the added complexity.

Despite the approaches taken by these states, there may be a desire to **maintain some level of the existing gas tax**, which not only acts as a revenue generator, but also to

1 https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions

tax fuel consumption which has significant negative externalities (e.g., greenhouse gas emissions). Maintaining a gas tax would also maintain the ongoing gas tax savings drivers see when purchasing an all-electric or hybrid vehicle, and help accelerate the fleet conversion to cleaner air vehicles.

One of the most significant concerns about an RUC program is that it would be regressive and have a disproportionately negative impact on lower-income households. Studies have found that gas taxes are regressive, with lower-income households paying a higher percentage of their income than high-income households. Furthermore, lower-income households tend to drive older, less fuel-efficient vehicles, paying more gas tax per mile driven than higher-income households with more efficient vehicles.[1] In this way, lower-income households would likely benefit from an RUC by leveling the per-mile fee; a 2010 study in Oregon found that a road charge is less regressive overall than a consumption-based fuel tax. The RUC could also invest revenues in public transit, which on average is used more by lower-income households or could incorporate lower rates for lower-income households as discussed above.

1 https://itif.org/publications/2019/04/22/policymakers-guide-road-user-charges