

Background Information for AWG Meeting #4

Nevada Sustainable Transportation Funding Advisory Work Group

November 2021

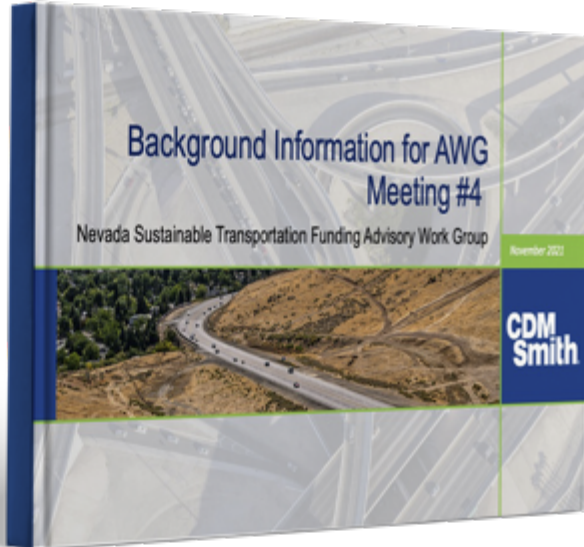


**CDM
Smith**

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How to use this briefing book



This briefing book is provided to Advisory Working Group members as background for the November 9, 2021, meeting. These materials are aligned with the Agenda for the meeting and provide background information on several of the topics to be reviewed and discussed.

During the meeting, slide presentations will summarize each of these topics (but not repeat everything), so it will be helpful to read the content of the briefing book prior to the meeting.

The project team is happy to answer any questions that arise prior to or during the meeting (info@NVtransportationfuture.org.)



Section 1

**Advisory Working Group
Meeting Roadmap**

AWG MEETINGS

Each AWG meeting has an overall theme, with specific agenda items and outcomes to support that theme.

The meeting information provided below is a roadmap of what is planned for coverage. Meetings that are several months out are planned only in low-fidelity, keeping the agenda more open to respond to issues raised during earlier meetings, or to adjust to new information. More detailed agendas, presenters, activities, action items, and expected outcomes are developed approximately 8 weeks in advance of the scheduled meeting.



8-WEEK AGENDA BUILD

The November AWG meeting agenda was developed in September. The January 2022 AWG meeting agenda is under development now.

About eight weeks ahead of an AWG meeting, we begin building the draft meeting agenda in greater detail. The September and November 2021 AWG meetings shown below illustrate how the meeting topics, activities, and expected outcomes come into sharper focus as the dates approach.

For November 9 AWG Meeting:

- Refine and adopt transportation revenue principles
- Demonstration of how revenue principles will be used to measure qualitative performance of various tax and fee mechanisms
- Menu of transportation revenue options to be further analyzed and considered in Nevada
- Common elements of new transportation funding packages enacted in other states
- Overview of two different road usage-based funding approaches: Utah's road user charge, and a vehicle efficiency-based road usage charge proposal

For January 11 AWG Meeting:



- Review fuel tax rate indexing in Nevada and elsewhere: advantages, drawbacks, and alternatives
- Application of AWG-selected principles to potential transportation revenue mechanisms
- Discussion and short-listing of most viable revenue options for further analysis and stress-testing



Section 2

**DRAFT transportation revenue principles
for AWG consideration**

GUIDING PRINCIPLES

The Advisory Working Group will soon establish guiding principles for Nevada's sustainable transportation funding solution.

During the September AWG meeting, members participated in a facilitated work session to identify guiding principles. Starting from concise words or phrases (listed below), AWG members shared their thoughts, views, and preferences regarding each guiding principle “theme.”

Following that discussion, principles have been drafted for consideration, as presented on the following pages. These draft principles will be a focus **at the November AWG meeting for discussion, vote, and potential adoption.**

Revenue Principles



- Financial sustainability
- Flexibility
- User equity
- Greenhouse gas emissions
- Social equity
- Sufficiency
- Transparency/ Efficiency and ease of compliance

Principles, positions, and policies are all ways in which a specific outcome can be achieved. For the AWG task, we are only concerned with principles, because these will act as the ruler by which we measure several alternative funding mechanisms. The following presents guidance on how to distinguish a principle from a policy or a position:

- ▶ **Principle:** Principles are aspirational outcomes that are used to measure the degree to which the revenue mechanism achieves the outcome. For example, a classic principle from Adam Smith tied to equity and fairness, “Similarly situated taxpayers should be taxed similarly.”
- ▶ **Position:** These are stances that are typically conveyed as constraints or “pass/fail” tests. If a revenue option does not conform to the position, it is deemed invalid. Example: “Revenue mechanisms must not increase taxes on rural residents.” The underlying principle in this example was intended to reflect “geographic equity,” but the wording used makes it a position, stance, or constraint that must be met.
- ▶ **Policy:** These are specific means of achieving the desired outcome. For example, “index to inflation” (which appears in a list of principles from another state) is not a principle, but rather a specific policy approach for achieving the principle of revenue sufficiency or sustainability.

DRAFT REVENUE PRINCIPLES

These draft revenue principles reflect AWG discussion at the September meeting, plus feedback received from the AWG in response to the first draft.

The principal objective of the AWG is to identify sustainable funding mechanism(s) for the State Highway Fund, while also considering new approaches for multimodal transportation funding for all users, that support the state’s goals of improving social and user equity while reducing greenhouse gas emissions.

As guiding revenue principles in the pursuit of this objective, *Nevada’s sustainable transportation funding mechanism(s) should be capable of:*

Draft Revenue Principle	AWG Guidance
<p>Financial Sustainability: Yielding revenue that correlates with maintenance needs for a robust transportation network; demand for transportation, regardless of changes in population, vehicle technologies, ownership, and travel patterns; fuel sources; or decreases in consumer spending.</p>	<p>Incorporates “sustainability” concept from AB 413. Supported by AWG comments on importance of revenue resilience through economic changes/ crises, population shifts, volatile transportation costs, and changing travel patterns and preferences. Also incorporates AWG support for “revenue diversification,” as well as importance of raising revenues to maintain the existing network.</p>
<p>Flexibility: Funding a wide range of transportation-related projects, programs, or priorities across various agencies to meet the needs of system users across all modes.</p>	<p>Incorporates “multimodal transportation needs of all users” concept from AB 413. “Projects, programs, and priorities” text reflects range of investment opportunities highlighted by the AWG discussion (i.e., infrastructure needed to support electrification). Flexibility concept also alludes to current constitutional restrictions on use of funds by mode; varying transportation investment needs by transportation agency.</p>

Draft revenue principles, page 2 of 3.

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Draft Revenue Principle	AWG Guidance
User Equity: Recovering a proportionate share of the costs from those who use the roadway network.	Incorporates “user equity” concept from AB 413. Supported by AWG discussion valuing both concepts and recognizing alignment between “user equity” and “user pays” as principles for those using the roadway network.
GHG Emissions: Aligning with state transportation GHG reduction goals.	Incorporates “greenhouse gas emission” reductions concept from AB 413, though avoids specifics beyond goals for the purposes of keeping this at the “principle” rather than “position” or “policy” level.
Social Equity: Improving the distributional impact on historically underserved groups, while considering the affordability to those contributing.	Incorporates “social equity” concept from AB 413. Reflects AWG discussion around evaluating the transportation cost burden across users.

Draft revenue principles, page 3 of 3.

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Draft Revenue Principle

AWG Guidance

Sufficiency: Generating sufficient revenue over targeted investment timeframes for existing and future transportation infrastructure needs.

Reflects AWG discussion regarding the importance of both near- and long-term sufficiency of revenues raised. Discussion highlighted how different revenue mechanisms may be needed to accommodate both immediate, prescient near-term needs with long-term sufficiency, especially given anticipated changes in transportation technology (i.e., growth in electric vehicle fleet, introduction of connected and automated vehicles with different travel patterns).

Transparency/ Efficiency and Ease of Compliance: Simple to explain, with awareness of how funds are used, cost-effective, and readily administered at statewide and local levels.

Reflects AWG discussion on the importance of both concepts, while also highlighting overlap between the two (allowing for their integration). Transparency should account for how funds are being administered and their effectiveness.



Section 3

**Success factors: recent transportation
revenue initiatives from other states**

OVERVIEW

We scanned all recently-enacted transportation revenue measures across the U.S. to identify trends, common elements, and success factors.

In reviewing all transportation revenue legislation that states have enacted since 2015, several trends emerged. This section highlights recent action in four states – **Colorado, Illinois, Ohio, and Utah** -- to illustrate both the similarities and differences in their approaches.

After scanning all state actions since 2015, the project team's observations are summarized on page 18. But first, some overall statistics:

29 

States have enacted legislation to increase state gas tax

20 

States currently index their motor fuel tax

28 

States had special fees on plug-in EVs*

14 

States assess fee on plug-in hybrids*

* Heading into 2021

In addition to recently-enacted measures, several more states have established transportation revenue task forces, commissions, or special study committees (like Nevada) to further investigate new options for transportation funding. *These initiatives are not captured in this section, which is limited to most recent measures that have been enacted into law.*



Colorado (2021): several new revenue sources provide \$5.3 billion over a ten-year investment horizon.

SB 21-260 was enacted and signed into law on June 17, 2021. The main revenue-related highlights from the bill include:

- An additional **2 cents per gallon fee on gasoline and diesel** beginning in 2022 that increases each year by 1 cent, up to 8 cents total by 2032. This fee will then be **indexed to construction cost inflation** and adjusted annually after 2032.
- A new **27-cent fee on deliveries** made by services like Amazon, FedEx, and Grubhub.
- **A 30-cent fee on Uber and Lyft rides**, with annual increases based on the Consumer Price Index. The fee would be discounted 50% for people carpooling or riding in an electric vehicle.
- An increase in **special registration fees for electric and hybrid vehicles** to reach tax parity between what average gas vehicles pay in fuel taxes.
- Federal stimulus funds and **transfers from the state general fund** are included.

Other notable features:

- About 10% of the total package (\$568 million) is earmarked for public transit and pedestrian improvements.
- A total of \$724 million (14%) will be dedicated to several programs to accelerate the transition to electric vehicles.
- The remaining \$4 billion will be spent on maintenance, new construction, and debt service for highway construction bonds.
- Of the \$5.3 billion, ten-year revenue package, about \$3.8 billion (72%) comes from new taxes and fees, while the rest comes from Colorado's general fund and federal stimulus money.



Illinois (2019): comprehensive, 6-year *Rebuild Illinois* funding package generates \$33.2 billion in transportation revenue from diverse sources.

Senate Bill 1939 was enacted and signed into law on June 28, 2019. The main revenue-related highlights from the bill include:

- A **19-cent-per-gallon tax increase on gasoline and a 24-cent-per-gallon increase on diesel** and special fuels.
- The motor fuels tax rates will be **indexed** to inflation based on the Consumer Price Index.
- Annual **vehicle registration fees** were increased by \$50. Other assorted vehicle-related fees were also increased.
- **Truck registration fees** were also increased by \$50 for trucks 8,000 lbs. or less and by \$100 for trucks that weigh more than 8,000 lbs.
- A **new \$100 registration surcharge on electric vehicles** is imposed, in lieu of motor fuel taxes.
- Over a 5-year period, revenue from the **sales tax on motor fuels will be shifted from the general fund to the Road Fund**. The sales tax on motor fuels is 6.25%. For five consecutive years, 1% of the 6.25% total will be shifted, so that by 2025, the Road Fund will receive 5% of the total.

Other notable features:

- Illinois had not increased its gasoline tax since 1990.
- A new Transportation Renewal Fund was created as the depository account for the increased fuel tax revenue. Funds from the account must be spent on critical transportation projects of state and local government—about 80% earmarked for road and bridge projects and 20% for rail and transit capital projects.
- The previous registration fee for electric vehicles had been \$34 every other year (or \$16 per year), while all other vehicles paid \$101. The new revenue measure removes the discounted fee for electric vehicles, so they now pay the same as all other vehicle registrations. At the same time, an additional registration fee of \$100 was enacted for electric vehicles.
- In Illinois, revenue from their Road Fund may also be used for certain public transportation expenses.



Ohio (2019): an increase in gas and diesel taxes, general fund transfers for transit, new fees on plug-in vehicles – and a recognition that Ohio’s future requires something different.

AB 64 was enacted and signed into law on April 2, 2019. The main revenue-related highlights from the bill include:

- A **10.5-cent-per-gallon tax increase on gasoline and a 19-cent-per-gallon increase on diesel fuel.**
- A new annual **registration fee of \$200 for electric vehicles and a \$100 fee for plug-in hybrid vehicles.**
- A **general revenue fund transfer** of \$70 million for public transportation.

Other notable features:

- Of the \$70 million in transit funding, \$16.6 million is directly distributed among the 27 transit agencies, with the remaining \$53.4 million earmarked for multiple grant programs aimed at assisting transit capital needs (i.e., vehicle purchases and preventive maintenance projects) and programs to enhance mobility for seniors and individuals with disabilities.
- A provision that would have indexed the fuel tax was removed in the final negotiations. Instead, the legislation created the Ohio Road to the Future study committee to examine long-term needs and alternative funding mechanisms for the future, including a vehicle miles traveled approach and possible pilot project.



Utah (2015 – 2019): a succession of transportation measures, each building upon the prior one, focuses on fuel tax indexing, local option sales taxes, and road usage charges as alternative to special surcharges on EVs.

Over the last six years, the Utah legislature has enacted transportation revenue measures in three different sessions: 2015, 2017, and 2019. Taken successively, the measures resulted in the following:

- **2015:** authorizes **local option sales tax for highways and transit**; replaces the state's cents-per-gallon fuel tax and instead imposes a **percentage tax per gallon** on the average wholesale price of fuel; **indexes the new fuel tax** to inflation (CPI); and requires Utah DOT to develop an implementation plan for a road usage charge.
- **2017:** adjusts the indexing provisions established in the 2015 legislation to ensure fuel tax revenue collections are more responsive to inflationary factors.
- **2019:** legislature directs Utah DOT to **implement a road usage charge for alternative fuel vehicles** (e.g., electric vehicles), offered to drivers as an alternative to the state's electric and hybrid vehicle registration surcharge.

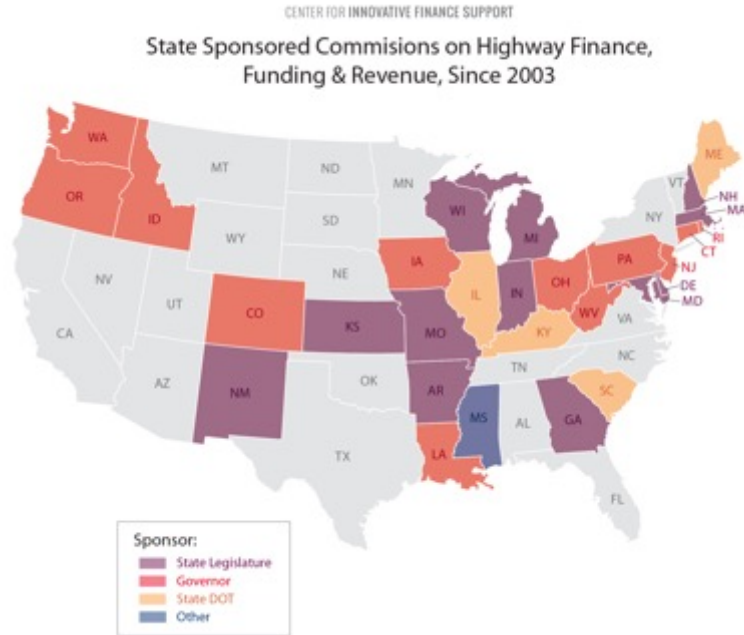
Other notable features:

- The legislature authorized local governments to enact a sales and use tax that could be used for either highways or transit funding – or both – at the discretion of the local government.
- Electric and alternative fuel vehicles were already subject to a flat fee surcharge in addition to their regular vehicle registration fee. The legislature allows drivers to choose which to pay: Utah's road usage charge, which is based on actual miles traveled, or the special registration surcharge. If EV owners opt for Utah's RUC, the amount they owe would be capped so it does not exceed the amount they otherwise would have paid under the special registration surcharge.

TAKE-AWAYS FROM OTHER RECENT MEASURES

A closer look at recent transportation revenue measures reveals common success factors.

Recent successful state transportation funding measures shared several notable traits – many of which might be helpful for Nevada:



- **Provisions to address both near-term *and* longer-term needs.** Several measures increased existing taxes or fees while also enacting provisions to provide longer-term funding sustainability.
- **More states are indexing to inflation.** Indexing was prominent for existing taxes (like the gas tax), but also applied to newly-created taxes and fees.
- **Multiple revenue sources.** While a few states narrowly increased existing gas taxes, those states that enacted comprehensive revenue packages included multiple revenue sources – not just an increase in a single source.
- **“Flexible” revenue sources.** Many states included revenue sources capable of funding non-highway projects, like public transportation, bicycle, and pedestrian facilities.
- **Addressing the evolution of the vehicle fleet.** While specifics varied, several measures contained provisions to collect revenue from high-MPG and/or alternative fuel vehicles. Registration surcharges were common, but in some cases, were paired with major investments supporting electrification (e.g., Colorado). Some states directed development of usage-based charges as an alternative to special EV fees.



Section 4

**Road Usage Charge: Utah's program &
an energy-efficiency based RUC proposal**

BACKGROUND

AB 413 directs the AWG to study at least two specific models for achieving sustainability of the State Highway Fund: Utah's road usage charge (RUC) and an efficiency-adjusted RUC concept

As previously covered in AWG briefing materials, three distinct categories of user-based transportation revenue sources are taxes and fees on fuel, vehicles, and distance traveled.

With fuel consumption on the decline, one option for generating stable, sufficient revenue in the near- to medium-term is to regularly increase the rate of fuel taxation. Rate increases can be done by legislative action and/or by indexing the rate of the excise tax to external factors such as inflation, fleet fuel economy, and fuel consumption.

Distance-based fees (referred to hereafter as road usage charges or RUC) are less familiar and less common. To date, three states have recently enacted programs, with 10 others conducting pilot tests and a dozen more conducting research.

Two of the leading alternatives to reliance exclusively or primarily on fuel tax increases are vehicle taxes and RUC. Vehicle taxes are simple to administer and familiar to customers who already pay annual fees based on vehicle weight, value, and age.

Regardless of the revenue mechanism – fuel taxes, vehicle taxes, or RUC – two key considerations in formulating revenue policy are: the **subject vehicles** and the **rates**. There are many other policy considerations and choices as well, but *subject vehicles* and *rates* are the principal choices that determine expected revenue yields.

This section contains the first step in analysis of the two funding models AB 413 required the AWG to consider: Utah's road usage charge program and the Natural Resource Defense Council's efficiency-adjusted RUC proposal. This section begins with more background on RUC, how it works, where it is happening, and the various policy choices available for putting a program in place. Next, the specific issue of rate setting is explored in more detail given the flexibility with which a RUC can be configured. Finally, the fuel tax, vehicle fee, and RUC elements of the Utah program and NRDC proposal are described, along with references for further reading.

28

States adopted surcharges on alternative fuel vehicles

\$20

Hybrids in Utah

\$225

All electric cars in Washington

BACKGROUND

Most states exploring RUC have also experimented with automated methods of reporting miles driven.

In addition to the methods discussed on the previous page for gathering odometer mileage data from vehicle owners, most states have also explored the use of in-vehicle technology and smartphones to automate the reporting of miles driven.

Smartphone applications. A popular prospective method of reporting miles driven is through a fit-for-purpose smartphone application. Several states have tested a variety of approaches to reporting miles using smartphones. The simplest involves using the phone's camera to take a photo of the odometer and upload it for processing. Other apps have attempted to use the smartphone as the mileage measuring device, but this approach has not yet proven viable for revenue operations due to the inability to reliably associate one smartphone with one vehicle at all times.

Plug-in devices. The most common approach to reporting miles driven in pilots since 2011 has been via devices that plug into a vehicle's on-board diagnostic (OBD-II) port, located under the steering column on most vehicles manufactured after 1996. This small device calculates miles driven using speed data from the vehicle's on-board computer and wirelessly transmits data via the cellular network for processing. Optionally, the device can detect the vehicle's location using a GPS antenna to facilitate exemptions for miles driven off road or out of state. Ten states have tested this technology. Oregon's program is open to any technology that meets the state's mileage reporting standards, but to date only plug-in devices have been qualified. Utah offers plug-in devices as the primary option for reporting miles in its program.

Native automaker telematics is the information and communication system built into vehicles, such as GM's OnStar. In 2016, California was the first state to successfully demonstrate using native automaker telematics to report miles driven in a RUC system. In 2020, Utah launched its operational RUC program and relies on native automaker telematics for some vehicle models to report miles driven (Tesla Models Y and 3 are incompatible with the plug-in device method because they do not have OBD-II ports, and therefore must use telematics to transmit mileage).



BACKGROUND

States deploying RUC as a revenue mechanism face numerous policy decisions.

- **Subject vehicles.** Fundamental to a RUC program is identifying in law the vehicles subject to the charge. Several states have researched RUC as a policy for all vehicles. However, given the challenge of transitioning revenue mechanisms rapidly, programs and research to date have focused on vehicles that consume little or no fuel (and thus pay little or no gas tax), including electric and high-MPG vehicles. Other possibilities exist. For example, the only large-scale RUC program in the world, New Zealand, applies to all diesel cars.
- **Setting rates.** A key policy choice for state legislatures is how to set the rate per mile for a RUC. Rates can vary by numerous factors including vehicle type, fuel efficiency, location of the registered owner's residence, income of the registered owner, and more. Early RUC programs examined the possibility of varying the per-mile rate by location of miles driven, but this required location data which proved unpopular with the public and has largely been abandoned.
- **Exemptions and refunds.** Along with setting rates, legislatures often prescribe exemptions. Examples include mileage exemptions for driving in other states, on private property, or on private roads. Other examples include vehicle exemptions for transit vehicles, state-owned vehicles, or emergency vehicles. Some programs have explored or allowed credits equal to gas taxes paid against RUC owed.
- **Local-option RUC.** Most states collect fuel taxes and distribute funds by formula to cities, counties, and other local jurisdictions. This can be done in a RUC program but can be more politically complex if the local tax itself is set by local jurisdictions, as is done with the fuel tax in Nevada and several other states. Hawaii, whose counties collect more fuel tax than the state, has explored this issue through its RUC pilot program.
- **Transition.** Given the unlikelihood of sudden enactment of a RUC program for all vehicles, states pursuing programs must balance the "startup" phase with the need for a transition. Oregon, for example, set up its RUC program with no intent of generating revenue in the short term. Rather, the intent was to establish a revenue mechanism using a small number of vehicles with little revenue at risk, gradually expanding the program in the future to address declining gas tax receipts.
- **Authorized agency.** RUC laws must direct one or more agencies to collect the charge. Virginia tapped the Department of Motor Vehicles. In Oregon and Utah, the state Departments of Transportation operate the programs, but in close collaboration with the administrators of the state's vehicle registry that serves as a basis for identifying subject vehicles, creating account relationships with subject vehicle owners, and enforcing payment.
- **Others.** States have addressed a range of other issues such as visitor travel, interstate interoperability, privacy protection, and distributional impacts.

BACKGROUND

Setting rates is among the policy issues that legislatures enacting RUC must confront. There are many variables to consider.

Cost recovery vs. revenue replacement. Building on the user-pay principle, cost recovery is a methodology policymakers can use to set per-mile rates. Analysis of the road network, its growth, and future demand generates estimates of the future capital, operations, and maintenance costs for roads. Allocating costs attributable to light-duty vehicles allows for calculation of the tax and fee rates that can generate revenue needed. More commonly, RUC is proposed as a *replacement* revenue mechanism for fuel taxes. Under this approach, the simplest method for calculating a per-mile rate is to divide the revenue currently generated by the gas tax by the number of miles driven. Regardless, the result is a base rate per mile driven for all light-duty vehicles.

Weight. To the extent the vehicle registry identifies reliable measures of vehicle weight, it is possible to vary the base per-mile rate based on vehicle weight. Vehicles weighing less than about 10,000 pounds have equivalently negligible impacts on road surfaces. *From a cost impact perspective* there is no justification for varying the rate charged to light-duty vehicles by their weight, irrespective of whether the vehicle is a compact sedan or a large SUV.

Size. As with weight, vehicles weighing less than about 10,000 pounds represent similar demand for travel. In traffic engineering terms they all represent one (1) "passenger car equivalent" (PCE). Only medium- and heavy-duty trucks represent sizes with a demand profile that may justify higher rates.

Propulsion type. The range of technologies available for vehicle propulsion has proliferated in recent years. Consumers may choose from diesel, gasoline, gas hybrid, diesel hybrid, plug-in hybrid, all-electric, fuel cell, and natural gas. Nearly all cars, regardless of propulsion type, are responsible for some emissions to varying degrees. However, vehicle propulsion type does not make any difference for road impacts. Although electric cars tend to weigh significantly more than their gasoline counterparts due to batteries, as mentioned above this weight difference is negligible when it comes to road surface impacts.

Vehicle fuel economy. Passenger cars receive a fuel economy rating from the U.S. Environmental Protection Agency (EPA). Each rating consists of three numbers: city, highway, and combined miles per gallon (MPG). With the advent of electric vehicles, the EPA created an "MPGe" rating. Although electric vehicles consume no fuel, the MPGe rating is designed to offer consumers a measure of the vehicle's efficiency relative to gasoline-powered vehicles.

Miles driven. Miles can be charged differently based on where and when they are driven, although doing so requires drivers to report their location. It is also possible to vary rates based on how many miles a given vehicle drives, e.g., offering a standard exemption or a discount on miles driven over a certain amount.

Owner characteristics. It is conceivable to vary the per-mile rate based on characteristics of the vehicle's owner such as income and residence location.

BACKGROUND

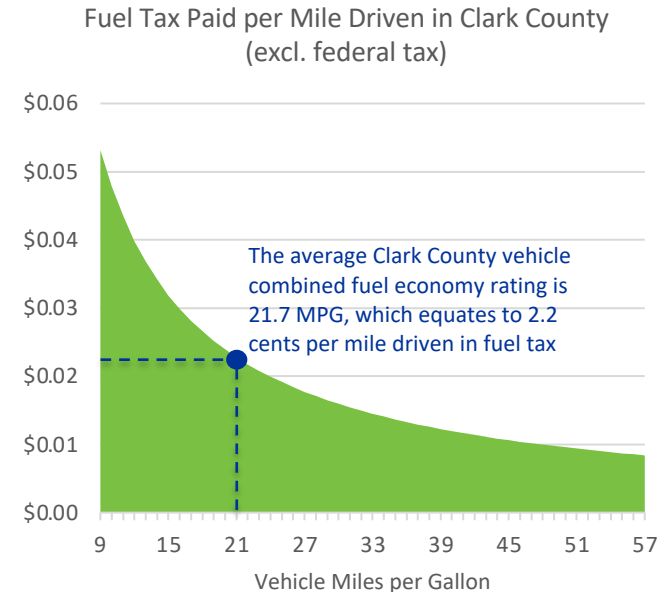
One variable to consider in setting per-mile rates is vehicle fuel efficiency.

The business case for switching from fuel taxes to RUC depends primarily on two factors: sustainability and equity. RUC can generate sustainable revenue because the amount of revenue generated is proportional to demand. As demand for driving increases, so does revenue available to support maintaining and operating the road network, regardless of what is fueling the vehicles doing the driving—gasoline, electricity, hydrogen, and so on.

At the same time, a RUC can support equitable contributions from vehicle owners based on their usage. The chart at right depicts the relationship between fuel taxes and miles per gallon (MPG) in Clark County. The higher the MPG (horizontal axis), the lower the amount a vehicle owner pays per mile driven in fuel taxes. The average vehicle in Clark County is rated 21.7 MPG (city-highway) combined. With a combined state and county fuel tax of 47.8 cents per gallon, that average vehicle contributes 2.2 cents for each mile driven. By contrast, a vehicle rated at 15 MPG contributes about 50% more at 3.3 cents per mile driven, while a vehicle rated at 45 MPG contributes about 80% less at 0.5 cents per mile driven. Electric vehicles do not currently contribute.

There are several ways a RUC program could use MPG as a factor in per-mile rates:

- A RUC program could apply only to vehicles above a certain MPG. For example, applying a RUC of 2.2 cents per mile to vehicles rated 22 MPG and higher would ensure all vehicles pay at least that much, while vehicles rated below 22 MPG would continue to pay fuel taxes at a higher effective rate per mile.
- A RUC program could provide discounted rates for vehicles in certain MPG categories. For example, the rate could be tiered with those above 30 MPG paying only 2 cents per mile.
- A RUC program could adjust RUC rates based on the vehicle's MPG rating.



BACKGROUND

An efficiency-adjusted RUC program calculates the per-mile rate based on the energy efficiency of a vehicle's operations.

A 2011 paper by David Greene argues for a per-mile fee as a long-term solution to road funding through user fees.¹ However, based on the cost and complexity of instrumenting a RUC at that time, Greene puts forth a bridge proposal to tax all energy used in transportation called the **Indexed Roadway User Toll on Energy (IRoUTE)**. The author argues that IRoUTE, which taxes all energy consumed in surface transportation, and which indexes the rate of taxes to both fuel efficiency and inflation, can create a long-term sustainable funding.

The author identifies several shortcomings with IRoUTE:

- First, the concept is not suitable for assessing heavy vehicle contributions to roads which the author argues would be more effective via a weight-and distance-based charge.
- Second, since its primary purpose is road funding, IRoUTE does not effectively or directly address greenhouse gas emissions.
- Third, the concept does not include a viable mechanism for taxing the energy consumed by electric vehicles. The paper does not address the social equity impacts of the concept.

Given the challenges with taxing electricity consumed by electric vehicles that existed in 2011 (and persist to this day), an alternative is to tax the miles driven by those vehicles. By combining the concept of a per-mile user fee with the IRoUTE, it is conceivable to envision a per-mile rate that adjusts with the energy efficiency of the vehicle's electricity consumption.

¹ Greene, David. What is greener than a VMT tax? The case for an indexed energy user fee to finance U.S. surface transportation. *Transportation Research Part D*, 2011.

BACKGROUND

In 2018, Utah became the second state to create a RUC program for light-duty vehicles in law. Electric, plug-in hybrid, and hybrid vehicles choose between paying a flat annual registration surcharge or a distance-based charge.

In 2018, the Utah legislature enacted Senate Bill 136 directing Utah DOT to implement a RUC program by January 1, 2020. The legislature had previously enacted annual registration surcharges for alternative fuel vehicles and wanted to offer owners of those vehicles a usage-based alternative fee. Vehicles subject to the surcharge that are eligible to enroll in the RUC program include all-electric, plug-in hybrid, and hybrid vehicles. In the ensuing 20 months, UDOT focused primarily on building the necessary administrative and technology features for a functional RUC program, including selection of mileage reporting options, creation of interfaces with the DMV, design of system specifications and business rules, and procurement of a vendor to provide mileage reporting and payment services to customers. Following extensive testing and communication with the public via mailers to eligible vehicles, the program launched on January 1, 2020. Among the over 50,000 eligible vehicles, so far, about 4,000 have enrolled in the RUC program.

Subject vehicles. Utah's RUC program is open to enrollment by owners of electric, plug-in hybrid, and hybrid vehicles in lieu of paying the annual flat fee (surcharge).

Rate setting. The alternative fuel vehicle annual flat fee (surcharge) is designed to recover costs of road usage from vehicles that pay little or no fuel tax. For that reason, the legislature specified rates that vary by vehicle type, with electric vehicles paying the most and hybrid vehicles paying the least. Like state fuel taxes, the rates of the surcharge are indexed to inflation. All vehicles who enroll in the RUC program pay 1.5 cents per mile instead of the surcharge. The amount any vehicle pays in RUC in one year is capped at the amount of the annual surcharge.

Exemptions and refunds. Since Utah's RUC serves as an option in lieu of the annual surcharge, there is no fuel tax credit or refund, nor exemptions for miles driven off road or out of state. The state is studying whether to offer such refunds or exemptions in the future.

Transition. Anticipating a large-scale transition to more fuel-efficient and electric vehicles, the Utah legislature is exploring pathways for extending the RUC program to all vehicles in the state by 2031.

Further reading. UDOT RUC History & Technical Information, <https://www.udot.utah.gov/connect/about-us/legislative/road-usage-charge-history/>

Vehicle type	2021 annual surcharge rates	2021 RUC rate
All-electric	\$120	- or - 1.5 cents/mile
Plug-in hybrid electric	\$52	
Hybrid	\$20	

BACKGROUND

The Natural Resource Defense Council (NRDC) proposes indexing the fuel tax to fuel consumption and creating an efficiency-adjusted RUC.

NRDC is a national environmental advocacy organization. Among the issue areas of interest to the organization are climate change and electrification of the vehicle fleet. NRDC regards the annual surcharges on electric vehicles that 28 states have enacted to replace gas tax revenues as punitive toward EV owners and detrimental to clean vehicle adoption goals. In response, NRDC put forward a modified form of the IROUTE concept that features three specific rate-setting recommendations, two for the fuel tax and one for RUC, along with a recommendation for applying mechanisms to vehicles by propulsion type.

Index the fuel tax to inflation. Because excise fuel tax rates do not automatically rise, the buying power of fuel tax revenues does not keep up with costs. As Washoe County, Clark County, and six other states already do, NRDC recommends indexing the per-gallon fuel excise tax rate to a measure of inflation.

Index the fuel tax to fuel consumption. As fuel efficiency increases, fuel consumption declines. Taxing gallons, even with an inflation index, does not account for reduced consumption of the product being taxed. To combat this, NRDC recommends indexing the per-gallon fuel excise tax rate to a negative measure of total fuel consumption. For example, if total fuel consumption increases by 1 percent, the tax rate declines by 1 percent, and vice versa.

The table at right illustrates two scenarios for how this combination of indices would work in practice.

Create an MPGe-adjusted RUC for electric cars. Since electric vehicles do not consume gasoline, NRDC recommends creating a RUC program. Rather than setting a rate per-mile for all vehicles to pay, NRDC proposes adjusting the rate based on the vehicle's MPGe. For example, taking the Clark County combined state and county fuel tax of 47.8 cents per gallon, a 90-MPGe electric vehicle would pay $47.8 \div 90 = 0.53$ cents per mile in RUC. This equates to \$53 per 10,000 miles. The rate would change over time as the rate of the fuel excise tax changes.

Further reading: NRDC, "A Simple Way to Fix the Gas Tax Forever," <https://www.nrdc.org/experts/max-baumhefner/simple-way-fix-gas-tax-forever>

Measure	Scenario 1	Scenario 2
Fuel tax rate, start	\$0.25/gal	\$0.25/gal
Inflation	+ 2%	+ 1%
Fuel consumption	- 1%	+ 2%
Fuel tax rate, end	\$0.2575/gal	\$0.2475/gal

Fee Component	25 MPG	90 MPGe	130 MPGe
Gas tax per mile	1.91c	0c	0c
RUC per mile	0c	0.53c	.37c
Total per 10k miles	\$191	\$53	\$37



Section 5

**Transportation revenue options for
further analysis and AWG consideration**

SECTION OVERVIEW

A menu of transportation revenue options is proposed for further analysis. This now includes revenue mechanisms recently enacted in other states.

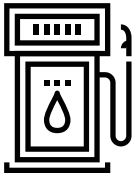
The September 2021 AWG Briefing Book included an overview and descriptions of transportation funding mechanisms used in Nevada and throughout the United States (Chapter 2). The following pages are intended to provide the AWG with a “menu” of options the project team will analyze in preparation for the January 11, 2022 meeting.

The analysis will include quantitative measures – e.g., how much revenue the mechanism can generate at a given tax rate – and a qualitative analysis – specifically, how each revenue mechanism performs when measured against the AWG’s adopted transportation revenue principles. The results of this analysis will be shared with the AWG in January to help the AWG shortlist those revenue mechanisms that appear most promising for fulfilling the AWG’s mission.

During the November 9, 2021 AWG meeting, we will ask members to identify options that do not merit further analysis and can be struck from the list. Menu options that appear with a strikethrough are ones the project team proposes for exclusion but should be reviewed by the AWG for final decisions. Similarly, we will ask members if the menu as presented includes all options that *do* merit further consideration and analysis – have we missed anything?

FUEL TAXES

Fuel taxes provide the largest share of funding for transportation in Nevada. New approaches are proposed for analysis.



The most common form of indirect usage charging, taxes on fuels used to propel motor vehicles have been enacted at the federal level and in all 50 states, 49 of them with the exclusive purpose of generating revenue primarily or entirely to fund roads and bridges. Various forms of fuel taxation exist.

Fuel-related tax mechanism	Used in Nevada?	Notes
Flat per-gallon excise fuel tax	Y	Will analyze rate increases.
Inflation index on per-gallon fuel tax rate	Y (select counties)	
Variable-rate tax based on the price of fuel	N	
Sales tax on fuel	N	
Excise tax with fuel efficiency index	N	

VEHICLE-RELATED FEES

There is a wide range of vehicle-related fees. Focus is on characteristics of the vehicle (rather than transaction-related fees).

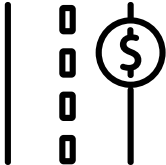


Vehicle related fees.
 Vehicle-related fees aim to recover the costs of vehicle licensing but can also serve as a convenient tool for revenue generation. Numerous types of vehicle fees exist.

Vehicle-related fee mechanisms	Used in Nevada?	Notes
Basic license fees	Y	
Value	Y (GST)	Sales taxes on new and used vehicles will also be analyzed.
Weight	Heavy vehicles only	
Fuel economy	N	
Engine type	N	Analysis will include special EV and hybrid registration surcharges
Age	N	

DIRECT USAGE-BASED FEES

Tolls and road concessions are omitted, but other forms of direct usage fees will be examined.



Direct usage fees. Increasingly common are a variety of direct usage-based fees which assess charges on system users based on actual consumption of or impacts to the transportation system.

Direct usage fee mechanisms	Used in Nevada?	Notes
Road usage charge (light vehicles)	N	
Weight-distance tax	Repealed in 1989	
Delivery fees	N	Colorado recently enacted fees on deliveries
Ride-share fees	N	Colorado recently enacted ride-share fees; municipalities also use this mechanism

FREIGHT-RELATED FEES

Very few freight-related fees have been imposed by states. However, a few have been proposed.

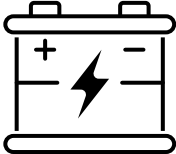


Freight-related fees. As a key user of the transportation system, freight businesses can contribute through revenue mechanisms in addition to fuel taxes, vehicle fees, and direct usage fees.

Freight-related tax and fee mechanisms	Used in Nevada?	Notes
Container fees, value-added tax on freight traffic	N	
Delivery fees	N	Colorado recently enacted fees on deliveries

INDIRECT USAGE TAXES AND FEES

Indirect usage taxes and fees attempt to collect revenue from products ancillary to (but necessary for) transportation.



Indirect usage fees. Other proposed forms of indirect usage fees beyond fuel taxes include taxes and fees on materials and products that serve as inputs to the use of the transportation system, such as tires, electricity, and batteries.

Indirect usage tax and fee mechanisms	Used in Nevada?	Notes
Batteries, tires, electricity, automotive parts, repair services, automotive insurance	N	AWG should select (or strike from this list) the specific items that could be taxed.