

The following document is supplemental to *NCHRP WebResource 2: Road Usage Charge Guide* (NCHRP Project 19-18, “Transitioning Fuel Tax Assessments to a Road Usage Charge”). The full WebResource can be found at <https://crp.trb.org/nchrpwebresource2/>.

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# Commercial Vehicle Economics Rate-Setting Decisions

## Description:

Road usage charging (RUC) is intended to provide a sustainable replacement of fuel taxes as a source of revenue for road maintenance and investment. By charging vehicles for the distance they travel, it is based on the “user-pays” principle according to the degree to which vehicles use the road network. It is critical to have an appropriate process and information to inform rate-setting decisions. This is particularly applicable to commercial vehicles. Policymakers must set rates or establish rate-setting methodologies, and their choices can be guided by principles such as the following:

- Efficiency (the system for charging vehicles should not be unduly complicated, and should be easy to understand and easy to implement)
- Cost-recovery (rates should be set to recover the infrastructure costs that vehicles generate in using the road network)
- Fairness (vehicles should pay according to their usage of the road network and the proportion of maintenance and capital costs that they generate)
- Net revenue-neutrality (the system should not be intended to generate additional revenue, but to seek to generate revenue levels similar to that seen with current systems).

On average, light-duty vehicles generate similar levels of wear and tear and consumption of road infrastructure, and it is logical that they pay similar amounts, per mile, to use the road network. For commercial medium- and heavy-duty vehicles, the amounts they currently pay, if averaged by mile, vary according to their vehicle class/size and weight. This is because their fuel consumption (and consequently the taxes they pay) is higher due to greater weight. Commercial vehicles may also be liable for other taxes, such as weight taxes, tire taxes, or higher registration fees, designed to recover the higher costs such vehicles generate from using the road network. To be efficient, fair and to recover costs effectively, a RUC system that includes medium and heavy vehicles should consider varying per mile rates by vehicle class/weight category to reflect the differences in what they pay now and/or the differences in the costs they generate on the road network.

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## Data Required:

There are two main approaches to setting charges for commercial vehicles:

- Replace existing charges with rates that are, on average, equivalent to what is being paid now
- Adopt a cost-allocation methodology to set rates based on an economic analysis of how best to recover a range of road infrastructure costs from different types of vehicles by class/weight category

The data needed for the first approach are:

- Amounts of fuel tax revenue generated by medium and heavy-duty vehicles, by vehicle classes
- Amounts of other relevant tax revenue generated by such vehicles
- Annual vehicle miles traveled by each vehicle class

For the second approach, a more detailed economic and engineering analysis of future road expenditure, and how to allocate the costs of that expenditure to users, is required. This requires not only the data listed above, but also:

- A forward-looking estimate of how much expenditure is expected on the road network in the next few years (e.g., 3 years), classified by various types of spending (e.g., routine maintenance, structural maintenance of bridges, new road capacity, safety improvements)
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## Data Sources:

Sources of data could include:

- Financial reports on revenue, allocated by vehicle class through survey data
- Road usage data on vehicle miles traveled by vehicle class
- Surveys of fuel usage by vehicle class, including from tax returns (e.g., IFTA)
- Budget forecasts of road spending by type of activity

## Analysis Steps:

### Two approaches – Simple Replacement or Cost-Allocation Study

Rate setting for simple revenue replacement requires the following steps:

1. Calculate how much an average vehicle in each vehicle category pays currently
2. Forecast estimated annual average vehicle miles traveled for a vehicle in each vehicle category
3. Divide what is paid for each vehicle class on average by estimated annual average miles driven for each vehicle class to develop a per-mile rate for each vehicle class

For a cost-allocation study, analysis needed beyond the above three steps includes:

1. Forecast of estimated spending by activity
2. Adopt economic principles as to how to allocate the costs of that spending by vehicle category
3. Develop an economic model that divides forecasted future spending by forecast traffic volumes by mile for each vehicle class, based upon an allocation of spending categories by economic principles
4. Run model based on revenue demands and traffic volumes to develop a rates table based on allocating costs to each vehicle class

## Considerations/Lessons Learned:

Setting rates for commercial vehicles is highly sensitive, and there may be greater acceptability if RUC is seen as an opportunity to simplify the range of taxes that commercial vehicle owners must pay to own and operate the vehicle. These should be reviewed to consider whether RUC can replace them. If a cost-allocation study is undertaken, the results may mean considerable differences in how different vehicle classes pay compared to now, and this may require transitional arrangements to phase in such changes.

## Sample Output (Part of the Oregon Weight Mileage Tax Rates Table)

COLUMN A WEIGHT GROUP	COLUMN B MILLS ( 1/10 OF 1 CENT ) PER MILE	COLUMN C DOLLARS PER MILE* DECIMAL FRACTION	COLUMN A WEIGHT GROUP	COLUMN B MILLS ( 1/10 OF 1 CENT ) PER MILE	COLUMN C DOLLARS PER MILE * DECIMAL FRACTION
26,001 - 28,000	72.0	.0720	52,001 - 54,000	120.5	.1205
28,001 - 30,000	76.4	.0764	54,001 - 56,000	125.0	.1250
30,001 - 32,000	79.8	.0798	56,001 - 58,000	130.2	.1302
32,001 - 34,000	83.4	.0834	58,001 - 60,000	136.1	.1361
			60,001 - 62,000	143.2	.1432
34,001 - 36,000	86.6	.0866			
36,001 - 38,000	91.1	.0911	62,001 - 64,000	151.1	.1511
38,001 - 40,000	94.5	.0945	64,001 - 66,000	159.7	.1597
40,001 - 42,000	98.0	.0980	66,001 - 68,000	171.1	.1711
			68,001 - 70,000	183.1	.1831
42,001 - 44,000	101.6	.1016	70,001 - 72,000	195.2	.1952
44,001 - 46,000	105.0	.1050			
46,001 - 48,000	108.4	.1084	72,001 - 74,000	206.4	.2064
48,001 - 50,000	112.0	.1120	74,001 - 76,000	217.0	.2170
50,001 - 52,000	116.1	.1161	76,001 - 78,000	227.4	.2274
			78,001 - 80,000	237.0	.2370
			80,001 AND OVER	USE TABLE B	