

# **Report on Impacts of Road Usage Charges in Rural, Urban and Mixed Counties**



**January 2013**





# Oregon

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## Department of Transportation

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Date: February 21, 2013

To: Road User Fee Task Force  
Mary Olson, Chair

From: James M. Whitty   
Administrator of the Road Usage Fee Task Force

RE: Report on Impacts of Road Usage Charges in Rural, Urban  
and Mixed Counties

This report represents the study of impacts of road usage charges in rural, urban and mixed counties in Oregon.

Based on data collected and analyses performed, the consultant produced a report on the impacts of possible mileage-based tax policy on rural, urban and mixed counties. The primary focus of this report is the impact of the rural and urban issues supported by the current and suggested future vehicle fleet mix for each type of county - rural, urban and mixed. The analysis and synthesis depicts various impacts a mileage tax policy will have on each major group and sub-group in the rural, urban and mixed county settings of Oregon. The impact analyses include total cost impact relative to current cost burden of the existing motor fuel excise tax system and expected behavioral impacts on users who may have to adapt to possible new technological features of a road usage charge.





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## Introduction

The prospect of an Oregon road usage charge has faced questions regarding the policy's relative impacts on urban and rural residents. The central concern of stakeholders is the notion that rural residents must drive longer distances and will therefore be unfairly burdened by charge per mile driven. Related concerns include the relative ability of rural residents to adapt to technological aspects and compliance requirements of a road usage charge system.

These concerns are not unique to Oregon, nor are they unique to transportation. Stakeholders and researchers in many policy areas often point to the perceived "urban-rural" divide as a stumbling block to coherent policy development. However, to date, no one has conducted a study of the issues facing urban versus rural residents relative to a transportation revenue policy that features road usage charging.

Earlier this year, the Oregon Department of Transportation undertook a study of urban and rural areas in order to answer fundamental questions and concerns about road usage charging policy. The study relied on quantitative data including Oregon demographics, travel patterns, vehicle ownership and usage, and transportation budgeting, as well as information collected through targeted surveys of residents of seven Oregon counties (two urban, three rural, and two "mixed"). This report includes a summary analysis of all the data collected and conclusions regarding road usage charging policy impacts on urban versus rural areas in Oregon.

Based on the research undertaken, this study concludes the following:

- Technology
  - Oregon residents have similar tastes, experiences, and capabilities with regard to technology, regardless of their location.
  - The proposed road usage charge provides such a range of mileage reporting options that no class of users is particularly disadvantaged by the system.
- Behavior
  - Based on self-reported mileage, there is no significant difference in the distance driven per year between urban and rural residents.
  - Although rural residents tend to drive longer distances for typical errands such as grocery or clothes shopping, school, and medical appointments, they also tend to engage in such activities less frequently than their urban counterparts.
  - When looking strictly at miles driven on Oregon public roads, rural households drive significantly fewer miles than their counterparts in urban areas.

- Vehicles
  - Based on data from ODOT’s Driver and Motor Vehicle Services Division (DMV), rural residents tend to drive less fuel-efficient vehicles than their urban counterparts. On the other hand, rural drivers tend to drive in conditions conducive to better fuel efficiency.
  - However, based on survey results, a majority of Oregonians view road usage charging as less fair to rural residents.<sup>1</sup>
  - Urban residents are far more likely to drive highly fuel efficient vehicles today and more likely to purchase highly fuel efficient vehicles in the near future than their counterparts in mixed or rural counties.
- Financial impacts
  - Rural residents generally will fare better relative to their urban counterparts under a road usage charge because they drive, in aggregate, fewer miles. They also have the opportunity to offset their road usage charge bill by subtracting off-road and out-of-state miles, which they report driving more than urban residents.

In short, despite perceptions that a road usage charge is unfair to rural residents, the data collected and analyzed for this study reveal that rural residents, on average, will not be affected in any significant way by a road usage charge—financially, behaviorally, or technologically.

What follows in this report is a summary of the research methodology (Chapter 2), analysis of the results (Chapter 3), brief discussion of key road usage charging impacts (Chapter 4), and conclusions (Chapter 5).

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<sup>1</sup> Survey participants were prompted to assume that rural drivers drive farther than their urban counterparts. Absent that assumption, the prevailing view may differ.

## Methodology

The methodology for conducting this research consisted of three basic steps, summarized as follows.

First, the research team gathered quantitative data from several sources, including:

- ODOT's Driver and Motor Vehicles Services Division (DMV) and Motor Carrier Transportation Division (MCTD) provided vehicle population, fuel efficiency, and new vehicle registration data by county for each of the past three years.
- Data were collected from the Federal Highway Administration (FHWA), ODOT's Transportation Data Section and from the Oregon Association of Counties (OAC), including data about the public road network.
- Finally, travel data were collected from ODOT and FHWA. These figures include vehicle miles of travel for the ODOT-maintained portion of the public road network (excluding county and city roads).

Next, a survey was conducted. The objective of the survey was to determine driving habits, future vehicle purchases, and transportation priorities.

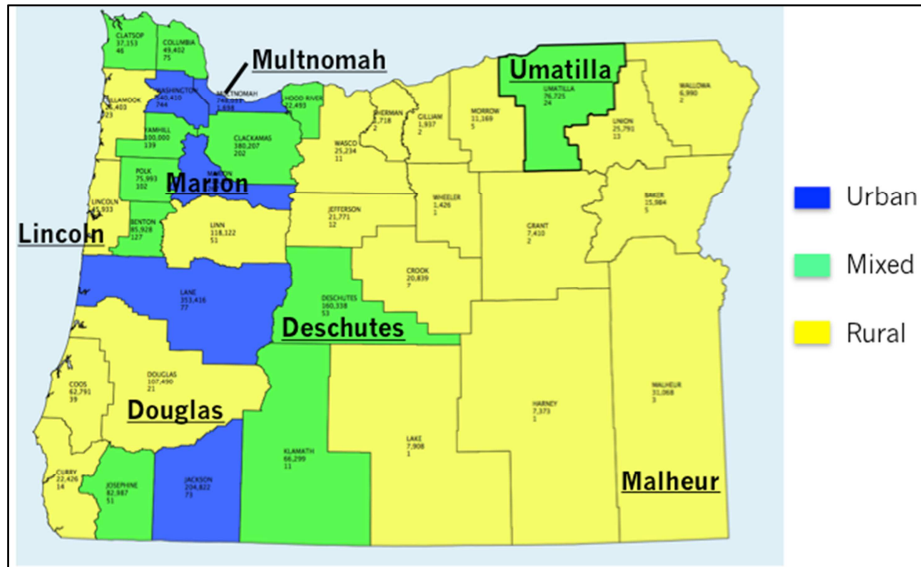
Between September 20 and 25, 2012, DHM Research conducted a telephone survey of 300 residents living in urban, mixed, and rural counties of Oregon. A total of 900 surveys were completed. The survey took an average of 13 minutes to administer. The sample size is sufficient to assess opinions generally, and allows a review by larger subgroups including gender and area. Each area included the following counties:

**Urban:** Multnomah, Marion (150 complete surveys each)

**Mixed:** Deschutes, Umatilla (150 complete surveys each)

**Rural:** Lincoln, Douglas, Malheur (100 complete surveys each)

The image below illustrates Oregon's 36 counties, color-coded by their designation for purposes of this study as urban, mixed, or rural. An analysis of Oregon counties was conducted, resulting in the classification of each county as urban, rural, or mixed. Note that those definitions were customized for this study and do not necessarily align with the lower-resolution categories of "urban" and "rural" employed by FHWA. The seven selected counties are labeled in large font size.



Finally, an integrated analysis of quantitative data and survey results was undertaken. The purpose of the integrated analysis was to cross-reference survey results with quantitative data in order to present a complete picture of the similarities, differences, and issues for urban versus rural residents in Oregon. The analysis is presented in the next chapter.

## Analysis of Urban vs. Rural Issues

The analysis of urban versus rural issues focuses on two areas: behavior and vehicles. In each case, the analysis draws on survey results as well as quantitative data gathered from ODOT and other sources. Each of the focus areas for analysis is summarized below, along with key questions related to each area.

- *Behavior.* The purpose of this analysis is to understand urban versus rural residents with respect to the following behaviors.
  - Driving Patterns. How do the driving patterns of urban and rural residents differ?
  - Technology. How do access to, familiarity with, and level of comfort using technology differ across urban and rural residents?
  - Beliefs. Do urban and rural residents hold distinct beliefs regarding transportation priorities, including taxation, and fairness of road usage charges?
- *Vehicles.* The purpose of this analysis is to discern vehicle purchasing patterns across urban and rural residents, including past, current, and future purchases.

### Behavior

#### Driving Patterns

According to the latest available data from the Federal Highway Administration, just over 120,000 lane-miles of public roads handled 33.8 billion vehicle miles of travel in Oregon during the year 2010. The following tables break down the infrastructure and travel by road classification and location.

Lane-Miles of Public Roadways in Oregon

Road Classification	Lane-Miles of Road			Rural as a % of Total
	Rural	Urban	Total	
Interstates	2,259	867	3,126	72%
Other Freeways and Expressways	0	253	253	0%
Other Principal Arterials	6,353	2,413	8,766	72%
Minor Arterials	4,860	2,621	7,481	65%
Major Collectors	16,790	3,827	20,617	81%
Minor Collectors	14,827	0	14,827	100%
Local Roads	49,432	17,744	67,176	74%
Total	94,521	27,725	122,246	77%

Source: FHWA Highway Statistics, 2010

**Vehicle Miles of Travel on Public Roadways in Oregon**

Road Classification	Vehicle Miles of Travel (millions)			Rural as a % of Total
	Rural	Urban	Total	
Interstates	4,243	4,511	8,754	48%
Other Freeways and Expressways	-	1,335	1,335	0%
Other Principal Arterials	4,470	4,784	9,254	48%
Minor Arterials	2,058	3,719	5,777	36%
Major Collectors	2,048	2,278	4,326	47%
Minor Collectors	595	-	595	100%
Local Roads	1,515	2,216	3,731	41%
Total	14,931	18,843	33,774	44%

Source: FHWA Highway Statistics, 2010

Although rural areas contain nearly 80% of road infrastructure by lane-miles, they account for only about 44% of vehicle miles of travel in Oregon. Many of those miles are pass-through traffic by urban residents, out-of-state residents, and trucks. Please note that FHWA’s definitions of urban and rural do not align with the definitions used in the remainder of this report. The above tables are provided for context only.

Survey results provided the following self-reported individual information. Overall, Oregon residents reported driving just fewer than 13,000 miles per year, on average, in their principal vehicle. As the following table shows, residents of “mixed” counties reported driving the most at just fewer than 14,000 miles. Interestingly, residents of rural counties reported driving fewer miles than their urban counterparts by over 300 miles.

**Average Annual Miles Driven By Household’s Principal Vehicle**

Response Category	Mean
Total	12,962
Urban	12,843
Mixed	13,865
Rural	12,511

Source: DHM Research, October 2012

These results run contrary to common perceptions. On a *per-trip* basis, rural county residents do tend to travel farther than their urban counterparts, as shown in the table below. For all categories of trips surveyed, rural residents travel farther than residents of mixed counties, and residents of mixed counties travel farther than residents of urban counties.

**Average One-Way Miles Driven For Various Trip Purposes**

Trip Purpose	Urban	Mixed	Rural
Medical appointments	8.8	18.4	24.0
Clothes shopping	7.9	16.4	22.5
Work or school	11.1	15.1	16.0
Grocery shopping	4.0	9.1	14.8
Restaurants	5.3	7.9	11.6

Source: DHM Research, October 2012

However, the higher distance traveled by rural county residents for typical trips is offset by the lower frequencies of such trips. The table below summarizes trip purposes by frequency for residents of urban, mixed, and rural counties. These lower trip frequencies

account for the approximately equal total annual vehicle mileage for urban and rural households, despite longer individual trip distances in rural counties.

#### Trip Frequency by Trip Purpose and County Type

Trip Purpose	Weekly			Monthly			Less frequent than monthly		
	Urban	Mixed	Rural	Urban	Mixed	Rural	Urban	Mixed	Rural
Medical appointments	11%	8%	10%	25%	28%	24%	64%	64%	66%
Clothes shopping	14%	13%	14%	42%	40%	33%	44%	47%	53%
Work or school	61%	59%	49%	n/a	n/a	n/a	n/a	n/a	n/a
Grocery shopping	82%	79%	73%	12%	17%	20%	6%	4%	7%
Restaurants	47%	39%	30%	29%	32%	36%	24%	29%	34%

Source: DHM Research, October 2012

Finally, when accounting for miles driven on Oregon public roads only, rural residents report significantly fewer miles than their urban counterparts. Whether deducting for out-of-state or off-road miles, rural residents in the aggregate tend to drive slightly fewer miles.

#### Miles Driven By County Type

County Type	Total miles driven (B + C)	B. Miles off road	C. Total on-road miles	D. Miles driven out-of-state	Total miles on Oregon public roads (C - D)
Urban	12,843	721	12,122	765	11,357
Mixed	13,865	1,077	12,788	1,495	11,293
Rural	12,511	1,090	11,421	1,939	9,482

Source: DHM Research, October 2012

For households with more than one vehicle, the previously described trends regarding total mileage, out-of-state travel, and off-road travel hold true for both the principal and secondary vehicles across the three types of counties.

These self-reported figures come with a caveat. Miles driven out-of-state are a function of the location of the seven counties surveyed relative to Oregon's borders with Washington, California, Idaho, and Nevada. For each category surveyed (urban, mixed, rural), there was a "border" county and a "landlocked" county, so the relative influence of border proximity on out-of-state traffic was similar in all three categories.

The table below summarizes the distribution of self-reported mileage across counties based on their locations relative to Oregon borders.

#### Miles Driven By Location and County Type

County Type	Total miles driven	Miles driven out-of-state	Total miles driven in Oregon
Urban Landlocked	12,090	663	11,427
Mixed Landlocked	12,773	1,035	11,738
Rural Landlocked	11,467	667	10,800
Urban Border	12,906	907	11,999
Mixed Border	14,953	1,982	12,971
Rural Border	14,608	4,576	10,032

Source: DHM Research, October 2012

To summarize, although residents of rural counties typically must drive longer distances per trip, their total mileage on an annual basis is on par with or even below that of residents of urban and mixed counties. Based on self-reported survey results that take into account off-road driving and out-of-state travel, we observe that households in rural counties, on average, drive significantly fewer miles on Oregon public roads than other Oregon households.

## Technology

Another area of distinction between urban and rural households is their behavior and attitudes regarding technology. Specifically, we measured access to and comfort with advanced technologies such as the Internet, e-commerce, and smartphones. These technologies increasingly play a role in transportation policy and road usage charging in particular.

Based on the survey results, not surprisingly, urban residents have higher levels of access to the Internet and higher adoption rates of smartphones than residents of mixed and rural areas. However, for those that do have access to the Internet, usage rates are fairly similar. The table below summarizes differences.

**Access to the Internet, Internet Usage, and Smartphone Adoption Rates**

County Type	Internet access at home	Of those with access, percent that use the Internet daily	One or more smartphones in household
Urban	91%	80%	54%
Mixed	86%	80%	50%
Rural	76%	73%	35%

Source: DHM Research, October 2012

Despite the relatively high numbers for Internet access across all counties and the penetration of smartphones, the level of comfort with technology lags for rural residents, compared with urban and mixed residents, as shown in the table below.

**Level of Comfort with Technology such as the Internet, E-commerce, and Smartphones**

County Type	Very comfortable	Somewhat comfortable	Not too comfortable	Not comfortable	Don't know
Urban	20%	42%	25%	10%	3%
Mixed	18%	40%	29%	11%	2%
Rural	17%	30%	28%	21%	4%

Source: DHM Research, October 2012

The data, however, do not suggest a significant technology gap that would adversely impact road usage charging, given the range of technological choices that would be available for all Oregonians under the program.

## Beliefs

Finally, we measured beliefs as an indicator of behavioral differences among urban and rural households, including public priorities, beliefs about fairness, and more specifically beliefs about the relative fairness of road usage charging.



First, there is only a very modest difference in views about the relative importance of transportation. In urban and mixed areas, households rank transportation issues fourth out of five, with the economy, healthcare, and education all drawing higher rankings. Only the environment ranks lower. In rural areas, transportation scored slightly higher, edging out education as the third most important issue out of the five surveyed.

**Relative Importance of Various Issues [Rank (Average Score out of 10)]**

Issue	Urban	Mixed	Rural
Economy and jobs	1 (8.1)	1 (8.1)	1 (8.2)
Cost of healthcare	2 (7.7)	2 (7.7)	2 (7.8)
Quality of K-12 education	3 (7.6)	3 (7.7)	4 (7.3)
Transportation, including congestion & gas prices	4 (7.2)	4 (7.0)	3 (7.5)
Environment	5 (7.0)	5 (6.2)	5 (6.4)

Source: DHM Research, October 2012

Within transportation specifically, households in all areas again tended to have similar priorities. The only notable difference is that urban residents tend to rank “reduce congestion” much more highly than mixed or rural residents. The top two priorities across all counties were: (1) “maintain roads and highways” and (2) “develop a sustainable way to fund transport without raising gas taxes or vehicle registration fees.”

**Transportation Issues – Percent Ranking Issues as “Urgent” or “High” Priority**

Issue	Urban	Mixed	Rural
Maintain roads and highways	57%	55%	51%
Develop a sustainable way to fund transport	49%	55%	50%
Improve safety	46%	44%	41%
Use technology to improve transportation efficiency	34%	35%	29%
Reduce congestion and improve traffic flow	41%	24%	23%

Source: DHM Research, October 2012

Interestingly, the biggest differences in beliefs between urban and rural residents emerged when asking about the urgency of improvements. Urban residents tend to believe in making improvements now: 55% of urban residents agreed that “we have transportation projects in our state that need fixing now,” whereas only 44% advocated waiting until the economy gets better to make transportation improvements. In mixed and rural counties, on the other hand, the numbers were reversed, with under 40% favoring projects now and 57% advocating waiting until the economy gets better.

Urban and rural residents also tend to hold distinct views about fairness of road funding. When asked to compare the fairness of road usage charging to the current system of gas taxes, a majority characterized road usage charging as either “more fair” or “about the same” in all areas, although the margin is much smaller in mixed and rural counties than in urban areas.

**Fairness of Road Usage Charging Relative to Gas Taxes**

County Type	More fair	About the same	Less fair	Did not respond
Urban	20%	38%	31%	11%
Mixed	11%	34%	49%	6%
Rural	13%	36%	40%	11%

Source: DHM Research, October 2012

Road usage charges are widely viewed as less fair than gas taxes specifically when applied to residents of rural areas. This view is consistent across all types of counties. However, it should be noted that survey participants were prompted to assume that rural drivers tend to driver longer distances than other drivers. If survey participants had been told that, in fact, rural residents drive fewer aggregate miles than others, their views would have likely changed.

**Fairness of Road Usage Charging for Rural Drivers Relative to Gas Taxes**

County Type	More fair	About the same	Less fair	Did not respond
Urban	9%	37%	50%	4%
Mixed	3%	28%	63%	6%
Rural	6%	30%	57%	7%

Source: DHM Research, October 2012

**Vehicles**

According to ODOT records, there were over 3.2 million light passenger vehicles and over 40,000 heavy vehicles registered in Oregon in 2011. This analysis focuses on light passenger vehicles. The table below summarizes light passenger vehicle registrations by county, including “efficient” vehicles, which are defined here as electric vehicles, plug-in hybrid electric vehicles, and hybrid vehicles.

**Light Passenger Vehicle Registrations in Oregon, 2011**

County	Classification	Population	Registered Passenger Vehicles	Efficient Vehicles <sup>2</sup>	Efficient Vehicles per 1000
Baker	Rural	15,984	17,300	15	0.87
Benton	Mixed	85,928	64,664	235	3.63
Clackamas	Mixed	380,207	328,456	926	2.82
Clatsop	Mixed	37,153	35,231	85	2.41
Columbia	Mixed	49,402	50,834	80	1.57
Coos	Rural	62,791	58,444	94	1.61
Crook	Rural	20,839	22,401	26	1.16
Curry	Rural	22,426	23,302	49	2.10
Deschutes	Mixed	160,338	156,021	289	1.85
Douglas	Rural	107,490	104,815	133	1.27
Gilliam	Rural	1,937	2,394	5	2.09
Grant	Rural	7,410	8,348	8	0.96
Harney	Rural	7,373	8,049	2	0.25
Hood River	Rural	22,493	24,120	41	1.70
Jackson	Urban	204,822	180,033	325	1.81
Jefferson	Rural	21,771	20,260	17	0.84
Josephine	Mixed	82,987	82,864	130	1.57
Klamath	Mixed	66,299	64,696	67	1.04
Lake	Rural	7,908	9,002	4	0.44
Lane	Urban	353,416	287,975	740	2.57
Lincoln	Rural	45,933	43,438	114	2.62
Linn	Rural	118,122	105,612	139	1.32
Malheur	Rural	31,068	26,924	23	0.85
Marion	Mixed	318,872	252,056	475	1.88
Morrow	Mixed	11,169	11,675	10	0.86
Multnomah	Urban	748,031	534,634	1,996	3.73
Polk	Mixed	75,993	61,507	161	2.62
Sherman	Rural	1,718	2,469	3	1.22
Tillamook	Rural	25,403	25,990	43	1.65
Umatilla	Mixed	76,725	69,479	81	1.17
Union	Mixed	25,791	24,643	33	1.34
Wallowa	Rural	6,990	8,288	4	0.48
Wasco	Rural	25,234	25,207	36	1.43
Washington	Urban	540,410	414,325	1,362	3.29
Wheeler	Rural	1,426	1,733	2	1.15
Yamhill	Mixed	100,000	84,701	182	2.15
Totals		3,871,859	3,241,890	7,935	2.45

Source: DMV, 2012

<sup>2</sup> For purposes of this study, "efficient vehicles" are defined as electric vehicles, plug-in hybrid electric vehicles, and hybrid vehicles.

The next table summarizes average fuel efficiency of vehicles in 2011 as well as the change in average fuel efficiency between 2009 and 2011 for each county.

**Light Passenger Vehicle Fuel Efficiency, 2009-2011**

County	Classification	Average efficiency, 2011 (MPG)	Change in fuel efficiency, 2009-2011 (MPG)
Baker	Rural	19.65	-0.06
Benton	Mixed	22.48	0.1
Clackamas	Mixed	21.55	0.09
Clatsop	Mixed	21.15	0.1
Columbia	Mixed	21.28	0.02
Coos	Rural	20.74	0.01
Crook	Rural	19.73	0.01
Curry	Rural	20.64	0
Deschutes	Mixed	20.44	0.11
Douglas	Rural	20.97	-0.02
Gilliam	Rural	19.84	-0.1
Grant	Rural	19.25	-0.09
Harney	Rural	18.84	-0.09
Hood River	Rural	21.42	0.01
Jackson	Urban	21.36	0.05
Jefferson	Rural	20.20	-0.03
Josephine	Mixed	21.16	0.01
Klamath	Mixed	20.03	-0.05
Lake	Rural	18.82	-0.15
Lane	Urban	21.83	0.08
Lincoln	Rural	21.37	0.02
Linn	Rural	21.18	0.03
Malheur	Rural	20.13	-0.14
Marion	Mixed	21.62	0.07
Morrow	Mixed	20.38	-0.1
Multnomah	Urban	22.79	0.16
Polk	Mixed	21.65	0.08
Sherman	Rural	20.03	-0.06
Tillamook	Rural	20.62	0.03
Umatilla	Mixed	20.61	-0.08
Union	Mixed	20.08	-0.05
Wallowa	Rural	19.28	-0.12
Wasco	Rural	20.97	-0.06
Washington	Urban	22.33	0.11
Wheeler	Rural	19.27	-0.15
Yamhill	Mixed	21.44	0.05
Totals		21.61	0.07

Source: DMV, 2012

Finally, the table below summarizes the number of efficient vehicles, efficient vehicles per 1000, average fuel efficiency, and change in fuel efficiency 2009-2011, all by county classification.

**Efficient Vehicles, Overall Average Fleet Fuel Efficiency (2011), and Change in Fuel Efficiency (2009-2011) By County Classification**

County Classification	Efficient vehicles purchased in 2011	Efficient vehicles per 100 new registrations, 2011	Efficient vehicles per 1000, 2011	Average efficiency, 2011 (MPG)	Change in fuel efficiency, 2009-2011 (MPG)
Urban	2,629	6.02	3.12	22.28	0.12
Mixed	1,557	4.81	2.14	21.26	0.06
Rural	377	3.32	1.41	20.71	(0.01)
Total	4,563	5.45	2.45	21.61	0.07

Source: DMV, 2012

What these data reveal is that residents of rural counties tend to drive less fuel-efficient vehicles than their urban and mixed counterparts. Moreover, since 2009, the average fuel efficiency of vehicles registered in rural counties has actually declined slightly, while fuel efficiency has increased in urban and mixed counties.

As the fleet forecast task demonstrated,<sup>3</sup> fuel efficiency is likely to continue to increase overall. However, based on our survey findings, there are differences among urban and rural residents. The tables below summarize some key findings from the survey.

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<sup>3</sup> cf. Fleet Forecast Final Report

**Next Vehicle Purchase: When?**

Time Frame	Urban	Mixed	Rural
-5 years	28%	25%	22%
5+ years	32%	40%	35%
Don't know	13%	13%	20%

Source: DHM Research, October 2012

**Next Vehicle Purchase: Used Vs. New?**

Type of Vehicle	Urban	Mixed	Rural
New	34%	32%	28%
Used	53%	57%	58%
Don't know	13%	11%	13%

Source: DHM Research, October 2012

**Next Vehicle Purchase: What is the Most Important Factor?**

Most Important Factor	Urban	Mixed	Rural
Fuel efficiency	43%	32%	40%
Price	20%	23%	20%
Safety	17%	21%	19%
Performance	14%	18%	16%
Did not respond	6%	6%	5%

Source: DHM Research, October 2012

**Next Vehicle Purchase: Will You Consider an Electric or Hybrid Vehicle?**

Type of Vehicle	Urban	Mixed	Rural
Consider Electric	29%	15%	17%
Consider Hybrid	41%	29%	30%

Source: DHM Research, October 2012

These survey results show that although their specific preferences differ, residents across all counties are roughly on the same time frame for their next vehicle purchase, with about a quarter intending to make a new purchase in the next two years. Moreover, fuel efficiency ranks as the single most important factor in the next vehicle purchase across all counties, even more important than price and safety. However, urban residents are much more likely than mixed or rural residents to consider purchasing an electric or hybrid vehicle.

## **Summary of Analysis of Urban vs. Rural Issues**

In summary, the analysis of urban, rural and mixed counties focused on two key areas: behaviors and vehicles. The results of the analysis show that rural motorists drive more miles than urban motorists, but less often, so they are not disproportionately affected. Rural county residents are less likely to own vehicles that will likely be subject to road usage charges and less likely to buy them in the future than their counterparts in urban counties.





## Urban vs. Rural Impacts of Road Usage Charges

Road usage charges would have distinct impacts on rural, mixed, and urban residents. In this section, we briefly summarize the financial and technological impacts, based on the preceding analysis.

### Financial Impacts

The proposed road usage charging policy in Oregon is aimed at highly fuel-efficient vehicles, namely, those with EPA-rated fuel economy of 55 miles per gallon or better. Based on the existing vehicle fleet and future purchasing preferences and factors expressed in the survey, the road usage charge will apply disproportionately to urban residents both at the outset and in the short and medium terms. For those rural residents who are affected by the policy, the relative financial impact on them will be smaller than for urban residents because they tend to relatively drive shorter distances on public roads.

*Urban example, average vehicle in good driving conditions.* At 1.56 cents per mile, an urban motorist driving a subject vehicle the self-reported average of 12,843 miles per year will encounter an annual road usage charge bill of \$200. If the motorist opted to receive offsets for mileage traveled out of state and off public roads, the bill would be \$189. A comparable motorist, driving a vehicle with the average fuel economy for an urban area of 22.28 miles per gallon (per DMV data), would pay \$173 in gas taxes. In this example, the 55 MPG+ motorist would pay about \$16-27 more per year under a road usage charge than the motorist with an average vehicle paying a fuel tax.

*Urban example, average vehicle in congested conditions.* Consider the same case described above, but due to poor urban driving conditions (e.g., slow, urban speeds, frequent stops due to signalized intersections, and traffic congestion), the motorist would average closer to 16 miles per gallon and pay \$240 in gas taxes. In this example, the motorist with a 55+ MPG vehicle would pay about \$40-50 less per year under a road usage charge than under a fuel tax with an average vehicle.

*Rural example, average vehicle in good driving conditions.* A rural motorist driving the self-reported average of 12,511 miles per year in a 55+ MPG vehicle would encounter a road usage charge bill of \$195, or \$178 if taking advantage of offsets for off-road and out-of-state mileage. The same motorist, driving a vehicle with average fuel economy for a rural area of 20.71 miles per gallon, would pay \$181 in fuel taxes. In this example, the motorist would pay anywhere from \$3 less to \$14 more per year under a road usage charge in a 55+ MPG vehicle than under a fuel tax with an average vehicle.

*Rural example, average vehicle in good driving conditions.* Consider the same case described above, but due to better rural driving conditions (e.g., free-flow speeds, infrequent stops, little congestion), the motorist would average closer to 24 miles per gallon and pay \$156 in gas taxes. In this example, the motorist would pay about \$20-40 *more* per year under a road usage charge with a 55+ MPG than under a fuel tax with an average vehicle.

Given the likelihood of rural drivers to encounter relatively smoother driving conditions than urban drivers, it is likely that the average rural motorist on a road usage charge would actually pay more, while an urban motorist would pay less, relative to the amounts they currently pay under the fuel tax. This is because the rural vehicle, despite having lower fuel efficiency ratings, will be driving more efficiently than urban vehicles. However, the differences from the status quo are relatively modest at less than \$50 per vehicle per year.

### **Technological Impacts**

The current proposed road usage charge policy allows for a wide range of mileage reporting options for motorist compliance, ranging from flat annual payments to monthly paper statements to automated Internet payments. Mileage can be counted in a number of ways, including manually by the owner or automatically using either basic or advanced in-vehicle devices that may even feature a connection to a smartphone. In the future, the possibility exists that motorists will have access to automated mileage counting devices already built into the vehicles. As a result of this array of choices, there are no foreseeable technological barriers that disproportionately impact rural or urban motorists.

## Conclusions

This analysis of the impacts of a road usage charge in Oregon on urban versus rural residents has considered data obtained through a telephone survey of 900 Oregon residents; data provided by ODOT, including DMV, the Transportation Data Section, Motor Carrier Transportation Division, and others; and data collected from FHWA's Highway Statistics.

The study has combined quantitative and survey analysis of the available data to answer questions about the relative impacts of a road usage charge on residents of urban, mixed, and rural counties. Several conclusions of this study worth highlighting include:

- Technology
  - Oregon residents have fundamentally similar tastes, experiences, and capabilities with regard to technology, regardless of their location.
  - The proposed road usage charge provides a range of technology options such that there is no class of users that will be particularly disadvantaged by the system.
- Behavior
  - Based on self-reported mileage, there is no significant difference in the distance driven per year between urban and rural residents.
  - Although rural residents tend to drive longer distances for typical errands such as grocery or clothes shopping, school, and medical appointments, they also tend to engage in such trips less frequently than their urban counterparts.
  - When looking strictly at miles driven on Oregon public roads, rural households drive significantly fewer miles than their counterparts in urban areas.
- Vehicles
  - Based on data from ODOT's Driver and Motor Vehicle Services Division (DMV), rural residents tend to drive less fuel-efficient vehicles than their urban counterparts. On the other hand, they tend to drive in conditions conducive to better fuel efficiency.
  - However, based on survey results, a majority of Oregonians view road usage charging as less fair to rural residents.
  - Urban residents are far more likely to drive highly fuel efficient vehicles today and more likely to purchase highly fuel efficient vehicles in the near future than their counterparts in mixed or rural counties.

- Financial impacts
  - Rural residents generally will fare better relative to their urban counterparts under a road usage charge because they drive, in aggregate, fewer miles. They also have the opportunity to offset their road usage charge bill by subtracting off-road and out-of-state miles, which they report driving more than urban residents.

Despite perceptions that a road usage charge is unfair to rural residents, the data collected and analyzed for this study reveal that rural residents, on average, will not be affected adversely in any significant way by a road usage charge—financially, behaviorally, or technologically. First, the proposed policy preserves the urban vs. rural equity arrangement of the current system of funding the Oregon State transportation system. Secondly, the intent to recover costs from highly fuel-efficient vehicles at a rate of 1.56 cents per mile is unlikely to influence vehicle purchasing habits or driving habits of rural residents. Finally, the range of technology choices envisioned for the system provides suitable solutions that can be familiar, comfortable, and convenient for all Oregon road users, regardless of where they live.

## Appendix A: Survey Questions

Hi, my name is \_\_\_ and I'm calling about quality of life issues in your community. I'm with an opinion research firm in Oregon. May I speak with (ask for voter on list)? (If not available, schedule callback.)

I'd like to read a list of issues facing the state. Using a scale of 0 to 10, where 0 means that you are not at all concerned, and 10 means you are very concerned, please rate the following issues. You can use any number between 0 and 10. (Randomize)

1. Economy and jobs
2. Transportation issues including congestion and the price of gas
3. Quality of K-12 education
4. Cost of healthcare
5. Environment

Here are some transportation issues facing communities across Oregon. Do you consider each issue as an urgent priority for the state to address, a high priority but not urgent, a medium priority, or a low priority? (Randomize)

6. Develop a sustainable way to fund transportation improvements besides raising gas taxes and vehicle registration fees
7. Use technology to increase efficiencies in the transportation system
8. Improve safety on roads and highways
9. Reduce congestion and improve traffic flow
10. Maintain roads and highways
11. Which one of these two statements comes closer to your view? (Rotate)
  - a. We have transportation projects in our state that need fixing now.
  - b. Transportation needs in our state can wait until the economy gets better.
12. Transportation improvements are mostly funded through a tax on gasoline. One idea is to eliminate the tax on gasoline and replace it with a tax on miles driven. Do you believe paying a road usage tax based on the total miles you drive would be more fair, less fair, or about the same as paying a tax on gasoline?
13. What about for residents in rural areas or small towns who often drive long distances? Do you believe paying a road usage tax based on the total miles driven would be more fair, less fair, or about the same as paying a tax on gasoline?

Please tell me if you do each of the following every week, about once a month, every 2-3 months, or few times a year. Let me know if you rarely or never do these activities. (Randomize)

14. Shop for clothes and other personal items
15. Shop for groceries and household items
16. Go to medical appointments
17. Go to restaurants
18. Go to work or to school if you're a fulltime student

(If few times a year or more) On average, how many miles do you drive one-way to: (Randomize)

19. Shop for clothes and other personal items
20. Shop for groceries and household items
21. Go to medical appointments
22. Go to restaurants
23. Go to work or to school if you're a fulltime student
  
24. How many vehicles does your household currently own?  
(If 0, skip)
  
25. (Vehicle #1) Thinking about the vehicle that you drive the most, what year is that vehicle?
  
26. Is it a car, light truck, or SUV?
  
27. Roughly how many miles does it get to the gallon?
  
28. Do you most often use that vehicle for everyday driving, mostly for recreation, or mostly for work related activities including getting to work? (Volunteered: all of the above)
  
29. How many total miles do you put on this vehicle in one year?
  
30. About how many total miles do you drive outside of Oregon in a year in this vehicle? Your best guess is fine.
  
31. About how many miles do you drive this vehicle off public roads?
  
32. (Vehicle #2) What year is your next most used vehicle?
  
33. Is it a car, light truck, or SUV?
  
34. About how many miles does it get to the gallon?
  
35. Do you most often use that vehicle for everyday driving, mostly for recreation, or mostly for work related activities including commuting? (Volunteered: all of the above)

36. How many total miles do you put on this vehicle in one year?
37. About how many total miles do you drive outside of Oregon in a year in this vehicle? Your best guess is fine.
38. About how many miles do you drive this vehicle off public roads?
39. When do you or any member of your household expect to purchase your next vehicle? (Read list)
  - a. Within the next year
  - b. 1-2 years
  - c. 2-5 years
  - d. More than 5 years from now
40. Are you likely to look for a new or used vehicle?
41. Please consider the importance of these factors in your next vehicle. You may have other priorities but please consider the importance of the following list. Is your most important:
  - a. Price
  - b. Safety
  - c. Fuel efficiency / miles per gallon
  - d. Performance

42. What's your least important?

(Rotate 43 & 44)

43. How likely are you to consider purchasing or leasing an electric vehicle over the next five years – very likely, somewhat likely, not too likely, or not at all likely?
44. How likely are you to consider purchasing or leasing a hybrid vehicle over the next five years – very likely, somewhat likely, not too likely, or not at all likely?
45. Here are four statements. Please tell me which one of these statements comes closer to how you feel about technology such as the Internet, online shopping, smartphones and apps, and in-vehicle entertainment and navigation systems.
  - a. I'm very comfortable with technology and may consider myself an early adopter.
  - b. I'm pretty comfortable with technology but I wouldn't say I'm an early adopter. I like to wait until things become more main stream.
  - c. I'm ok with technology because I have to use it but I prefer not to have too much of it.
  - d. Technology and I don't always get along. I prefer not to use technology if I can.
46. How often do you use the internet at home – daily, several times a week but not every day, about once a week, several times a month, or you rarely use the internet at home?
47. How many smartphones does your household own?

These last few questions make sure we have a valid sample. It's important we collect an answer to each question. All of your responses are confidential and cannot identify you in any way.

48. In which year were you born?
49. How long have you lived in Oregon?
50. What is your total household size?
51. Is your total household income before taxes between:
52. Which of the following best describes your working status?
  - a. Working full-time
  - b. Working part-time
  - c. Not working, looking for work, or in-between jobs
  - d. Retired
  - e. Student
  - f. Homemaker
  - g. Other
53. Is your ethnicity:
54. (DO NOT ASK) Record gender
55. (FROM SAMPLE) Record city
56. (FROM SAMPLE) Record county