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Highway Cost Allocation Study

The Oregon Highway Cost Allocation Study

Carl Batten and Sarah Dammen, **ECONorthwest**

Highway Cost Allocation in Oregon

- First study in 1937; 17 studies so far
- Since 1999, State Constitution has required a study every two years, and adjustment of revenue sources if found necessary
- Are the shares of revenues paid by light and heavy vehicles fair and proportionate to their shares of costs?

Highway Cost Allocation in Oregon

- Study Review Team reviews methods, data, and results, and discusses issues
  - Eleven members, chaired by State Economist
    - Doug Anderson, Metro
    - Doug Benzon, Idaho Department of Transportation
    - Jerri Bohard, Oregon Department of Transportation
    - John Gallup, Portland State University
    - Mazen Malik, Oregon Legislative Revenue Office
    - Mike McArthur, Association of Oregon Counties
    - Timothy Morgan, AAA Oregon
    - Don Negri, Willamette University
    - Jon Oshel, Association of Oregon Counties
    - Tom Potiowsky, Chair, State Economist
    - Bob Russell, Oregon Trucking Associations

What is Highway Cost Allocation?

Do various classes of highway users pay user fees in proportion to the costs they impose on the highway system?

- Define user classes
- Allocate costs to user classes
- Attribute revenues to user classes
- Calculate equity ratios
  - Share of revenue / Share of cost

Two approaches for 2011

- Traditional approach
  - Budgeted expenditures are assumed to represent costs and are allocated out to vehicle classes
- Efficient-fee approach
  - Costs imposed by each vehicle class are estimated directly—not tied to expenditures in any particular biennium
- Revenue attribution is the same

Oregon's Traditional Approach

- Costs to allocate are expenditures over upcoming biennium
- Expenditures of federal funds are included (because they are interchangeable)
- Expenditures by local governments of state funds are included
- Expenditures by local governments of federal and some own-source funds also are included (interchangeability and accountability)
- Chapter 2 of Traditional Report describes structure

Efficient-Fee Approach

- Wear and tear charges based on vehicle weight and configuration and on the characteristics of roads and bridges
- Congestion charges based on amount of cost imposed on other users
  - Vary by road segment and time of day
- Emissions charges based on amount of emissions
  - Vary with weight, speed, fuel, and location

Results of 2011 Studies

- Traditional approach
  - Light vehicle equity ratio: 0.9954
  - Heavy vehicle equity ratio: 1.0089
- Efficient-fee approach
  - Light vehicle equity ratio: 0.9873
  - Heavy vehicle equity ratio: 1.0253

Heavy Vehicles

- Vehicles between 10,001 and 26,000 pounds are overpaying
- Most vehicles between 26,001 and 78,000 pounds are underpaying
- Vehicles between 78,001 and 80,000 pounds are overpaying (1.26 equity ratio). This class accounts for 44% of heavy vehicle miles traveled.
- Most vehicles over 80,000 pounds are underpaying
- Road Use Assessment Fee Vehicles are underpaying (0.48 equity ratio)
- Full details are provided in Chapter 6 of Traditional Report

Recommendations

- No changes to rates are necessary for light-heavy fairness and proportionality
- Chapter 7 of Traditional Report describes revenue-neutral changes to rate structures that would improve equity within heavy vehicles.
  - Flatter Table "A" rate structure (28,000 lbs go from 4.98 to 10.26 cents per mile; 80,000 lbs go from 16.38 to 11.91 cents per mile)
  - Higher Table "B" rates (for example, 105,500 lbs, 7 axles go from 18.11 to 29.39 cents per mile)
  - Higher Road Use Assessment Fees (7.1 to 14.8 cents per ESAL-mile)

2011 Efficient-Fee Study

- Each vehicle would pay a fee for each mile it travels
- Fee consists of five components
  - Congestion charge based on cost of delay imposed on others
  - Wear and tear charge for roads
  - Wear and tear charge for bridges
  - Emissions charge
  - Charge for administrative and other costs
- We estimate the share of efficient-fee charges that would be paid by each vehicle class and call that their share of costs
- We then compare those shares of costs to shares of revenue under current-law instruments and rates

Efficient Congestion Charge

- Determined by cost of delay imposed on others
- Varies with volume and capacity; we assume dynamic pricing
- Since the fee won't actually be charged, we use current volumes to determine shares of cost
- We scale congestion-fee revenues to add up to revenue that would be generated if efficient fees were charged
- Congestion charge would generate $209.5 million of annual revenue (13.4% of total)
- Light vehicles would pay 96% of the congestion charges

Efficient Wear and Tear Charge

- Determined by cost of preservation and maintenance imposed on system
- Varies with weight and configuration of vehicle and with strength and condition of road or bridge
- Wear and tear charges would generate $453.0 million for roads and $163.3 million for bridges, or $616.3 million of annual revenue (39.5% of total)
- Light vehicles would pay 34.2% of road charges and 44.8% of bridge charges, or 37.0% of all wear and tear charges

Efficient Emissions Charge

- Determined by cost that emissions impose on everyone
- Best charged per unit of fuel, rather than per mile
- Emissions charges would generate $493.6 million of annual revenue (31.7% of total)
- Light vehicles would pay 66.6% of emissions charges
- Emissions charges paid by highway users could be used to offset administrative and other costs; we assume that they will be. Remaining administrative and other costs require additional annual revenue of $239.3 million (15.4% of total)
- Light vehicles would pay 93% of a VMT charge to recover remaining administrative and other costs

Getting to an Efficient System

- Charge vehicles for the costs they impose at the times and places they travel
  - Highway users will adjust their behavior to best meet their own needs given the costs they impose on everyone
  - When each vehicle is paying for the costs it imposes, there will be no more need for highway cost allocation studies
- Optimal investment in capacity, preservation, and maintenance
  - Highway agencies will adjust their behavior to best meet the needs of highway users
  - Where cost-effective, capacity may be provided by investing in alternative modes
- First step is better data. Need many more functioning traffic counters in Oregon.

Highway Cost Allocation Study

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Highway Cost Allocation in Oregon

- Department of Administrative Services, Office of Economic Analysis contracts for and oversees study
- ECONorthwest, with Roger Mingo, Jack Faucett Associates, Mark Ford, and HDR conducted the 2011 study
- Brian Hedman of the Cadmus Group served as Project Manager
- ODOT staff provided data and technical assistance

Oregon's Traditional Approach

- Expenditures on bond-financed projects are reduced to amount of bond payments that will be made within the biennium (about 16% of expenditures)
- Allocated costs for bond-financed projects are carried forward to future studies until bond is paid off (nine more biennial studies)
- Additional detail in Chapter 3

Alternative-Fee-Paying Vehicles

- Subsidy amount calculated as difference between what they do pay and what they would pay if they paid regular fees
- Subsidy amount is allocated to weight classes as a "cost" in proportion to vehicle miles traveled by full-fee-paying vehicles
- Flat-fee vehicles no longer considered to be subsidized
- Additional detail in Chapter 3

Flat-fee Rates

Rate per 100 pounds per year	Logs (50% empty)	Sand & Gravel	Wood Chips
Current flat-fee rate	$7.59	$7.53	$30.65
Rate to match current WMT	$7.36	$9.23	$23.05
Rate to match recommended WMT	$6.99	$13.01	$32.71

2011 Traditional

Declared Weight			Equity Ratios: Full-Fee Unadjusted	Equity Ratios: Full-Fee Subsidy-Adjusted	Annual VMT: All	Annual VMT: Full-Fee	Annual VMT: Alternative Fee	Annual VMT Shares: All	Annual VMT Shares: Full-Fee	Annual VMT Shares: Alternative Fee
1	to	10,000	1.0029	**0.9954**	35,416,749,479	34,756,643,957	660,105,523	93.0%	93.5%	73.2%
10,001	to	26,000	1.2313	**1.2439**	622,014,193	488,807,967	133,206,226	1.6%	1.3%	14.8%
26,001	to	78,000	0.8190	**0.8301**	373,366,522	275,369,501	97,997,022	1.0%	0.7%	10.9%
78,001	to	80,000	1.2453	**1.2630**	1,169,779,027	1,164,919,723	4,859,304	3.1%	3.1%	0.5%
80,001	to	104,000	0.7004	**0.7114**	232,111,779	230,498,180	1,613,599	0.6%	0.6%	0.2%
104,001	to	105,500	0.6706	**0.6813**	266,176,184	262,743,054	3,433,130	0.7%	0.7%	0.4%
105,501	and	up	0.4693	**0.4776**	3,234,030	3,234,030	0	0.0%	0.0%	0.0%
Total			1.0000	**1.0000**	38,083,431,215	37,182,216,412	901,214,803	100.0%	100.0%	100.0%
10,001	and	up	0.9944	**1.0089**	2,666,681,736	2,425,572,455	241,109,281	7.0%	6.5%	26.8%
26,001	to	80,000	1.1737	**1.1903**	1,543,145,549	1,440,289,224	102,856,326	4.1%	3.9%	11.4%
80,001	to	105,500	0.6836	**0.6945**	498,287,963	493,241,234	5,046,729	1.3%	1.3%	0.6%
26,001	to	105,500	0.9788	**0.9934**	2,041,433,513	1,933,530,458	107,903,055	5.4%	5.2%	12.0%
26,001	and	up	0.9712	**0.9857**	2,044,667,543	1,936,764,488	107,903,055	5.4%	5.2%	12.0%

Declared Weight			Annual Cost Responsibility: State	Federal	Local	Full-Fee Cost	Cost Responsibility Shares: State	Federal	Local	Full-Fee Cost
1	to	10,000	558,874,196	228,517,708	283,403,850	1,050,838,017	68.4%	56.0%	65.4%	65.5%
10,001	to	26,000	24,060,248	17,850,314	23,583,720	49,365,286	2.9%	4.4%	5.4%	3.1%
26,001	to	78,000	26,857,404	15,455,291	23,490,371	50,139,813	3.3%	3.8%	5.4%	3.1%
78,001	to	80,000	120,377,520	77,570,214	51,592,914	248,504,047	14.7%	19.0%	11.9%	15.5%
80,001	to	104,000	39,145,584	29,634,837	17,875,788	86,037,571	4.8%	7.3%	4.1%	5.4%
104,001	to	105,500	45,840,269	37,668,104	29,042,405	111,032,142	5.6%	9.2%	6.7%	6.9%
105,501	and	up	1,564,832	1,436,491	4,542,529	7,541,801	0.2%	0.4%	1.0%	0.5%
Total			816,720,053	408,132,959	433,531,577	1,603,458,677	100.0%	100.0%	100.0%	100.0%
10,001	and	up	257,845,857	179,615,251	150,127,727	552,620,660	31.6%	44.0%	34.6%	34.5%
26,001	to	80,000	147,234,924	93,025,506	75,083,285	298,643,860	18.0%	22.8%	17.3%	18.6%
80,001	to	105,500	84,985,853	67,302,941	46,918,193	197,069,713	10.4%	16.5%	10.8%	12.3%
26,001	to	105,500	232,220,777	160,328,447	122,001,478	495,713,573	28.4%	39.3%	28.1%	30.9%
26,001	and	up	233,785,609	161,764,938	126,544,007	503,255,374	28.6%	39.6%	29.2%	31.4%

Declared Weight			Annual User Fees: All	Full-Fee	Subsidy	Allocated Subsidy	User Fee Shares: All	Full-Fee	Subsidy	Allocated Subsidy
1	to	10,000	742,409,718	734,078,259	5,610,310	26,879,031	65.9%	65.7%	19.5%	93.5%
10,001	to	26,000	45,644,216	42,339,113	9,257,294	378,019	4.1%	3.8%	32.2%	1.3%
26,001	to	78,000	27,297,061	28,601,158	11,067,345	212,957	2.4%	2.6%	38.5%	0.7%
78,001	to	80,000	215,170,591	215,543,485	1,272,004	900,890	19.1%	19.3%	4.4%	3.1%
80,001	to	104,000	41,798,995	41,971,100	466,894	178,256	3.7%	3.8%	1.6%	0.6%
104,001	to	105,500	51,446,130	51,860,017	1,080,998	203,192	4.6%	4.6%	3.8%	0.7%
105,501	and	up	2,465,528	2,465,528	0	2,501	0.2%	0.2%	0.0%	0.0%
Total			1,126,232,238	1,116,858,658	28,754,846	28,754,846	100.0%	100.0%	100.0%	100.0%
10,001	and	up	383,822,520	382,780,399	23,144,535	1,875,815	34.1%	34.3%	80.5%	6.5%
26,001	to	80,000	242,467,652	244,144,642	12,339,350	1,113,847	21.5%	21.9%	42.9%	3.9%
80,001	to	105,500	93,245,125	93,831,117	1,547,892	381,448	8.3%	8.4%	5.4%	1.3%
26,001	to	105,500	335,712,777	337,975,759	13,887,241	1,495,295	29.8%	30.3%	48.3%	5.2%
26,001	and	up	338,178,304	340,441,287	13,887,241	1,497,796	30.0%	30.5%	48.3%	5.2%

2011 Efficient Fee			Annual Congestion Fee	Annual Pavement Fee	Annual Bridge Fee	Annual Common Charge	Annual Emissions Fee	Total Efficient Fees
Declared Weight								
1	to	10,000	201,183,857	155,074,838	73,174,737	222,587,300	385,604,702	1,037,625,434
10,001	to	26,000	2,422,408	29,989,173	10,812,875	3,909,236	16,268,270	63,401,962
26,001	to	78,000	1,321,276	29,107,058	7,648,970	2,346,283	14,306,089	54,729,675
78,001	to	80,000	3,038,427	137,023,626	25,543,554	7,351,826	53,171,052	226,128,485
80,001	to	104,000	659,452	39,133,692	20,618,738	1,458,771	10,993,183	72,863,836
104,001	to	105,500	836,472	55,160,057	25,214,789	1,672,864	13,085,118	95,969,300
105,501	and	up	21,026	7,521,108	325,068	20,313	176,313	8,063,829
Total			209,482,918	453,009,552	163,338,731	239,346,592	493,604,728	1,558,782,521
10,001	and	up	8,299,061	297,934,714	90,163,995	16,759,292	108,000,025	521,157,087
26,001	to	80,000	4,359,704	166,130,683	33,192,524	9,698,108	67,477,141	280,858,160
80,001	to	105,500	1,495,924	94,293,749	45,833,527	3,131,635	24,078,301	168,833,136
26,001	to	105,500	5,855,627	260,424,432	79,026,051	12,829,743	91,555,442	449,691,296
26,001	and	up	5,876,654	267,945,540	79,351,120	12,850,056	91,731,755	457,755,125

			Congestion Fee Shares	Pavement Fee Shares	Bridge Fee Shares	Common Shares	Emissions Fee Shares	Share of Total Efficient Fees	Share of Full-Fee Revenues	Equity Ratio
Declared Weight										
1	to	10,000	96.0%	34.2%	44.8%	93.0%	78.1%	66.6%	65.7%	0.9873
10,001	to	26,000	1.2%	6.6%	6.6%	1.6%	3.3%	4.1%	3.8%	0.9320
26,001	to	78,000	0.6%	6.4%	4.7%	1.0%	2.9%	3.5%	2.6%	0.7293
78,001	to	80,000	1.5%	30.2%	15.6%	3.1%	10.8%	14.5%	19.3%	1.3302
80,001	to	104,000	0.3%	8.6%	12.6%	0.6%	2.2%	4.7%	3.8%	0.8065
104,001	to	105,500	0.4%	12.2%	15.4%	0.7%	2.7%	6.2%	4.6%	0.7537
105,501	and	up	0.0%	1.7%	0.2%	0.0%	0.0%	0.5%	0.2%	0.4267
10,001	and	up	4.0%	65.8%	55.2%	7.0%	21.9%	33.4%	34.3%	1.0253
26,001	to	80,000	2.1%	36.7%	20.3%	4.1%	13.7%	18.0%	21.9%	1.2131
80,001	to	105,500	0.7%	20.8%	28.1%	1.3%	4.9%	10.8%	8.4%	0.7765
26,001	to	105,500	2.8%	57.5%	48.4%	5.4%	18.5%	28.8%	30.3%	1.0492
26,001	and	up	2.8%	59.1%	48.6%	5.4%	18.6%	29.4%	30.5%	1.0382

Cents per Mile			Average Congestion Fee	Average Pavement Fee	Average Bridge Fee	Average Common Charge	Average Emissions Fee	Average Efficient Fees
Declared Weight								
1	to	10,000	0.57	0.44	0.21	0.63	1.09	2.93
10,001	to	26,000	0.39	4.82	1.74	0.63	2.62	10.19
26,001	to	78,000	0.35	7.80	2.05	0.63	3.83	14.66
78,001	to	80,000	0.26	11.71	2.18	0.63	4.55	19.33
80,001	to	104,000	0.28	16.86	8.88	0.63	4.74	31.39
104,001	to	105,500	0.31	20.72	9.47	0.63	4.92	36.05
105,501	and	up	0.65	232.70	10.06	0.63	5.46	249.49
All			0.55	1.19	0.43	0.63	1.30	4.09