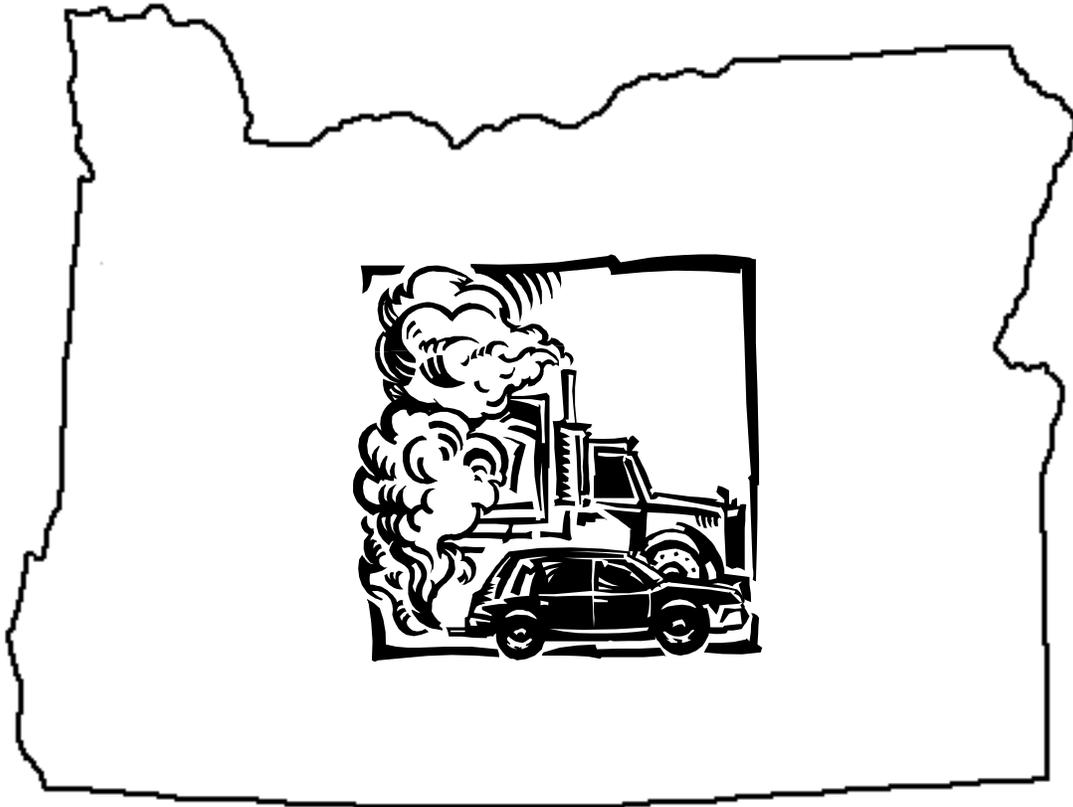


# GOODBYE GRIDLOCK: IMPROVING THE WAY OREGON FUNDS TRANSPORTATION



A Report by the Oregon Environmental Council  
April 2002

# GOODBYE GRIDLOCK: IMPROVING THE WAY OREGON FUNDS TRANSPORTATION

*Goodbye Gridlock* examines how our state, city and local governments raise and spend transportation dollars, and suggests how to make the transportation system more efficient, affordable and environmentally sound by changing how we pay for transportation. This report also recommends investing transportation dollars in cost-effective transportation solutions that provide Oregonians with affordable and convenient travel choices.

By Christine Hagerbaumer

We gratefully acknowledge the support of the Bullitt Foundation, which helped make this project possible, along with contributions from our members across Oregon.

The opinions expressed in this report do not necessarily reflect the view of the supporting foundations and individuals.

We also thank staff at the Oregon DOT, Tri-Met, and City of Portland who promptly responded to our information requests.



Oregon Environmental Council

*Clean air  
Clean water  
Clear thinking*

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## EXECUTIVE SUMMARY

### HOW WE RAISE AND SPEND TRANSPORTATION DOLLARS MATTERS

Oregon is struggling to adequately fund its transportation system, in large part due to rapid growth in driving during the 1980s and 1990s. Oregonians now drive an astounding 33 billion miles every year.<sup>1</sup> But revenues haven't kept pace with needs, and this mobility comes at a price: heavy wear and tear on our roads, congestion, and serious environmental impacts.

For many years, Oregon invested heavily in road infrastructure. These roads, highways and bridges are now crumbling while we try to keep up with congestion by building more roads that we can't afford to maintain. Urban Oregonians are stuck in traffic, and rural Oregonians are dodging potholes. And, while Oregon has fewer smoggy days than in decades past, air pollution remains a problem. Even rural Oregonians are breathing certain hazardous air pollutants, like benzene, at levels far exceeding health benchmarks.

Our transportation problems all stem from the same cause: the system of paying for roads is fundamentally broken. Simply adding money will not fix these problems. The system must move away from the gas tax to fees that more accurately reflect the costs of roads and driving. Such fees would give drivers more control over their costs, manage demand for roads in ways more creative than pouring concrete, and reduce environmental impacts.

The way things work today, we pay a tax on the amount of gasoline we consume each trip. We pay a bit more when our trip is longer or when we're stuck in traffic, but rarely does what we pay reflect the actual cost of our trip. A car trip on an uncongested road in a low polluting car should cost much less than a car trip during peak hours in a highly polluting car. But the gas tax does a poor job of reflecting these differences. This disconnect between the price we pay and the actual costs we incur results in more congestion and more air pollution than any of us want.

There's a better way to price auto travel – fair, individualized fees that accurately reflect the cost of

each trip. For example, instead of rationing limited road space like the former Soviet Union rationed bread (by making everyone stand in line), we should charge a toll that rises during traffic jams and falls during off-peak hours. Free-flowing traffic would result. There's nothing radical about this idea. Telephone companies, airlines, electric utilities, hotels, and theaters all adjust prices to match supply with demand. It's time for the road system to catch up.

We can maintain and strengthen our transportation investments *and* leverage important social goals by structuring the road finance system correctly. By adopting more accurate fees for transportation and ditching less accurate taxes, we will provide travelers with new opportunities to save money, encourage more efficient travel, ease the general tax burden, and increase equity. An improved road finance system will strengthen our economy and reduce congestion, pollution, and traffic fatalities. It will also make transportation more affordable for the average Oregonian and for our state, county and city governments.

#### QUEUE OR PAY

Imagine what would happen if a phone company was forced to charge the same amount for a long distance call whether it was made on Christmas morning, or at 10:00 AM on a weekday, or at midnight on a weekend. There are two possibilities: either you'd never be able to get through at popular times because the line would be busy, or the phone company would spend more and more money trying to build enough phone line capacity to carry all the peak period calls, driving up the cost of a call no matter when it's made. Our road system is no different. Because the cost of driving during peak periods is the same as the cost of driving off-peak, we get traffic jams and costs that keep spiraling upwards because of the need for ever more road capacity.

### RECOMMENDATIONS FOR FAIR, INDIVIDUALIZED FEES

The Oregon Environmental Council (OEC) recommends that state, city and county governments convert some of the fixed costs of driving into variable costs and recoup all driving-related road and pollution costs from drivers.

<sup>4</sup> *Give drivers more control over costs:* We describe several policy options for converting the existing fixed costs of driving into variable costs,



giving drivers the ability to save money by driving less. The most effective of these policies is mileage-based auto insurance. Driving even one mile less is a sure way of reducing accident risk, and ought to be a sure way to reduce an insurance premium. The state should provide auto insurance companies with an incentive to offer drivers this option.

<sup>4</sup> *Base road repair fees on actual damage to roads:* Road maintenance, operation and preservation costs should be covered through a Vehicle Miles Traveled (VMT) fee on light vehicles, a weight mile tax on heavy vehicles that do the most damage to roads, and a studded tire fee. The VMT fee should be set high enough to cover the costs of maintaining less-traveled roads in remote and rural areas of Oregon, as well as the cost of traffic-related law enforcement.



Joe Walicki

<sup>4</sup> *Relieve congestion and reduce unnecessary road building with value pricing:* An extensive highway and road system links all of Oregon’s communities, but excess traffic on certain segments harms the economy and frustrates travelers. Value pricing (tolls that vary by time of day) is used successfully on highways around the world, including California, to discourage discretionary travel on the busiest roads at the busiest hours. Tolls can be raised to account for the cost of congestion during peak hours on congested routes and lowered at less congested times. Drivers who pay the higher toll experience a faster, easier, less stressful trip. Others shift their trips to off-peak to avoid the additional charge, switch to less congested roadways, take transit, or participate in carpools or vanpools. Because value pricing reduces congestion, it reduces the need to build expensive new capacity.

<sup>4</sup> *Make polluting vehicles pay:* Pollution from cars harms human health, contributes to global warming, and damages the environment. The VMT fee should reflect the air pollution characteristics and fuel economy of each vehicle. In other words, highly polluting, gas-guzzling vehicles should pay a higher per-mile rate, while clean, fuel-efficient vehicles should pay a lower per-mile rate. The fee should also be set high enough to cover the costs of water pollution from road and highway runoff. A hazardous substance tax on petroleum and a tire disposal fee would round out the picture.

<sup>4</sup> *Reduce “one-size-fits-all” taxes:* By implementing fair, individualized fees on transportation, the state could reduce the registration fee; cities and counties could reduce property taxes; and general funds could be redirected from cleaning up car pollution to other important needs, like schools.

<sup>4</sup> *Don’t wait till it’s too late:* It will probably take at least a decade to implement the fees suggested above, and we have to begin today. The state should implement pilot projects and take other necessary steps to transition smoothly.

## RECOMMENDATIONS FOR EFFECTIVE INVESTMENTS

Transportation investments also matter. For years, Oregon focused almost exclusively on building additional road capacity to relieve congestion. But a package of solutions that focuses on reducing demand for road space can be less expensive and more long-lasting than road expansion – and much less environmentally damaging.

<sup>4</sup> *Allow vehicle-related fees to be spent on the best transportation solutions:* The current constitutional restriction on the use of the gas tax and other vehicle-related taxes (which requires these funds to be spent on roads alone) makes it difficult to fund the most effective transportation solutions. Congestion relief can often be achieved very cost-effectively through a package of solutions, including small road improvements, increased transit service, and programs that give travelers more transportation choices, reducing the need to drive alone.



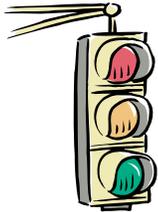
Brita Johnson

<sup>4</sup> *Fix roads before building new ones:* The state should have the discretion to spend dollars where the needs are greatest and should therefore repeal the law that requires the Oregon Department of Transportation (ODOT) to spend a certain amount each year on road expansion when existing roads are falling apart.

<sup>4</sup> *Give drivers incentives to purchase cleaner and more fuel-efficient vehicles:* We recommend a grant or rebate program coupled with incentives like preferential parking and access to high-occupancy vehicle lanes. As mentioned above, driver fees should also incorporate pollution-related costs; this will provide the strongest incentive to switch to cleaner cars.



# THE CURRENT FUNDING SYSTEM: WHERE THE MONEY COMES FROM AND WHERE IT GOES

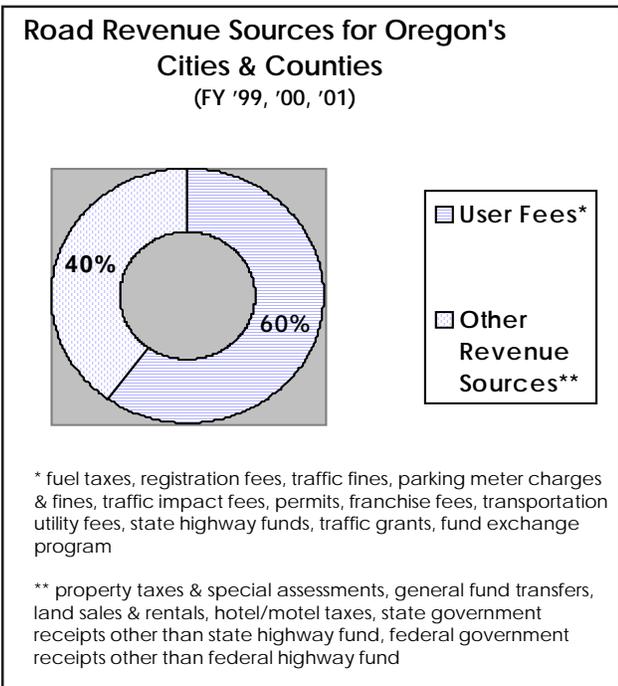


It's very expensive to place stoplights at busy intersections; build and maintain the highways that cars, trucks and buses traverse; and pay bus drivers' wages. Governmental and quasi-governmental agencies rely on a variety of revenue sources to

provide the infrastructure that keeps Oregon moving.

## HOW ROADS ARE FUNDED

By "roads" we mean the whole kit and kaboodle: construction of local streets, county roads, and state highways, and operation and maintenance of the same. Once concrete has been laid, governments must patch potholes, sweep streets, operate signals and do many other things to permit safe driving.



The bulk of funding for roads comes from the state gasoline tax and an equivalent "weight-mile" tax on heavy trucks. The registration fee also funds

roads. But cities and counties, in particular, must rely on a number of other sources to fund roads because of inadequate revenues from these statewide taxes. In fact, for every \$10 spent by cities and counties on roads, about \$4 is derived from taxes that don't relate to driving, such as property taxes.<sup>2</sup>

All told, the state of Oregon and its cities and counties spent more than \$1.4 billion on roads and highways in 2000.

## HOW TRAFFIC ENFORCEMENT IS FUNDED

We need law enforcement on the road because drivers break the law, but traffic tickets do not cover the full costs of highway patrol. Instead law enforcement and emergency services are funded in part by Oregon taxpayers out of their income tax payments to the state's general fund. State highway patrol is receiving \$37.2 million each year from the general fund during the 2001-2003 biennium. If one also considers the amount spent on traffic enforcement by city and county governments out of their general funds, the figure rises significantly. In fact, around \$85 million of non-traffic fine dollars are spent on traffic enforcement in Oregon each year.<sup>3</sup> In other words, each Oregon household pays about \$63 per year toward traffic enforcement, not counting traffic fines – whether the family owns a car or not.

## HOW TRANSIT IS FUNDED

Transit in Oregon can be divided into two categories: (1) transit that serves elderly and disabled populations specifically and (2) transit that provides mobility to the general population. Most larger communities provide local bus service. The Portland region also has light rail, streetcar and trolley service. Almost all of Oregon's communities provide some type of senior and disabled transit service, and most cities are connected by intercity bus or train.

Transit is funded through two main sources: capital funds and operating funds. Infrastructure and equipment (e.g., buses) are funded with capital funds. Operating costs (e.g., bus drivers) are funded with operating funds. Adding together the capital and operating expenses for Oregon's large and small transit systems (including special needs transit and certain intercity routes), total expenses in year 2000 were just over \$420 million.<sup>4</sup>



courtesy of ODOT

*The Valley Retriever is one of several bus companies serving Oregon's smaller communities.*

In urban areas, 15% of the costs were covered by farebox revenues, 14% by the federal government, 1% by the state government, and 70% by local sources. Local sources include payroll taxes, property taxes, local option taxes and bond measures. For rural area and special needs transit, 19% of the funds come from the federal government, 18% from the state government, and 63% from local sources (including local farebox revenues).<sup>5</sup>

Passenger rail is another important component of Oregon's transportation system. The Amtrak Cascades operates in the Pacific Northwest Rail Corridor (Eugene, Oregon to Vancouver, British Columbia), and Amtrak's Coast Starlight – a long-distance train between Los Angeles and Seattle – makes several stops in Oregon. Amtrak Thruway buses provide important connections to these trains. Studies are underway to determine the viability of launching several new commuter rail lines and reviving long-distance rail between Portland and Boise. The state government provided \$5 million to help cover the operating costs of passenger rail in Oregon in 2000.

## HOW BICYCLE AND PEDESTRIAN INFRASTRUCTURE IS FUNDED

Oregon law says that bicycle and pedestrian infrastructure must be provided when roads are built or reconstructed. State Highway Fund dollars can be used for these improvements, as well as federal gas tax dollars. Grant sources include the federal government, the ODOT Bicycle and Pedestrian Program, and the Oregon Economic and Community Development Department. Local sources of funding include general funds (primarily property taxes), special bond levies, transportation impact fees, system develop-

ment charges, Local Improvement Districts, and charges to adjacent property owners.

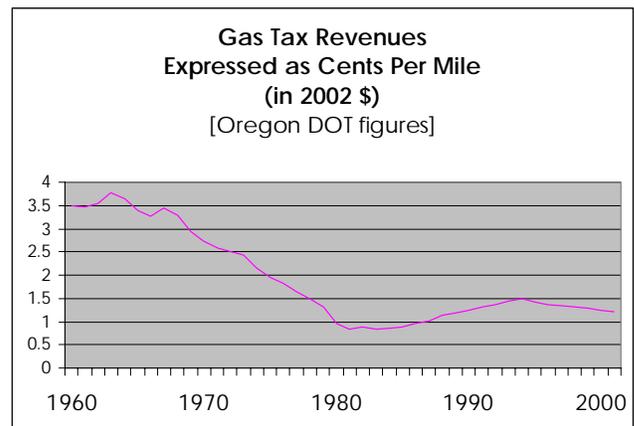
## THE FUNDING GAPS ARE HUGE

### Road Funding Needs

ODOT estimates state highway and bridge needs of \$29.1 billion between 1998-2017, with anticipated revenues of \$13.9 billion.<sup>6</sup> Cities and counties are also falling behind.

Since the gas tax last increased in 1993 (to 24¢ per gallon), several trends have affected the revenues raised by this tax and the corresponding weight-mile tax on heavy-duty trucks:

- Our highway taxes have not kept up with inflation. We'd need to increase the gas tax by about one cent per year if we were to keep up with a modest inflation rate of 3-4%.<sup>7</sup>
- Because of improved fuel economy, the average vehicle pays 1.23¢ per mile today, as opposed to 1.28¢ per mile in 1993.<sup>8</sup>
- The weight-mile tax rates have been lowered due to studies that adjust what is paid by heavy vehicles compared to what is paid by light vehicles. An 80,000 tractor-trailer that once paid 14.5¢ per mile now pays 11.9¢ per mile to drive on Oregon's roads.<sup>9</sup> (While heavy trucks cause much more damage to our roads, passenger vehicles contribute more to congestion because of their sheer and ever-increasing number.)

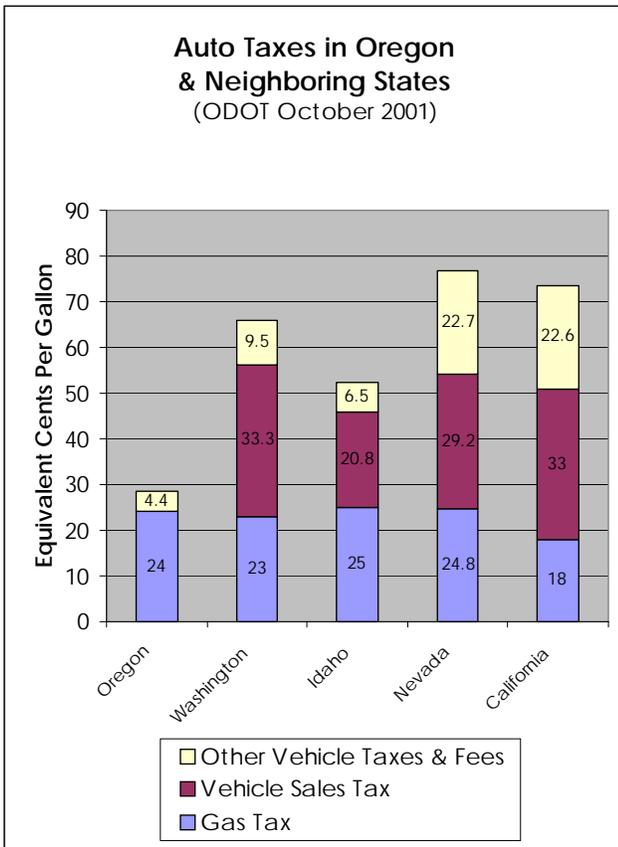




Road funding gaps are also driven by increased costs:

- The costs of road maintenance and construction have increased.
- Many bridges and some segments of the highway system are old and need replacement.
- We also need to improve bridges to withstand earthquakes and modify bridges and culverts so that endangered salmon can pass safely.

Many may be surprised to know that the average Oregonian spends less than \$150 per year in gas taxes.<sup>10</sup> Considering what we pay for electricity and water, roads are cheap. Are we really paying our fair share?



Oregonians pay much less in automobile-related taxes than our neighbors. We pay an average of 28.4¢ per gallon, which includes the gas tax, registration fee, and car titling fees. In Washington, drivers pay an

average of 65.8¢, in Idaho 52.3¢, in Nevada 76.7¢, and in California 73.6¢.<sup>11</sup> This is due in large part to the fact that our neighbors charge a sales tax on automobiles.

### Transit Funding Needs

The 1997 ODOT Oregon Public Transportation Plan projects that, to simply keep pace with growth, Oregon needs to spend \$10.6 billion on public transit between 1997 and 2015. Anticipated revenue will cover only 70% of that cost.

The cost to operate a transit system that meets Oregon’s goals will cost nearly \$16.7 billion over the same period time, but anticipated revenues will cover less than half that cost.

### Sidewalk and Bike Path Funding Needs

No one has determined how much it would cost to provide bikeways and walkways along *all* of Oregon’s streets and roads. It is relatively inexpensive to add these features when streets and roads are being built, but retrofitting facilities that were built without bike paths and sidewalks is a large task. ODOT has estimated that the overall cost to retrofit the sections of urban highways needing sidewalks and/or bike lanes is somewhere between \$120 and \$150 million.<sup>12</sup> Retrofitting local arterials and collectors adds significantly to that bill.



## GUIDING PRINCIPLES FOR A TRANSPORTATION FUNDING SYSTEM

*4 Raise adequate revenue:* We should raise enough money to meet transportation needs.

*4 Charge fair, individualized fees:* The funding system should reflect the full costs and benefits of using the transportation system and reinforce the relationship between user fees and the uses of revenues. Only when we've made an explicit choice to subsidize a certain mode or certain population should we do so.

*4 Manage demand:* Transportation demand management increases the capacity of existing transportation infrastructure. Fair, individualized fees are the most effective way to manage demand.

*4 Make efficient and effective investments:* We should fund the most effective and efficient improvements in a given situation, regardless of mode or jurisdiction. The funding system must be flexible enough to fund the most appropriate technical solutions, including transportation demand management projects.

*4 Preserve transportation assets:* Just as a homeowner fixes his or her roof before building a new addition on the house, we should maintain and preserve our existing transportation assets.

*4 Support common social goals:* Our transportation system should support a sustainable economy and environment. How we raise funds and what we invest in are integral to meeting these goals. We should meet the transportation needs not only of those with physical and financial resources, but also the needs of our youth, our elderly, our disabled, and our low-income populations.

## OEC'S VISION FOR A SUSTAINABLE TRANSPORTATION FUTURE



courtesy of the Bicycle Transportation Alliance

*The entire state benefits from sustainable transportation options.*

The ideal transportation system offers people a choice of ways to get around. No one should be forced to drive a two-ton vehicle to a neighborhood park or convenience store because sidewalks and bicycle lanes do not exist. A "multi-modal" transportation system is much more reliable and resilient than a system that relies on one mode (e.g., cars) alone.

Transportation is about getting where we need to go – whether it be our job, the grocery store, or our place of worship. If most of the places we need to go are located near us, a large part of the problem has been solved. That's why it is so important to plan new development and transportation simultaneously.

The ideal transportation system moves people and goods in a timely manner. It is cost-effective for the traveler (i.e., affordable to everyone) and cost-effective for the government (i.e., requiring minimal societal resources). The ideal transportation system minimizes negative consequences, such as air and water pollution, traffic accidents, and neighborhood blight. The ideal transportation system is responsive to community needs and supports a vibrant economy.



# FAIR, INDIVIDUALIZED FEES: THE KEY TO FUNDING TRANSPORTATION AND MANAGING DEMAND

## STOP SUBSIDIZING DRIVING

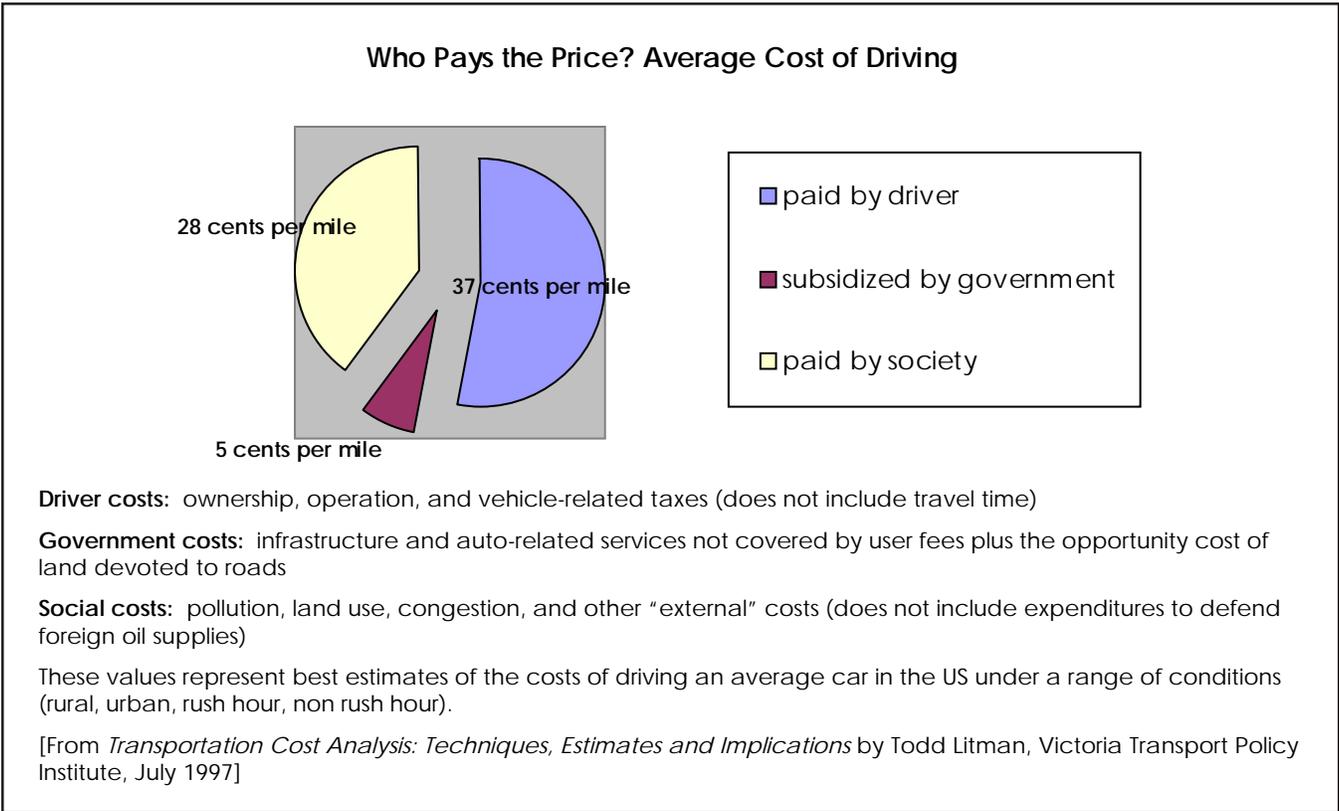
Most Oregonians are aware of subsidies for transit. Few are aware of subsidies for automobile use. Driving is subsidized from two vantage points. First, the cost of providing automobile infrastructure is not paid for solely out of fees paid by drivers. About 83% of what Oregon spends on constructing, maintaining and operating state, county and local roads is derived from user fees, but the rest comes from a mishmash of property taxes, general funds, timber sales on public lands, and other sources that have nothing to do with using the roads.<sup>13</sup>

Consider also that most of us park for free despite the fact that no parking space is truly “free” – there’s the expense of building and maintaining parking spaces, as well as the tradeoff between using

the space for parking or something more valuable – like housing. Higher office rents, tax deductions and general funds actually cover the cost of these “free” parking spaces. By one estimate, the unrecouped cost of providing parking to the average vehicle in the United States is between \$788 and \$1,531 per year.<sup>14</sup>

Ever wonder how much land is devoted to parking? It’s estimated that parking lots and roads cover about 50% of most urban areas.<sup>15</sup> In the Portland metropolitan area, commercial and industrial surface parking lots alone take up an area bigger than Oregon City.<sup>16</sup>

Drivers are subsidized even more significantly from another vantage point – the money to clean up the damage that cars do to the environment and the community must come from somewhere. For example, who covers the cost of respiratory illness aggravated by air pollution from cars and trucks? General taxpayers pay through the Oregon Health Plan, as well as everyone who purchases private health insurance. These costs are described, in a term borrowed from economics, as the “external” costs of transport. They are external because they are not paid for directly by the person who imposes the costs. However, this does not mean they are free.





*Parking is heavily subsidized.*

The burden of payment falls elsewhere in society – through higher insurance premiums, lower yields from agriculture, delays imposed on other drivers, and so on.

The price we pay to drive a car is artificially low – all of us are paying collectively to subsidize the social and environmental costs of driving. A number of different studies have been done to determine the level of subsidy. The Victoria Transport Policy Institute has reviewed these studies and estimates that the average automobile is subsidized by nearly one-half.<sup>17</sup>

Because the price paid to drive a car is significantly lower than the cost to support the activity, we're getting more auto travel than our roads, clean air, and communities can support. Most would agree that we can't continue to absorb more automobile travel indefinitely. We can't afford to build enough lanes, and we can't withstand the pollution.

A balance needs to be struck between the benefits provided by automobile travel and the negative consequences. By putting a price on these negative consequences – and charging drivers that price – drivers will minimize costs. Fair, individualized fees will affect travel choices, reward responsible behavior and reduce the total costs imposed by transportation.

## SEEK BALANCE

Around the middle of the last century, government began disinvesting in transit and focusing instead on financing automobile infrastructure. The interstate highway system was one of the largest public works projects in United States' history. Considering state, county and local road building as well, much more money has been poured into roads than into transit. This has led to an automobile-oriented society where transit is barely able to compete. If we reduce subsidies for auto use, transit will be able to compete on a more even playing ground, eventually requiring much less subsidization.

## CAPTURE COSTS

The only way to achieve an efficient transportation system is to charge drivers the *full* costs of road construction and repair, as well as environmental damage. As closely as possible, the fees paid should be associated with actual use of the system. This gives drivers the incentive to use their cars more wisely.

### NEW ROADS ARE MAGNETS

When we build additional road capacity, a phenomenon coined "triple convergence" occurs. First, many drivers who formerly used alternative routes during peak hours switch to the newly built capacity. Second, many drivers who formerly traveled before or after peak hours switch to driving during peak hours. Third, some travelers who used to take transit during peak hours switch to driving. The new capacity quickly fills up and creates demand for even more capacity. Groundbreaking research published in 1997 found that 60-96% of increased highway capacity is filled with trips that would not have otherwise occurred within five years of a project's completion.<sup>18</sup> Moreover, when highways are expanded, people have an incentive to buy more cars and change their location. Businesses relocate to the fringe, as well. Over the long run, this intensifies congestion.



**USING MARKET FORCES**

When we purchase a service or product, the price we pay does not always reflect the true cost of providing that product. Market distortions allow many of the environmental and social costs to be shifted onto someone else. We can correct these market distortions by directing and nurturing markets to achieve better outcomes for society.

When the price of a product is adjusted to reflect the full social and environmental cost, it removes the burden from each individual of having to understand all the implications of every decision. Incorporating external costs is the most efficient way to achieve environmental and community sustainability. And it's only fair – the costs of pollution are real, significant and not currently paid by the consumer.

The main thrust of using market forces is to create better, more differentiated charges, not necessarily higher charges. So, for example, less polluting vehicles traveling on uncongested roads should pay significantly less than highly polluting vehicles traveling on congested roads.

User fees work. People who pay for trash collection on a per can basis recycle more than those who pay through general property taxes. And when people pay for each increment of household electricity or water, they use these resources more efficiently. Likewise, the more you use your telephone, the more it costs, and discounts for weekend or night calling help telephone companies shift the load on the telephone system to less busy hours. Roads are no different. People should pay for what they use of the roads; this is fair and efficient.

**PRICING OPTIONS**



**Problem** We need to collect enough money to maintain and preserve Oregon's highways and roads. We also need to provide access to remote and rural parts of Oregon.



**Solutions** Vehicle miles traveled fee, weight-mile tax, studded tire fee

Vehicle Miles Traveled (VMT) fee: A vehicle miles traveled fee is a road use fee based on miles driven. A VMT fee could be based on odometer readings or by using more sophisticated technology to track mileage.

A VMT fee would more accurately charge for road use than the gas tax. When the gas tax was first implemented, most automobiles had similar operating characteristics. Today, however, automobile gas mileage performance varies widely, from 8 to 70 miles per gallon, so the gas tax has become a less accurate measure of actual road use. In fact, gas tax revenues cannot keep pace with VMT growth. In Oregon, VMT has increased about 74% since 1980, while fuel consumption has increased about 29%.<sup>19</sup> This is largely why revenues haven't kept pace with needs.



Studies indicate that 2¢ per mile VMT fee would reduce VMT, fuel use and air pollution by approximately 4.5%. At 5¢ per mile, an 11% reduction would be achieved.<sup>20</sup>

A VMT fee could be graduated to increase equity between lower-income and higher-income Oregonians as well as between rural and urban Oregonians. In other words, lower rates could be charged for the first several thousand miles, and the rate could increase in thousand mile increments thereafter. Rural residents could be given a larger base of lower cost miles. This recognizes that some driving is a necessity and that many rural Oregonians must drive longer distances.

Another important concern is travel across state borders. Oregon drivers should not pay the VMT fee out-of-state, and drivers from other states should pay for traveling on our roads. It would be technologically feasible to continue to charge a gas tax to drivers from other states, and to subtract out-of-state mileage from the bill that Oregon drivers pay. ODOT needs to determine how to do so cost-effectively.

The state should take the necessary steps to phase in VMT fees on light cars and trucks while reducing less accurate taxes, like the registration fee and gas tax. The rate per mile should cover the cost to the system of wear and tear and operations, including the cost of maintaining roads in rural areas of Oregon that aren't heavily traveled. It should also cover the costs of traffic patrol. If we converted the current gas tax (24¢ per gallon), the VMT fee would be roughly 1¼¢ per mile.<sup>21</sup> The current gas tax is not raising enough to cover road and bridge maintenance, operations and preservation costs, so a base VMT fee should be somewhat higher than 1¼¢, but perhaps not more than 1½¢ because a combination of the



VMT fee and fees described below will greatly reduce government costs.

We suggest a flat per-mile charge for lighter vehicles, but if cost responsibility studies indicate a great deal of variation in how much damage vehicles less than 26,000 pounds cause to the roads, the per-mile charge could be based on vehicle weight, just as Oregon's heavy duty vehicles pay a weight-mile tax.

### A NOTE ON MILEAGE-BASED CHARGES

Mileage charges can capture more of the social costs from driving than fuel taxes because most of these costs – infrastructure, congestion, accident risk, and some forms of pollution – are linked more directly to miles than fuel consumption. Mileage fees give drivers a direct incentive to drive less, reducing traffic and accidents. Mileage fees also do a better job of reducing particulate emissions and highway runoff than fuel taxes because these forms of pollution are directly related to how much a car is driven.

In contrast, smog and carbon monoxide pollution depend primarily on vehicle technology, while greenhouse gas emissions depend primarily on fuel conservation. Therefore, mileage charges should also incorporate the pollution and fuel economy characteristics of the vehicle.

Weight-mile tax: Oregon has one of the most fair and accurate user fees in the country – the weight-mile tax on trucks weighing more than 26,000 pounds. The damage heavy trucks impose on the roads is directly related to the weight per axle.

Oregon should retain the weight-mile tax and continue to conduct cost responsibility studies to ensure that heavy-duty vehicles are paying their fair share.



Joe Walicki

*The weight-mile tax fairly charges trucks for the damage they do to Oregon's roads.*

Studded tire fee: To fully repair the damage done by studded tires, state, county and local governments would need to expend about \$50.2 million each year.<sup>22</sup>

Several northern states and Canadian provinces have banned the use of studded tires because numerous studies have shown that drivers increase speeds when using studded tires, resulting in no net safety benefit. Oregon, on the other hand, allows studded tires. It seems only fair that drivers who choose to use them should pay for the damage that they cause.

Studded tires should either be taxed at the point of sale (on the order of \$30 per tire), or the state should require an annual permit for using studded tires (around \$8 per tire).

### MANAGING DEMAND SAVES MONEY

The debate over transportation finance has centered on how to raise more money for the transportation system. But that's only one part of the picture. If the finance system is structured correctly, price signals will dampen demand, reducing the need for additional road infrastructure. This will reduce the need for additional dollars. The 1993 Oregon Roads Finance Study concluded that road users would benefit almost as much with current revenues and reduced VMT growth as with increased revenues and current VMT growth. In other words, reducing VMT is as effective as accommodating it (and better for the environment!).



**Problem** Congestion forces us to continually build more lanes and highways.



**Solution** Value pricing

Value pricing: Most roads are congested only during certain hours of the day. When drivers express frustration and highway officials respond by building more capacity, it's simply to accommodate more driving at those times. But there's a different (and much less expensive) way to address the problem. We can implement strategies that reduce traffic volumes, move traffic out of the peak period, or otherwise improve the flow of traffic. The most effective mechanism to do this is value pricing (also known as "peak period pricing" or "congestion pricing").



Value pricing charges drivers for road use based on the costs of using a particular road at a specific time. The charge varies according to the amount of traffic, and the fee is collected electronically so motorists don't have to slow down. Under value pricing, a number of drivers choose to drive at a less congested time, drive fewer times a week, switch to transit, or carpool to divide the cost among more passengers. Moving just a small amount of traffic out of peak periods can relieve congestion quite effectively. A 5% reduction in the number of cars on a congested highway can reduce congestion by 10-30%.<sup>23</sup>

The Traffic Relief Options Study evaluated the potential for peak period pricing in the Portland region. The study looked at value pricing from many different angles – cost, time savings, equity, land use impacts, environmental impacts, freight movement, etc. – and found that it would relieve congestion very effectively and have positive impacts across the board.

Oregon should value price all major freeways that experience persistent congestion. Only after variable tolling is in place can we know whether the demand for additional capacity is truly warranted.



courtesy of DEQ

Stuck in traffic.



**Problem** Even if we manage congestion more effectively, some road expansion is necessary.



**Solutions** Value pricing revenues, traffic impact fees

Value pricing: If congestion persists on tolled facilities, value pricing revenues should be used to expand capacity (as long as the improvements meet environmental and neighborhood criteria).

### IS VALUE PRICING FAIR?

Some folks must drive during peak hours and may not be able to avoid higher tolls. But value pricing is not punitive. Drivers are paying for their actual contribution to congestion – no more and no less. Those who impose congestion costs ought to contribute more toward the expansion of the highway system since the system is typically expanded to accommodate their peak period use. Pricing the roads correctly is no more “punitive” than charging people more to make a telephone call during the day than during nights or weekends.

Drivers are already “paying” for congestion with their time or lost wages; value pricing gives drivers more control and more options to deal with traffic.

Most rush hour drivers are middle-income and upper-income drivers. A study of drivers on the Bay Bridge in California found that only 4% of all rush hour travelers were low-income residents. Similarly, a study in Minneapolis-St. Paul found that only 3% of peak hour travelers were low-income.<sup>24</sup> Low-income travelers often have less flexible work schedules and face greater penalties for arriving late and would benefit greatly from a faster, easier, more predictable trip. On State Route 91 in California, drivers of all income levels choose the value priced lanes.



Many drivers choose the value priced lanes on California's SR 91.

### TOLL ROADS: SEPARATING “WANTS” FROM “NEEDS”

Toll financing is a way to approach road financing in a business-like manner. If drivers don't want a road project enough to pay for it through tolls, the project likely isn't cost-effective. And if road users expect to pay tolls to cover the cost of a highway investment, they may press more vigorously for an efficient investment than if it were paid for out of gas tax revenues.

In fact, trying to estimate road “needs” without accurate prices is like judging how hungry a person is at an all-you-can-eat buffet . . . appetites are invariably exaggerated when additional portions are free.

Proposals to build *new* tollroads must be carefully evaluated, however. They should be supported only when users pay a majority of the costs *and* the roads meet strict environmental and land use criteria. Studies of proposed tollroads in Yamhill County found that a tolled Tualatin-Sherwood Highway would recover only 35% in toll revenues and a tolled Newberg-Dundee Bypass only 45%.<sup>25</sup> In 1999, OEC drafted and passed a bill that requires ODOT to use willingness-to-pay as one of the criteria for selecting which projects get built under the Statewide Transportation Improvement Program.



Traffic impact fees (system development charges): A traffic impact fee is a charge placed on new development to cover the costs of the additional transportation capacity required to serve that development. The traffic impact fee is based on the development's projected impact on the transportation system. Only those developments that will cause an increase in vehicle trips are charged.

Oregon should rely more on traffic impact fees to fund the transportation infrastructure needs of new development. Traffic impact fees support the philosophy that growth should pay its way.



**Problem** Motor-vehicle pollution harms human health, contributes to global warming, and damages the environment. These impacts are costly to society.



**Solutions** "Smog" fee, fuel tax, tire disposal fee, hazardous substance fee

"Smog" fee: A "smog" fee is a tax on the air pollution produced by a vehicle. Air pollution is costly to society because it contributes to illness and death; damages agriculture, forests and grasses; and hastens the deterioration of buildings. A smog fee could be based on emissions per mile multiplied by the number of miles traveled. The fee could be set to reflect each vehicle's contribution to the total cost of air pollution in a particular region.

Oregon should encourage cleaner cars by implementing smog fees in areas with marginal air quality. The average cost of the health and property damage due to air pollution from Oregon's cars is .74¢ per vehicle mile, or roughly 15¢ per gallon of gasoline.<sup>26</sup>



Fuel tax: An accurate gas tax would cover the cost of carbon dioxide emissions which are hastening global warming, as well as the cost of military expenditures needed to secure the availability of oil and the environmental costs of oil exploration and spills.

The state should retain a modest fuel tax *or* incorporate the cost of global warming into the VMT fee. (Different fuels have different greenhouse gas emissions.) Proceeds from the tax should be used to implement transportation projects that reduce greenhouse gas emissions.

Calculations of the impacts of fuel prices on driving and fuel consumption vary, but research indicates that a 10% increase in vehicle fuel prices will, over the long run, reduce vehicle travel by 3-5%, and reduce petroleum consumption by 7% or more.<sup>27</sup>



courtesy of DEQ

The average gas-powered car emits 4.5 tons of CO<sub>2</sub> (the chief contributor to global warming) each year.

Tire disposal fee: Many states assess tire fees to fund waste tire programs, particularly to cover the costs of cleaning up illegal dumps. Oregon levied a \$1 fee on new replacement tires for several years, but the fee was sunsetted in 1992 and has not been resurrected. The Oregon Department of Environmental Quality's waste tire program is now limited in scope (mainly administering permits for hauling and storing waste tires), and recycling rates have plummeted.

Oregon should reinstitute the tire disposal fee in the range of \$1 to \$3 per tire. The fee could be assessed on new replacement tires, on tires purchased with a new car, or as part of the vehicle registration transfer process.



courtesy of DEQ

Oil leaks pollute Oregon's water.



Hazardous substance tax: Oregon currently charges a fee for the use of certain hazardous substances. Petroleum products are exempt even though the oil from just one oil change can contaminate a million gallons of water.<sup>23</sup>

Oregon should charge a hazardous substance tax on the wholesale value of hazardous substances, including petroleum products.



**Problem** Parking lots consume valuable land and send polluted stormwater runoff into our waters.



**Solution** Parking fees

Parking fees: Pricing parking would have the primary effect of encouraging more efficient land use. Fees could take the form of a tax on parking providers or on the drivers who park. Parking garage and parking meter rates could also be structured to reflect peak period use. Discounts for daily or monthly parking could be eliminated. Rates could be higher for parking in excess of a certain number of hours to discourage commuting by single-occupancy vehicles. Lower fees could be offered for high-occupancy vehicles.

Local and regional governments and businesses should implement parking pricing, preferably on a regional level.

## TRANSITION AND TRANSACTION COSTS

There are a number of costs associated with transitioning to new methods of road finance, as well as ongoing costs associated with collecting revenues. New technologies are emerging which will reduce the administrative and compliance costs of mileage-based fees. Cost estimates are beyond the scope of this report, but several of these technologies are already in use. On-the-ground applications around the world are proving the technology and providing useful information on collection techniques.



*Transponders and other technologies can be used to determine fees.*

### SHOULD ALTERNATIVE MODES PAY USER FEES?

If drivers pay user fees, shouldn't transit riders, bicycle riders and pedestrians? Yes, all modes should pay for the costs they impose (both the direct costs of providing infrastructure and the external social and environmental costs). Currently, cars and trucks generate more than 90% of the external costs of transportation,<sup>29</sup> and don't pay all their direct costs. OEC suggests that we work toward pricing auto travel correctly so that other travel modes will be in greater demand. Then transit farebox revenues will rise, and subsidies will drop dramatically.

We could charge bicyclists (and other non-motorized travelers) directly for their use of roads and sidewalks, but the cost of administering the fee could easily outweigh the amount of revenue raised. In other words, it would likely cost more to collect a bicycle fee than the actual costs bicyclists are imposing on the roads.

And, remember, every time someone chooses to walk or bicycle or skateboard instead of driving, that person is providing cleaner air to all of us. Not to mention reducing health care costs by exercising.

In deciding whether to implement a user fee, all costs and benefits need to be taken into account. Every mile that one chooses to bicycle or walk instead of driving saves Oregon money in air pollution and health related costs. In other words, what we don't collect directly from bicyclists for their use of the roads, we get back from bicyclists in reduced health costs. (By the way, pedestrians and bicyclists already do pay for bike paths and sidewalks through property taxes!)



### PRIVACY CONCERNS

Concerns have been raised over the use of advanced technologies to track where or how much we drive. Interestingly, Automatic Vehicle Identification (AVI) technology has been readily adopted by drivers on tollways around the United States. Most tollways offer drivers the option of the traditional tollbooth or using AVI. Drivers overwhelmingly choose AVI because it eliminates the need to stop at a tollbooth.

The operators of the variably tolled State Route 91 in California require all motorists who use the expressway to place an electronic transponder in their autos, but offer them the option of a pre-paid "blind" account. Only a handful of drivers have chosen the "blind" account option. Moreover, many new cars are equipped with Global Positioning Satellite (GPS) technology, which is seen as a boon to the owners of these cars because it allows them to instantly identify their location, get directions, and track their car if it is stolen.

In real world applications, most drivers accept vehicle tracking technology, just as most of us utilize credit cards and cell phones without worrying about being tracked.

### REDUCE LESS ACCURATE TAXES

It is only fair that we reduce less accurate taxes while implementing more accurate ones. By implementing fair, individualized fees on transportation, the state could reduce or eliminate the gas tax and registration fee; cities and counties could reduce property taxes; and general funds could be redirected from pollution clean up programs to other important needs, like schools.

Tax shifting is not a "pie-in-the-sky" idea. Over the past decade, several European countries have cut taxes on personal income while at the same time raising taxes on such things as fossil fuels, solid waste, air and water pollution, and pesticides. These tax shifts are proving effective at reducing environmental harm and increasing job opportunities.

Why do we suggest reducing or eliminating the registration fee? Because registration fees don't reflect auto use. The rationale for a registration fee is to keep track of the number and location of vehicles being driven by Oregon's households and to, in essence, charge these vehicles for "access" to the road system. However, registration fees are paid only once every two years and are not based on actual use of the system, so they have no effect on driving choices. Registration fees are the pricing mechanism furthest

removed from the actual decision to drive at a given time or location.

### FAIRNESS

People perceive what is fair or equitable in different ways. There is a fundamental fairness associated with "paying for what you get and getting what you pay for," which supports the notion that drivers should pay for their use of the roads and for the environmental impacts of driving.

Equity also relates to fair treatment of people who can't drive for physical or other relevant reasons. Most of us agree that everyone should be able to get around, even though some will need to be subsidized (for example, disabled persons).



courtesy of Tri-Met

*Transit means mobility for many Oregonians.*

Additional equity concerns relate to lower-income people. Taxes that shift some costs onto people with a greater ability to pay are called "progressive." Likewise, taxes that are a greater burden on people with less ability to pay are called "regressive." The pricing options discussed in this report tend to be more progressive than the current transportation finance system. Equity will depend on how each is implemented and how the revenue is used.

One key point to remember is that the alternatives to using a car often don't exist or are highly inconvenient. This scarcity of alternatives has much to do with the fact that transit is unable to compete with the heavily subsidized automobile. Removing subsidies for automobile use by implementing pricing policies such as value pricing would result in greater demand for alternatives to the automobile. Greater demand, in turn, would result in more frequent and convenient alternatives. In the long run, increasing efficiency and reducing costs will make the transportation system more accessible and affordable for lower-income citizens.



### DON'T NON-USERS BENEFIT FROM ROADS?

Everyone purchases products that come to market via subsidized transportation, and the price of these products often reflects that subsidy. Should all individuals therefore pay for roads whether or not they use them for personal travel? No! This would be like making homeowners pay the electricity bills for all of Oregon's companies since we all benefit from having jobs. The issue is not that we don't all benefit from roads, the issue is how we should pay for these benefits. The economically efficient approach is to charge for transportation as it's being used and for businesses to incorporate transportation costs into the price of their products. This will encourage more efficient transport of goods, and will encourage consumers to buy locally produced products.

One benefit that we all get from roads, whether or not we use them, is the fact that emergency vehicles can reach our homes. This argues for some general taxes being used for roads, but only a very small amount – the value of this external benefit has been estimated at only 1% of the level of the external costs of transportation.<sup>30</sup>

Giving drivers more control over costs will reduce Oregon's road expenses. Reducing driving reduces the cost of maintaining and expanding roads, and reduces the state's health care costs.

Pay-as-you-drive auto insurance: Currently you must buy insurance for six months or a year at a flat rate determined primarily by your address and age, and the model and age of your car. Everyone in your rate class pays the same, whether you drive 6,000 miles a year or 20,000. That's like everyone in your neighborhood paying the same yearly bill for gasoline and filling up anytime at no additional cost. It's also unfair because driving less is a sure way of reducing accident risk, and ought to be a sure way to reduce an insurance premium.

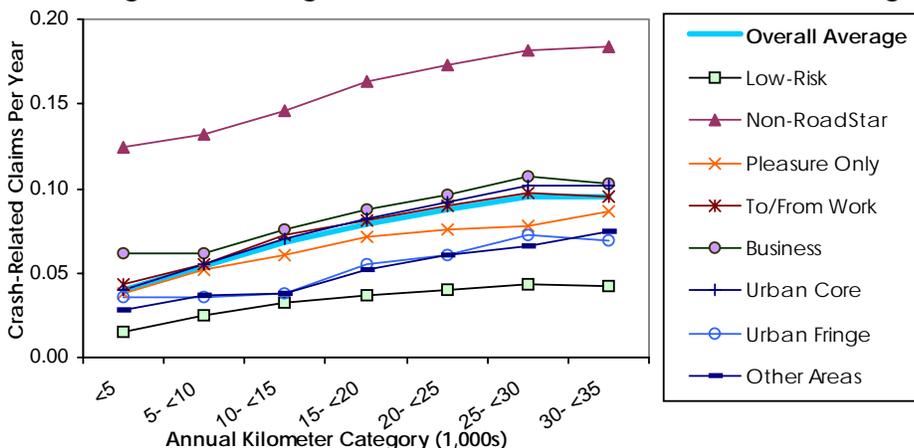
Mileage-based insurance converts the existing rating factors required by state law, such as a driver's crash and moving violation history, vehicle type, and geographic territory, into a per-mile rate. Mileage-based auto insurance is predicted to reduce auto travel by about 10%.<sup>32</sup> By giving drivers a direct financial incentive to reduce mileage, mileage-based insurance would save tax dollars on roadwork, reduce the number of crashes, curb congestion, and slash the huge environmental impacts of the automobile. Also, allowing customers to purchase insurance in smaller increments would make it more affordable for low-income drivers.

### REDUCE ROAD DEMAND BY GIVING DRIVERS MORE CONTROL OVER COSTS

Three-quarters of the expense of owning and driving a car are fixed – they don't vary if a person drives more or less.<sup>31</sup> If these costs could be transformed into variable costs, drivers could significantly lower the cost of owning a car by driving less. There are several ways to do this, and the beauty of these strategies is that they don't increase the cost of driving at all!

The state should give auto insurance companies an incentive to offer usage-based insurance and, over time, should consider mandating that it be provided.

All Categories of Driving Show Increased Crashes with Increased Driving



[From *Distance-Based Vehicle Insurance as a TDM Strategy* by Todd Litman, Victoria Transport Policy Institute, 2002]



Parking “cash out”: Under parking cash out, employers offer a cash benefit in lieu of free parking. Employees can accept a salary increase instead of free parking and get to work via transit, vanpool, carpool, foot or bicycle. Or, they can eliminate the trip completely by telecommuting. A study of parking cash out programs in California found that they reduced single-occupancy vehicle commuting by 13%.<sup>33</sup>

The state now provides employers a tax credit for offering parking cash out. It is one of a number of transportation programs to reduce drive-alone commutes eligible for the Business Energy Tax Credit. The state should beef up the Oregon Office of Energy’s ability to market the Business Energy Tax Credit and consider mandating that certain businesses offer parking cash out.

Car sharing organizations: Car sharing is a form of short-term auto rental, with neighborhood locations, automatic checkout, and options to rent by the hour or the mile. Members have easy access to cars when they need them, but avoid car ownership. OEC helped establish the first for-profit neighborhood car sharing corporation in the country – CarSharing Portland, which has now merged with Flexcar. Where appropriate, local governments should encourage the formation and expansion of car sharing organizations.



*Flexcar provides members access to a fleet of conveniently located vehicles.*

Location efficient home mortgage (LEM): LEMs require lenders to take into account the transportation-related costs of potential homebuyers. Homebuyers who do not own a car or have lower-than-average car expenses because they rely primarily on transit have more disposable income and greater borrowing power. LEMs encourage prospective homebuyers to locate near and use transit. Regional

and local governments should team up with housing authorities to fund a LEM pilot project.

### POCKETBOOK IMPLICATIONS

How will fair, individualized fees impact Oregonian’s pocketbooks? People who put lots of miles on polluting, gas-guzzling cars will certainly pay more than people who drive fewer miles in cleaner, more fuel-efficient cars. And peak period drivers (mainly urban and suburban residents) will pay more than off peak drivers.

But this differentiated fee structure will, at the same time, reduce the need to spend billions on road construction and repair. For example, if we stick with the current system and try to keep up with congestion by building more roads, Metro has estimated that every driver in the Portland region would have to pay about \$725 more each year over the next 20 years to cover the \$13 billion price tag of widening and expanding the region’s roads and highways.<sup>34</sup> The funding system that we suggest in this report will reduce the amount of taxes we need to raise from drivers for road construction and repair. The total bill will certainly be less.

The general tax burden will also fall because of reduced health care and pollution costs.

Drivers will also have more control over the costs of driving that are currently fixed (e.g., auto insurance). Drivers in a pilot pay-as-you-drive auto insurance program in Texas were able to reduce their auto insurance expenses by an average of 25%.<sup>35</sup>



*All Oregonians bear the financial burden of air pollution.*



# WORTHWHILE WAYS TO SPEND TRANSPORTATION DOLLARS

## WHY A "CARS ONLY" INVESTMENT STRATEGY WON'T WORK

### An Auto-Centered Transportation System Is Expensive

The automobile has been remarkably successful at providing reliable, versatile, private, comfortable, and convenient transportation. Unfortunately, there are downsides to a transportation system that is almost wholly automobile dependent, one of which is the cost.

As mentioned above, the cost to taxpayers of trying to keep up with congestion by building more roads is enormous. Consider also that a lack of transportation choices forces people to own cars. Automobiles are expensive, and the high up-front costs of automobiles make it difficult to economize on travel.

One study of 28 metropolitan areas in the U.S. found that in sprawling cities where driving is the only practical form of transportation, households spend more money on transportation than in compact metropolitan areas where there are a variety of ways to get around.<sup>36</sup> It found that the average American family living in a highly sprawling area where road systems dominate devotes 20% more of their income to transportation than a family living in a metro area with the least sprawl and greatest number of choices. Expressed in dollars, the family living in a highly sprawling area pays roughly \$7,800 per year in transportation expenses, \$1,300 more per year than the family living in an area with easy access to the places family members go.

Higher transportation spending strains family finances. Every dollar that is spent on a home increases equity. Cars, on the other hand, simply depreciate in value.

We can reduce congestion and the high costs of transportation by implementing the fair, individualized fees described in this report and by investing in transportation options.

## Many Oregonians Don't Drive; Others Don't Want to Be Forced to Drive

Everybody needs accessible and affordable ways to get around. Eight percent of Oregon's households are automobile-less,<sup>37</sup> and one out of six Oregonians over the age of 16 do not have a valid driver's license.<sup>38</sup> Some people can't afford cars; others are too young or too old to drive; and others simply don't want to. For example, school-age children make up approximately 18% of Oregon's population.<sup>39</sup> Walkways and bikeways help children stay fit and healthy and learn how to be independent. They help parents, too, by reducing the obligation to chauffeur kids around.

We need to work together – not for or against cars – but for a diverse mix of transportation options. Convenient and safe access to transit, cycling and walking benefits everyone; even folks who always drive benefit from transit because it reduces congestion.

By changing the road funding system, we will spur the development of convenient alternatives to driving as well as carpooling and vanpooling.



courtesy of the Bicycle Transportation Alliance

*Bicycling helps kids stay fit and healthy.*

## Excess Driving Damages Our Environment and Our Communities

Transportation impacts the environment on many levels. Motor vehicles are responsible for more than half of Oregon's air pollution<sup>40</sup> and nearly half of Oregon's global warming pollution.<sup>41</sup> Toxic highway runoff and the use of de-icing compounds and pesticides on the right-of-way pollute our waters. Oregon's open spaces, farmland and animal habitat are threatened by development that occurs along new roads. Cars kill more animals than hunting and animal experimentation combined, and roads break



up important animal habitat.<sup>42</sup> Most vehicles are powered by a non-renewable resource – oil – which damages the environment at all stages of the industrial process. Manufacturing, maintaining and disposing of cars and trucks releases toxic emissions. And, finally, motor vehicles contribute their share of noise pollution.



Richard Colisch

*Breathing with asthma is like breathing through a straw. Air pollution makes asthma worse.*

All motorized vehicles have environmental impacts. Nothing would do more to spur the purchase of cleaner cars, trucks and buses than to charge these vehicles for the costs they are imposing on society. We also suggest implementing a grant/rebate program to help individuals, businesses, public agencies and transit companies with the high up-front costs of cleaner vehicles.

Besides these many environmental impacts, a huge number of people die or are injured in vehicular accidents, and our quality of life is reduced by rampant traffic. Car crashes are the number one cause of death nationwide for children ages 4 to 14.<sup>43</sup> Everybody wants safe and quiet neighborhoods where children can safely walk or bicycle to school, but speeding cars and unsafe roads plague many communities.

### Congestion Impacts Oregon’s Businesses

A healthy economy depends on efficient transportation. Convenient, reliable connections are needed to link markets, goods and people. Congestion hurts businesses. Delays on the expressway can cost commercial vehicles \$20 to \$60 per hour or more per vehicle.<sup>44</sup> Businesses must own more vehicles, pay more in drivers’ wages, and pay

higher maintenance and fuel costs when the system suffers from persistent congestion.

Employers also depend on a reliable, diversified transportation system to get employees to work on time. Many businesses help fund Transportation Management Associations that work with employers to promote environmentally sound commuting. For example, the Westside Transportation Alliance, serving Washington County, represents 135 companies and 70,000 employees, including such companies as Intel, Nike, Tektronix, Sequent, Cascade Microtech, Timberline Software, and Norris, Beggs & Simpson.<sup>45</sup> These employers recognize that providing their employees more commuting choices can improve productivity and morale.

Changing the way we pay for roads and providing alternatives to driving alone will significantly reduce congestion and boost Oregon’s economic productivity.

### THE BUSINESS COMMUNITY SUPPORTS TRANSPORTATION FINANCE REFORM

The Oregon Business Council recommends that the state consider new ways to collect revenue, including pricing systems based on vehicle miles and time-of-use rather than fuel taxes; privatization and other new models of delivery; and demand management to utilize existing highways and roads more effectively.<sup>46</sup>

The Oregon Business Association supports the development of alternative funding mechanisms, including congestion pricing.<sup>47</sup> It supports deleting the statute that requires ODOT to spend a specific amount on highway modernization, reasoning that ODOT should have the discretion to set appropriate spending levels for modernization within the context of ODOT’s biennial budget. The Oregon Business Association also supports increased transit and transportation demand management programs.

Associated Oregon Industries believes the state must make incremental changes to shift away from reliance on the gas tax and supports experimental pilot programs.<sup>48</sup>

### EFFECTIVE INVESTMENTS

#### Apply Integrated Transportation Planning

The electric utility industry learned that building new capacity is not always the most cost-effective way to meet increasing demand. It is often cheaper to make existing plants more efficient or help



customers conserve energy. Transportation is no different. Rather than focusing exclusively on building additional road capacity to meet expected demand, transportation planners should identify the full range of options for increasing supply and reducing demand. The environmental costs of each option must also be taken into consideration.

In the case of a congested interchange, for example, the traditional solution has been to reconstruct and enlarge the interchange. But congestion relief might be better achieved by providing improved local street connections to move short trips off of the freeway and by working with employers near the interchange to reduce drive-alone commuting. This type of solution tends to be less expensive than massive interchange upgrades – and much less environmentally damaging.



*What if this were the only answer to congestion?*

Puget Sound’s Commute Trip Reduction Program: On an average workday morning in 2001, Puget Sound’s Commute Trip Reduction program removed 19,950 vehicles from the region’s roadways. If these vehicles were added back onto the highways, the equivalent of 16 additional lane miles would be needed to accommodate the demand. The cost to the state just to construct these roadways could approach \$92 million. In 2001 alone, the program reduced petroleum consumption by 6.4 million gallons and carbon dioxide emissions by 64,000 tons and saved Washington citizens over \$10 million

in fuel costs. All this was achieved at a cost of \$6.6 million from state, county and local governments, leveraging a \$35 million investment from employers.<sup>49</sup>

The Portland Region’s Employee Commute Options Program: The Employee Commute Options Program removes 18,104 one-way weekday auto trips from the region’s roadways, boosting transit use and carpool. If these trips were added back to the high-ways, we’d need 14.5 additional lane miles to accommodate the demand. Regional and local governments contribute around \$2.4 million each year toward the program, a tiny fraction of the millions we’d otherwise have to spend in road construction.<sup>50</sup> And the region is reaping similar environmental benefits to those described in the Puget Sound program.

Integrated transportation planning is still in its early phases. It is not as simple to implement integrated planning in the transportation realm as the electric industry realm, in large part because it is difficult to quantify the effectiveness of many non-construction options. Thankfully, more information is being gathered on the benefits and costs of these non-road alternatives as more governments invest in such strategies.

One way to gain better information would be to implement a “traffic buster” grant program (see below).

#### “TRAFFIC BUSTER” GRANTS

Governments could pay entrepreneurs to reduce auto trips by instituting Traffic Buster Grant Programs. By allowing people to make money by reducing vehicle trips (and thereby conserving capacity), we could create the partnerships necessary to cost-effectively meet transportation system needs and reduce transportation’s impact on the environment.

Like contractors hired to expand roadway capacity, entrepreneurs (public and private) would enter into an agreement with the state or local government to provide a specified amount of “capacity” in a specific area. Their performance would be monitored, and they would be paid for their product – trip reduction. Making money available for trip reduction would stimulate entrepreneurs to develop innovative projects.

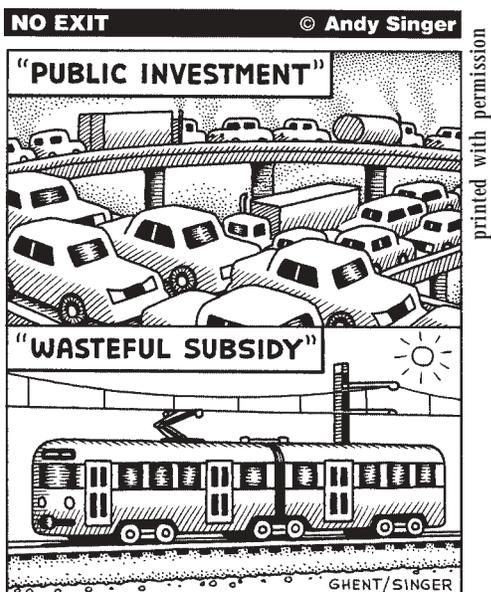


### LUTRAQ: A MODEL OF INTEGRATED TRANSPORTATION PLANNING

In the early 1990s, 1000 Friends of Oregon conducted a landmark study – the Land Use, Transportation, Air Quality Connection (LUTRAQ) – which modeled a number of alternatives to building a major bypass on the western edge of the Portland metropolitan area. LUTRAQ found that a complementary package of transit and pedestrian improvements, focused development near transit stations, parking charges, selected highway improvements and peak period pricing would eliminate the need to build a new ring freeway and achieve greater congestion reduction and fewer environmental impacts.<sup>51</sup> Because of LUTRAQ and strong citizen support for an alternative to the bypass, alternative transportation solutions are now being implemented.

### Allow Vehicle-Related Fees to Be Spent on Reducing Air Pollution, Curbing Congestion, and Enforcing Traffic Laws

Oregon’s Constitution currently restricts the use of all revenues from vehicle-related fees to fund road construction, maintenance and operation (with the exception of bikeways and walkways on new road projects). This makes sense on first blush, but it has the unintended effect of funding projects that might not be the best solution for the problem. Drivers benefit from non-road projects that cost-effectively reduce congestion and air pollution. And drivers are the primary beneficiaries of traffic enforcement. The Constitution should be amended to allow monies to be used for traffic enforcement, for funding transportation projects that reduce traffic or air pollution, and for providing mobility to senior citizens and people with disabilities.



printed with permission

Some people are opposed to using dollars charged to drivers to support non-driver modes. But if more congestion relief can be achieved for less money, it’s the smartest thing to do – and the best thing for drivers. Oregonians want their children and elderly parents to be able to get where they need to go. Many families would choose to spend some of their gas tax dollars each year on a first-rate transit system and ample sidewalks and bikeways as opposed to spending hours behind the wheel chauffeuring the family’s non-drivers around.

### THE BICYCLE RENAISSANCE

Investment in bicycle infrastructure is proving its worth – bicycling is experiencing a renaissance in Oregon. In Portland, bicycling has nearly doubled over the past decade.<sup>52</sup> Eugene and Corvallis have relatively high rates of bicycle commuting – 6% and 8% of adults bicycle to work respectively.<sup>53</sup> Ashland has the highest walk-to-work rate in Oregon (15% of trips).<sup>54</sup> This proves that when the places we need to go are near and when we have walkways and bikeways to get there, a number of people will walk or bike. In the Netherlands, a rather wet and cold country, half of all trips are made by bicycle!<sup>55</sup>



courtesy of the Bicycle Transportation Alliance

Full bike ranks – one symbol of Oregon’s bicycle renaissance.

Simple investments pay off. In Portland, a partnership between the city and several downtown health clubs to provide showers, clothing, lockers, and secure bike parking to bike commuters generated an additional 16,100 bicycle trips in the first year of operation, resulting in 47,700 fewer vehicle miles traveled and 24 fewer tons of carbon dioxide emissions.<sup>56</sup>



Richard Colisch

### EVERYBODY NEEDS SIDEWALKS

Every Oregonian is a pedestrian or wheelchair user at some point during the day. We've all faced the daunting task of crossing a busy road at an unsafe location. Sidewalks and safe pedestrian crossings serve everybody and encourage one of the healthiest forms of exercise.

#### Fix Roads First

The continuing deterioration of road surfaces and bridges is cause for alarm. The longer we defer maintenance needs, the more costly they become. We all know that if we postpone car maintenance, we soon have a massive repair bill on our hands. Likewise, postponing regular maintenance of roads and freeways carries with it a similar increase in cost. On average, for every dollar spent treating pavement in "fair or better" condition, four dollars would be required to repair that same pavement once it has reached "poor" condition.<sup>57</sup>

Driving on bad roads is also expensive. Cracked and bumpy roads increase car maintenance costs and reduce fuel efficiency.

Oregon has a significant backlog of repairs. Why? Inadequate revenues and misguided investments. Oregon state law (ORS 366.507) requires the Oregon Department of Transportation to spend about \$50 million each year on road expansion even though existing roads are falling apart.

The state should repeal this law. Existing roads must be maintained before new roads are built.



courtesy of the Bicycle Transportation Alliance

*Maintaining the 31,785 miles of paved road in Oregon is an expensive job.*

#### Fund Transportation Choices that Reduce Traffic

As stated above, we believe it makes economic and environmental sense to use some Highway Trust Fund dollars to fund transit projects that reduce traffic or air pollution and provide mobility to senior citizens and people with disabilities. Many vehicle users benefit from public transportation as a backup service for personal use, as well as being able to travel less congested roads and breathe cleaner air.

Because highway users and the general public benefit from transit and because the negative impacts of transit are low compared to autos, broad-based taxes are also justified. The payroll tax, a fee on businesses based on number of employees, is a local source of funding in the Portland and Eugene areas that other transit districts could adopt. Likewise, property or income taxes may have some merit.

Another source of revenue for transit is the Traffic Impact Fees mentioned earlier. These are one-time fees some local governments assess on new development and changes in property use. The fees help cover the cost of transportation facilities that are needed to serve new development.

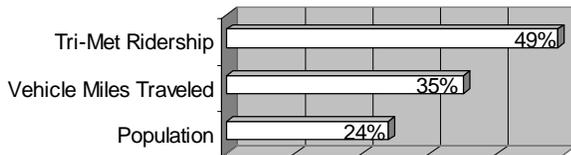


Extending that concept, transportation utility fees could be assessed on businesses and households based on how many trips they generate. Transportation utility fees could be lower for sites near transit, for employers that limit free parking and encourage carpooling, and for households without cars. The fees could cover a broad range of transportation needs, including road, transit, bicycle and pedestrian projects.

### THE ECONOMIC BENEFITS OF SPENDING ON TRANSIT

Spending on transit has many benefits. By providing travelers another way to get around, it reduces car trips. This reduces congestion and the other negative impacts of too much traffic. Ridership on transit is increasing statewide. In areas well served by transit, like the City of Portland, 15% of all trips are taken on bus or MAX.<sup>58</sup> Ridership on Tri-Met is growing faster than both population growth and driving. In 2001, Tri-Met provided more than 84 million rides – that’s nearly 4½ times more than the number of trips taken through the Portland International Airport.<sup>59</sup>

#### Tri-Met Ridership Outstrips Vehicle Miles Traveled 1990-2000



Transit encourages development and boosts real estate values near certain transit corridors. It increases business revenues, employs people, and increases business access to a broader labor force. Transit saves individuals money on auto ownership and operation. Finally, the fatality rate of transit is 1% of the fatality rate of auto travel.<sup>60</sup>

For every \$10 million invested in public transportation, more than \$15 million is saved in transportation costs to both highway and public transportation users, according to a national study.<sup>61</sup> These include operating, fuel and congestion costs. According to an Oregon-specific study, each dollar invested in transit generates \$2.10 in Oregon’s statewide economy.<sup>62</sup> As one example of how this works, Tri-Met estimates that construction of the Interstate MAX light rail project will add approximately \$30 million to the state income tax receipts during its construction – and the state is paying nothing toward the capital cost.<sup>63</sup> During these difficult economic times, lawmakers should consider investing in transit as a way to boost the economy.

### A SUCCESS STORY: THE PACIFIC NORTHWEST RAIL CORRIDOR

Amtrak service in the Pacific Northwest Rail Corridor (Eugene, OR – Vancouver, BC) is proving a worthy investment. Each year, rail passenger ridership on the Oregon segment increases by about 11%.<sup>64</sup> In 1999, the train diverted more than 31 million miles of traffic from Oregon and Washington highways and prevented more than 717 tons of air pollution.<sup>65</sup>

A study by the Washington Department of Transportation compared the financial and social costs of operating intercity air, auto and rail travel. It concluded that passenger rail service costs Washington residents approximately 10-14¢ less per passenger mile than auto or air travel and, at the same time, provides greater environmental benefits.<sup>66</sup> The corridor is expected to generate profits as early as 2017.<sup>67</sup>



*The Amtrak Cascades offers travelers a comfortable, low-stress trip between Eugene, OR, and Vancouver, BC.*

### Give Drivers Incentives to Purchase Cleaner, More Fuel-Efficient Vehicles

Oregon’s transportation sector is the largest source of air pollution and global warming emissions. The state must encourage the use of cleaner and more fuel-efficient vehicles.

Under a system of flat mileage-based charges, drivers of more fuel-efficient and alternative fuel vehicles will pay more than they currently do for their use of the roads. This could undermine the state’s goal of reducing air and global warming pollution. However, we must remember that all vehicles – no matter how clean their tailpipe emissions are – contribute to congestion, wear and tear, and water pollution (and should pay accordingly).

One way to address this conundrum would be to charge a different rate per mile based on the environmental-friendliness of the vehicle. Another



way would be to get serious about giving Oregonians up-front incentives to purchase cleaner cars.

Auto industry research firm J.D. Power and Associates recently determined that 60% of new car buyers would strongly consider purchasing a hybrid-electric vehicle and would be willing to pay nearly \$1,000 extra.<sup>68</sup>



Richard Colisch

*Fuel-efficient and clean electric-hybrids are increasing in popularity.*

OEC recommends a grant or rebate program, coupled with incentives like preferential parking and access to high-occupancy vehicle lanes. Grants and rebates are the most successful incentives<sup>69</sup> because:

- Consumers prefer and take advantage of grant and rebate programs more readily than tax-based incentives.
- Grants and rebates are available to non-taxable fleets. This is important because the primary market for clean vehicles is government fleets.
- They are available to small companies, such as florists, who earn little net income.
- They offer certainty. Customers know how much the grant or rebate is worth at the time it is offered and can incorporate a specific dollar amount into their calculation of how much they will pay for a car. Until customers know their tax liability, they often will not know the dollar value of a tax benefit.
- They offer immediate benefit. Tax-based incentives, on the other hand, require that the customer wait till the end of the tax year.

## Retire the Dirtiest Cars

In several states, “cash for clunkers” programs have been implemented to retire old, heavily polluting cars. Companies subject to pollution controls pay above-market prices for the worst vehicles and send them to the junkyards. This gives auto owners a strong incentive to scrap their old cars, and it gives companies a relatively inexpensive way to reduce required emissions.

The Oregon Department of Environmental Quality (DEQ) has implemented the CHOICES program to give citizens an incentive to scrap cars that fail the Vehicle Inspection Program. If they scrap a dirty car, drivers receive a free annual Tri-Met transit pass, a \$500 Bike Gallery certificate, or a \$500 Flexcar certificate. These incentives have so far not proven high enough to encourage many car retirements.

The CHOICES program should be revised to provide more significant incentives for drivers to scrap the dirtiest of Oregon’s vehicles. DEQ should consider partnerships with businesses subject to emissions controls to help fund the program.



*One old car that didn't even make it to the junkyard.*



## A COMPREHENSIVE TRANSPORTATION FUNDING PACKAGE

OEC suggests a variety of funding mechanisms that will make the transportation system more efficient, affordable and environmentally sound. We also recommend investing transportation dollars in

cost-effective solutions that provide Oregonians with affordable and convenient travel choices. The table below summarizes our long-term transportation funding plan.

FUNDING NEED	FUNDING MECHANISM	APPROPRIATE USES
<i>Cars and Trucks</i>		
road maintenance, operation and preservation	<ul style="list-style-type: none"> <li>1 base VMT fee</li> <li>1 weight-mile tax</li> <li>1 studded tire fee</li> <li>1 "access" surcharge on base VMT fee/weight-mile tax to cover costs of maintaining less-traveled roads in remote and rural areas of Oregon</li> </ul>	<ul style="list-style-type: none"> <li>1 distribute to state, cities and counties for road maintenance, operation and preservation</li> </ul>
additional capacity to reduce congestion	<ul style="list-style-type: none"> <li>1 tolls that vary by level of congestion (applied on heavily traveled highways and bridges)</li> <li>1 traffic impact fees</li> </ul>	<ul style="list-style-type: none"> <li>1 maintain and preserve the tolled infrastructure</li> <li>1 mitigate value pricing spillover effects with neighborhood traffic calming measures</li> <li>1 improve local street connections</li> <li>1 implement transportation demand management programs</li> <li>1 provide transit and other alternatives in congested corridors</li> <li>1 if warranted, add road/highway capacity</li> </ul>
traffic enforcement	<ul style="list-style-type: none"> <li>1 traffic fines</li> <li>1 "patrol" surcharge on base VMT fee/weight-mile tax</li> </ul>	<ul style="list-style-type: none"> <li>1 cover the costs of police on traffic duty</li> </ul>
air pollution mitigation	<ul style="list-style-type: none"> <li>1 "smog" surcharge on base VMT fee/weight-mile tax proportionate to the pollution characteristics of the vehicle</li> </ul>	<ul style="list-style-type: none"> <li>1 provide grants/rebates to Oregon residents and fleets for purchase of cleaner vehicles (including heavy-duty trucks and buses)</li> <li>1 fund improved "CHOICES" program</li> <li>1 fund Oregon Health Plan</li> </ul>
greenhouse gas mitigation (global warming pollution)	<ul style="list-style-type: none"> <li>1 "gas guzzler" surcharge on base VMT fee/weight-mile tax proportionate to the fuel economy of the vehicle</li> <li>1 fuel tax</li> </ul>	<ul style="list-style-type: none"> <li>1 fund greenhouse gas offset programs in the transportation sector</li> </ul>
reduce contaminated runoff from roads and parking lots	<ul style="list-style-type: none"> <li>1 "water pollution" surcharge on base VMT fee/weight-mile tax</li> <li>1 hazardous substances tax on petroleum</li> <li>1 tax on parking infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>1 fund water quality programs</li> <li>1 fund parking management programs</li> <li>1 convert impervious surfaces to pervious cover</li> </ul>
reduce tire waste	<ul style="list-style-type: none"> <li>1 tire disposal fee</li> </ul>	<ul style="list-style-type: none"> <li>1 roadside and illegal dump cleanup</li> <li>1 tire recycling</li> </ul>



FUNDING NEED	FUNDING MECHANISM	APPROPRIATE USES
<i>Alternative Modes</i>		
transportation and operating expenses	<ul style="list-style-type: none"> <li>1 transit user charges (farebox revenues)</li> <li>1 traffic impact</li> <li>1 fees/transportation utility fees</li> <li>1 payroll taxes</li> <li>1 road user charges</li> <li>1 other road-based charges?</li> </ul>	1 transit capital and operating expenses
bicycle and pedestrian infrastructure	<ul style="list-style-type: none"> <li>1 traffic impact fees/transportation utility fees</li> <li>1 road user charges</li> <li>1 other road-based charges?</li> </ul>	1 bicycle and pedestrian infrastructure

**PROPOSAL FOR PHASING IN A FAIR AND EFFICIENT TRANSPORTATION FUNDING SYSTEM**

It will take at least a decade to transition to a new transportation finance system. OEC suggests the following schedule for moving Oregon’s transportation finance system into the 21<sup>st</sup> Century.

By 2003

- Provide auto insurance companies with an incentive to offer drivers a mileage-based insurance option. Pay-as-you-drive insurance will save the state money in terms of less congestion and fewer accidents. This is a logical first step toward pricing reform because it changes the way an existing fee is paid, imposing no new expense.
- Implement a studded tire fee.
- Implement a tire disposal fee.
- Initiate a “Traffic Buster” Grant Program in congested corridors. Pay entrepreneurs to make money by reducing vehicle trips (and thereby conserving capacity). Gather information on the most effective transportation demand management programs.
- Require certain employers to offer cash vouchers as an alternative to free parking.
- Repeal ORS 366.507, which requires ODOT to spend a specific amount on building new roads. Prioritize maintenance, preservation, and safe and efficient operation of the existing state highway system above projects that add capacity.

By 2005

- Establish a VMT fee pilot that drivers can opt into instead of paying the gas tax. Set milestones for phasing in the VMT fee while phasing out the gas tax.
- Implement a hazardous substance tax on petroleum.
- Establish a grant and/or rebate program for the purchase of cleaner and more fuel-efficient vehicles.
- Fund the CHOICES program at a level that will encourage more car owners to retire the dirtiest cars on the road.





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By 2007

- Implement at least two value pricing pilot projects in the Portland metropolitan area.
- Complete the necessary research on how to implement mileage-based fees and at what level.
- Amend the Constitution so that vehicle-related taxes can be used to fund highway patrol, transportation projects that reduce traffic and air pollution, and mobility services for senior citizens and people with disabilities.

By 2009

- Institute value pricing on additional congested highway corridors and bridges throughout Oregon.
- Apply a VMT fee. Ensure that the per-mile rate incorporates the cost of road maintenance, operation and preservation, including access to remote and rural areas of Oregon; highway patrol; and air, global warming and water pollution. The charge should contain a rural discount and be graduated to increase equity.
- Reduce or eliminate the registration fee.

By 2011

- Implement value pricing on all major congested corridors in the state.
- Eliminate the gas tax, assuring global warming is a component of the VMT fee).



## LEADING THE NATION IN ENACTING FAIR FEES: OREGON'S PAST AND FUTURE

YEAR	EVENT
1846	Barlow Talopensasa tollroad.
1905	Vehicle registration fee enacted.
1919	Oregon enacts nation's first gasoline tax.
1925	Ton-mile and passenger-mile tax levied on all for-hire vehicles.
1933	Ton-mile tax imposed on commercial vehicles (based on loaded weight of vehicle and number of miles traveled per year).
1943	Fuel tax established on diesel and other motor fuels.
1945	First motor vehicle cost responsibility study conducted.
1947	First weight-mile tax implemented (based on registered gross weight and distance traveled).
1949	Oregon is the first to prorate commercial vehicle registration fees between states in proportion to miles operated in each state.
1999	Oregon requires evaluation of willingness-to-pay on all major new road construction projects.

2003	Oregon jumps starts a transition to mileage-based auto insurance. Studded tire fee enacted. Tire disposal fee enacted.
2005	Drivers may opt into nation's first Vehicle Miles Traveled (VMT) fee, opting out of the gas tax. Hazardous substance fee enacted on petroleum.
2007	Several value pricing pilot projects are implemented.
2009	Oregon completes VMT phase in, incorporating environmental costs into the permile fee.
2011	Oregon implements value pricing on all major congested highways and bridges in the state. Less accurate taxes are reduced or eliminated.



## OEC'S HISTORY PROMOTING TRANSPORTATION FINANCE REFORM

The Oregon Environmental Council (OEC) entered the transportation picture in the early 1990s. We believe that the most effective way to protect the environment from transportation impacts is to change the inefficient economic signals, subsidies, and forces that promote excessive driving.

OEC has made progress in forwarding a number of market-based concepts:

- In 1993, we persuaded Metro to study congestion pricing. The resulting Traffic Relief Options Study found that peak period pricing could successfully relieve congestion in an equitable, cost-effective manner.
- In 1996, we helped establish the first for-profit neighborhood car sharing corporation in the country – CarSharing Portland, which is now called FlexCar.
- In 1999, we proposed and passed House Bill 3090 which requires ODOT to determine “willingness to pay” through tolls on drivers when it plans major new capacity increases.
- In 2001, we urged the Willamette Valley Alternative Transportation Futures project to study the effects of a Vehicle Miles Traveled fee and found the fee would significantly reduce projected congestion.
- In part due to OEC's efforts in 2001, the state now provides employers a tax credit for offering a cash benefit to employees in lieu of free parking. This gives employees an incentive to reduce drive-alone car commuting.
- In 2001, we proposed and passed House Bill 3871 out of the House of Representatives. This bill would have provided a tax credit to auto insurance companies that offer a pay-as-you-drive auto insurance option.



<sup>1</sup> Oregon DOT, 2000. Transportation Key Facts 2000. ([www.odot.state.or.us/comm/newscenter/facts/Key\\_Facts\\_2000.pdf](http://www.odot.state.or.us/comm/newscenter/facts/Key_Facts_2000.pdf))

<sup>2</sup> Derived from Oregon DOT 1999, 2000 and 2001 annual receipt questionnaires to cities and counties [Cities Local Road Street Summary; County Receipts for Roads and Streets].

<sup>3</sup> Derived from Oregon DOT 2000 and 2001 annual disbursement questionnaires to cities and counties [Cities Local Road & Street Survey – Disbursements; County Disbursements for Roads and Streets] and ODOT 2001-2003 Program Budget. Total figure was arrived at by halving the state's FY 2001-2003 general fund disbursement, 2) adding the average of two years of city and county general fund and serial levy distributions (FY 2000 and 2001), and 3) subtracting city and county traffic fines.

<sup>4</sup> Van Der Hyde, D., Personal Communication with Dinah Van Der Hyde of Oregon DOT Public Transit Division, March 2002.

<sup>5</sup> Van Der Hyde, D., Personal Communication with Dinah Van Der Hyde of Oregon DOT Public Transit Division, March 2002.

<sup>6</sup> Oregon DOT, 1999. 1999 Oregon Highway Plan.

<sup>7</sup> Oregon Business Council, 2001. Policy Playbook: Policy Issues and Recommendations for 2001.

<sup>8</sup> Oregon Business Council, 2001. Policy Playbook: Policy Issues and Recommendations for 2001.

<sup>9</sup> Oregon Business Council, 2001. Policy Playbook: Policy Issues and Recommendations for 2001.

<sup>10</sup> Oregon DOT, 2001. Alternatives to the Motor Fuel Tax: Final Report SR 561, by Rufolo, Bertini, and Kimpel.

<sup>11</sup> Oregon DOT, 2001. Comparison of Automobile Related Taxes-Chart, October 2001. ([www.odot.state.or.us/tdb/policy/tax/autotax01.htm](http://www.odot.state.or.us/tdb/policy/tax/autotax01.htm))

<sup>12</sup> Oregon DOT, 1995. Oregon Bicycle and Pedestrian Plan: An Element of the Oregon Transportation Plan.

<sup>13</sup> Revenue sources from FY 2001 summaries of city and county receipts were examined and split into user/non-user categories. All state dollars spent on roads are derived from user fees.

<sup>14</sup> Delucchi, M. and Murphy, J, 1998. "Motor Vehicle Goods and Services Bundled in the Private Sector," Annualized Social Cost of Motor-Vehicle Use in the U.S., 1990-1991, Vol. 6, Institute of Transportation Studies. ([www.engr.ucdavis.edu/~its](http://www.engr.ucdavis.edu/~its))

<sup>15</sup> Renner, M, 1988. "Rethinking the Role of the Automobile" Worldwatch Paper #84, June 1988, p. 46. Note: most studies are based on roads and parking lots.

<sup>16</sup> Metro, 1998. Shared Parking Handbook.

<sup>17</sup> Litman, T, 1999. Socially Optimal Transport Prices and Markets; Principles, Strategies and Impacts, Victoria Transportation Policy Institute. ([www.vtpi.org/0\\_price.htm](http://www.vtpi.org/0_price.htm))

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<sup>19</sup> Malik, M. Personal communication with Mazen Malik of Oregon DOT, March 2002.

<sup>20</sup> Litman, T, Komanoff, C, and Howell, D, 1998. Road Relief: Tax and Pricing Shifts for a Fairer, Cleaner, and Less Congested Transportation System in Washington State, Energy Outreach Center. ([www.climatesolutions.org](http://www.climatesolutions.org))

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<sup>22</sup> Oregon DOT, 2000. Studded Tires in Oregon. ([www.odot.state.or.us/fsbpublic/STUDED%20TIRES.pdf](http://www.odot.state.or.us/fsbpublic/STUDED%20TIRES.pdf))

<sup>23</sup> Litman, T, 2001. Online TDM Encyclopedia, Victoria Transport Policy Institute. ([www.vtpi.org/tdm/](http://www.vtpi.org/tdm/))

<sup>24</sup> Metro, 1999. Traffic Relief Options Study Working Paper 9.

<sup>25</sup> Carlson, J, 1996. Memo to House Interim Task Force from June Carlson, Oregon DOT, October 15, 1996.

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