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Statewide Congestion Overview for Oregon
Part 2

This issue of Policy Notes summarizes the report, *Statewide Congestion Overview for Oregon*, updated by Brian Gregor, P.E., Senior Transportation Analyst with the Oregon Department of Transportation (See http://www.odot.state.or.us/tddtpau/cms.html). The *Overview* provides information on statewide congestion trends and the major factors that influence congestion. Information for this report was drawn from published data sources, existing ODOT databases, and the analysis of congestion on state highways.

Part 1 of this summary appeared in *Policy Notes, February 2002*, and focused on the complex linkages among congestion, land use and economic development. Part 2 focuses on trends of the past and what those trends tell us about the future.

The long-term trends from 1970 to 2000 show vehicle miles of travel (VMT) growth strongly associated with economic growth in Oregon. The ratio between VMT and total statewide personal income has stayed almost constant at about 360 miles per $1000. The 30-year trends of per capita VMT and per capita real income are very close to one another. (Figure 1)

The growth of VMT in Oregon over the past 30 years was primarily a consequence of economic growth. In particular, the number of jobs grew as a result of social, demographic and economic changes: baby boomers entering the workforce, greater participation of women in the workforce, structural changes in the economy, and migration of people to Oregon. Increasing levels of work had two large influences on transportation: 1) demands on time increased, increasing the importance of speed and convenience of transportation, and 2) incomes increased, increasing consumption and the demand for transporting goods and services. More specifically:

- Increasing numbers of workers resulted in increasing numbers of commuters.
- The amount of time people could devote to household maintenance activities decreased because more time was spent on paid work.
- More goods and services were purchased to substitute for household activities people no longer had time to do.
- Increased time pressures made automobiles and other private vehicle transportation more attractive. People more frequently chained household travel with commutes, something more easily done in a private vehicle.
- Households were able to afford owning more private vehicles.
- As people used private vehicles for more of their travel, they used public transportation less often and shared rides less frequently.
- Rising household incomes lead to rising levels of consumption. Moreover, since the early 1980s, people have chosen to allocate increasing proportions of their incomes to consumption. More consumption leads to more household travel for consumption purposes, and more truck travel due to increased production and distribution of goods.

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The economic returns of vehicle travel may have remained fairly constant over the past 30 years for several reasons. First, by 1970 most of the state and interstate highway system was in place. Less than 10% of interstate highway mileage in the state was constructed after 1970, and most of that was completed by the mid-1970s. Until recently, the state has been well served by a surplus of highway capacity. Second, people and businesses have options to compensate for rising congestion without reducing travel. They can reschedule or reroute their travel; they can chain activities together to accomplish more per trip. They may also compensate for congestion through their destination and location choices. Third, economic benefits from expanded markets help to mitigate rising transportation costs due to congestion. Market expansions allow more specialization and trade to occur, increasing the economic benefits from travel.

Congestion in Oregon has grown because the economy has grown and created more travel, while the level of investment in the state's road system has fallen. During the 1960s, an average of 2.5% of total state personal income was spent on highway capital outlay. By the late 1990s, the rate of investment had fallen by about two-thirds (Figure 2). If Oregonians were to invest in highways at the same rate as in the 1960s, they would have to spend about $1.5 billion more than is currently being spent on highway capital outlay.

The following illustrates the significance of this declining rate of investment. The Texas Transportation Institute's (TTI) Urban Mobility Study includes estimates of the annual increases in freeway and principal arterial lane-miles needed to keep up with the average annual percentage increase in VMT from 1995 to 2000.[1] The combined estimates for the Eugene-Springfield, Portland-Vancouver and Salem metropolitan areas are shown in the first data column of Table 1. The study also compares the estimated "needs" with the average number of lane-miles added over the same period to calculate the annual lane-mile deficit. These values are shown in the second and third data columns of the table. In order to maintain current levels of mobility in these areas, an additional 71 lane-miles are needed each year. On average, only 27 lane-miles are being added per year, leaving an annual deficit of 44 lane-miles.

The effect of the declining highway investment rate can be illustrated by calculating what the annual lane-mile deficit might have been if highway capital outlay was at the 1960s average rate rather than the 1995-2000 rate. If capital outlays were at the 1960s rate, about three times as much money would have been spent on highway capital outlays between 1995 and 2000. The average annual number of lane-miles added might have been three times greater and have erased the total annual lane-mile deficit, as shown in the final two columns of Table 1.

In large part, the mobility enjoyed by Oregonians over the past several decades has been the result of relatively high levels of highway capital investments made from the late 1950s through the early 1970s. Congestion has increased because the excess capacity created by those investments has been used up and not replaced. Declining revenues are not the only cause of declining rates of highway construction. Heightened concerns about the negative impacts of highways on the environment and land use have created a complex web of rules and regulations that limit or delay highway construction. Hence, a gap continues to widen between the escalating costs of highway construction and diminishing resources to pay for them.

Public support for limiting highway construction has not been accompanied by equal support for limiting the use of private vehicles or providing transportation alternatives. A large number of trips would have to be moved from private vehicles to public transportation, shared rides or other modes to maintain mobility. For example, the TTI estimates that to maintain existing mobility in the Portland-Vancouver metropolitan area, about 81,000 daily trips would have to be shifted from single-occupant vehicles (SOVs) to carpools or transit each year. [2] This could be accomplished if 40,000 people no longer commuted to and from work by SOVs. According to the 2000 Census, 73% of workers in Clackamas, Clark, Multonomah and Washington counties commuted by SOV. If the rate dropped to equal that for commuters residing in the City of Portland (63%), the number of metropolitan area commuters would drop by about 87,000. This would offset about two years of traffic growth.

Given the trend in highway investment, it is safe to predict highway funding will not be enough to handle traffic growth. Therefore, congestion can be expected to increase in step with population and economic growth. This poses significant issues as to how mobility should be allocated fairly and efficiently among travelers. There are three primary approaches:

1. Do nothing so that mobility is allocated much as it is now, by individuals choosing when and where they travel;
2. Regulate the use of motor vehicles to reduce the amount of travel at certain times, on certain facilities or in certain areas; and,
3. Price highway use so that mobility is allocated by the willingness of travelers to pay for it.

Since the first approach requires no controversial action, it may be the most likely to occur in the foreseeable future. One could expect people to cope with rising congestion in the ways described above. More study is needed to investigate what the effect on the state's comparative advantages might be and how this might affect future economic growth.

Given the improbability of maintaining current mobility levels, it is important for ODOT and other road agencies to strive to get the most value out of congestion management efforts. This can be done by pursuing several objectives. The first is to get the most use out of limited transportation space. This may be accomplished by focusing on reducing bottlenecks, reducing traffic fluctuations, reducing traffic delays due to accidents, increasing passenger and freight throughput by increasing densities in congested corridors, and reserving corridors for future transportation uses, particularly in rapidly growing areas.

The second objective is to target congestion relief towards activities that provide the most benefits to Oregonians. Different activities are affected to varying degrees by congestion. For example, transportation costs are very important to the Port of Portland, but not as important to retailers. Research is needed that goes beyond estimating how and how many vehicles would be affected by a proposed improvement. Estimates are required of how different households, businesses and areas would be affected. Economic, land use and transportation models are needed to do this analysis.

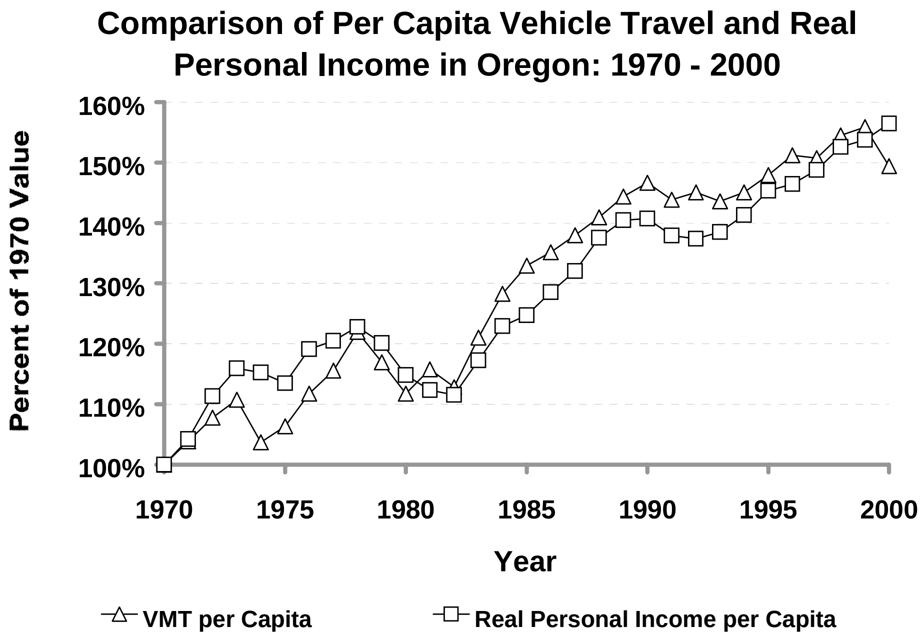
The third objective is to help people cope with congestion. This requires the application of knowledge about how people manage the conflicting time demands of their jobs, households and travel. The experience of the past shows people have been able to limit the effect of rising congestion on their travel time budgets. The availability of choices has allowed them to shift routes, change travel times, chain trips, change how they travel, and change where they live or work in order to limit the effect of congestion on their lives. Failing to take into account the various coping strategies could end up making people worse off. For example, efforts to reduce SOV commuting need to recognize that many people (particularly working women) chain commute and household trips to help balance the time demands of work, home, children and travel. Objectives for helping people cope with congestion include helping them balance work and home responsibilities through flexible work amounts, schedules and telecommuting options.

Finally, it is important to recognize congestion management is not "one size fits all." Rather, urban areas of different sizes require policies that differ as well. Travel and congestion are very much related to the size of the economy of an area. Larger metropolitan areas have larger, more complex economies due to larger markets, more specialization and trade. They achieve greater agglomeration economies and larger benefits from clustering. They also experience greater costs for roadway expansions. Small metropolitan areas should not be compared with larger areas and their transportation policies should not be the same. These areas have smaller markets and are less able to afford congestion costs. Moreover, these areas are less densely settled and therefore are less constrained in their abilities to add highway capacity. A congestion policy that makes sense for a more populous area may not make sense for a less populous one.

[1]David Schrank and Tim Lomax, The 2002 Urban Mobility Report, Texas Transportation Institute, Table A-14. The annual average is computed from data for the period between 1995 and 2000.

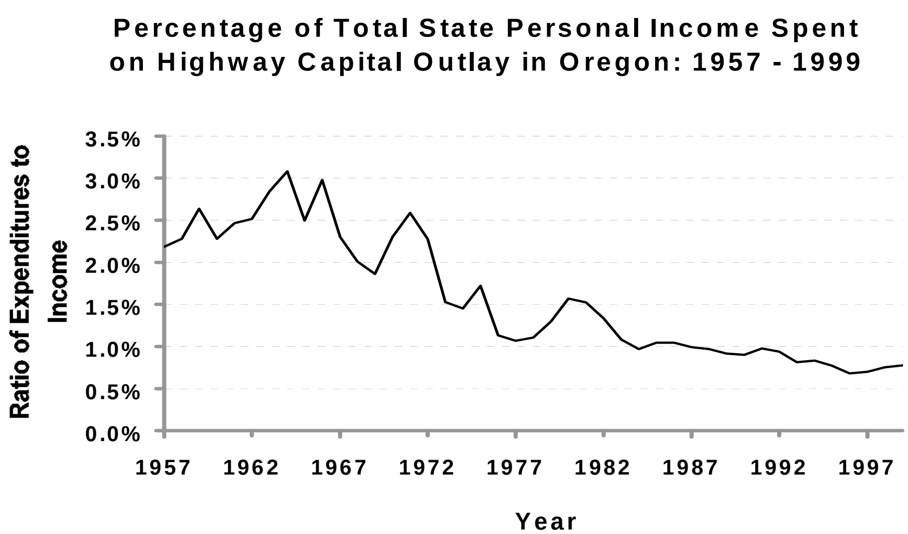
[2] Ibid, Table A-15, p. 69.

Figure 1



Sources: VMT–ODOT Finance Section, Income–Bureau of Economic Analysis, CPI–Bureau of Labor Statistics (Portland area CPI), Analysis–ODOT TPAU

Figure 2



Sources: Personal Income–US Bureau of Economic Analysis; Capital Expenditures-*Highway Statistics Summary to 1995*, Table HF-202C, *Highway Statistics* reports for years 1996-1999, Table HF2

Table 1

Comparison of Lane-Mile Deficiencies Under Current and 1960s Investment Rates

	1995 – 2000 TTI Estimates			Assuming 1960s Investment Rates	
	Lane-Miles Needed Annually	Lane-Miles Built Annually	Annual Lane-Mile Deficit	Lane-Miles Built Annually	Annual Lane-Mile Deficit/ <Surplus>
Freeways	29	5	24	15	14
Principal Arterials	42	22	20	66	<24>
Total	71	27	44	81	<10>

Sources: 1990s estimates of lane-miles needed, built and deficiency from UMS Table A-14. Lane-miles built is the difference between the lane-miles needed and the annual deficiency.