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Citation Details

Dill, Jennifer, "Getting from here to there in the region" (2007 Metropolitan Briefing Book, Institute for Portland Metropolitan Studies, Portland State University)

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GETTING FROM HERE TO THERE IN THE REGION

by Jennifer Dill, Associate Professor, Nohad A. Toulan School of Urban Studies & Planning, Portland State University

When we think about the transportation system, we often think about commuting to and from work. Why isn't there direct transit service from my home to work? How congested will it be when I leave work today? But commuting is only one type of daily regional travel (see Table 1). Unfortunately, data are insufficient to tell us exactly how to categorize all of the travel happening here (or in any U.S. region). We can get some idea from the types of vehicles and infrastructure used. For example, goods movement, both locally and through-travel, accounts for most of the travel on railroads and in ships at the ports. Goods include merchandise being moved to or from locations within the region as well as through-travel on vehicles just passing through—for example, on trucks traveling the I-5 corridor between California and Washington. Large, heavy-duty trucks, which are primarily for goods movement, account for about 5% of the vehicle miles traveled (VMT) on Portland area roads (Economic Development Research Group, 2005). The remaining vehicles on our roadways are for “personal” travel by area residents, visitors and pass-through passengers, and “commercial” travel by businesses and governments. We don't regularly collect data on most forms of commercial travel, but personal travel likely represents the majority of light-duty vehicles on roadways. This paper focuses on personal travel by area residents.

Table 1: Types of travel

Category	Examples	
Personal Travel	Commuting	Going between work and home
	Other personal travel by residents	Grocery shopping
		Taking kids to soccer practice
		Doctors appointment
		Picking up the dry cleaning
		Visiting a work client
	Visitors	Walking from a hotel to the Convention Center
		Arriving by train from Seattle
	Passenger through-travel	Driving from California to Washington on I-5
Flying from Eugene to Frankfurt, Germany with a layover at PDX		
Commercial Travel & Goods Movement	Utility services	Garbage pick-up
		Telephone, gas, electric, etc. service
	Public vehicles	Police and fire vehicles
		City and county vehicles
		Mail delivery
	Urban goods and services	Couriers and messengers
		Store deliveries and repair services
		Construction equipment
		Goods arriving at the Port delivered by truck to local stores
	Goods movement through-travel	Cargo arriving by ship from China and leaving by train to Idaho or truck to southern Oregon
		Trucks traveling on I-5 from California to Washington

Source: Adapted from Pisarski, 2006

Where Are We Going?

Commuting to and from work actually represents a small portion of all personal travel but is important because it influences many other travel decisions. Nationwide in 2001, commuting to and from work only accounted for about 15% of all personal trips by all travel modes, while over 40% were for shopping and other family/personal business (Pisarski, 2006). This result resembles what was found in the last travel survey conducted in this region over ten years ago (the 1994-95 Household Activity Survey).

Over the past 30 years nationwide, commuting to and from work has represented a declining share of all personal travel. It's not because we're working less, but because we're traveling a lot more for other reasons, such as shopping, personal business, and other errands. Despite its shrinking share of overall travel, commuting has an important influence on overall personal travel. People often make other trips on the way to or from work, such as dropping kids off at school or stopping at the gym. The mode they choose for commuting, how long it takes, and where they work will influence many other travel decisions. Work locations and commuting can also influence people's choice of where to live.

Commuting patterns are as diverse as the types of travel. While downtown Portland is a popular commute destination, people are commuting in all directions. In both 1990 and 2000, about two-thirds of all residents of the six-county region lived and worked within the same county, while 30% crossed county lines to get to work but stayed within the region (Table 2).

Nationwide, most urban areas have seen an increase in suburb-to-suburb commuting, and Portland is no exception. In 2000, over 210,000 new regional residents added to the work commute, compared to 1990. Of these, 27% lived and worked in Washington County and 11% commuted to Washington County from one of the other five counties (far right column in Table 2). The shift presents challenges to transportation planners. As traffic flows become more dispersed, traditional forms of fixed-route transit service become less cost-effective.

Table 2: Commute Flows for Residents of the Region's Six Counties

Home County	Workplace County	% of all commutes		% of growth in commutes, 1990 to 2000
		1990	2000	
Multnomah	Multnomah	31%	28%	15%
Washington	Multnomah	7%	6%	2%
Clackamas	Multnomah	7%	6%	2%
Clark	Multnomah	4%	4%	5%
Yamhill & Columbia	Multnomah	1%	1%	1%
Washington	Washington	13%	16%	27%
Multnomah	Washington	3%	3%	5%
Clackamas	Washington	2%	2%	3%
Clark, Yamhill & Columbia	Washington	1%	2%	3%
Clackamas	Clackamas	9%	9%	8%
Remaining 5 counties	Clackamas	4%	5%	6%
Clark	Clark	9%	11%	17%
Remaining 5 counties	Clark	1%	1%	
Columbia	Columbia	1%	1%	0%
Remaining 5 counties	Columbia	<1%	<1%	0%
Yamhill	Yamhill	3%	3%	2%
Remaining 5 counties	Yamhill	<1%	<1%	1%
All 6 counties	Outside the 6 county region	3%	3%	3%
		100%	100%	100%
<i>Lives and works in same county</i>		67%	67%	69%
<i>Lives in one county and works in a different county</i>		30%	30%	28%
<i>Lives in region and works outside region</i>		3%	3%	3%

Source: 1990 and 2000 Census data provided by Metro

How Are We Getting There?

Most personal travel occurs in private vehicles —cars, SUVs, vans, pick-up trucks, and motorcycles. The 1994-95 Portland Household Activity Survey found that 84% of all personal trips were made in personal vehicles, while 8% were made walking, 3% on transit, 4% on school buses, and 1% on bicycles. If and how this pattern may have changed in the past 10 years is not clear. We do have more recent data on commuting. The Census Bureau collects data on commute modes in its Decennial Census and in the new annual American Community Survey (ACS). For commute trips, people are more likely to use transit and less likely to walk, compared to all trips.

Compared to residents in most other large metropolitan areas, Portland-Vancouver commuters are more likely use alternative modes to get to work, rather than driving alone. In 2005, the ACS found that 73% of the workers 16 years and older in the metropolitan statistical area (MSA, including Multnomah, Clackamas, Washington, and Clark counties) drove alone to work. This rate is lower than that in most other MSAs of similar size. Figure 1 shows the share of workers who usually drove alone to work for the Portland-Vancouver MSA, along with the next 20 larger and smaller MSAs by population within the 50 states. The regions are arranged from largest (left) to smallest (right). Portland-Vancouver

has the fourth lowest drive-alone rate of these 41 regions, behind San Francisco-Oakland, Washington DC, and Boston. Residents are more likely to use transit for commuting than other types of trips. Much of the difference is due to a higher rate of transit commuting (6%) than in all but six of the other regions. In addition, 11% carpooled (ranked 14th), 3% walked (ranked 5th), and 1% bicycled (ranked 2nd). About 5% of workers in the region worked at home most of the time.

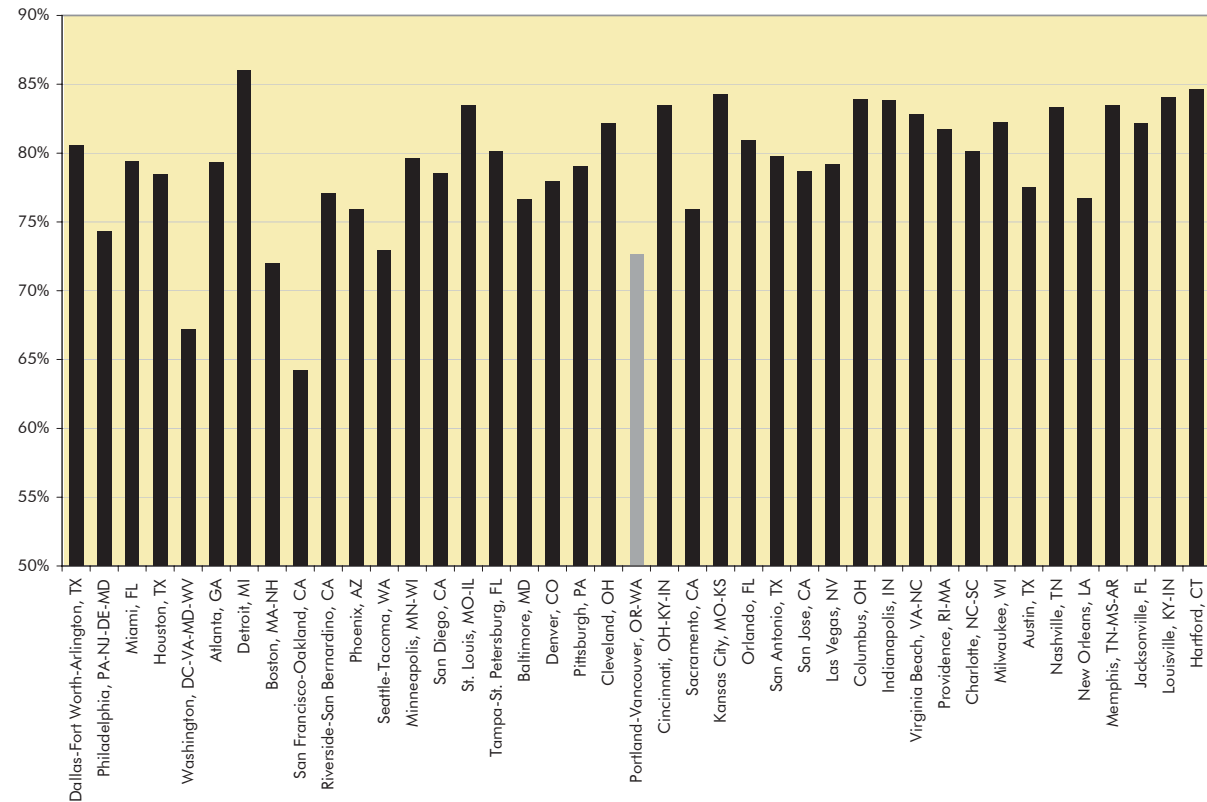


Figure 1: Percent of Workers Driving Alone to Work in 41 Metropolitan Areas
Source: American Community Survey, www.census.gov

The higher rates of transit commuting in the region are reflected in overall higher transit ridership per person in the region. Ridership data reported by transit agencies to the federal government show that Portland-Vancouver area residents make an average of about 50 trips a year on transit. Only four of the other 40 regions had higher rates in 2004 (Figure 2). The number of transit trips a person makes depends somewhat on the amount of transit service available. Therefore, another commonly used measure of transit performance is the number of transit trips taken per “revenue” mile of service (when vehicles are collecting passengers). In 2004, transit riders made 3.3 trips per revenue mile on TriMet and C-Tran, ranking 9th among the 41 MSAs. Between 1997 and 2004, only six of the 41 regions saw an increase in trips per revenue mile, including Portland-Vancouver (a 12% increase). Trips per revenue mile also grew by more than 10% in Dallas-Ft. Worth, Boston, and San Antonio. Miami, Tampa-St. Petersburg, and Orlando saw increases of less than 5%.

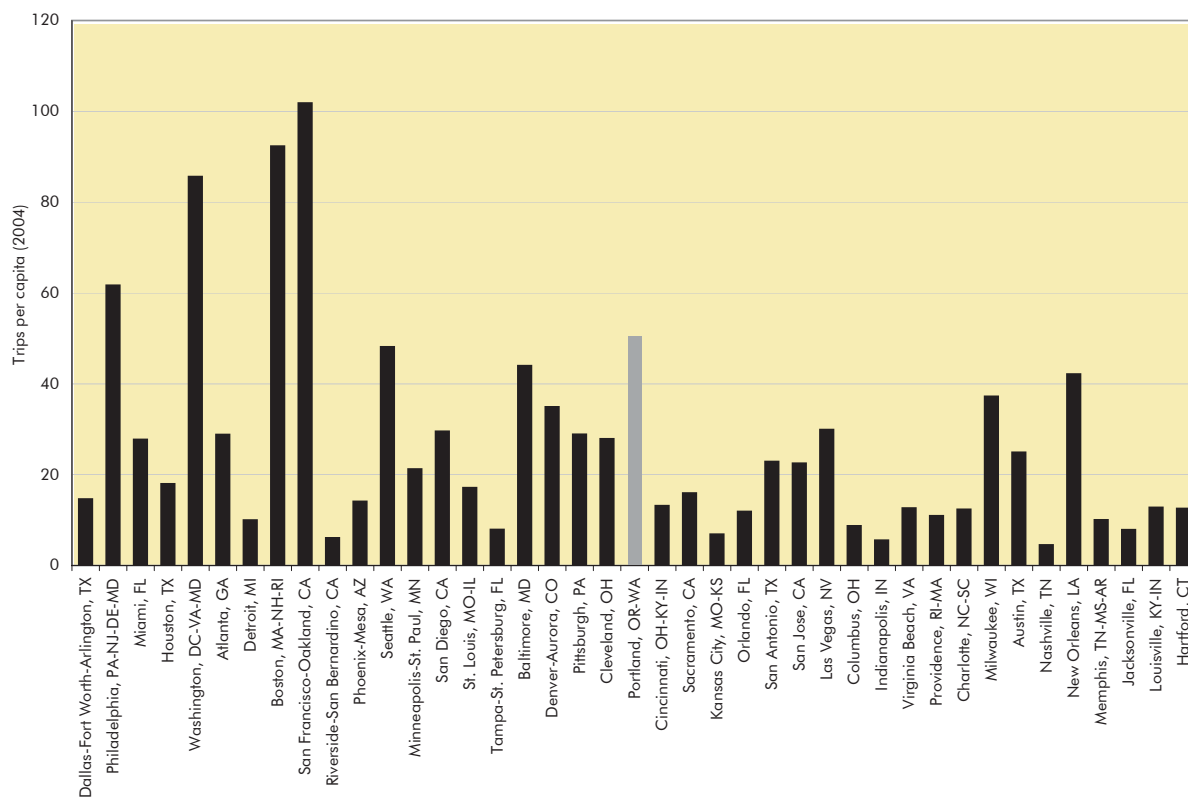


Figure 2: Transit Trips per Capita, 2004

Source: Author’s calculations using Federal Transit Administration’s National Transit Database, <http://www.ntdprogram.com>. Excludes demand response and vanpool service. MSA population data are from 2005 ACS.

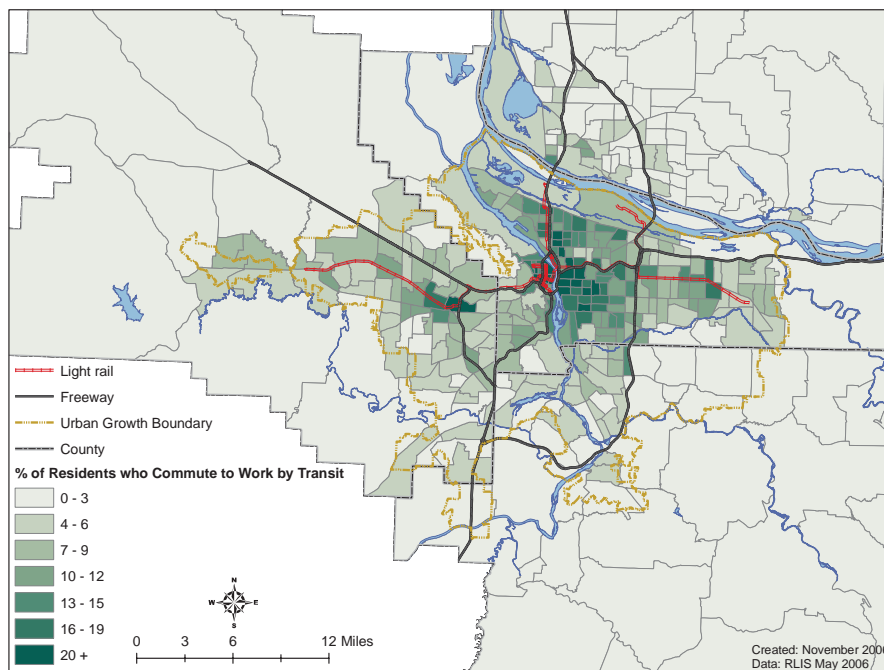


Figure 3: Percent of Workers Commuting by Transit, by Census Tract, 2000
Source: 2000 Census, Summary File 3

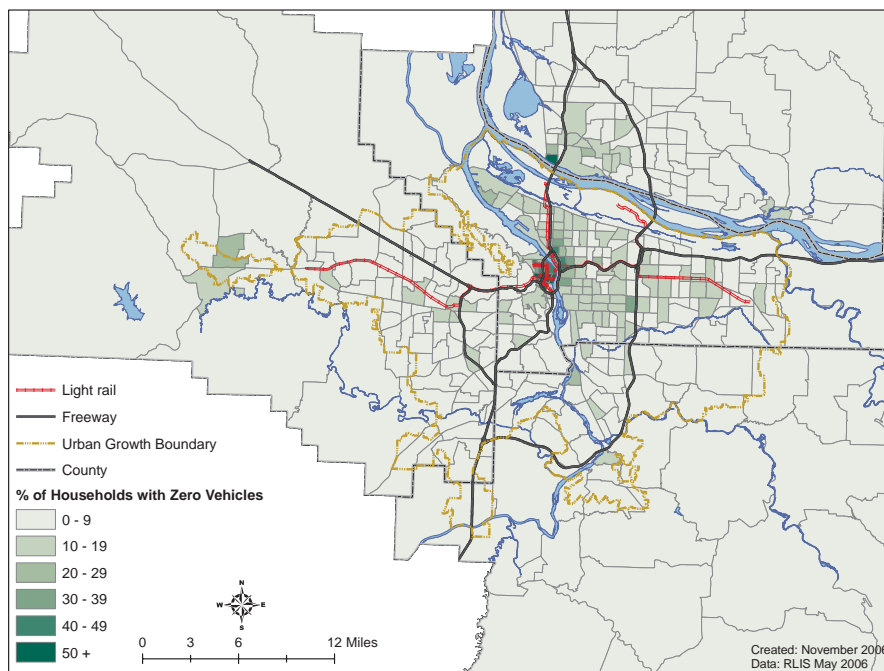


Figure 4: Percent Households with No Vehicle, 2000
Source: 2000 Census, Summary File 3

Transit use for commuting varies significantly throughout the region, with the highest rates closest to downtown Portland and Beaverton (Figure 3).

What About Accessibility?

The transportation system affects access to jobs and essential services. In most regions, including Portland, having a vehicle can make a difference between holding a steady job or not. Throughout the region, 8% of all households do not have a vehicle. These households are concentrated in and near downtown Portland and Vancouver, though carless households are found in the suburbs as well (Figure 4). Vehicle ownership is related to income and race/ethnicity. One in five households headed by a black householder does not have a vehicle, and 12% of Hispanic households do not have a vehicle, compared to 8% of white households.

Access and mobility also vary by age. One of the more significant demographic changes that will influence our transportation system in the next 30 years is the aging of the baby boomer generation. In 2000, 10.5% of the region's population was 65 or older. This share is projected to be 17% in 2030. The number of people 65 and older is expected to more than double, from 166,000 to 394,000 (Neal et al., 2006). These older adults are spread throughout the region, with some high concentrations in areas far from urban centers (Figure 5). This distribution reflects a trend towards "aging in place." Nearly two-thirds of households headed by people 65 and older in the region have lived in the same home for more than 10 years; over 40% have lived in the same home for more than 20 years. Therefore, the homes that baby boomers are living in today probably will be the ones that they live in after they retire. When choosing a new home, homeowners in their 40s may not be thinking about their mobility needs when they are 70.

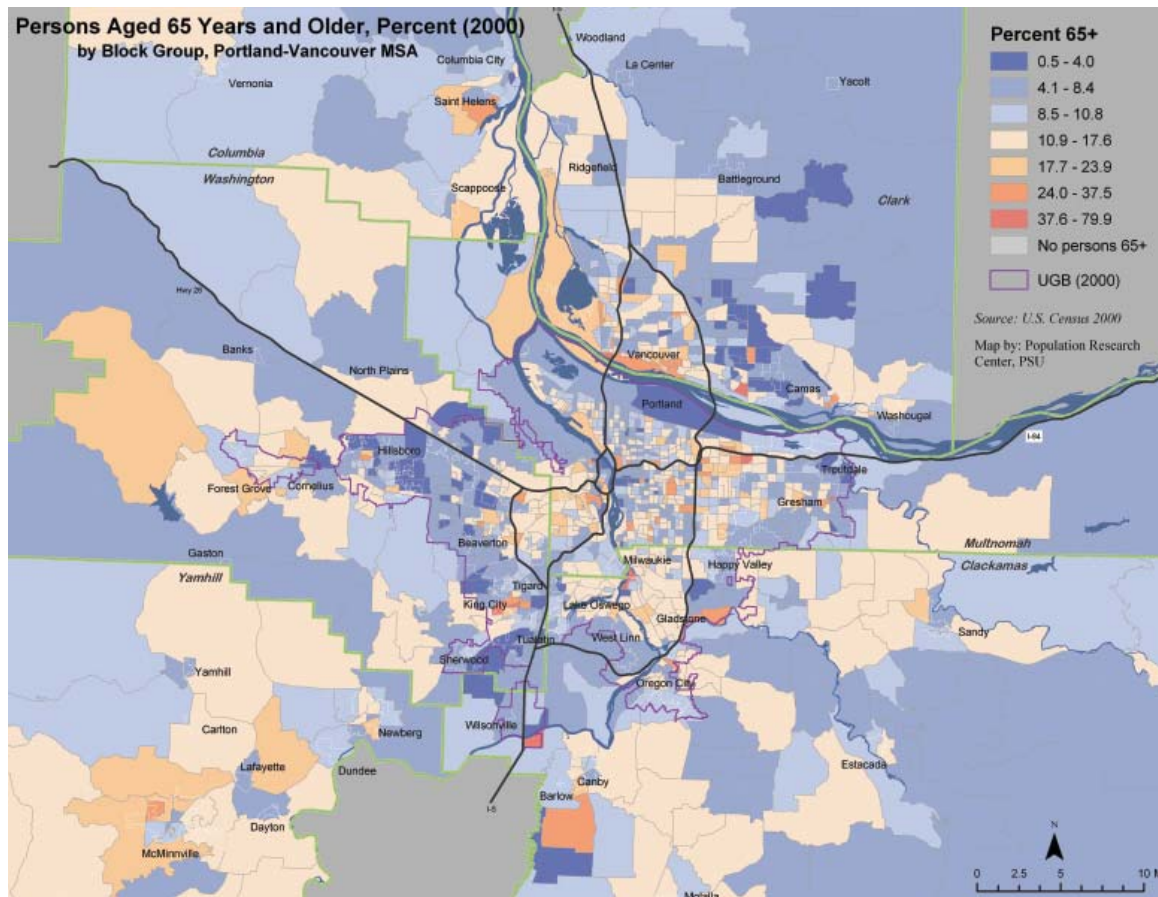


Figure 5: Proportion of Persons Aged 65 Years and Older in the Portland-Vancouver MSA, by Block Group, 2000

Source: Neal et al., 2006

How Much Are We Traveling?

Despite the higher rates of using alternative modes for commuting, most of the region's travel occurs in private vehicles. Residents of the region drove about 19.5 miles per day in 2003, according to data from the Texas Transportation Institute's (TTI) Urban Mobility program. This figure was below the median for the 41 MSAs (23.6 vehicle miles per capita).

All of this vehicle travel does contribute to congestion. The average peak hour traveler experiences nearly 40 hours of delay per year due to congestion (Figure 6). Over half (54%) of this delay is caused by incidents, such as vehicle crashes, rather than recurring congestion caused by too many vehicles.

However, congestion can be measured in ways that influence the conclusions made. The annual TTI report on mobility includes several different measures of congestion and performance. The news media often highlight TTI's "travel time index," which is a ratio of a vehicle's travel time during the peak period to travel time under free-flow conditions. In 2003, the index for the Portland-Vancouver region was 1.37, indicating that peak-period commuters traveled 37% longer in the congested period. Using this measure, the region scored above the median (1.33) and ranked in the top 15 of the 41 regions. The difference in ranking compared to the total annual hours of delay stems from the different measures. The region's residents tend to have shorter distance commutes than do residents of the other regions. Therefore, even when they are delayed by a greater percent (37%), the total time they are delayed is shorter. For example, the travel time index for the Seattle-Tacoma region in 2003 was 1.38, just a little higher than in our region, but that region's commuters spent an extra 46 hours per year in peak period congestion, compared to 39 hours in Portland-Vancouver. Why? Even under free flow conditions, Seattle's commuters spend almost four minutes longer because they are traveling further distances.

Congestion has increased significantly over the past 20 years (Figure 7). In 1982, travelers spent an extra 7 hours a year in peak hour congestion, compared to 39.3 hours in 2003, a 461% increase. Why was there such a large increase in congestion delay when vehicle travel only increased about 150% over the same period? When the volume of traffic approaches the capacity of the roadway, even a small increase in

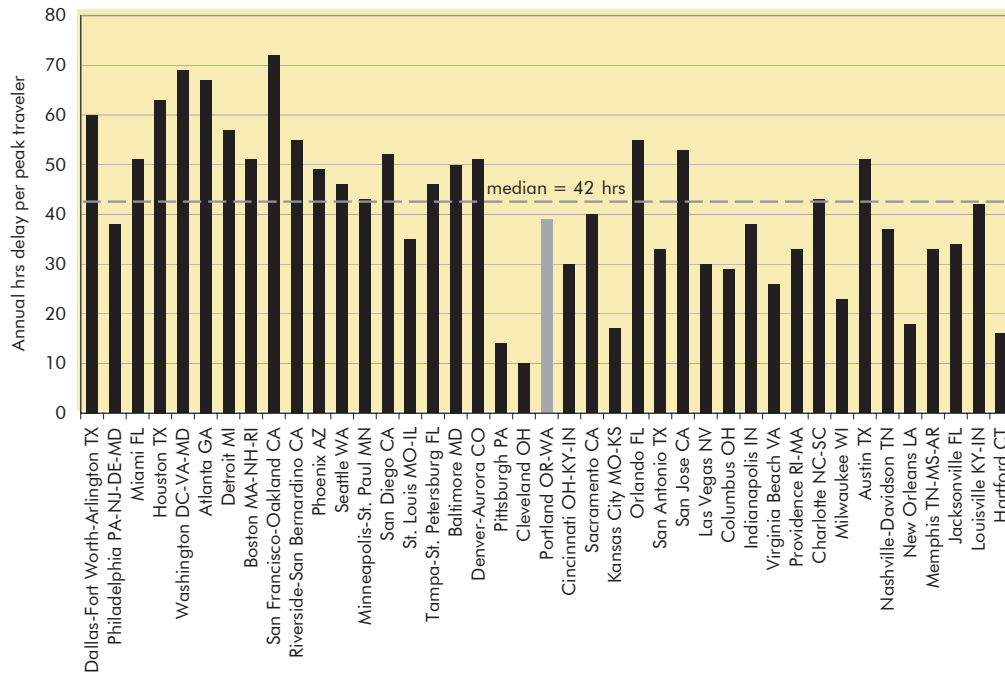


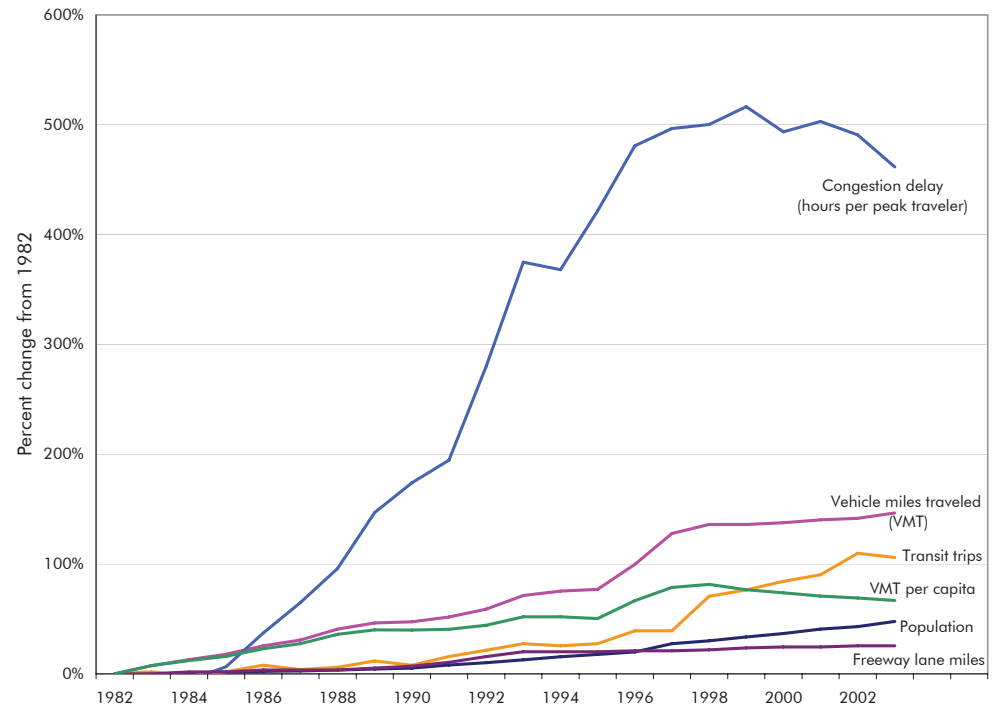
Figure 6: Annual Hours of Delay per Peak Period Traveler, 2003

Source: Texas Transportation Institute
2005 Urban Mobility Report
<http://mobility.tamu.edu/ums/>

the number of vehicles causes a proportionally larger increase in the amount of delay. Imagine a roadway in the middle of the night with just a few cars. You could double the number of cars – a 100% increase in volume –without causing any delay; everyone could still go the speed limit. But, at 4:00 p.m. on a weekday leaving downtown Portland, when there are far more vehicles on the road, adding just a few more can slow down traffic significantly. As vehicle travel increased in the region over 20 years, each day the roadways experienced more tipping points when adding cars caused delay. The “peak hour” is now a few hours. It should be noted, however, that hours of delay declined from 1999 to 2003. During this same time, VMT per capita declined, and the total number of transit trips increased faster than population. Reducing VMT per capita is one objective of Oregon’s Transportation Planning Rule (TPR).

Figure 7: Trends in Travel, Portland-Vancouver, 1982-2003

Source: Data from Texas Transportation Institute, 2005 Mobility Report
<http://mobility.tamu.edu/ums/>



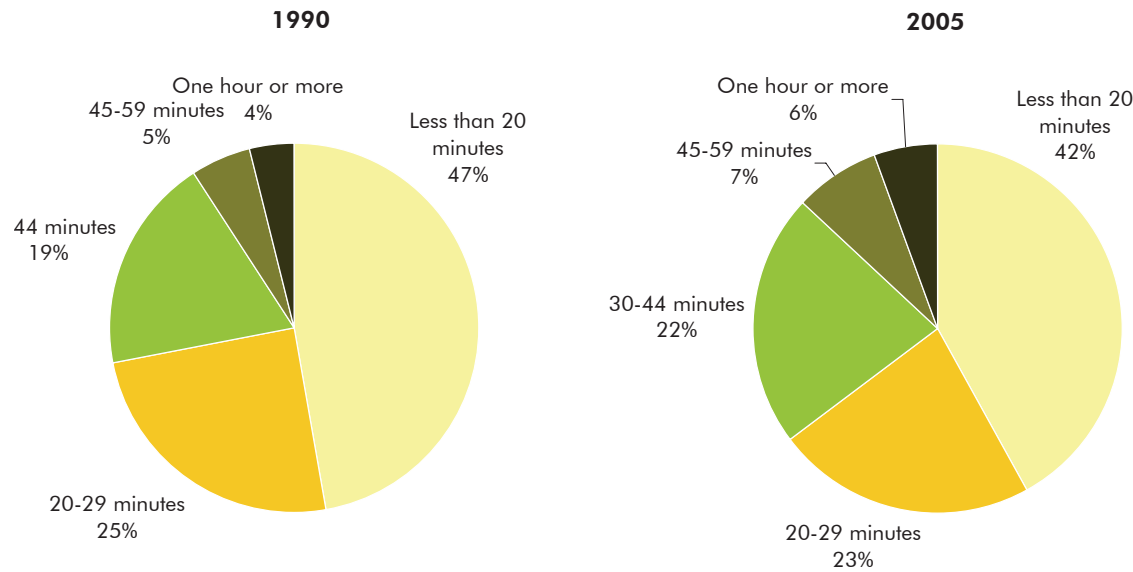


Figure 8: Commute times of Portland-Vancouver Workers, 1990 and 2005
 Source: 1990 US Census SF3 and 2005 American Community Survey. Includes workers in the Portland-Vancouver MSA 16 years and older who did not work at home.



Courtesy of the Portland Development Commission

Increasing congestion and changing commute patterns are contributing to longer commutes. However, most commuters (65%) spend less than 30 minutes getting to work. In 1990, 47% of the region’s commuters got to work in less than 20 minutes, compared to 42% in 2005 (Figure 8).

Thoughts about the Future

Many discussions regarding transportation in the future focus on the congestion. However, several factors and conditions indicate that “solving” the congestion problem, or even reducing congestion significantly, is highly unlikely. One reason is what Anthony Downs calls “triple convergence,” which involves temporal, modal, and spatial shifts (2004). For example, if travel times on a congested freeway were reduced during the morning peak by adding a lane to the freeway, people would respond in three ways. Some people driving on parallel roadways would switch to the freeway. Some people using transit or other modes would switch to driving on the freeway because it’s faster. And some people who were traveling after the peak to avoid congestion would move their trip earlier. These shifts, along with population growth, can quickly erase the improvements made.

Does this mean we should give up on addressing congestion? Certainly not. Over half of congestion is caused by crashes and other non-recurring problems, such as construction projects and weather conditions (Figure 9). Non-recurring congestion is often worse because it’s unpredictable. Commuters and trucking firms can plan around the peak period congestion that happens every weekday. But unexpected delays

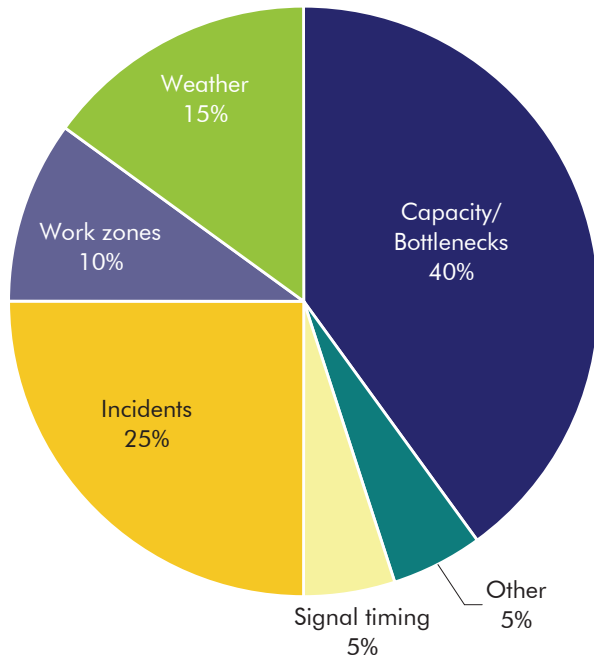


Figure 9: Causes of congestion

Source: Metro, Metropolitan Mobility the Smart Way, http://www.metro-region.org/library_docs/trans/report_final_small.pdf

can cost trucking firms revenue and cause frustration for most drivers. Programs like ODOT's COMET patrols, which aim to clear crashes and stalled motorists quickly, can significantly reduce congestion caused by incidents. Better traffic signal timing and ramp meters can also smooth traffic flow. Using these and other types of intelligent transportation systems (ITS) to manage our transportation system better can help reduce congestion, usually at a lower cost than expanding capacity.

Figure 7 also suggests that reducing the amount of driving per person may help manage congestion. Therefore, improving the attractiveness of travel options including transit, ridesharing, walking, bicycling, and telecommuting is important. Programs and policies that do so can also improve the safety, livability, and attractiveness of regional neighborhoods, such as narrower streets, sidewalks, traffic calming devices, a lively

mix of land uses, street trees, bicycle facilities, and putting parking lots behind buildings. Recent programs using individualized marketing aimed at residents and employer-based programs have also been successful in the short term. Longer-term solutions include changing land use patterns to make origins and destinations closer so that people could walk or bike and increasing densities to make transit more effective. Debate exists concerning how much land use patterns influence travel and congestion. However, despite the questionable effects on congestion, changing land use plans and zoning to promote mixed-use zoning and higher densities of housing gives people more choices. The market and the planning system should provide a variety of neighborhoods and housing types that allow people to choose among several travel modes other than driving. Providing choices is an important public policy objective, whether or not it changes travel patterns.

The Portland region has already started working on implementing most of these ideas to help improve our transportation system. However, the current level of effort will not be enough to deal with the population and job growth expected over the next 20 years. Without additional funding, our problems will worsen.

State and federal gas taxes make up the majority of funding for roads. However, like most U.S. states, Oregon's gas tax revenues have not kept up with inflation and the growth in travel. In Oregon, the amount of gasoline taxes collected per mile driven fell 50% from 1970 to 2003, from 2.31 cents to 1.16 cents per mile (Whitty and Imholt, 2005). Fuel taxes are an attractive funding option for the near term because they resemble a user fee—how much people pay in fuel taxes is somewhat proportional to how much they use the system. However, as vehicles become more fuel efficient and use other types of fuels, traditional per gallon gasoline taxes will no longer be a good user fee. Moreover, legislative bodies and the voters have been unwilling to increase gas taxes to keep up with increasing demand and costs.

In addition to increasing fuel taxes, two options should be considered. First is the pricing of new infrastructure. Many other states and regions are using tolling to pay for new infrastructure, including high-occupancy toll lanes along existing roadways, along with tolls on new freeways and bridges. Tolls, particularly ones that vary based upon the amount of congestion, are one solution that doesn't result in Downs' triple convergence. The second solution is longer term and is being tested in Oregon right now—a vehicle mileage fee. With such a fee, drivers would pay for every mile they drive, rather than for every gallon of gasoline they buy. Such a system could also incorporate congestion charging, with higher rates for driving on the most congested roads during peak periods. This option faces some technical and many political challenges. Both of these funding options send signals to drivers to make appropriate decisions about whether, when, and where to drive and could have significant effects on future levels of congestion. They should be part of a comprehensive set of strategies, along with operations management, encouraging travel options, and changing land use.

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