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2007 Portland Metropolitan Region Transportation System Performance Report

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PORTLAND STATE UNIVERSITY
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NOHAD A. TOULAN SCHOOL OF URBAN STUDIES AND PLANNING

2007
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Portland State
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Acknowledgement

This report is based on the Statewide Congestion Overview, prepared by Brian Gregor of the Oregon Department of Transportation in February 2004. This report draws from that work, including some data and methodologies. The graphical technique used to show Portland, peer western cities, and the remaining comparison metropolitan areas was originally conceived in the Statewide Congestion Overview. This technique has been replicated for new graphics produced in this report. The Statewide Congestion Overview is the inspiration for this report and is available at:
http://www.its.pdx.edu/pdf/CongestionOverview021704.pdf

We gratefully acknowledge the Texas Transportation Institute (TTI) for providing us the 2007 Urban Mobility Report (2005 data) for use in this report.

In addition, we sincerely appreciate the input and assistance provided by our other regional and statewide partners including the Oregon Department of Transportation, Metro, TriMet, the City of Portland and the Port of Portland.

Contributors

Robert L. Bertini and Alex Bigazzi prepared this report. We acknowledge Brian Gregor, Oregon Department of Transportation as a primary contributor, since we used data, methodologies and graphical techniques developed in the Statewide Congestion Overview (February 2004) which he authored. Nick Carey, Sonoko Endo, Christopher Monsere, Jennifer Dill and Jacob Baglien, Portland State University assisted with the earlier versions of this report. Any views presented here, or any errors or omissions are solely the responsibility of the Portland State University Center for Transportation Studies.

Preface

Our transportation system is a key ingredient in the economy, quality of life and urban fabric of the Portland metropolitan area. It has been stated in the past that it is not possible to manage our transportation system tomorrow unless we understand how it is performing today. In this spirit, the Portland State University Center for Transportation Studies has been working with regional and statewide partners to develop new capabilities to measure, monitor and track the performance of the transportation system in real time and using archived data sources. We believe that it is possible to leverage these disparate data sources toward providing better transportation system performance information for planners, engineers, citizens, researchers and decision-makers. Using this information, we can collaboratively develop policies and programs that can help make our transportation system more efficient, equitable and effective.

With this in mind, we are pleased to present the 2007 Portland Metropolitan Region Transportation System Performance Report. We have attempted to make this report comprehensive and multimodal in spirit. We truly view this as a starting point, a work in progress, and we intend to continue to improve the content and format of this report in years to come. Of the new charts that were added for this years' report, several relate to environmental health or sustainability (air quality, drive-alone commuters, etc.). We are also in the process of developing other "green" performance measures such as motor vehicle emissions, fuel consumption, and person-miles traveled. These new performance measures will appear in future versions of this report.

The Center for Transportation Studies strives to stimulate and conduct multidisciplinary research on transportation issues, facilitating the dissemination of information and encouraging the implementation of research results. We welcome both comments on this report and participation in Center for Transportation Studies programs and activities from all interested parties. We invite you to visit our website at www.cts.pdx.edu, and thank you in advance for your interest and input.

Robert L. Bertini, Ph.D., P.E.
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Senior Fellow, Center for Transportation Studies

Comparing Urban Areas

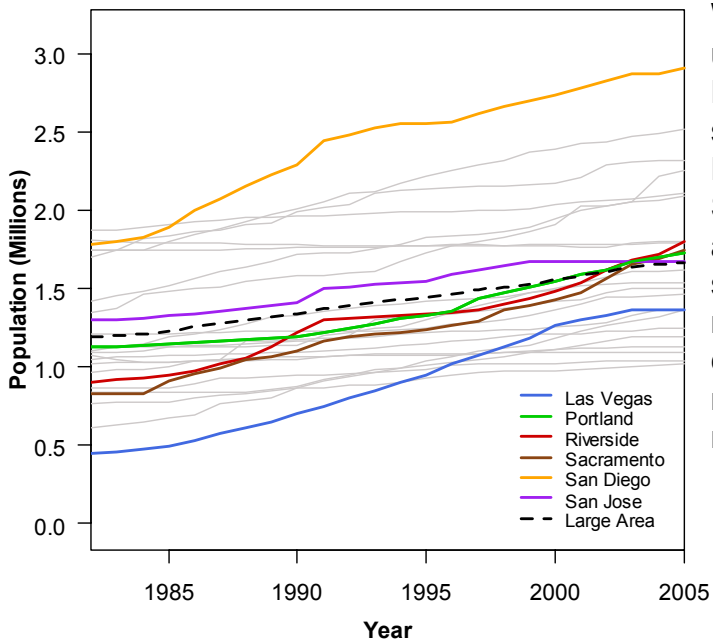
Using methods suggested by the 2004 Statewide Congestion Overview, this section examines ways that urban areas are compared using national-level data sources.

Comparing Urban Areas

Large Urban Areas:

- Baltimore MD
- Buffalo NY
- Cincinnati OH-KY-IN
- Cleveland OH
- Columbus OH
- Denver-Aurora CO
- Indianapolis IN
- Kansas City MO-KS
- Las Vegas NV
- Memphis TN-MS-AR
- Milwaukee WI
- Minneapolis-St. Paul MN
- New Orleans LA
- Orlando FL
- Pittsburgh PA
- Portland OR-WA
- Providence RI-MA
- Riverside-San Bernardino CA
- Sacramento CA
- San Antonio TX
- San Diego CA
- San Jose CA
- St. Louis MO-IL
- Tampa-St. Petersburg FL
- Virginia Beach VA

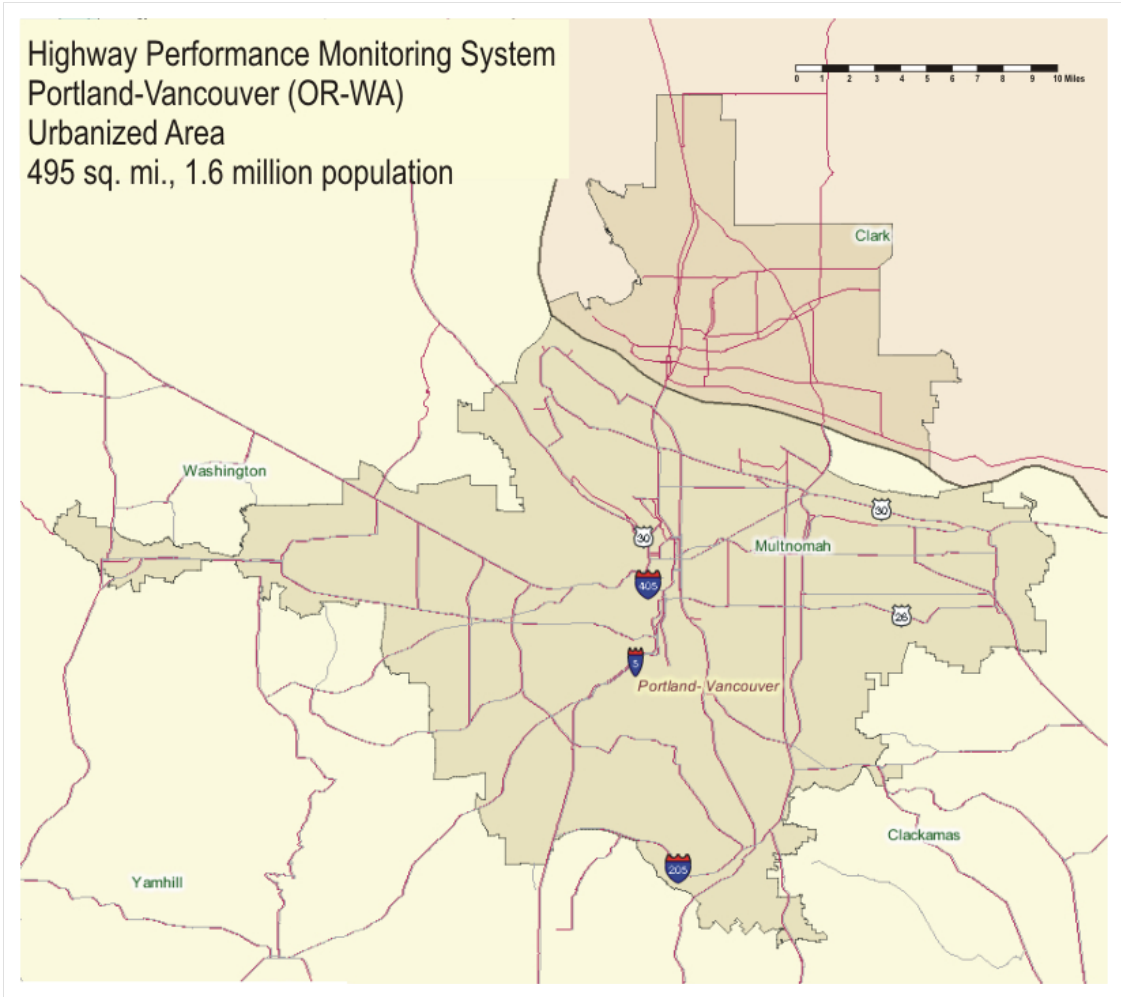
The Texas Transportation Institute's annual Urban Mobility Report categorizes each urban area by size. In this study, we compare the Portland region to other urban areas in the Large category (populations of 1-3 million people). The 25 Large areas are listed on this page to the left. Data reported are through the year 2005. Because of population growth, several cities have moved up to a larger size group, including Phoenix and Seattle which are no longer in the Large group. Revisions were also made to the Urban Mobility Report methodology, affecting the way measures were collected and calculated. The most significant difference from the previous reports is that minor arterials are now included in the analysis, leading to higher VMT, delay, and other measures.



When graphically comparing Large urban areas from the Urban Mobility Report, the colored lines are for the six western cities: Las Vegas, Riverside-San Bernardino, Sacramento, San Diego, San Jose, and Portland. In the sample plot shown here, the grey lines are for the remaining cities in the Large category, and the dashed black line represents the average value measured across all 25 Large cities.

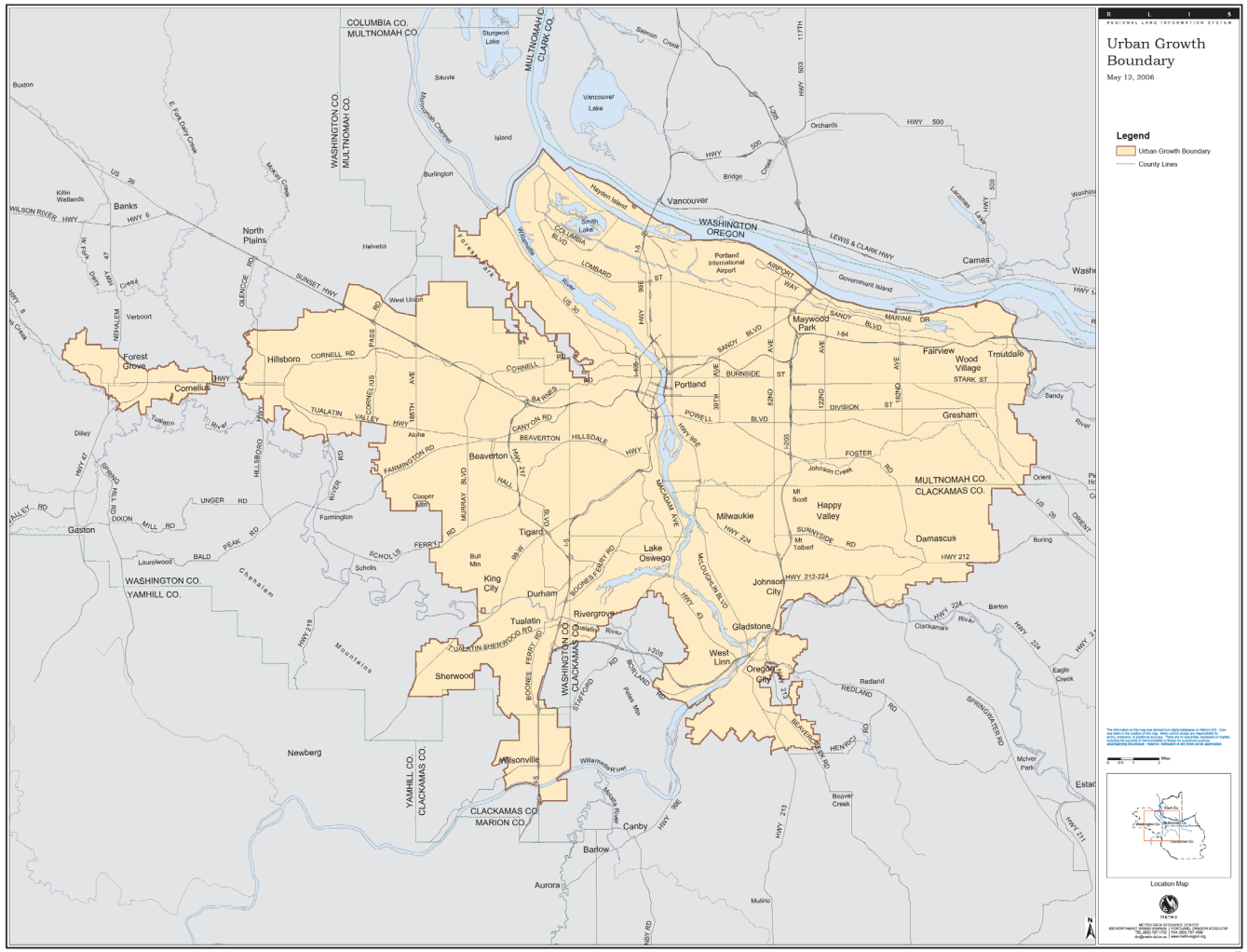
Portland-Vancouver Urbanized Area

This map shows the Portland-Vancouver Urbanized Area, which is used by the Federal Highway Performance Monitoring System (HPMS). The data reported by the Urban Mobility Report includes estimates of travel, population, and land area for this area (different than the area inscribed by the Urban Growth Boundary or the U.S. Census). Changing the boundary of this area would change the results of the Urban Mobility Report.



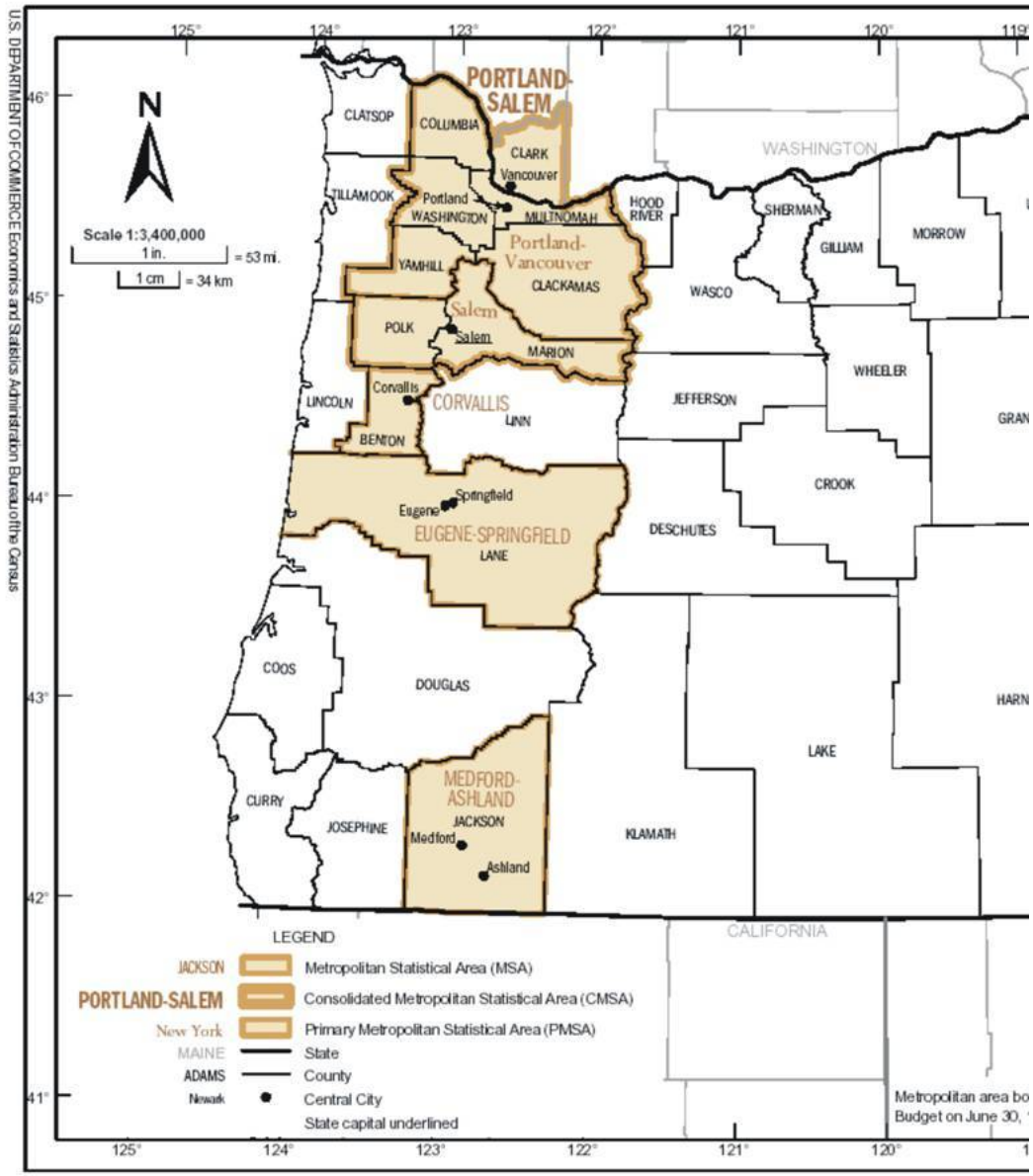
Urban Growth Boundary

In contrast to the map of the Portland-Vancouver urbanized area, this map shows the Metro 2006 Urban Growth Boundary.



U.S. Census Areas

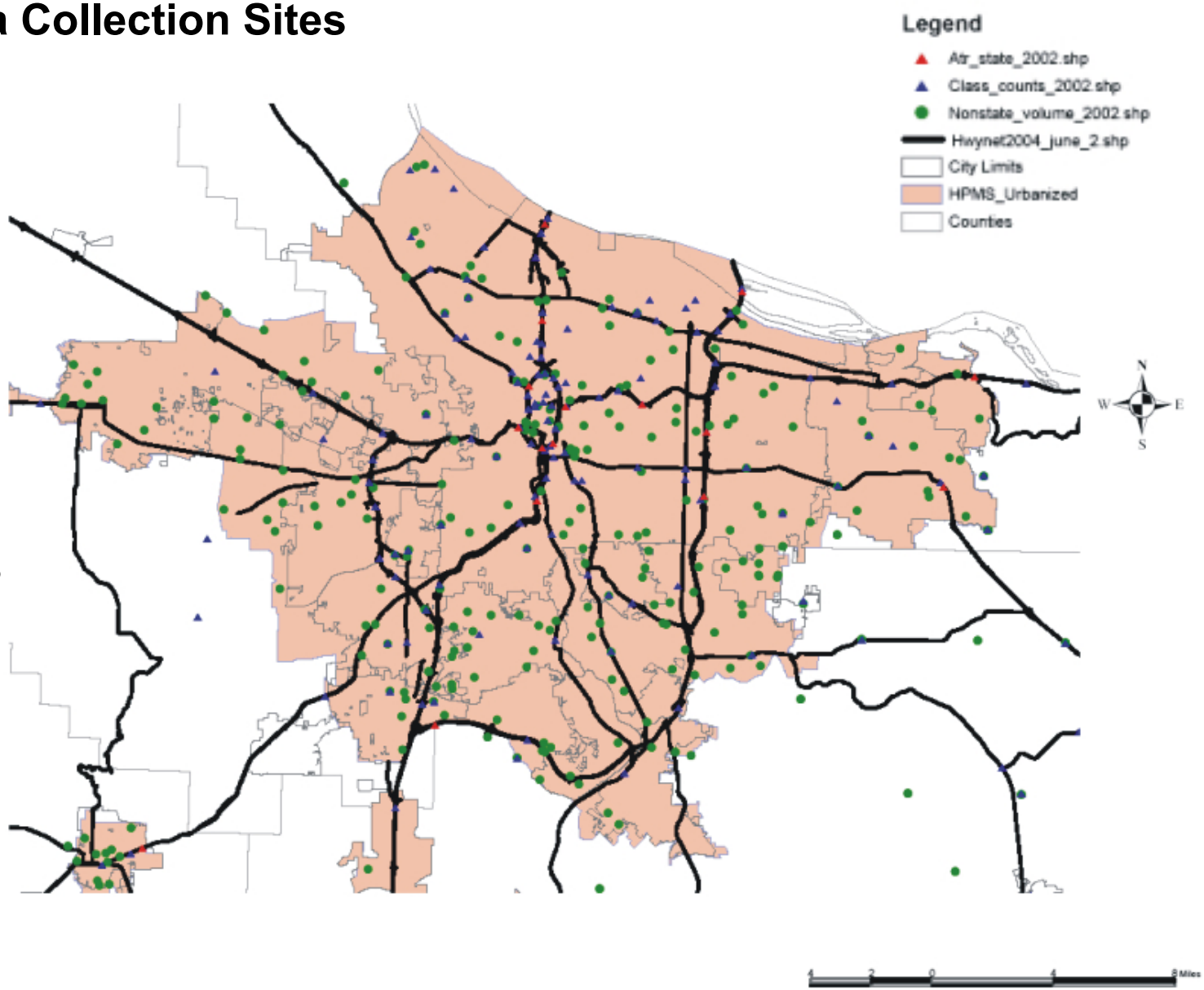
From the standpoint of the U.S. Census, the Portland-Vancouver Primary Metropolitan Statistical Area (PMSA) includes Clackamas, Clark, Columbia, Multnomah, Washington and Yamhill Counties. The Salem PMSA includes Polk and Marion Counties. The Portland-Salem Consolidated Metropolitan Statistical Area (CMSA) includes both the Salem and Portland-Vancouver PMSAs.



HPMS Data Collection Sites

This map shows sites in the Portland metropolitan area where traffic count data were recorded. Typically data are collected for one 48-hour period every three years. Thus, for the 2005 data set, 1/3 of the data were likely recorded in 2002, 1/3 in 2003 and 1/3 in 2004. For data recorded on state highways, the 48-hour data are adjusted to account for seasonal differences.

Data Source: Oregon Department of Transportation.

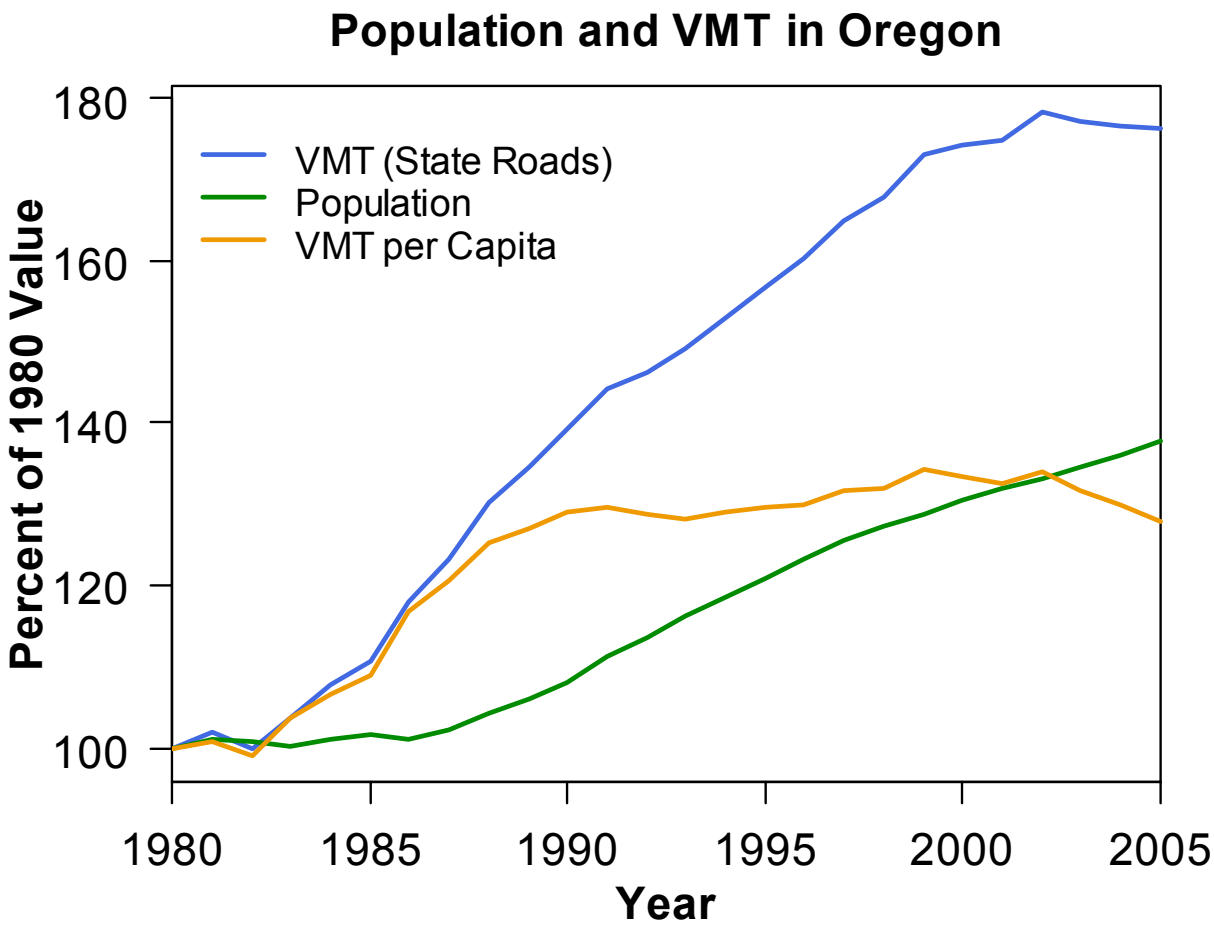


State of Oregon Trends

Using methods suggested by the 2004 Statewide Congestion Overview, this section examines trends on a statewide basis.

Oregon Population and Vehicle Miles Traveled

Oregon saw an increase in traffic on major roads in urban areas of about 75 percent between 1980 and 2005. However, VMT has declined yearly since 2002. Population and VMT per capita increased by 38% and 28%, respectively, over the same period. VMT per capita has declined recently and in 2005 was at its lowest level since 1989.

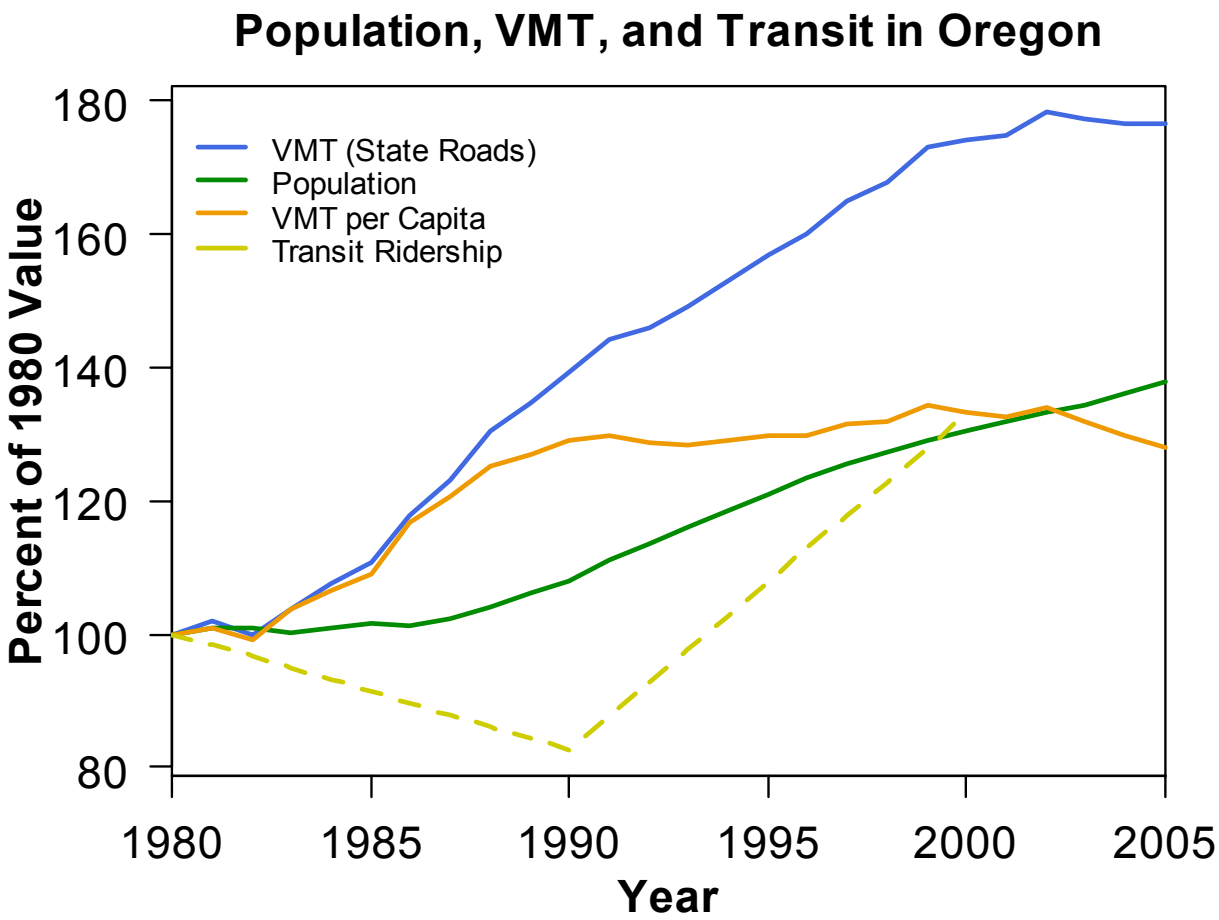


Data Sources: VMT - ODOT; Population - Portland State University Population Research Center

(Figure 1-1)

Oregon Population, Vehicle Miles Traveled and Transit Ridership

In addition to what was shown on the previous page, this graph shows that transit ridership (work trips) decreased between 1980 and 1990, and increased between 1990 and 2000. The overall increase in transit ridership between 1980 and 2000 was about 30 percent.



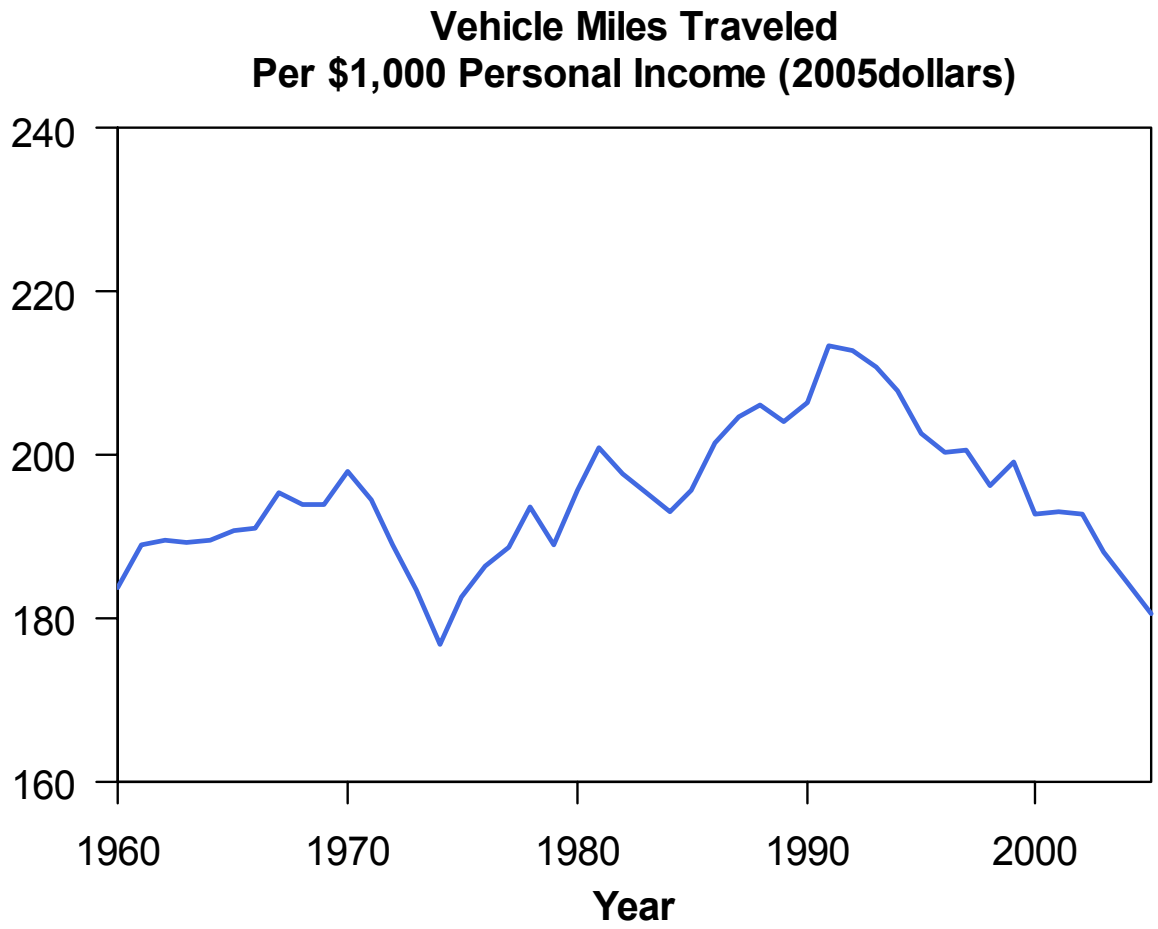
Data Sources: VMT - ODOT; Population - Portland State University Population Research Center; Transit – U.S. Census Journey to Work.

Note: Transit data for Portland-Salem CMSA, from census years only (3 data points, so trends difficult to discern)

(Figure 1-2)

Oregon VMT Related to Income

The ratio of VMT to total statewide personal income has not changed significantly over the past forty-five years. It peaked in 1991, and is currently the lowest it has been since 1974. These VMT values are for state-owned highways only. VMT estimates by ODOT for all Oregon roads are typically about 66% higher.

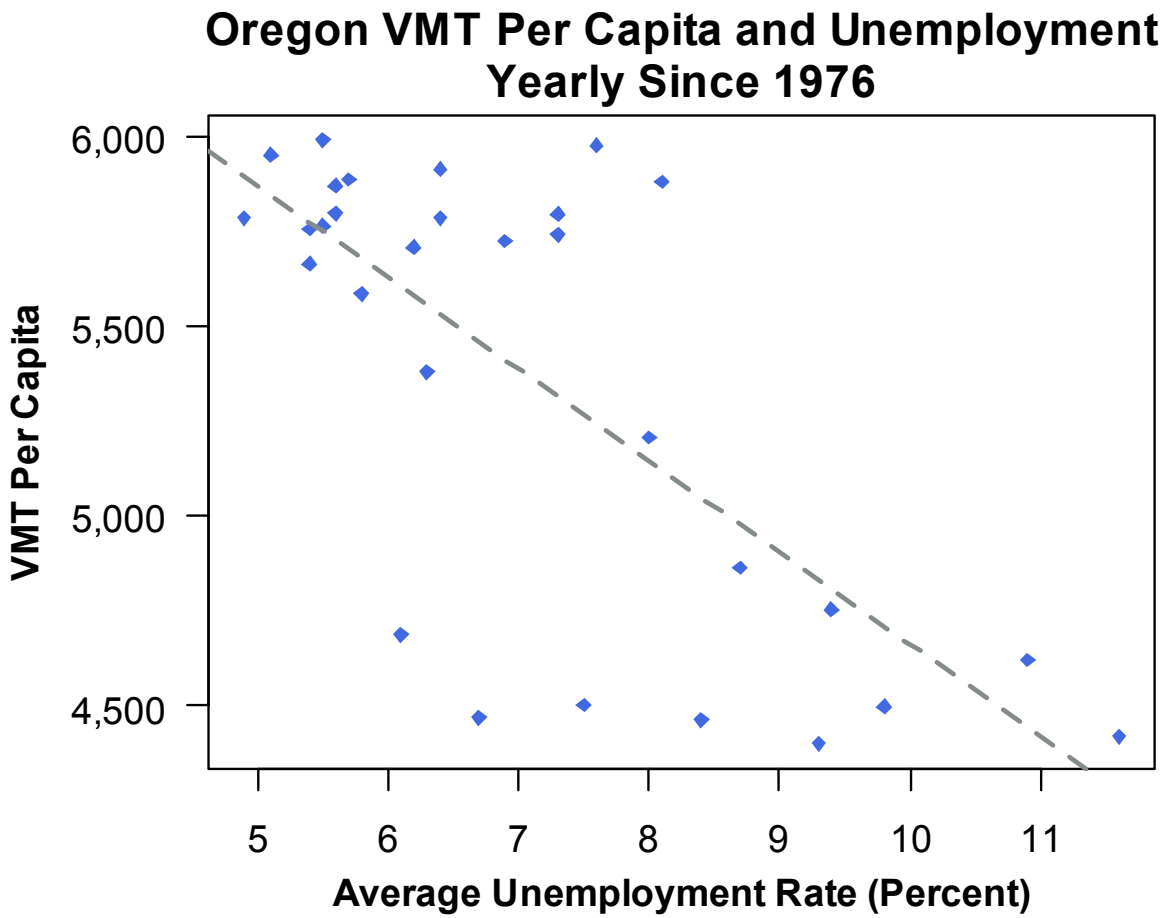


Data Sources: VMT - ODOT; Income – U.S. Bureau of Economic Analysis; CPI – U.S. Bureau of Labor Statistics

(Figure 1-3)

Oregon VMT and Unemployment

This graph shows the relationship between annual VMT per capita and annual average unemployment rate since 1976.

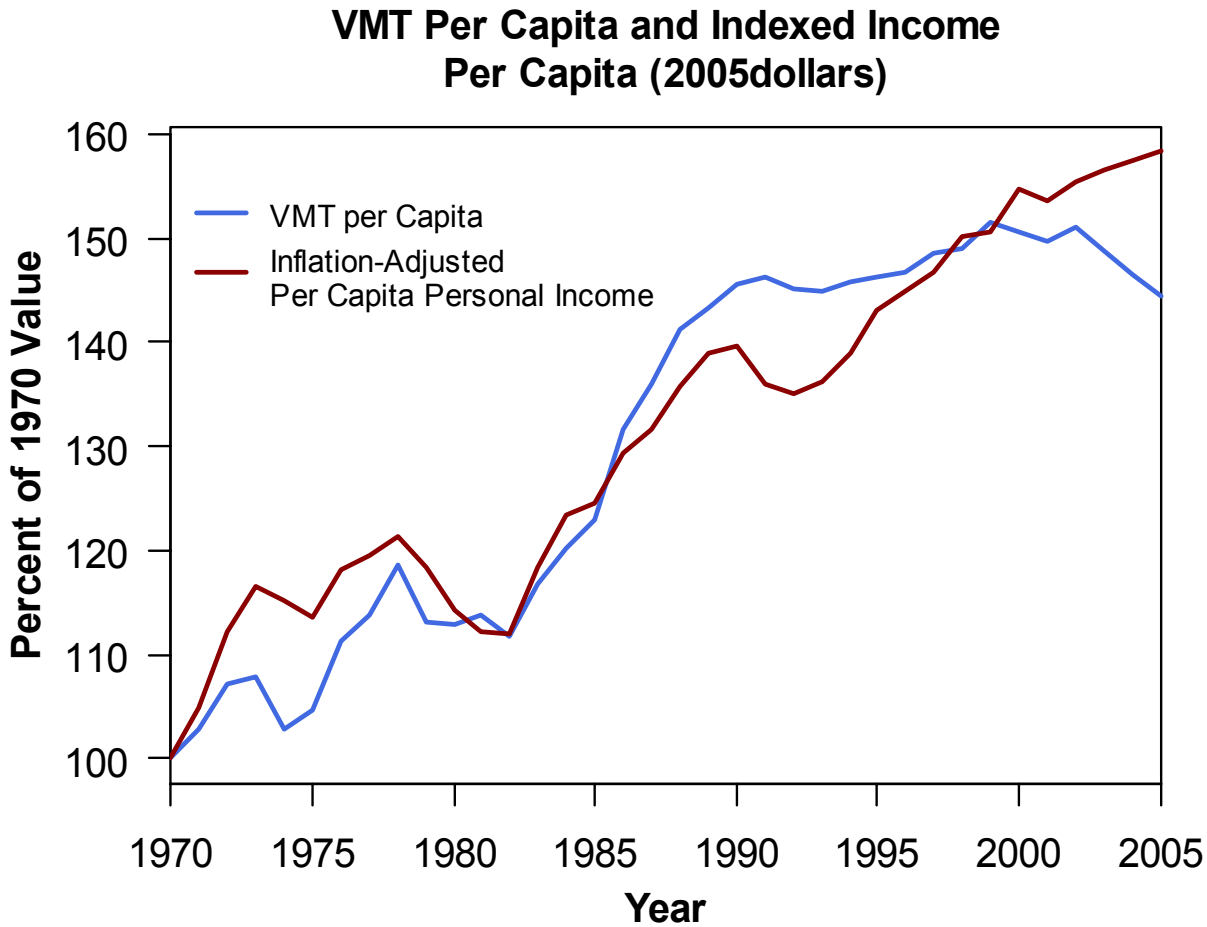


Data Sources: VMT – ODOT; Unemployment – U.S. Bureau of Labor Statistics.

(Figure 1-4)

Oregon Per Capita VMT Related to Per Capita Income

Statewide personal income and VMT have shown similar trends of growth. Thus it appears that the increase in VMT is tracking with growth in the economy. This constant relationship between VMT and personal income per capita was a conclusion from the Statewide Congestion Overview.



Data Sources: VMT - ODOT; Income – U.S. Bureau of Economic Analysis; CPI – U.S. Bureau of Labor Statistics

(Figure 1-5)

Oregon Average Wages

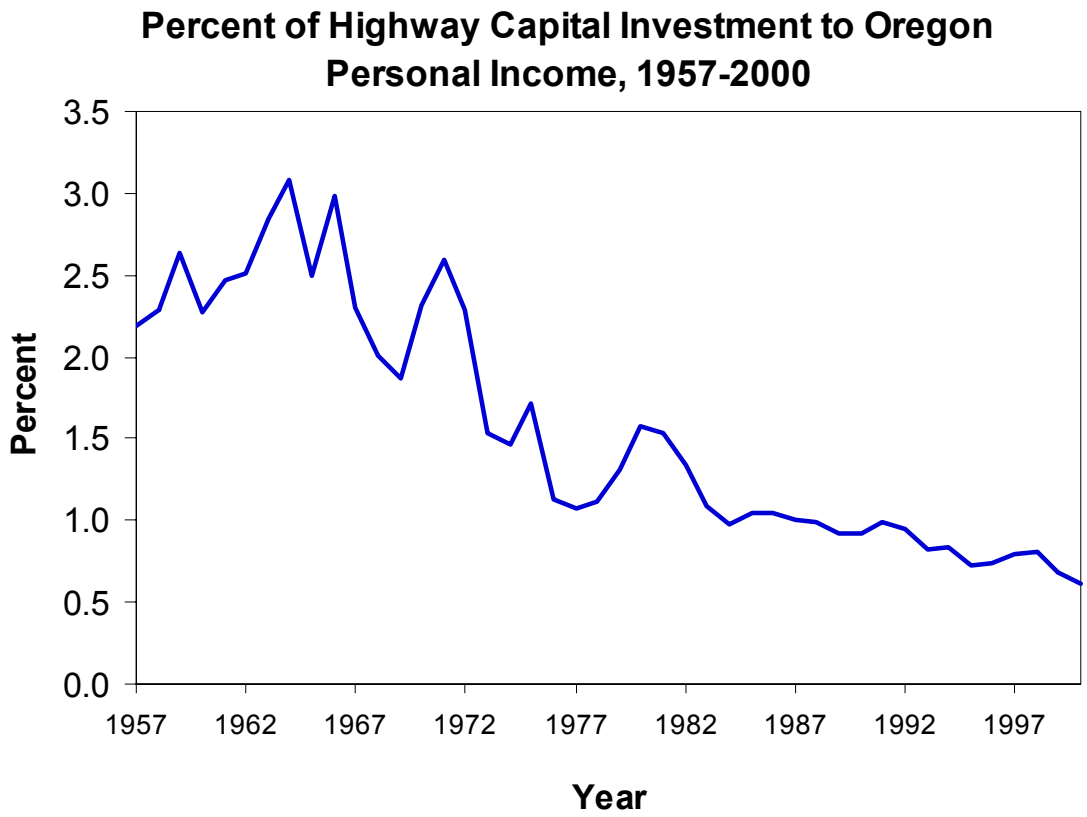
Oregonians' average annual wages (after adjusting for inflation) have not changed much over time. This is a similar conclusion to one shown in the Statewide Congestion Overview.

Data Sources: Income - Bureau of Economic Analysis; CPI - Bureau of Labor Statistics

(Figure 1-6)

Oregon Highway Capital Investment

The ratio of highway capital investment to statewide personal income has declined rapidly over the past 43 years. It peaked in 1968 at about 3 percent, and dropped to about 0.6 percent in 2000. As stated in the Statewide Congestion Overview (2004, p. 13) the decrease in highway capital investment increases the gap between VMT and lane-miles.

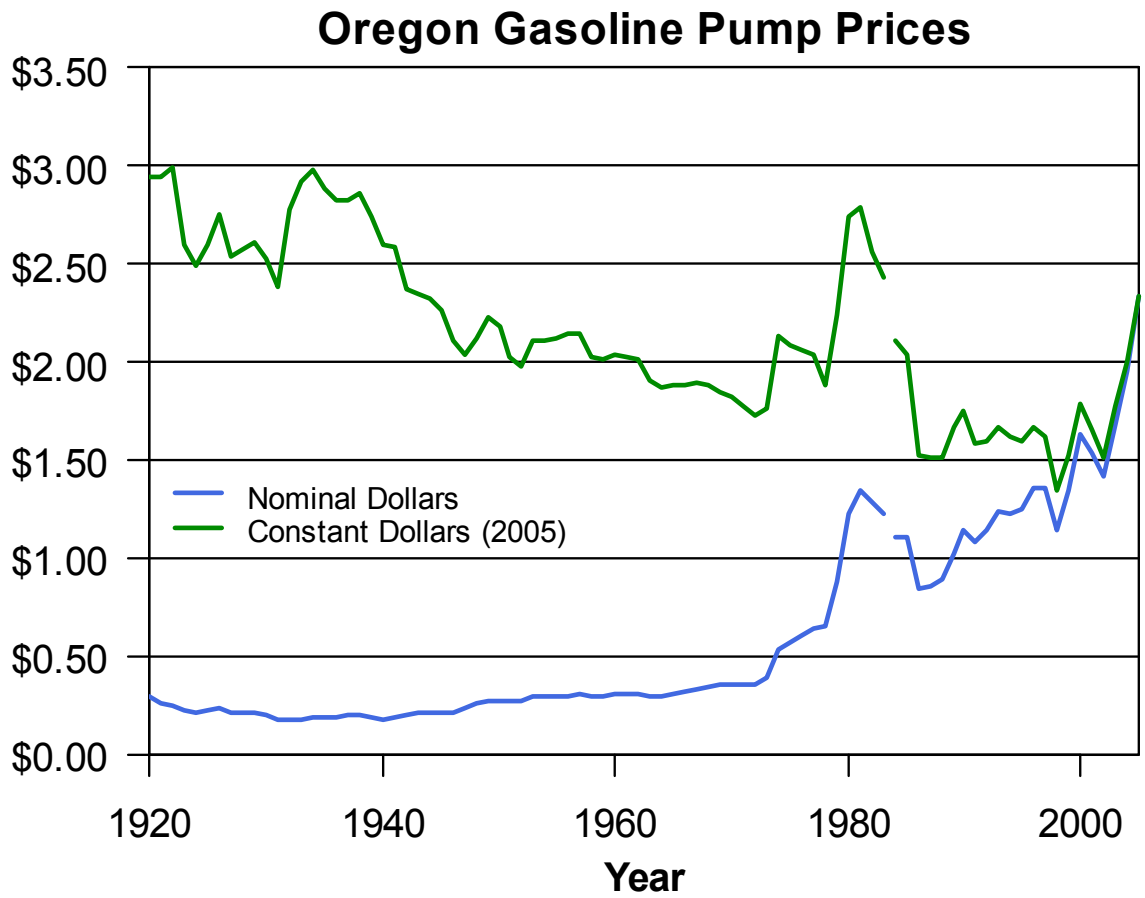


Data Sources: Personal Income - US Bureau of Economic Analysis; Capital Expenditures - Highway Statistics Summary to 1995, Table HF-202C, Highway Statistics reports for years 1996-2000, Table HF2

(Figure 1-7)

Oregon Gasoline Prices

This chart shows gasoline prices (including tax) over the past 80 years. Both the nominal and inflation-adjusted prices are presented. Until recently, real gasoline pump prices had been declining steadily since 1920, with several large spikes in the 1970s. Since 1998 the trend has been increasing.



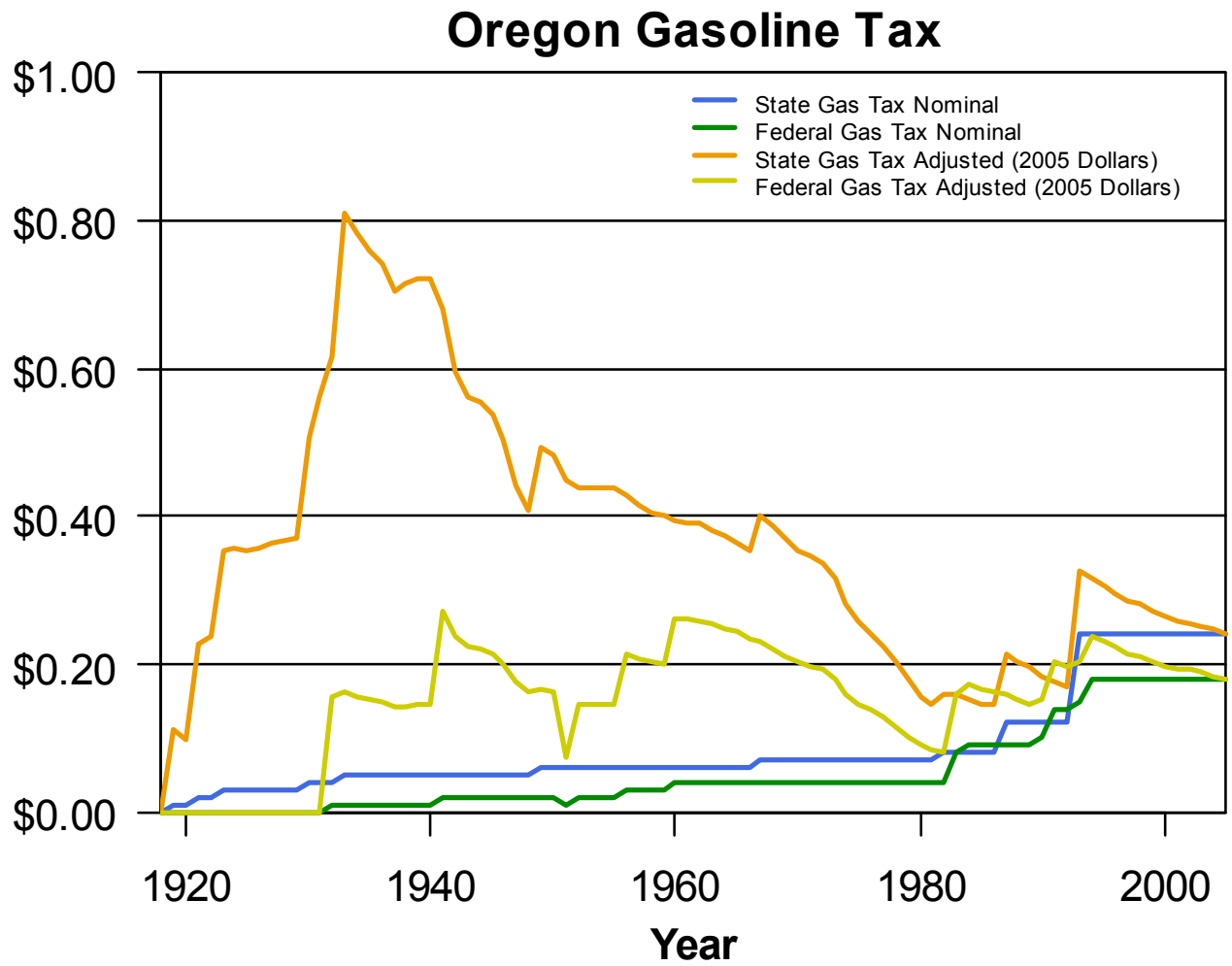
Data Sources: Pump prices – American Petroleum Institute (before 1984) and the Energy Information Administration (from 1984); CPI - Bureau of Labor Statistics

Note: The discontinuity in the chart reflects different data sources for gasoline pump prices before and after 1984.

(Figure 1-8)

Oregon Gasoline Taxes

Fuel taxes (federal and state) are calculated as a fixed number of cents per gallon purchased. As shown, the nominal Oregon gasoline tax (currently 24¢/gallon) has increased since 1920, but has not kept up with inflation. Similarly, the federal tax (currently 18¢/gallon) has lost purchasing power due to inflationary effects.

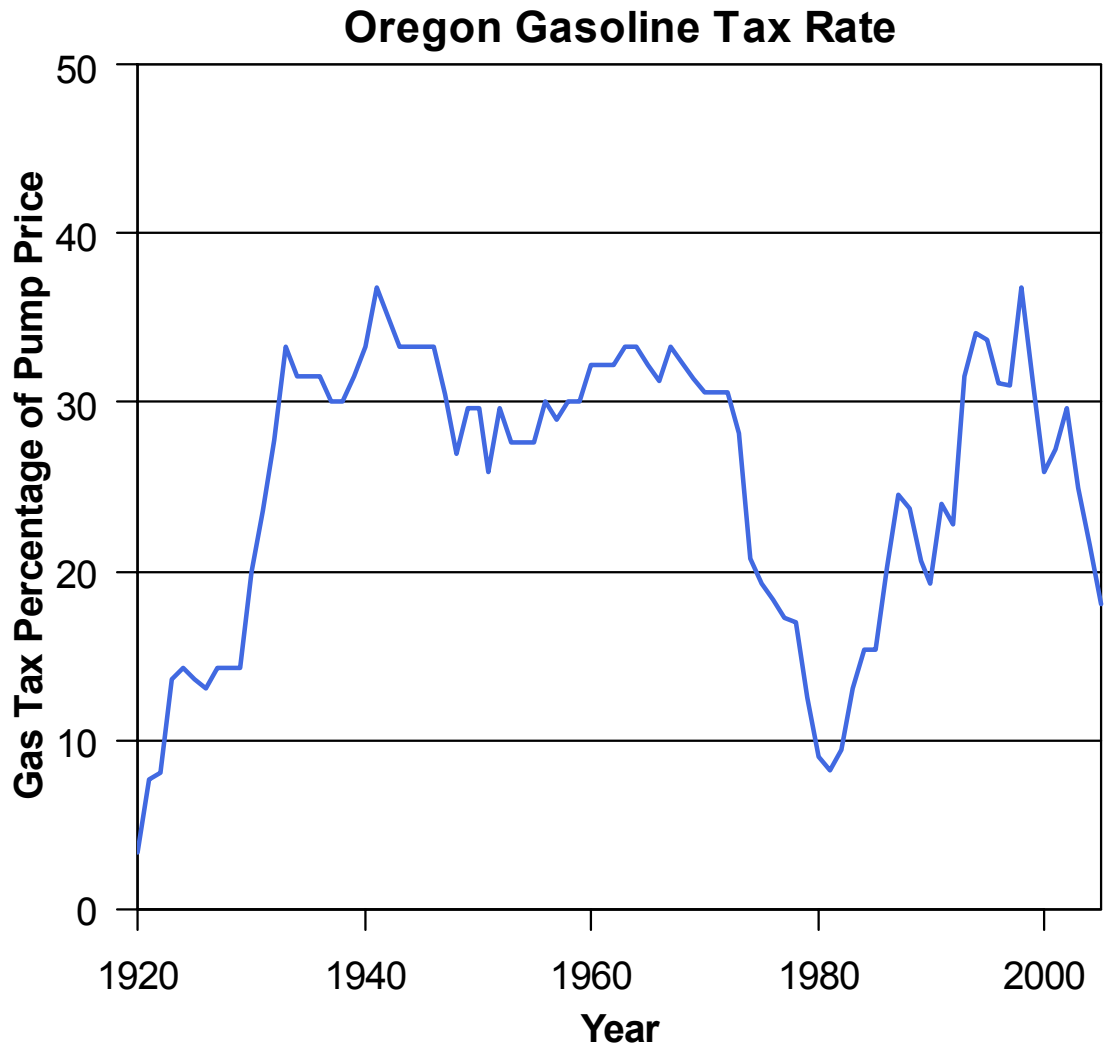


Data Sources: Gasoline Tax – American Petroleum Institute and ODOT; CPI - Bureau of Labor Statistics

(Figure 1-9)

Oregon Gasoline Tax Rate

The gasoline tax rate (federal and state gas taxes as a percentage of the pump price) was around 30% for much of the last century. Because gasoline taxes are a set monetary value, the gas tax rate will fall as pump prices rise.

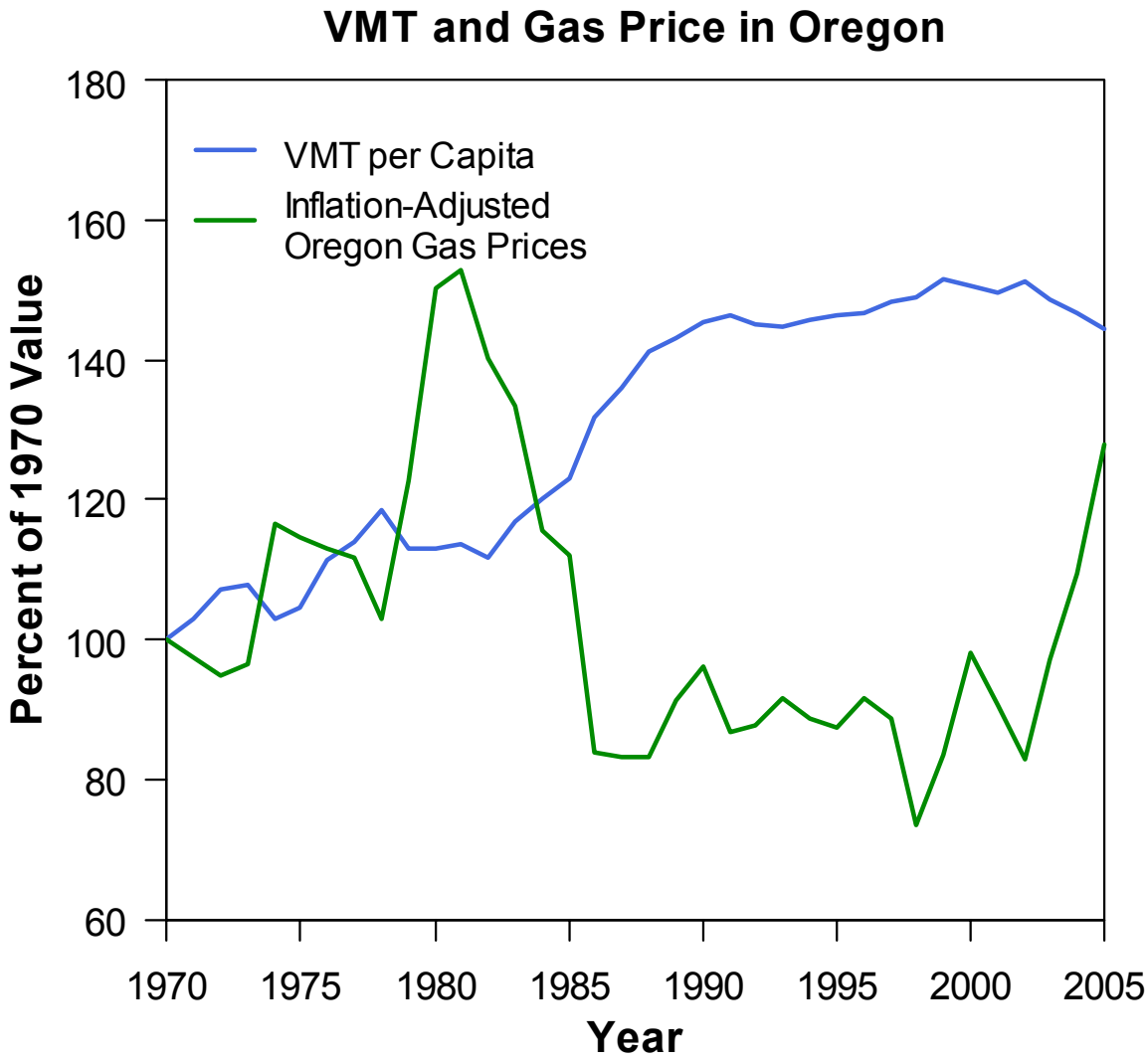


Data Sources: Gasoline Tax – American Petroleum Institute and ODOT; Pump Price – American Petroleum Institute and the U.S. Energy Information Administration

(Figure 1-10)

Oregon VMT and Fuel Prices

This chart shows the relationship between state travel per capita and gas pump prices since 1970. As can be seen, although the overall VMT has increased, rising fuel prices often correspond with lower VMT.

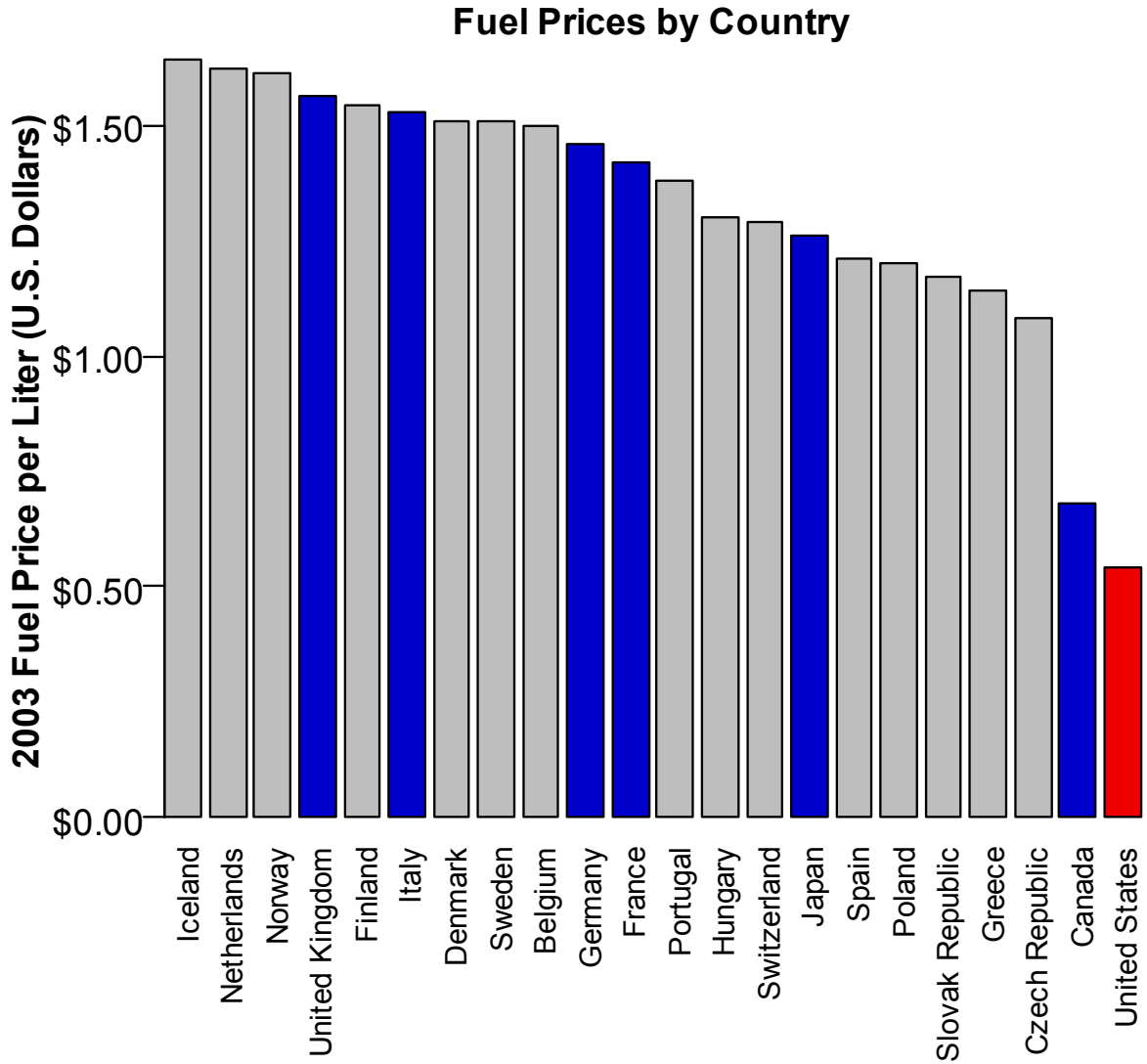


Data Sources: VMT – ODOT; Pump Price – American Petroleum Institute and the U.S. Energy Information Administration

(Figure 1-11)

International Fuel Prices

For an international perspective, this chart shows that as of 2003 the United States and Canada had significantly lower fuel prices than most other countries. The countries coded blue are part of the G8 (data not available for Russia).

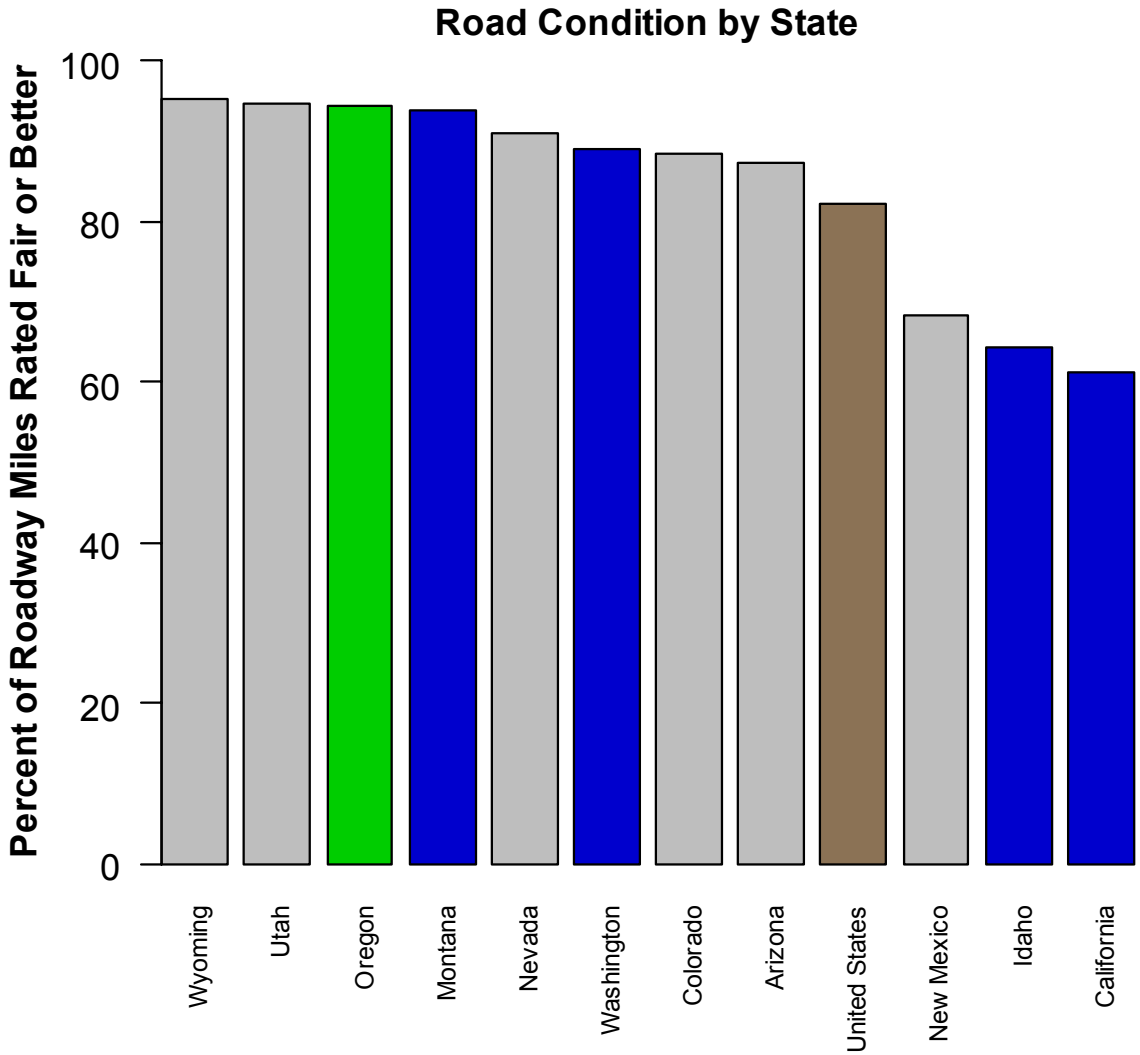


Data Source: Organisation for Economic Co-Operation and Development

(Figure 1-12)

Road Conditions by State

This chart shows that the condition of Oregon roads compares well to the 10 other Western states and the U.S. average, as of 2005. The rating system classifies roadways as Very Good, Good, Fair, Mediocre, and Poor, based on the International Roughness Index and the Present Serviceability Rating. Higher values are better.

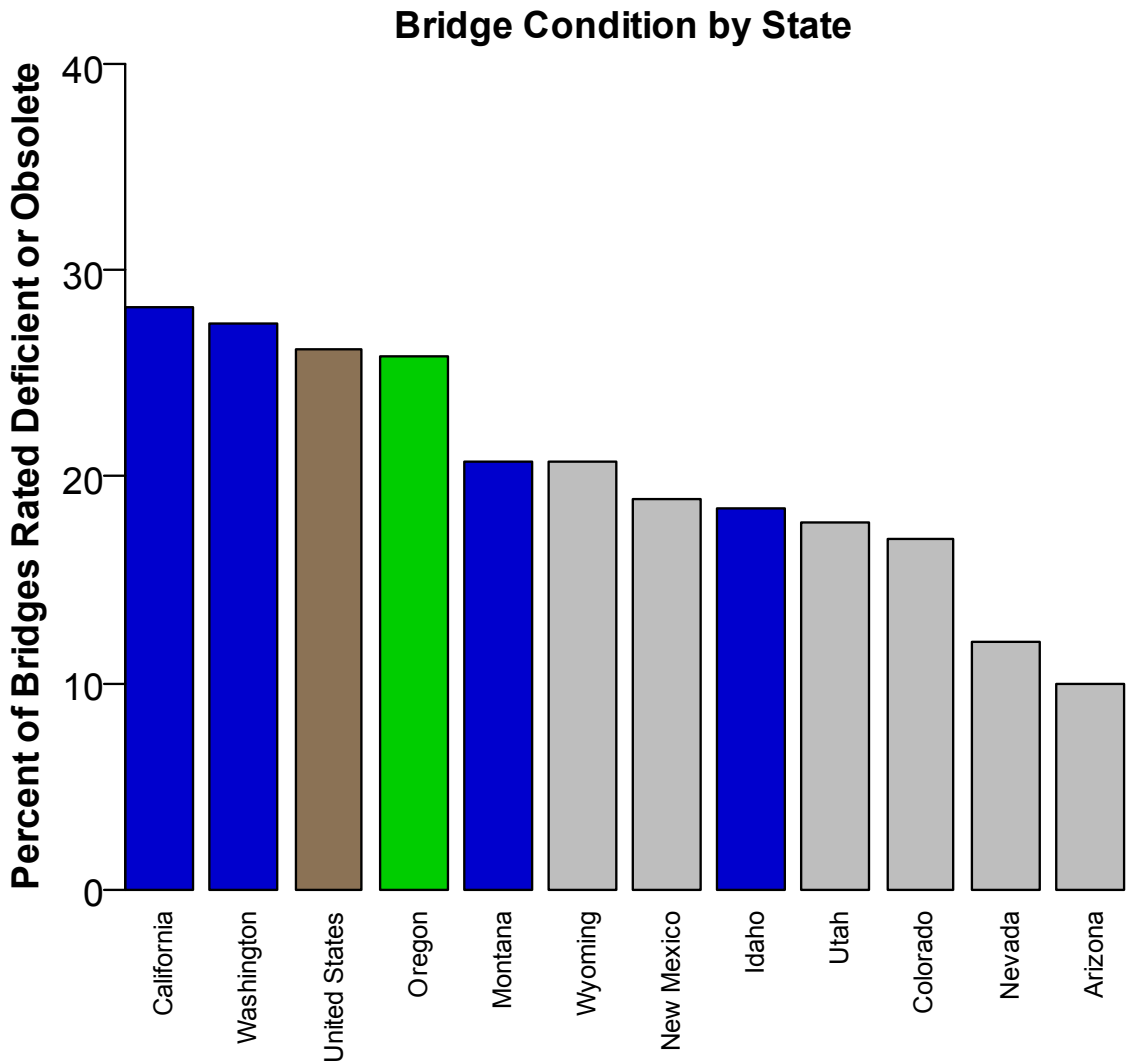


Data Source: Federal Highway Administration

(Figure 1-13)

Bridge Conditions by State

This chart shows the percent of bridges rated structurally deficient or functionally obsolete for 11 Western states and the U.S. average. Lower values are better. Oregon rates slightly better than the national average and the other Pacific Coast states. Still, over ¼ of Oregon bridges are deficient or obsolete as of 2005.

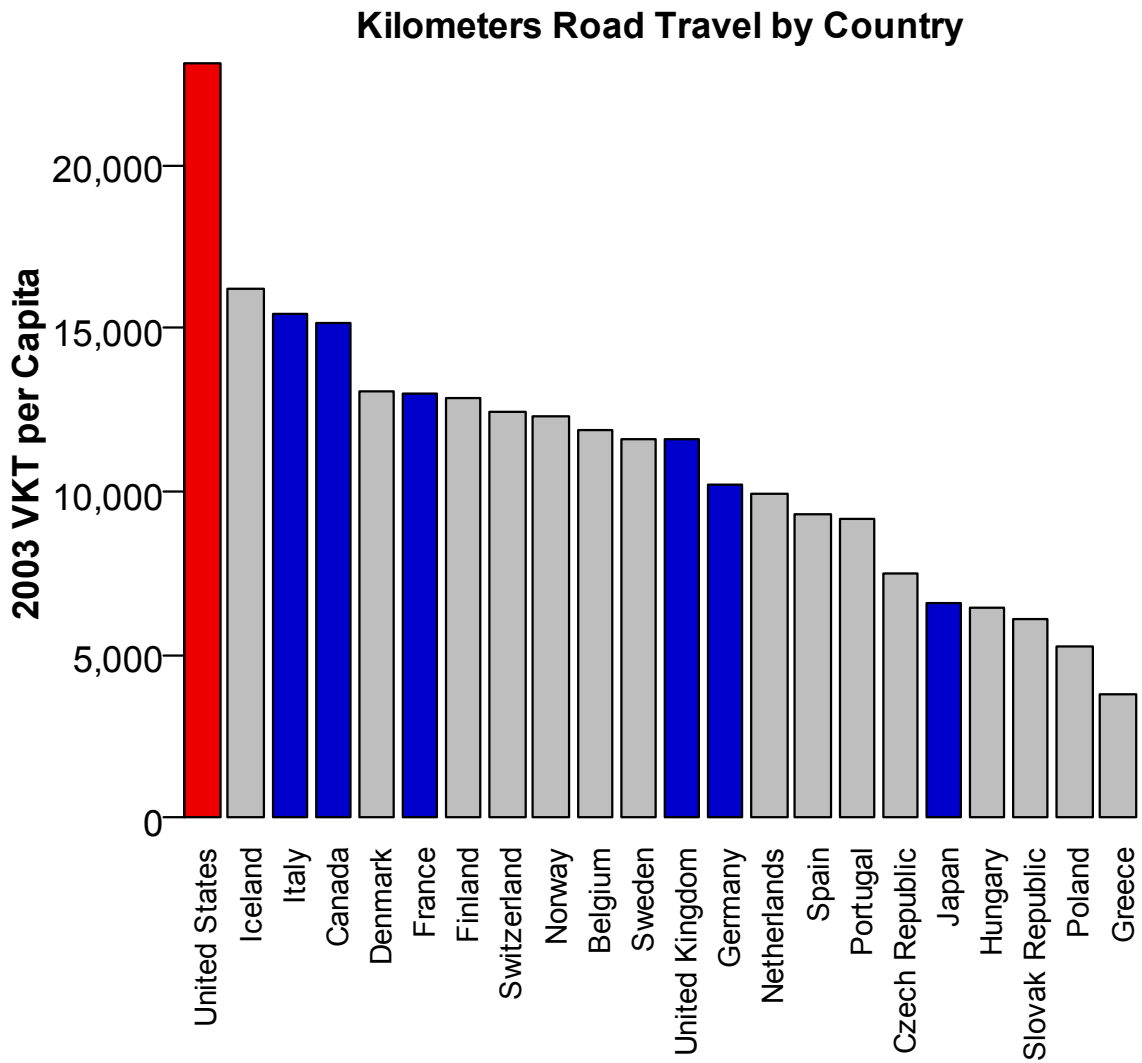


Data Source: Federal Highway Administration

(Figure 1-14)

International Vehicle Travel Per Capita

For an international perspective on driving volume, this chart shows annual Vehicle Kilometers Traveled per capita in 2003. VKT includes road travel by both private car and bus. The United States had significantly more travel per person than other countries shown here. The countries coded blue are part of the G8 (without Russia).

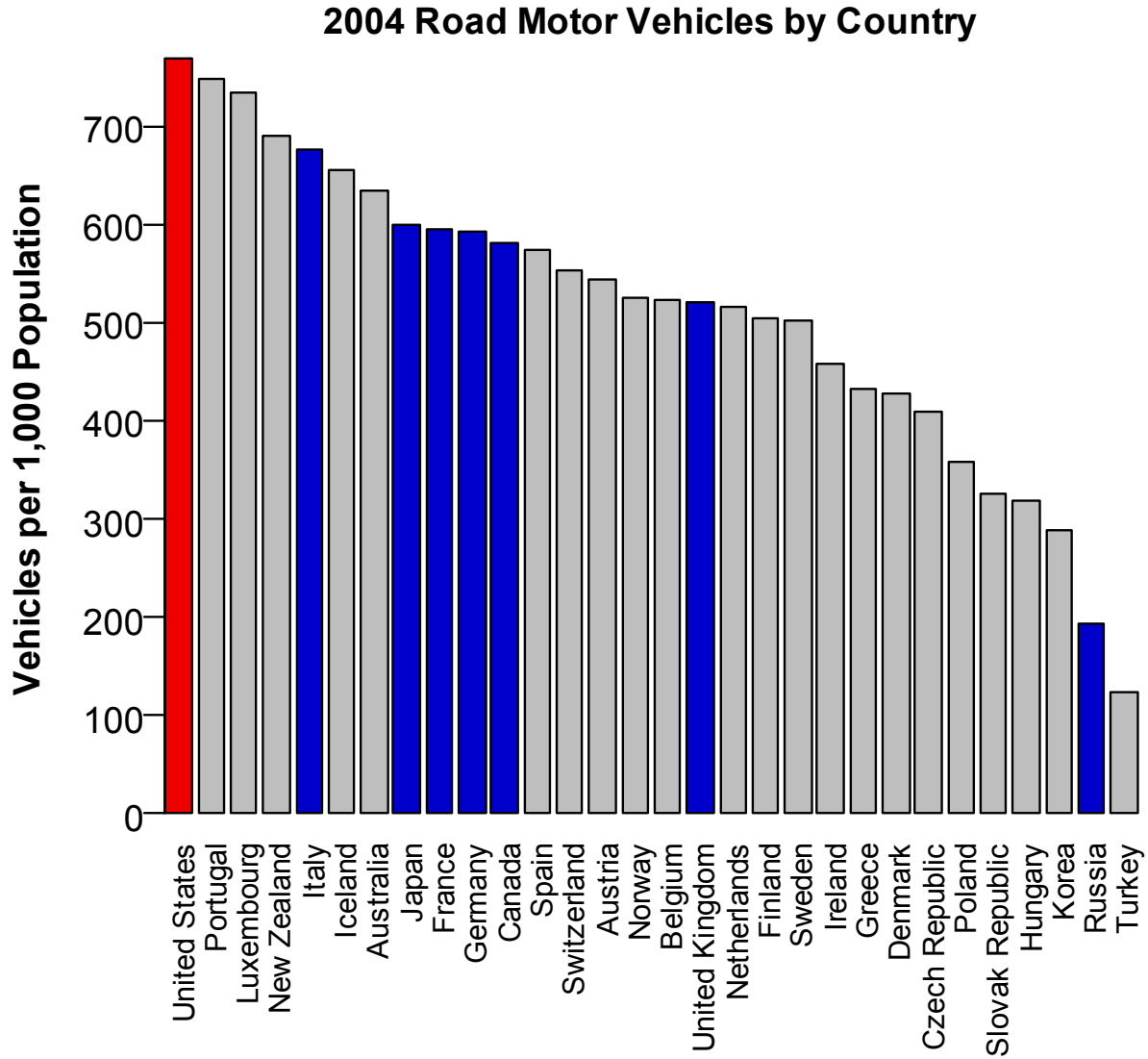


Data Source: Organisation for Economic Co-Operation and Development

(Figure 1-15)

International Vehicle Ownership per Capita

This figure shows that as of 2004 the United States had the most motor vehicles per capita of the countries shown here. A high vehicle ownership rate partly explains the high VKT per capita shown on the previous page. The countries coded blue are the G8.



Data Source: Organisation for Economic Co-Operation and Development

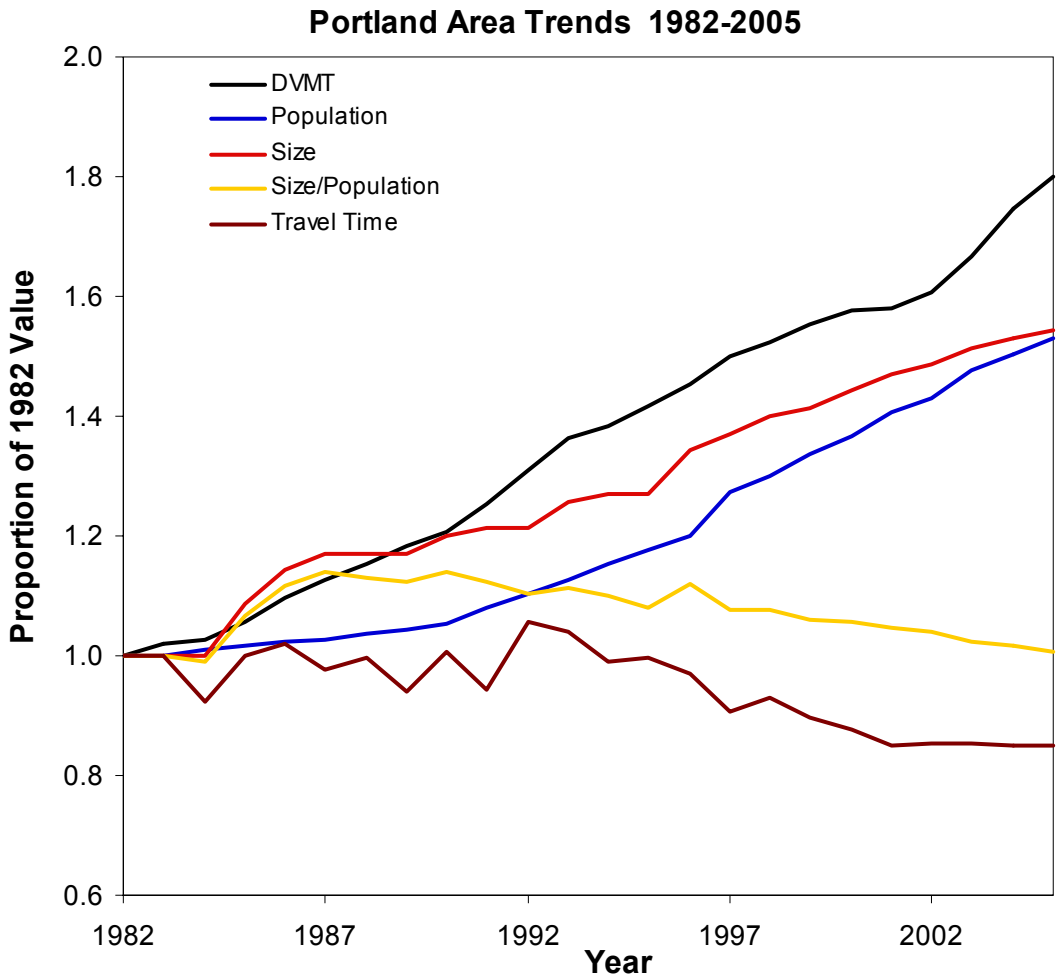
(Figure 1-16)

Portland Metropolitan Region Trends

Using methods suggested by the 2004 Statewide Congestion Overview, this section examines trends observed in the Portland Metropolitan Region.

Portland Metropolitan Region Trends

This figure shows the proportion change in VMT, total annual travel time in peak periods, population and size (sq. mi.) in the Portland-Vancouver urbanized area. With growth in population, land area and the Oregon economy, VMT has increased. But as the urban area did not see increases in the ratio of size/population, travel time remained nearly constant. DVMT values are daily vehicle miles of travel for freeways and arterials.



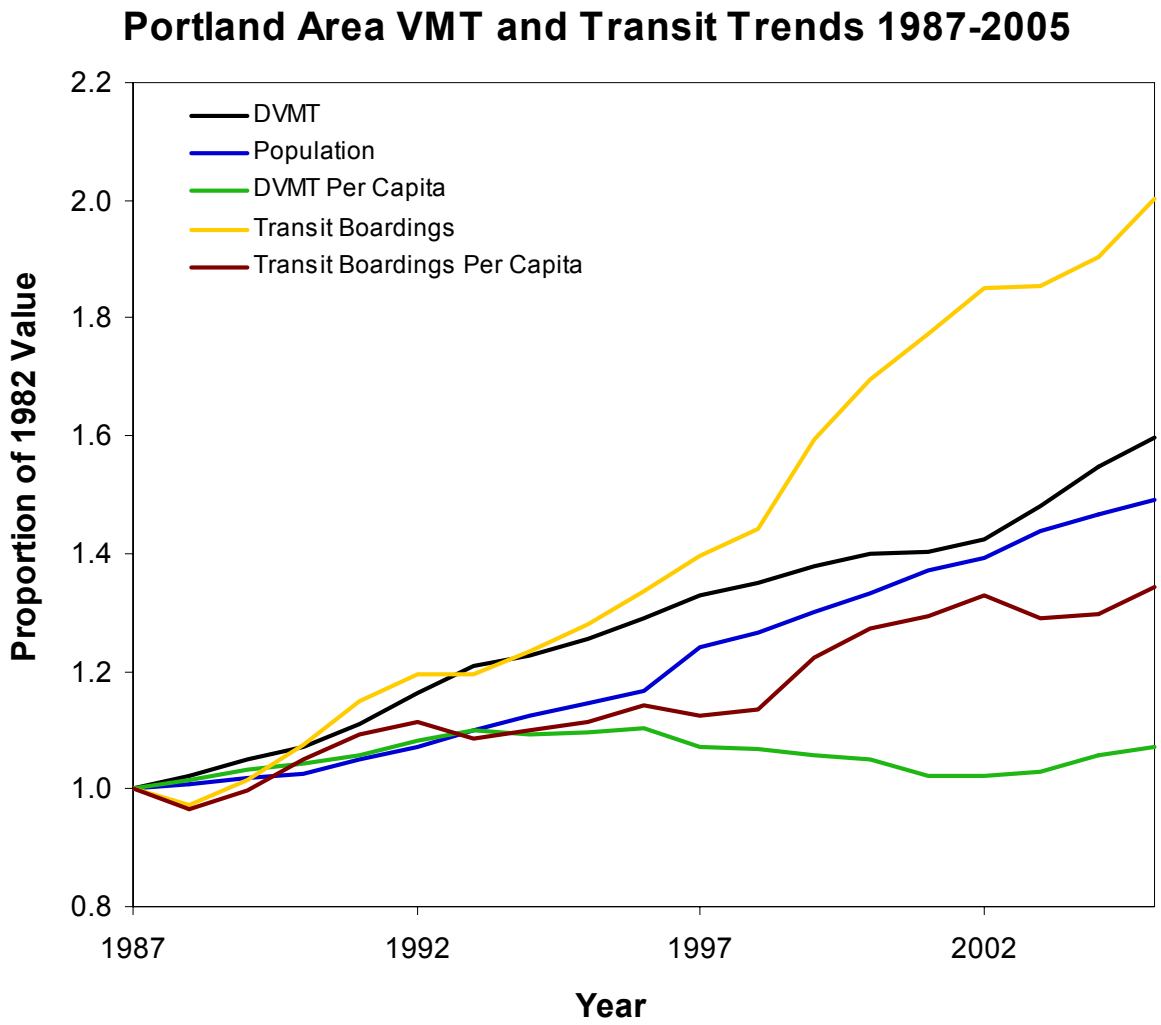
Note: the size data used here are from the Urban Mobility Report and do not match the data used in the Statewide Congestion Overview.

Data Sources: VMT, Population, Size, Speed & Travel Time - 2007 Urban Mobility Report

(Figure 2-1)

Portland Area VMT and Transit Trends

This figure shows the proportion change in VMT, VMT per capita, transit boardings and transit boardings per capita in the Portland-Vancouver urbanized area.

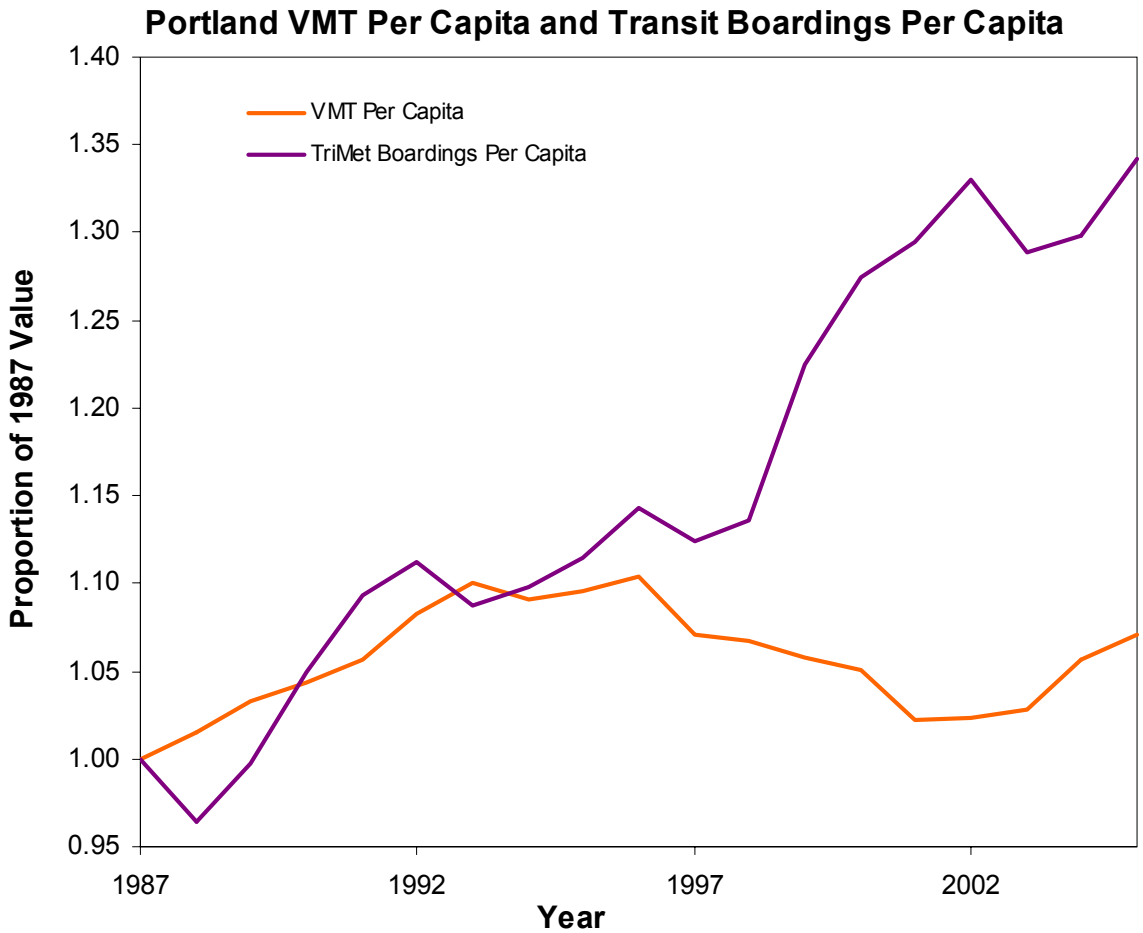


Data Sources: VMT, Population, Size, Speed & Travel Time - 2007 Urban Mobility Report; Transit Boardings - TriMet

(Figure 2-2)

Portland Area Per Capita VMT and Transit Trends

This figure shows the proportion change in VMT per capita in the Portland-Vancouver urbanized area and Tri-Met transit boardings per capita.



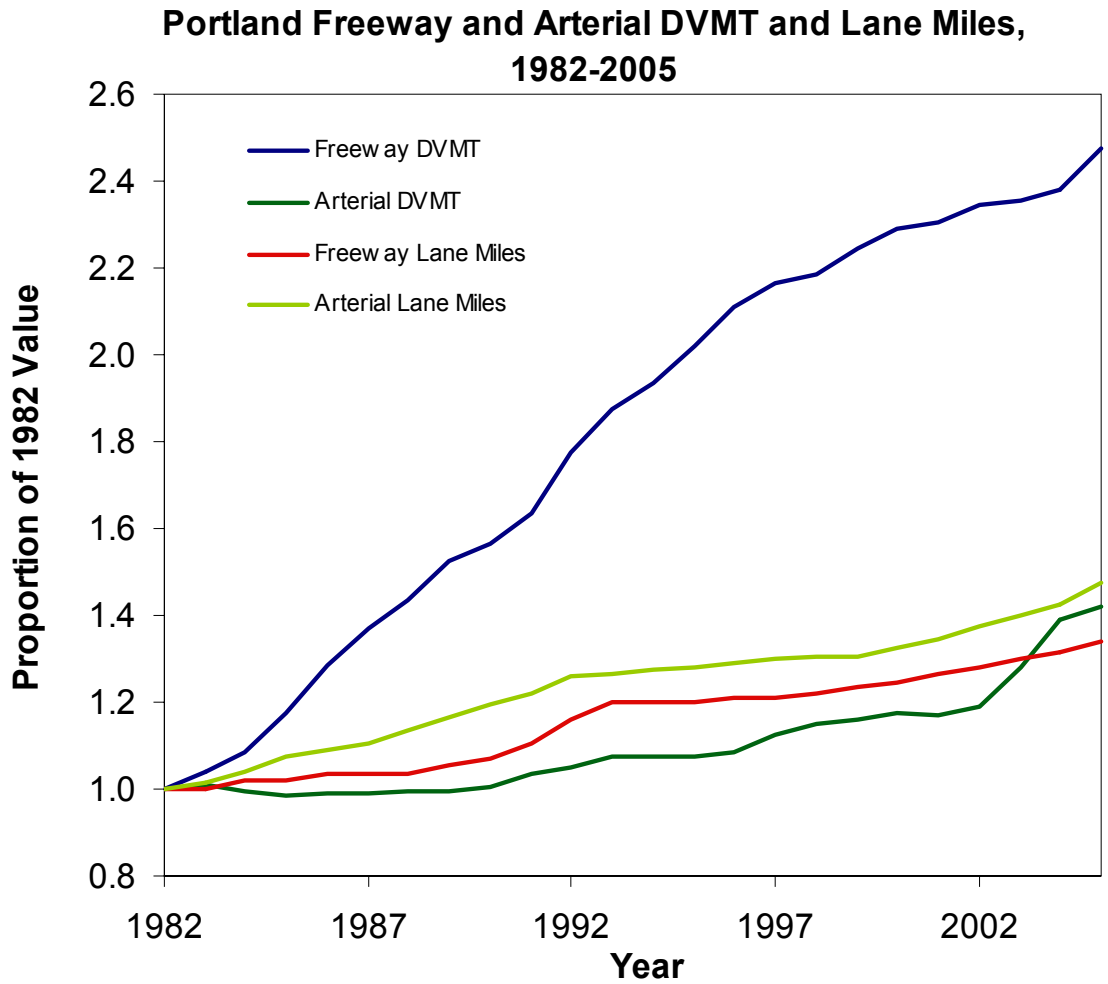
Data Sources: VMT, Population, Size, Speed & Travel Time - 2007 Urban Mobility Report; Transit Boardings - TriMet

(Figure 2-3)

Portland Daily Freeway and Arterial VMT and Lane Miles

Daily VMT on freeways increased dramatically between 1982 and 2005. Lane miles on arterials have been added at a rate greater than the increase in VMT. However, lane miles on freeways have increased by only 34 percent since 1982. The gap of VMT and lane miles on freeways may explain the declining speeds on Portland freeways.

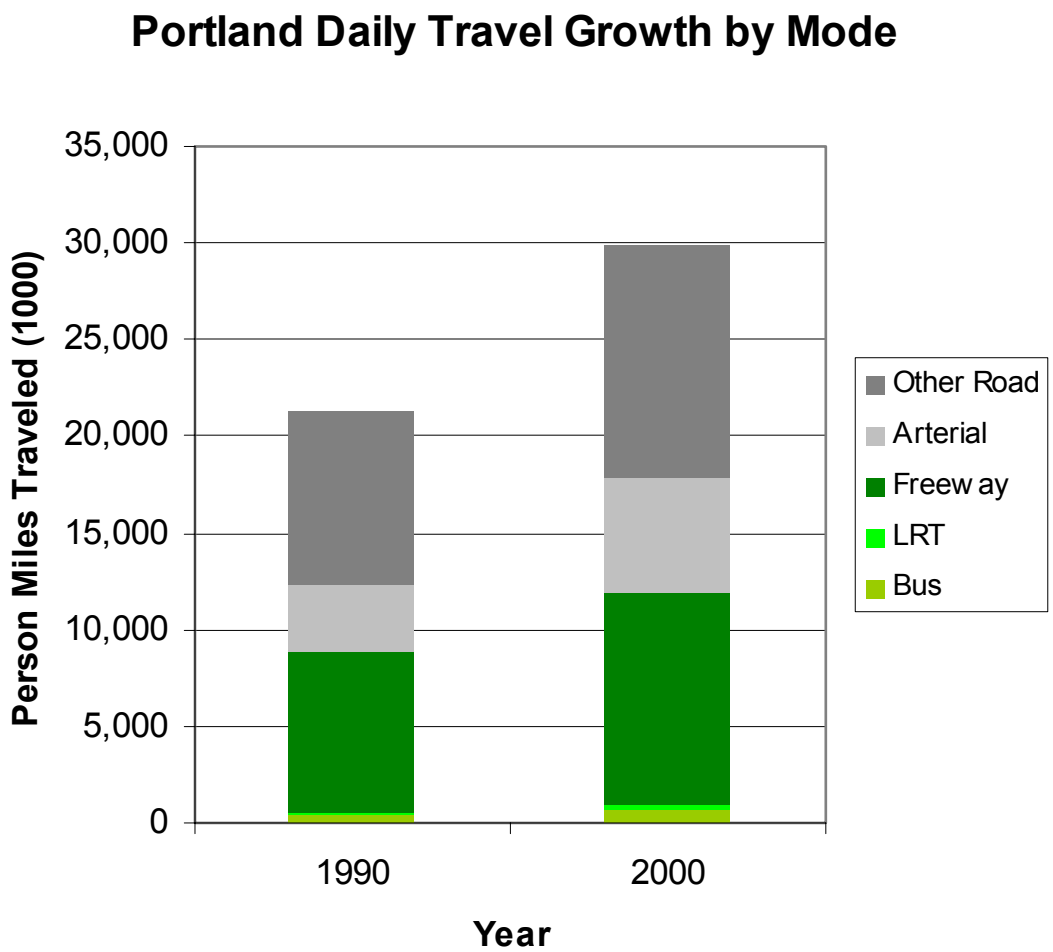
Data Sources: DVMT and Lane Miles - 2007 Urban Mobility Report



(Figure 2-4)

Portland Growth in Person Travel by Mode

This shows how daily person miles traveled increased between 1990-2000 by mode.

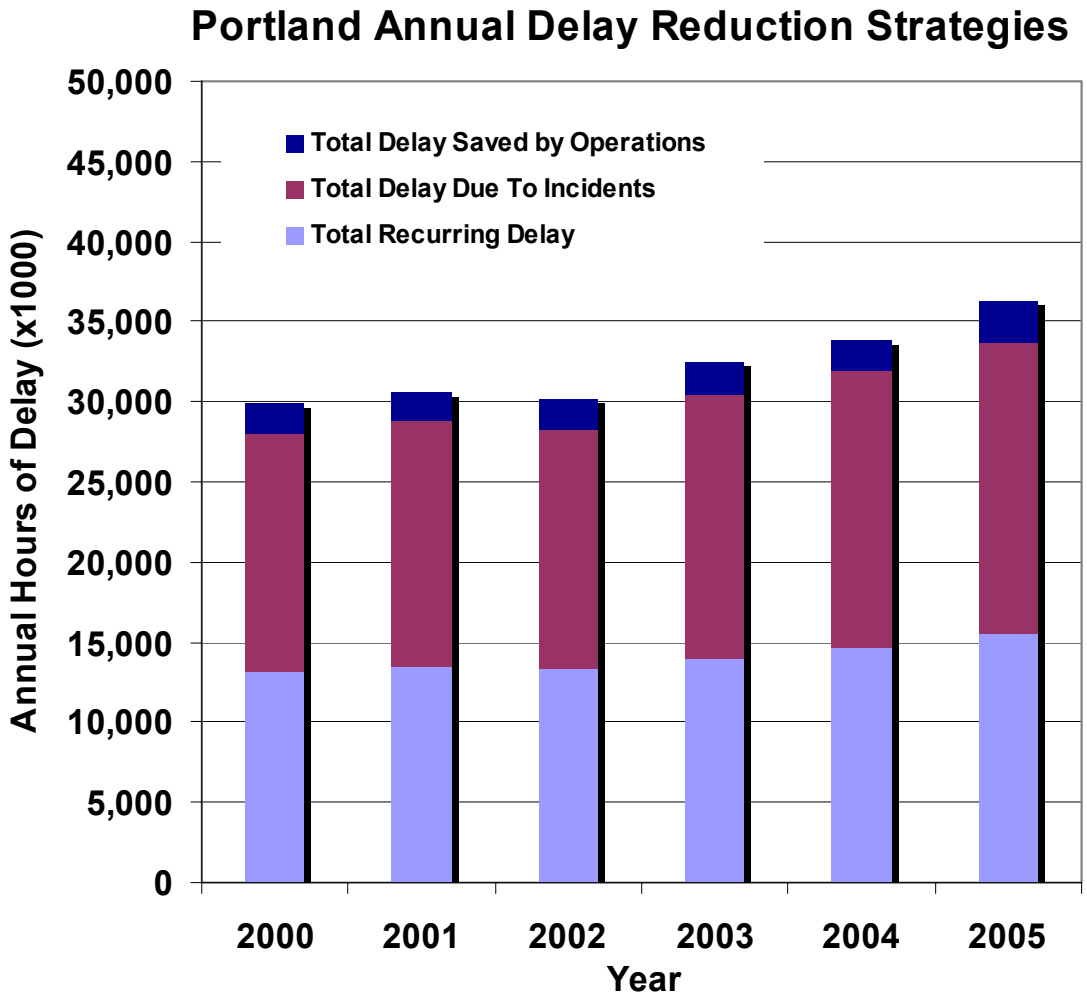


Data Sources: Table B-2 on page B-36 in the Statewide Congestion Overview; U.S. Census; Urban Mobility Report

(Figure 2-5)

Portland Delay Reduction Strategies

This chart shows the annual delay savings due to operational strategies, delay due to incidents and recurring delay. As shown, the delay experienced by motorists would be greater without these strategies in place. There are still, however, opportunities for further delay reduction.



Data Source: 2007 Urban Mobility Report

Caution: data are only available since 2000, thus it is difficult to draw conclusions from any trends that may be visible.

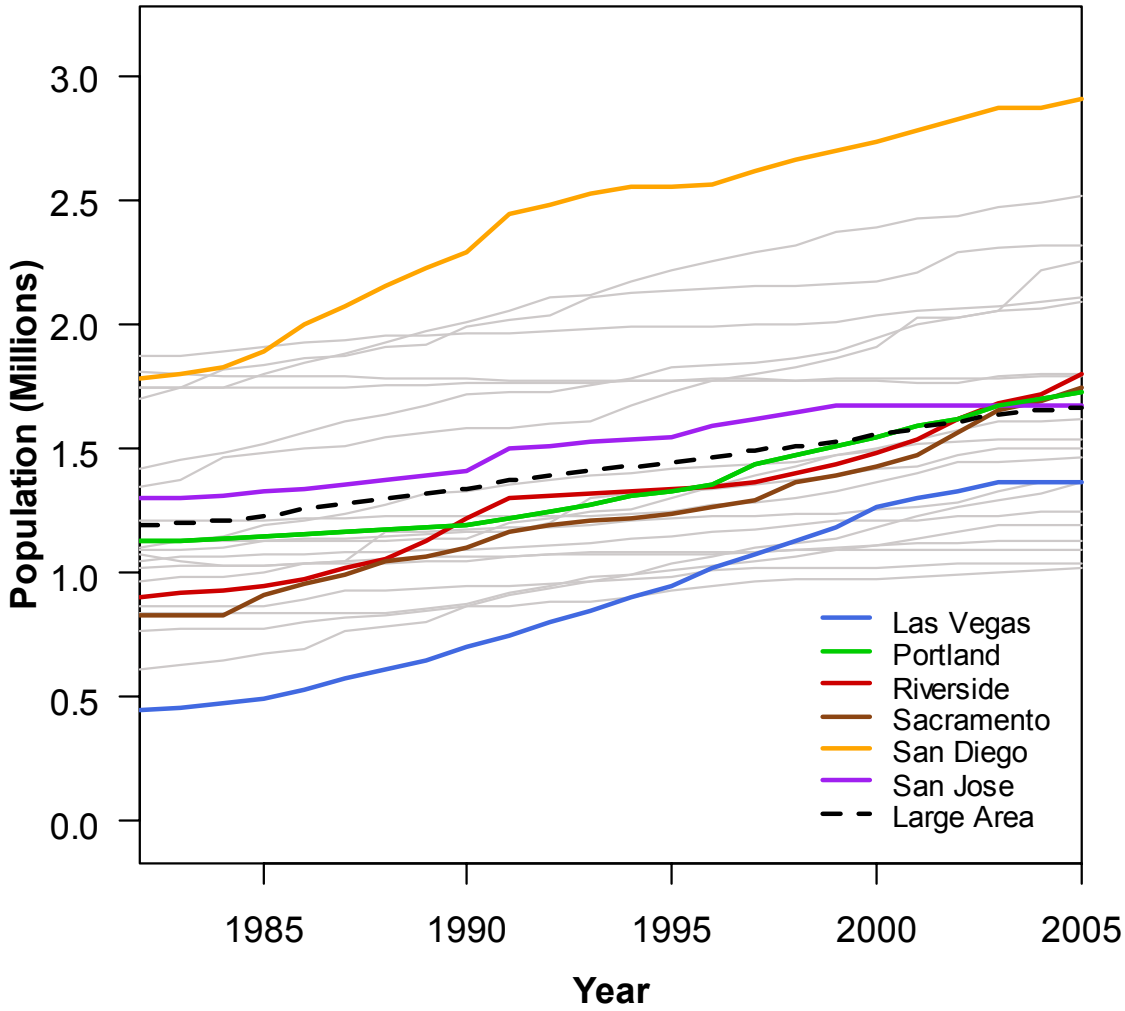
(Figure 2-6)

Comparing Portland to Other Large Urban Areas

Using methods suggested by the 2004 Statewide Congestion Overview, this section compares Portland to other Large urban areas. The following charts highlight the six Western cities in this size category.

Population Trends

This is a comparison of population growth among Large urbanized areas with population between 1 and 3 million. The Portland-Vancouver area has a population slightly above the group average. Populations in most cities have increasing trends with about the same rates. San Diego is by far the largest city in this category.

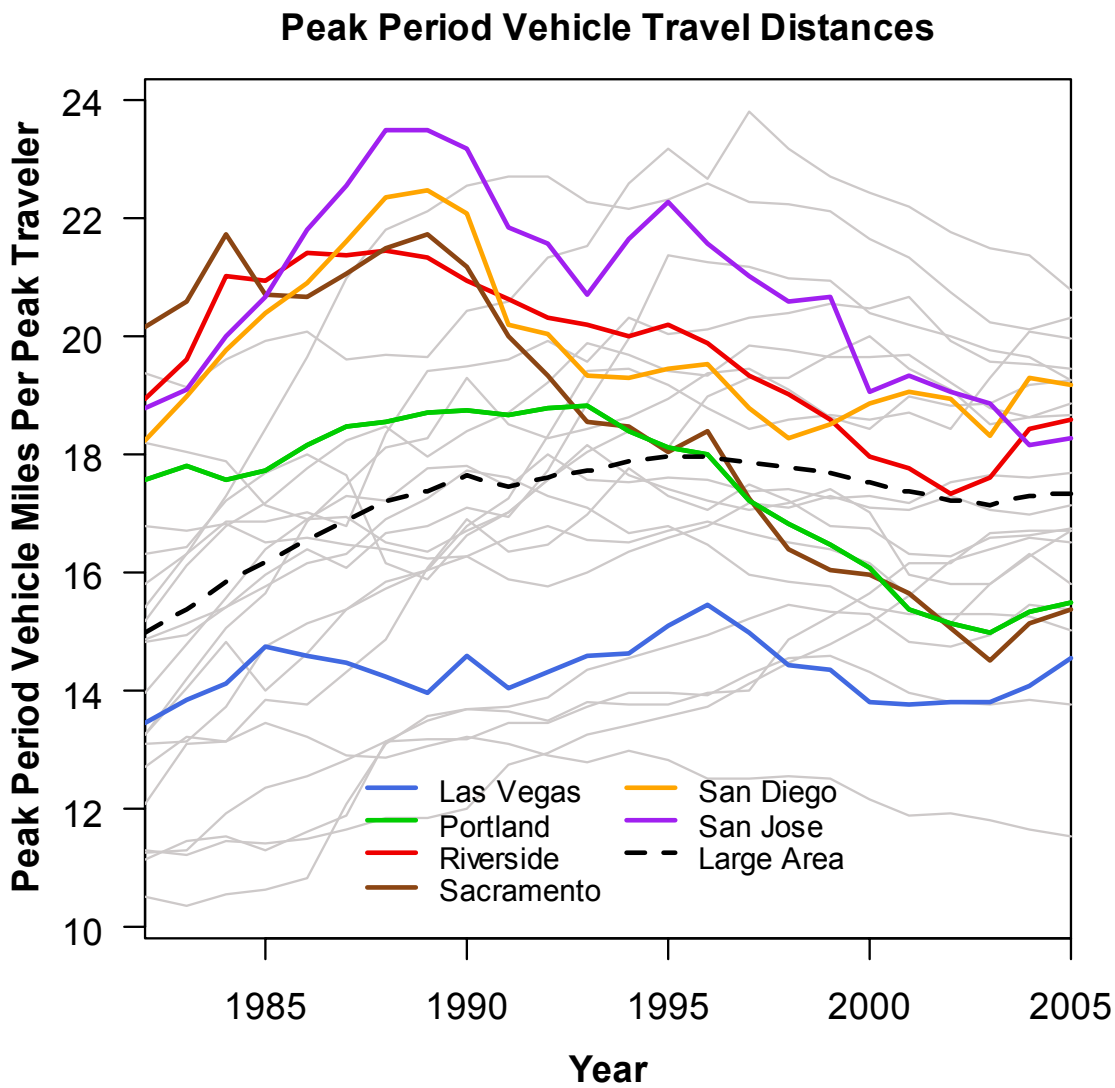


Data Source: 2007 Urban Mobility Report

(Figure 3-1)

Travel Distance Trends

This chart shows average daily travel distances per peak period traveler on the major road system (freeway and arterials). Peak period travelers in Portland drive shorter distances than average.

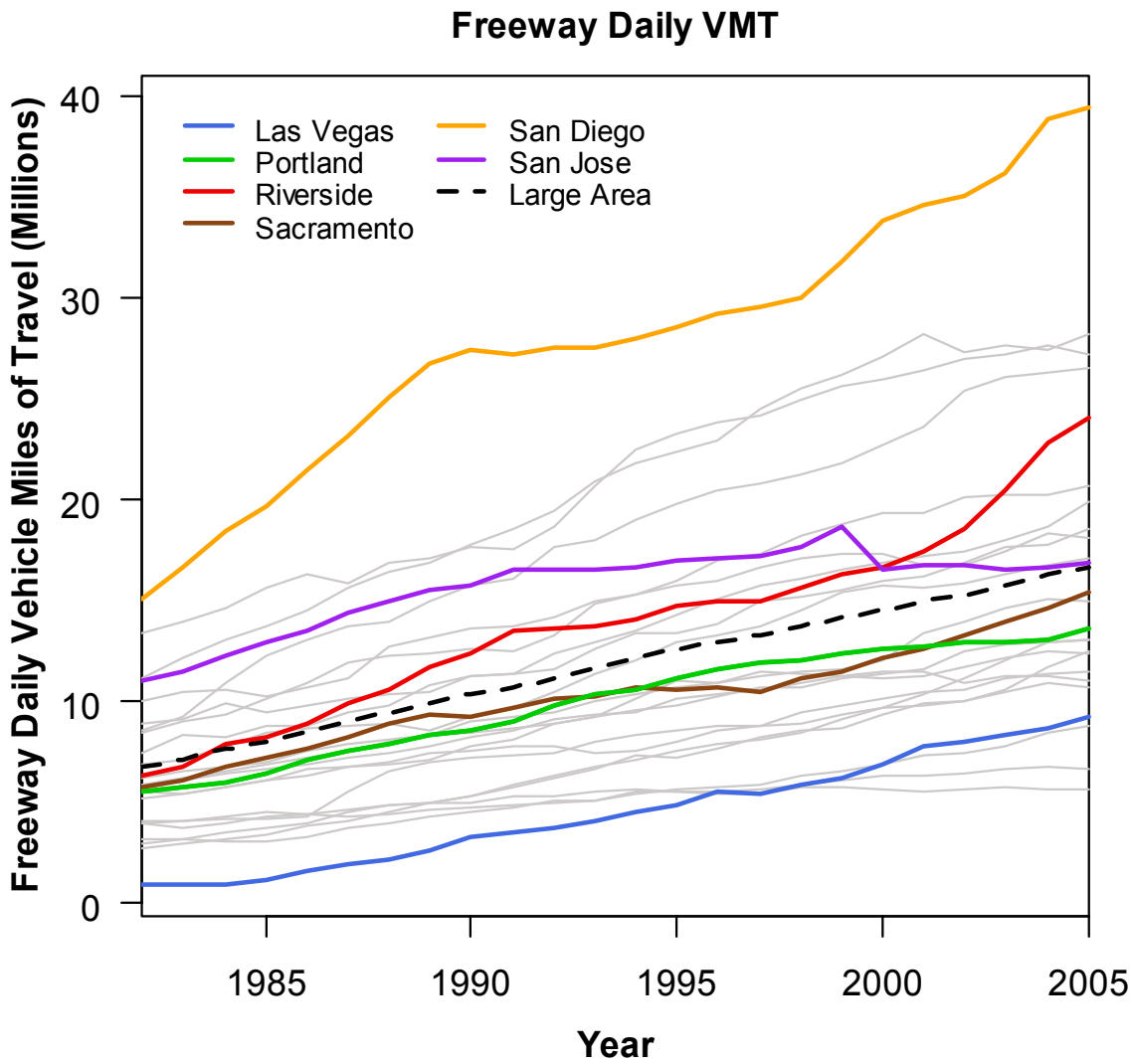


Data Sources: 2007 Urban Mobility Report

(Figure 3-2)

Highway VMT Trends

This shows that daily VMT is increasing over time, but that Portland remains below average for the population group.



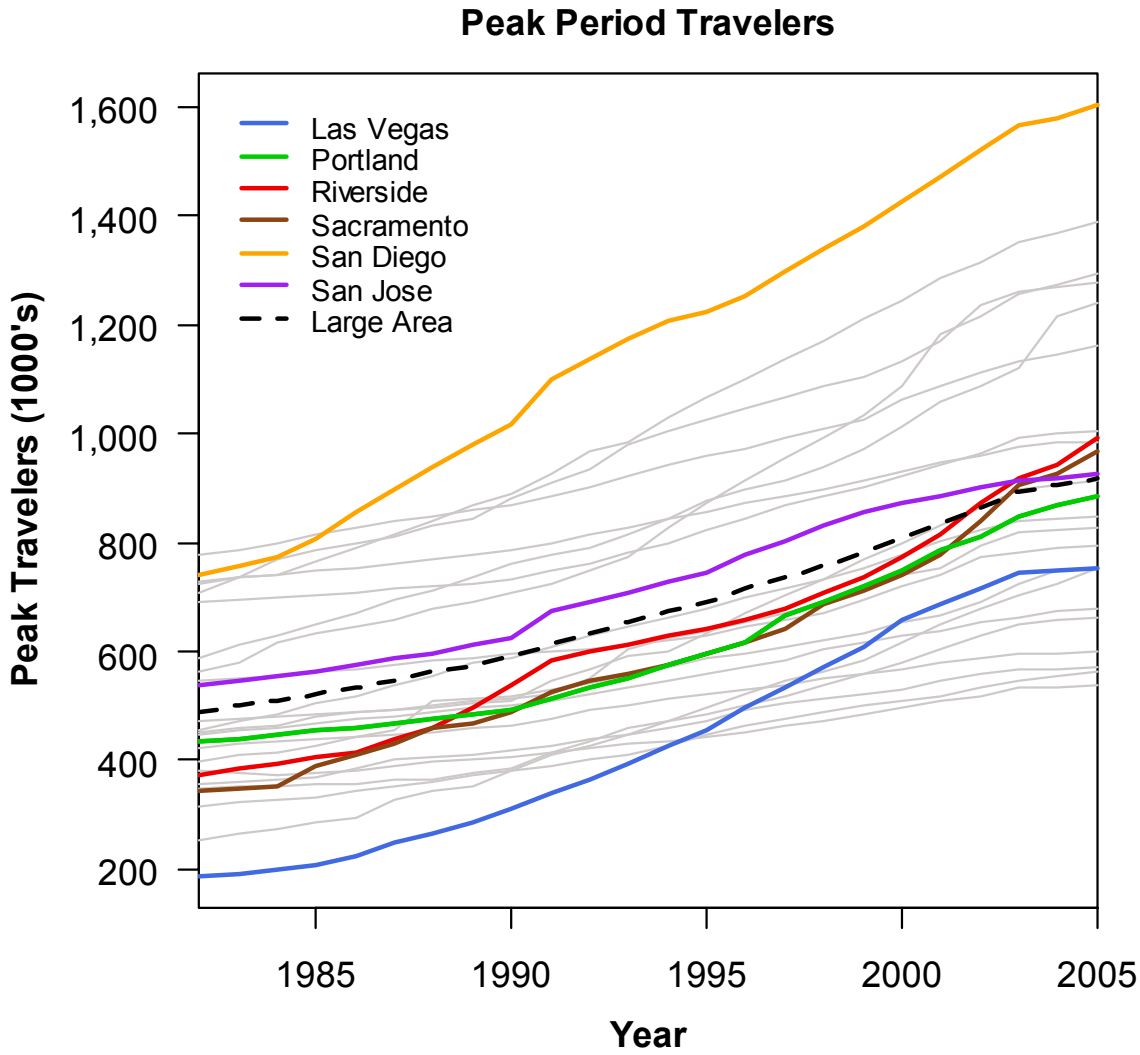
Data Source: 2007 Urban Mobility Report

Note: The drop in DVMT for San Jose in 2000 reflects a significant decrease in the quantity of freeway lane-miles measured for the urban area.

(Figure 3-3)

Number of Peak Period Travelers

The number of peak period travelers in the Portland-Vancouver urbanized area is also lower than average, compared to other Large urban areas.

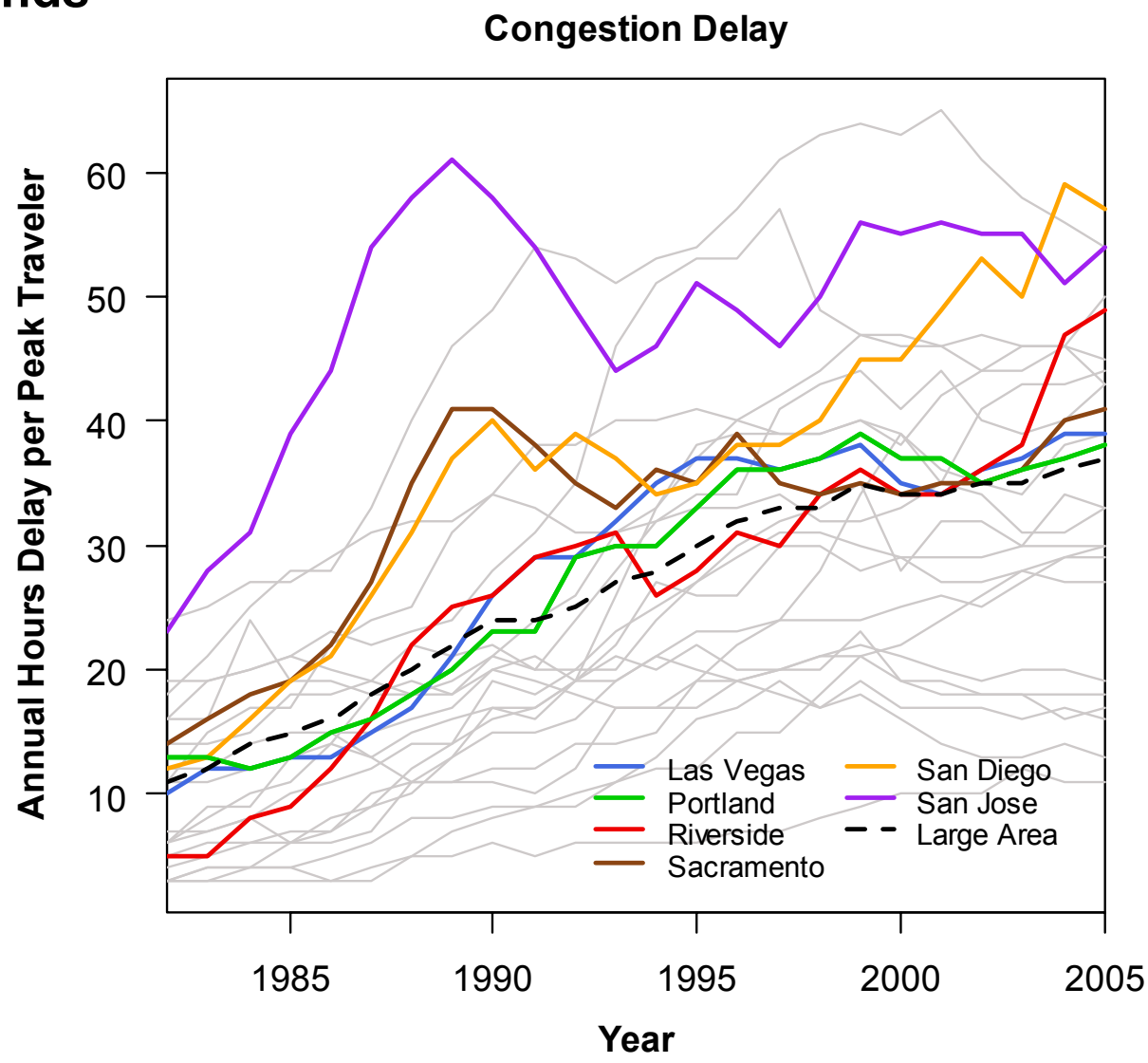


Data Source: 2007 Urban Mobility Report

(Figure 3-4)

Annual Congestion Trends

Annual congestion delay for peak period travelers in Portland has been close to the Large area average since 1982. It has exceeded the average since 1992. Shorter-than-average travel distance coupled with lower-than-average travel speed has leveled off the delay actually experienced by travelers.

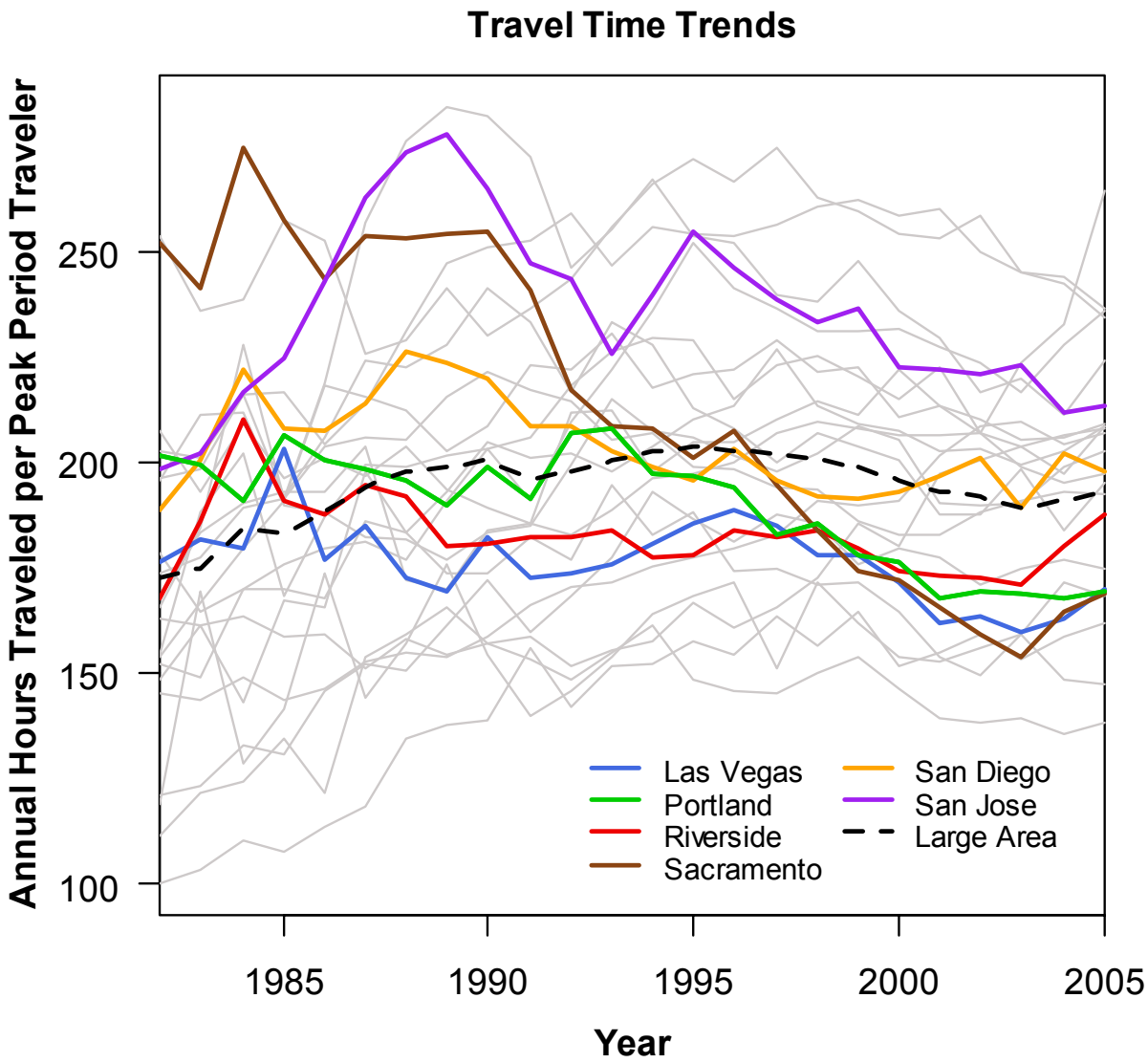


Data Source: 2007 Urban Mobility Report

(Figure 3-5)

Travel Time Trends

Portland annual travel time per peak period traveler has remained below average for Large areas since 1994. Again, shorter-than-average travel distance has eased the impact of congestion on travel time.

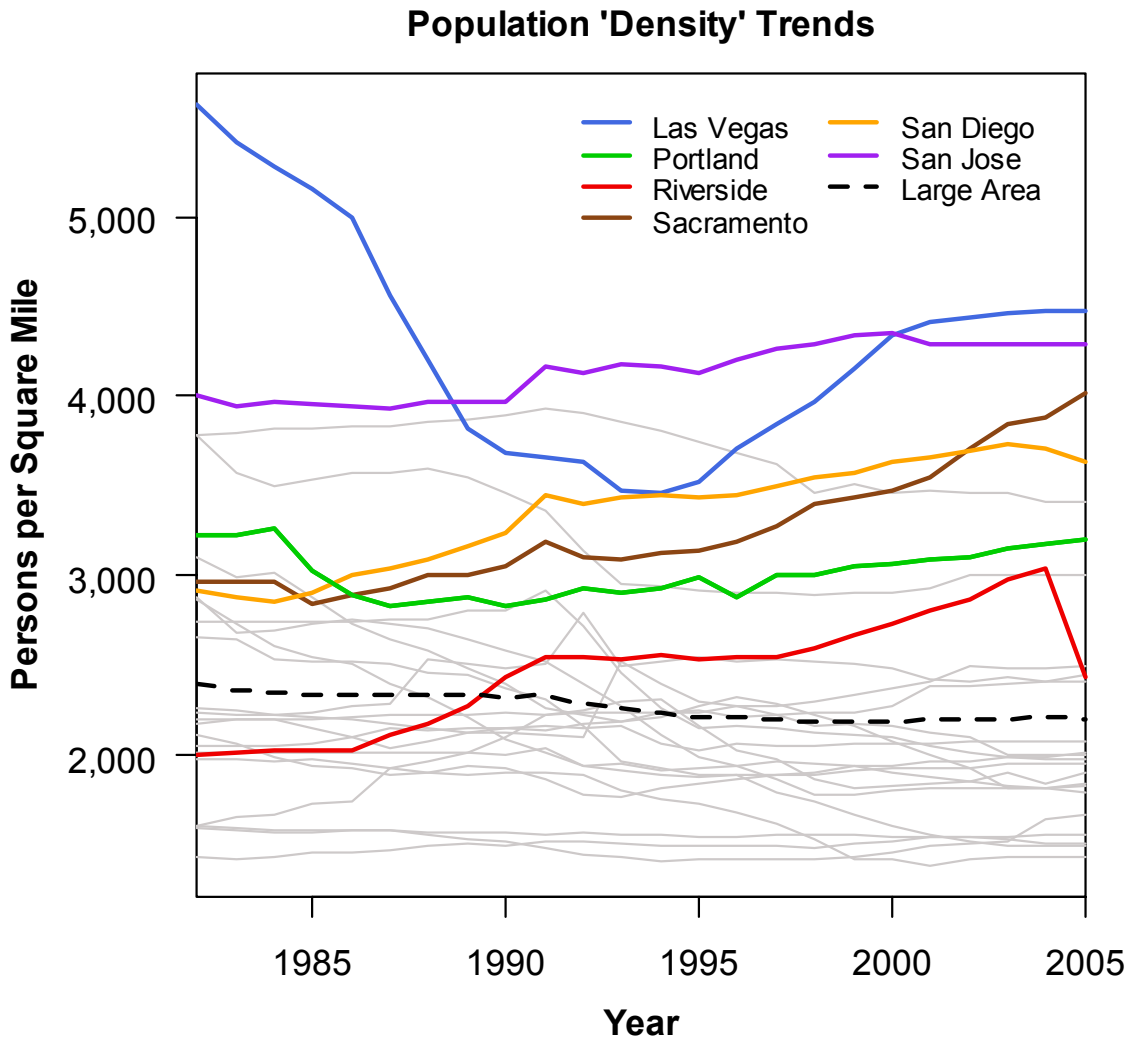


Data Source: 2007 Urban Mobility Report

(Figure 3-6)

Portland-Vancouver Area Population "Density" Trends

The Portland-Vancouver urbanized area (defined on p. 7) has consistently exhibited a higher population "density" (population/area) than average for Large urban areas. The land area and population data used here indicates that among the Large urban areas, Las Vegas, San Jose, Sacramento, and San Diego are the four densest cities. There are other ways to define the boundaries of urban areas that would produce different results.



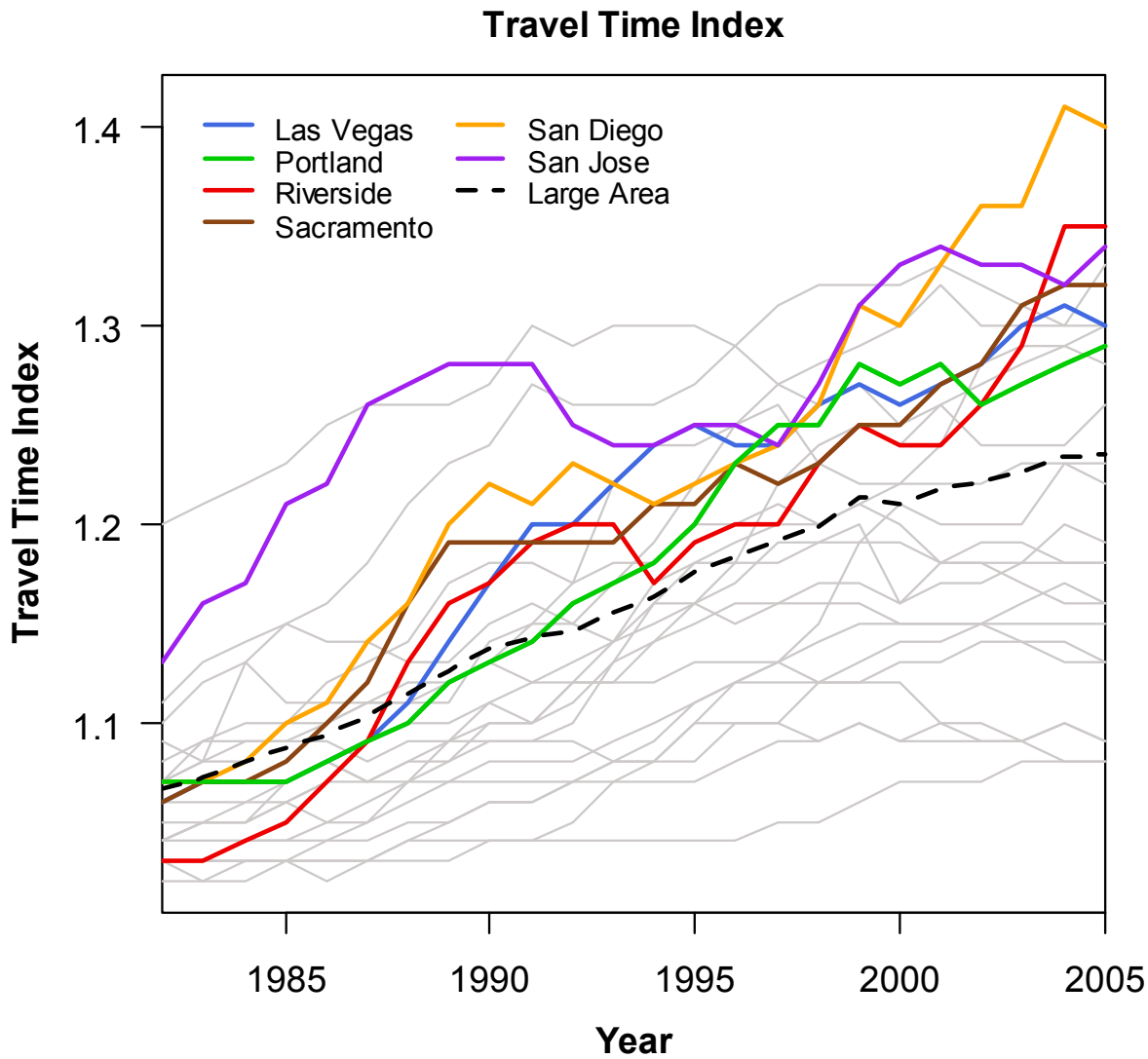
Data Source: 2007 Urban Mobility Report

Note: The drop in 2005 for Riverside reflects a significant increase in the defined urban area.

(Figure 3-7)

Travel Time Index

Travel Time Index (TTI) is an estimate of how much longer it takes on average to travel on the major road system during peak times vs. off-peak times. It considers the effects of everyday recurring congestion and the effects of congestion due to incidents. The TTI is the ratio of travel time in the peak period to the travel time at free-flow conditions. A value of 1.35 indicates a 20-minute free-flow trip takes 27 minutes in the peak

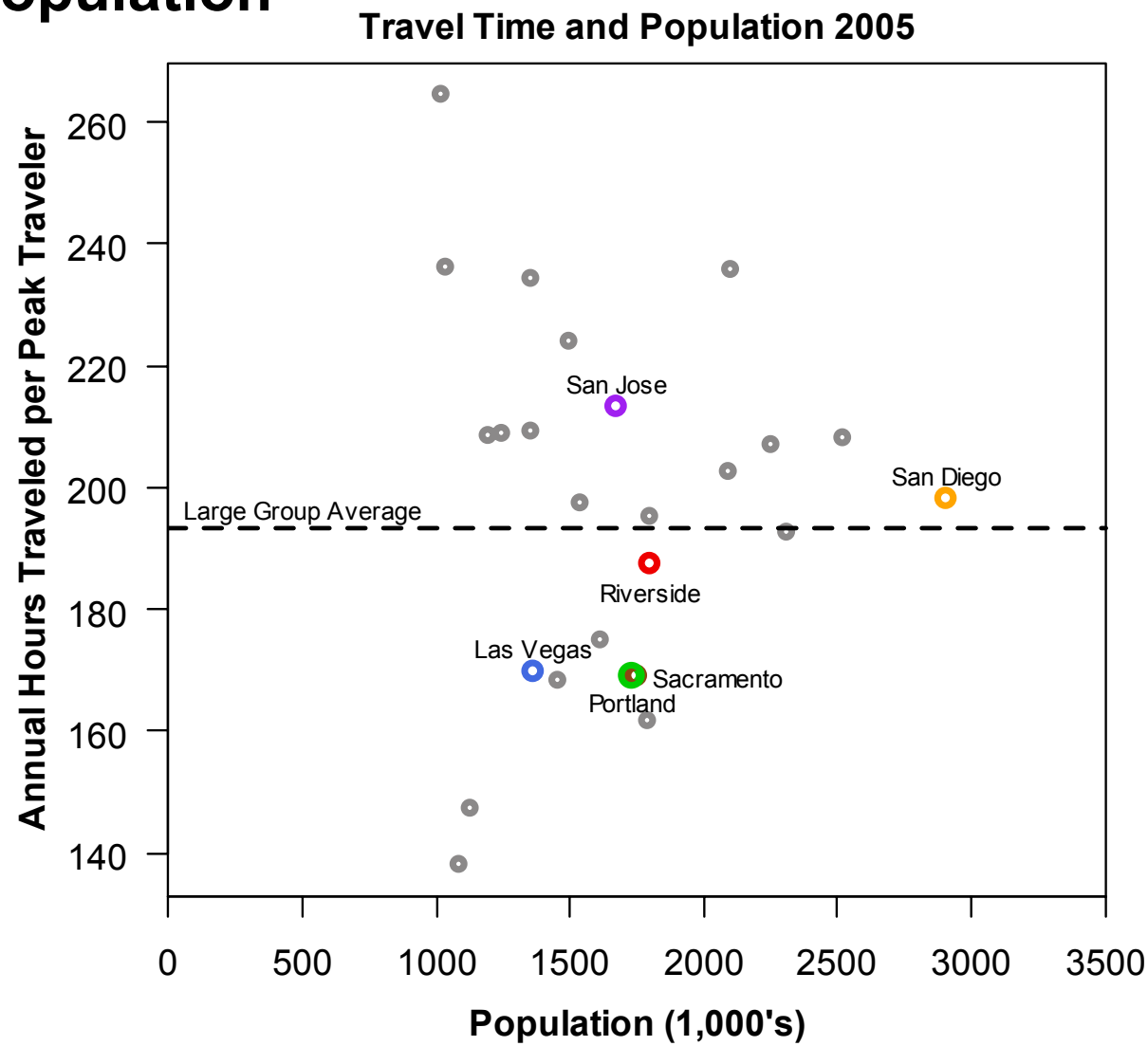


Data Source: 2007 Urban Mobility Report

(Figure 3-8)

Travel Time and Population

Portland's population is 11th out of the 25 Large areas (25th overall), and the hours of travel per peak period traveler is well below average for Large areas.

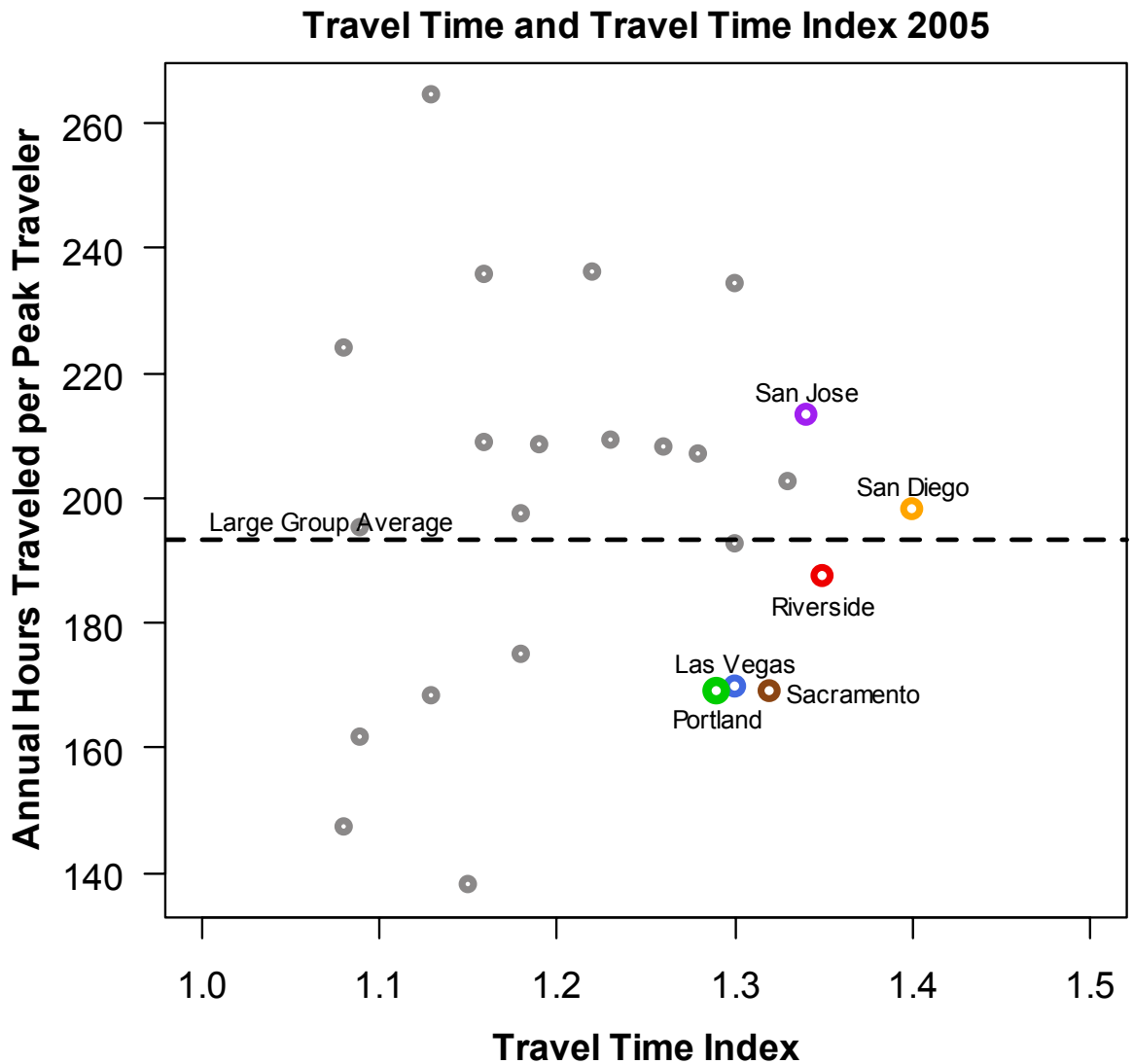


Data Source: 2007 Urban Mobility Report

(Figure 3-9)

Travel Time and Travel Time Index

The annual amount of travel per peak period traveler in Portland is among the 7 lowest when compared to other Large cities, while the Travel Time Index for Portland is among the top 9 out of the 25 Large cities.

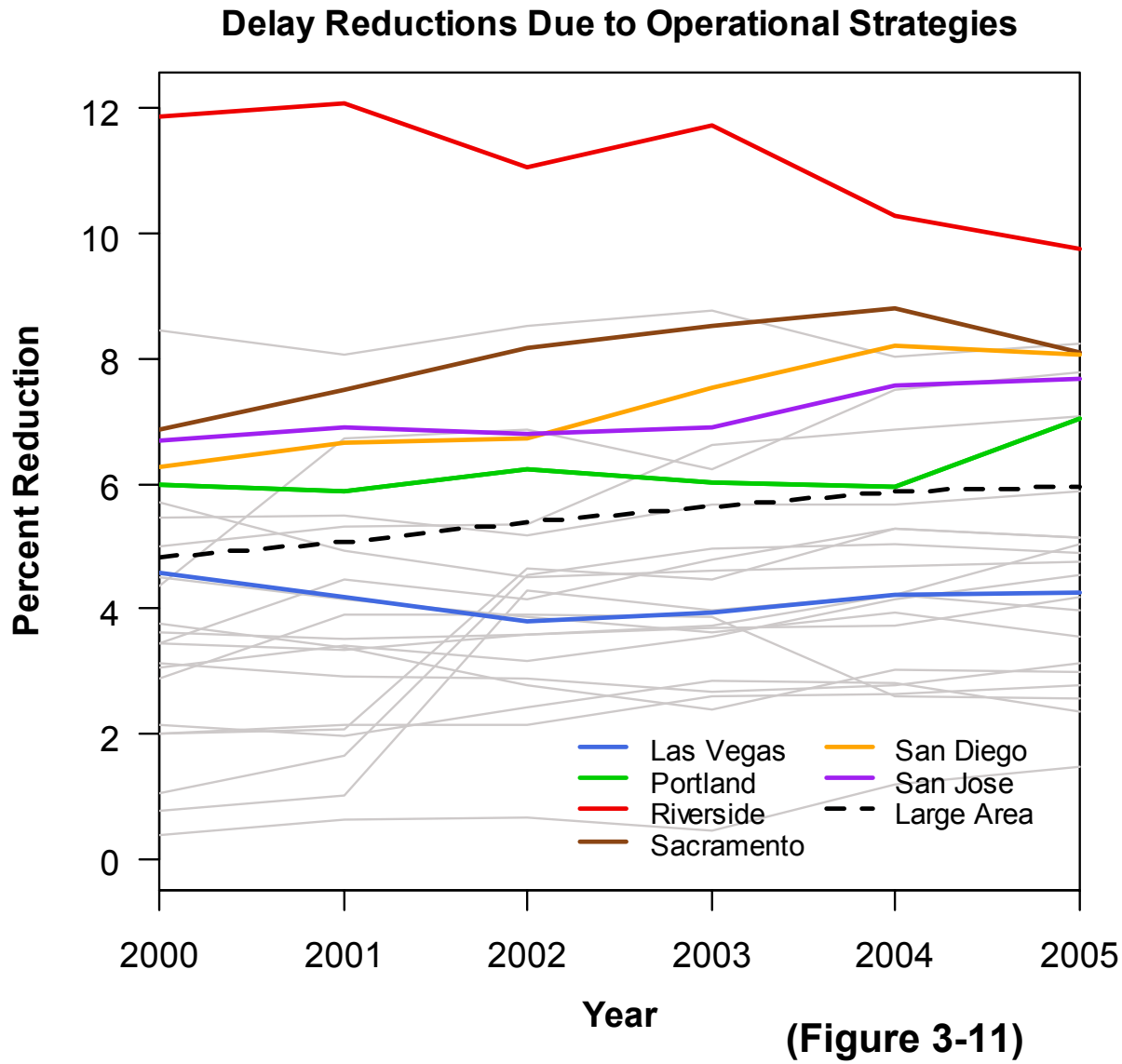


Data Source: 2007 Urban Mobility Report

(Figure 3-10)

Delay Reduction Due to Operational Strategies

Since 2000, the Urban Mobility Report has estimated the delay reduction due to operational strategies such as incident management, freeway ramp metering and arterial traffic signal coordination. As shown, the percent reduction in Portland is above average when compared to other Large areas.

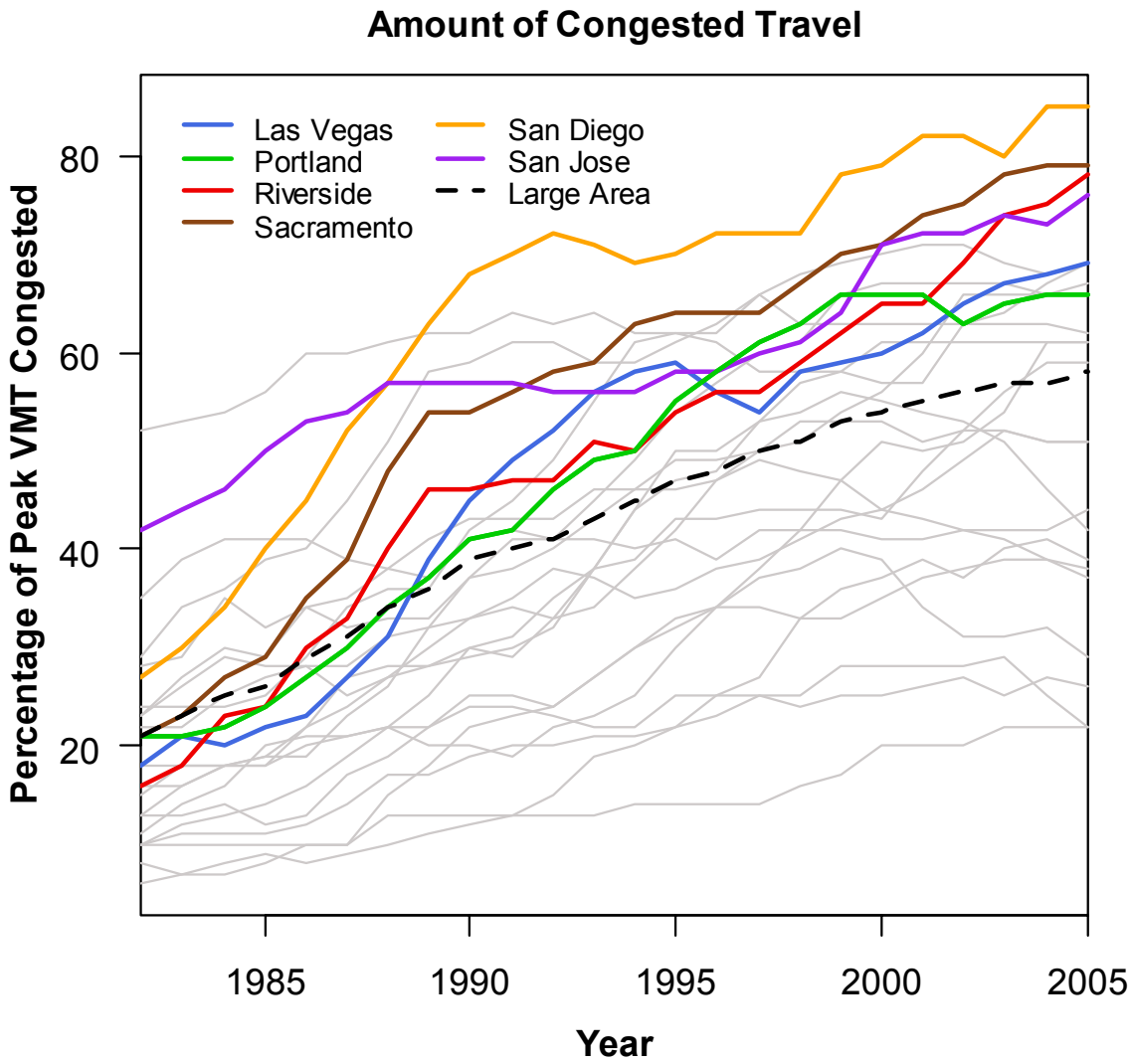


Data Source: 2007 Urban Mobility Report

(Figure 3-11)

Congestion During Peak Period

This chart shows the amount of congestion during the peak period as a percentage of peak period VMT. The Western cities show the greatest amount of congestion out of the Large urban area group, and the value is increasing for most cities.

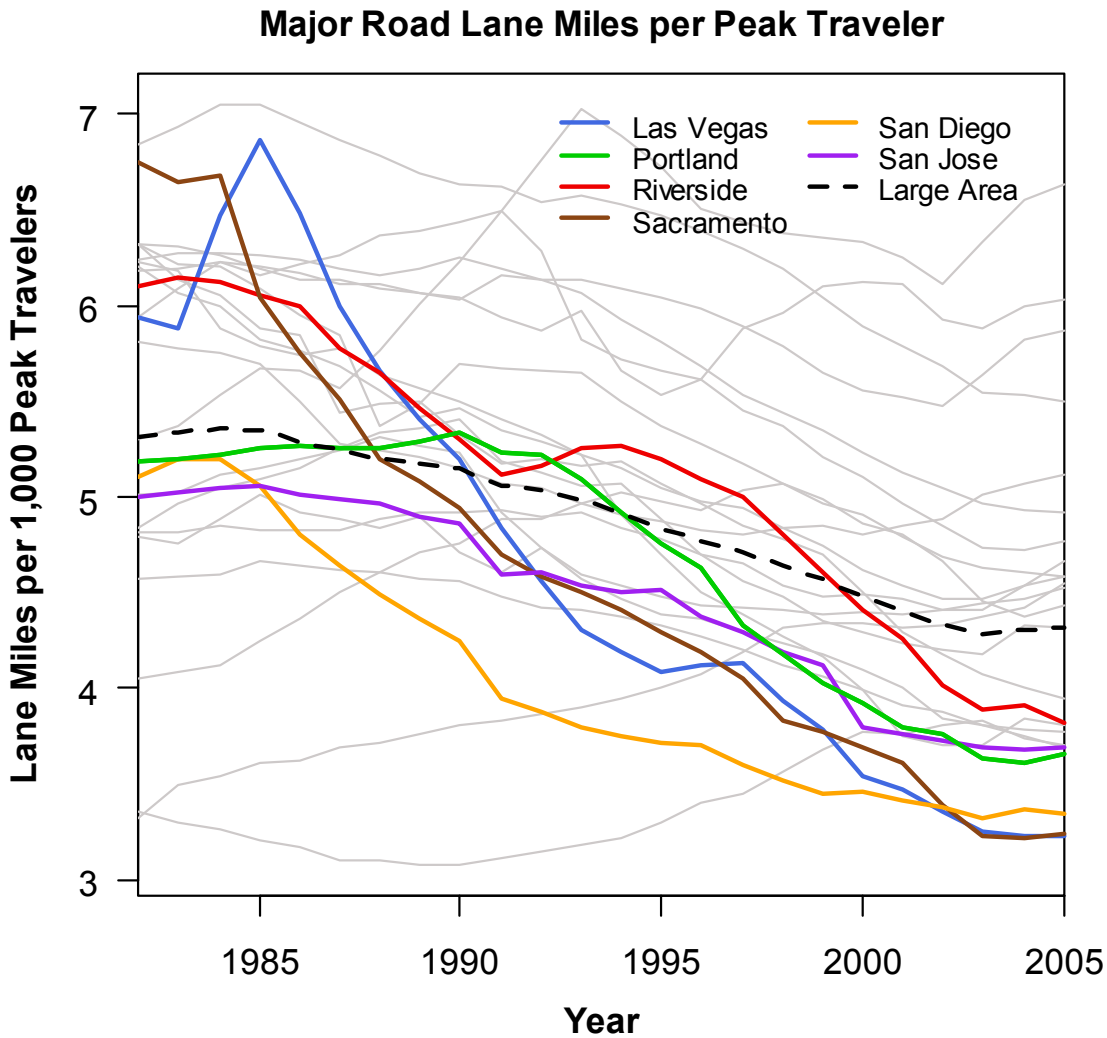


Data Source: 2007 Urban Mobility Report

(Figure 3-12)

Roadway Per Peak Traveler

One of the causes of increased congestion is a reduction in the roadway lane-miles per traveler as populations increase faster than new roadway is built. As the Western cities have the greatest congestion, they also have the least roadway per peak traveler.

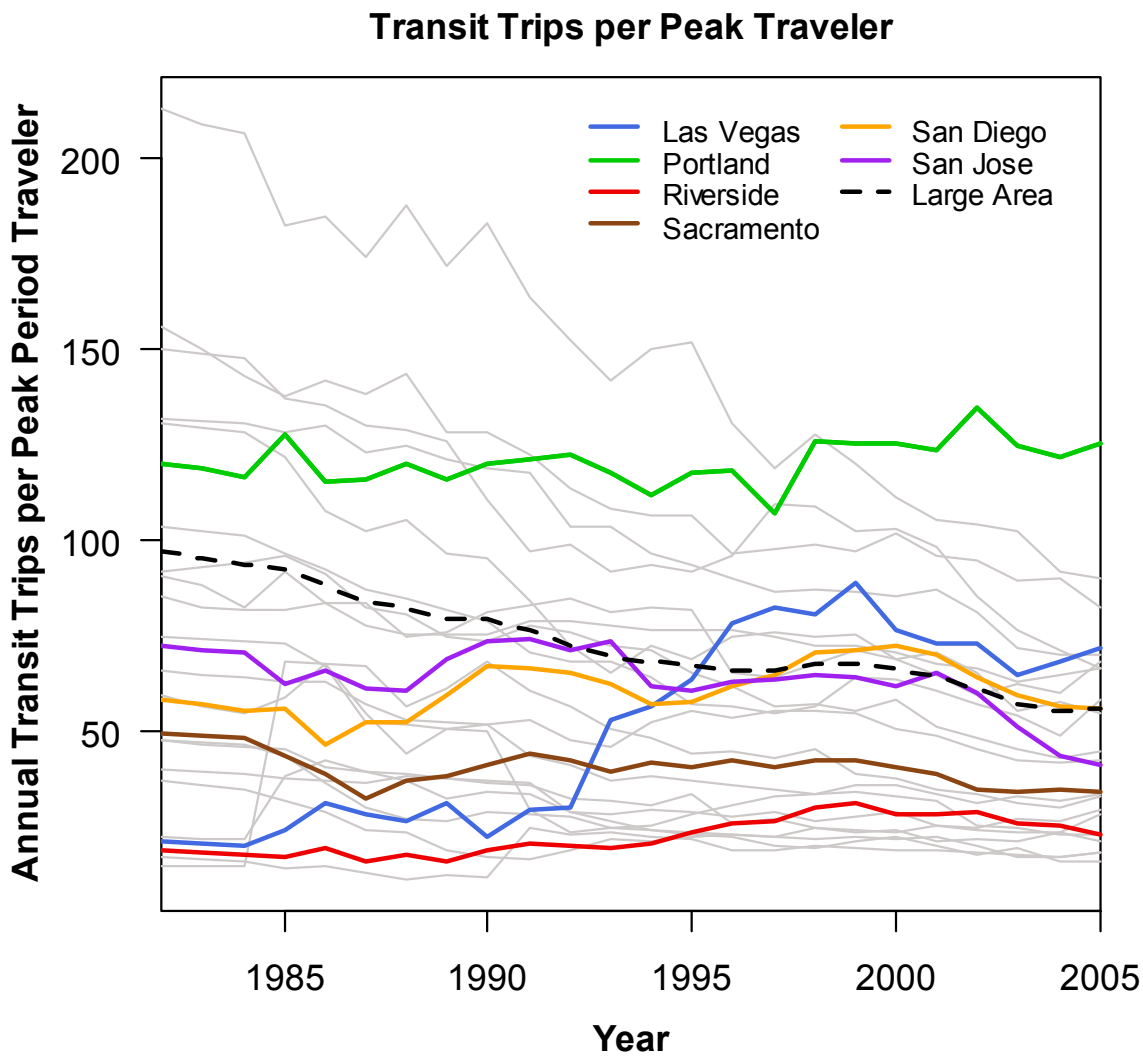


Data Source: 2007 Urban Mobility Report

(Figure 3-13)

Transit Trips Per Peak Traveler

This figure shows the annual number of public transit trips per peak period traveler. By this measure, Portland has had the most transit use in the Large urban area group for more than five years.

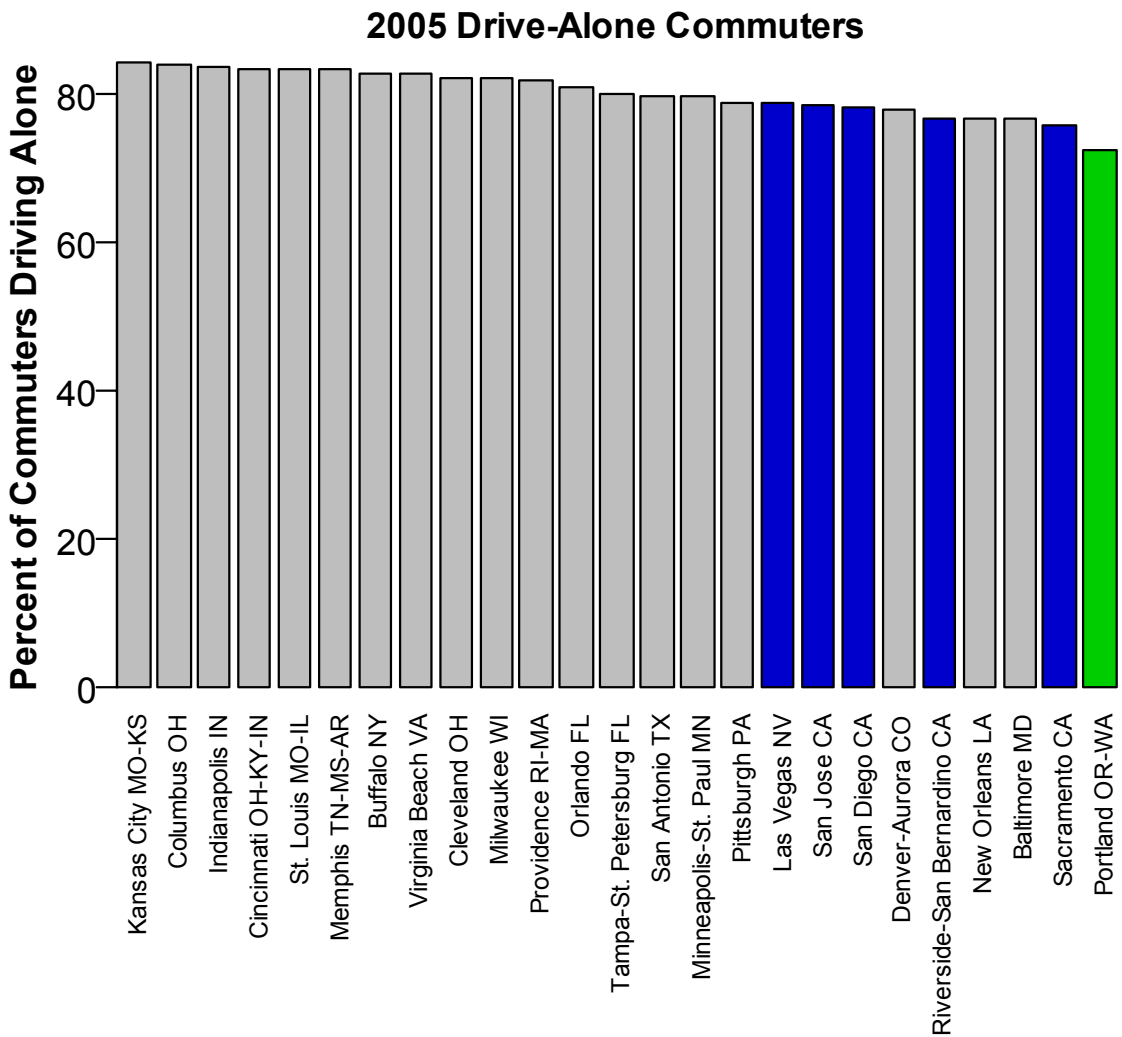


Data Source: 2007 Urban Mobility Report

(Figure 3-14)

Drive Alone Commuters

This figure shows the percent of commuters driving single-occupancy vehicles in 2005. Portland had the lowest percentage in the Large urban area group, showing a large amount of transit use, carpooling, and non-motorized transport. These modes are discussed later in this report.

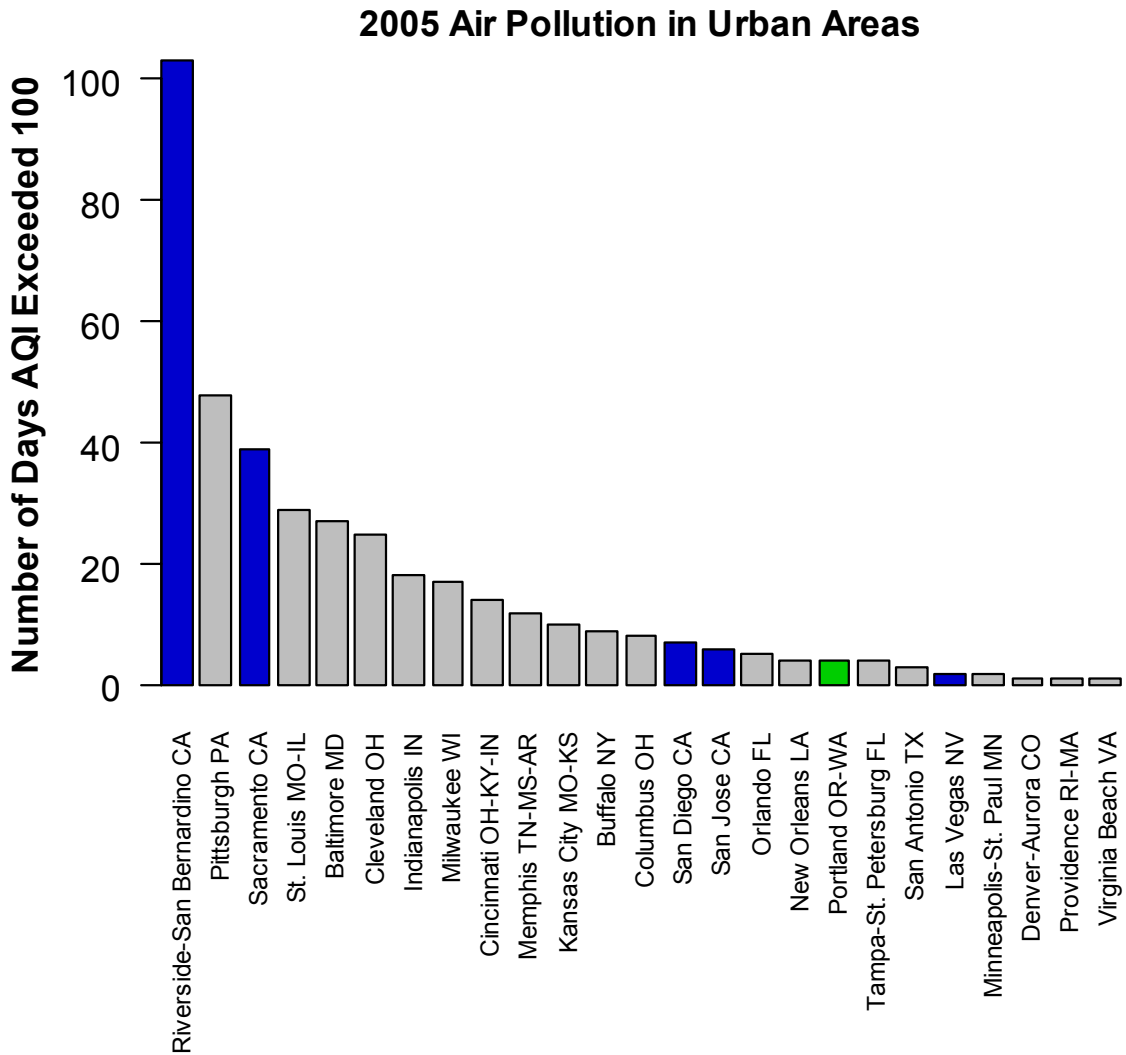


Data Source: American Community Survey, U.S. Census

(Figure 3-15)

Air Quality

Vehicle exhaust is a known contributor to air pollution in urban areas. This figure shows air quality as measured by the Air Quality Index (AQI) for 2005. More pollution registers higher AQI values. Portland ranks well in relation to other Large urban areas.



Data Source: U.S. Environmental Protection Agency

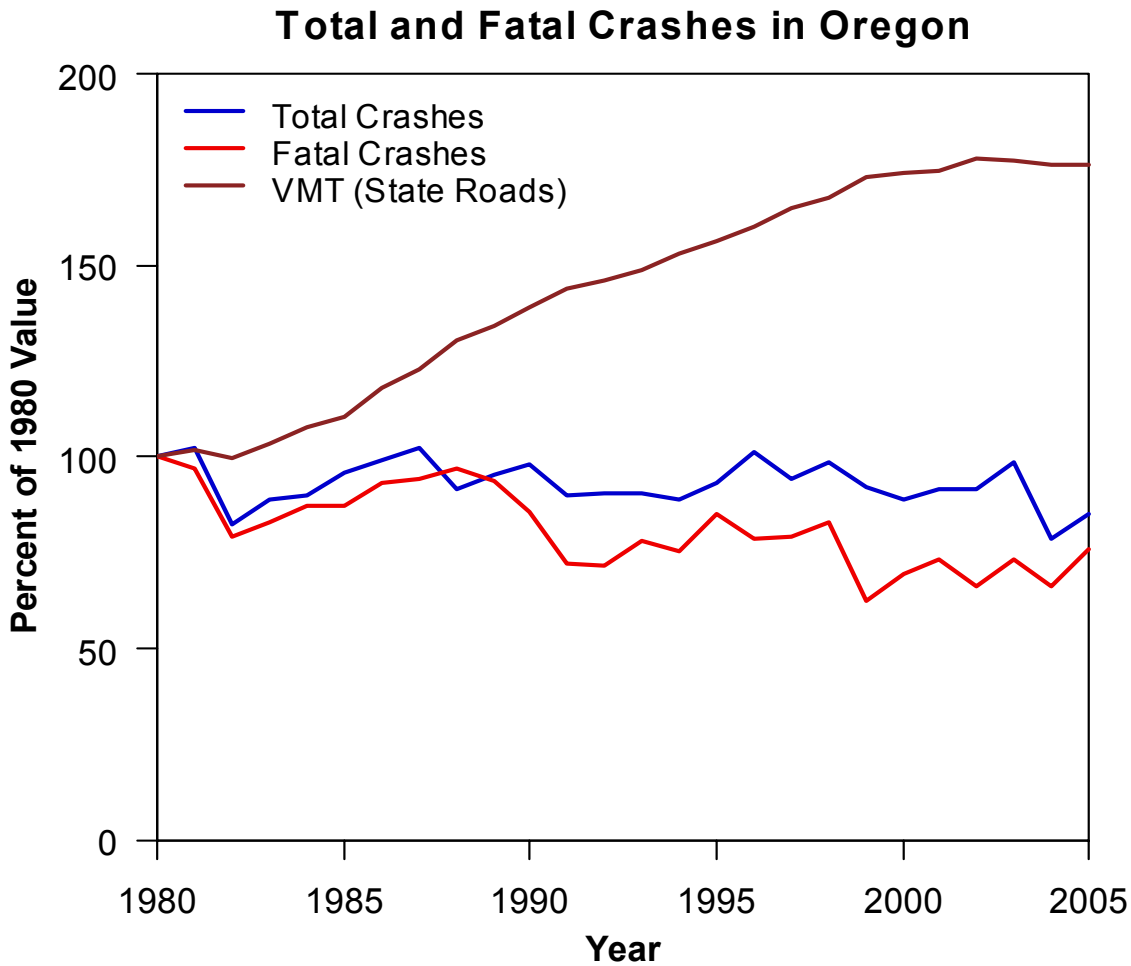
(Figure 3-16)

Safety Trends

Using methods suggested by the 2004 Statewide Congestion Overview, this section examines recent transportation safety trends.

Oregon Motor Vehicle Crash Trends

Despite increasing travel on Oregon highways, both total and fatal crash numbers have declined as a proportion of 1980 values. Improvements in vehicle design, highway design, and social behaviors such as increased seat belt use and less tolerance for impaired driving have contributed to the improvement.



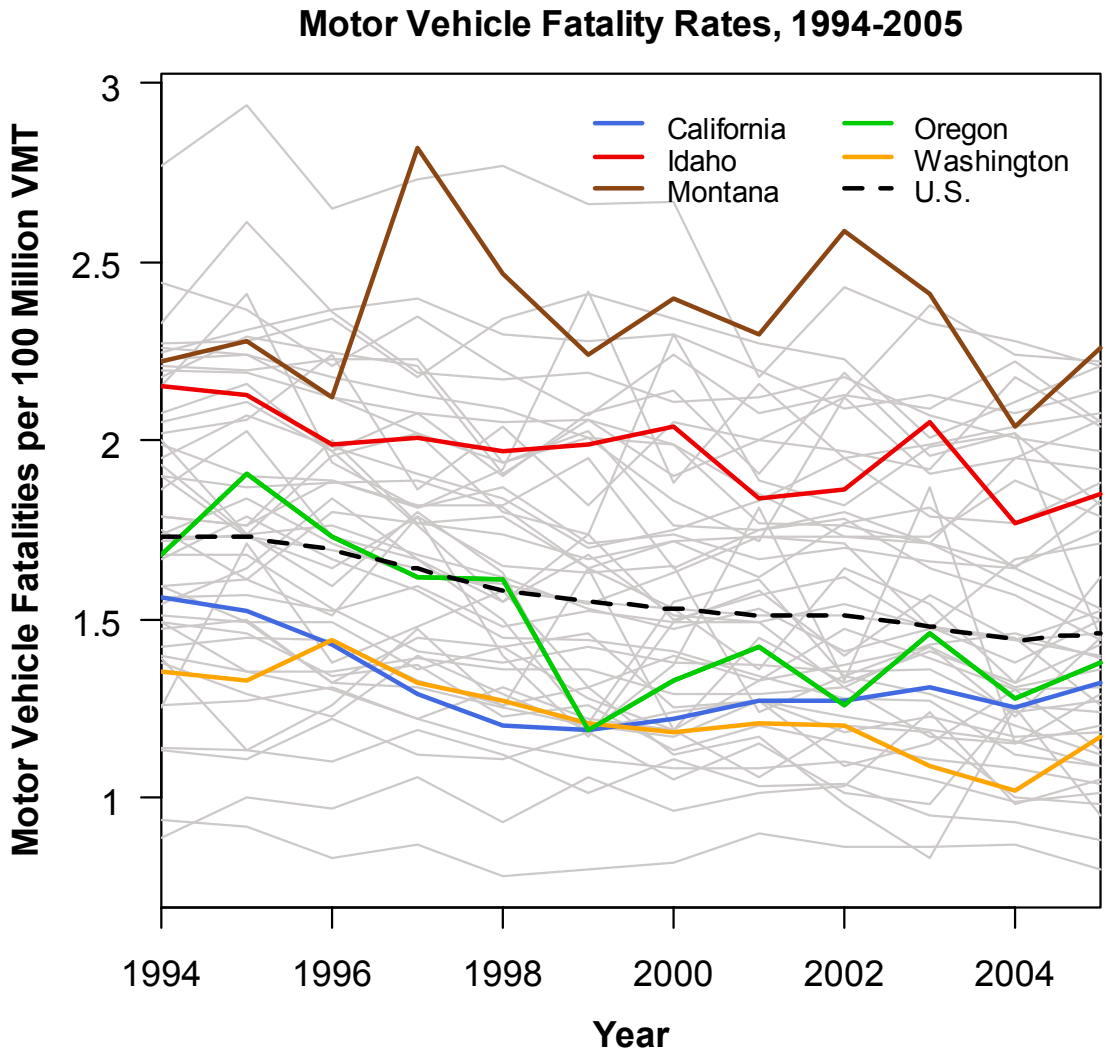
Minimum property damage requirements for crash reporting has changed over the time shown

Data Source: ODOT

(Figure 4-1)

National Motor Vehicle Crash Trends

This figure shows a comparison of motor vehicle fatality rates per 100 million vehicle miles traveled for all 50 US states. Although fatal crashes represent only a portion of the total safety performance they provide a useful benchmark for comparison. Oregon rates have generally been below the national average.

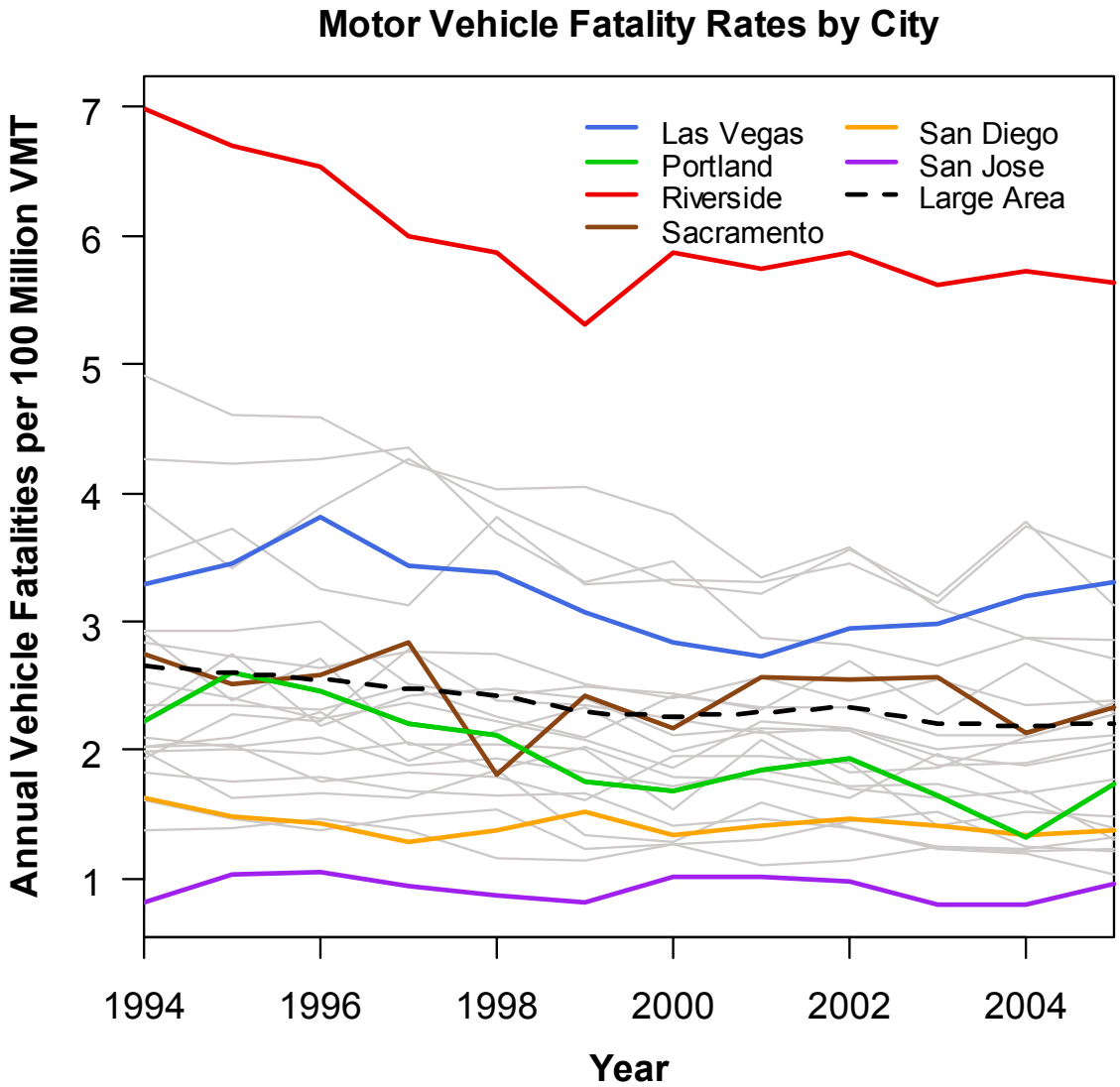


Data Source: National Highway Traffic Safety Administration (NHTSA), Fatality Analysis and Reporting System (FARS)

(Figure 4-2)

Motor Vehicle Safety

This figure shows an urban area comparison of motor vehicle fatality rates expressed per 100 million VMT. The Portland urban area is below average for the large population group.

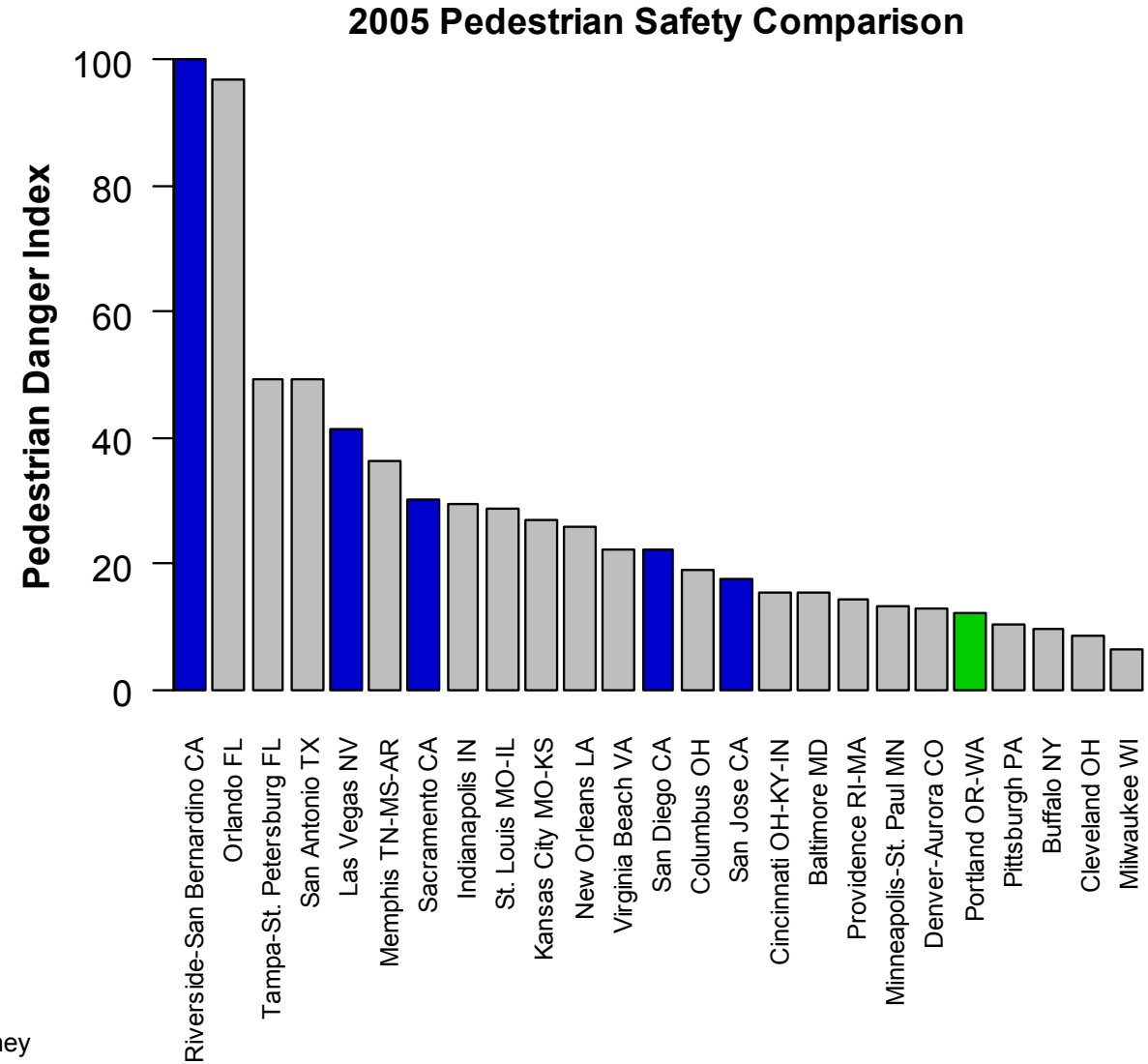


Data Sources: NHTSA FARS, 2007 Urban Mobility Report

(Figure 4-3)

Pedestrian Safety

This figure shows the "Pedestrian Danger Index" for the 25 Large urbanized areas. The index is calculated by dividing the yearly pedestrian fatality rate per 100,000 population by the percentage of commuters walking to work and normalizing that figure to 100. Lower indices are desirable. The index may not reflect the exposure of the total number of people walking since it only includes adjustment for work trips.

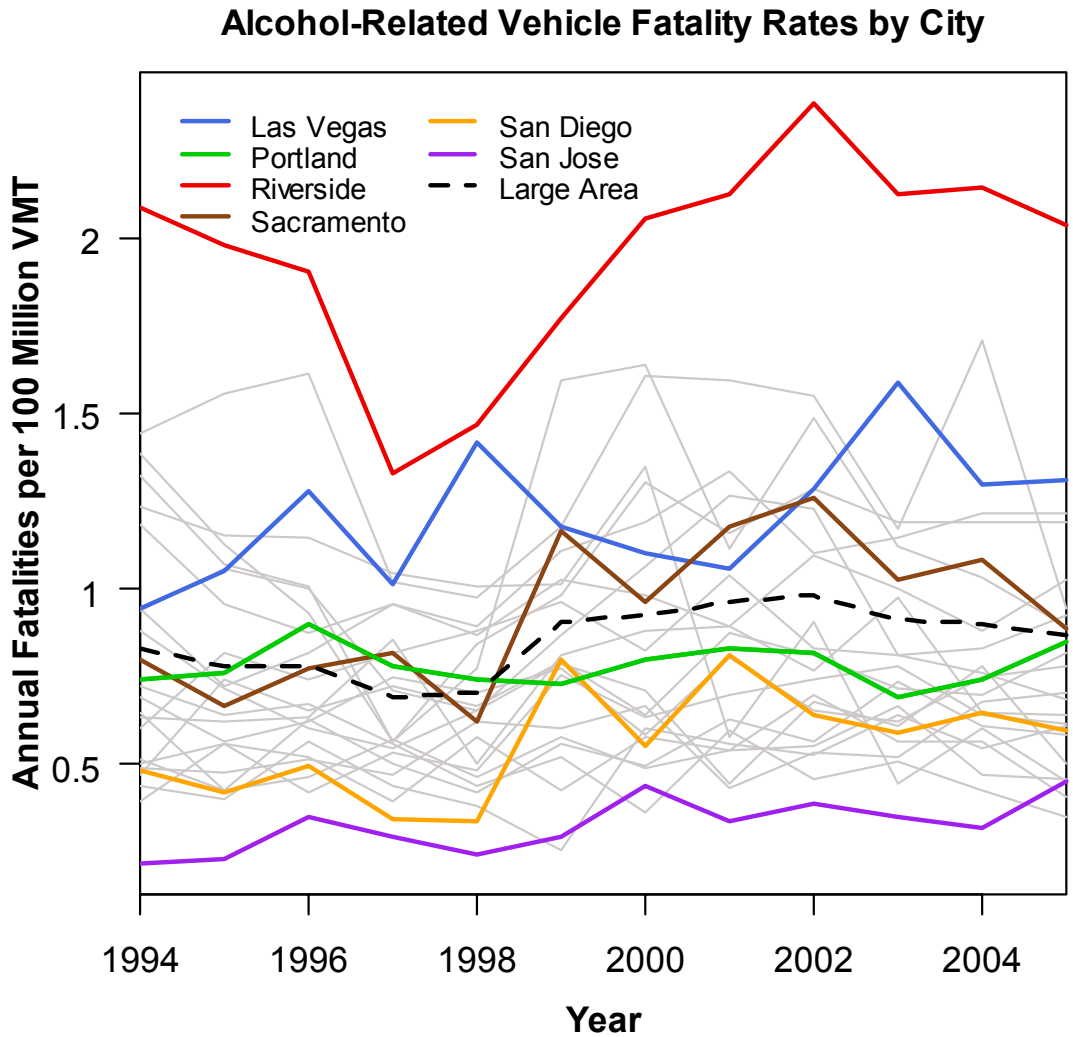


Data Source: NHTSA FARS, U.S. Census Journey to Work, 2007 Urban Mobility Report

(Figure 4-4)

Alcohol-Related Fatality Rates

Alcohol-related crashes often account for more than one third of motor vehicle fatalities. This figure shows alcohol-related fatality rates for Large urban areas, as defined by the 2007 Urban Mobility Report. Portland is about average for the large population group.

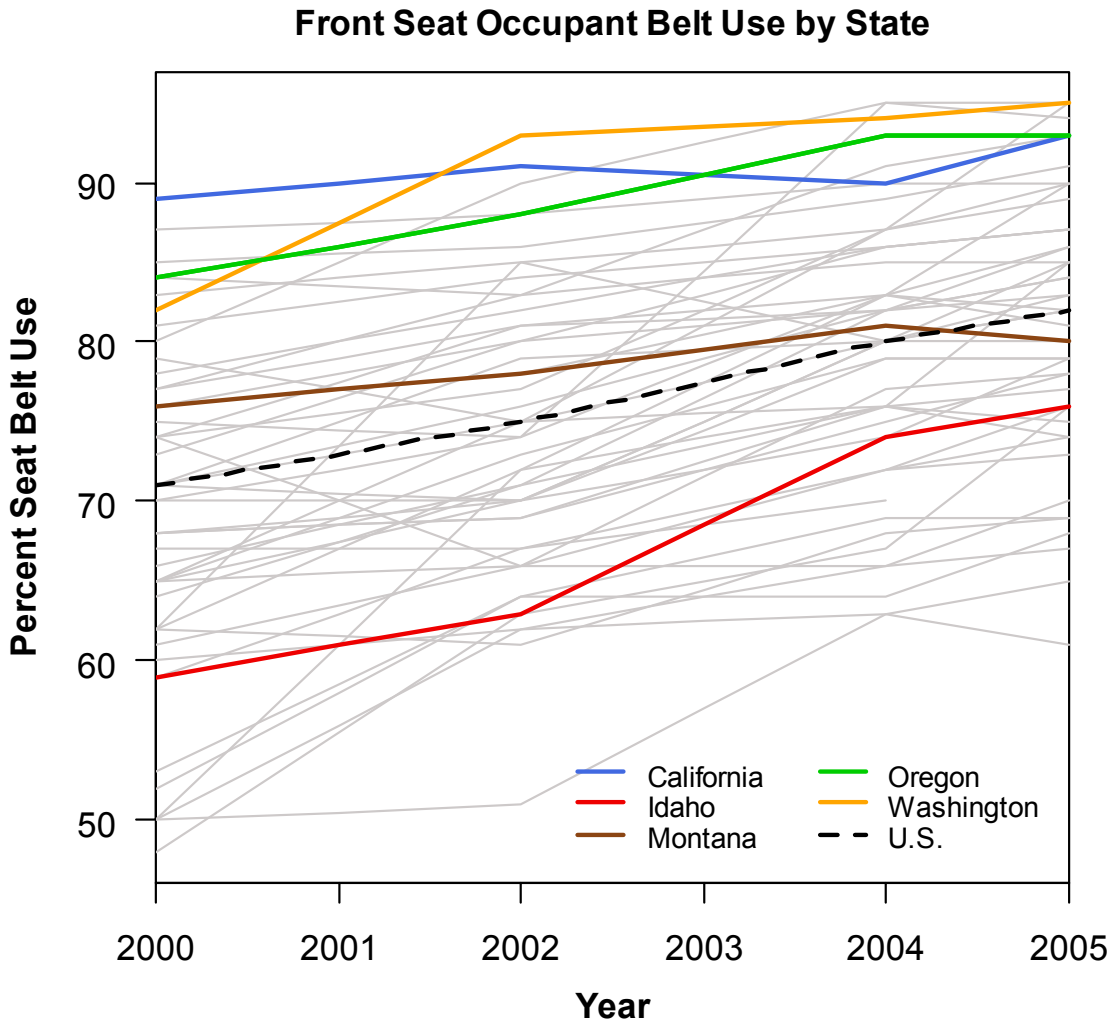


Data Source: NHTSA, FARS

(Figure 4-5)

Safety Belt Use By State

Safety belts are known to reduce crash fatalities or crash injury severity for front seat occupants. This figure shows a high percentage of seat belt use for the three Pacific Coast states, and usage increasing nationwide.

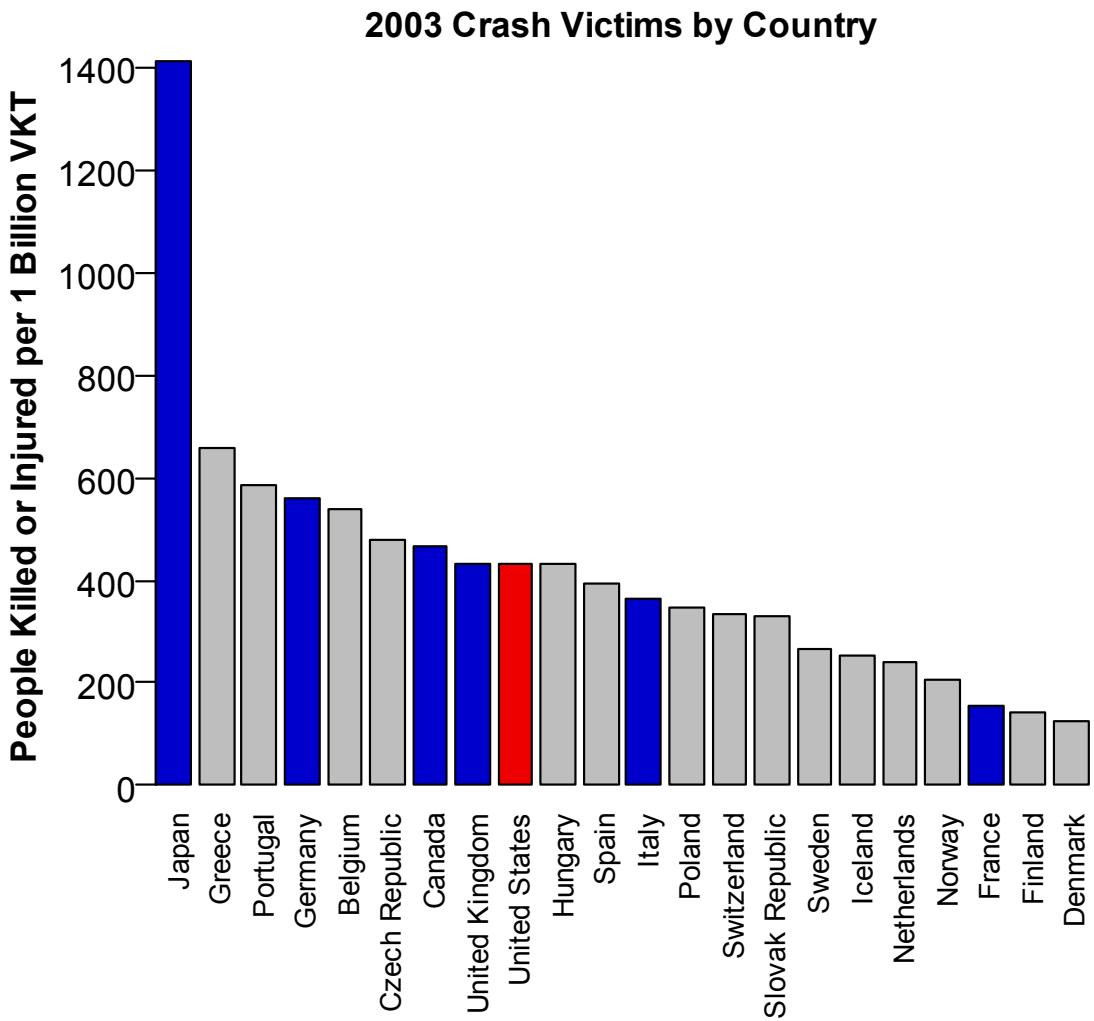


Data Source: USDOT, National Highway Traffic Safety Administration

(Figure 4-6)

International Motor Vehicle Safety Comparison

For an international safety context, this figure shows a combined motor vehicle injury and fatality rate per billion vehicle kilometers traveled. Along with the U.S., the blue shaded countries are part of the G8 (no data available for Russia).



Data Source: Organisation for Economic Co-Operation and Development

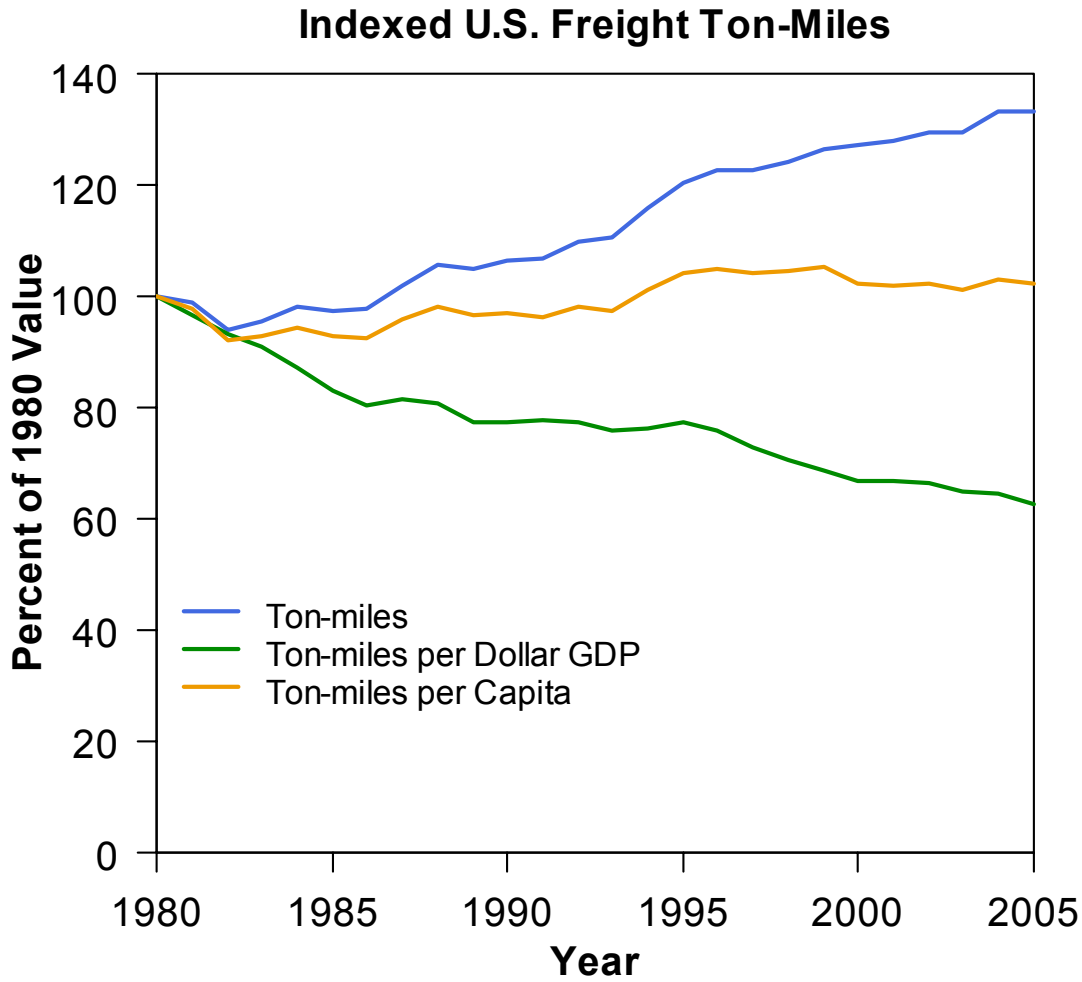
(Figure 4-7)

Freight Trends

Using methods suggested by the 2004 Statewide Congestion Overview, this section examines recent freight transportation trends.

National Freight Trends

This figure shows the national trends in ton-miles of freight related to gross domestic product and population. The ton-miles moved per capita has remained relatively flat, while the total ton-miles continues to grow, yet at a lower rate than the overall GDP.

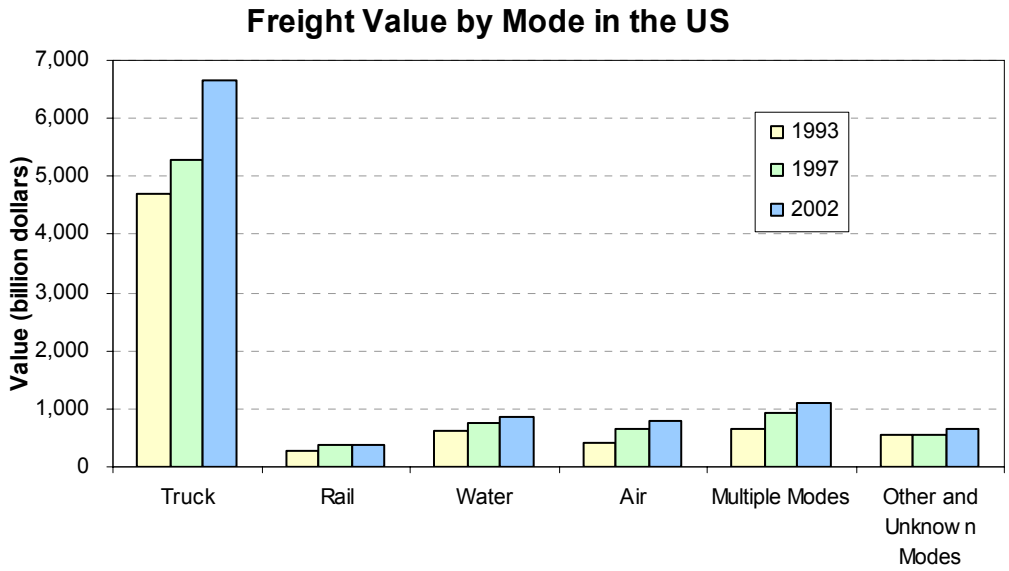


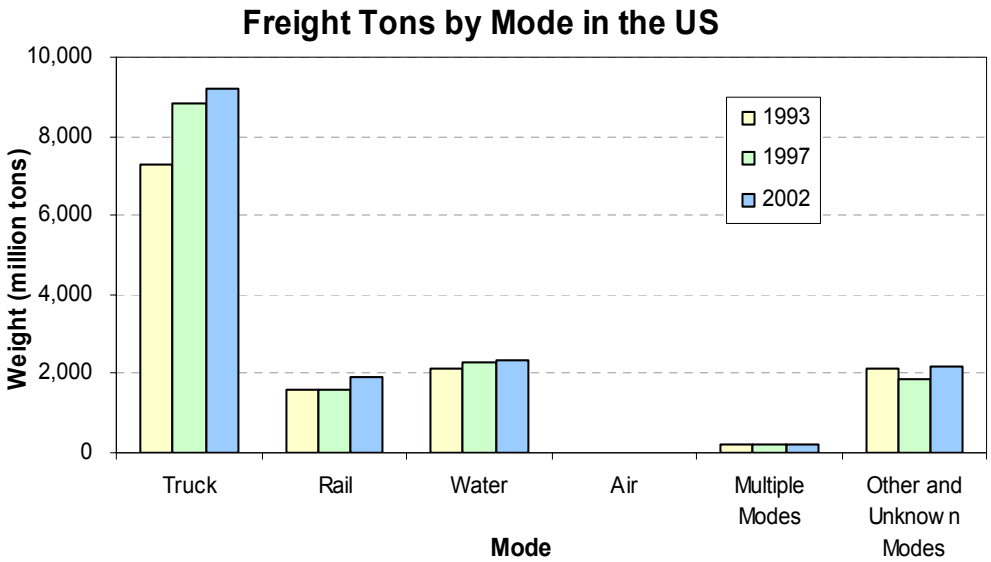
Data Sources: U.S. Bureau of Transportation Statistics, U.S. Bureau of Economic Analysis, and U.S. Census

(Figure 5-1)

U.S. Freight Mode Trends

These figures show U.S. Commodity Flow statistics by mode over a ten year period, for both dollar value and weight. As shown, truck movements dominate both value and weight measures. The impact of air freight in high value movements only is also visible.



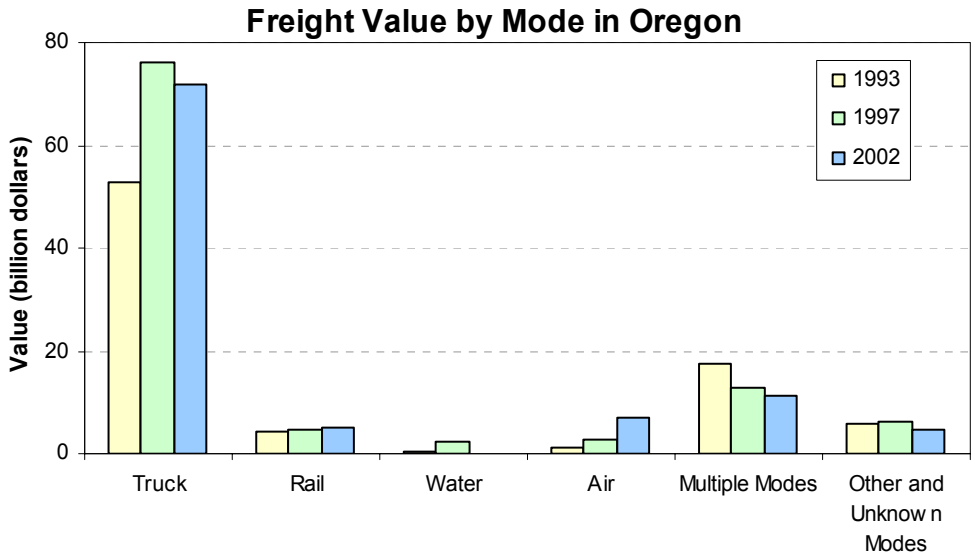


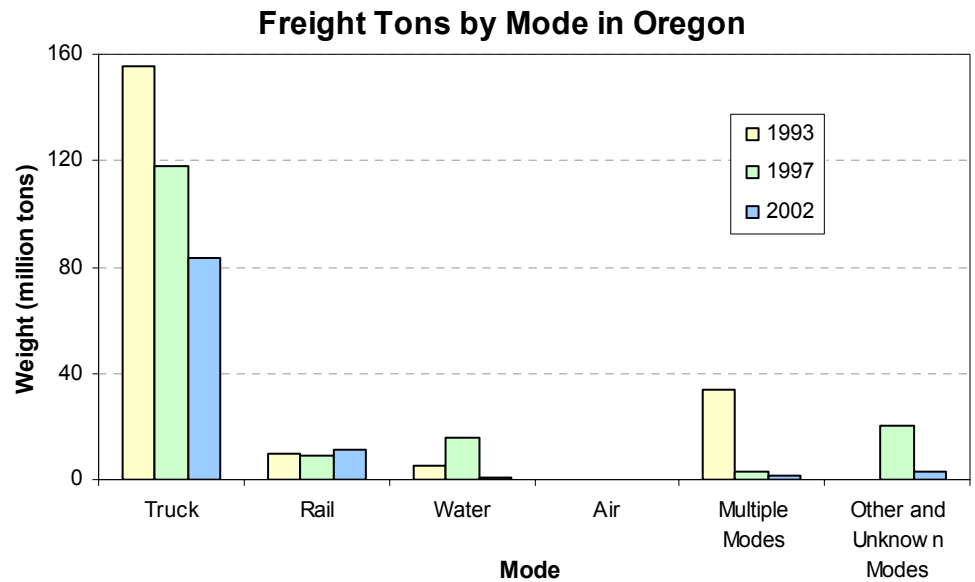
Data Source: Bureau of Transportation Statistics, Shipments in America

(Figure 5-2)

Oregon Freight Mode Trends

These figures show Oregon Commodity Flow statistics by mode over a ten year period, for both dollar value and weight. As seen nationally, truck movements dominate both value and weight measures.



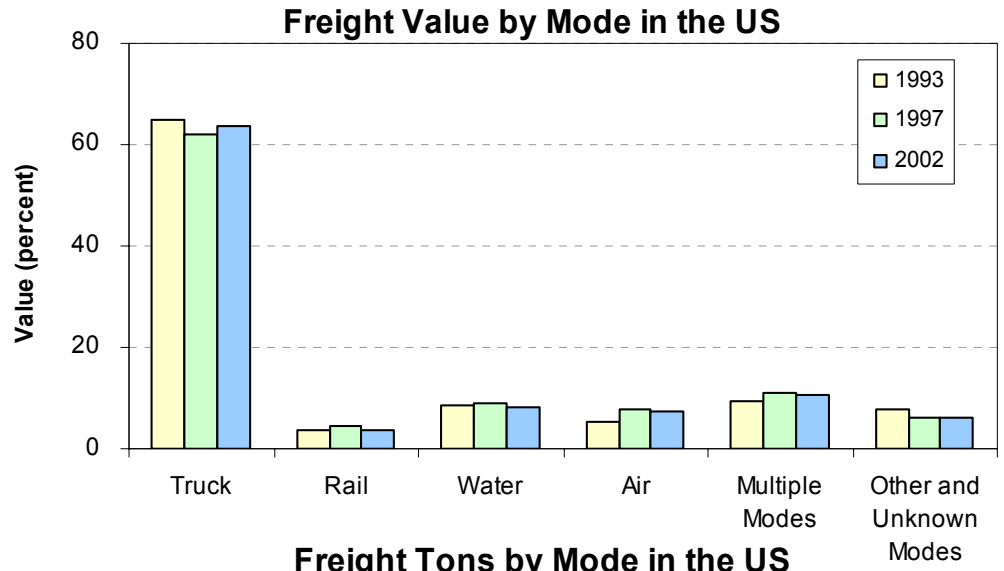


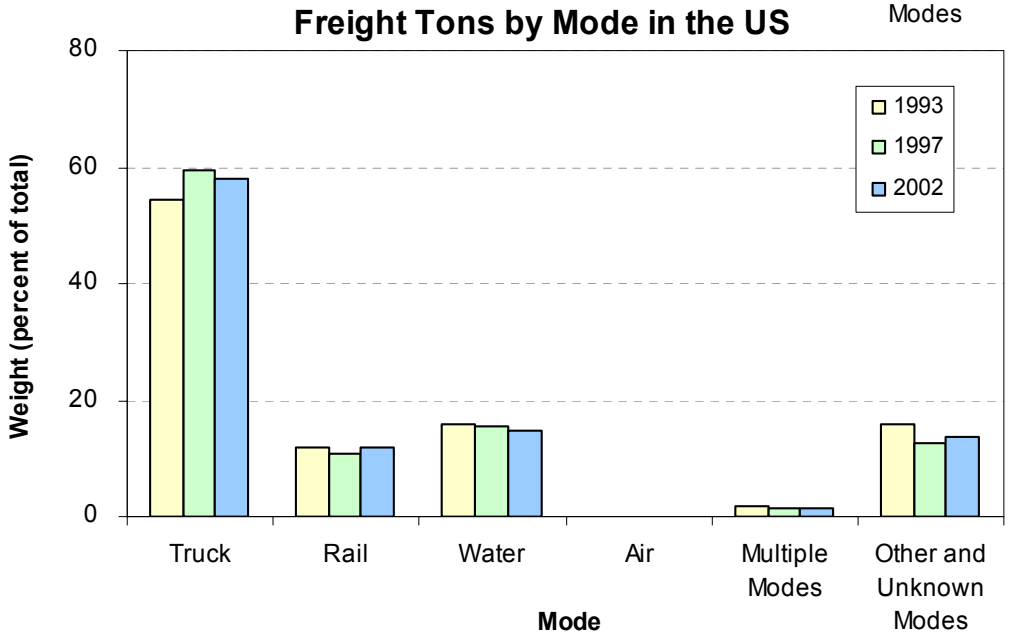
Data Source: Bureau of Transportation Statistics, Shipments in America

(Figure 5-3)

U.S. Freight Mode Trends

These show U.S. Commodity Flow statistics over ten years by mode. As opposed to raw values, these figures show percentages of total movements by dollar value and weight.



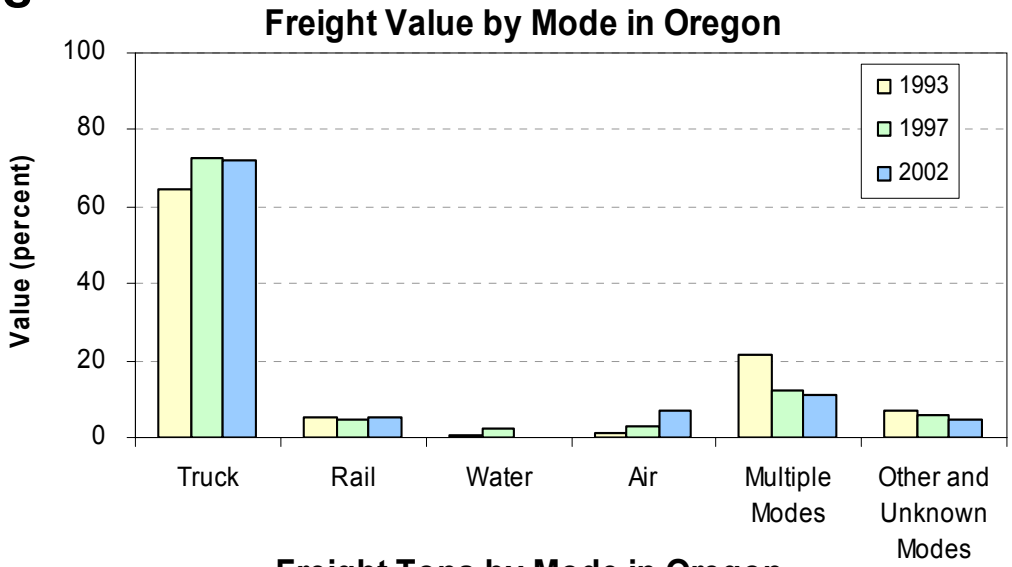


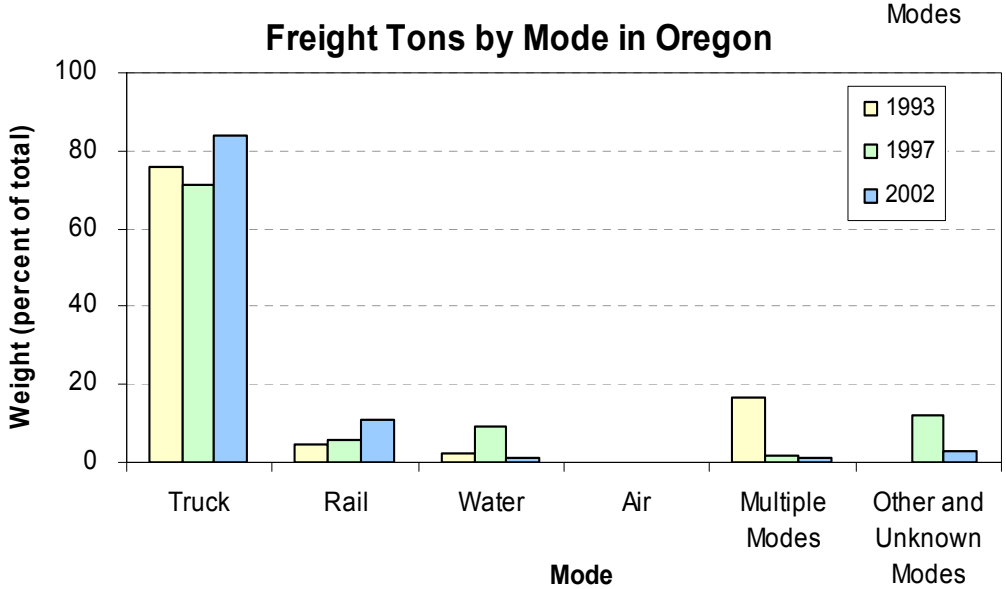
Data Source: Bureau of Transportation Statistics, Shipments in America

(Figure 5-4)

Oregon Freight Mode Trends

These show Oregon Commodity Flow statistics over ten years by mode. The figures show percentages of total movements by dollar value and weight.



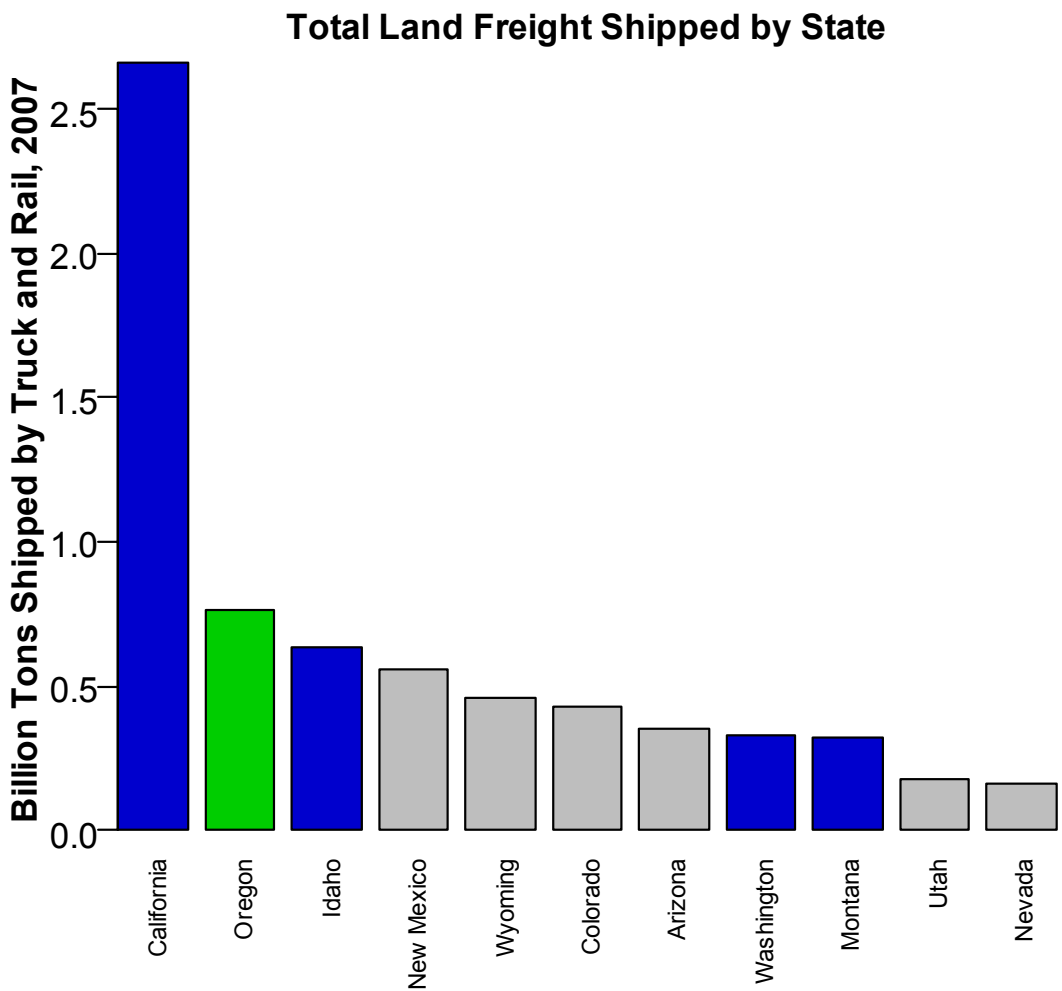


Data Source: Bureau of Transportation Statistics, Shipments in America

(Figure 5-5)

Land Freight by State

This chart shows the total weight of land freight to and from 11 Western states in 2007. These shipments were by truck, rail, or a combination of truck and rail. In addition to land freight, California dominated the Western states in freight shipments by all modes combined.

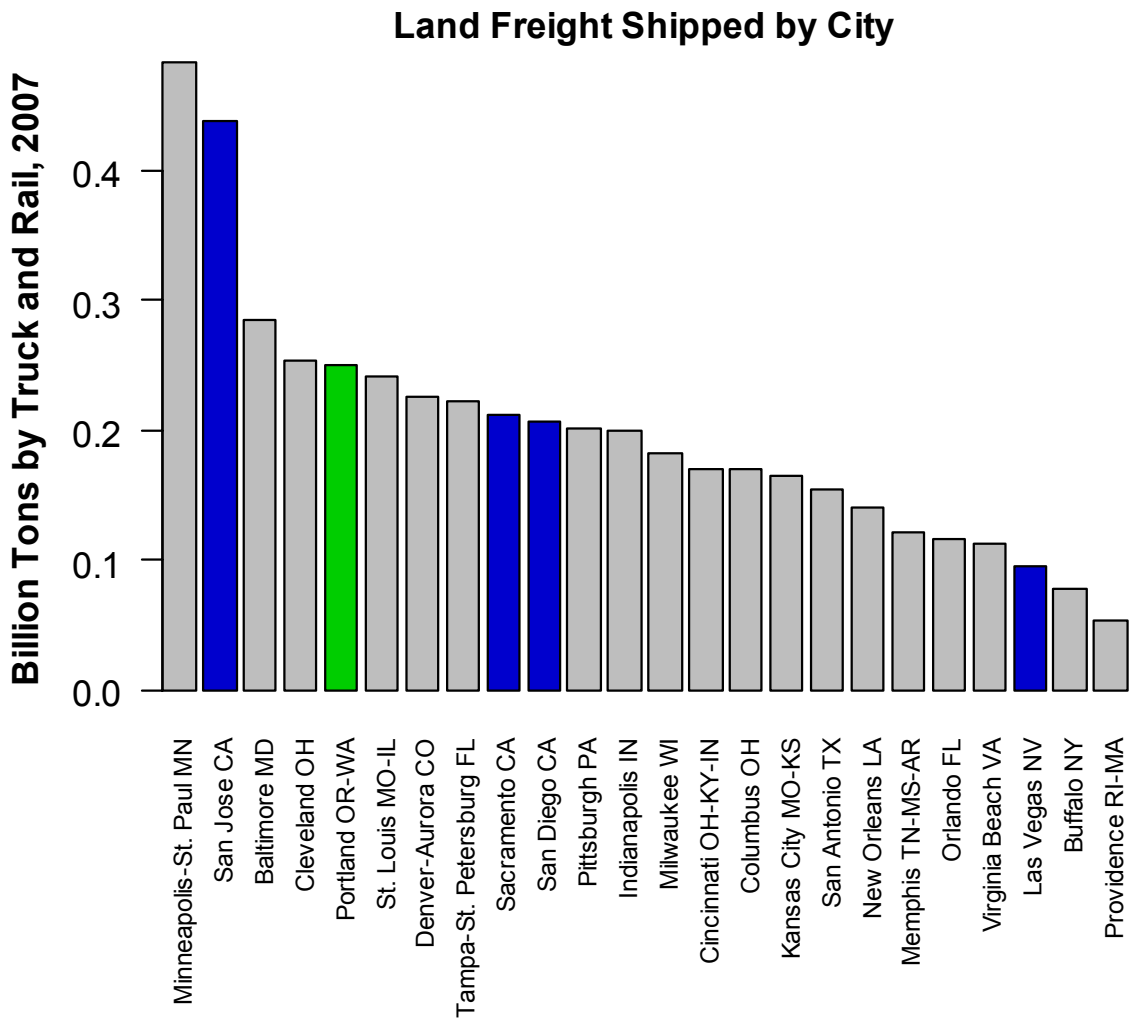


Data Source: FHWA Freight Analysis Framework

(Figure 5-6)

Land Freight by Urban Area

This chart shows the total weight of land freight to and from 25 Large urban areas in 2007. These shipments were by truck, rail, or a combination of truck and rail. The urban area size group is for populations of 1-3 million, as defined in the Urban Mobility Report. When freight by all modes is considered, the primary difference is that New Orleans ranks higher in relation to the other cities.



Data Source: FHWA Freight Analysis Framework

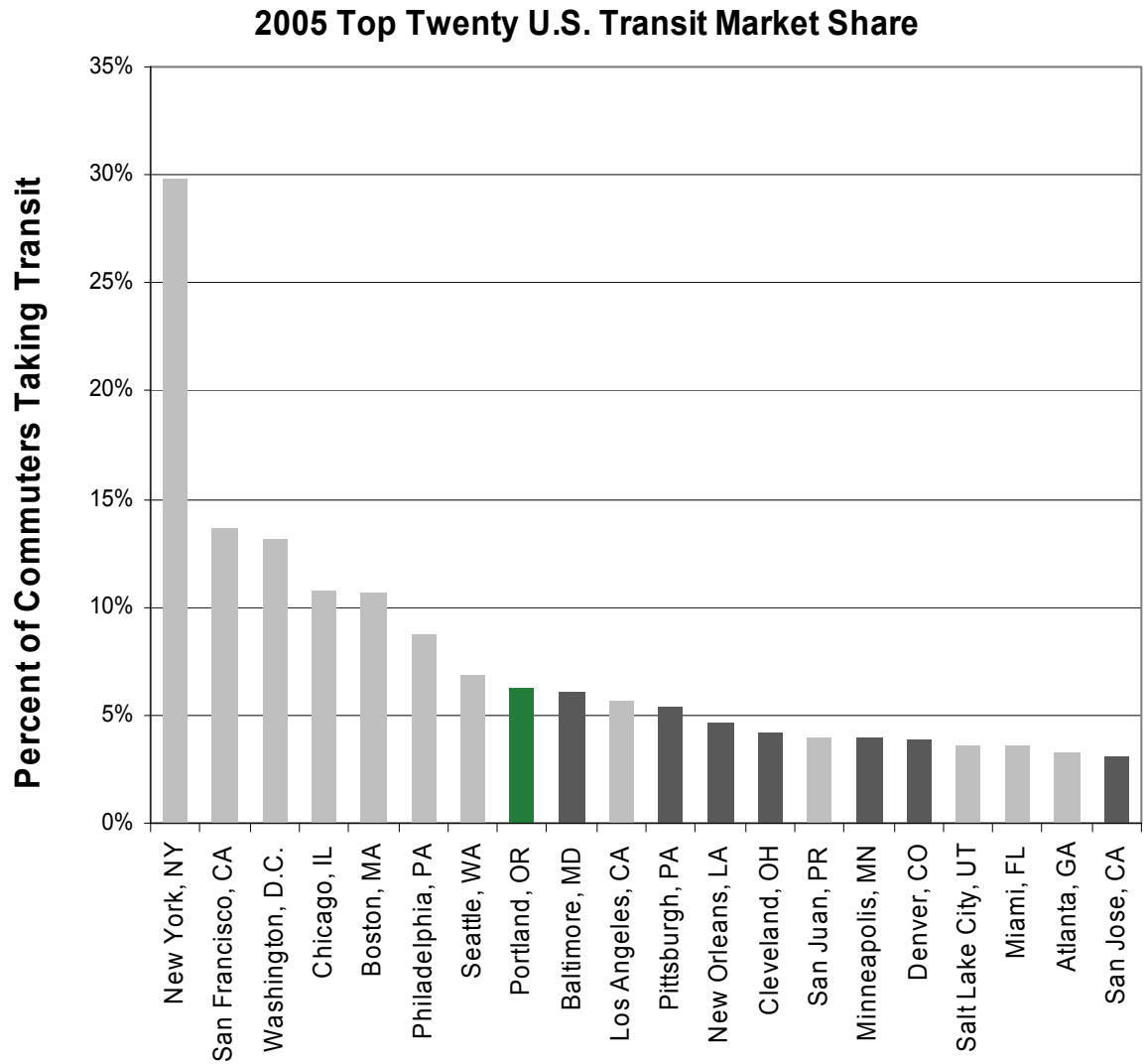
(Figure 5-7)

Portland Region Transit and Non-Motorized Transportation Trends

Using methods suggested by the 2004 Statewide Congestion Overview, this section examines recent trends in transit ridership and non-motorized transportation in the Portland region.

Transit Market Share

By transit market share, Portland appears in the top ten large cities in the nation, with more than 5% of work trips by transit. This figure includes Metropolitan Statistical Areas with population over 1 million. Portland ranks first among Large Urban Areas defined in the Urban Mobility Report (population of 1-3 million, shaded darker).

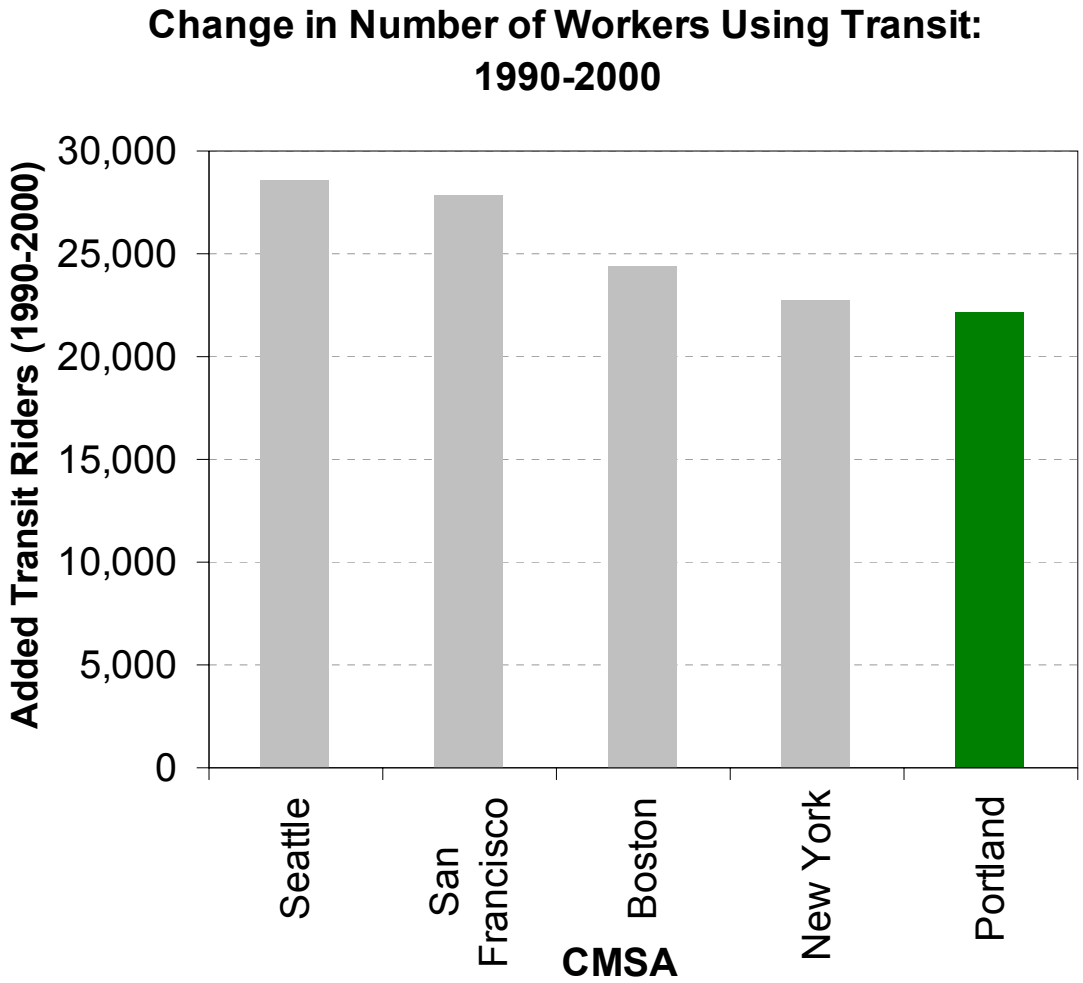


Data Source: 2005 American Community Survey, U.S. Census

(Figure 6-1)

Change in Transit Ridership

Portland appears fifth in the top ten CMSAs in terms of the number of work trip transit riders added between 1990-2000. Portland added nearly 25,000 riders. The New York CMSA (which by itself accounted for 36% of all transit work trips in 1990) added approximately the same number. This was a period during which Portland's capital transit investment in the Westside MAX came online.

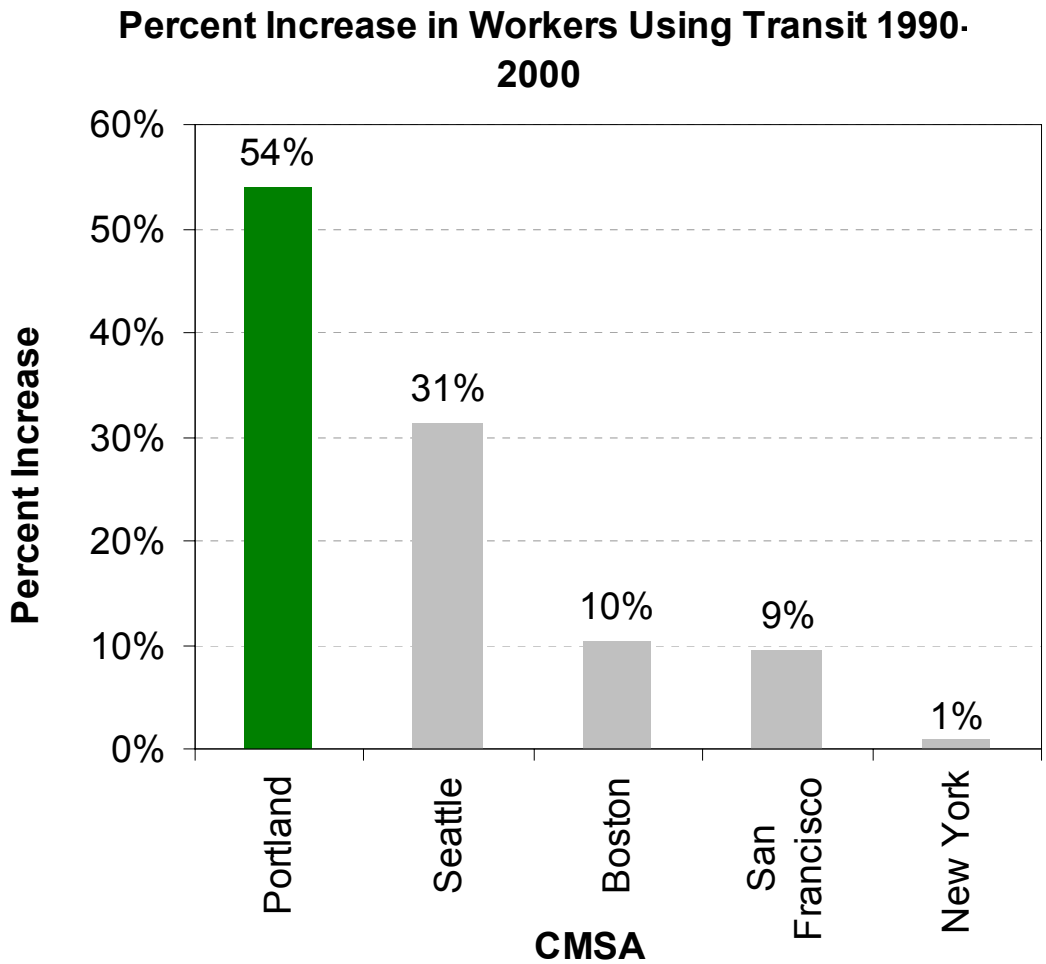


Data Source: U.S. Census Journey to Work.

(Figure 6-2)

Increase in Transit Share

Portland led the nation in the percent increase in workers using transit, 1990-2000.

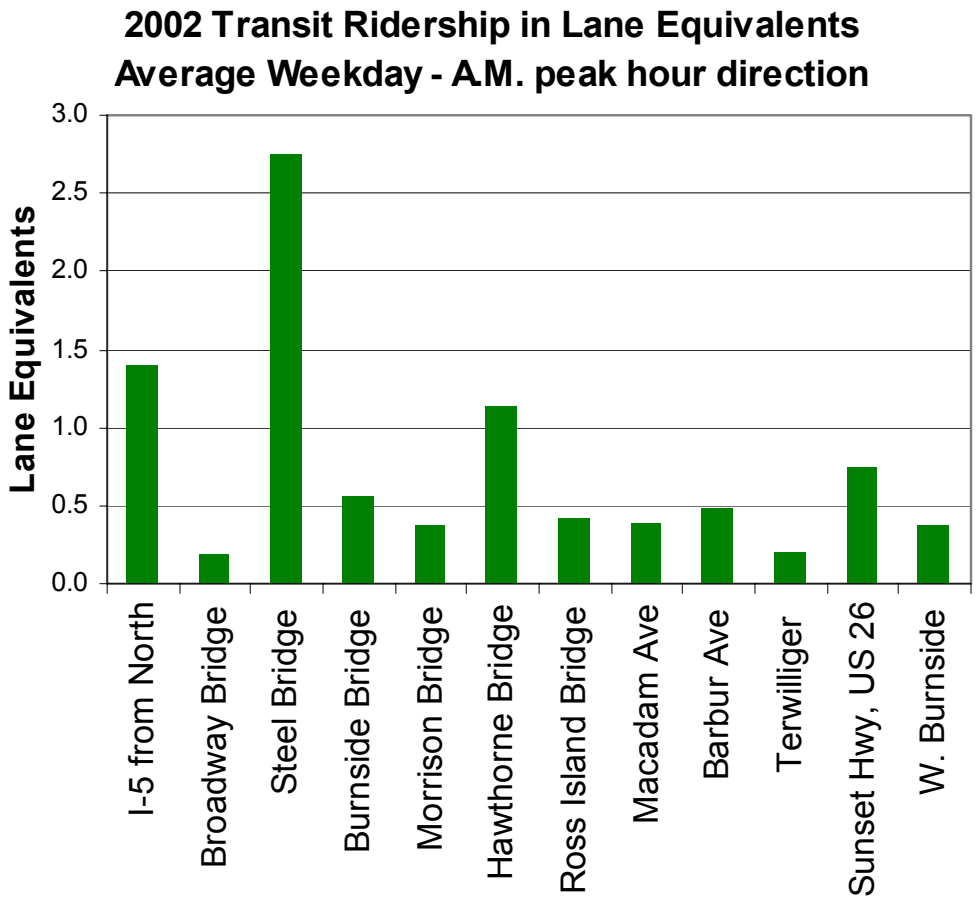


Data Source: U.S. Census

(Figure 6-3)

Lane Equivalents Saved By Transit Ridership

This figure shows an estimate of the magnitude of the impact of transit ridership into downtown Portland during weekday peak periods. For example, this indicates that an equivalent of 1.5 freeway lanes are "saved" by the presence of transit capacity along the I-5 corridor.

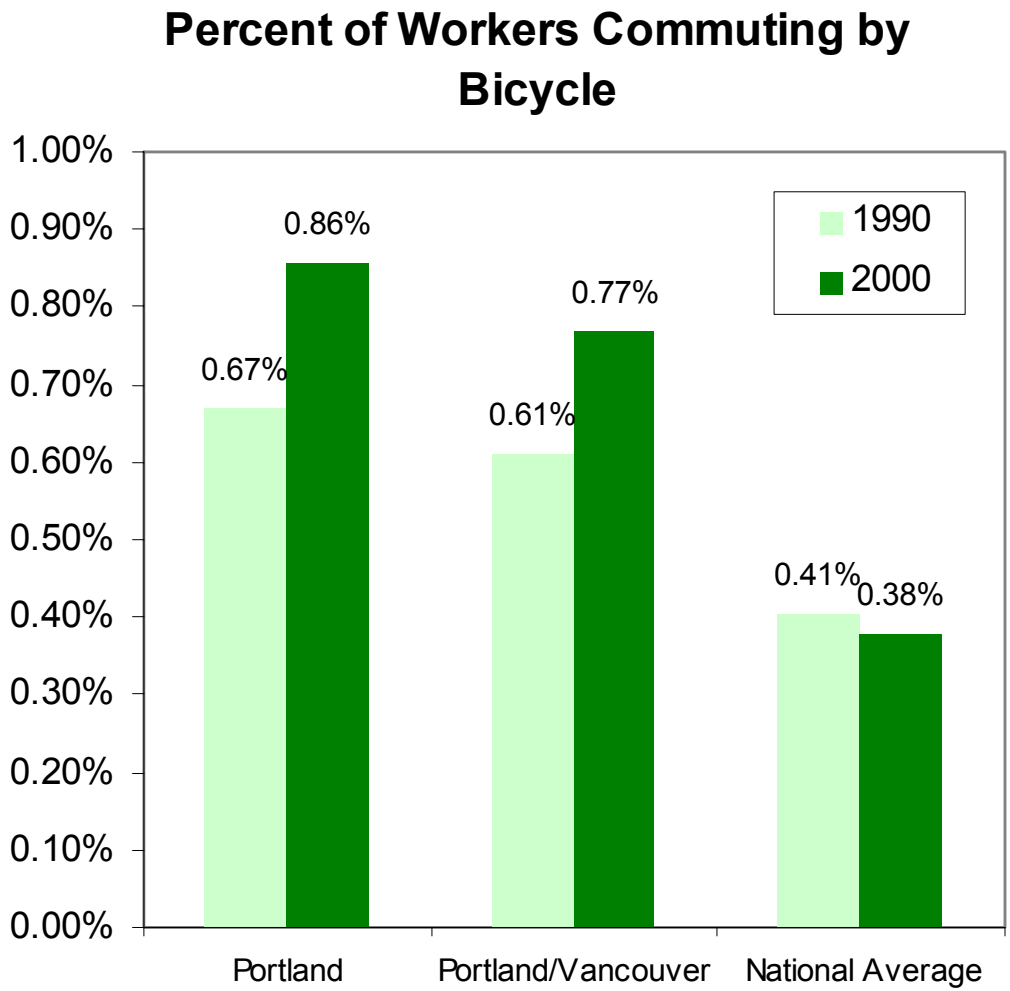


Data Sources: TriMet and C-Tran

(Figure 6-4)

Bicycle Commuting

The percent of workers commuting by bicycle in Portland and in Portland/Vancouver increased between 1990-2000, despite a decrease in the national average.

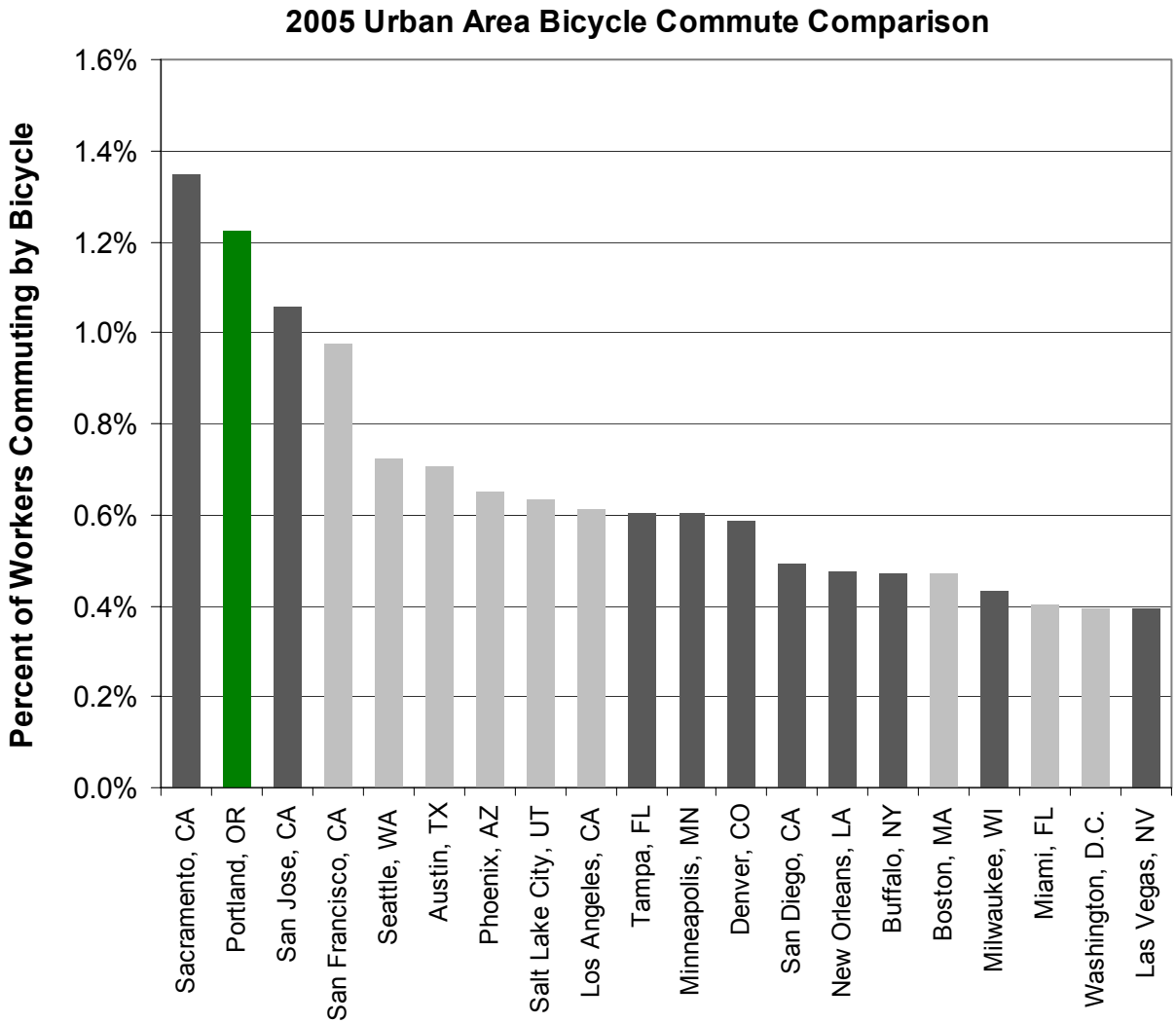


Data Source: U.S. Census

(Figure 6-5)

Bicycle Commuting

This figure shows that in 2005 Portland stood out nationally as exhibiting the second-highest proportion of bicycle commuters among large metropolitan areas. The figure shows the top 20 U.S. Metropolitan Statistical Areas with populations over 1,000,000. For MSA's with population over 500,000, Portland ranked fifth.

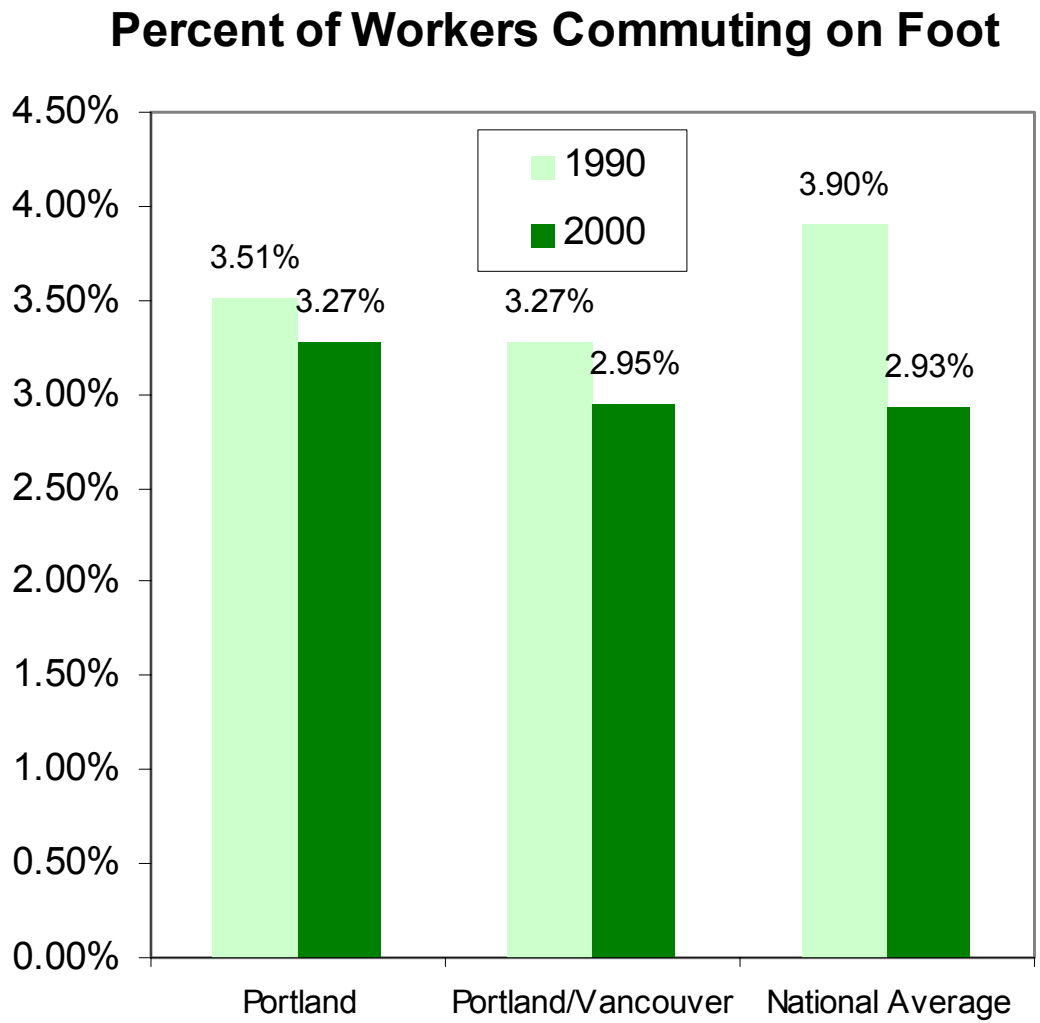


Data Source: 2005 American Community Survey, U.S. Census

(Figure 6-6)

Walk Commuting

The percent of workers commuting on foot in Portland and in Portland/Vancouver decreased between 1990-2000, similar to the decrease in the national average.

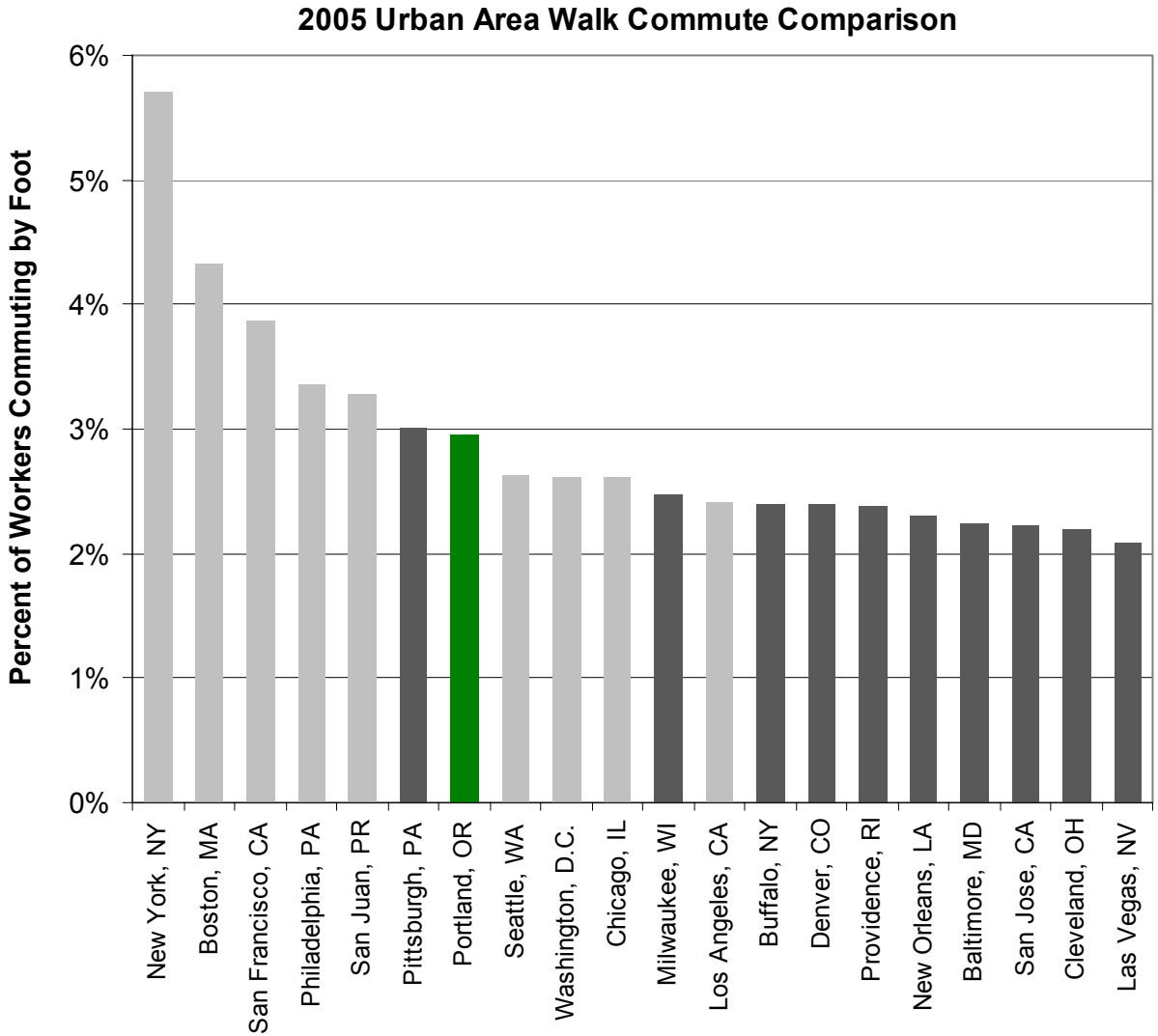


Data Source: U.S. Census

(Figure 6-7)

Walk Commuting

This figure shows that in 2005 Portland exhibited a high proportion of walk commuters among large cities (Metropolitan Statistical Areas with population over 1 million), with almost 3% of commuters choosing to walk to work. In the Large Urban Area group defined by the Urban Mobility Report (shaded dark), Portland ranked a close second behind Pittsburgh.

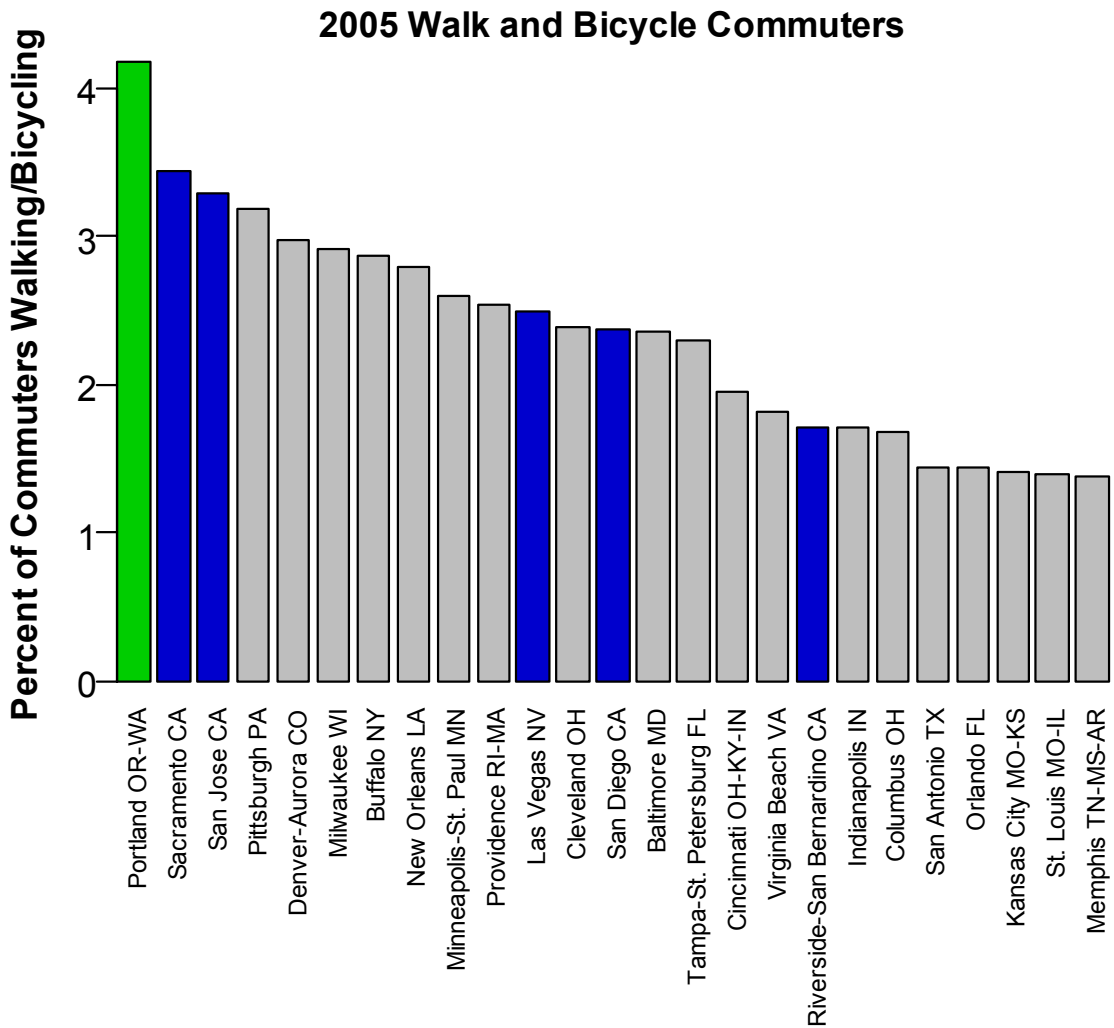


Data Source: 2005 American Community Survey, U.S. Census

(Figure 6-8)

Non-Motorized Commuting

This figure shows a combination of walk and bicycle non-motorized commute modes for the Urban Mobility Report's Large urban areas in 2005. With high percentages of both walk and bicycle commuters, Portland led the group with more than 4% of commuters using non-motorized transportation.

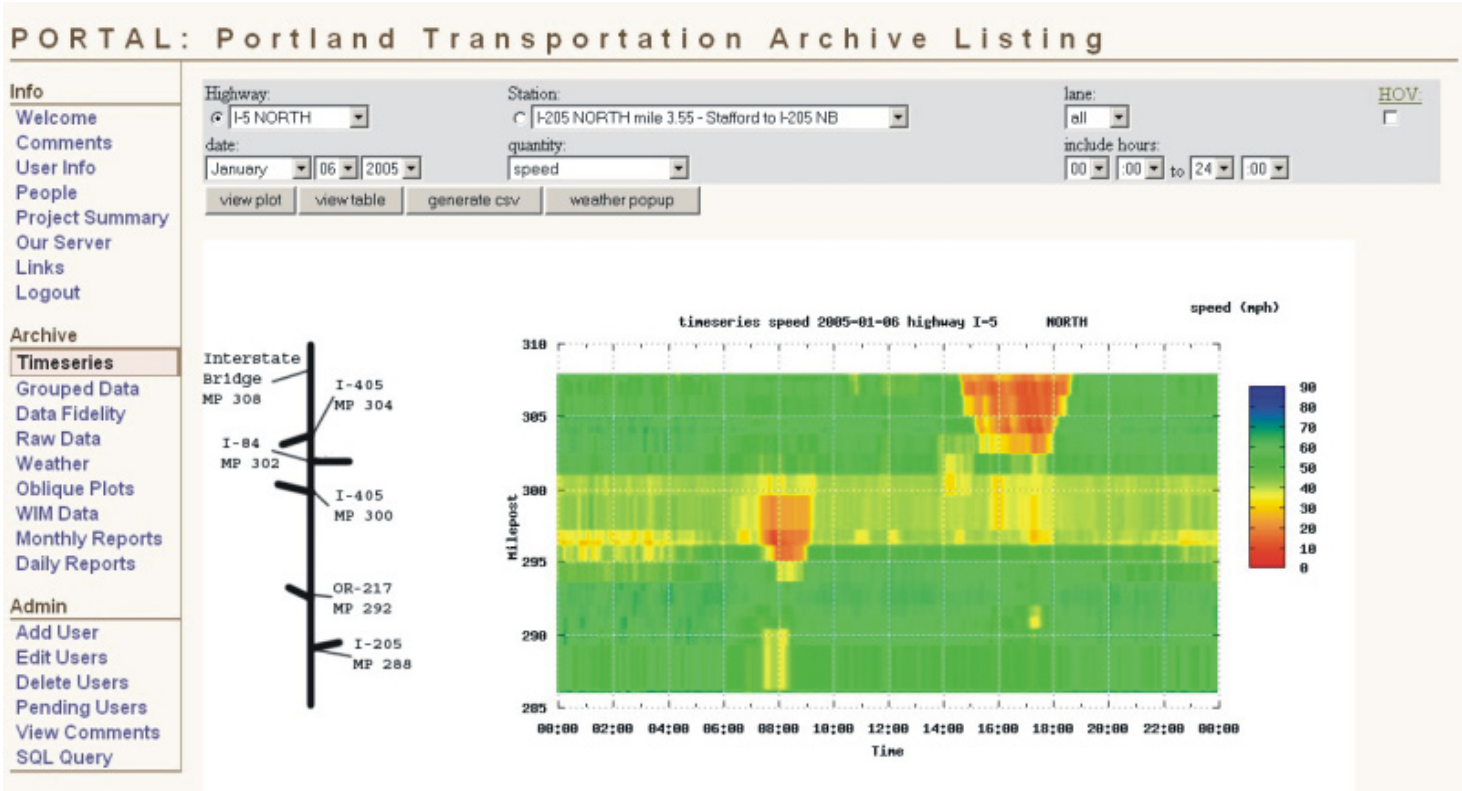


Data Source: 2005 American Community Survey, U.S. Census

(Figure 6-9)

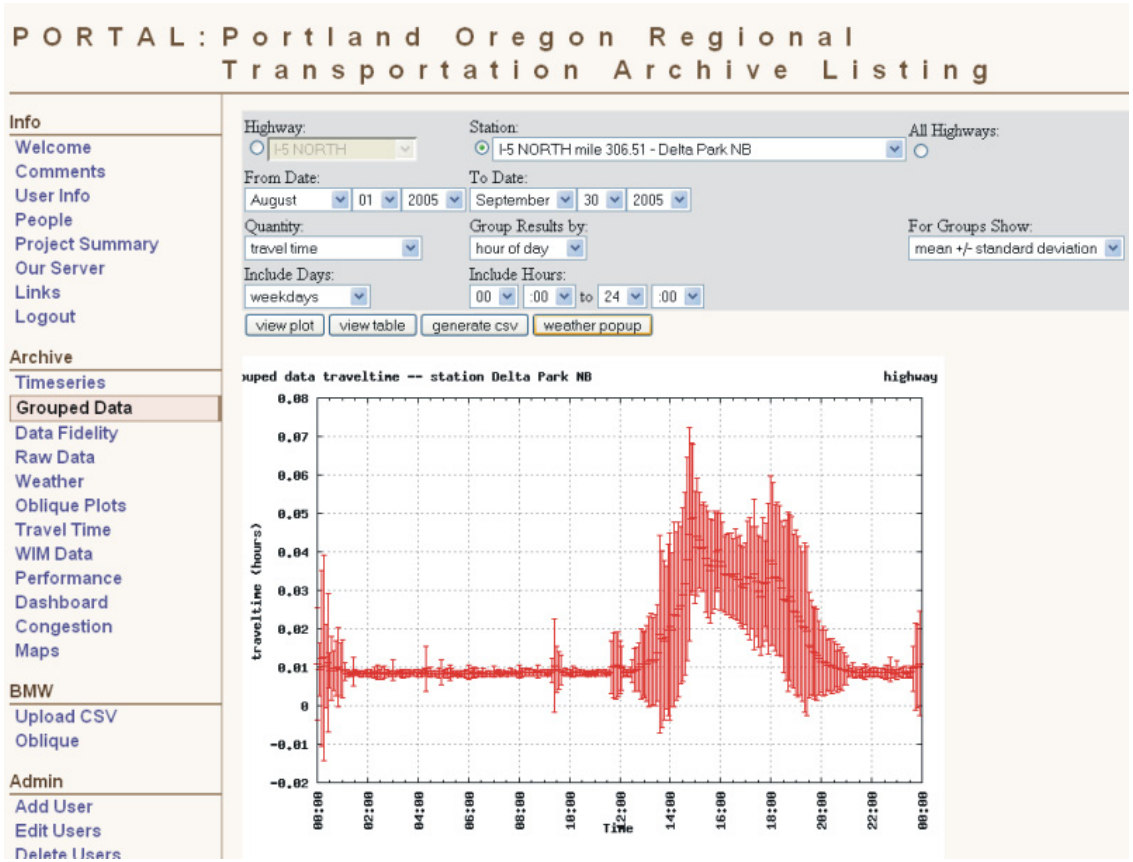
Future Data Sources

This section describes future data sources that will assist in preparation of future editions of this report. Portland State University is now the Portland region's official data archive for intelligent transportation systems data. Since July 2004, PSU has been archiving data from the region's freeways. This image shows the speed recorded on northbound I-5 on one day.



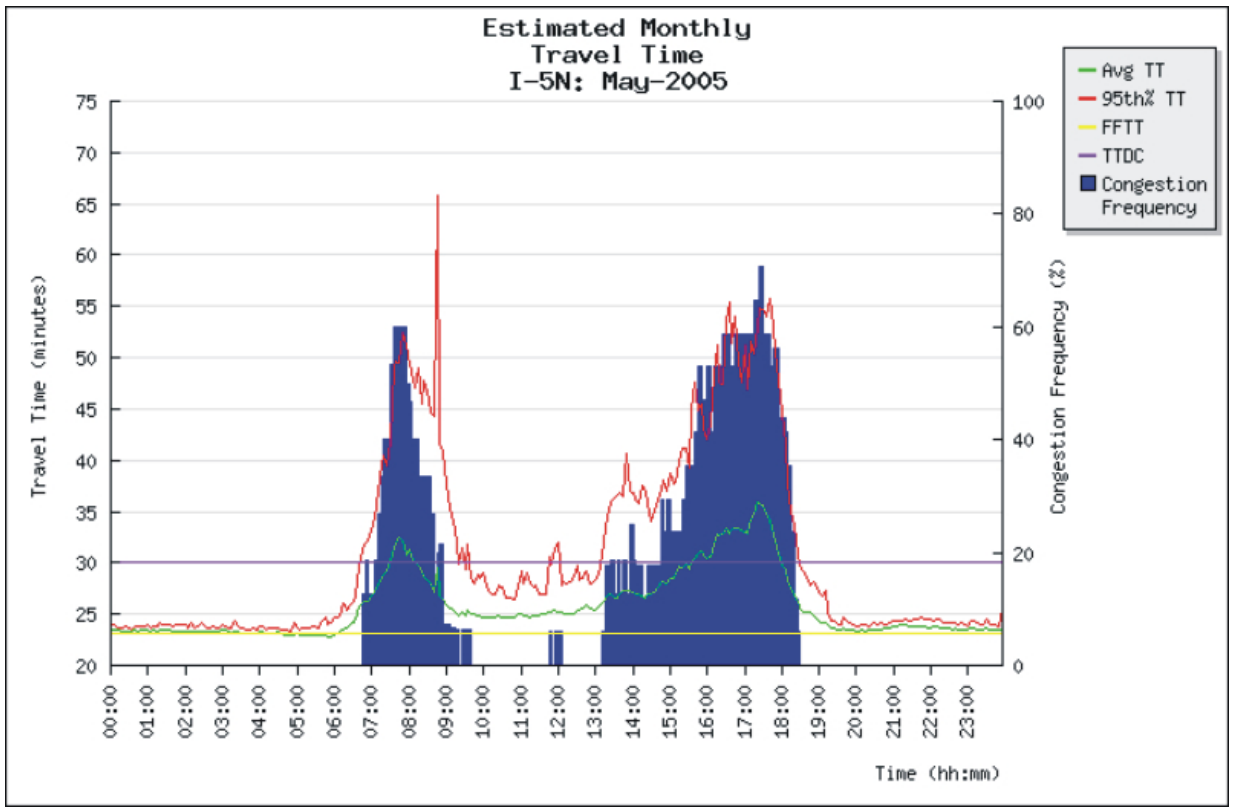
Freeway Segment Travel Time

This figure shows average freeway segment travel time (for a portion of northbound I-5 near Delta Park) by hour of the day for the months of August-September 2005. The graph shows the mean values as well as one standard deviation above and below the average.



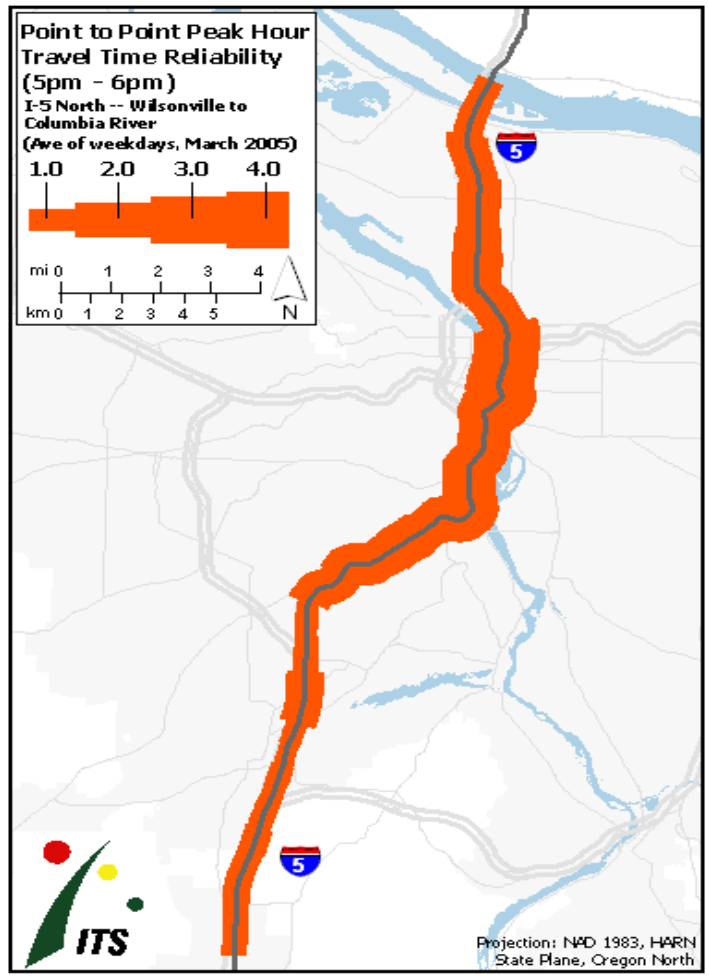
Freeway Segment Travel Time Reliability

This figure shows the estimated travel time for Northbound I-5 during May 2005. The green line shows the mean travel time by time of day, while the red line shows the 95th percentile travel time. The blue bars show the percent of the time that each 5 minute time slice experienced congestion during the month.



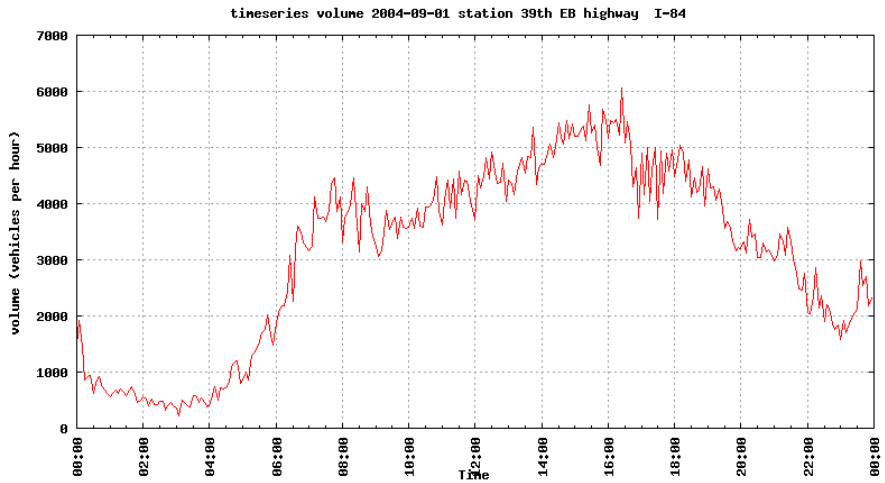
Freeway Segment Travel Time Reliability

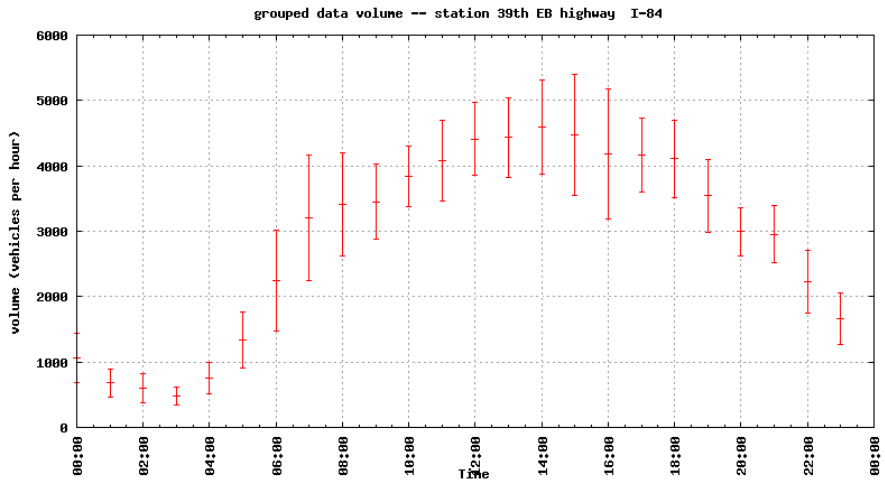
This figure illustrates the reliability of travel time for Northbound I-5 during March 2005. This map uses line thickness to illustrate travel time reliability for the entire corridor between 5 and 6 pm.



Freeway Traffic Volume Trends

These figures show actual traffic volume data for one location on eastbound I-84 (39th Ave). The upper figure shows 5-minute volumes measured on one day (September 1, 2004), while the lower figure shows the mean (and plus/minus one standard deviation) of the hourly volumes measured during the month of August 2004.





Closure

In this report we have attempted to present a wide array of methods of assessing the performance of the Portland transportation system, using analysis of available data. We hope that this has contributed to the important debate regarding the kind of transportation system, quality of life, and region that we want to have in the future.