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First Annual Portland Metropolitan Region Transportation System Performance Report

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PORTLAND STATE UNIVERSITY
CENTER FOR TRANSPORTATION STUDIES
DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING
SCHOOL OF URBAN STUDIES AND PLANNING

First Annual Portland Metropolitan Region Transportation System Performance Report

September 8, 2004

**PORTLAND STATE
UNIVERSITY**

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, seven 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. Much of the information in this report is an update to the Statewide Congestion Overview to include 2002 data. The Statewide Congestion Overview is the inspiration for this report and is available at:

<http://www.odot.state.or.us/tddtpau/papers/cms/CongestionOverview021704.PDF>

We gratefully acknowledge the Texas Transportation Institute (TTI) for providing us the advance 2004 Urban Mobility Report (2002 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

Primary Contributor: Brian Gregor, Oregon Department of Transportation

Using data, methodologies and graphical techniques developed in the Statewide Congestion Overview (February 2004), this report has been compiled with the assistance of Brian Gregor of the Oregon Department of Transportation.

Other Contributors: Sonoko Endo, Christopher Monsere, Jennifer Dill and Jacob Baglien, Portland State University Center for Transportation Studies.

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 this First Annual 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 over the next year, and in years to come. We hope that you will help us.

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.

Associate Professor of Civil & Environmental Engineering and Urban Studies & Planning
Director, 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.

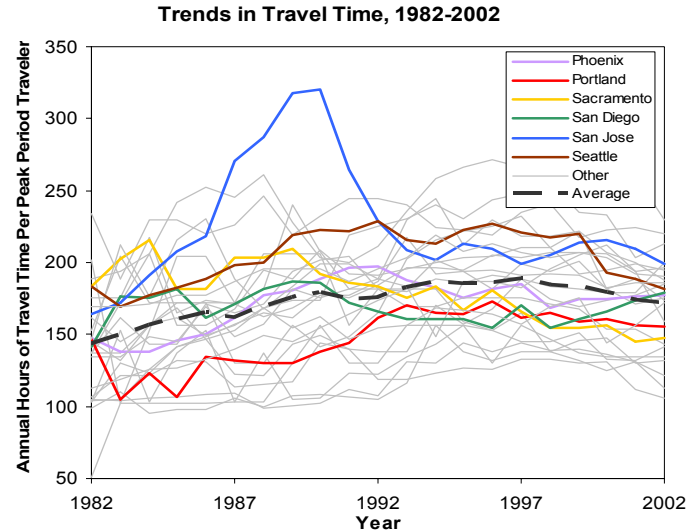
Comparing Urban Areas

Large Urban Areas:

- Atlanta GA
- Baltimore MD
- Buffalo NY
- Cincinnati OH-KY-IN
- Cleveland OH
- Columbus OH
- Denver-Aurora CO
- Indianapolis IN
- Kansas City MO-KS
- Las Vegas NV
- Milwaukee WI
- Minneapolis-St. Paul MN
- New Orleans LA
- Oklahoma City OK
- Orlando FL
- Phoenix AZ
- Pittsburgh PA
- Portland OR-WA
- Riverside-San Bernardino CA
- Sacramento CA
- San Antonio TX
- San Diego CA
- San Jose CA
- Seattle WA
- St. Louis MO-IL
- Tampa-St. Petersburg FL
- Virginia Beach VA

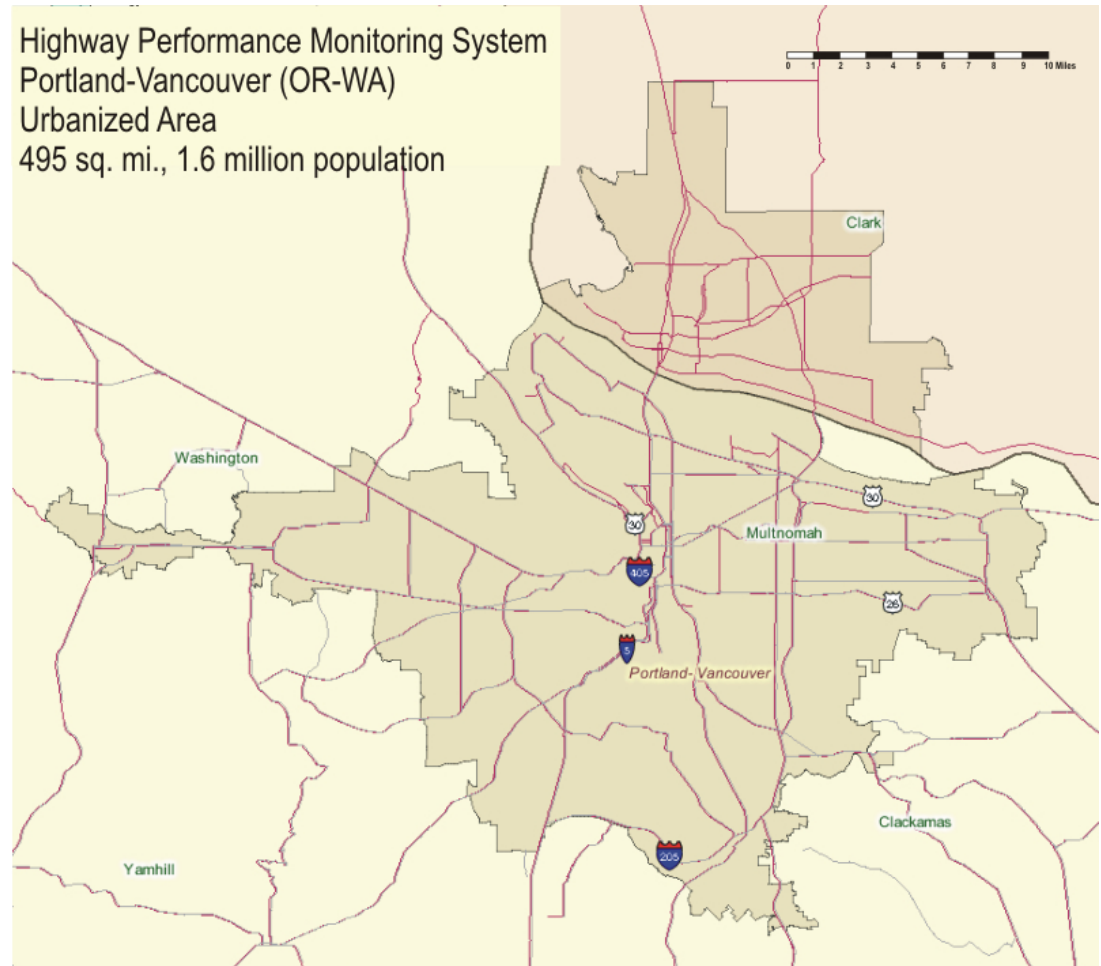
The Texas Transportation Institute's annual Urban Mobility Report categorizes each urban area by size. In this study, we compare the Portland region to other urban areas in the Large category, with populations between 1-3 million people. The 27 Large areas are listed below. Data reported are through the year 2002.

When graphically comparing Large urban areas from the Urban Mobility Report, the colored lines are for the six western cities: Phoenix, Sacramento, San Diego, San Jose and Seattle, plus 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 27 Large cities.



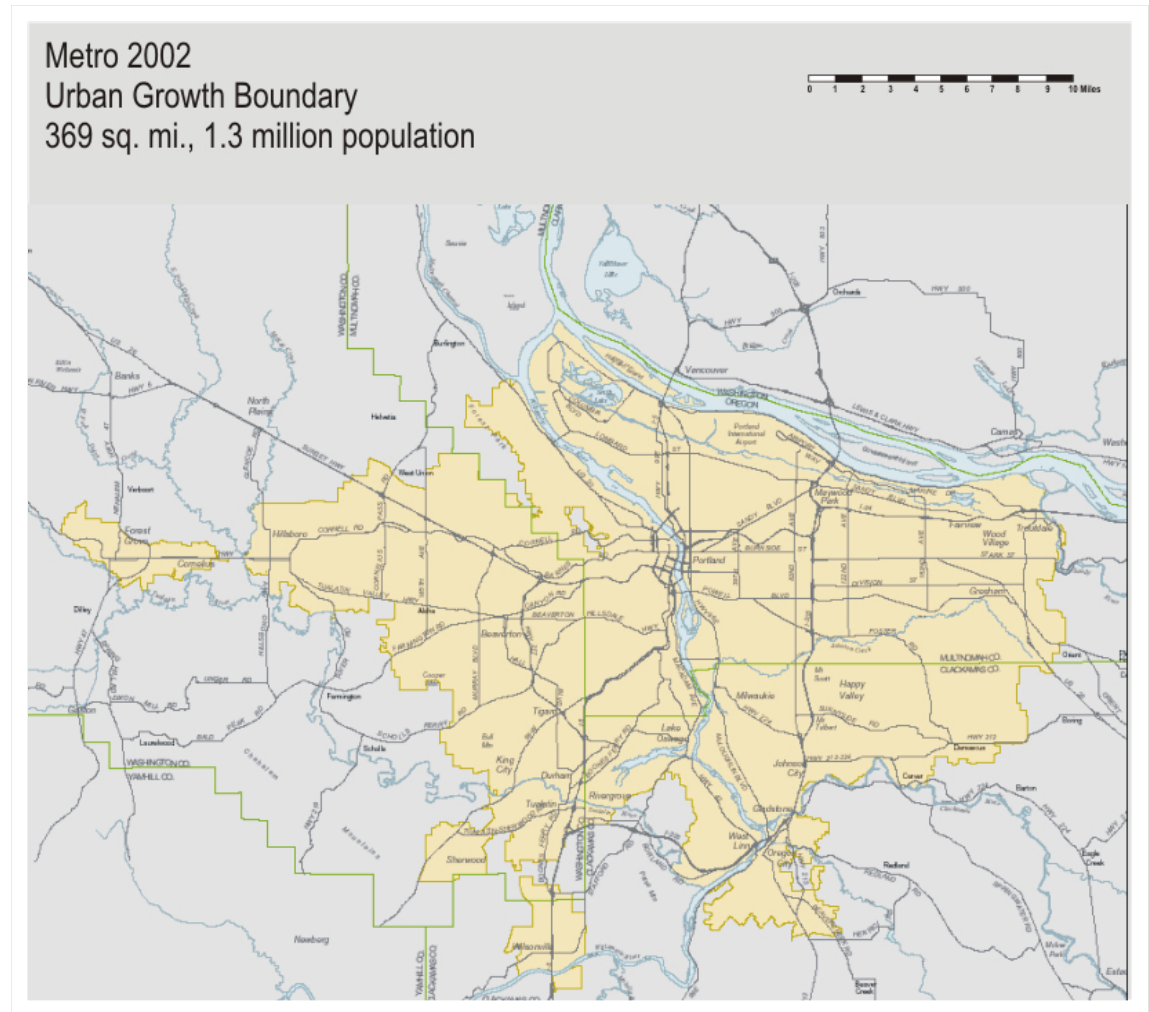
Portland-Vancouver Urbanized Area

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, land area for this area (different than the area inscribed by the Urban Growth Boundary and the U.S. Census). Changing the boundary of this area would change the results of the Urban Mobility Report.



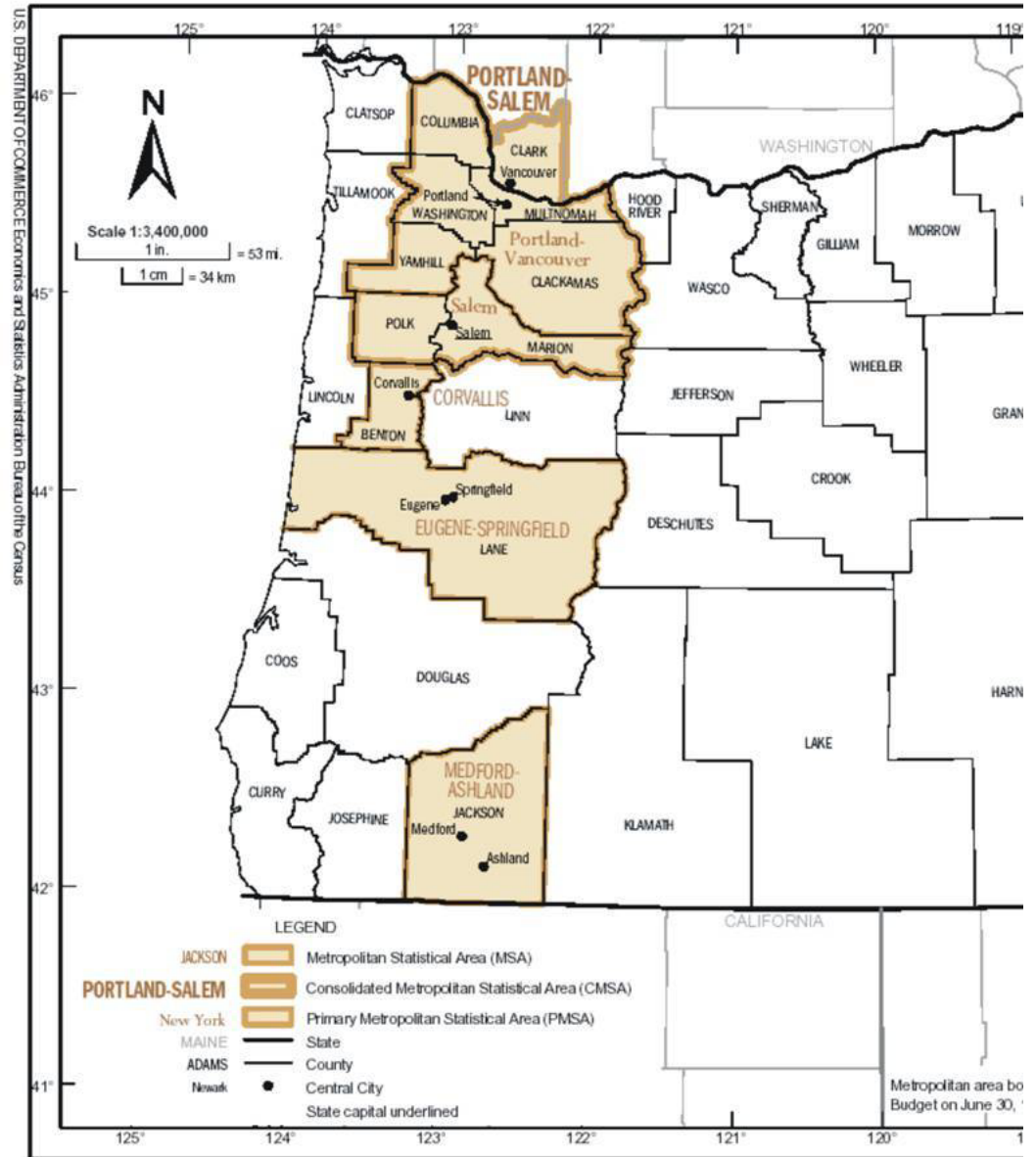
Urban Growth Boundary

In contrast to the map of the Portland-Vancouver urbanized area, this map shows the Metro 2002 Urban Growth Boundary.



U.S. Census Areas

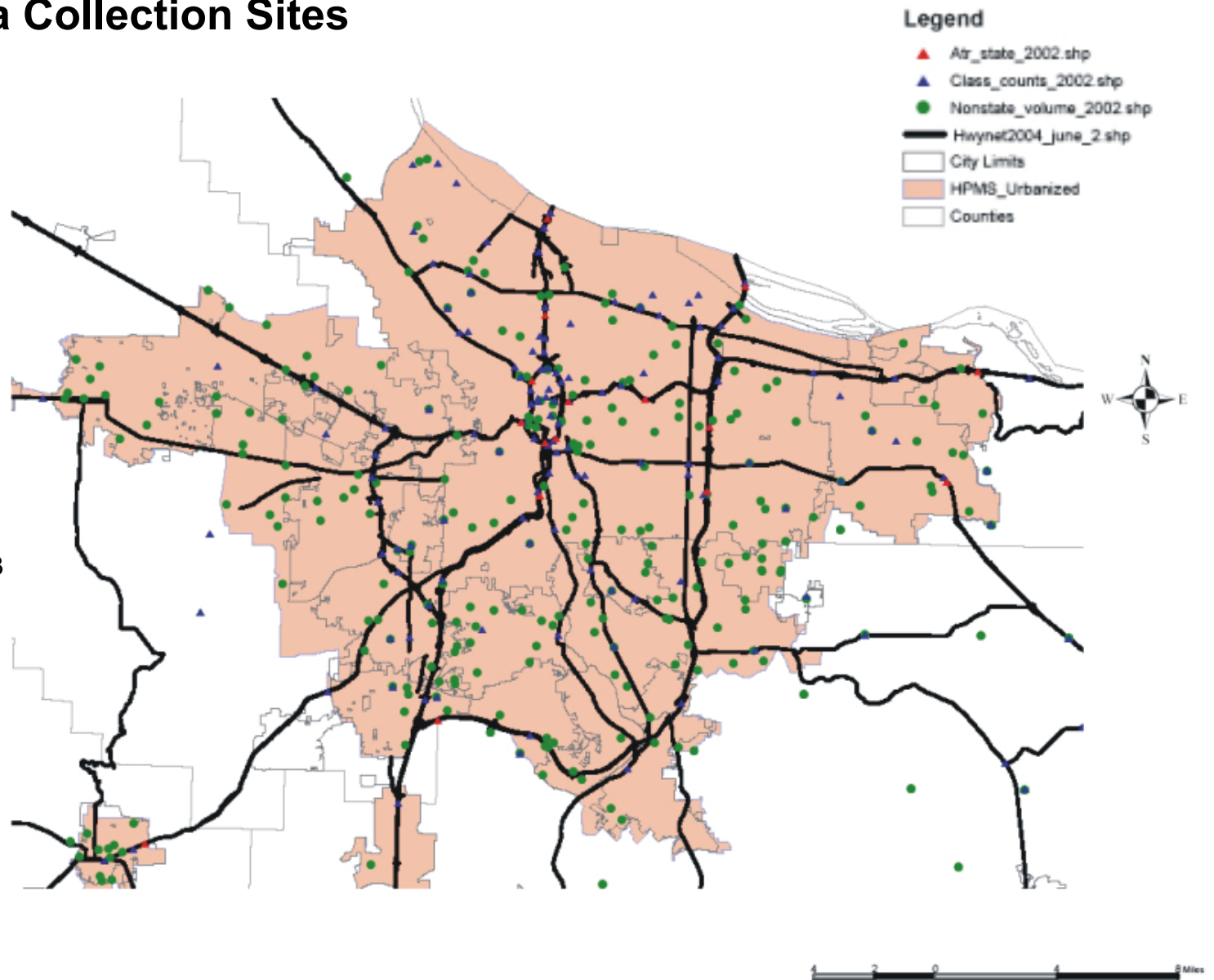
From the standpoint of the U.S. Census, the Portland-Vancouver Primary Metropolitan Statistical Area (PMSA) includes Clackamas, Clark, Columbia, Multnomah, Washington and Yamhill Counties. The Salem PMSA includes Polk and Marion Counties. The Portland-Salem Consolidated Metropolitan Statistical Area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



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 2002 data set, 1/3 of the data were likely recorded in 1999, 1/3 in 2000 and 1/3 in 2001. For data recorded on state highways, the 48-hour data are adjusted to account for seasonal differences.

Data Source: Oregon Department of Transportation.



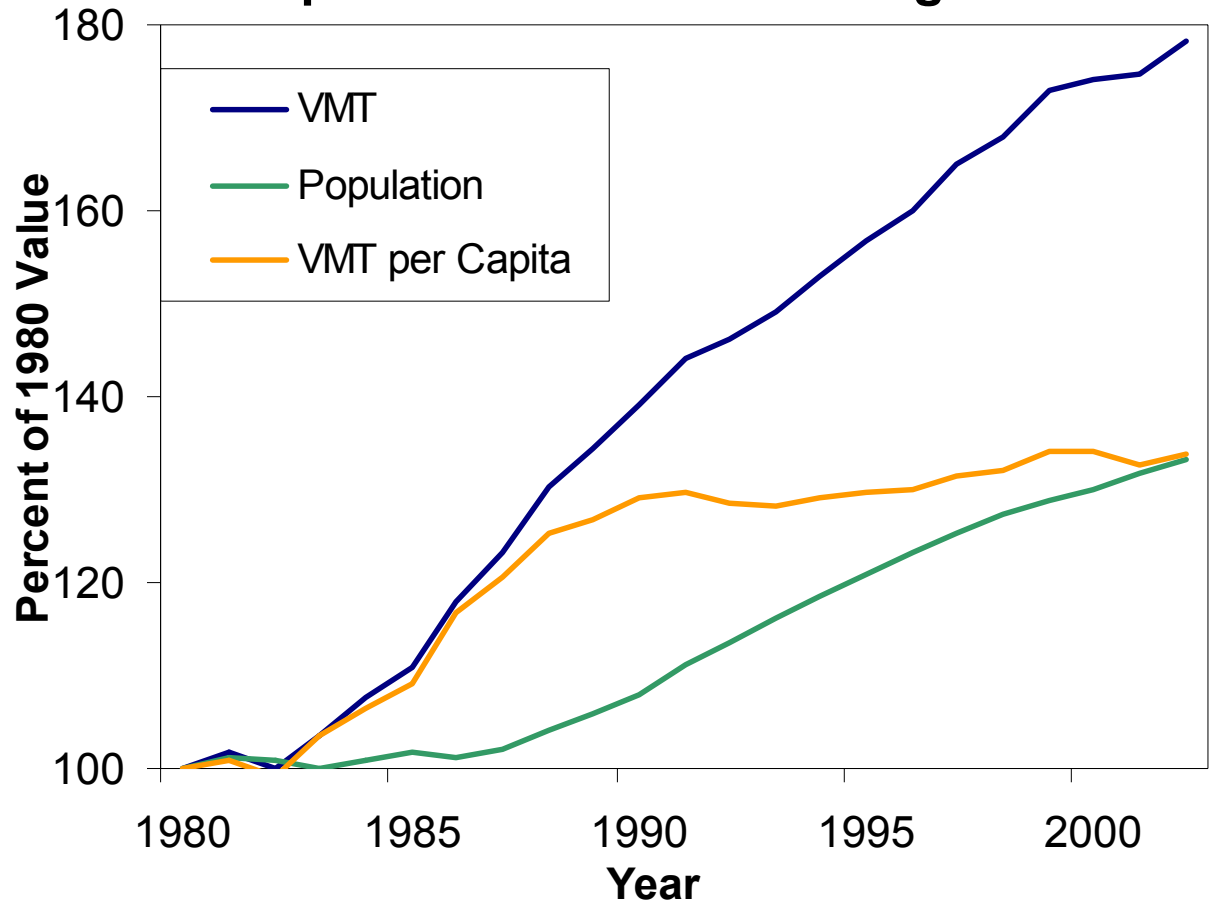
State of Oregon Trends

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 80 percent between 1980 and 2002. However, its annual growth rate has declined since 1991. Both population and VMT per capita have increased by about 33 percent over the same period. Compared with population, growth in VMT per capita is slowing and has not changed much over the past five years.

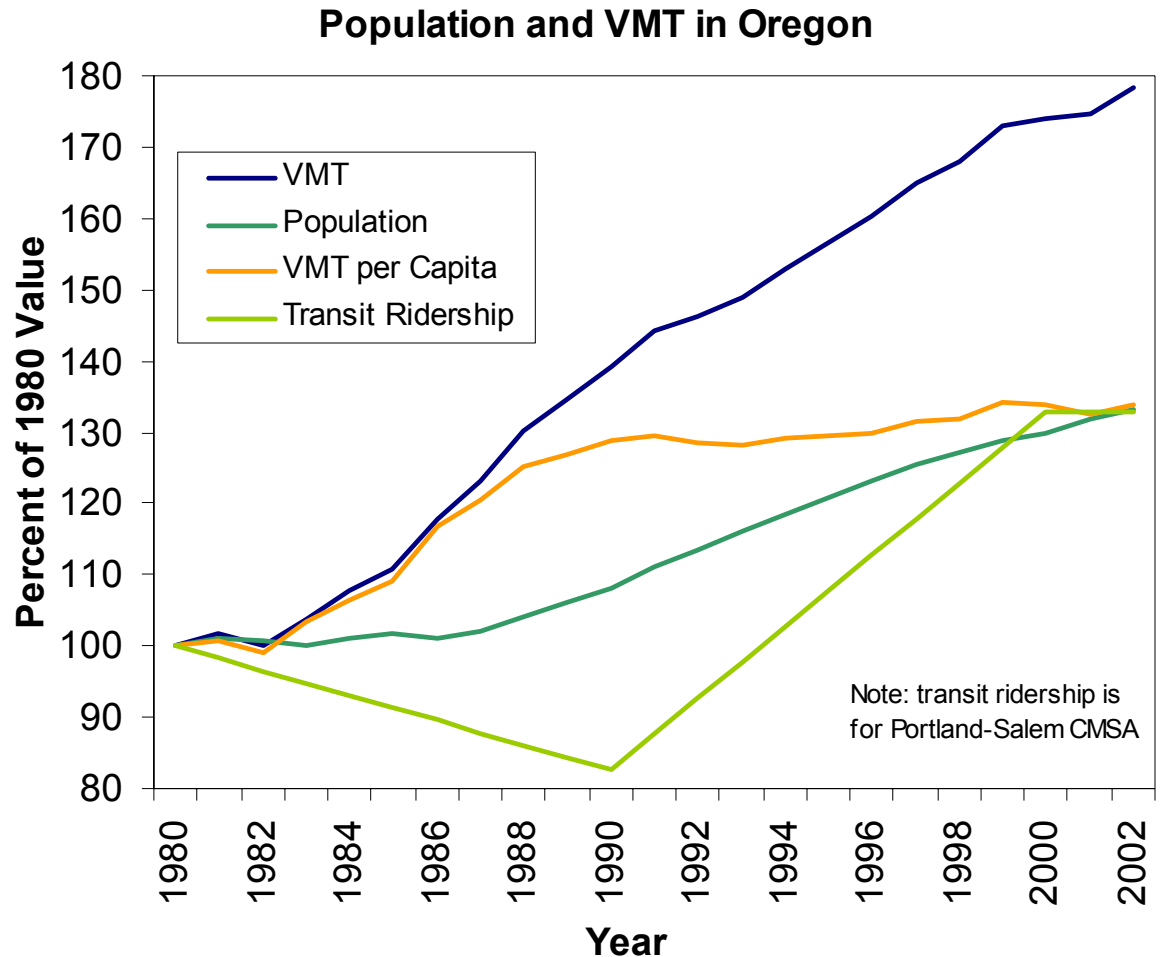
Population and VMT in Oregon



Data Sources: VMT - ODOT Finance Section; Population - Portland State University Center of Population Research & Census

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 to 1990, and increased from 1990 to 2000. The increase in transit ridership between 1980 and 2002 was about 30 percent.

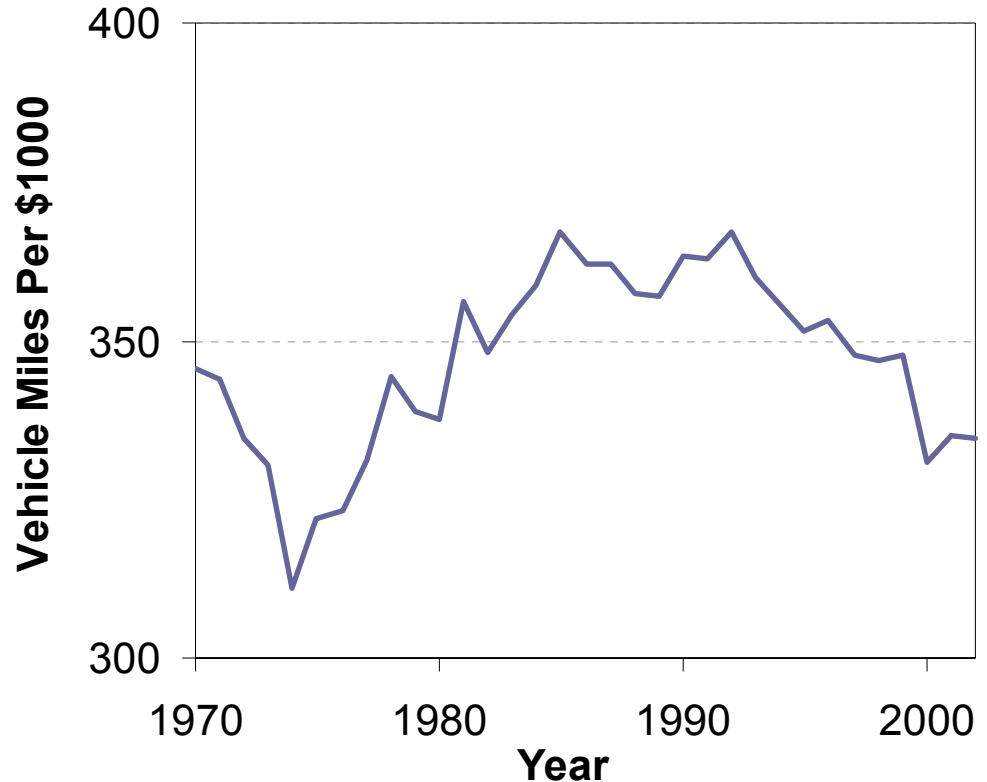


Data Sources: VMT - ODOT Finance Section; Population - Portland State University Center of Population Research & Census; Transit - U.S. Census Journey to Work.

Oregon VMT Related to Income

The ratio of VMT to total statewide personal income has not changed much over the past twenty years. It peaked twice in 1985 and 1992, and has been decreasing since then.

Statewide VMT Per \$1,000 Personal Income (2002 Dollars), 1970-2002

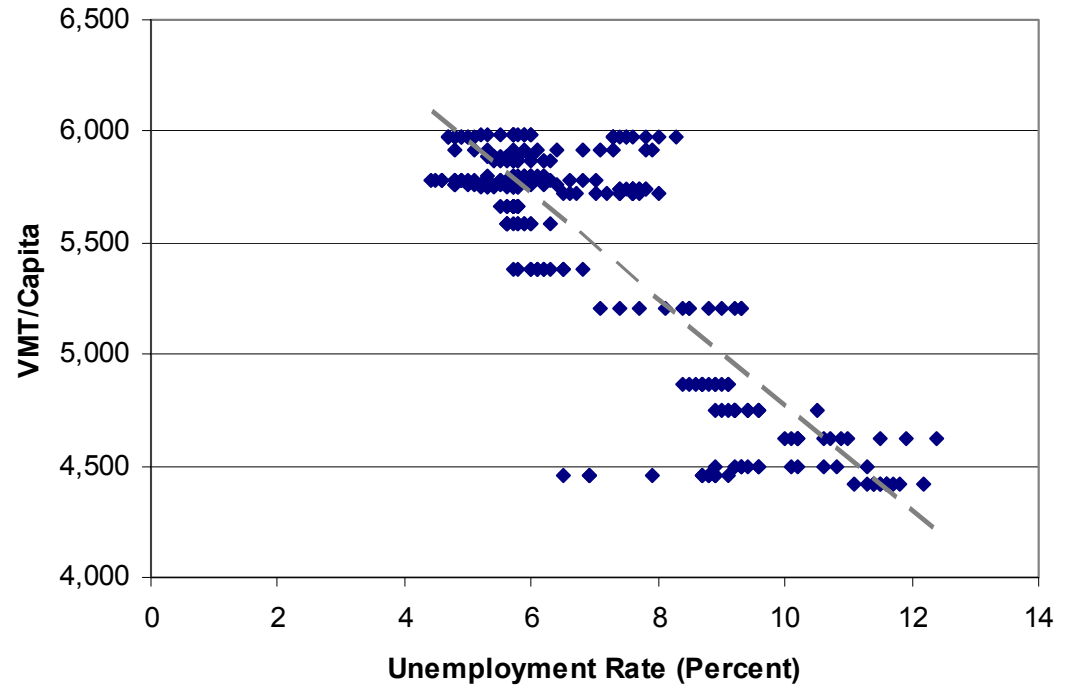


Data Sources: Statewide VMT provided by Brian Gregor, Statewide Congestion Overview; VMT - ODOT Finance Section; Personal Income - US Bureau of Economic Analysis

Oregon VMT and Unemployment

This graph shows the relationship between annual VMT per capita and monthly Oregon unemployment rates since 1982.

Oregon VMT Per Capita and Unemployment

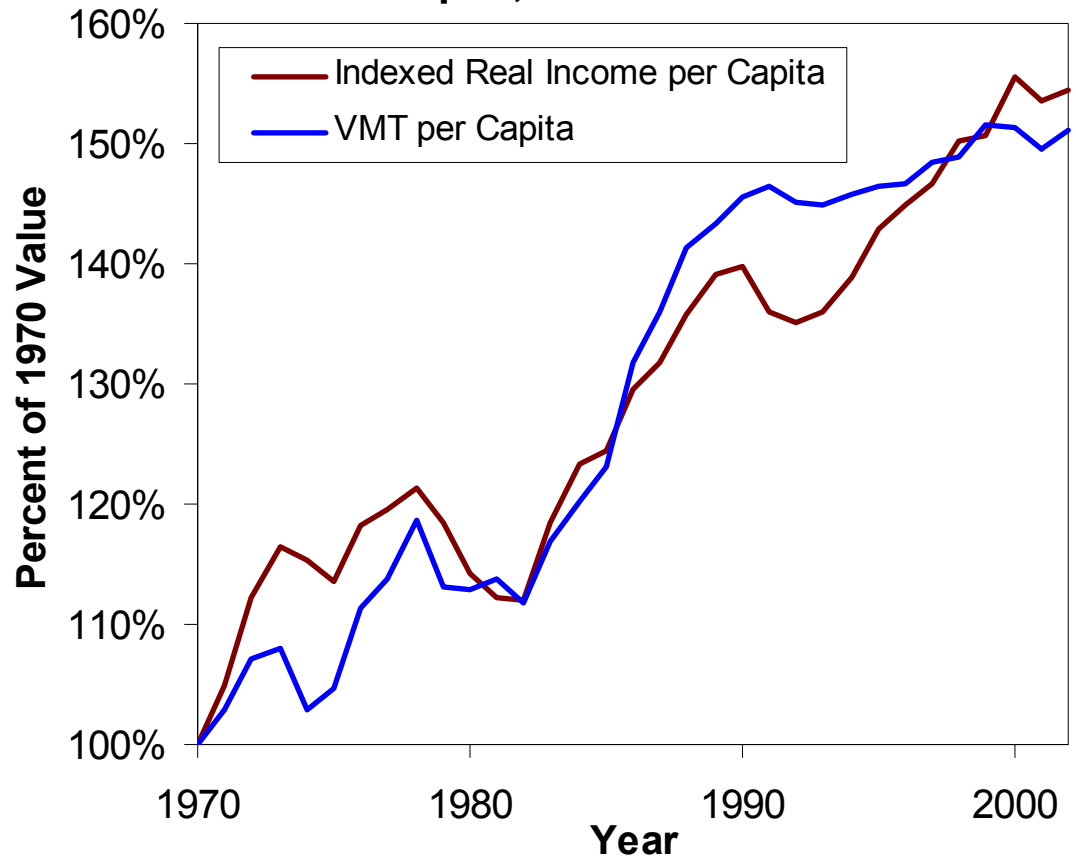


Source: Statewide VMT provided by Brian Gregor, Statewide Congestion Overview; Unemployment – U.S. Bureau of Labor Statistics.

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 (2004, p. 6).

VMT Per Capita and Personal Income Per Capita, 1970-2002

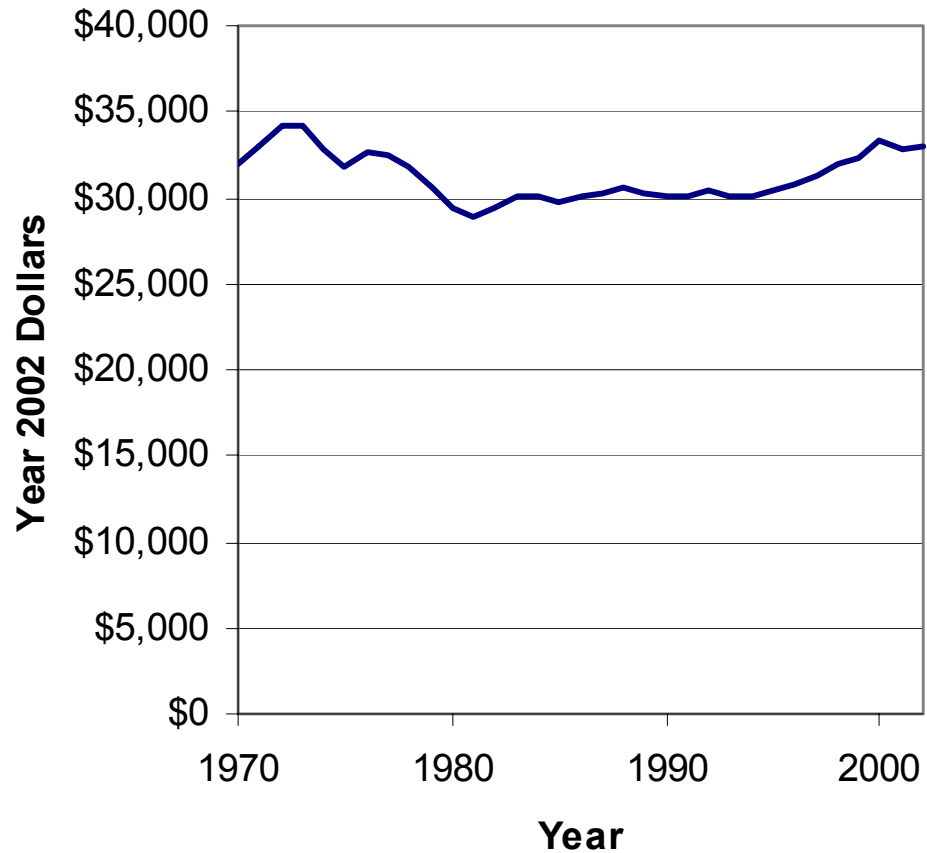


Data Sources: VMT - ODOT Finance Section; Income - Bureau of Economic Analysis; CPI - Bureau of Labor Statistics

Oregon Average Wages

Oregonians' average annual wages (after adjusting for inflation) has not changed much over time. This is a similar conclusion to one shown in the Statewide Congestion Overview (2004, p. 9).

Oregon Average Annual Wages

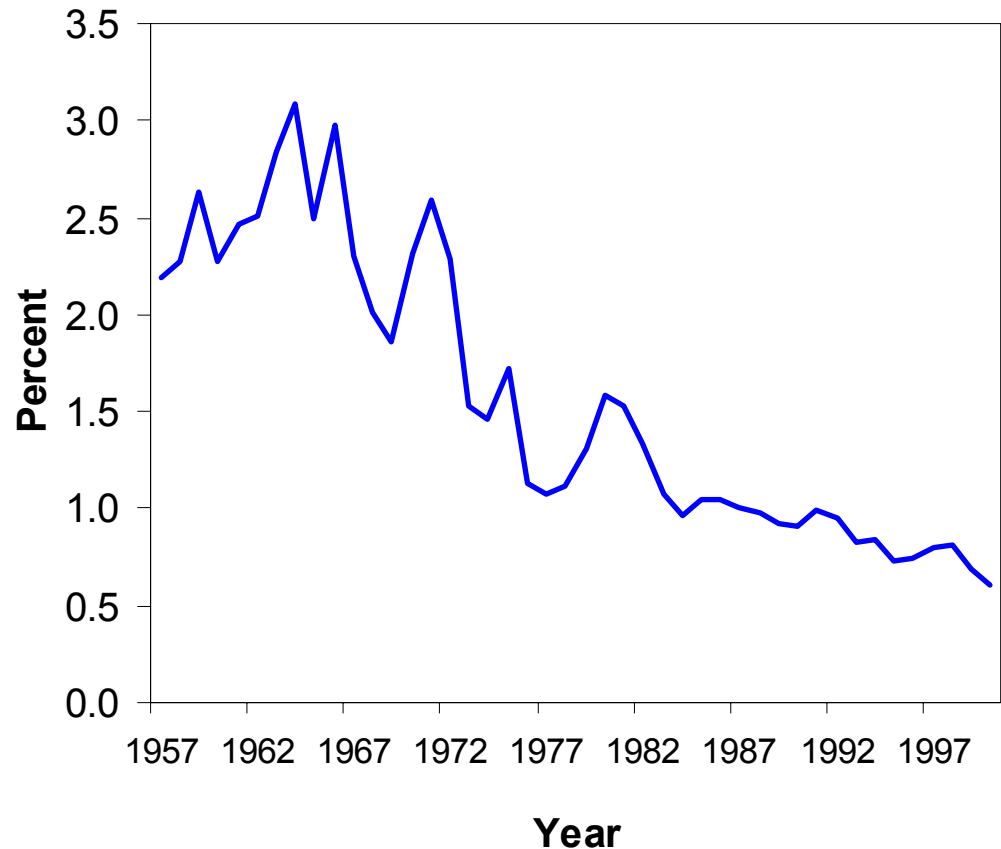


Data Sources: Income - Bureau of Economic Analysis; CPI - Bureau of Labor Statistics

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 has 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.

Percent of Highway Capital Investment to Oregon Personal Income, 1957-2000

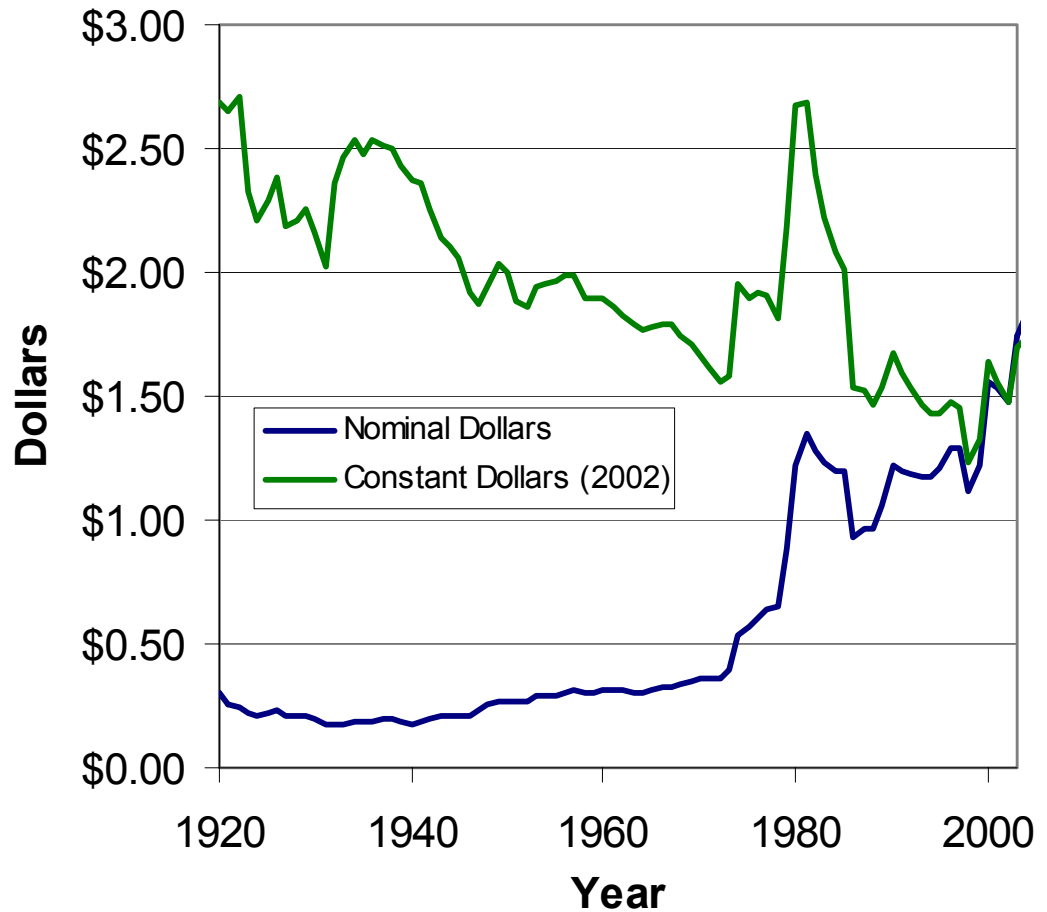


Data Sources: Personal Income - US Bureau of Economic Analysis; Capital Expenditures - Highway Statistics Summary to 1995, Table HF-202C, Highway Statistics reports for years 1996-2000, Table HF2

Oregon Gasoline Prices

This shows gasoline prices in nominal (unadjusted dollars) over the past 80 years. Also the prices have been adjusted for inflation which indicates that real gasoline pump prices have been declining steadily since 1920, with several large spikes in the 1970s. Since 1998 the trend has been increasing.

Oregon Gasoline Pump Prices

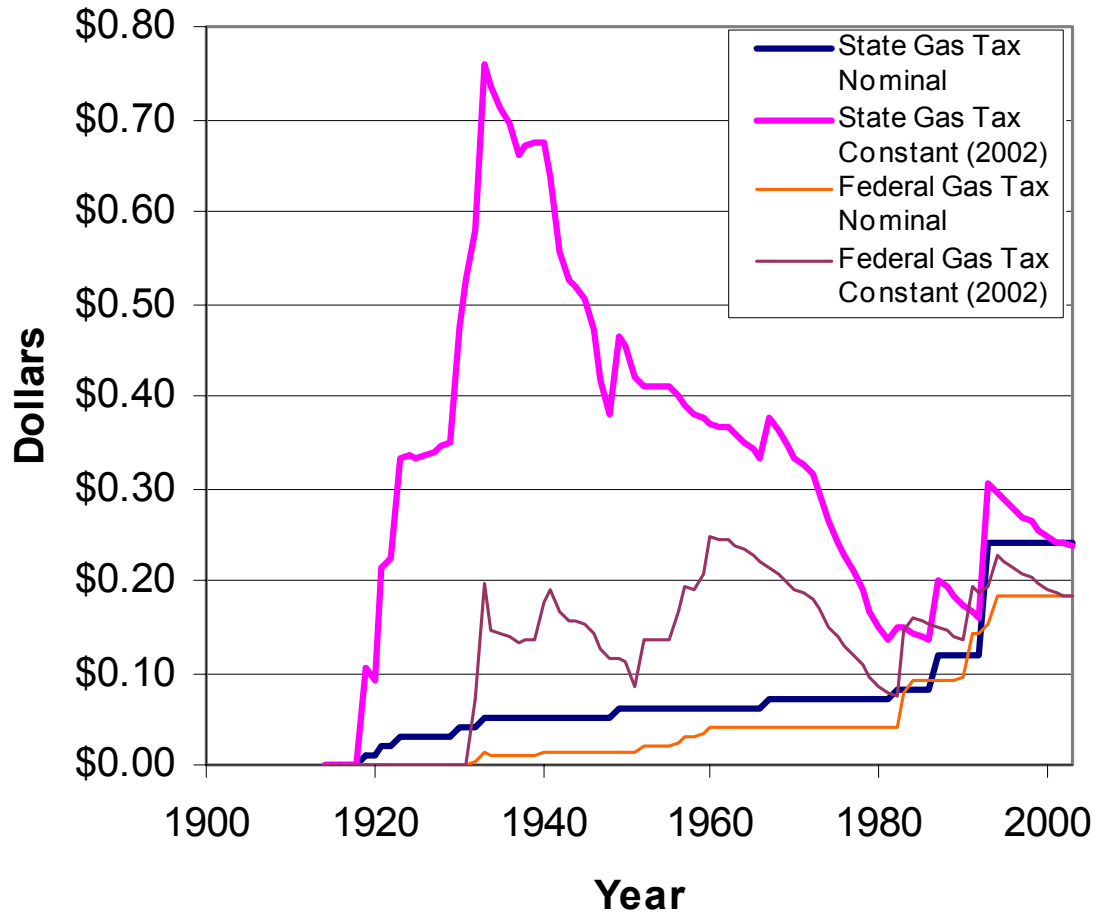


Data Sources: Pump prices – American Petroleum Institute and Oregon Department of Energy; CPI - Bureau of Labor Statistics

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.

Oregon Gasoline Tax



Data Sources: Pump prices – American Petroleum Institute and Oregon Department of Energy; CPI - Bureau of Labor Statistics

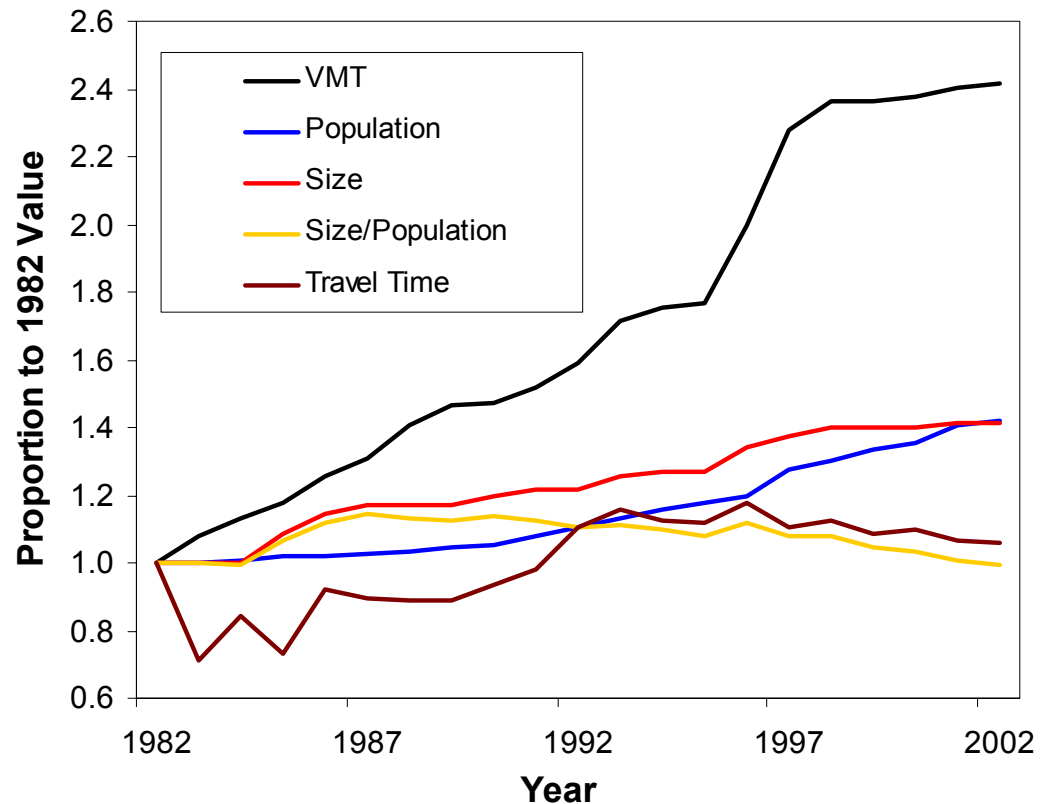
Portland Metropolitan Region Trends

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.

Portland Area Trends 1982-2002



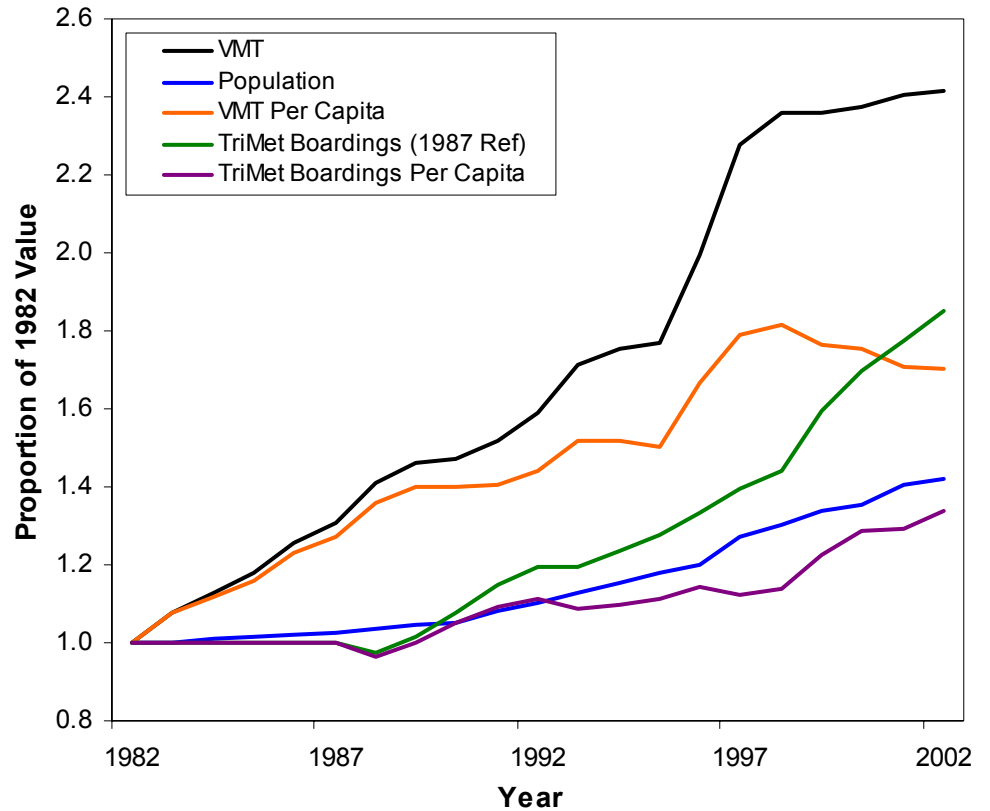
Note: the size data used here are from the Urban Mobility Report and do not match the data used in the Statewide Congestion Overview.

Data Sources: VMT, Population, Size, Speed & Travel Time - 2004 Urban Mobility Report

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.

Portland Area VMT and Transit Trends 1982-2002

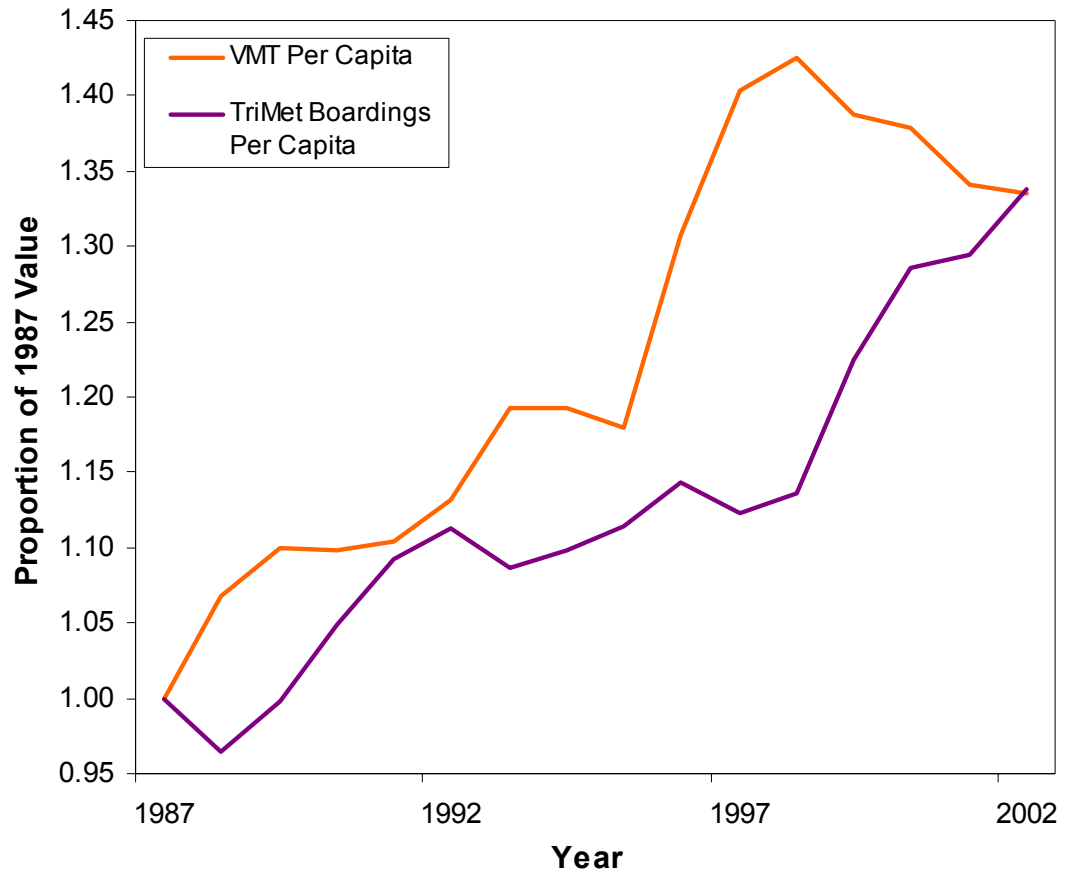


Data Sources: VMT, Population, Size, Speed & Travel Time - 2004 Urban Mobility Report; Transit Boardings - TriMet

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.

Portland Area VMT Per Capita and Transit Boardings Per Capita

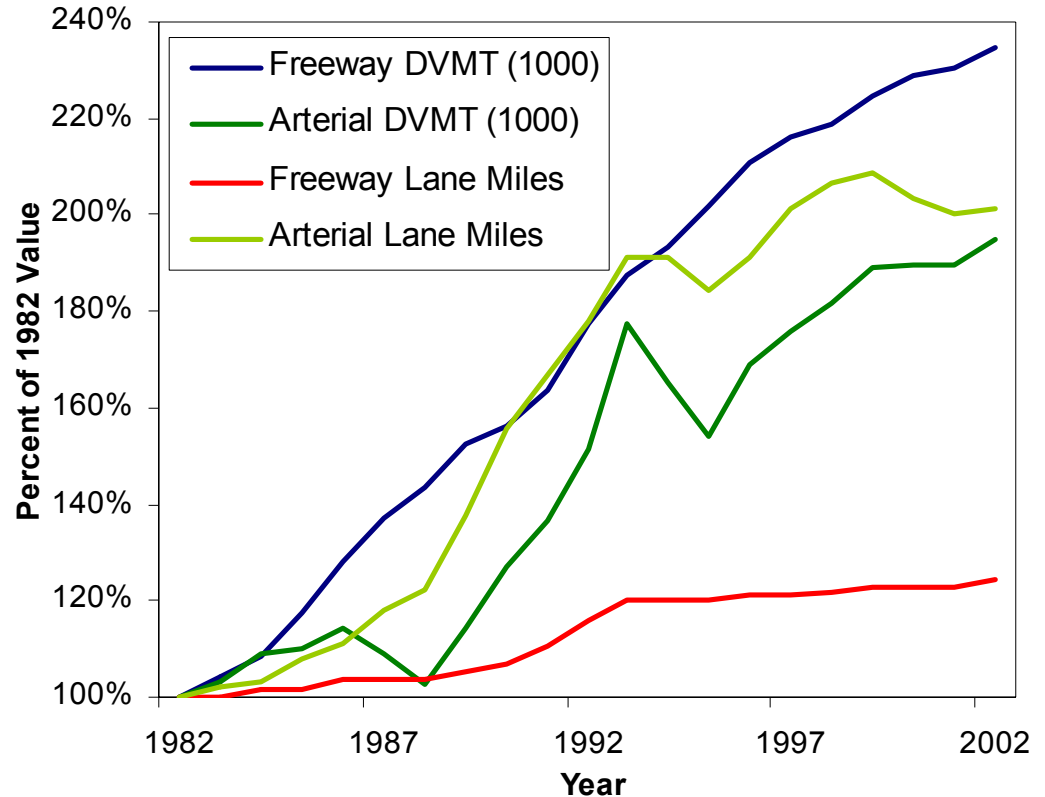


Data Sources: VMT, Population, Size, Speed & Travel Time - 2004 Urban Mobility Report; Transit Boardings - TriMet

Portland Daily Freeway and Arterial VMT and Lane Miles

Daily VMT on freeways more than doubled between 1982 and 2002, and has doubled on arterials. 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 25 percent over the past 20 years. The gap of VMT and lane miles on freeways may explain the declining speeds on Portland freeways.

Portland Freeway and PAS VMT and Lane Miles, 1982-2002

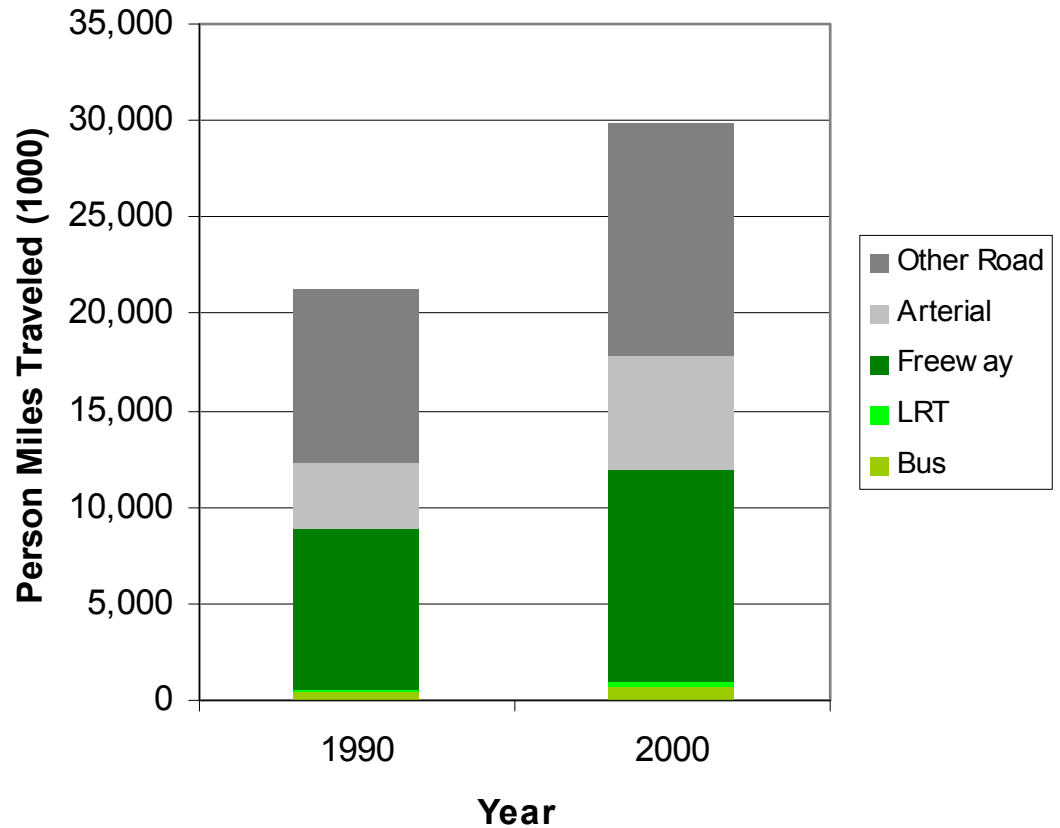


Data Sources: DVMT and Lane Miles - 2004
Urban Mobility Report

Portland Growth in Person Travel by Mode

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

Portland Daily Travel Growth by Mode

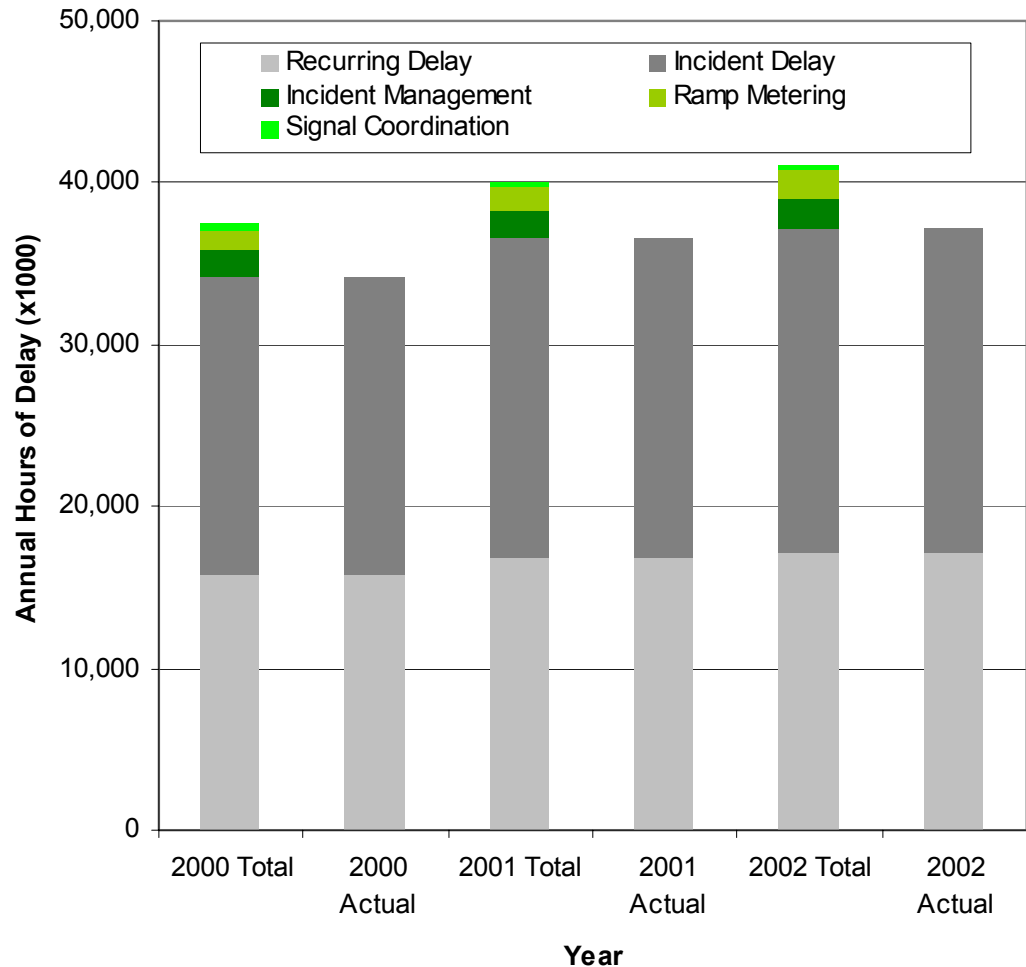


Data Sources: Table B-2 on page B-36 in the Statewide Congestion Overview; U.S. Census; 2004 Urban Mobility Report

Portland Delay Reduction Strategies

This chart shows the annual delay savings due to operational strategies such as incident management (the COMET program), freeway ramp metering and arterial traffic signal coordination. As shown, the delay experienced by motorists would be much greater without these strategies in place.

Portland Annual Delay Reduction Strategies



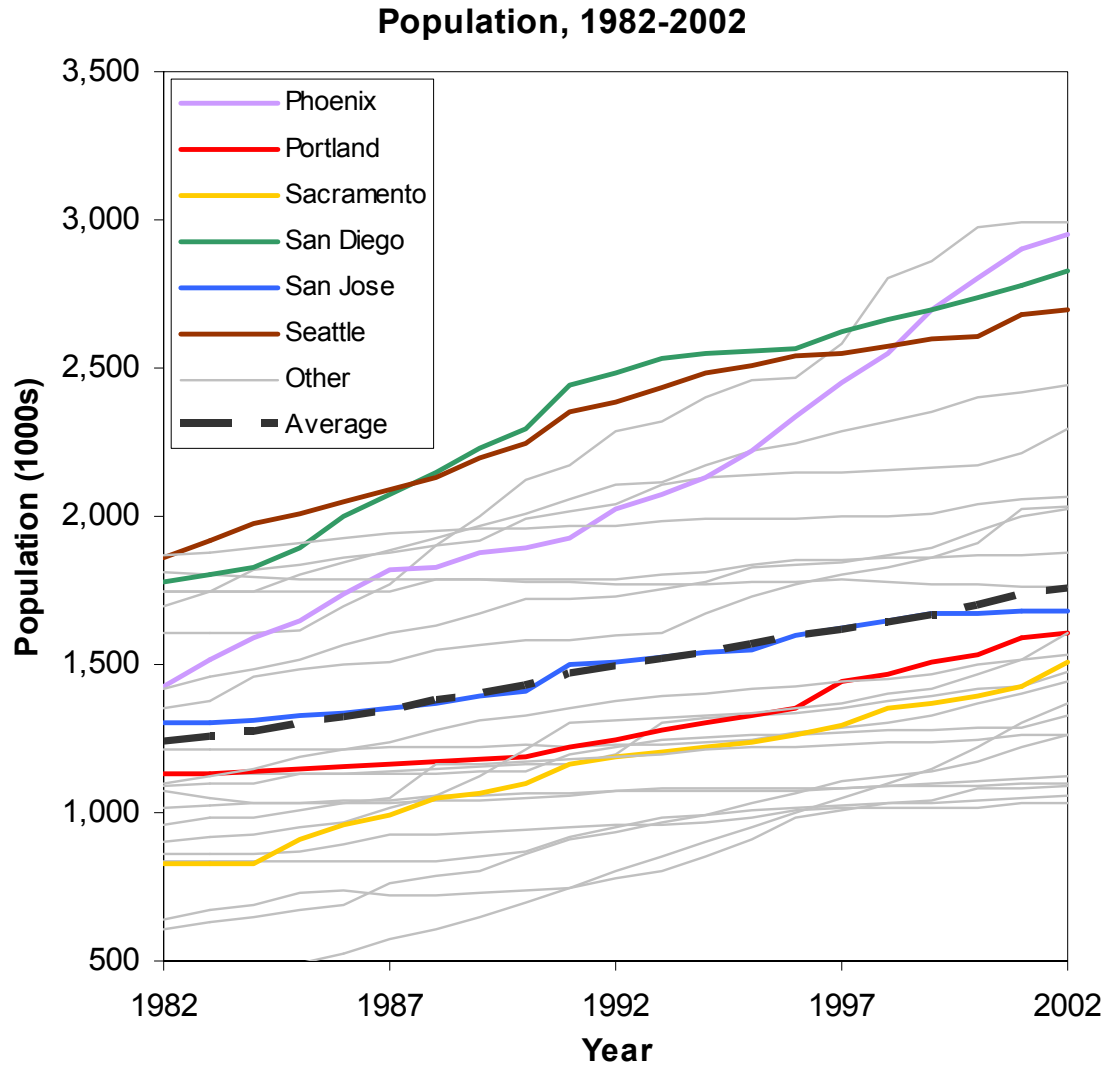
Caution: data are only available for the past three years, thus it is difficult to draw conclusions from any trends that may be visible.
 Data Source: 2004 Urban Mobility Report

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.

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 lower population than average. Populations in most cities have increasing trends with about same rates. Only Phoenix (and Atlanta) show very rapid population increases.



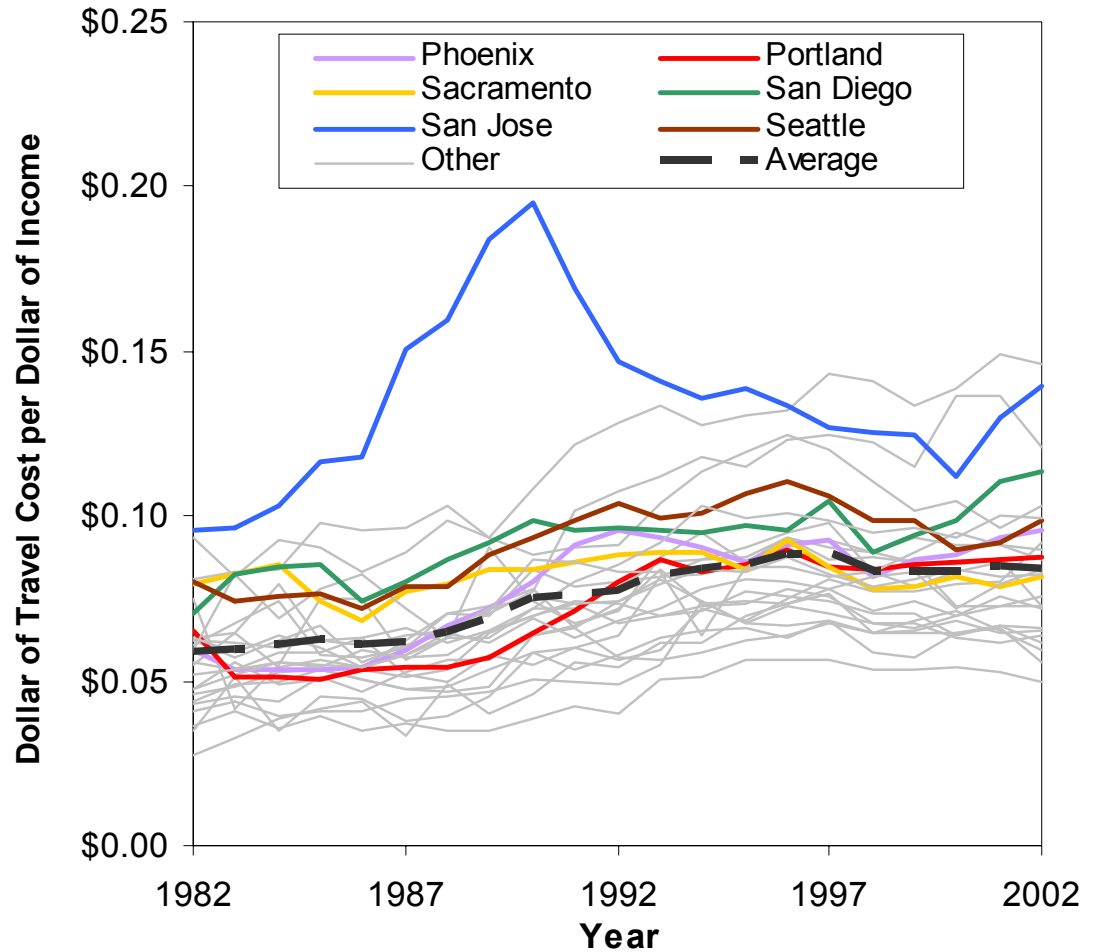
Data Sources: Population - 2004 Urban Mobility Report

Travel Cost

Comparing estimated travel costs during peak periods with total personal income for each urban area (adjusting for inflation and cost-of-living differences) shows that the relative cost of travel after adjusting inflation and cost-of-living differences has remained relatively constant over time.

Data Sources: Per capita personal income, CPI and Cost of Living Index through 2002 were provided by Brian Gregor, author of 2004 Statewide Congestion Overview; Delay Costs - 2004 Urban Mobility Report; 2002 CPI - Bureau of Labor Statistics; 2002 Cost of Living Index - Sperling's Best Places

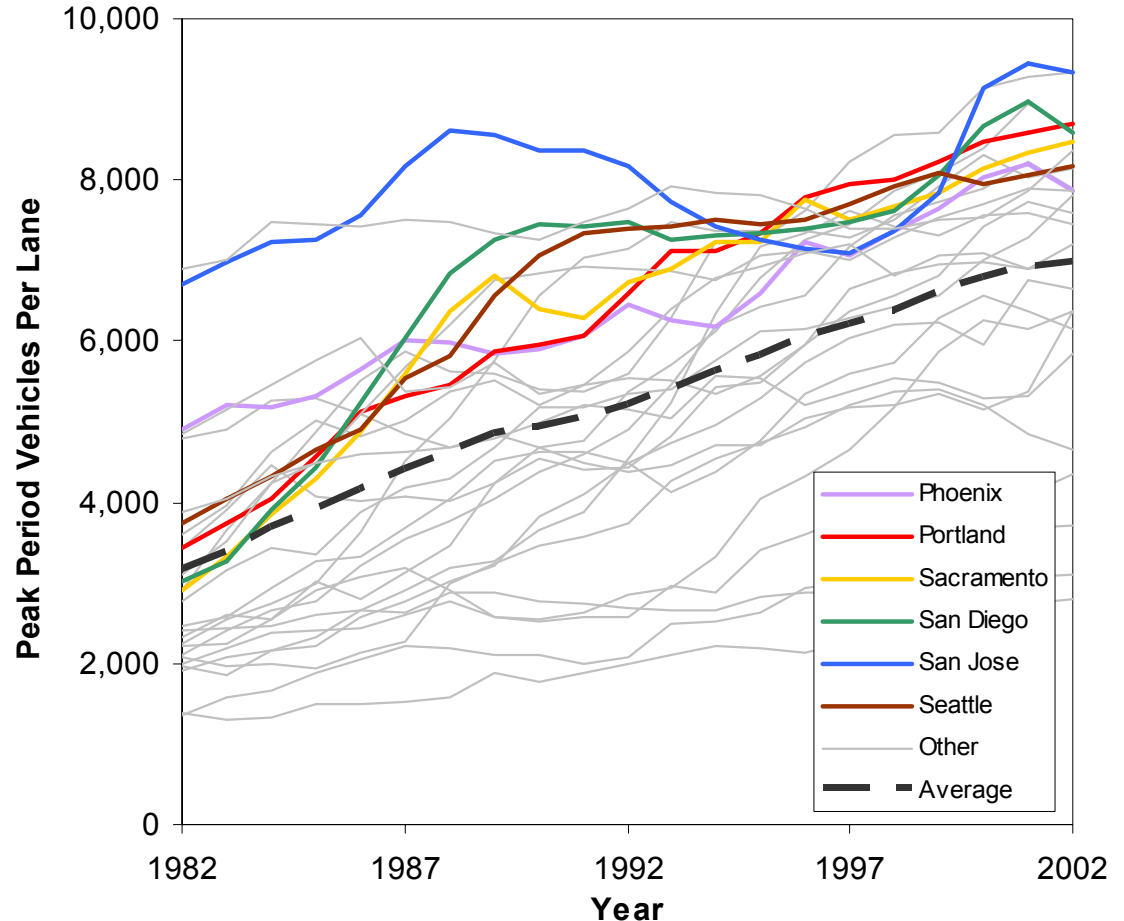
Trends in Travel Cost, 1982-2002



Road Usage Trends

This shows the number of vehicles per lane mile per hour during the peak period. Assuming that the average freeway lane has enough capacity to carry about 2,200 vehicles per hour under ideal conditions, the usage on Portland freeways and major arterials is equivalent to four hours of average capacity. Average usage among large urbanized areas is about 3.5 times the capacity. This conclusion was drawn from the Statewide Congestion Overview (2004, p. A-16)

Peak Period Major Road System Usage, 1982-2002

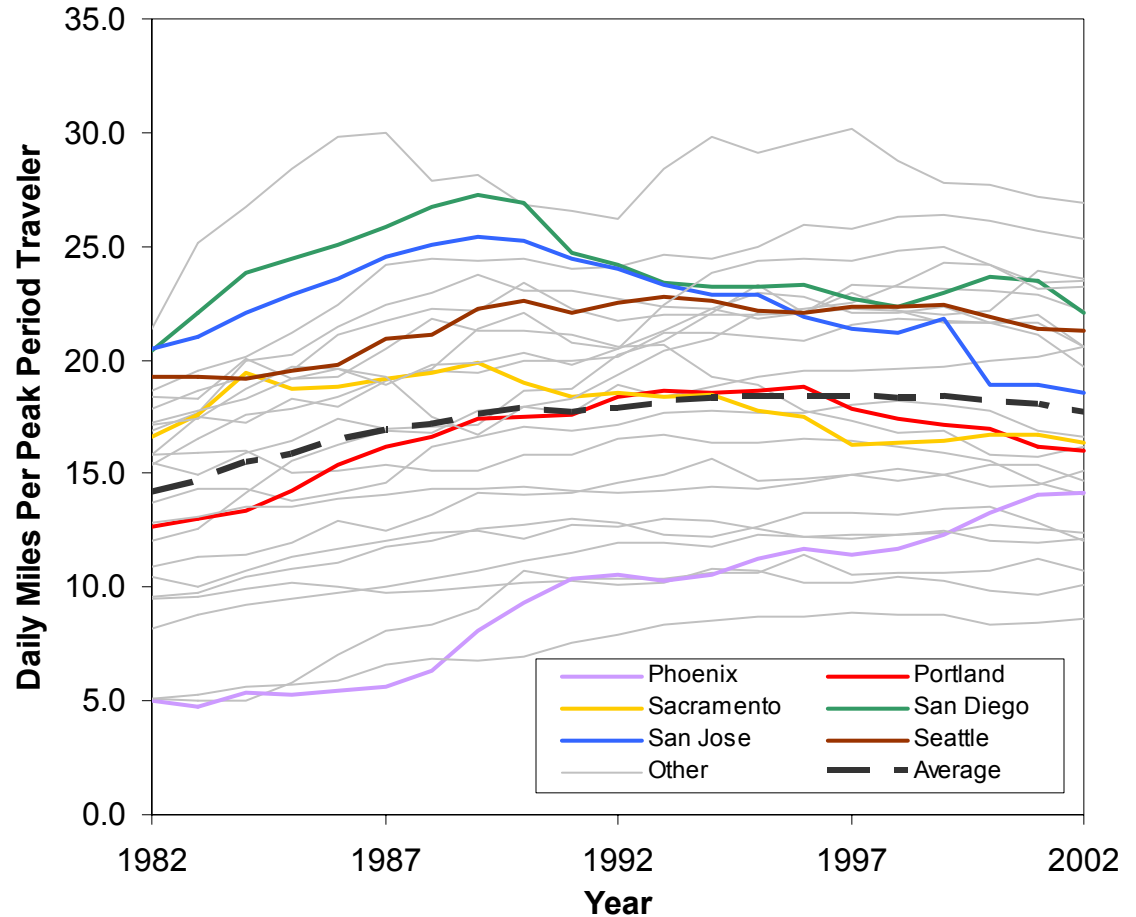


Data Sources: System Lane Miles, System DVMT % Percentage of Congested Time on System - 2004 Urban Mobility Report

Travel Distance Trends

This shows average travel distances per peak period traveler on the major road system. Peak period travelers in Portland drive shorter distances than average. Compared with vehicles per lane and the travel time index which are higher than average, this shows a different picture.

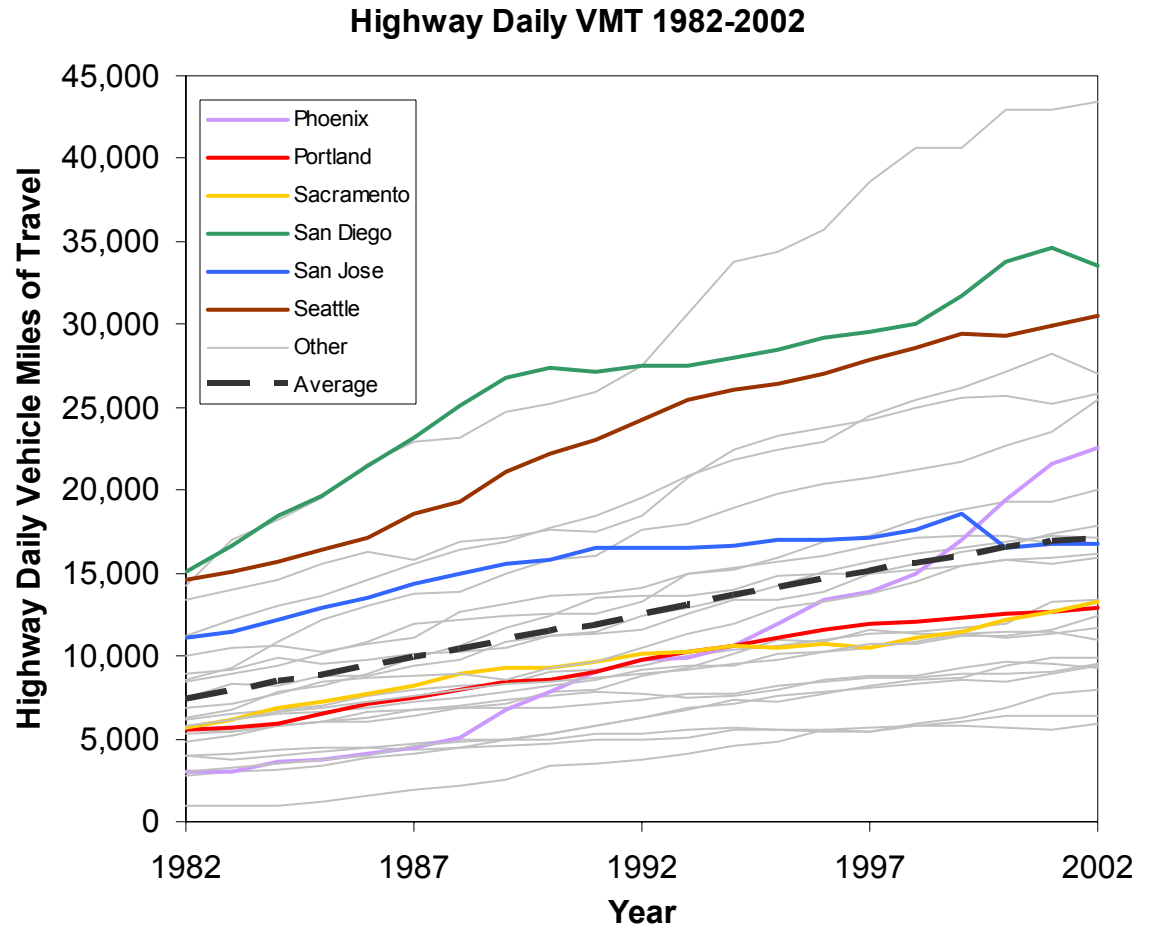
Peak Period Vehicle Travel Distances on Congested Major Roads, 1982-2002



Data Sources: Freeway DVMT & Peak Travelers - 2004 Urban Mobility Report

Highway VMT Trends

This shows that daily VMT is increasing over time, but that Portland remains below average and is also growing at a rate slightly lower than average.

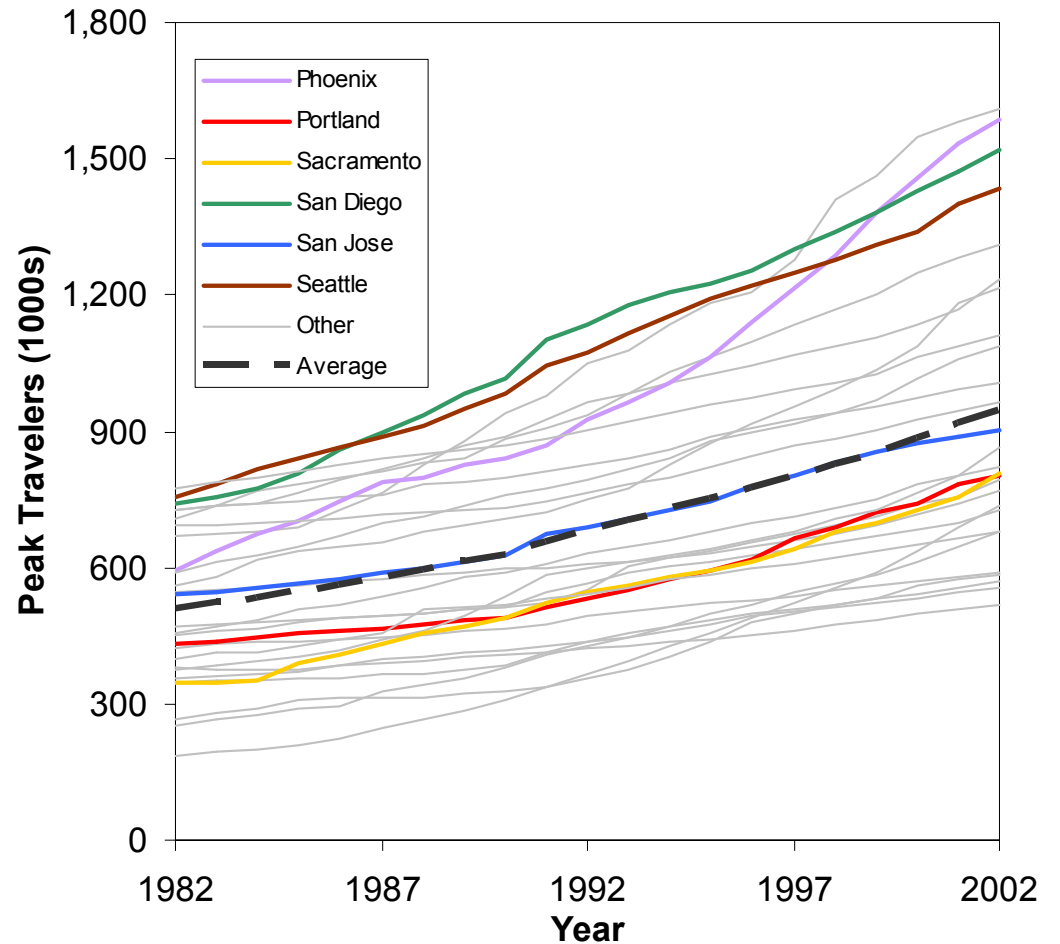


Data Sources: Freeway DVMT - 2004 Urban Mobility Report

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.

Peak Period Travelers 1982-2002

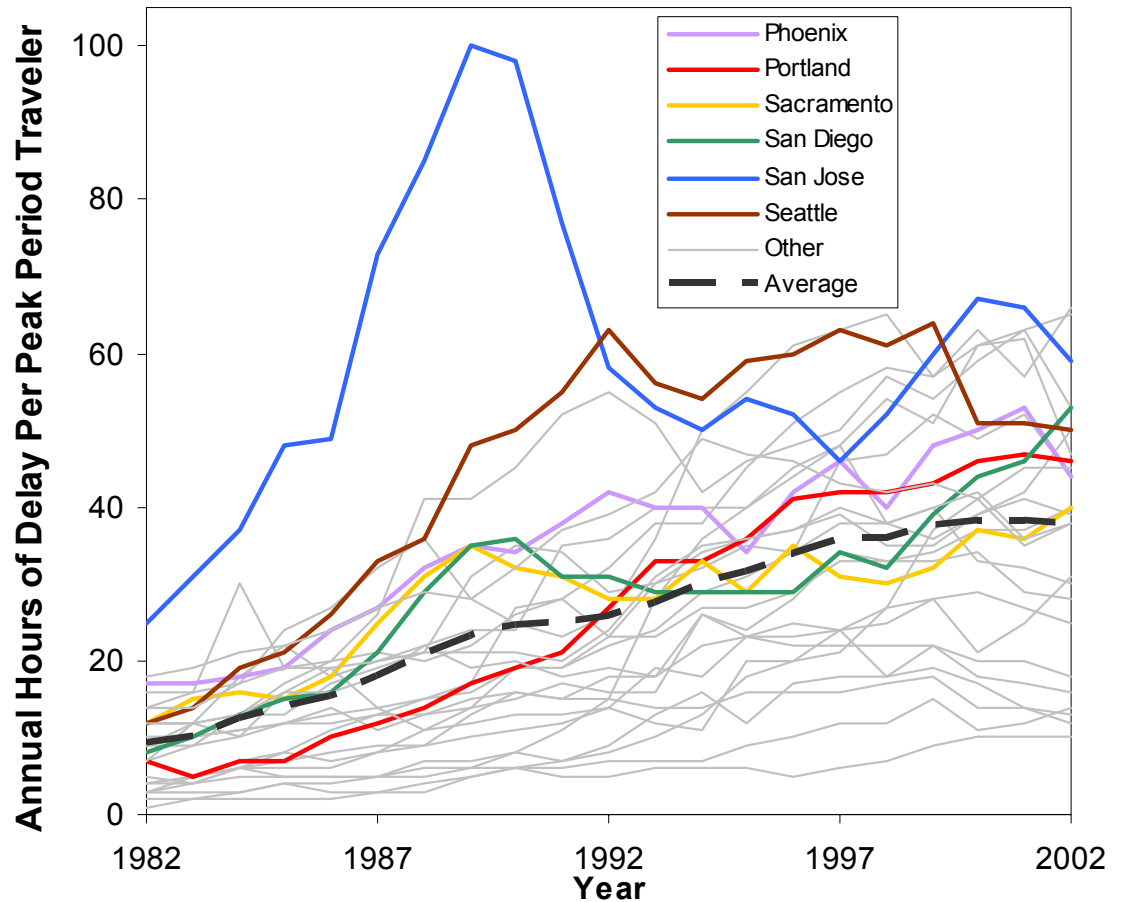


Data Sources: Freeway DVMT & Peak Travelers - 2004 Urban Mobility Report

Annual Congestion Trends

Annual congestion delay for peak period travelers in Portland has increased from 7 hours per year in 1982 to 46 hours per year in 2002, and has been close to the large area average. It had been below the average before 1992, and exceeded the average after that. Shorter-than-average travel distance coupled with lower-than-average travel speed has leveled off the delay actually experienced by travelers.

Major Road Congestion Delay, 1982-2002

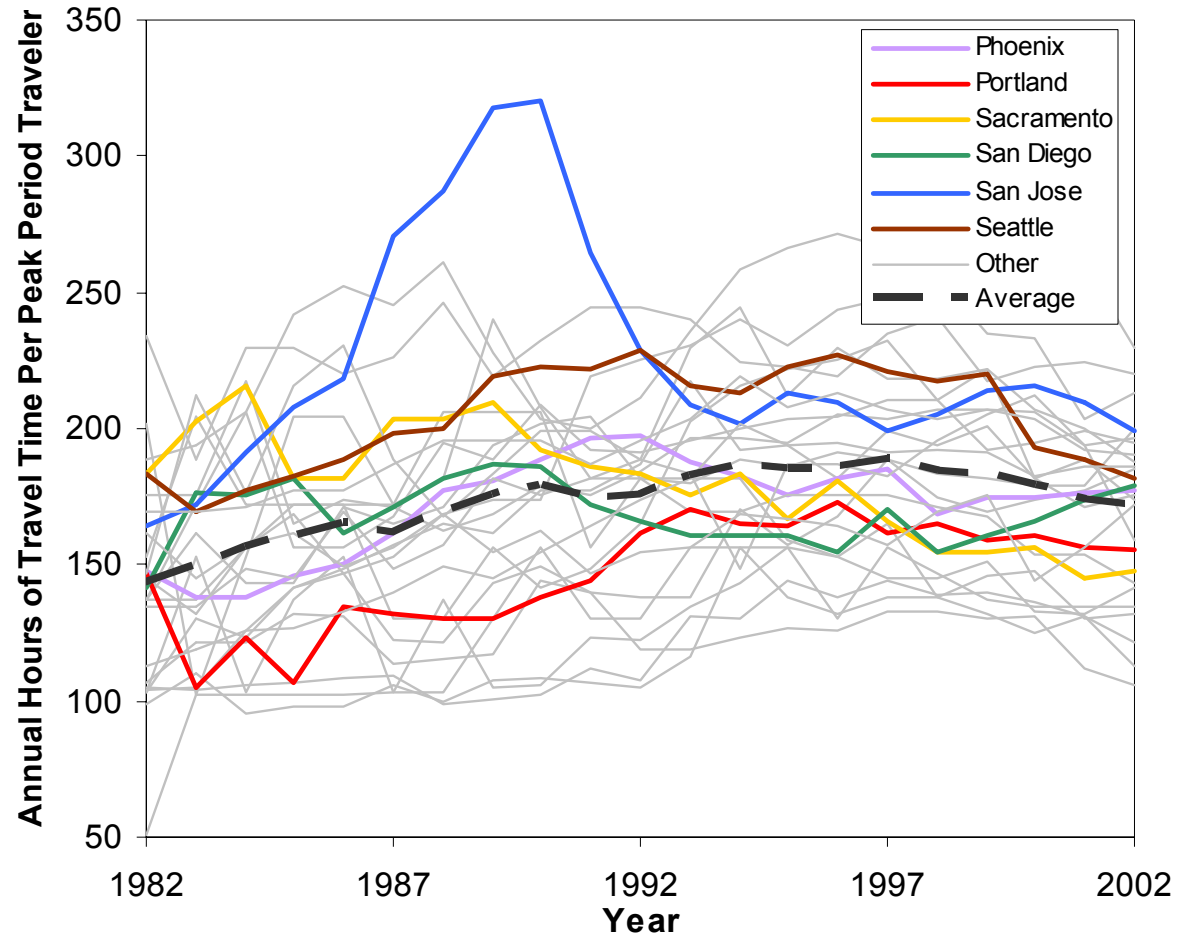


Data Source: 2004 Urban Mobility Report

Travel Time Trends

Portland annual travel time per peak period traveler has remained below average. Despite increases in congestion delay, travel time has not changed noticeably in the Portland-Vancouver urbanized area. Again, shorter-than-average travel distance has eased the impact of congestion on travel time.

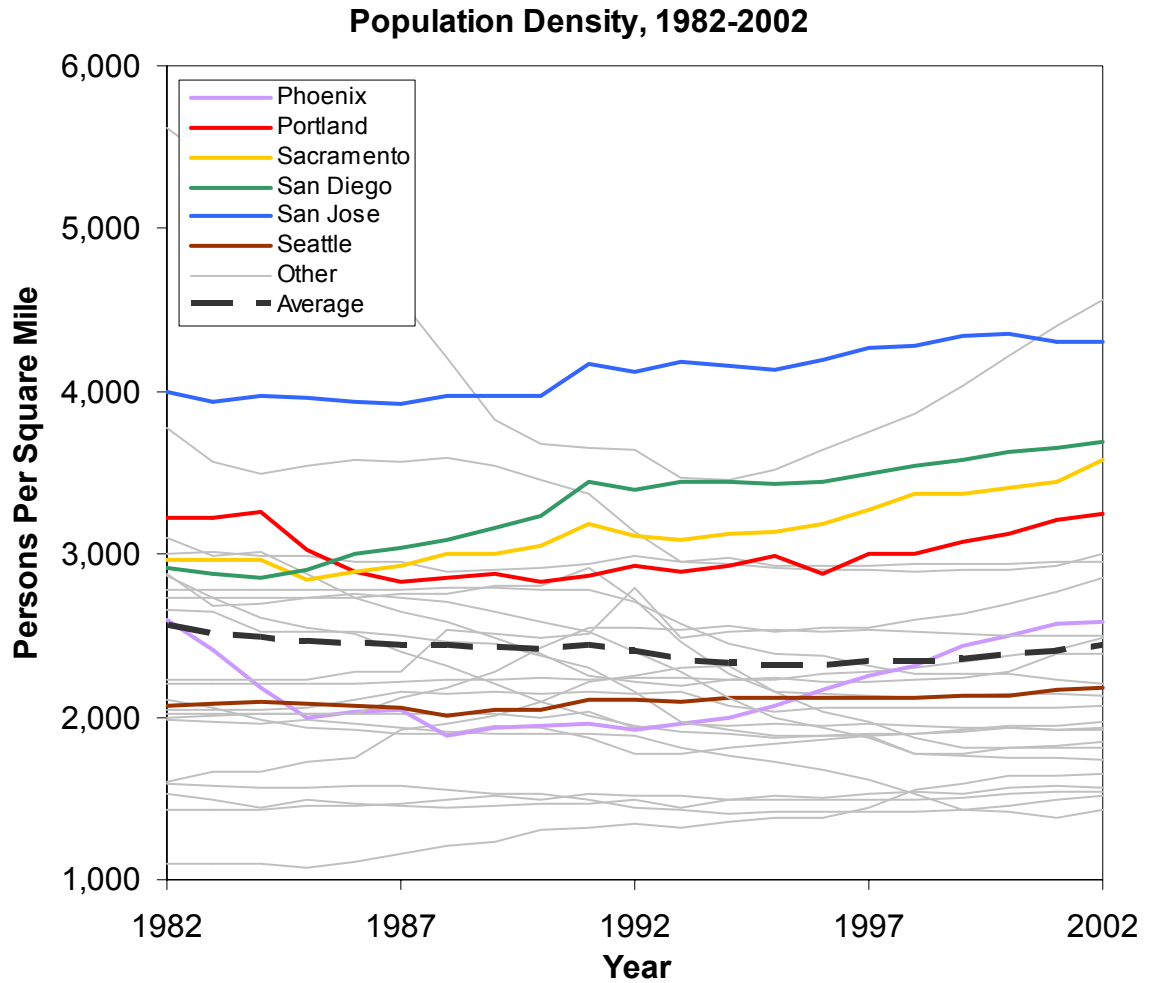
Trends in Travel Time, 1982-2002



Data Sources: Annual Travel Time & Peak Period Traveler - 2004 Urban Mobility Report

Portland-Vancouver Area Population “Density” Trends

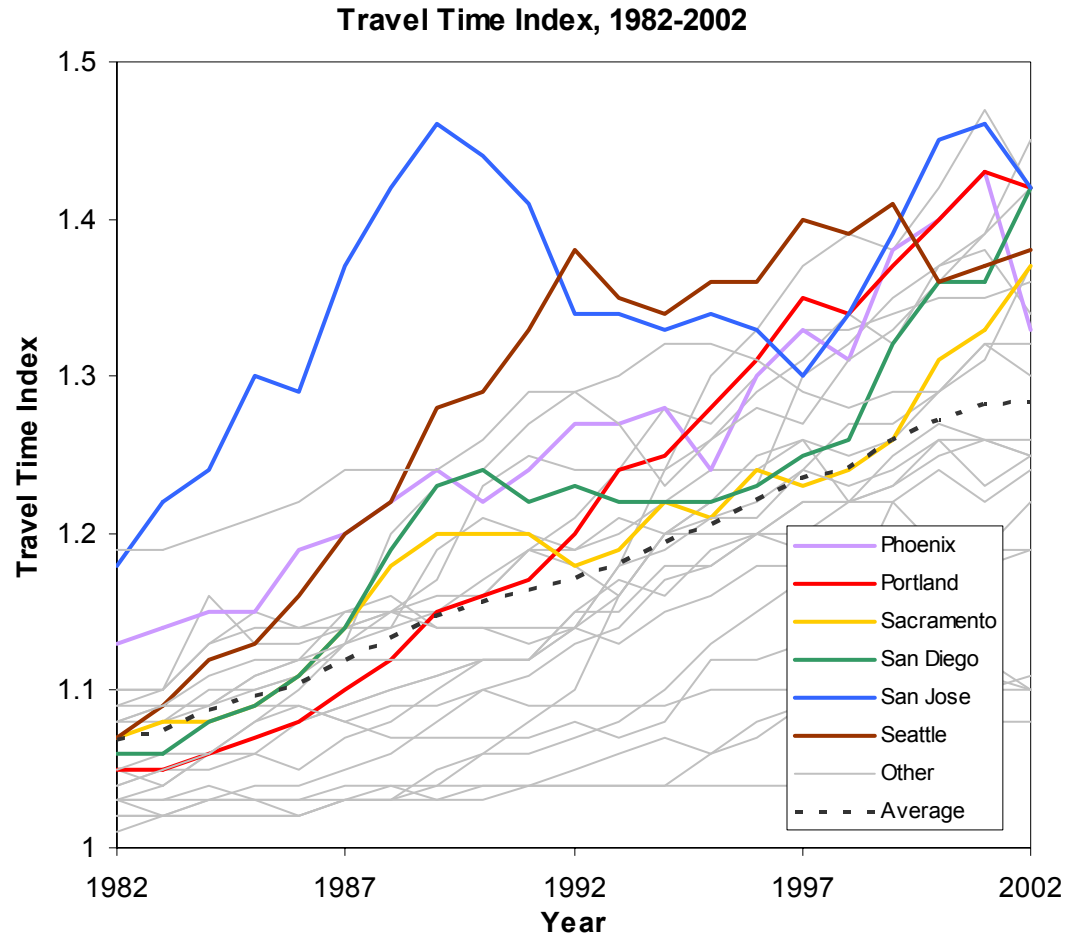
The Portland-Vancouver urbanized area (as defined on p. 7) has consistently exhibited a higher population “density” (population/area) than average large urban areas, and it has been increasing slightly. The land area and population data used here indicates that among the large urban areas, Las Vegas, San Jose and San Diego are the three densest cities. There are other ways to define the boundaries of urban areas, with different populations that would reveal different results.



Data Sources: Population & Land Area - 2004
Urban Mobility Report

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 considering 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

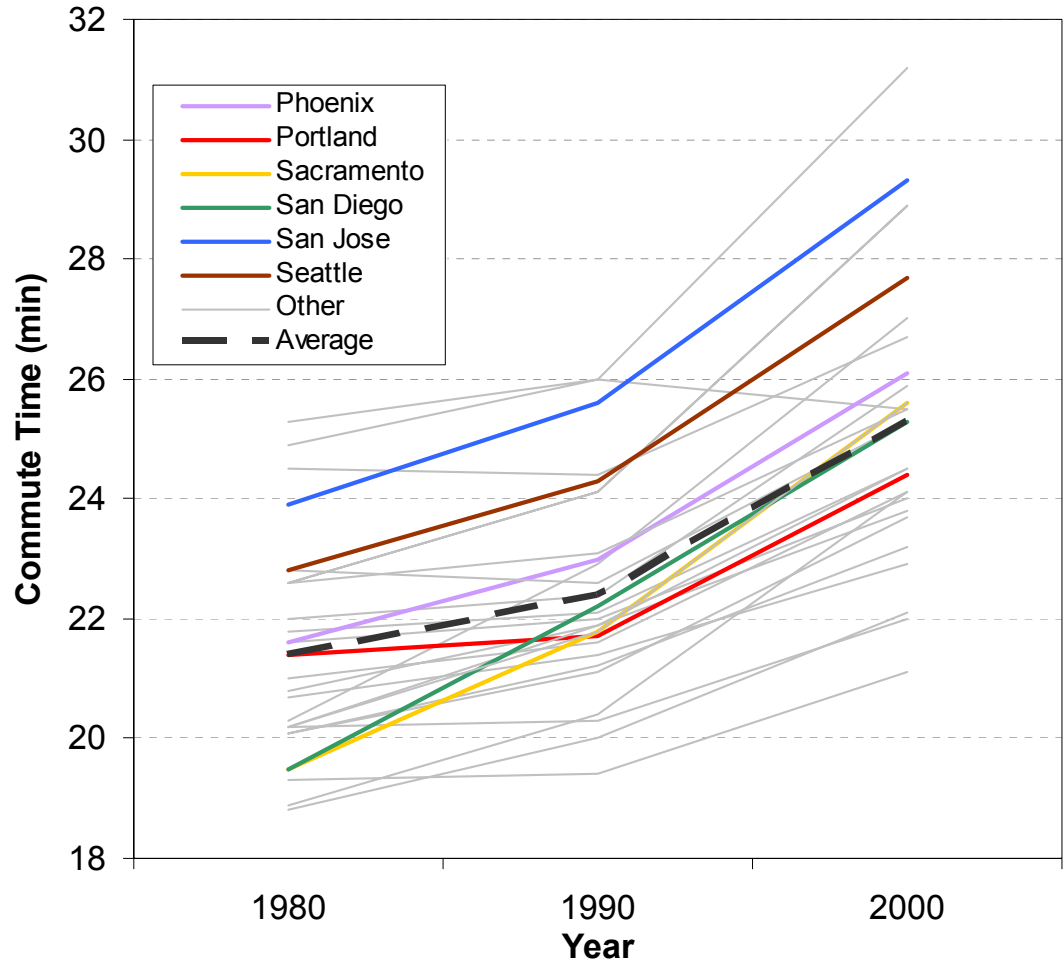


Data Source: 2004 Urban Mobility Report

Commute Time Trends

This shows travel time to work for workers who work outside their homes from Census data. Travel time to work has been increasing in all large urbanized areas including Portland. Travel time to work in Portland area remains below average. The longest commute time to work in the large urban areas is in Atlanta (31.2 minutes).

Census Commute to Work Travel Time, 1980-2000



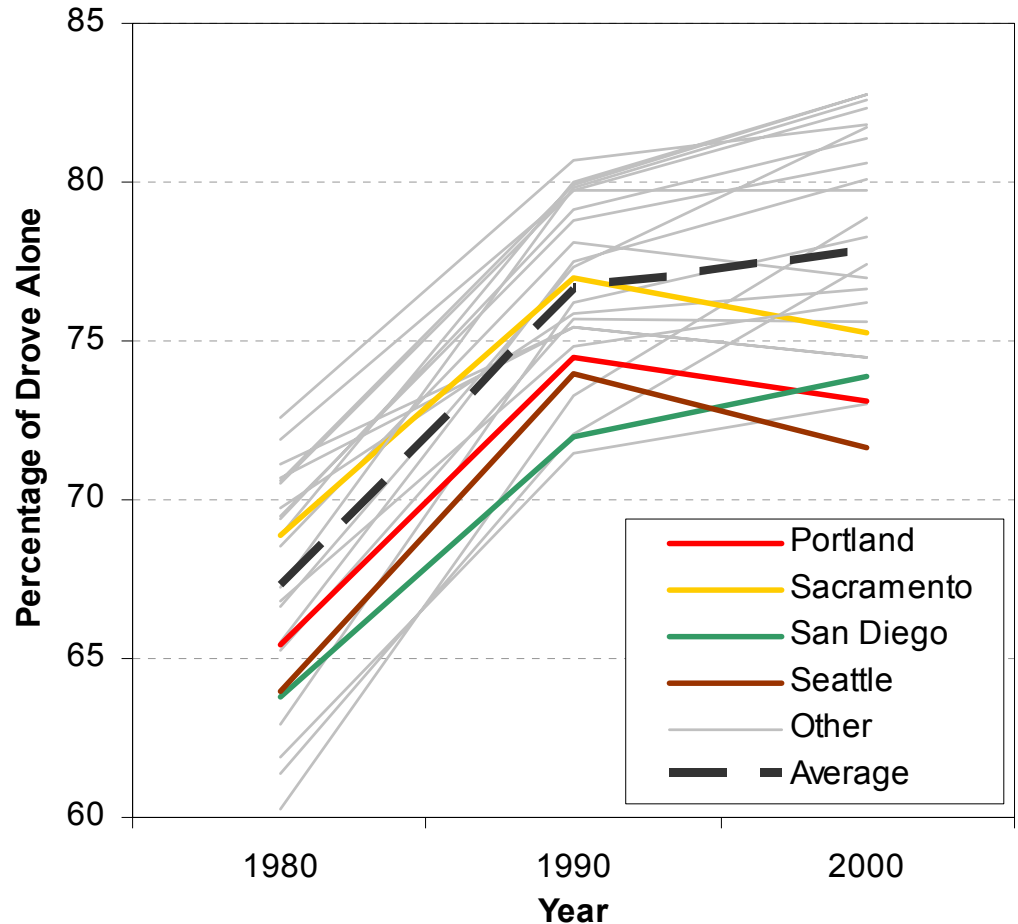
Caution: data are only available at 10 year intervals, thus it is difficult to draw conclusions from any trends that may be visible.

Data Sources: FWHA, Census Transportation Planning Package

Share of “Drive Alone” Commuters

The percentage of commuters who drove alone to work (out of all modes) has been increasing in most cities. But the percentage has dropped in Portland and some other urbanized areas. Portland and Seattle have the lowest fractions of commuters who drove alone among large urban areas.

Percentage of "Drove Alone" Commuters, 1980-2000



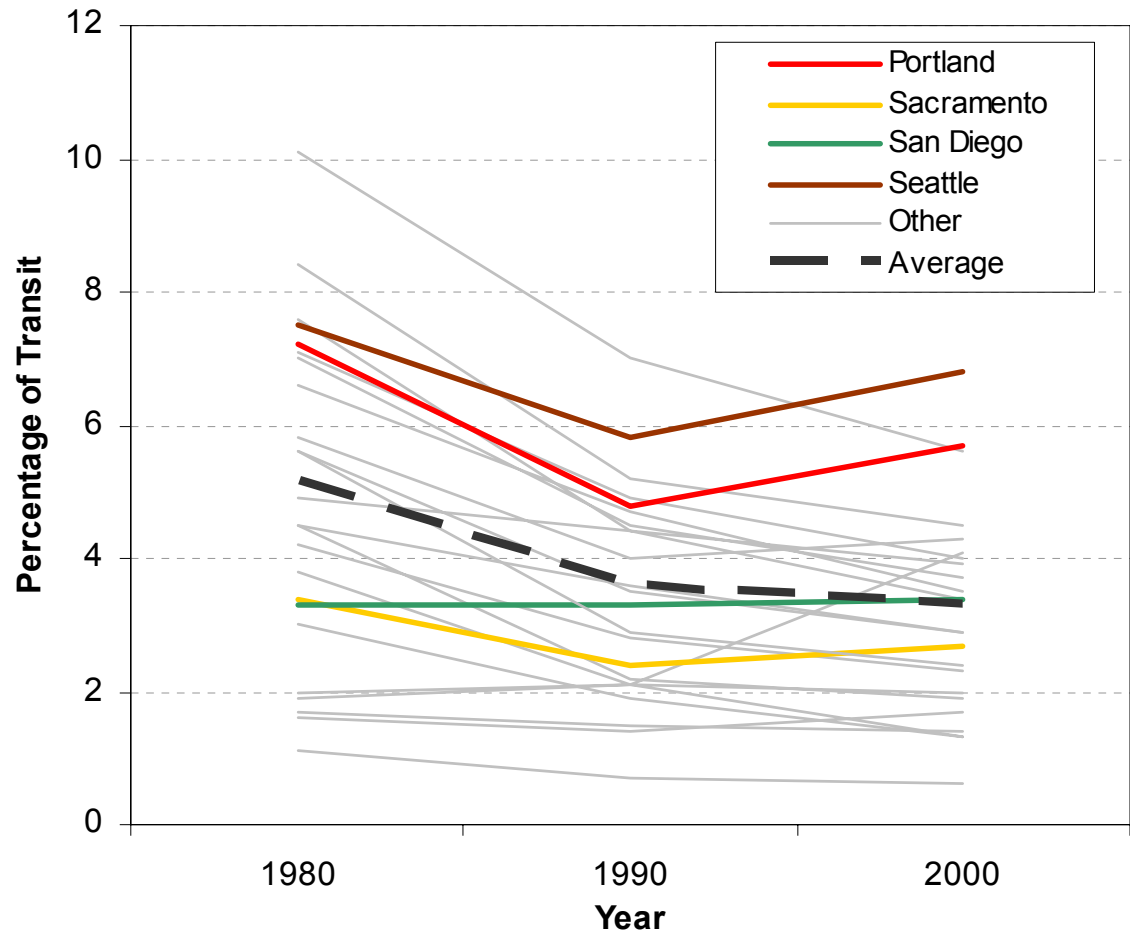
Caution: data are only available at 10 year intervals, thus it is difficult to draw conclusions from any trends that may be visible.

Data Sources: FWHA, Census Transportation Planning Package

Transit Commute Share Trends

Census data show that the percent of commuters who used transit in both Portland and Seattle has increased since 1990, in contrast to most of their large urban regions where the share has decreased.

Percentage of "Transit" Commuters, 1980-2000



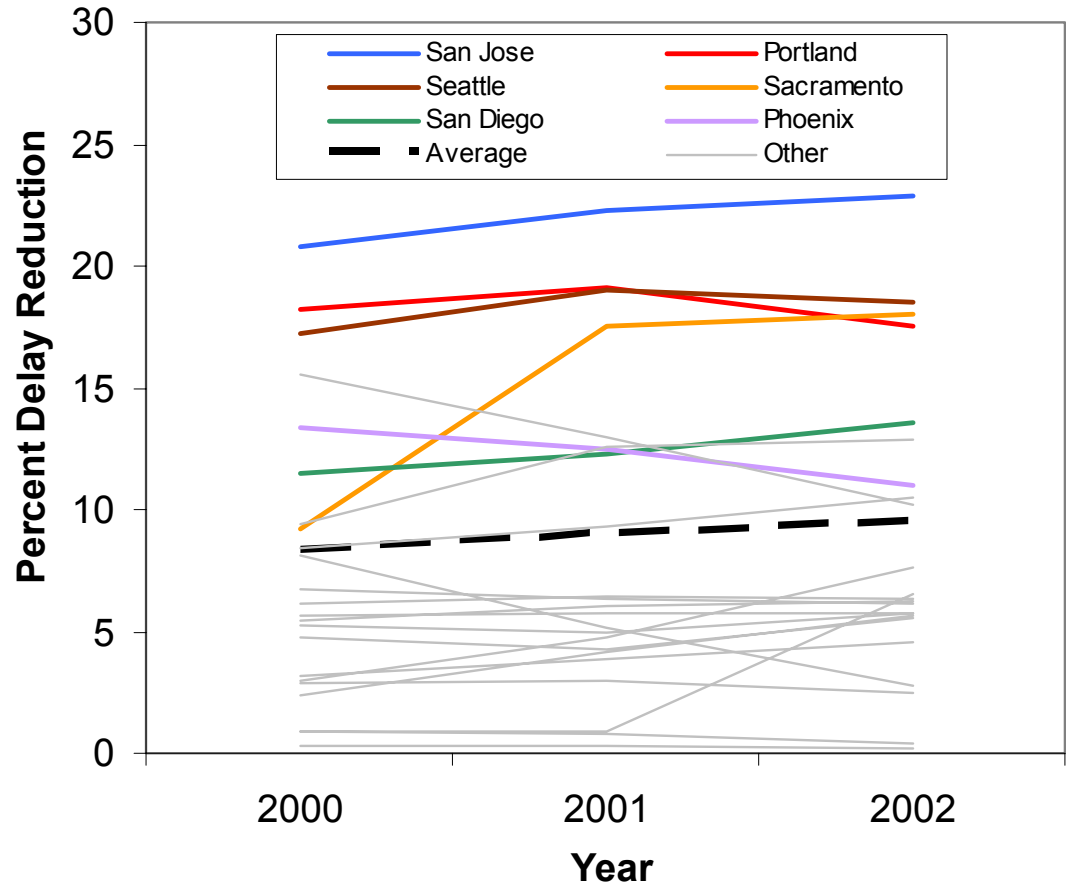
Caution: data are only available at 10 year intervals, thus it is difficult to draw conclusions from any trends that may be visible.

Data Sources: FWHA, Census Transportation Planning Package

Delay Reduction Due to Operational Strategies

For the past three years, the Urban Mobility Report has estimated the percent 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 regions that have operational strategies in place.

Delay Reduction Due to Operational Strategies, 2000-2002



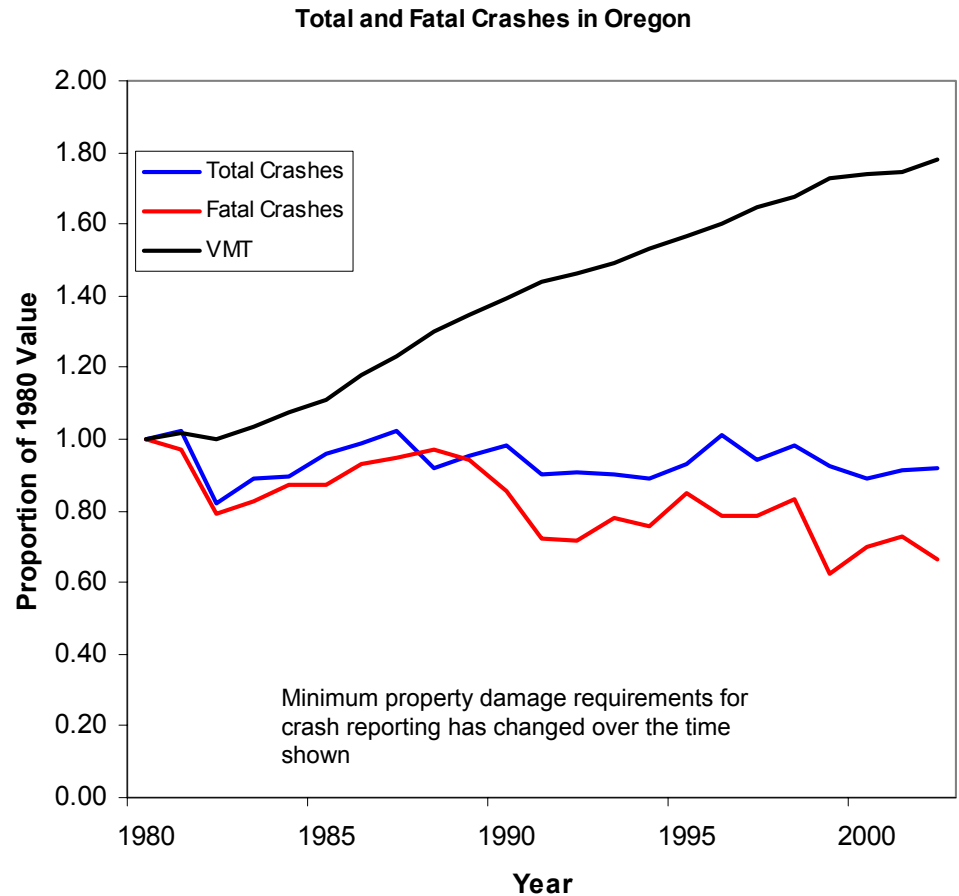
Caution: data are only available for the past three years, thus it is difficult to draw conclusions from any trends that may be visible.
 Data Source: 2004 Urban Mobility Report

Safety Trends

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

Oregon Motor Vehicle Crash Trends

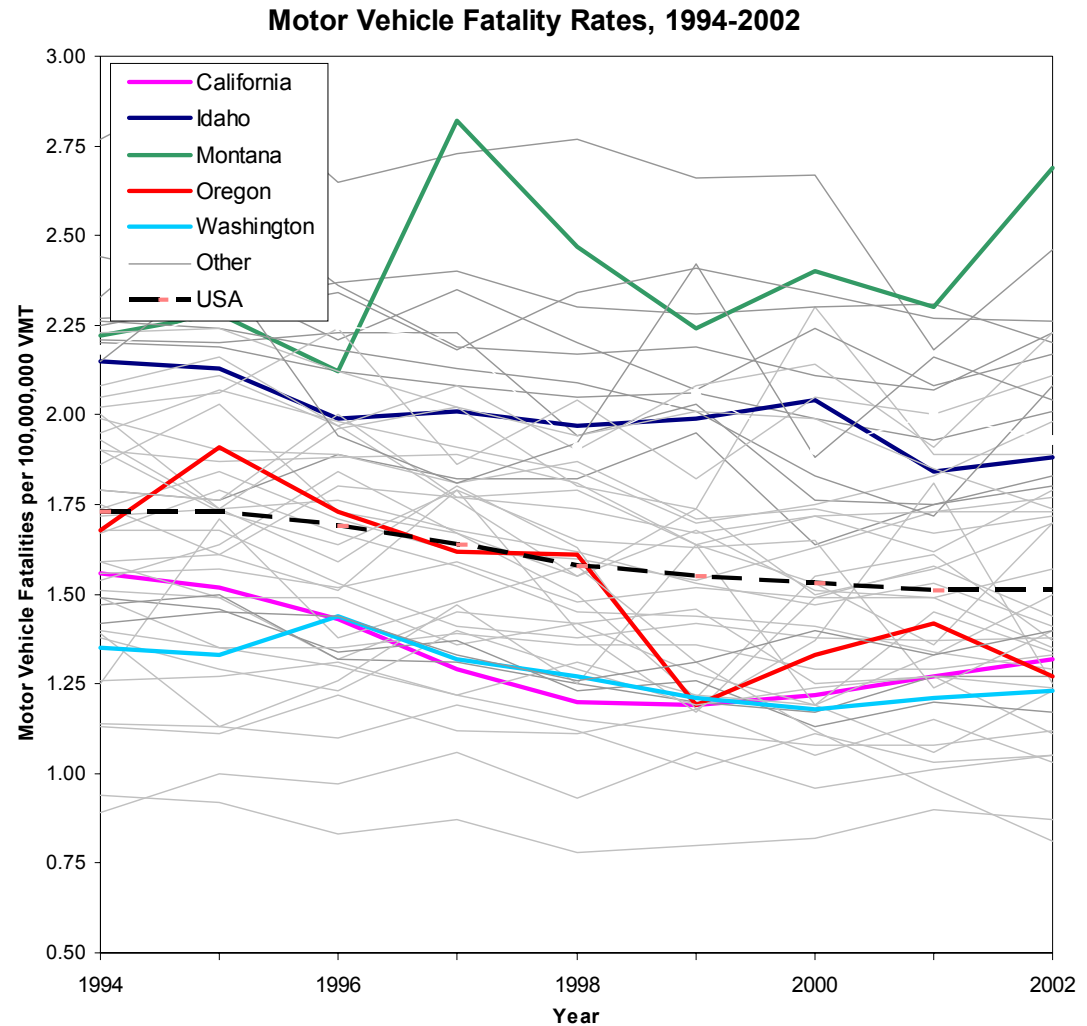
Despite increasing travel on Oregon highways, both total and fatal crashes numbers have declined as a proportion of 1980 values. Improvements in vehicle design, highway design, and social behaviors such as increased seat belt use and less tolerance for impaired driving have contributed to the improvement.



Data Source: Oregon Department of Transportation

National Motor Vehicle Crash Trends

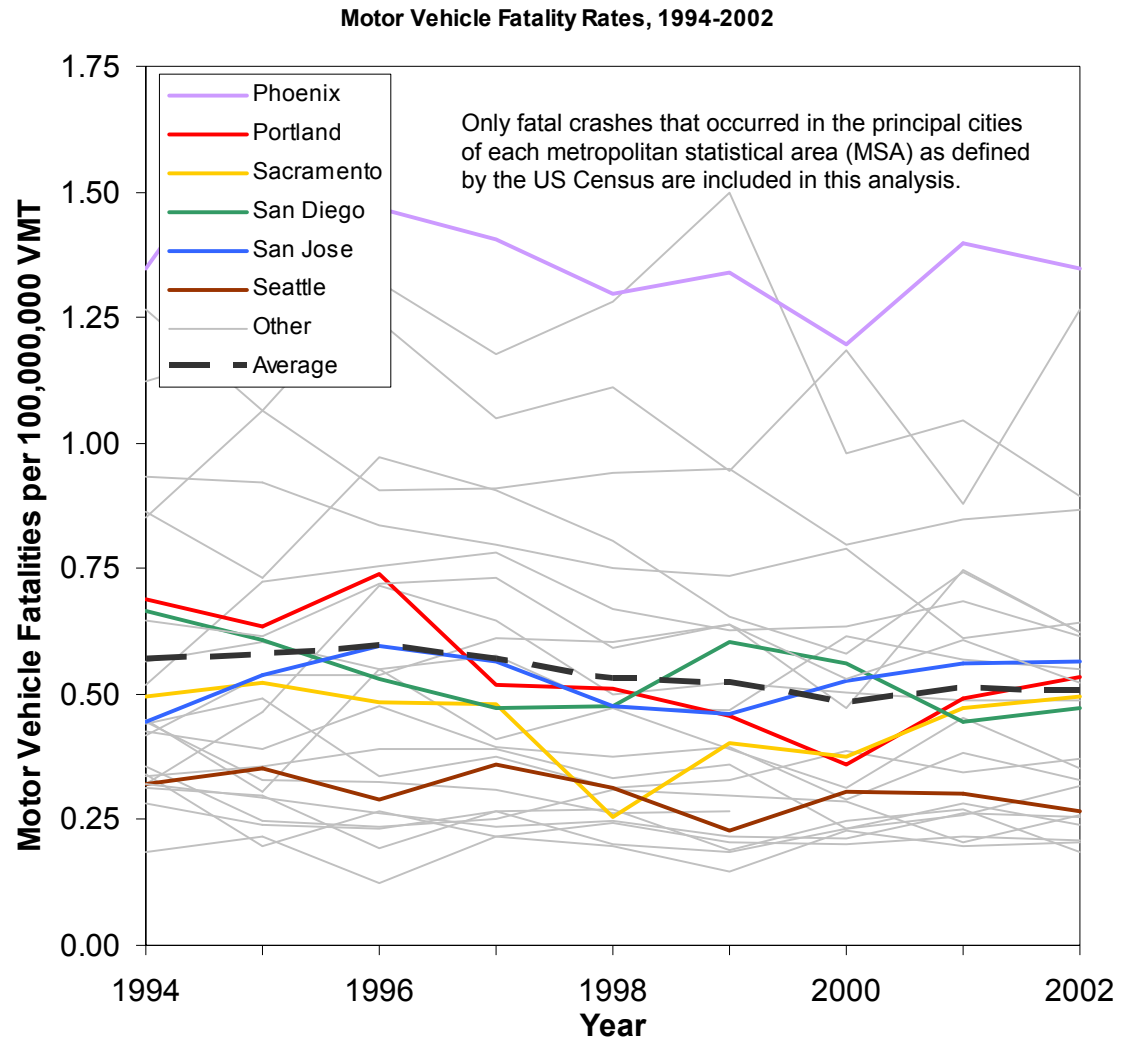
This figure shows a comparison of motor vehicle fatality rates per 100 million vehicle miles traveled for all 50 US states. Although fatal crashes represent only a portion of the total safety performance they provide a useful benchmark for comparison. Oregon rates have generally been below the national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



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

Motor Vehicle Safety

This figure shows a comparison of motor vehicle fatality rates expressed per 100 million VMT. The Portland urbanized area is below average with a slight downward trend. Note that all cities are below the national rate (approximately 1.75).

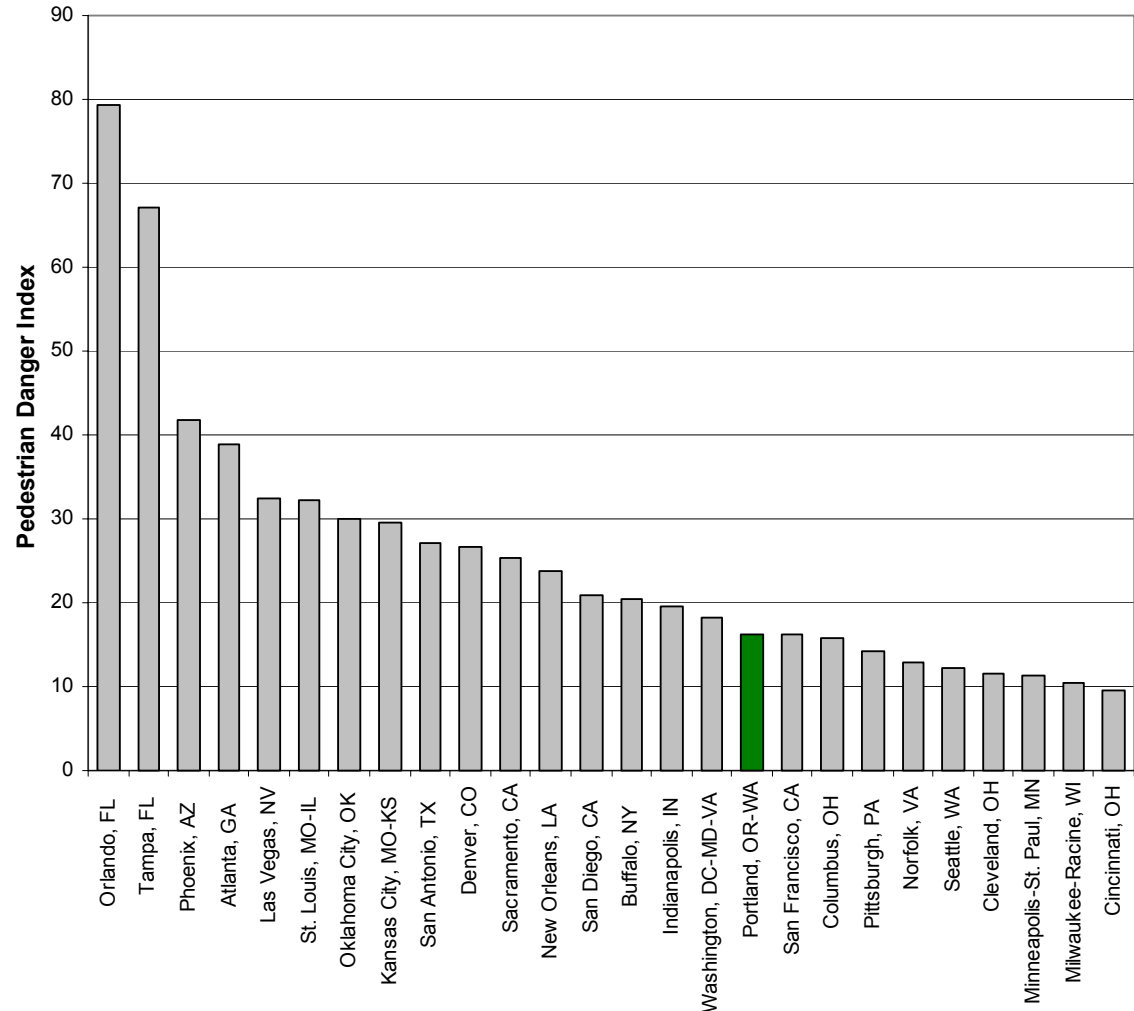


Data Source: National Highway Traffic Safety Administration, Fatality Analysis and Reporting System (FARS), System DVMT estimates from Urban Mobility Report, 2004

Pedestrian Safety

This figure shows the “Pedestrian Danger Index” for the 27 large urbanized areas. The index is calculated by dividing the average yearly pedestrian fatality rate per 100,000 population by the percentage of commuters walking to work and the 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.

2002 Pedestrian Safety Comparison



Data Source: Surface Transportation Policy Project. “Mean Streets 2002” using NHSTA FAR data, US Census Journey to Work

Note: The complete index includes a ranking of 49 metropolitan areas. MSA and CMSA names have been shortened in figure.

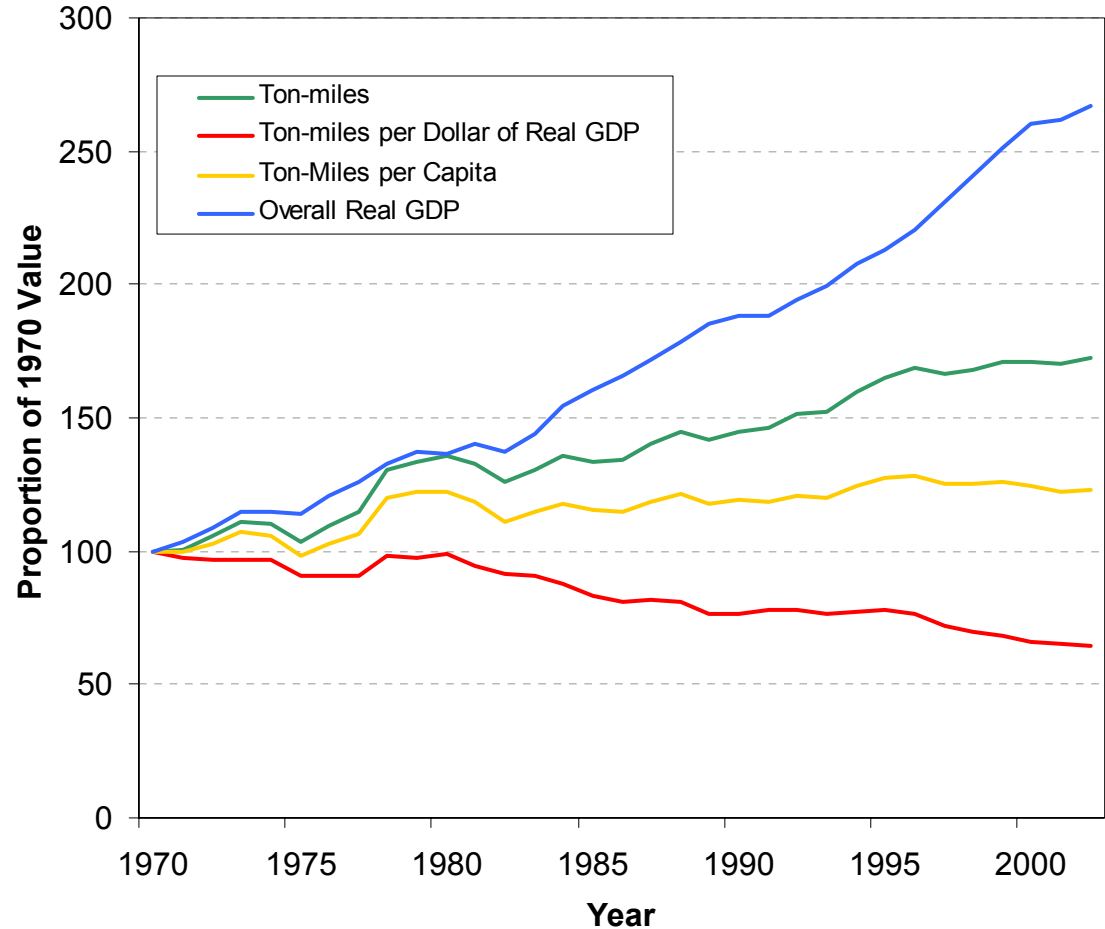
Freight Trends

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

National Freight Trends

This shows the national trends in ton-miles of freight related to gross domestic product. 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.

Freight Ton-Miles and U.S. Real Gross Domestic Product

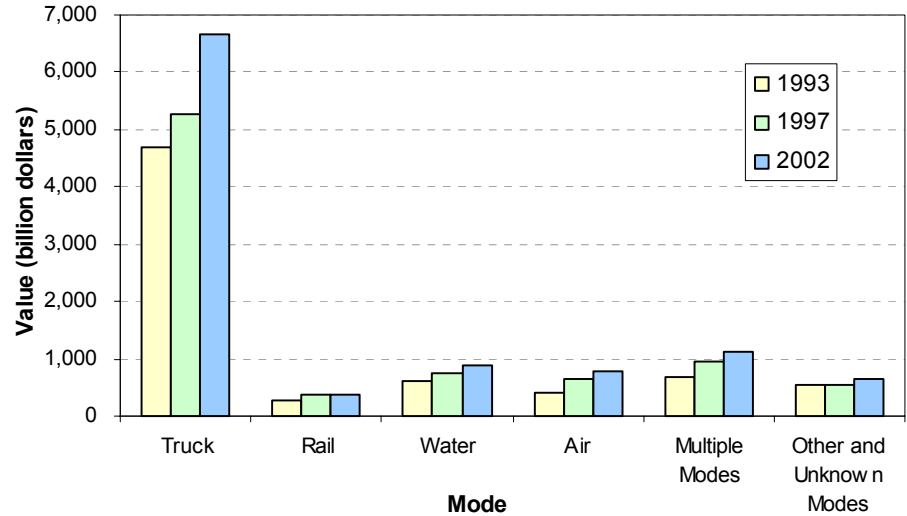


Data Source: Bureau of Transportation Statistics, Shipments in America

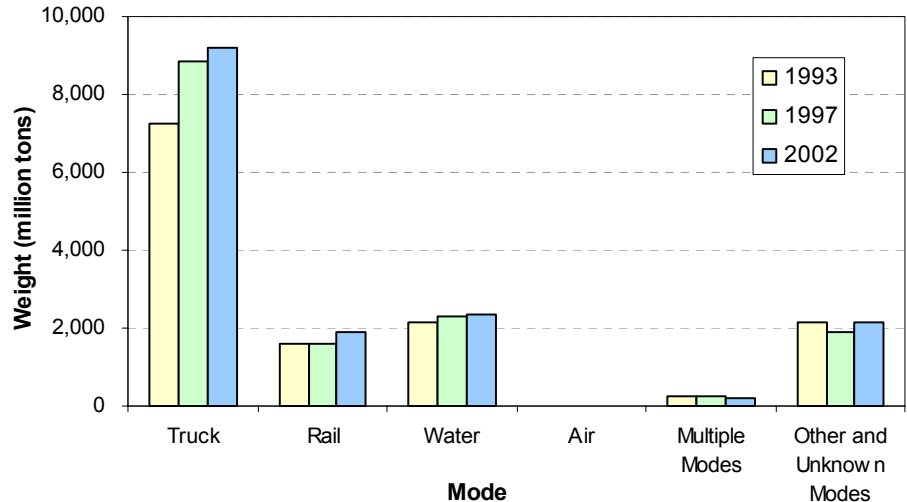
U.S. Freight Mode Trends

This shows U.S. Commodity Flow statistics for the past ten years, for both value and weight by mode. As shown, truck movements dominate both value and weight. The impact of air freight in high value movements is also visible.

Freight Value by Mode in the US



Freight Tons by Mode in the US

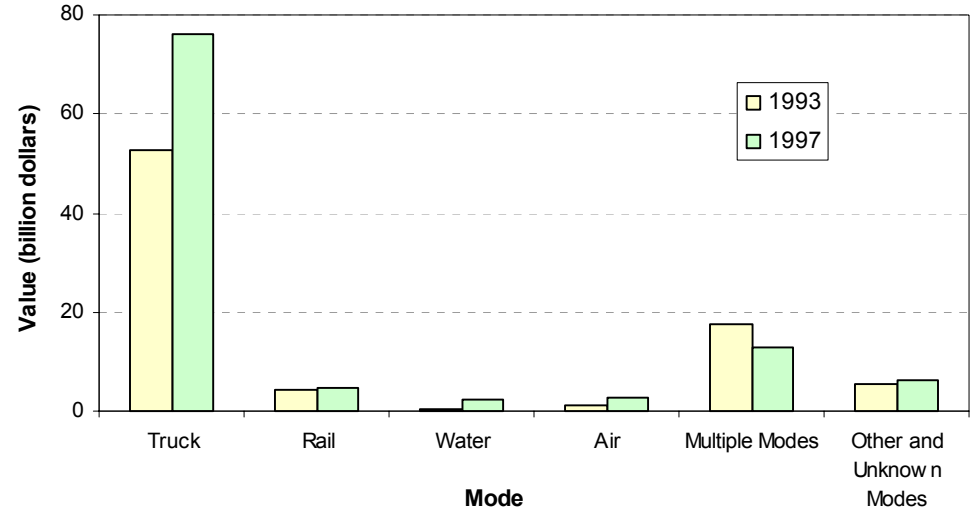


Data Source: Bureau of Transportation Statistics, Shipments in America

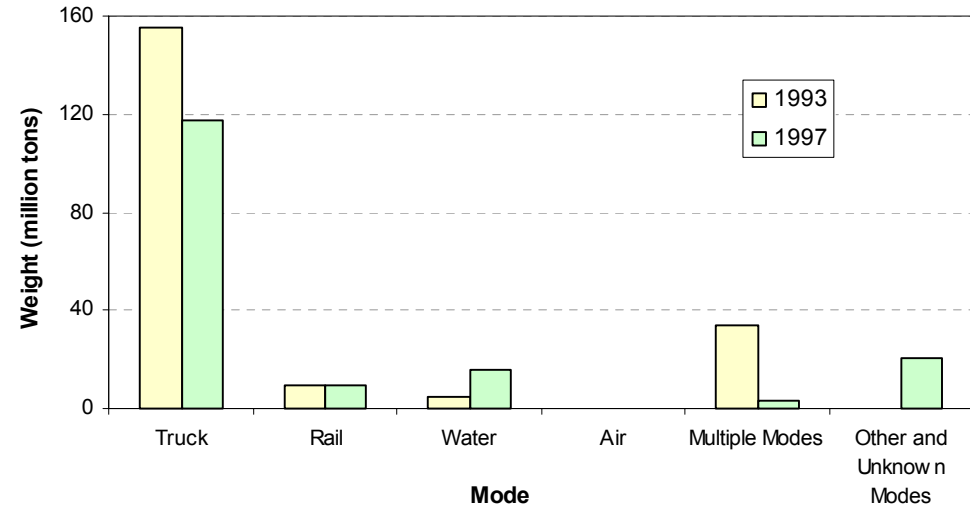
Oregon Freight Mode Trends

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Freight Value by Mode in Oregon



Freight Tons by Mode in Oregon

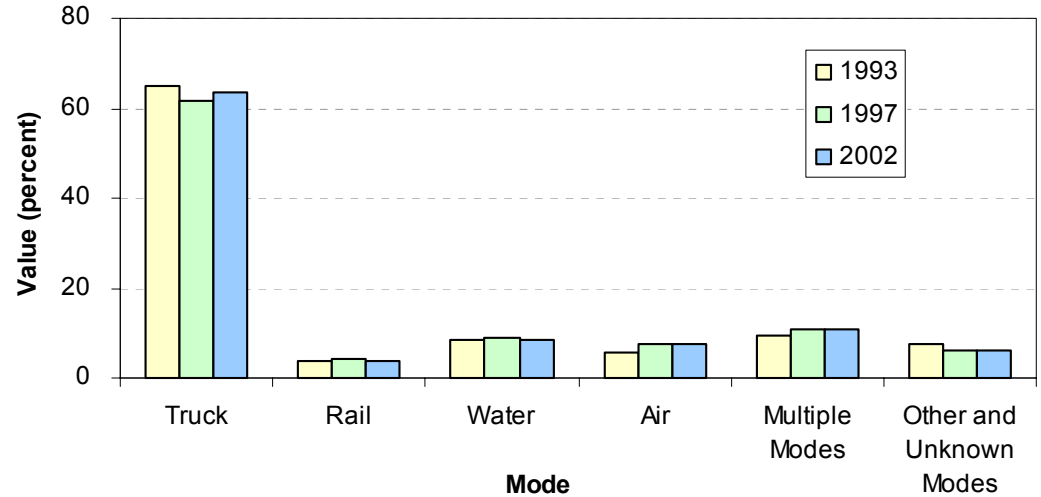


Note: 2002 data are not yet available by state.
 Data Source: Bureau of Transportation Statistics, Shipments in America

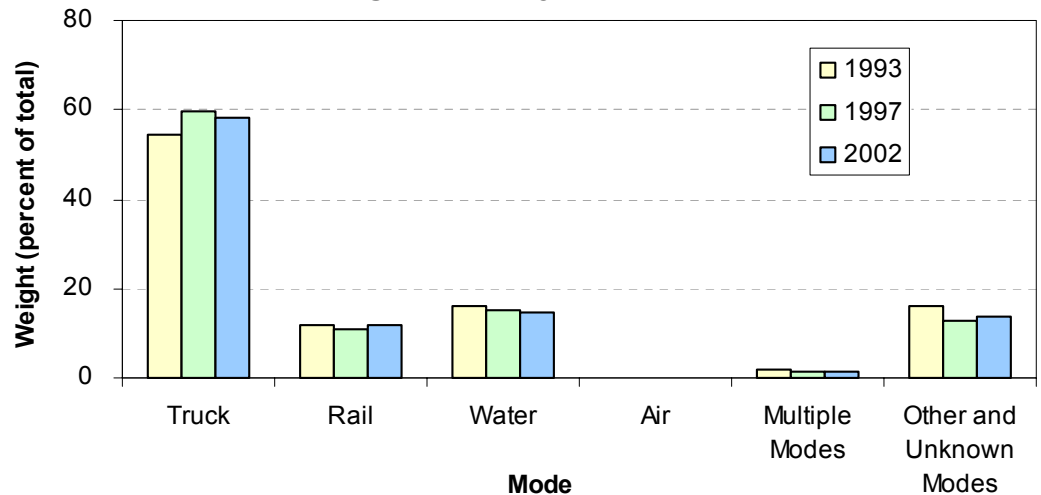
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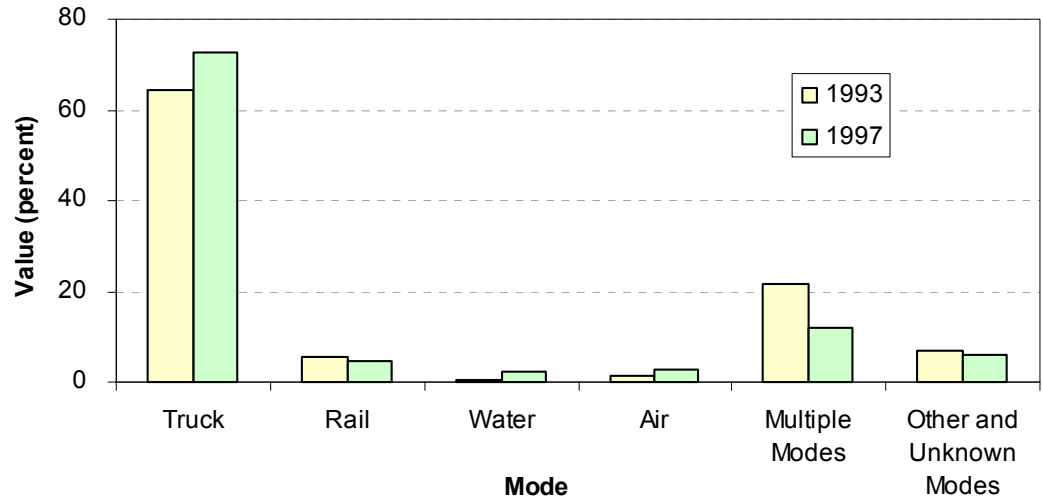


Data Source: Bureau of Transportation Statistics, Shipments in America

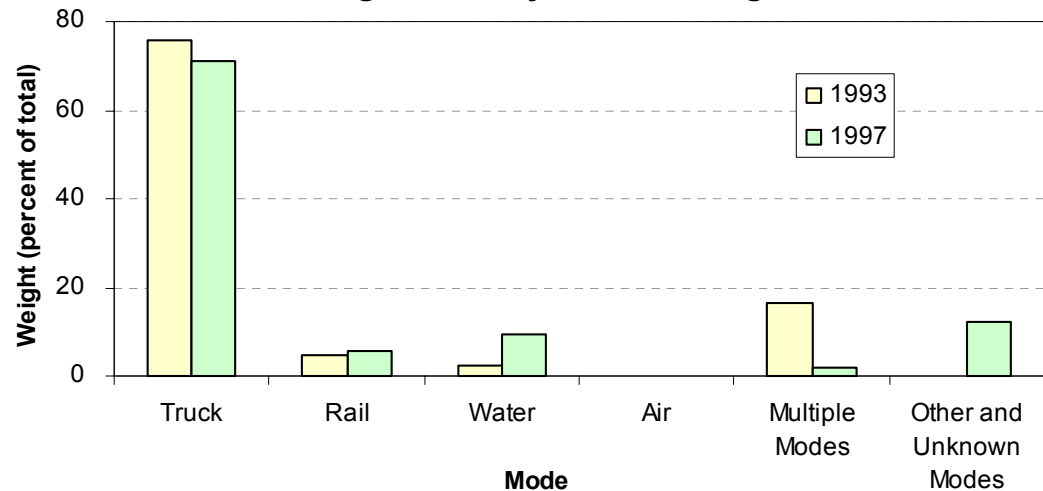
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Freight Value by Mode in Oregon



Freight Tons by Mode in Oregon



Note: 2002 data are not yet available by state.
 Data Source: Bureau of Transportation Statistics, Shipments in America

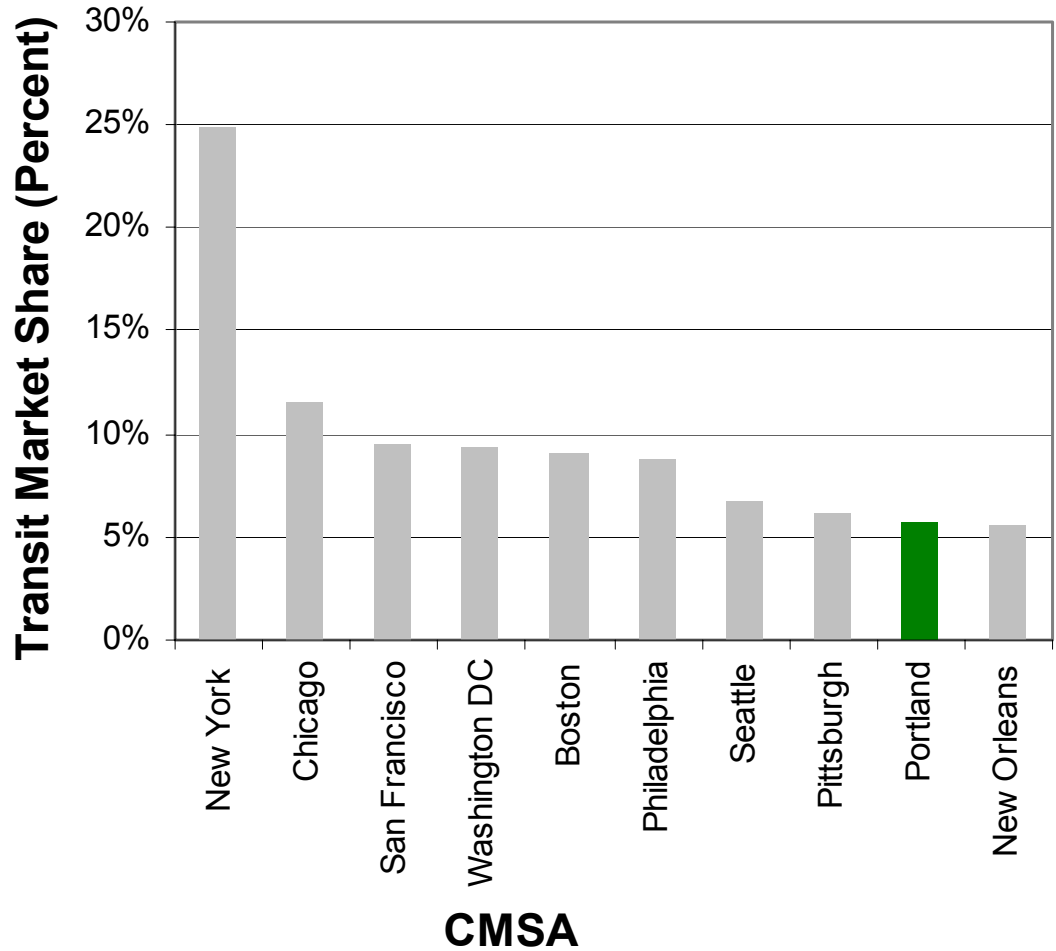
Portland Region Transit and Non-Motorized Transportation Trends

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

Portland appears in the top ten CMSAs in the nation with more than 5% work trip transit market share.

Top Ten U.S. 2000 Transit Market Share

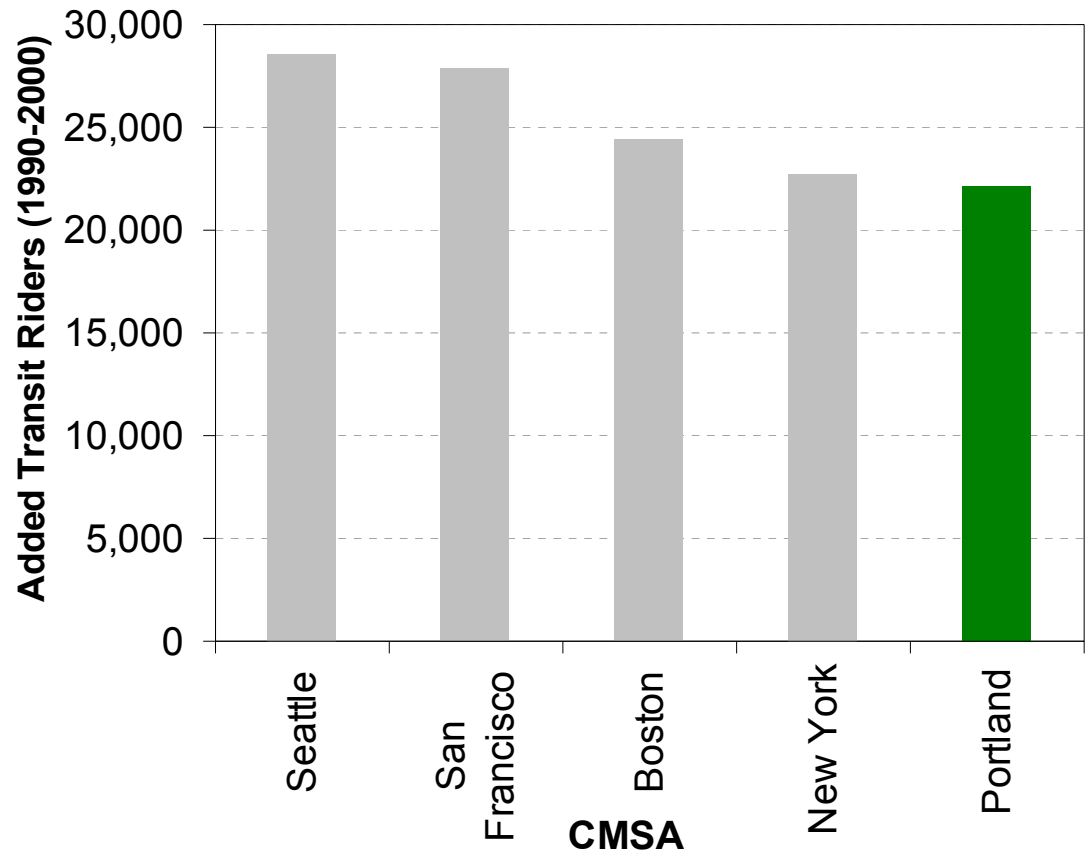


Data Source: U.S. Census Journey to Work, includes taxicabs.

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.

**Change in Number of Workers Using Transit:
1990-2000**

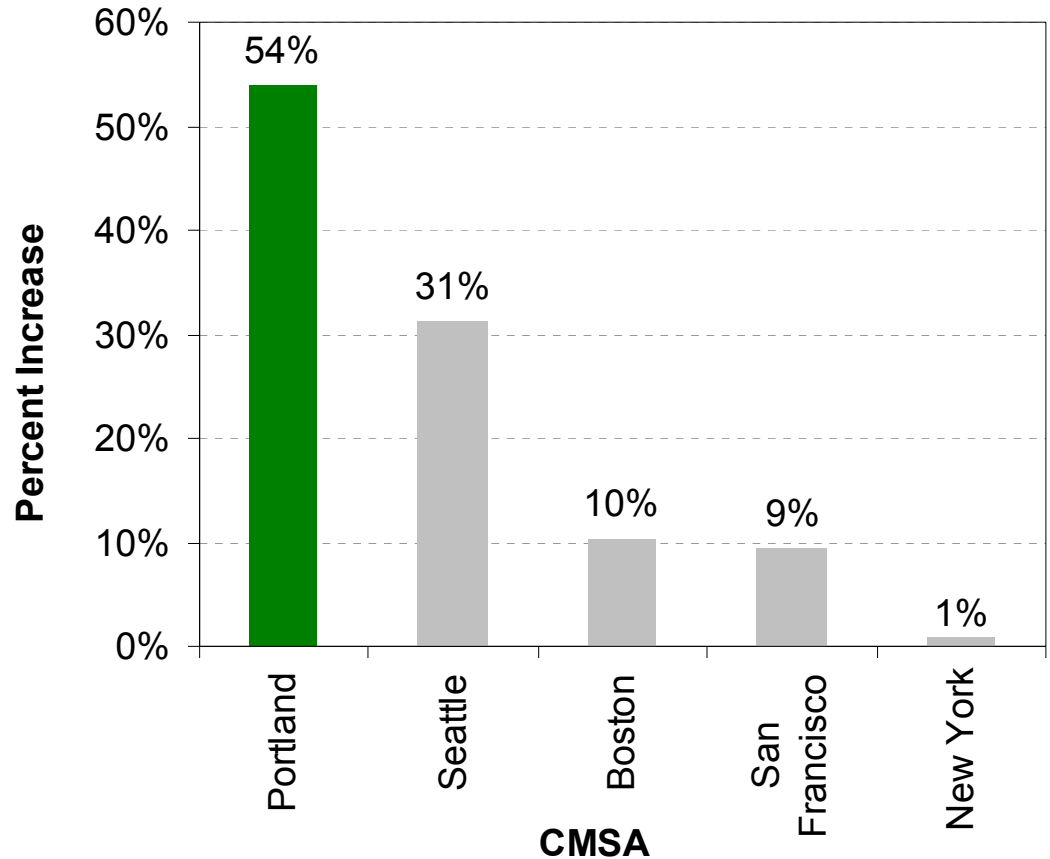


Data Source: U.S. Census Journey to Work.

Increase in Transit Share

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

Percent Increase in Workers Using Transit 1990-2000

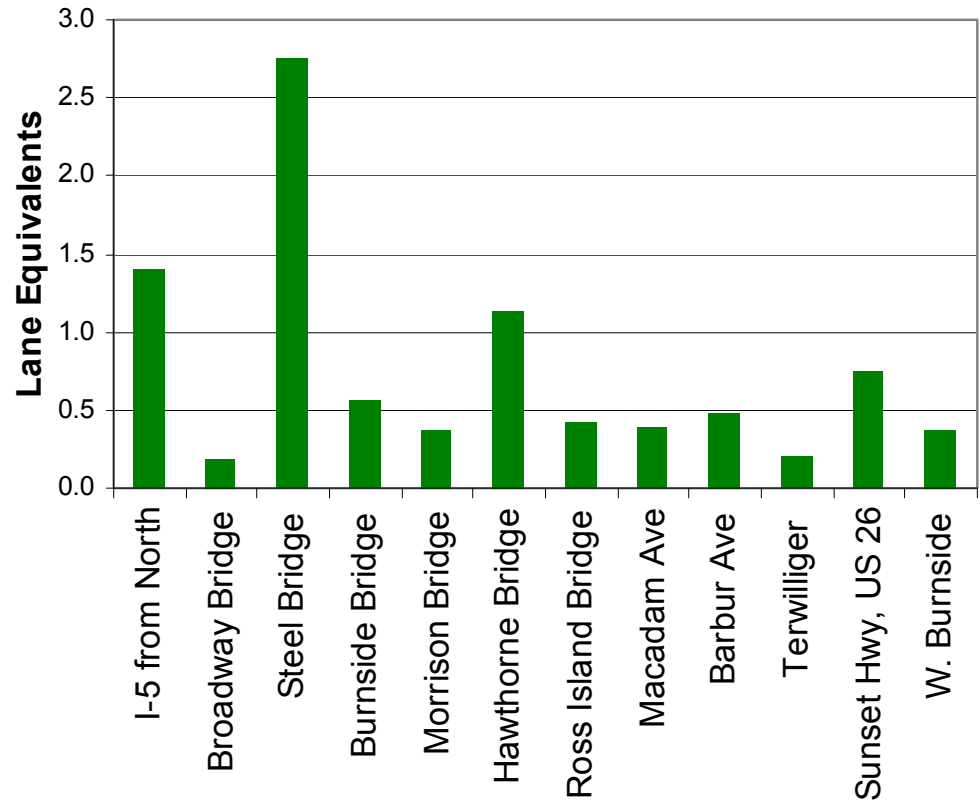


Data Source: U.S. Census

Lane Equivalents Saved By Transit Ridership

This 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.

**2002 Transit Ridership in Lane Equivalents
Average Weekday - A.M. peak hour direction**

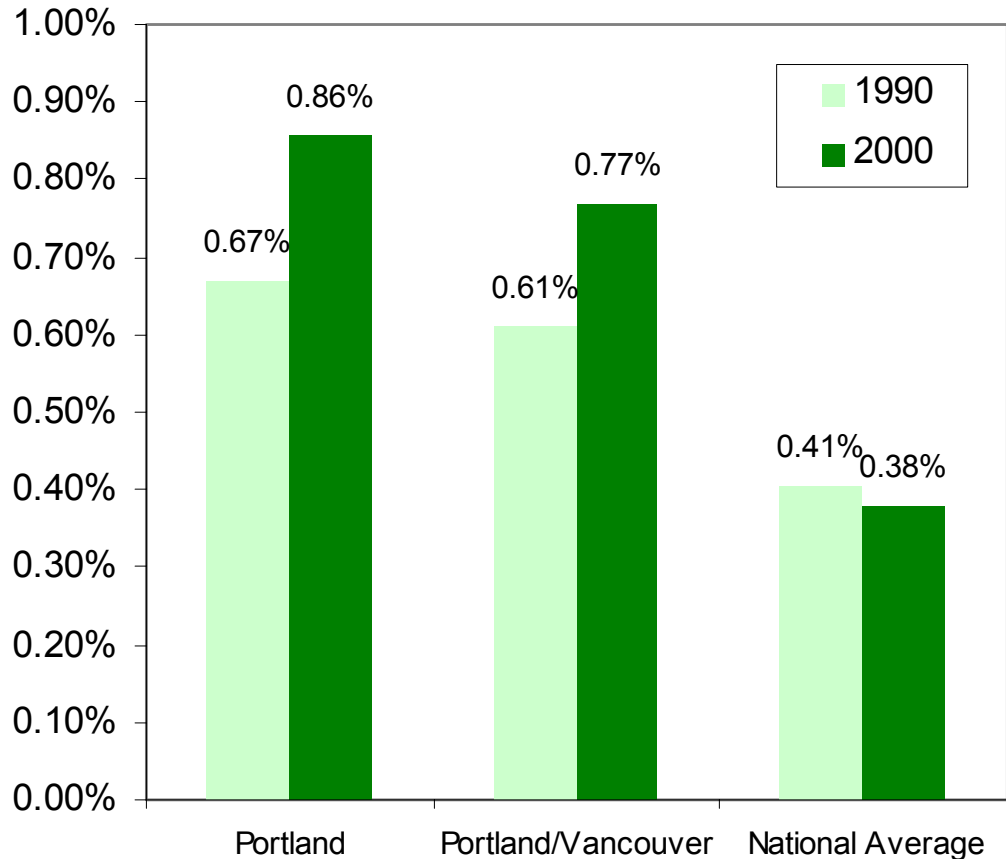


Data Source: TriMet

Bicycle Commuting

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

Percent of Workers Commuting by Bicycle

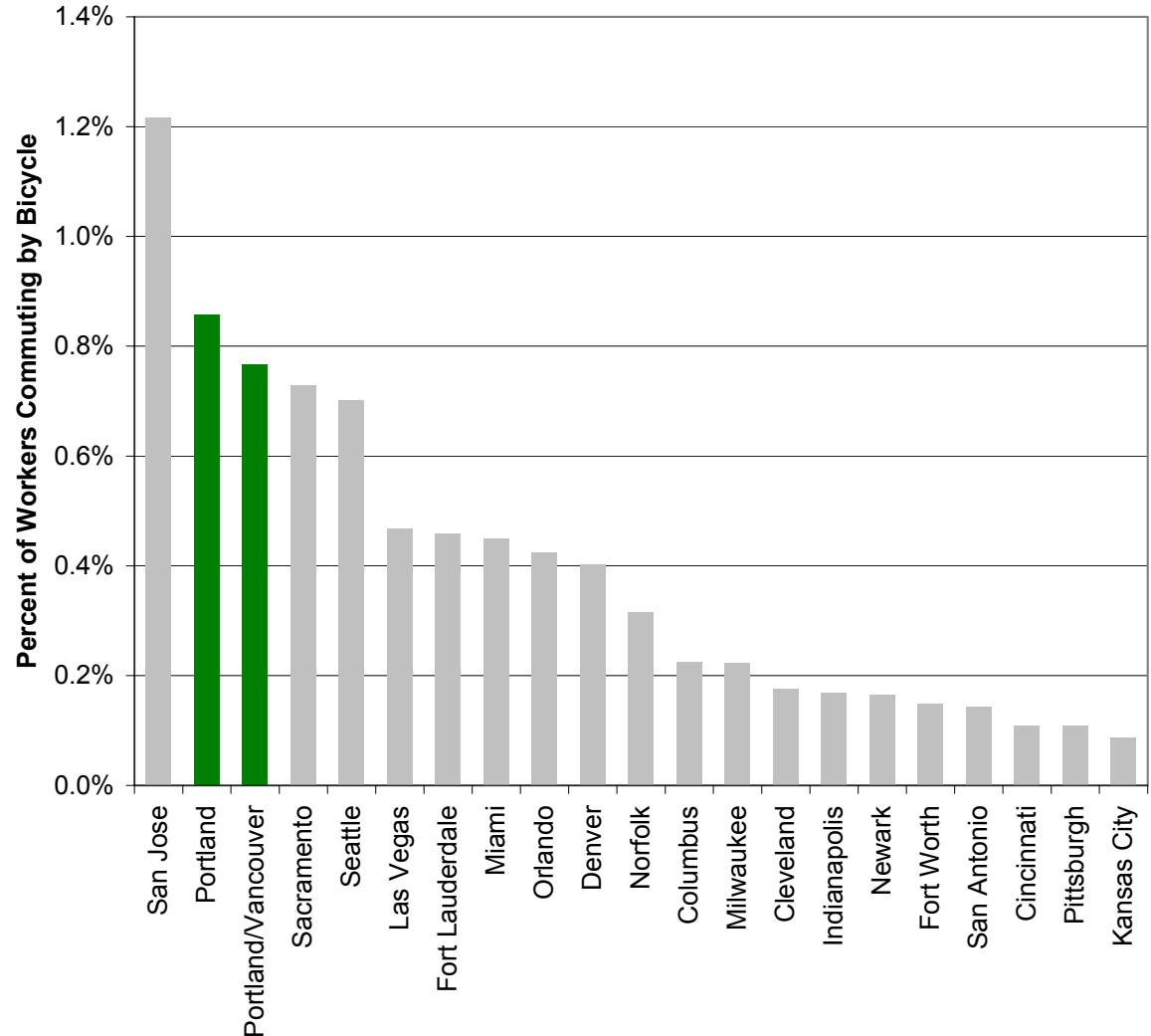


Data Sources: 1990 Summary Tape File 3 (SF 3) - Sample data, P049. Means of Transportation to Work - Universe: Workers 16 years and over; 2000 Summary File 3 (SF 3) - Sample data, P30. Means of Transportation to Work for Workers 16 Years and Over - Universe: Workers 16 years and over

Bicycle Commuting

This figure shows that in 2000 Portland and the combined Portland/Vancouver metropolitan area stood out nationally as exhibiting the second- and third-highest proportion of bicycle commuters among comparable cities.

2000 Urban Area Bicycle Commute Comparison

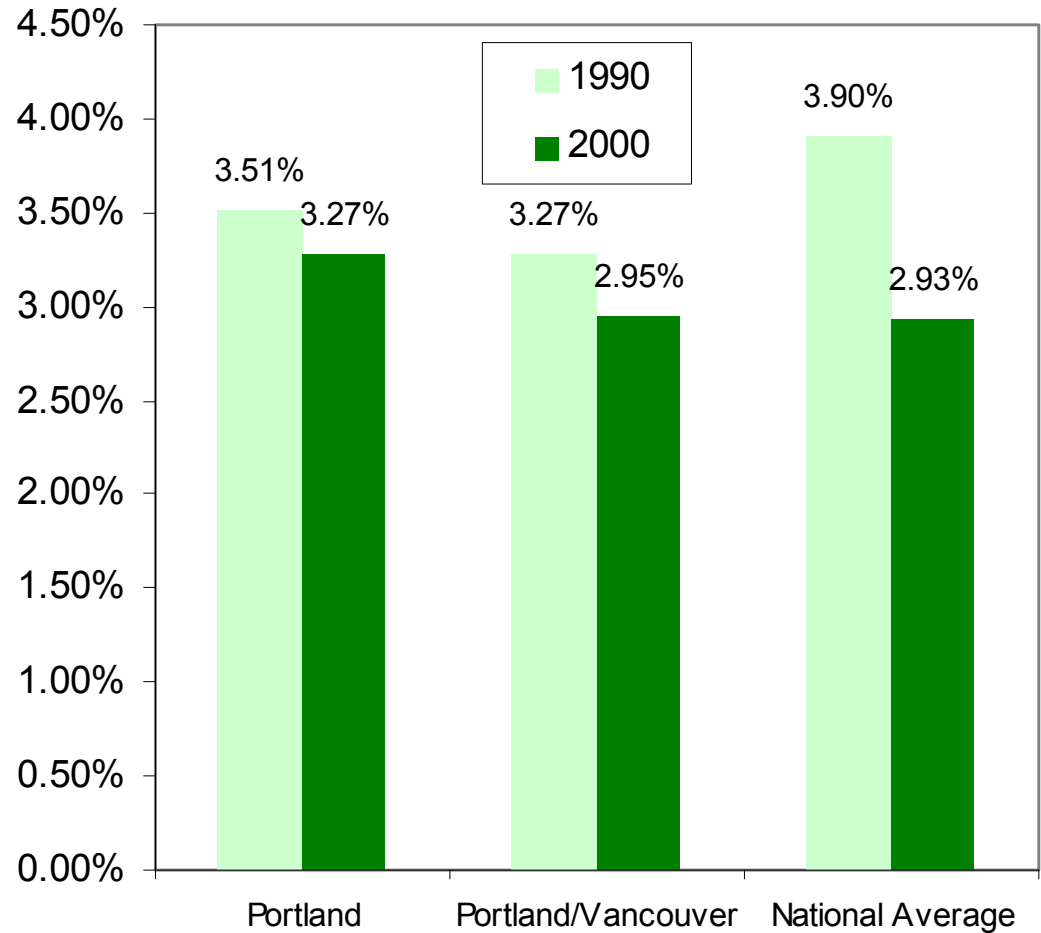


Data Source: 2000 Summary File 3 (SF 3) - Sample data, P30. Means of Transportation to Work for Workers 16 Years and Over - Universe: Workers 16 years and over

Walk Commuting

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

Percent of Workers Commuting on Foot

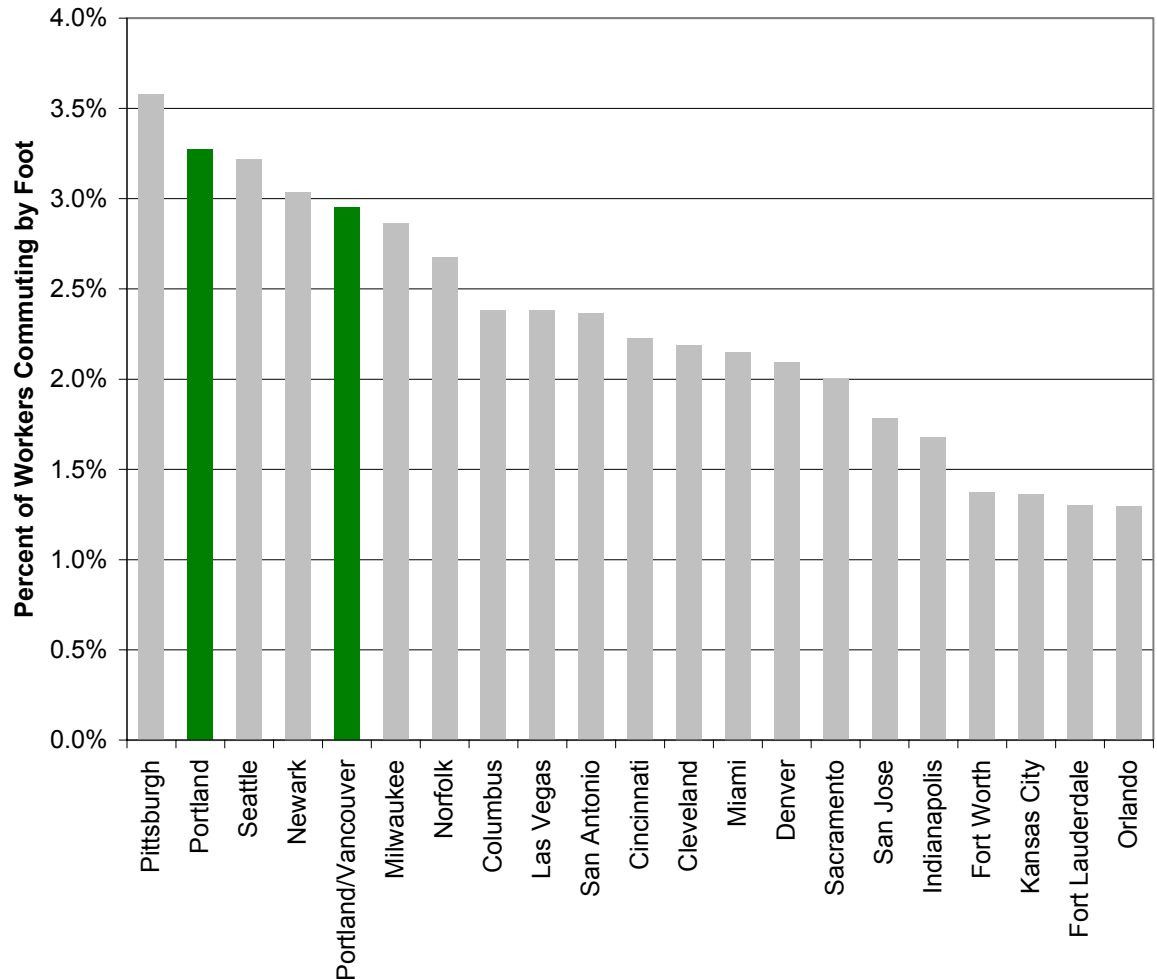


Data Sources: 1990 Summary Tape File 3 (SF 3) - Sample data, P049. Means of Transportation to Work - Universe: Workers 16 years and over; 2000 Summary File 3 (SF 3) - Sample data, P30. Means of Transportation to Work for Workers 16 Years and Over - Universe: Workers 16 years and over

Walk Commuting

This figure indicates that Portland stood out in 2000 as exhibiting the second-highest proportion of walk commuters among comparable cities, with more than 3% of commuters choosing to walk to work.

2000 Urban Area Walk Commute Comparison



Data Source: 2000 Summary File 3 (SF 3) - Sample data, P30. Means of Transportation to Work for Workers 16 Years and Over - Universe: Workers 16 years and over

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 eastbound on U.S. 26 on one day.

PORTAL: Portland Transportation Archive Listing Version 2.0

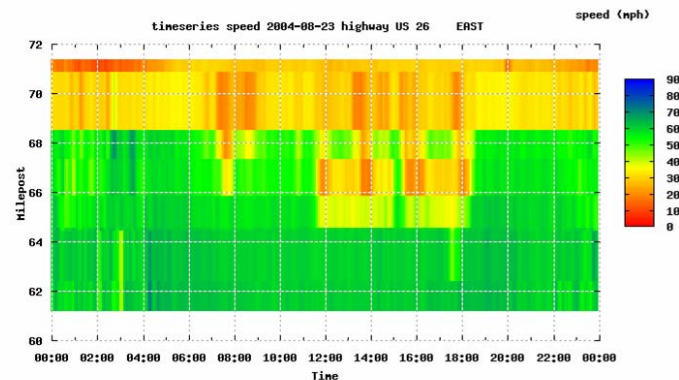
ADUS

[Welcome](#)
[Timeseries](#)
[Grouped Data](#)
[Data Fidelity](#)
[Raw Data](#)
[Ramp Data](#)
[Weather](#)
[Comments](#)
[User Info](#)
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[Our Server](#)
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Admin

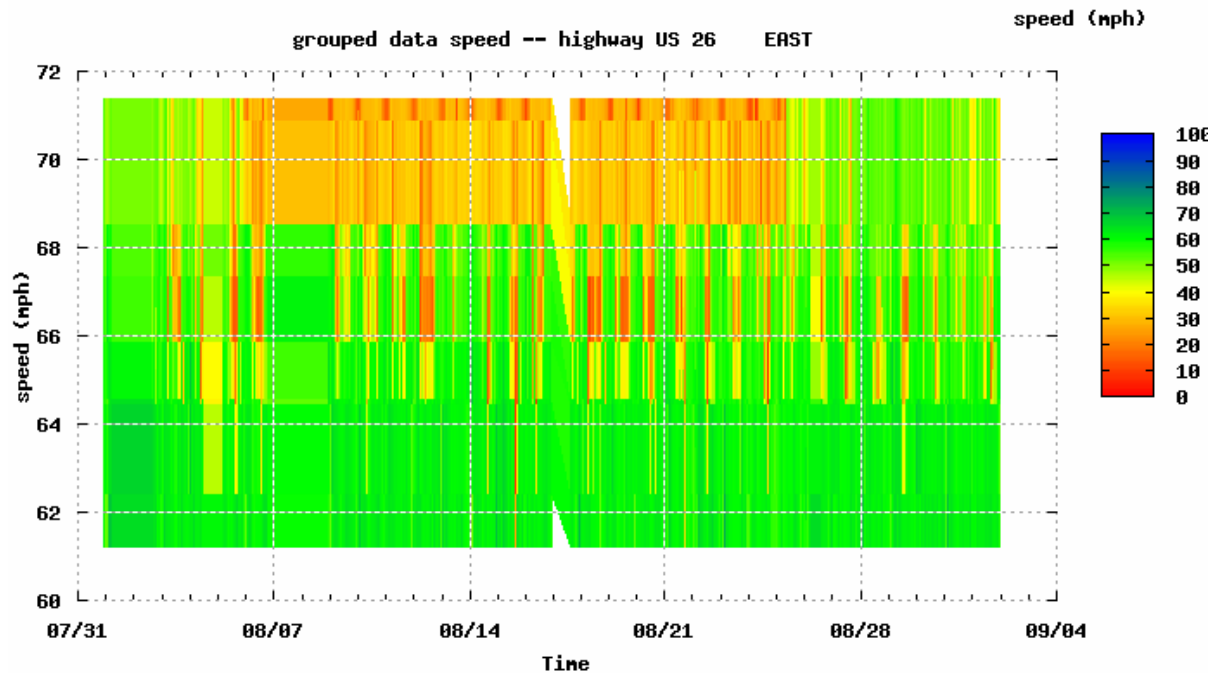
[Add User](#)
[Edit User](#)
[Delete User](#)
[Pending Users](#)

highway: US 26 EAST 217 NORTH mile 0.66 - Walker Rd NB
 station: 217 NORTH mile 0.66 - Walker Rd NB
 lane: all HOV
 date: August 23 2004
 quantity: speed
 include hours: 00 :00 to 24 :00



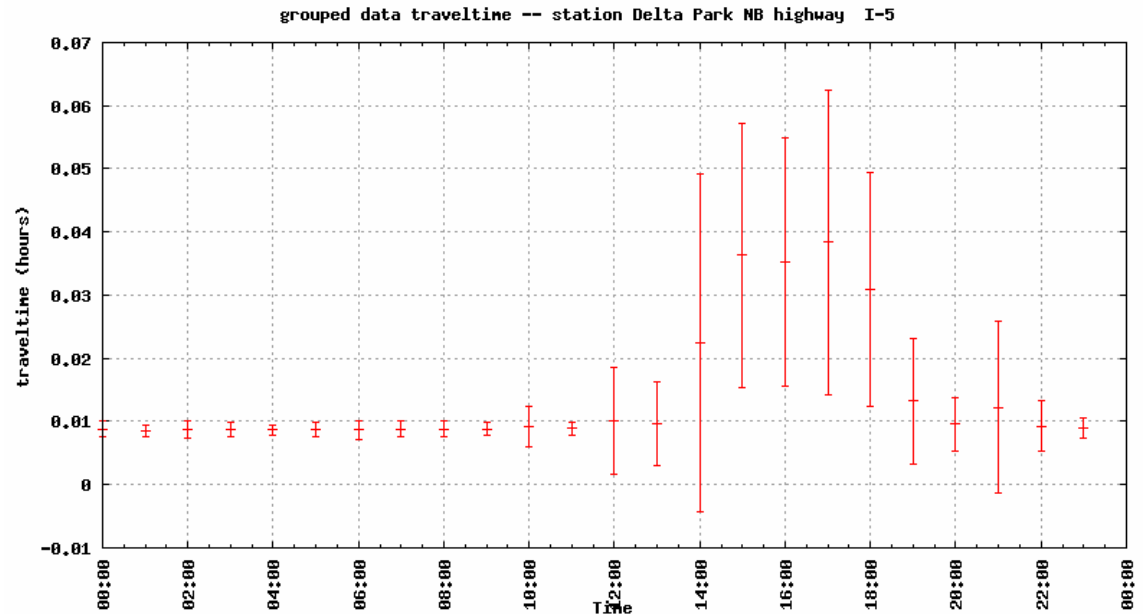
Speed on Freeway Segments

This figure shows the average speed for eastbound highway U.S. 26 between August 1 and September 1, 2004 by day. In the future it will be possible to trace speed differences over time.



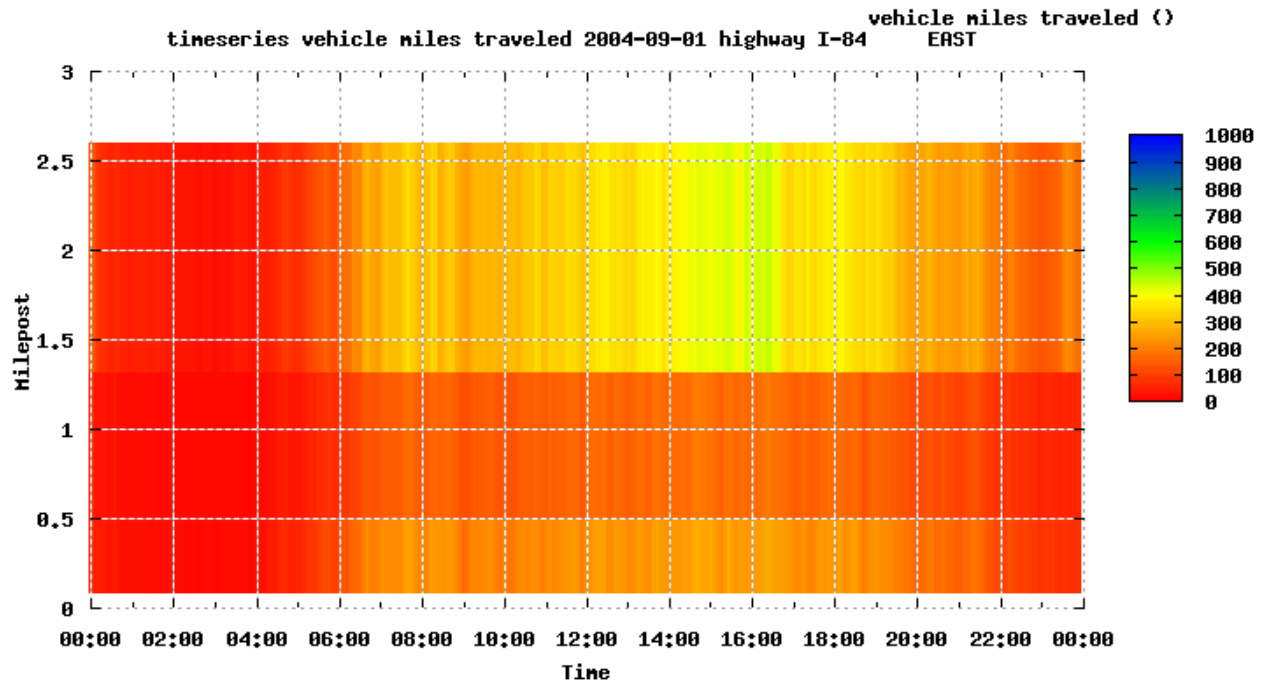
Freeway Segment Travel Time

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 month of August 2004. The graph shows the mean values as well as one standard deviation above and below the average.



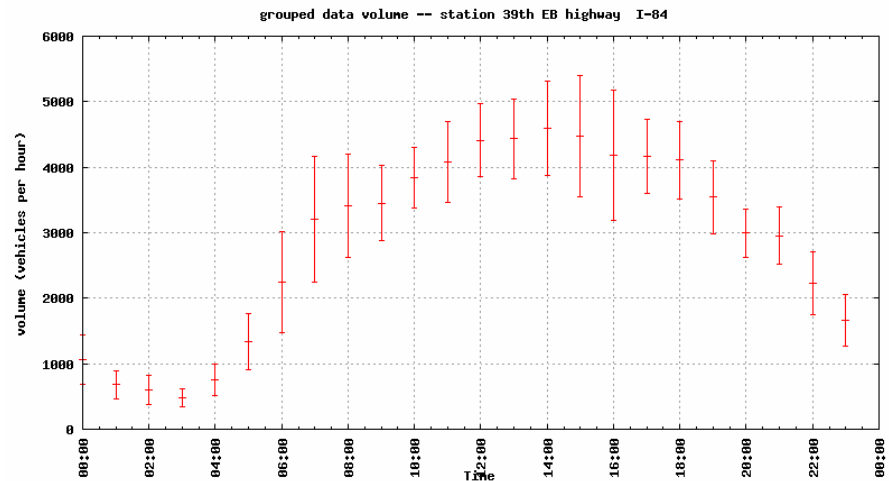
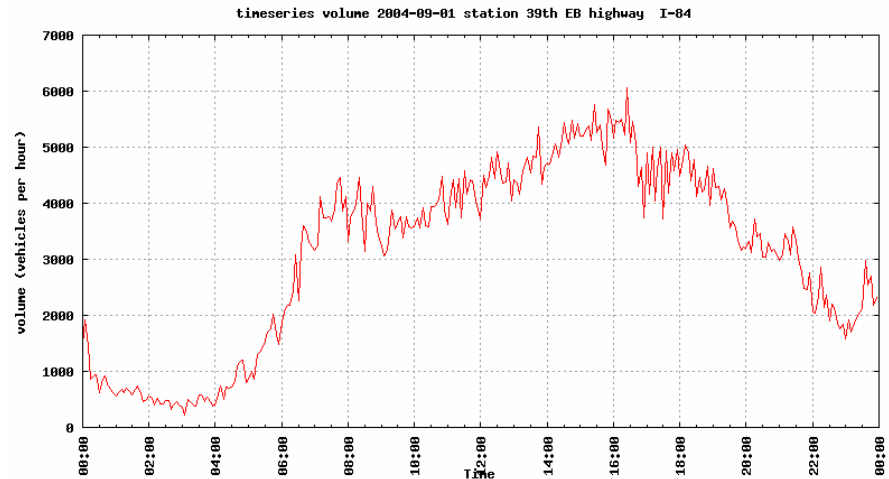
Freeway Segment Vehicle Miles Traveled (VMT)

This figure shows the number of vehicle miles traveled on eastbound I-84 on September 1, 2004. In the future we will be able to estimate the total VMT for the entire freeway system in the Portland region.



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 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.

