



TRANSPORTATION INDICATORS

Introduction

I. Purpose of Transportation Indicators

The King County Countywide Planning Policies (CPPs) describe a regional vision of growth and development. Land use, transportation, and other plan elements are to be coordinated to achieve this overarching vision. The CPPs cover a twenty-year time span, during which time growth and development are expected to occur according to the policies in the plan so that the regional vision may be realized. The CPPs call for monitoring the achievement of the key outcomes and identifying trends that support or detract from them.

The key outcomes of the CPPs transportation policies are to:

- Enhance Transportation and Land Use Linkages
- Increase the Availability of Modes other than Single Occupant Vehicle
- Reduce Commercial Traffic Congestion
- Protect and Improve the Transportation Infrastructure

The Transportation Indicators show changes over time in mobility-related phenomena as growth and change occur, and the goals of the CPPs are realized. The goals include an increase in regional mobility and progress towards a multi-modal transportation system.

By reporting on parameters that are related to the linkage between transportation and land use development, and on the transportation choices made by King County residents, the Benchmark Report will help the Growth Management Planning Council (GMPC) evaluate regional progress toward the achievement of the Countywide Planning Policies' vision. The Benchmark Committee of the GMPC selected these Indicators as a first effort to report meaningful transportation data to the GMPC as it relates to the achievement of the Countywide Planning Policies.

II. Key Observations*

The Indicators report the latest available data and also establish a historical trend. The Countywide Planning Policies were adopted in 1994, and most local Comprehensive Plans were adopted in 1994 or later, hence the data should not be expected to reflect the full impact of the policies.

Indicator #41 Percent of residents who commute one-way within 30 minutes.

- In 1999, about 78% of King County commuters traveled less than thirty minutes to or from work.

Indicator #42 Metro Transit Ridership

- Metro transit passenger boardings for 1999 were 96,605,000, an increase of 2,349,000 from the previous year.
- Metro transit ridership, measured in passenger boardings, has increased from 1995 from 50.1 rides per capita to 1999 with 57.6 rides per capita.

* See Section V for definitions of terms.



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Indicator #43 Percent of residents who walk or use transit, bicycles or carpools as alternatives to the single occupant vehicle.

- In 1999 the split in the mode of transportation for all day travel was Transit: 5.9%; High Occupancy Vehicle (HOV)/ Carpool: 35.3%; Non-Motorized/Other: 6.9%; Single Occupancy Vehicle (SOV): 51.9%.
- The high proportion of trips using the HOV mode (35% in 1999) is characteristic of daily travel, when family members frequently accompany the adult driver on shopping, recreation, and other trip types.
- The U.S. 1990 Census reports the county's mode split for work trips as 74% SOV, 12% HOV, 9% transit, and 5% by non-motorized modes. These figures apply to peak hour travel, and cannot be compared to the all day data reported in the table for this Indicator.

Indicator #44 Ability of goods and services to move efficiently and cost effectively through the region.

- At all three King County sites investigated: SR 18 at Auburn, I-5 at 185th St., and SR 522 at Woodinville, truck traffic has increased substantially between 1993 and 1999. Traffic along I-5 has seen the most increase in congestion from 1995 to 1999, particular by southbound morning travel and afternoon northbound travel with a volume-capacity (v/c) ratio at or above 1.25. At a v/c ratio of .5, travel speeds begin to decline with increasing traffic flow.
- Yet at SR 18 and SR 522, traffic congestion at peak hour has decreased due to a number of factors including road improvement, lane construction and decreases in peak-hour traffic.
- The growth rate of truck traffic in 1999 has far outpaced that of autos, from double the growth rate of auto traffic on SR 18 to five times the growth rate of autos on SR 522.

Indicator #45 Number of lane miles of city, county, and state roads and bridges in need of repair and preservation.

- In 1999, the total countywide lane miles in need of repair and preservation was 4,503.

III. Discussion

The county's transportation system is inextricably linked to its growth and development. This linkage means that growth trends may be evaluated through transportation system performance. Policy-based investments in the transportation system should produce and reinforce the desired development patterns. The Countywide Planning Policies call for a more compact, dense pattern of development that can be served efficiently and effectively with transportation investments, and which maximizes the use of existing transit services and road facilities.

The trends reported here have been apparent for the last several years before the Countywide Planning Policies were adopted. The CPPs goals and policies have not necessarily affected recent growth and development that is just now producing increased travel demand. As transportation and growth policies influence future development, the Indicator trends should show a decrease in the rate of growth of vehicle miles of travel, and an increase in per capita transit usage. While growth and transportation are linked closely, the location and density of growth, and the mode and trip length of urban travel have complex relationships that can only be explained by intricate traffic models.

The influence of transportation investments on the transportation Indicators will take some time to be recognized, since much of the current investment was programmed before the Countywide Planning Policies were adopted.



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VMT and Air Quality

Environment Indicator #12, *Vehicle miles traveled per capita per year*, is closely related to the Transportation Indicators. VMT per person increased 50.8% from 1985 to 1999. The increase is due to a combination of factors, including population and employment growth, lower density suburban development and increased propensity to travel. The result has been more vehicles on the road traveling more miles per capita.

Motor vehicles are the major source of carbon monoxide and hydrocarbon air pollutants. The VMT Indicator is used in the Environment section of the Benchmark Report to help monitor air quality. Although King County's per capita VMT is still increasing, regional air quality has improved with respect to the parameters identified in federal air quality standards. The regulation of auto emissions has been the primary contributor to improved air quality. Factors such as auto fuel efficiency and the availability of oxygenated gasoline in the wintertime also contribute to air quality improvement.

Commute Times

Available information indicates that the percent of residents who commute one way within thirty minutes is around 80%, and has changed little since 1989. The figures are taken from the Puget Sound Transportation Panel Survey (PSTPS) conducted by the Puget Sound Regional Council, the only annual source of information for this Indicator. The PSTPS is a longitudinal survey, which takes twice-yearly travel surveys from the same households. The survey methodology does not fully account for new growth. The result of this procedure is an overly-stable Indicator, which is only partially representative of new household growth in suburban King County. Future work for this Indicator will include finding a data source that describes the transportation characteristics of new growth as well as the present population.

Transit Ridership

Transit ridership dipped from 1990 - 1994, but has risen steadily from 1994 - 1999. It is generally keeping pace with population growth in the county. Transit ridership is a function of several regional variables, including fuel prices, unemployment, transit fare changes, suburban employment growth, and public perception of transit service and traffic congestion. Regional economic performance or fluctuations in fuel prices may explain the smaller trends within the data.

IV. General Information about Indicators and Data Sources

The transportation Indicators are based on data that are as reliable and consistent as possible within their limitations. Work in future years will attempt to improve and expand on data sources, and to provide more comparative information. As an example, the Commute Trip Reduction report from the State Energy Office contains valuable insight on SOV (single occupant vehicle) and VMT (vehicle miles traveled) reductions at major employment sites in the county.

Two Indicators that are currently not part of the Benchmark Report may provide valuable insight to transportation and land use development in the county: *Transportation Concurrency Approvals* and *Traffic Congestion*. The Growth Management Act requires jurisdictions to develop concurrency programs that maintain level-of-service standards for transportation and mobility. Transportation congestion is highly visible



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and readily experienced, and is easily related to transportation measures. Each can be quantified and reported on a yearly basis, and each is significant to the performance of the transportation system as it serves land use.



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V. Definition of Terms

- *HOV* is a high occupancy vehicle such as a van or carpool.
- *Mode* is the means of transportation, such as transit, walking or bicycling.
- *Mode split* describes the number or proportion of people using each transportation mode.
- *Non-Motorized* types of transportation include walking and bicycling.
- *SOV* is a single occupant vehicle.
- *Transit ridership* refers to the number of passenger boardings on motorbus, trolleybus, streetcar, and DART services.. These numbers do not include Vanpool, para-transit ridership or Sound Transit Service.
- *VMT* is vehicle miles traveled. See Environment Indicator #12 for more information.
- *Volume-to-Capacity Ratio (V/C)* is a level-of-service measure for roadways calculated by dividing the hour with the highest vehicle traffic volume by the carrying capacity of the road. Typically, a v/c ratio is calculated for the morning and afternoon commute.



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Outcome: Enhance Transportation and Land Use Linkages

INDICATOR 41: Percent of County residents who commute one-way within 30 minutes.

Percent of County Residents whose Daily One-Way Commutes is less than 30 Minutes, more than 30 Minutes and to more than One Workplace								
	1992	1993	1994	1995	1996	1997	1998	1999
Less than 30 minutes	81%	83%	78%	NA	83%	79%	NA	78%
More than 30 minutes	17%	15%	17%	NA	13%	17%	NA	17%
More than one work place	2%	2%	5%	NA	4%	4%	NA	5%

* No data was collected in 1995 or 1998.

Definitions:

- *These figures are taken from the Puget Sound Transportation Panel Survey (PSTPS) conducted by the Puget Sound Regional Council. This is the only annual source of information currently available for this Indicator. The sample of King County households (about 800) which provided the data represents a stable sample of county residents that changed only slightly over the survey period. The PSTPS is a longitudinal survey, which takes semi-annual travel surveys from the same households. These are selected and stratified to include higher-than-random numbers of families that use transit and carpools. The survey information only partly accounts for new growth in the county, since the same households have been used each year, allowing only for replacement of drop-out households. The result of this procedure is to show an overly stable Indicator, which is partially representative of new household growth in suburban King County.*

Observations:

- 78% of King County residents take less than thirty minutes to commute to or from work.
- This indicator does not include those commuters who live outside of King County and commute into or through King County. As the number of inter-county commuters increase, road congestion worsens, particularly along freeway corridors, causing longer travel times for commuters along those corridors.
- Future research may involve tracking all commuters who work in King County regardless of whether they reside within or outside King County. As average housing prices are higher in King County than in the surrounding communities, people move to neighboring counties and commute into King County for work. Currently, inter-county commuters are not measured in this indicator.

Data Source: *Puget Sound Transportation Panel Survey*, 1984-1994, 1996-1997, 1999, Puget Sound Regional Council.

Policy Rationale: The policy rationale stems from Countywide Planning Policies T-1 and T-4. This Indicator measures accessibility. The proximity of households to employment means more travel options are available, and fewer vehicle miles will be traveled.

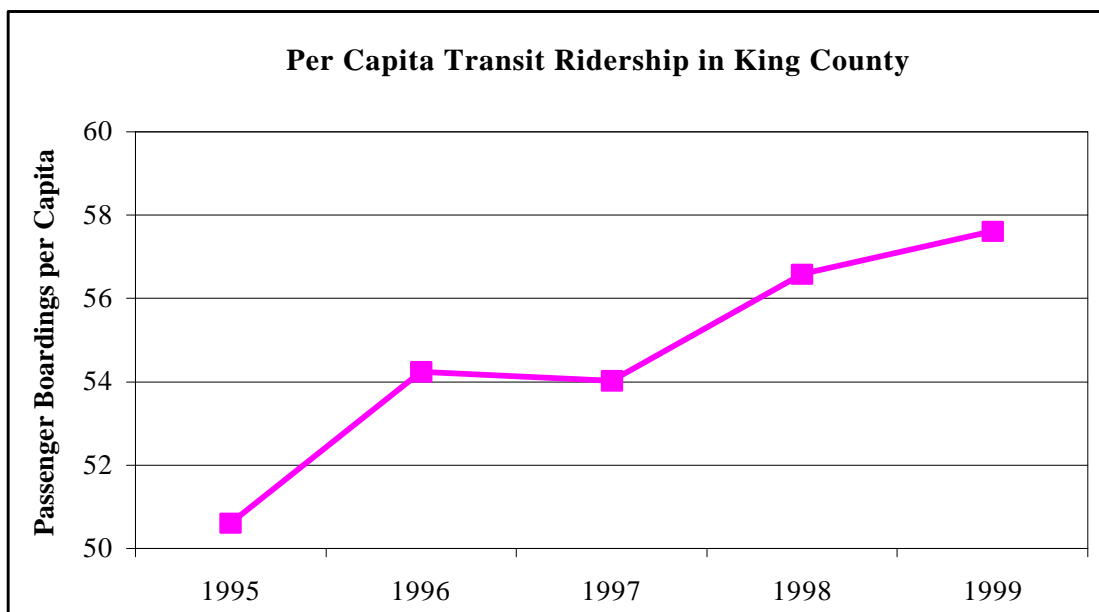


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Outcome: *Increase the Availability of Modes Other Than Single Occupant Vehicle.*

INDICATOR 42: Metro Transit Ridership.

Annual Metro Transit Ridership				
1995	1996	1997	1998	1999
81,657,696	88,334,963	88,926,696	94,256,548	96,605,574



Definitions:

- Ridership for 1995 - 1999 is based on annual operating statistics of passenger boarding on Metro Transit.
- Transit Ridership refers to the number of passenger boardings on motorbus, trolleybus, streetcar, and DART services. These numbers do not include Vanpool, para-transit ridership or Sound Transit Service.

Observations:

- Transit ridership grew by 2.5% from 1998 to 1999. From 1995 to 1999, transit ridership increased at an annual average rate of 4.3%.
- Transit ridership is a function of several regional variables, among them fuel prices, regional unemployment, transit fare changes, suburban employment growth, and public perception of transit service and traffic congestion. The ridership figures since 1996 show the effect of the Six-Year Plan enacted in the fall of 1996.



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INDICATOR 42:

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- During the 10 year period from 1990 to 1999, King County population increased by 11.2% and transit miles traveled increased by 23.3%.
- Prior to this year, transit ridership was measured using linked trips excluding transfers. The change to boarding-based ridership was necessitated by the move to regional passes in 1999. As well, this method of reporting ridership is consistent with the way in which ridership historically has been reported by the National Transit Database of the U.S. Department of Transportation.

Data Source: *Metro Transit General Manager's Quarterly Management Report*, Metro Transit Division, 4th Quarter, 1999. The ridership figures are derived from a sampling of transit ridership during the year; the population figures are consistent with those in the *King County Annual Growth Report*.

Policy Rationale: The policy rationale stems from Countywide Planning Policies FW-18, T-1, T-5, and T-14. Transit demand management plays an important role in the development of key strategies for serving future growth. Transit use affects mode split, air quality, vehicle miles traveled, and traffic congestion. It is a significant part of a multi-modal system.



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Outcome: Assess the Mode Split

INDICATOR 43: Percent of residents who walk or use transit, bicycles or carpools as alternatives to the single occupant vehicle.

Percent of County Residents Who Travel by Means other than Single Occupancy										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Transit	3.6%	NA	3.9%	4.1%	3.7%	NA	3.8%	5.7%	NA	5.9%
HOV/Carpool	33.4%	NA	35.3%	34.3%	35.8%	NA	33.8%	33.0%	NA	35.3%
Non-Motorized/ Other	5.8%	NA	5.8%	7.3%	6.3%	NA	6.9%	6.9%	NA	6.9%
SOV	56.3%	NA	54.4%	53.6%	53.7%	NA	55.4%	54.4%	NA	51.9%

Notes:

- HOV = High Occupancy Vehicle (van or carpool); Non-Motorized = Bicycle, Pedestrian; SOV = Single Occupant Vehicle. The numbers for 1997 are unweighted, so that the transit and HOV numbers may be overstated. The actual share of transit may be closer to 4 - 4.5%.
- No data was collected in 1991, 1995 and 1998.

Definitions:

- Percent distributions for each transportation mode were computed using the Puget Sound Transportation Panel Survey (PSTPS). For each of the seven years of PSTPS panel members were categorized by county of residence and by primary mode to work. The trip modes for each year were grouped accordingly: Single Occupancy Vehicles (SOV), High Occupancy Vehicles (including carpool, vanpool, and drive-on ferry), Transit (including bus, para-transit, walk-on ferry, and monorail), Non-Motorized (including walk and bicycle) and Other (including taxi, motorcycle, school bus, boat, plane, and train).
- The data was derived from the PSRC's Puget Sound Transportation Panel Survey, the same as for Indicator # 41. The same limitations apply, namely that the use of a constant panel over several years does not reflect growth trends adequately, and the data may show more stability than is actually the case.

Observations:

- The table shows that about one-third of daily household travel is made by high occupancy vehicles, and one-half by single occupancy vehicles. The remainder is by transit or non-motorized modes.
- The Washington State Energy Office's Report concludes that some trip reduction to work occurs because of telecommuting. In the 435 King County sites surveyed for 1995, the reduction in average daily person trips because of telecommuting was 280.
- The PSTPS does not measure travel at peak commute hours of the day. This is the time traffic is most congested and therefore most important to track. In the future this report may use data from the Washington State Energy Office's Commute Trip Reduction Program to track the use of alternative travel modes for commuting to work.



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INDICATOR 43:

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Observations: (continued)

- The high proportion of trips using the HOV mode (35.3% in 1999) is characteristic of daily travel. Looking at all trips, family members frequently accompany the adult driver on shopping, recreation, and other trip types. Peak hour HOV usage is approximately 20% of all person trips.
- The U.S. 1990 Census reports the county's mode split for work trips as 74% SOV, 12% HOV, 9% transit, and 5% by non-motorized modes. These figures apply to peak hour travel, not to the all-day data reported in the table above.
- Transit usage on a daily basis is about 6% of total travel, roughly the same as the regional peak hour mode split.

Data Source: *Puget Sound Transportation Panel Survey (PSTPS) 1984 -1997*, The Puget Sound Regional Council. Seattle, WA. *Initial Impacts, Benefits, and Costs of Washington's Commute Trip Reduction Program*. Washington State Energy Office.

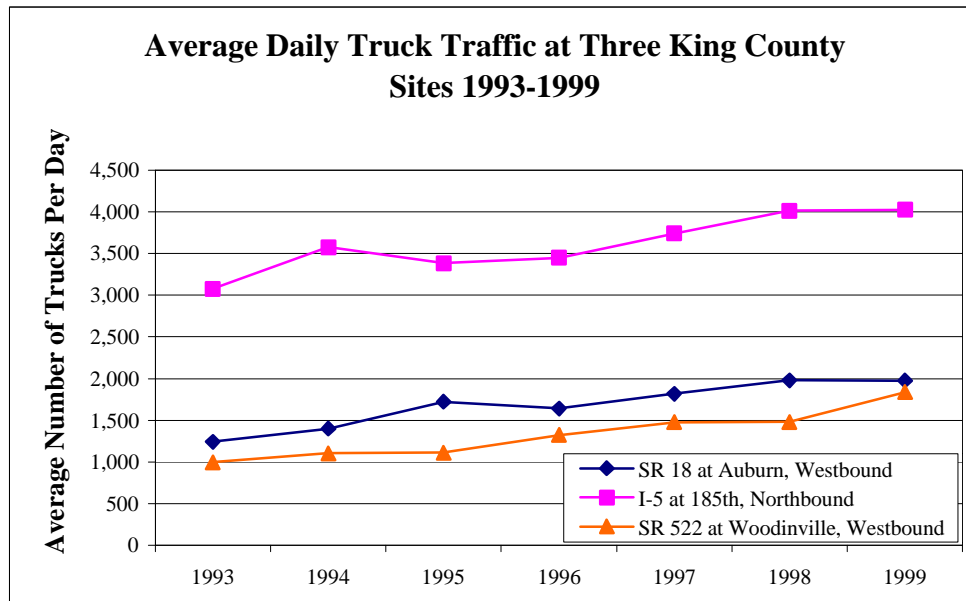
Policy Rationale: The policy rationale stems from Countywide Planning Policies FW-18, FW-19, T-1, T-7, T-8 and T-12. The CPPs encourage the development of an effective multi-modal transportation system that supports the use of modes other than the single occupant vehicle. Telecommuting is not counted as a mode of travel, but it may be tracked in the future as a factor in reducing commute trips.

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Outcome: Reduce Commercial Traffic Congestion

INDICATOR 44: Ability of goods and services to move efficiently and cost effectively through the region.

A. Average Daily Traffic: Freight Mobility



Definitions:

- The annual average daily traffic (ADT) is obtained by dividing the total annual vehicle counts by the number of days that counts were made.

Observations:

- At all three King County sites, truck traffic has increased substantially. However, truck traffic has increased at a faster rate than auto traffic at all three sites to become a larger share of total vehicles on the roads.
- With continued economic development, truck and auto traffic are likely to expand. At the same time, volume-to-capacity ratios continue to deteriorate along certain major corridors, as road capacity remains constant. The greater the roadway congestion, the more time it takes to move goods. This results in the increased cost of transporting freight by truck through King County.

Data Source: The data used to derive annual average daily traffic (ADT) and volume-to-capacity (v/c) ratios was obtained from the Transportation Data Office of the Washington Department of Transportation (WashDOT). Washington Department of Transportation collects vehicle counts by thirteen different axle types on state highways in King County.

Policy Rationale: The policy rationale stems from the Countywide Planning policies FW-20 and T-1. Freight and good mobility are critical to the economy and health of the region. Consideration should be given to enhancing mobility for freight and goods movement. Action that only improves commuting accessibility may not adequately address freight and goods mobility.



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Insert Freight Mobility Map

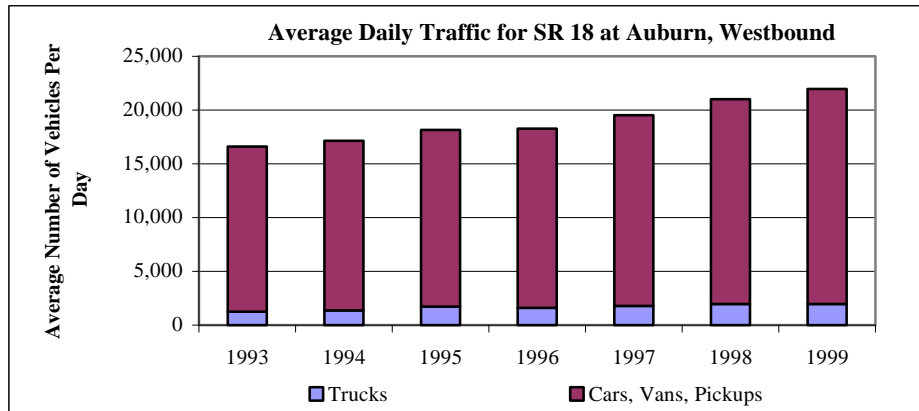
TRANSPORTATION INDICATORS

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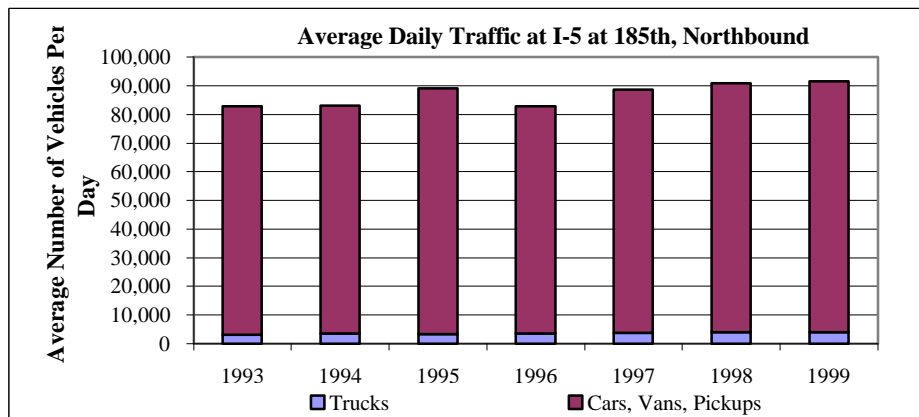
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B. Average Daily Traffic: Trucks and Cars

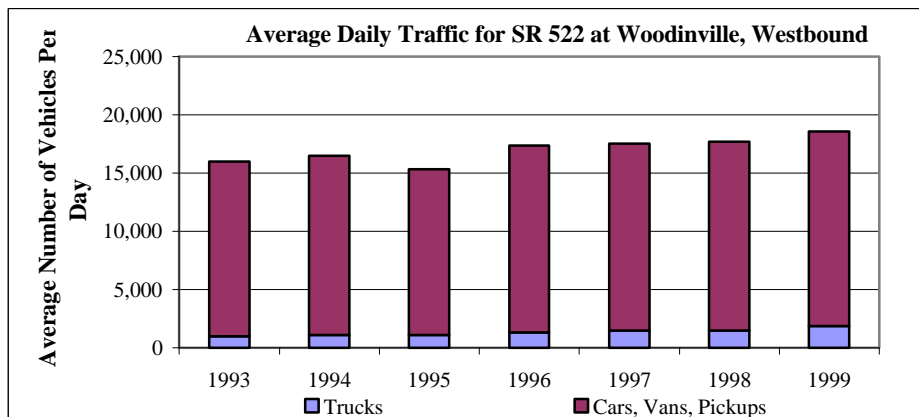
Auburn



I-5



Woodinville



* See page 141 for actual numbers.

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INDICATOR 44:

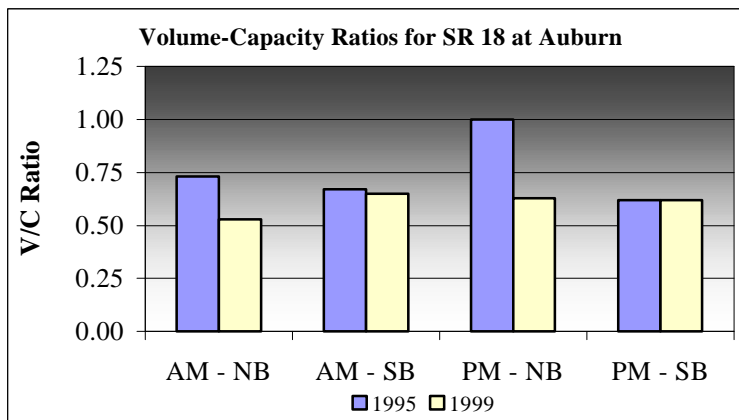
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C. Congestion: Volume to Capacity Ratios

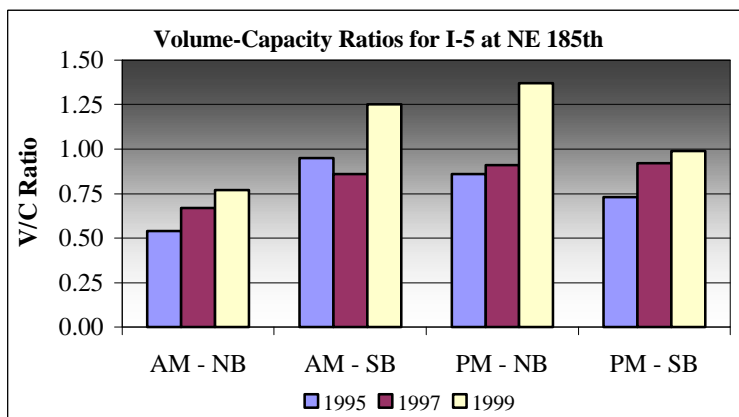
Definitions

- AM and PM refer to the morning and afternoon peak periods. NB and SB indicate traffic heading northbound and southbound respectively, while EB and WB refer to eastbound and westbound traffic.
- Volume-to-capacity (v/c) ratios measure traffic congestion by dividing the peak-hour traffic volume of the most congested hour in the morning and afternoon commute by the road capacity. This measurement does not directly show effects like peak-spreading or increases in road capacity due to improvements.

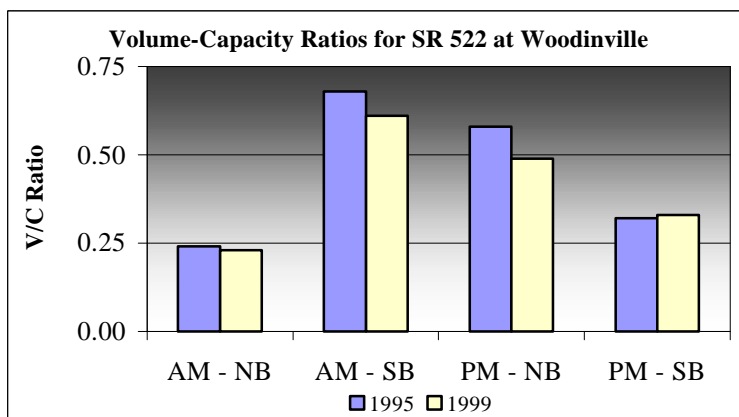
Auburn



I-5



Woodinville



V/C Ratio Description

- < 0.3 Free-flow operations
- .3 - .5 Reasonably free-flow operations; ability to maneuver is only slightly restricted
- .5 - .75 Travel speed still at or near free-flow, but ability to maneuver within the traffic stream is noticeably restricted
- .75 - .9 Travel speeds begin to decline with increasing flows; minor incidents can be expected to cause queuing
- .9 - 1.0 Operation at or near capacity and therefore volatile because there is virtually no useable gaps in the traffic stream; maneuverability is extremely limited; any disruption to the traffic stream, such as vehicles entering from ramps or changing lanes can cause disruption
- varies Breakdown in vehicular flow with queues forming behind major breakdown points, such as traffic accidents or recurring



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INDICATOR 44:

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Observations:

- While truck traffic at all three sites has increased, congestion at peak-hours for SR 18 at Auburn and SR 522 at Woodinville has decreased.
- At SR 18, two additional lanes have been added since 1995 increasing road capacity. At SR 522, the lanes were widened to increase capacity. As well, total peak hour traffic at these locations has decreased since 1995. This could be the result of commuters choosing to travel at different times or different routes.
- Congestion at I-5 has risen dramatically since 1995, particularly in morning travel southbound and afternoon travel northbound. The v/c ratios at these hours are above 1.25. The increase in congestion along I-5 at these times may be the result of the increase in inter-county commuters who reside in Snohomish County and commute into King County for work.
- About 50% of traffic delay in King County is the result of non-recurring incidents (traffic accidents) rather than roadway congestion.

Indicator 44: Background Information

Average Daily Traffic SR 18 at Auburn, West Bound								
	1993	1994	1995	1996	1997	1998	1999	Annual Average Change
Trucks	1,241	1,400	1,720	1,640	1,818	1,981	1,974	8.0%
Cars, Vans, Pickups	15,388	15,729	16,431	16,653	17,670	19,028	19,965	4.4%
Total vehicles	16,629	17,129	18,151	18,293	19,488	21,008	21,939	4.7%
Trucks as % of Total	7.5%	8.2%	9.5%	9.0%	9.3%	9.4%	9.0%	

Average Daily Traffic for I-5 at 185 th , North Bound								
	1993	1994	1995	1996	1997	1998	1999	Annual Average Change
Trucks	3,080	3,578	3,387	3,452	3,743	4,016	4,029	4.6%
Cars, Vans, Pickups	79,796	79,405	85,724	79,489	84,942	86,899	87,531	1.6%
Total vehicles	82,876	82,983	89,111	82,941	88,685	90,915	91,560	1.7%
Trucks as % of Total	3.7%	4.3%	3.8%	4.2%	4.2%	4.4%	4.4%	

Average Daily Traffic for SR 522 at Woodinville, West Bound								
	1993	1994	1995	1996	1997	1998	1999	Annual Average Change
Trucks	996	1,102	1,111	1,322	1,476	1,478	1,838	10.8%
Cars, Vans, Pickups	14,977	15,368	14,230	16,034	16,022	16,180	16,729	1.9%
Total vehicles	15,973	16,470	15,341	17,356	17,498	17,658	18,567	2.5%
Trucks as % of Total	6.2%	6.7%	7.2%	7.6%	8.4%	8.4%	9.9%	



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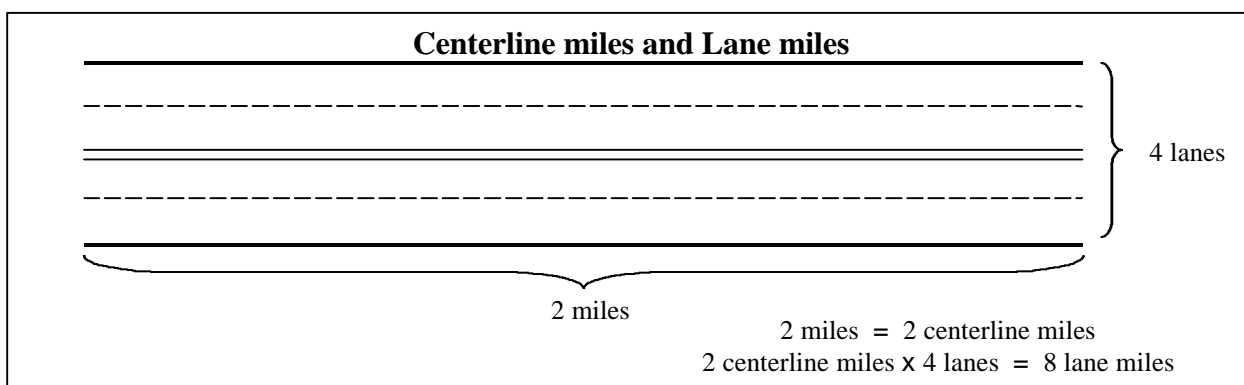
Outcome: Protect and Improve Transportation Infrastructure

INDICATOR 45: Number of lane miles of city, county and state roads and bridges in need of repair and preservation.

Number of Lane Miles in Need of Repair and Preservation	
Total Lane Miles Needing Repair in 1999	4,503

Definitions:

- **Lane miles** refers to the total length of all lanes under consideration. **Centerline miles** refers to the number of miles along the “center line” of a road regardless of the number of lanes it contains. It is used to estimate the total amount of roadway in a jurisdiction. Thus a four-lane road of two “centerline” miles would amount to eight lane miles. Repair and construction costs are generally estimated in lane miles. An average for most cities would be approximately 2.3 lane miles per centerline mile



- There are three basic operations that agencies undertake on their roads: **maintenance, rehabilitation, and reconstruction**. Maintenance refers to routine procedures such as crack sealing, patching, and pre-leveling (or skin patching) which needs to be done on all roadways every 2 - 6 years (see table below). Rehabilitation ordinarily involves repaving of a road segment. This needs to be done about every 12 years on arterials and approximately every 25 years on residential streets. Reconstruction refers to the major rebuilding of a roadway.
- As used in the table above, the terms “**repair**” and “**preservation**” are loosely defined. In most cases they refer to the number of lane miles in need of any of the three types of operations **in the near future (one to two-years)**. Because they have not yet been precisely defined, there may be considerable variation in the number of lane miles each city considers in need of “repair” or “preservation”. The numbers above and in the background table should be taken as broad estimates.
- Roads are generally divided into **arterials, collectors, and residential streets**. They may be further classified as urban or rural. Generally, arterials (because they carry the most traffic) will need maintenance and rehabilitation more often than residential streets.
- There are three types of paved roadways: **asphalt, bituminous-treated (BST) and Portland Cement Concrete**. BST is generally not used on arterial or collector pavements. Other than in Seattle, there will be very few, if any, Portland Cement Concrete pavements. Asphalt is most common.



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INDICATOR 44:

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Observations:

- As reported by the cities, the county, and the state approximately 4,700 lane miles of roads in King County will require maintenance, rehabilitation, or reconstruction in the next few years.
- It is difficult to estimate the actual cost of road repair per lane mile since there are so many variables to consider. However, the chart below gives some approximate costs per square yard and per lane mile for 1997 depending on whether the segment is an arterial or residential street. For instance, rehabilitating (repaving) an asphalt arterial would cost approximately \$42,000 per lane mile. The costs are for the in-place materials and do not reflect any improvements or overhead.
- In future years, a more precise definition of “lane miles in need of repair” will yield more consistent numbers from the jurisdictions and their projected annual road budgets.

Data Source: Cities Benchmark Data; King County Transportation Planning, Washington State Department of Transportation. Derald Christensen, Measurement Research Corporation, Gig Harbor, WA.

Policy Rationale: The policy rationale stems from Countywide Planning Policies FW-20 through FW-23 and T-8. This Indicator attempts to measure our ability to protect and preserve our existing infrastructure, and to eliminate, lessen or defer the need to invest in new facilities.

Indicator # 45 Background Information

Approximate Cost for Repair and Preservation by Square Yard and Lane Mile for Arterial and Residential Streets in 1997							
	Routine Maint.	Rehab: Asphalt	Rehab: BST	Rehab: PCC	Reconst: Asphalt	Reconst: BST	Reconst: PCC
Unit Cost - Arterial/yd ²	\$0.75	\$6	\$250	NA	\$20	\$5	\$60
Unit Cost - Residential	\$0.50	\$5	\$125	NA	\$15	\$4	\$50
Lane Mile Cost - Arterial	\$5,280	\$42,000	\$14,600	NA	\$140,000	\$35,200	\$4,224
Lane Mile Cost- Residential	\$3,227	\$32,300	\$8,067	NA	\$96,800	\$25,800	\$3,226
Average Expected Life - Arterial	2 - 4	12	8	12 - 30	15 - 20	7 - 8	30
Average Expected Life - Residential	4 - 6	27	10	20 - 50	25 - 30	8 - 15	50

Budgeting for Road Repair and Preservation

Dividing the total budget by the number of centerline miles yields the amount of budgeted dollars per mile of roadway. As the table on the following page shows, the total budgeted dollars divided by the total centerline miles gives a per mile budget in the neighborhood of \$4,000. Other sources confirm that a yearly budget of approximately \$4,500 - \$5,000 per centerline mile of roadway is reasonable for most jurisdictions. However, there is considerable variation among jurisdictions depending on the current condition of roads and on the overhead costs in the city. Some cities may include more overhead costs in their calculations and hence have a considerably higher figure per mile.

Another method of estimating the costs of road maintenance and rehabilitation is to assume that approximately 3 - 8% of a jurisdiction's centerline miles of road will need attention each year. For a city such as Federal Way, which budgeted about \$4,500 per centerline mile per year, the total budget of \$925,000 is roughly equal to the cost of repaving 5% of the lane miles with asphalt. (i.e. 5% of 205 centerline miles equals 23.5 lane miles in need of repaving at a cost of \$42,000 per arterial lane mile. This amounts to \$990,000). However, in actuality, of the 5% of the lane miles in need of attention, some will be at a lower cost (maintenance) and some at a higher cost (reconstruction).



Metropolitan King County *Countywide Planning Policies* Benchmark Program

TRANSPORTATION INDICATORS

Indicator #45 Background Information

Number of Lane Miles in Need of Repair and Preservation by Jurisdiction					
	Total Centerline Miles 1999	Total Lane Miles 1999	Typical Annual Number of Lane Miles in need of repair	Estimated Number of Lane Miles in need of repair in 1999	Percent of Lane Miles in need of Repair in 1999
Algona	NA	NA	NA	NA	NA
Auburn	151.0	377.0	20.8	200.0	53.1%
Beaux Arts	2.5	3.0	0.3	0.0	0.0%
Bellevue	372.0	846.0	51.3	329.0	38.9%
Black Diamond	NA	NA	NA	NA	NA
Bothell	NA	600.0	NA	60.0	10.0%
Burien	113.0	246.6	15.6	37.0	15.0%
Carnation	9.3	18.6	1.3	1.2	6.5%
Clyde Hill	NA	NA	NA	NA	NA
Covington	50.0	60.0	6.9	10.0	16.7%
Des Moines	85.2	NA	11.8	NA	NA
Duvall	NA	NA	NA	NA	NA
Enumclaw	27.6	NA	3.8	NA	NA
Federal Way	234.9	475.3	32.4	50.5	10.6%
Hunts Point	NA	NA	NA	0.3	NA
Issaquah	48.6	109.9	6.7	18.0	16.4%
Kenmore	103.4	216.5	14.3	0.0	0.0%
Kent	218.0	510.0	30.1	25.0	4.9%
Kirkland	150.0	295.0	20.7	100.0	33.9%
Lake Forest Park	NA	NA	NA	NA	NA
Maple Valley	47.5	93.5	6.6	1.5	1.6%
Medina	NA	NA	NA	NA	NA
Mercer Island	79.9	165.9	11.0	14.0	8.4%
Milton	0.3	NA	0.0	NA	NA
Newcastle	27.0	54.0	3.7	1.0	1.9%
Normandy Park	26.7	NA	3.7	53.4	NA
North Bend	23.4	A	3.2	NA	NA
Pacific	NA	NA	NA	3.0	NA
Redmond	130.0	290.0	17.9	70.0	24.1%
Renton	174.0	453.0	24.0	138.0	30.5%
SeaTac	129.1	NA	17.8	NA	NA
Seattle	1691.0	4230.0	233.4	3088.0	73.0%
Shoreline	167.8	353.3	23.2	52.8	14.9%
Skykomish	3.3	3.3	0.4	3.3	100.0%
Snoqualmie	18.5	41.0	2.5	5.0	12.2%
Tukwila	53.8	NA	7.4	NA	NA
Woodinville	43.5	94.4	6.0	2.5	2.6%
Unincorporated King	1907.0	4192.7	263.2	240.0	5.7%
Yarrow Point	NA	NA	NA	NA	NA

Note:

1. This "typical" amount of lane miles that would need repair in a given year is based on the following formula: 6% of centerline miles x 2.3 lane miles per centerline mile or 0.06 x Centerline Miles x 2.3 = lane miles in need of repair each year. This assumes that maintenance and rehabilitation is being done regularly, and has not been deferred for a number of years. The actual lane miles in need of repair often reflect years of deferred maintenance.
2. In addition to 89 lane miles of road resurfacing/maintenance in King County completed in 1999, the State of Washington undertakes many projects such as bridge repair and painting, which cannot be measured in lane miles. These are not included in the table.
3. Cities that did not report information for each category noted with a NA.



TRANSPORTATION INDICATORS

INDICATOR 45:

(continued from previous page)

Indicator #45 Background Information

1999 Road Budgets by Jurisdictions in King County				
Cities	Road Maintenance and Preservation	New Construction	Other	Total
Algona	NA	NA	NA	NA
Auburn	\$1,369,000	\$31,000,000	\$2,631,000	\$35,000,000
Beaux Arts	\$10,000	\$0	\$17,595	\$27,595
Bellevue	NA	NA	NA	NA
Black Diamond	NA	NA	NA	NA
Bothell	NA	NA	NA	NA
Burien	NA	NA	NA	NA
Carnation	\$68,000	\$0	\$48,000	\$116,000
Clyde Hill	\$162,500	\$0	\$0	\$162,500
Covington	\$465,244	\$500,000	\$153,626	\$1,118,870
Des Moines	NA	NA	NA	NA
Duvall	NA	NA	NA	NA
Enumclaw	NA	NA	NA	NA
Federal Way	\$4,152,206	\$16,687,842	\$0	\$20,840,048
Hunts Point	NA	NA	NA	NA
Issaquah	\$490,000	\$0	\$0	\$490,000
Kenmore	NA	NA	NA	NA
Kent	\$500,000	\$250,000	\$80,000	\$830,000
Kirkland	\$1,250,000	\$2,025,000	\$0	\$3,275,000
Lake Forest Park	NA	NA	NA	NA
Maple Valley	NA	NA	NA	NA
Medina	NA	NA	NA	NA
Mercer Island	\$1,181,000	\$125,000	\$354,000	\$1,660,000
Milton	NA	NA	NA	NA
Newcastle	NA	NA	NA	NA
Normandy Park	\$85,760	\$0	\$0	\$85,760
North Bend	NA	NA	NA	NA
Pacific	\$126,000	\$0	\$256,000	\$382,000
Redmond	NA	NA	NA	NA
Renton	\$2,148,893	\$14,597,800	\$3,271,719	\$20,018,412
SeaTac	\$2,378,624	\$2,378,624	\$5,225,540	\$9,072,766
Seattle	\$6,100,000	NA	NA	NA
Shoreline	\$2,180,168	\$151,951	\$782,004	\$3,114,123
Skykomish	\$32,000	\$0	\$0	\$32,000
Snoqualmie	\$94,210	\$355,962	\$1,169,291	\$1,619,463
Tukwila	NA	NA	NA	\$375,808
Woodinville	NA	NA	NA	NA
Unincorporated King	\$2,400,000	\$0	NA	\$65,000,000
Yarrow Point	NA	NA	NA	NA