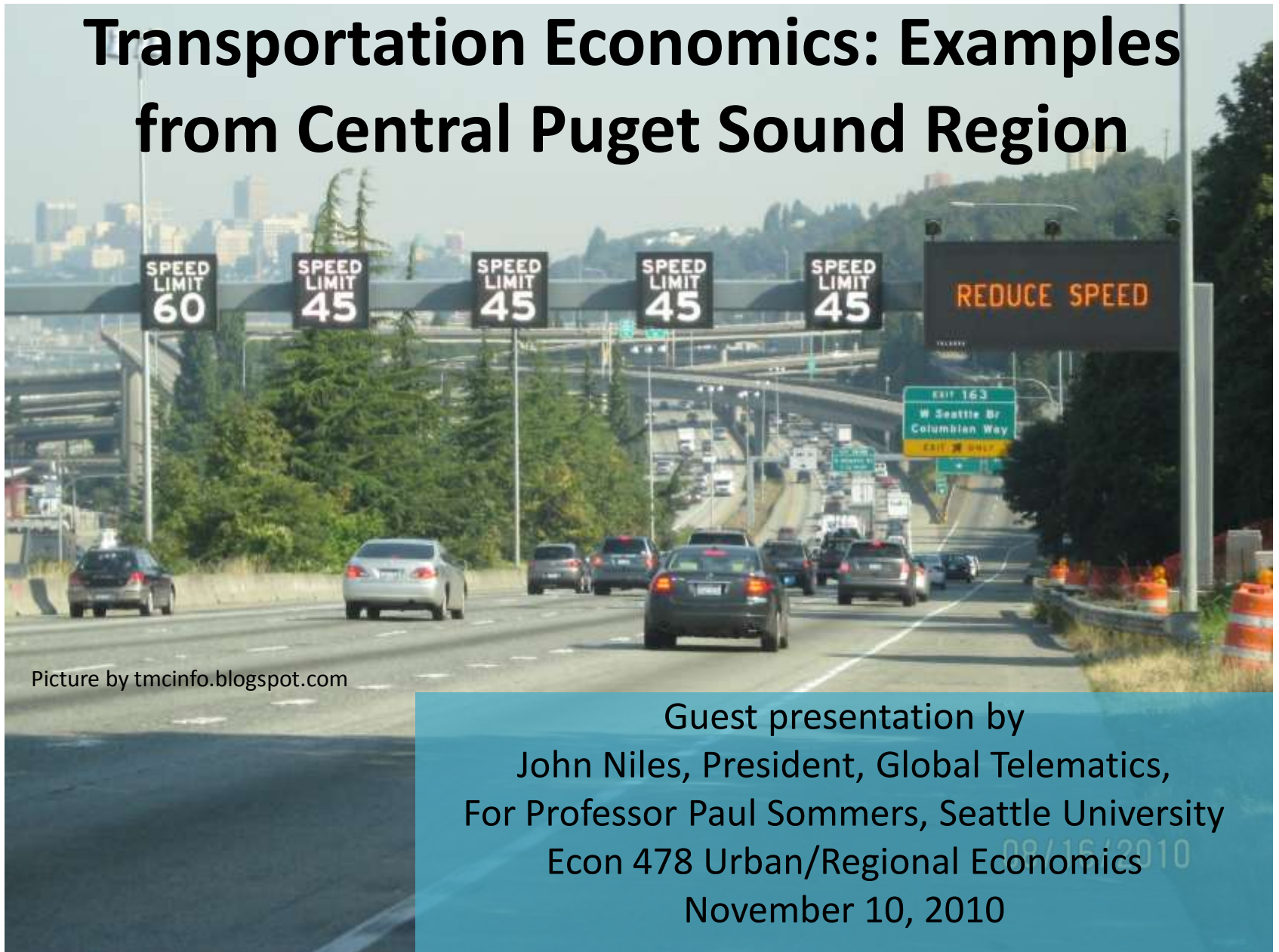


# Transportation Economics: Examples from Central Puget Sound Region



Picture by [tmcinfo.blogspot.com](http://tmcinfo.blogspot.com)

Guest presentation by  
John Niles, President, Global Telematics,  
For Professor Paul Sommers, Seattle University  
Econ 478 Urban/Regional Economics  
November 10, 2010

# What is Global Telematics?

- Independent policy research and consulting assistance
- Specialty: interaction of transportation & telecom
- For government agencies, think tanks, civic associations, universities, foundations
- Telematics (originally, in Europe) = marriage of computers & telecommunications
- Telematics applies to health care, education, transportation, et al
- Telematics (lately, worldwide) = information technology applied to transportation
- [www.globaltelematics.com](http://www.globaltelematics.com)
- [www.twitter.com/jn\\_seattle](https://www.twitter.com/jn_seattle)

# Many big differences between telecommunicating & proximity

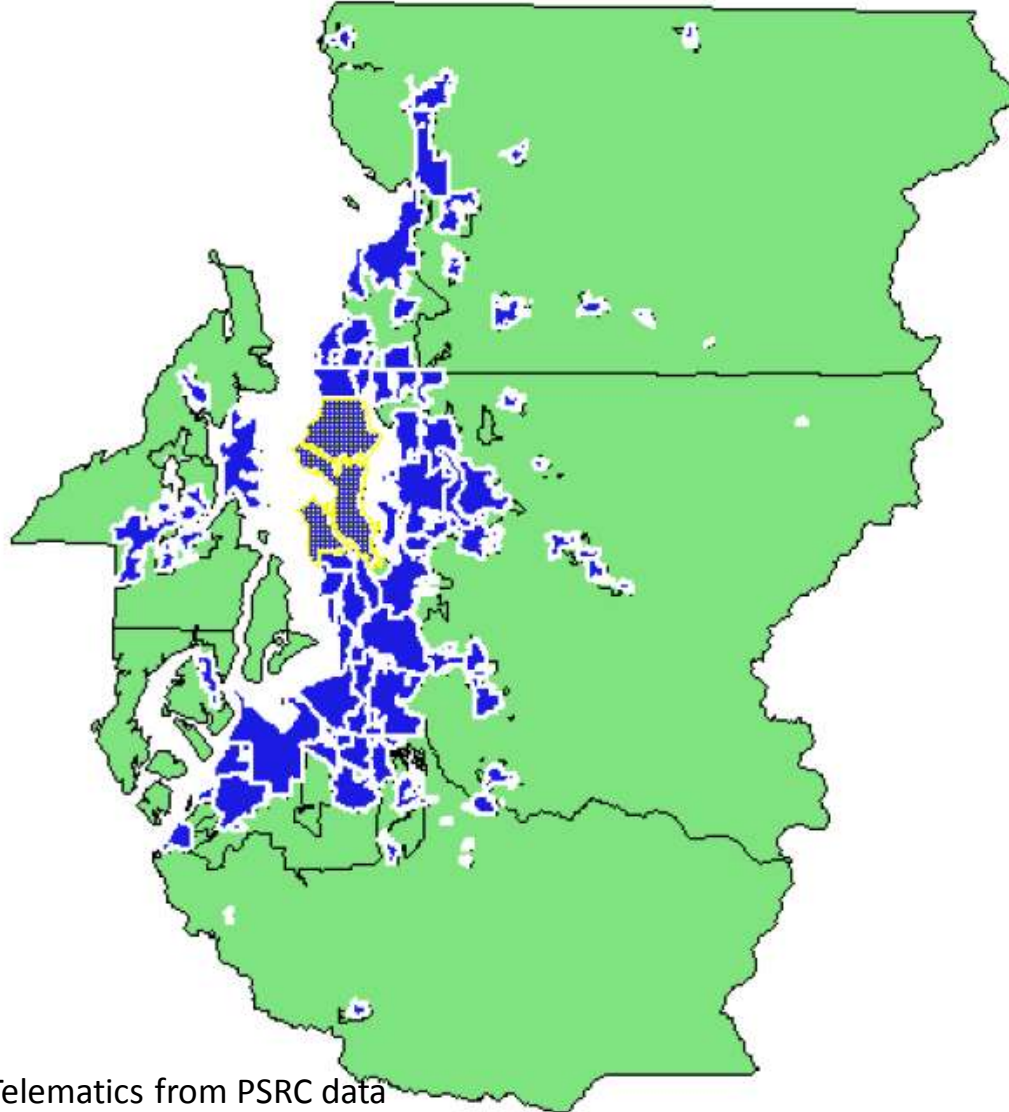
- For example, kind of attention needed
- Different levels of concern & commitment
- Power & status
- Peripheral opportunities in visiting
- Unique values in each
- More complements, than substitutes
- Telecom makes travel more efficient & effective

# Central Puget Sound Region (CPSR)



Map from Municipal Research and Services Center

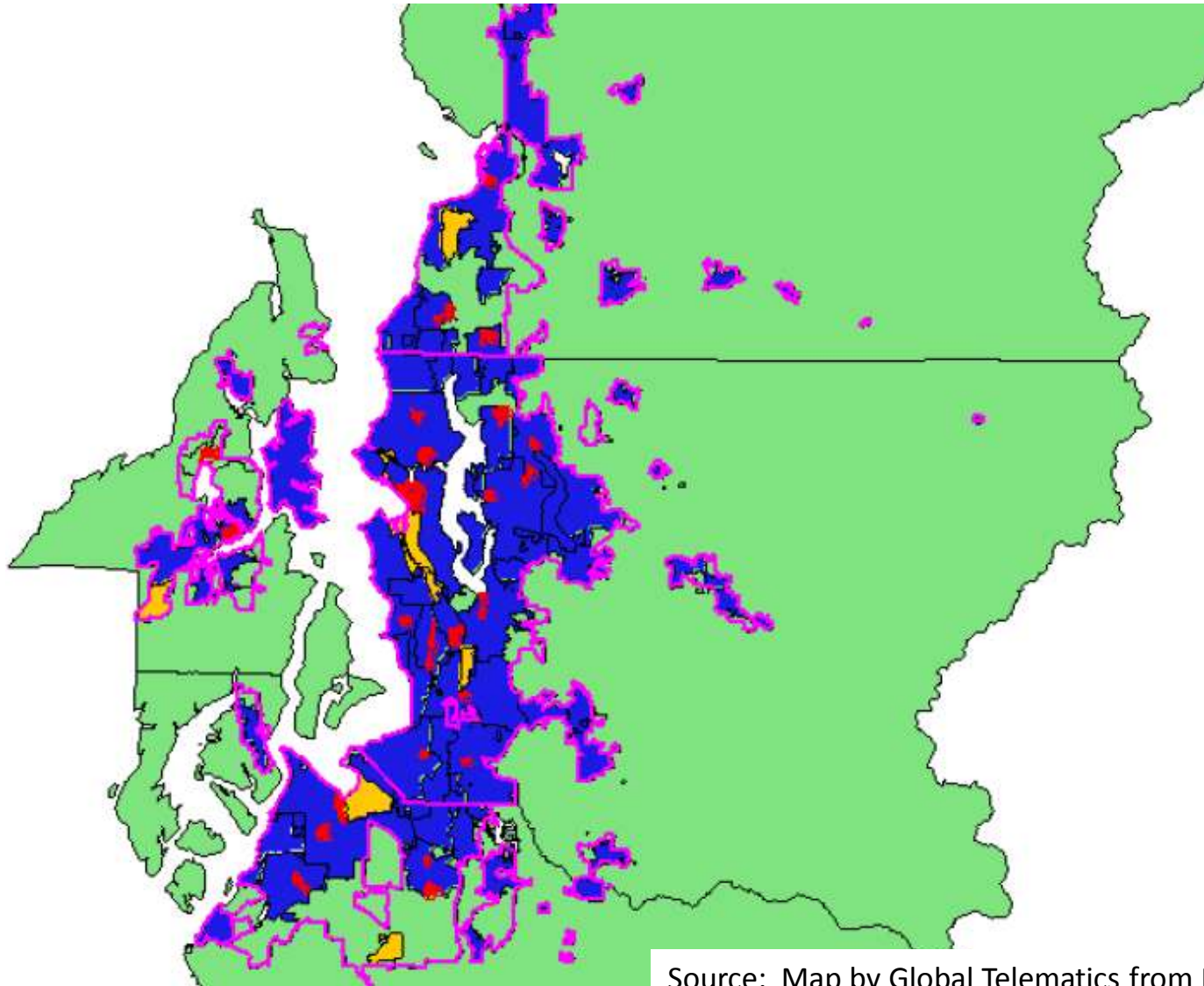
# Central Puget Sound Region Cities



Source: Map by Global Telematics from PSRC data



# CPSR Urban Features



Source: Map by Global Telematics from PSRC data

# CPSR Transportation Network With Congested Roads in Red

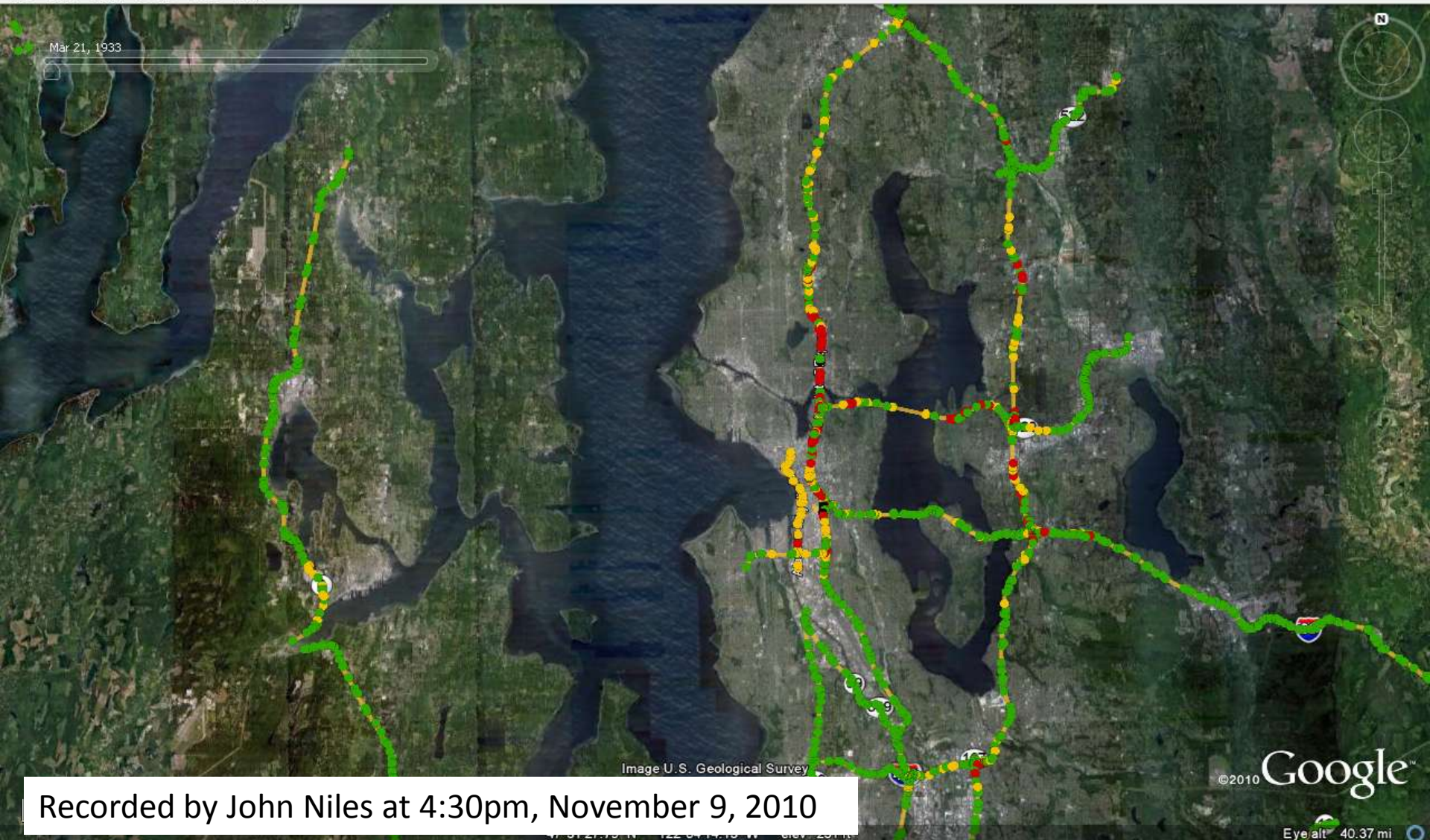


Source: PSRC map made with data from WSDOT 2006 Highway Performance Monitoring System.



# Seattle-Bellevue Road Congestion

File Edit View Tools Add Help

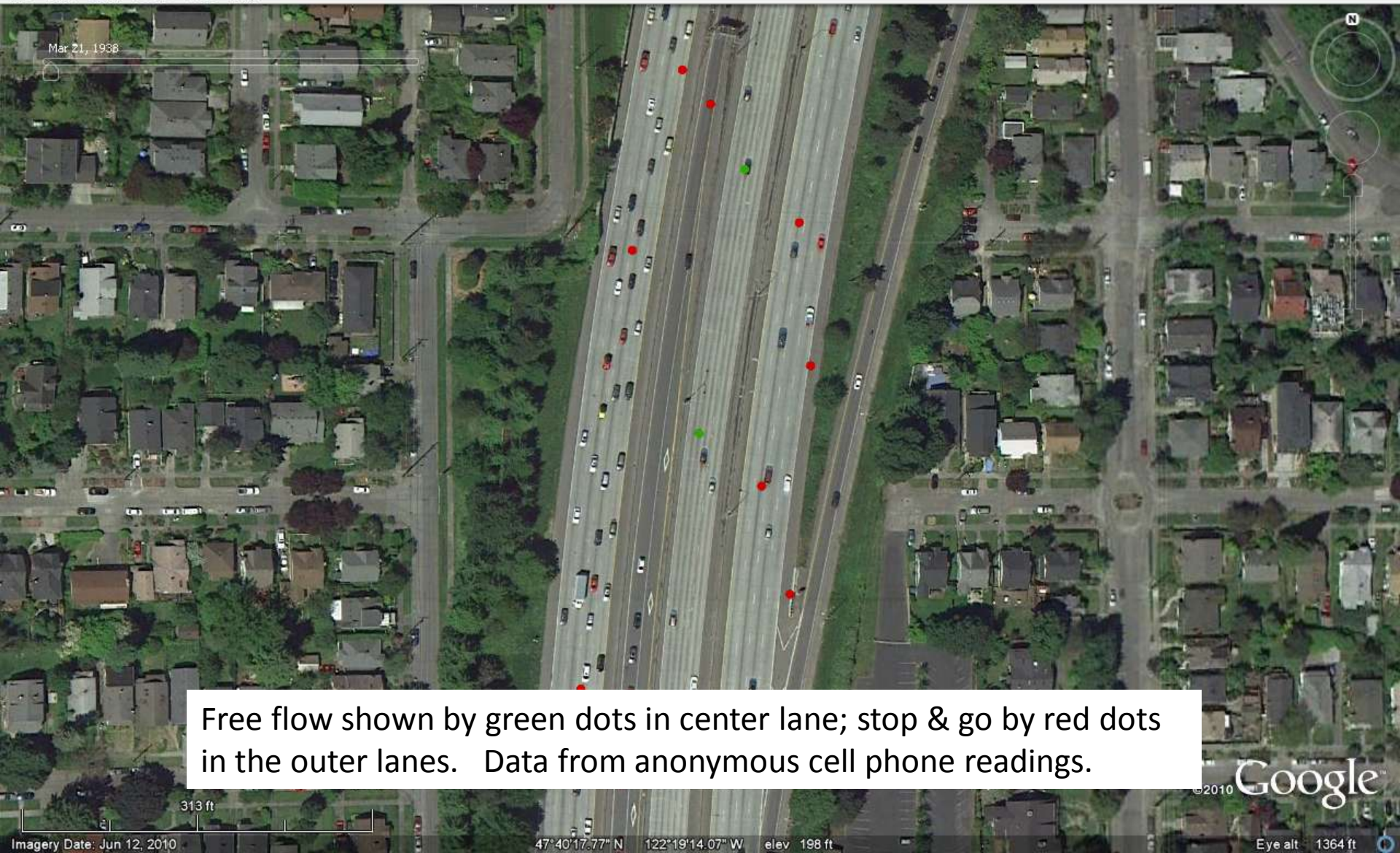


Recorded by John Niles at 4:30pm, November 9, 2010



# Express Lanes at Free Flow!

File Edit View Tools Add Help



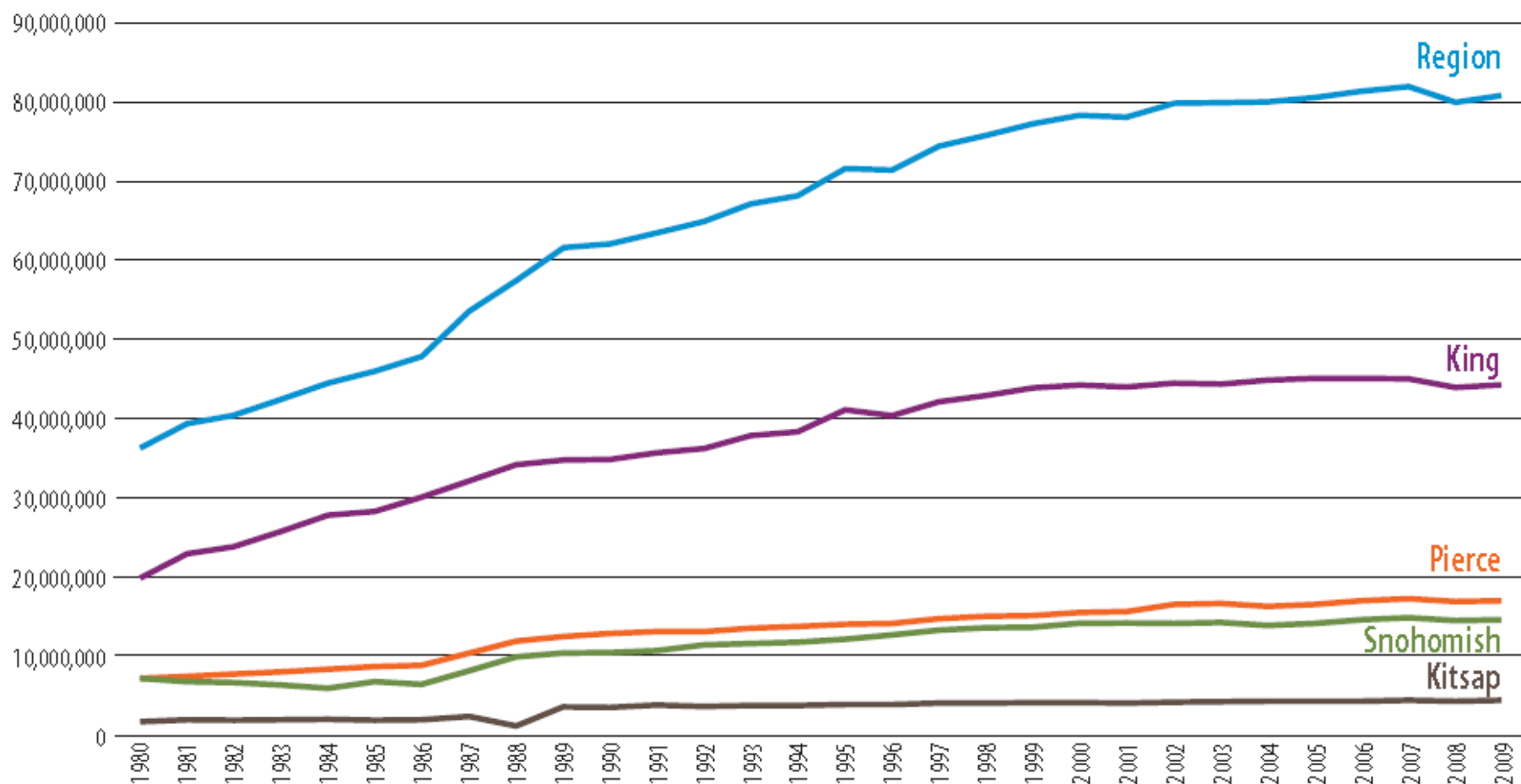
Free flow shown by green dots in center lane; stop & go by red dots in the outer lanes. Data from anonymous cell phone readings.

©2010 Google

Eye alt 1364 ft

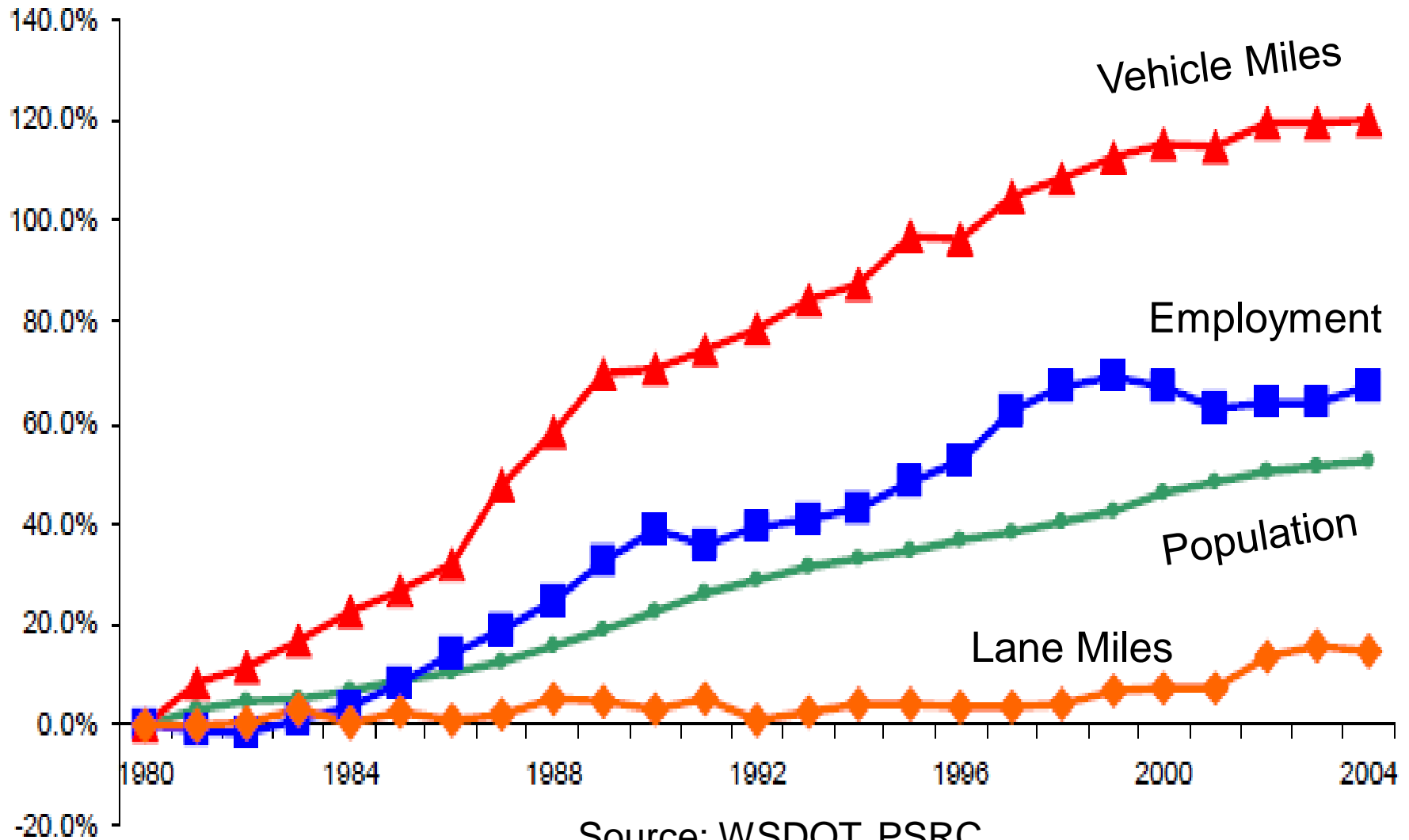
# Growth in Regional Daily Travel

Figure 1. Daily VMT by County



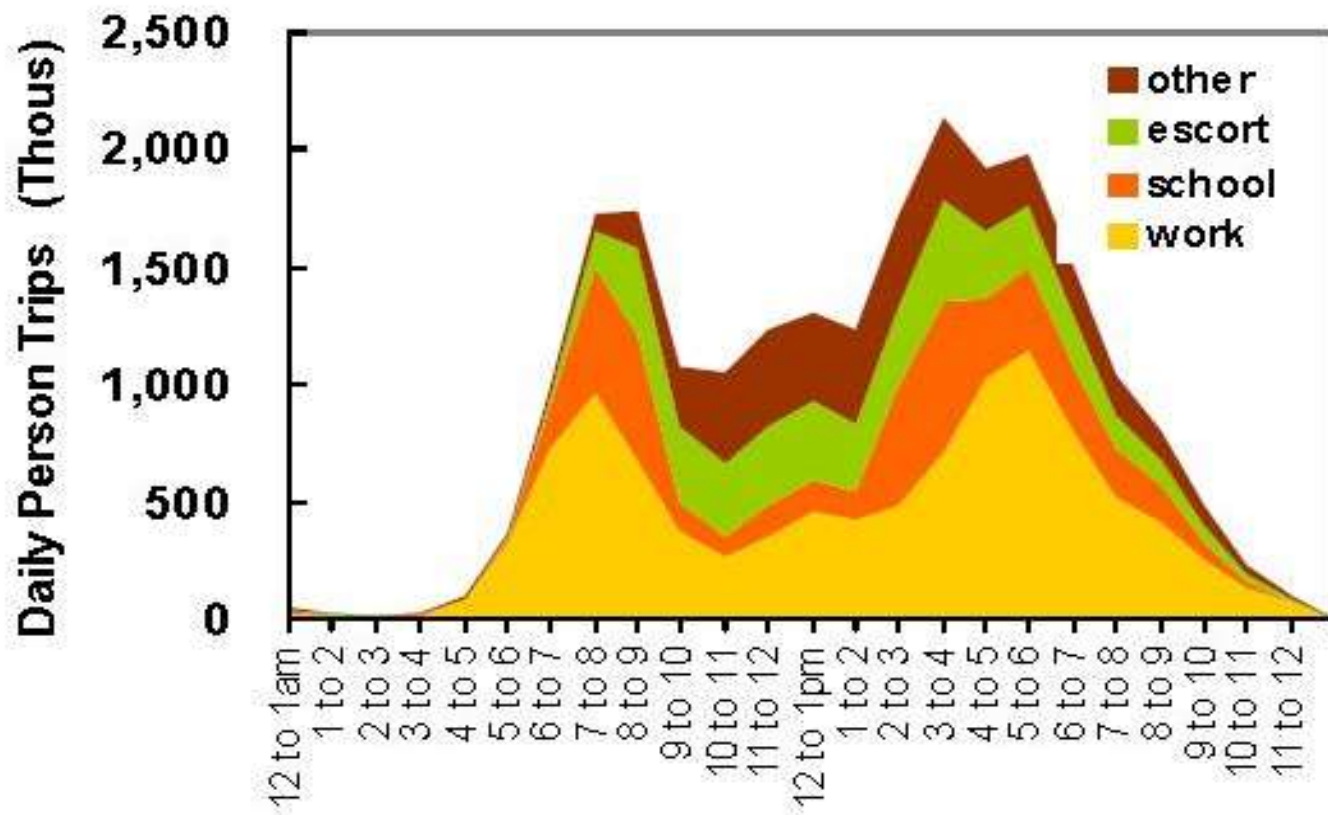
Source: PSRC

# Little growth in highway lane miles



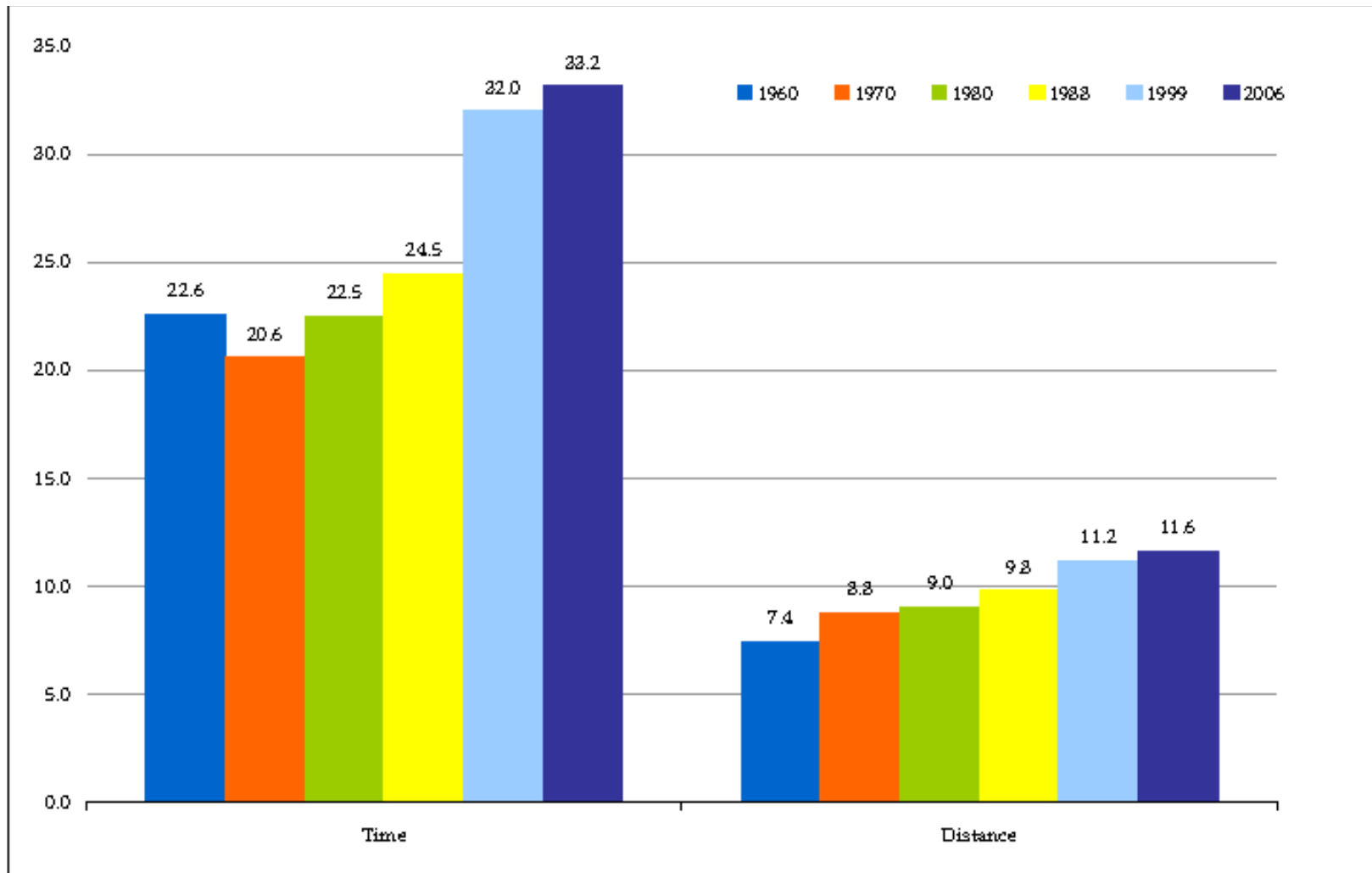


# Trip Purpose by Time of Day



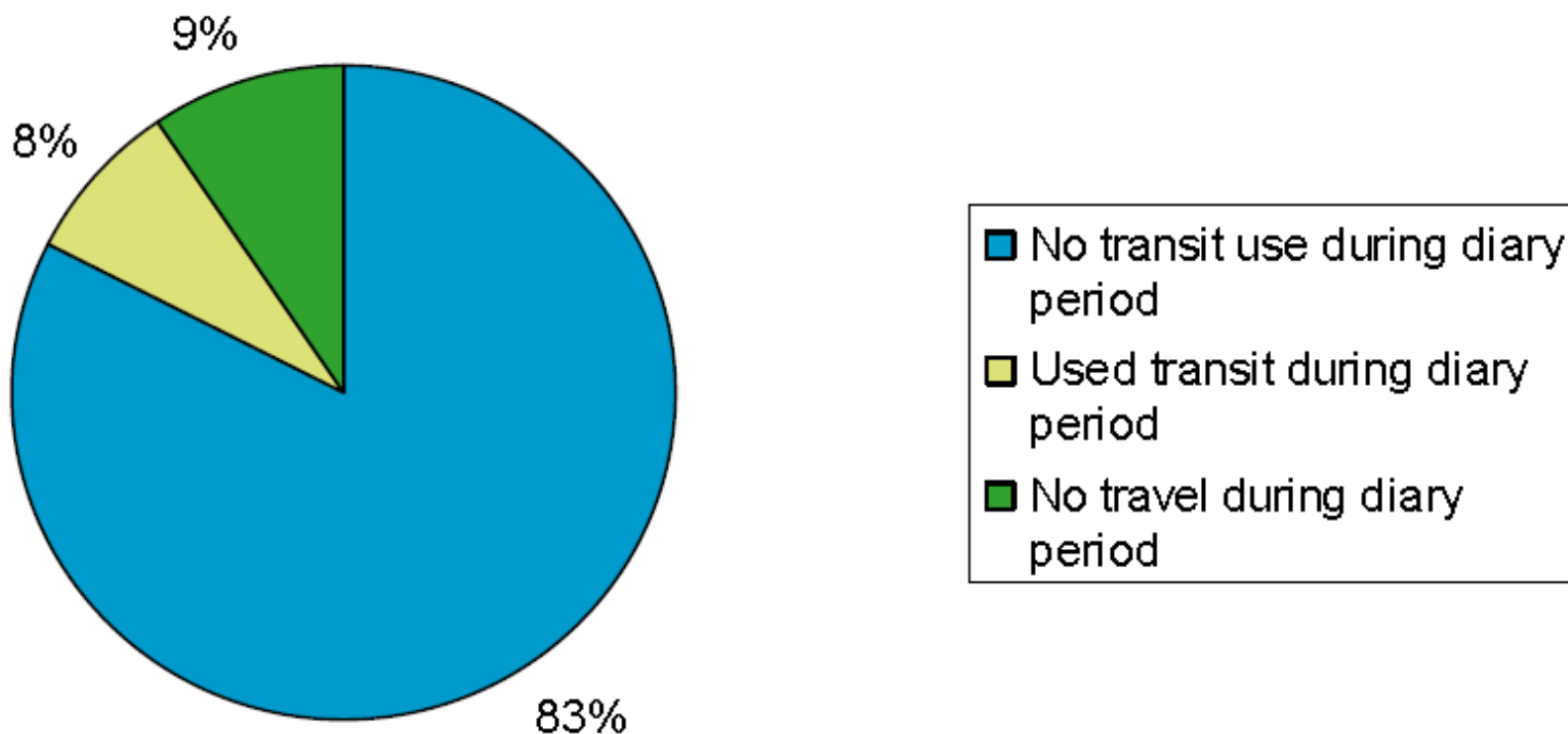
Source: PSRC, 2006

# Commuting Distance & Time



Source: PSRC Household Travel Survey

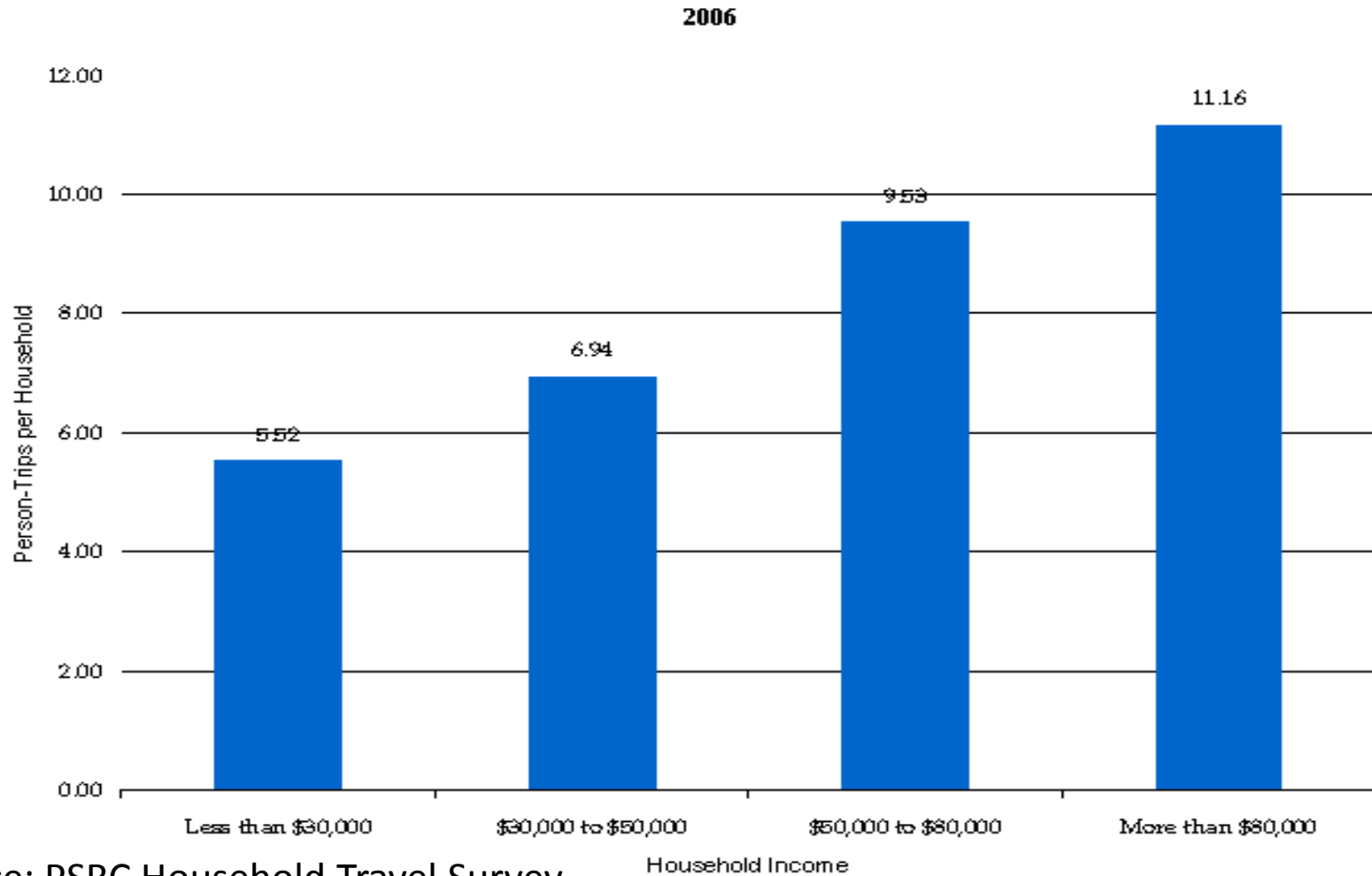
# Surveyed CPSR Households Reporting Transit Use, 2006



Source: PSRC Household Travel Survey

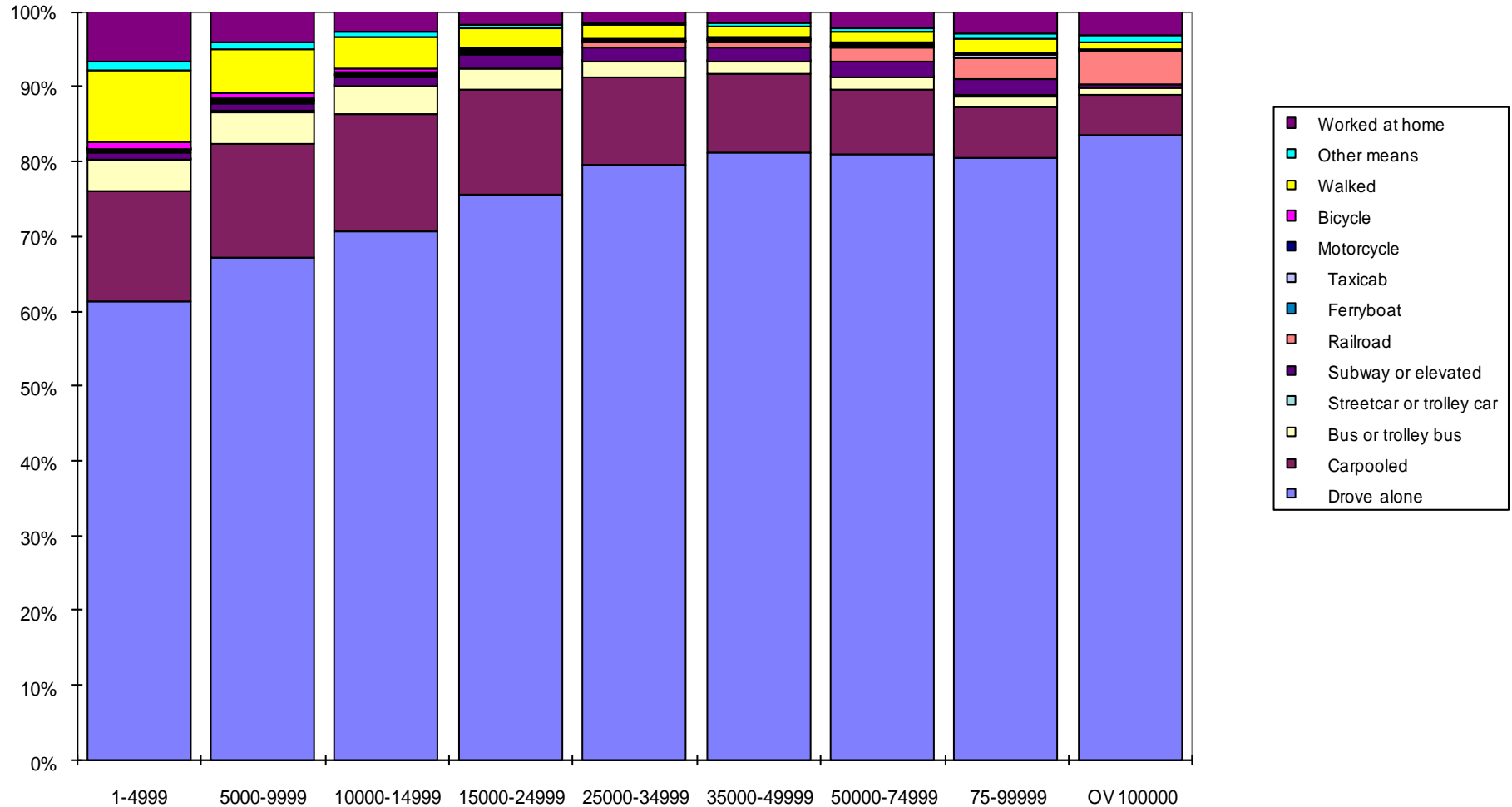


# Trip Making Rises with Household Income

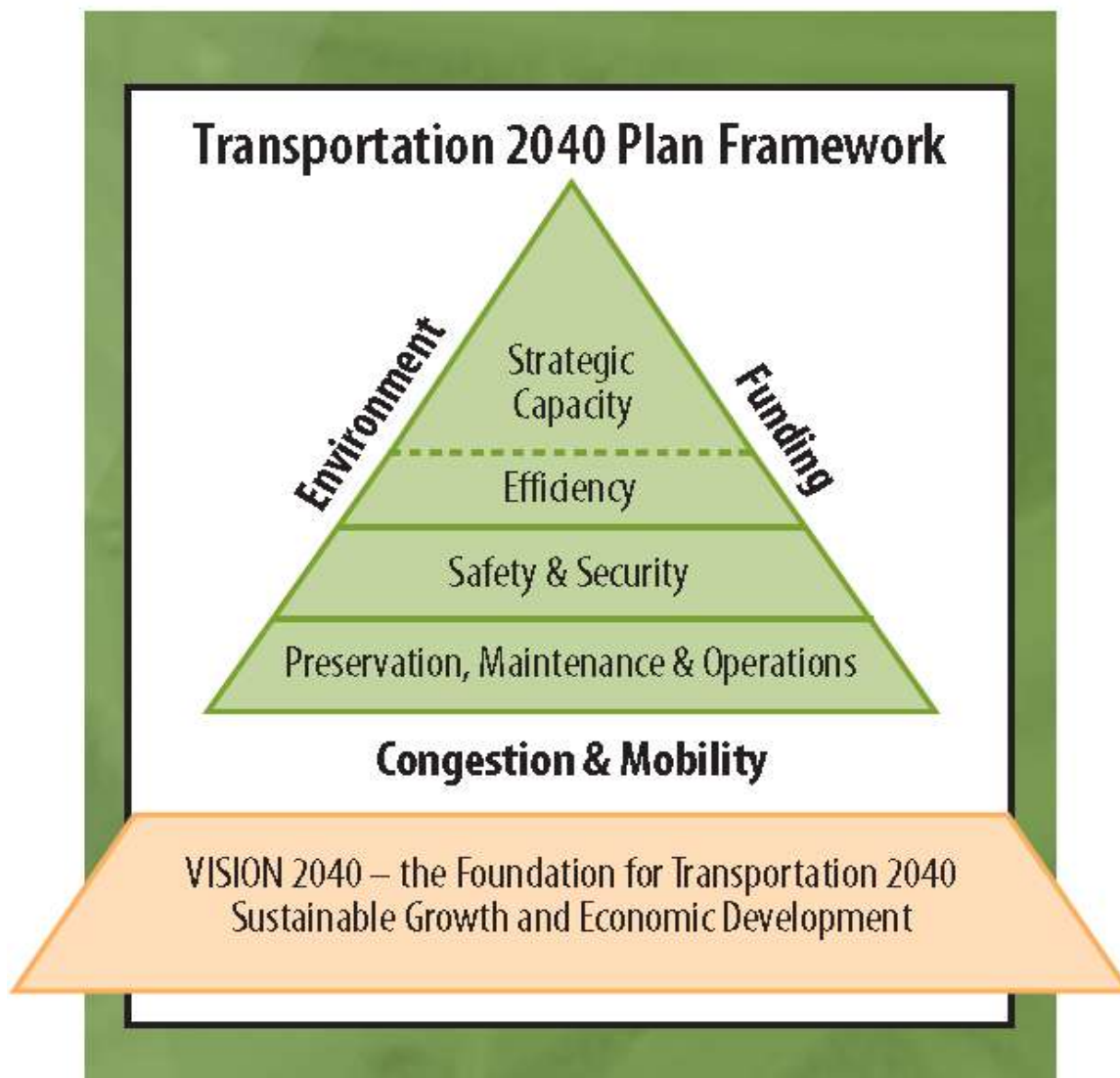


Source: PSRC Household Travel Survey

# Mode Choice by Income



Source, Alan Pisarski, *Commuting in America*

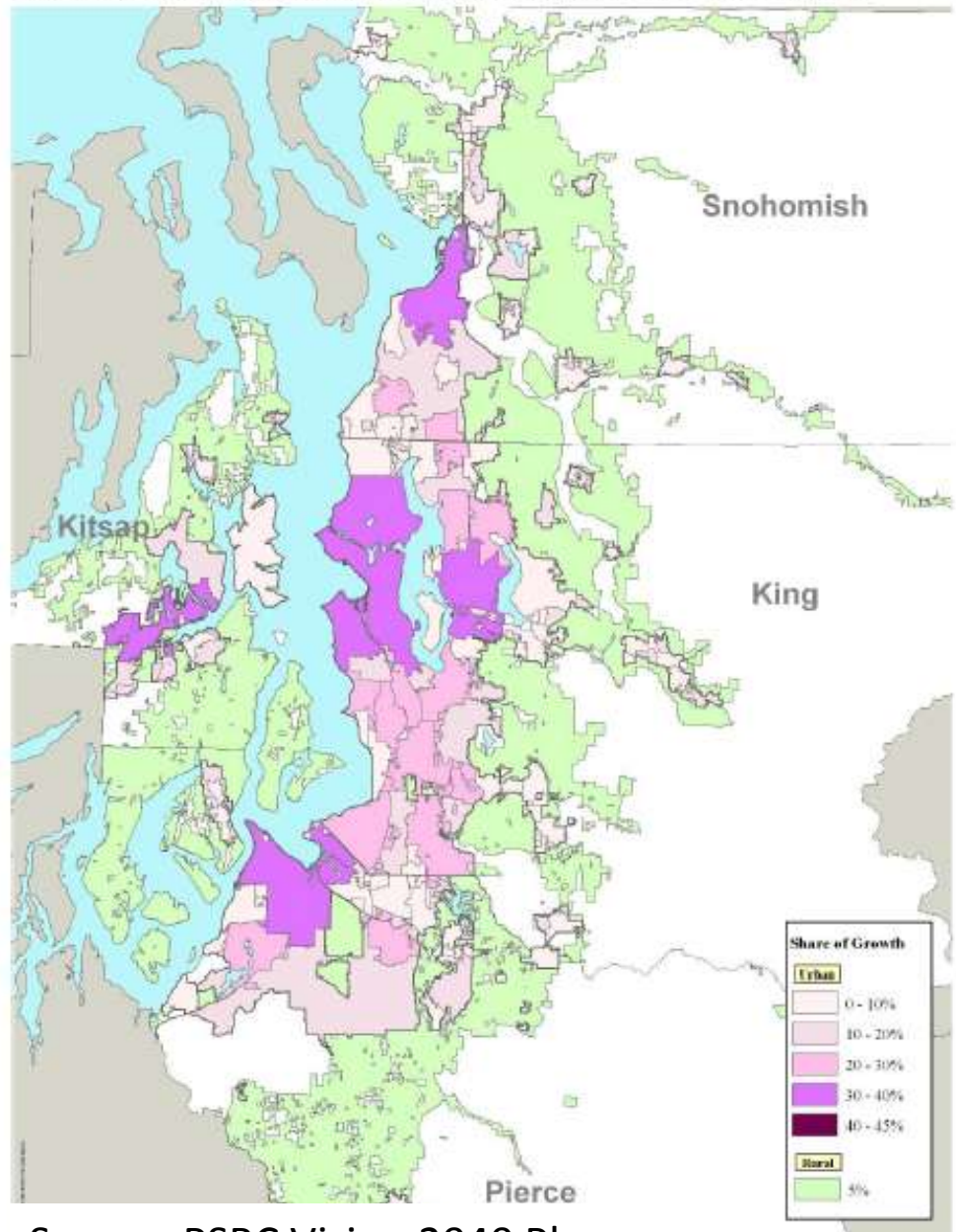


Source: PSRC Destination 2040 Plan Executive Summary



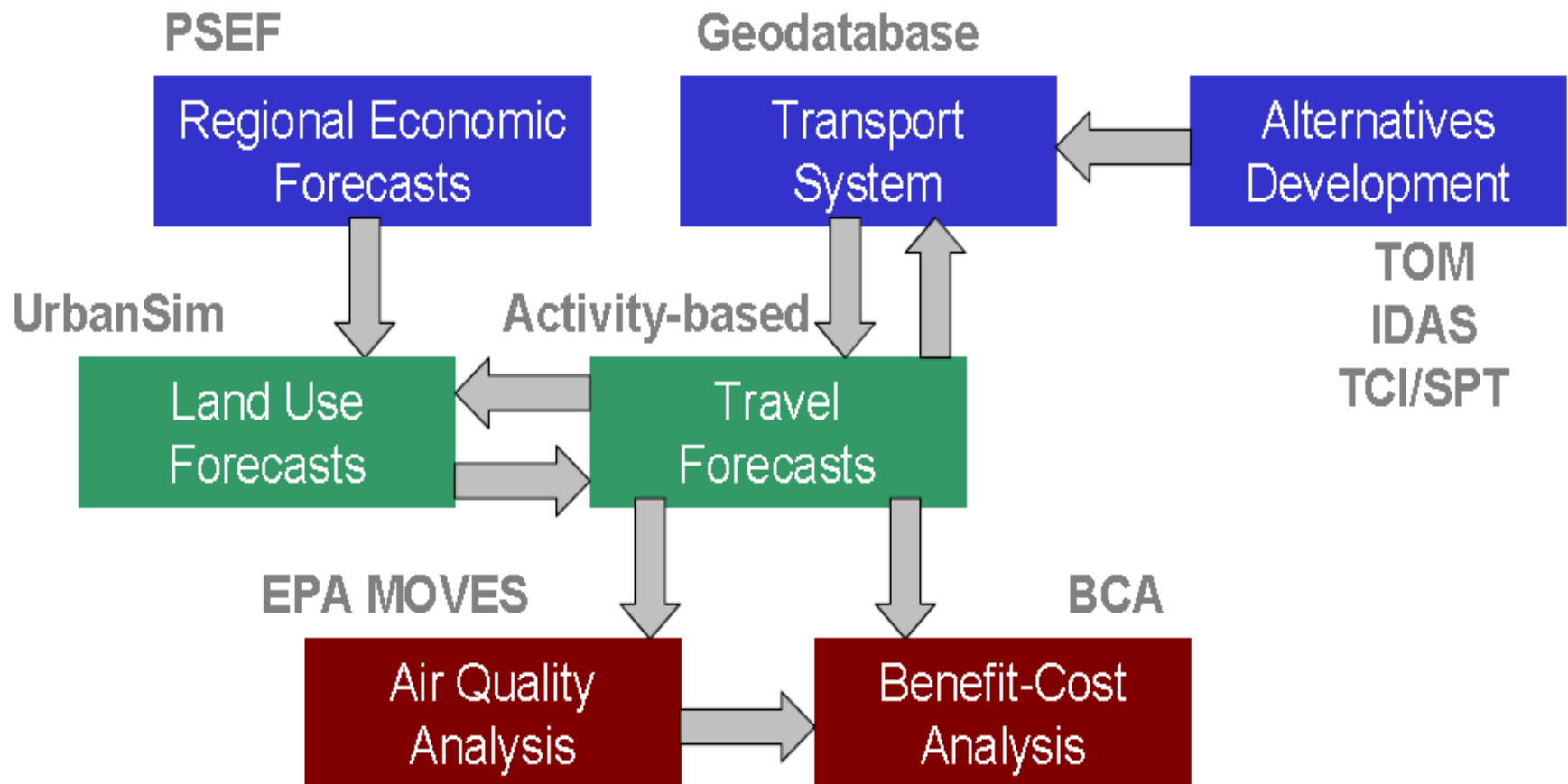
# PSRC Transportation Planning Supports the Vision 2040 Growth Plan

FIGURE 4-4: PREFERRED GROWTH ALTERNATIVE MAP  
— SHARE OF ADDITIONAL POPULATION AND EMPLOYMENT GROWTH, BY REGIONAL GEOGRAPHY (2000-2040)

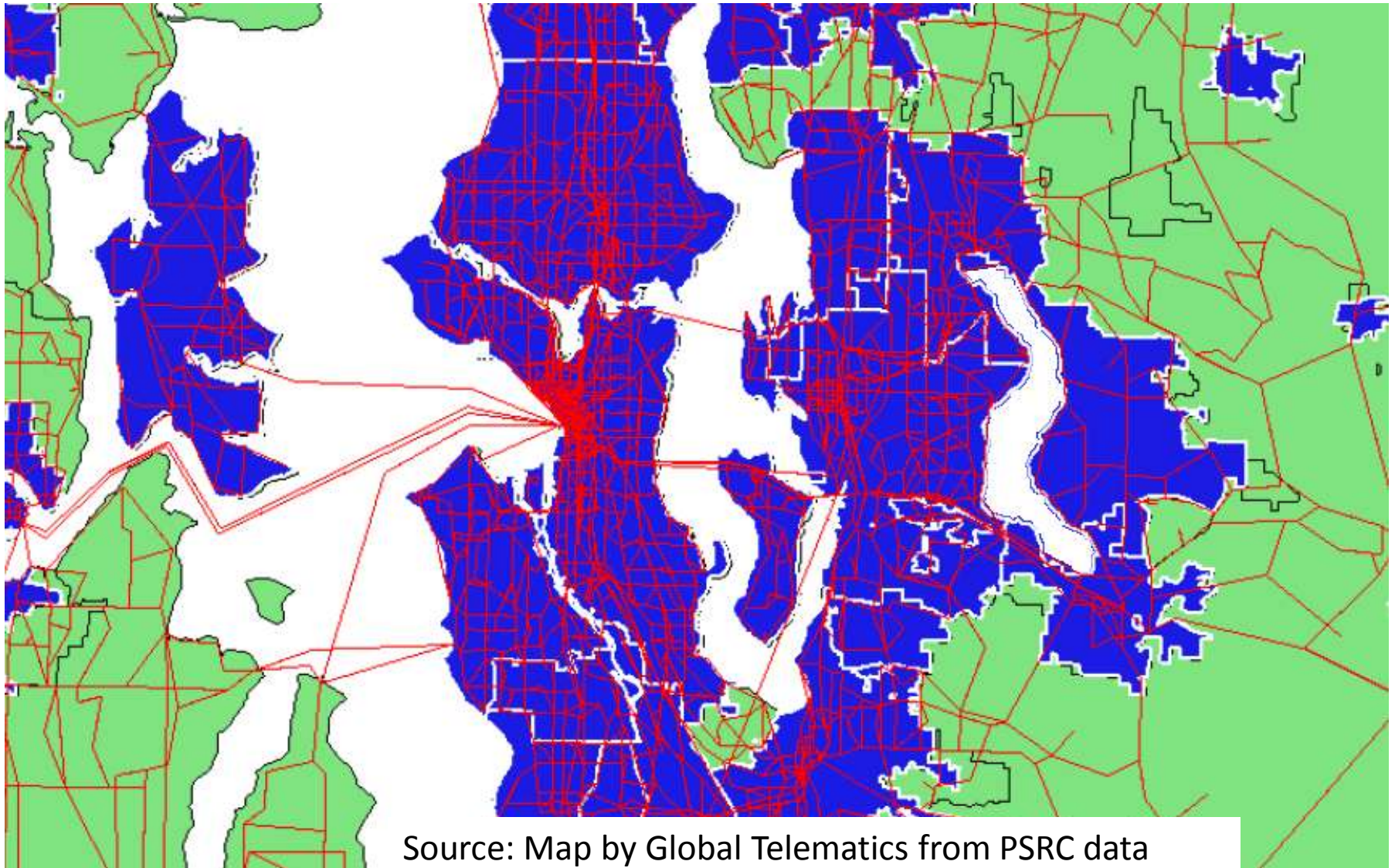


Source: PSRC Vision 2040 Plan

# Overview of PSRC Transportation Planning Tools

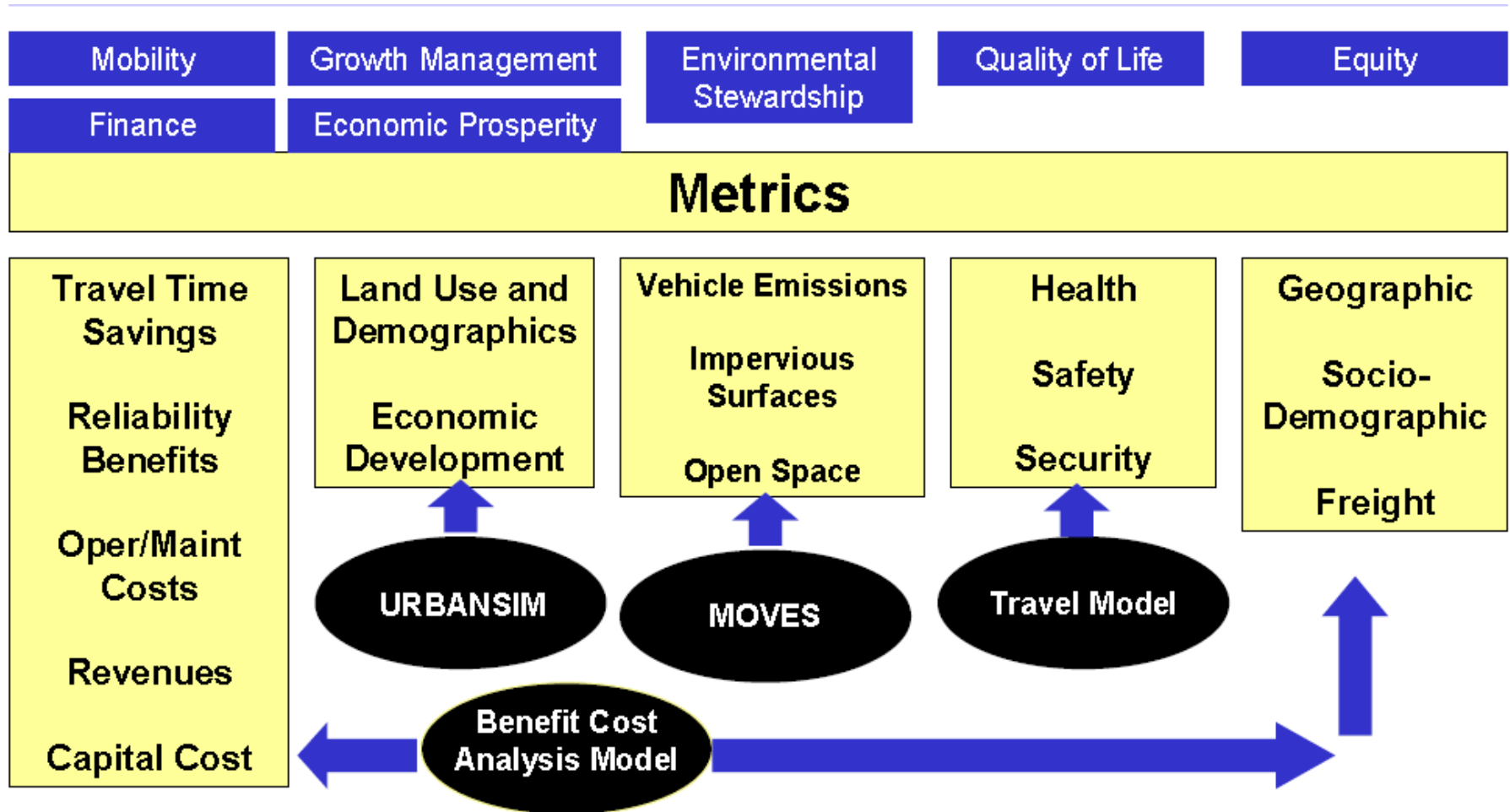


# Modeled Transportation Network



Source: Map by Global Telematics from PSRC data

# PSRC Criteria for Evaluating Alternatives

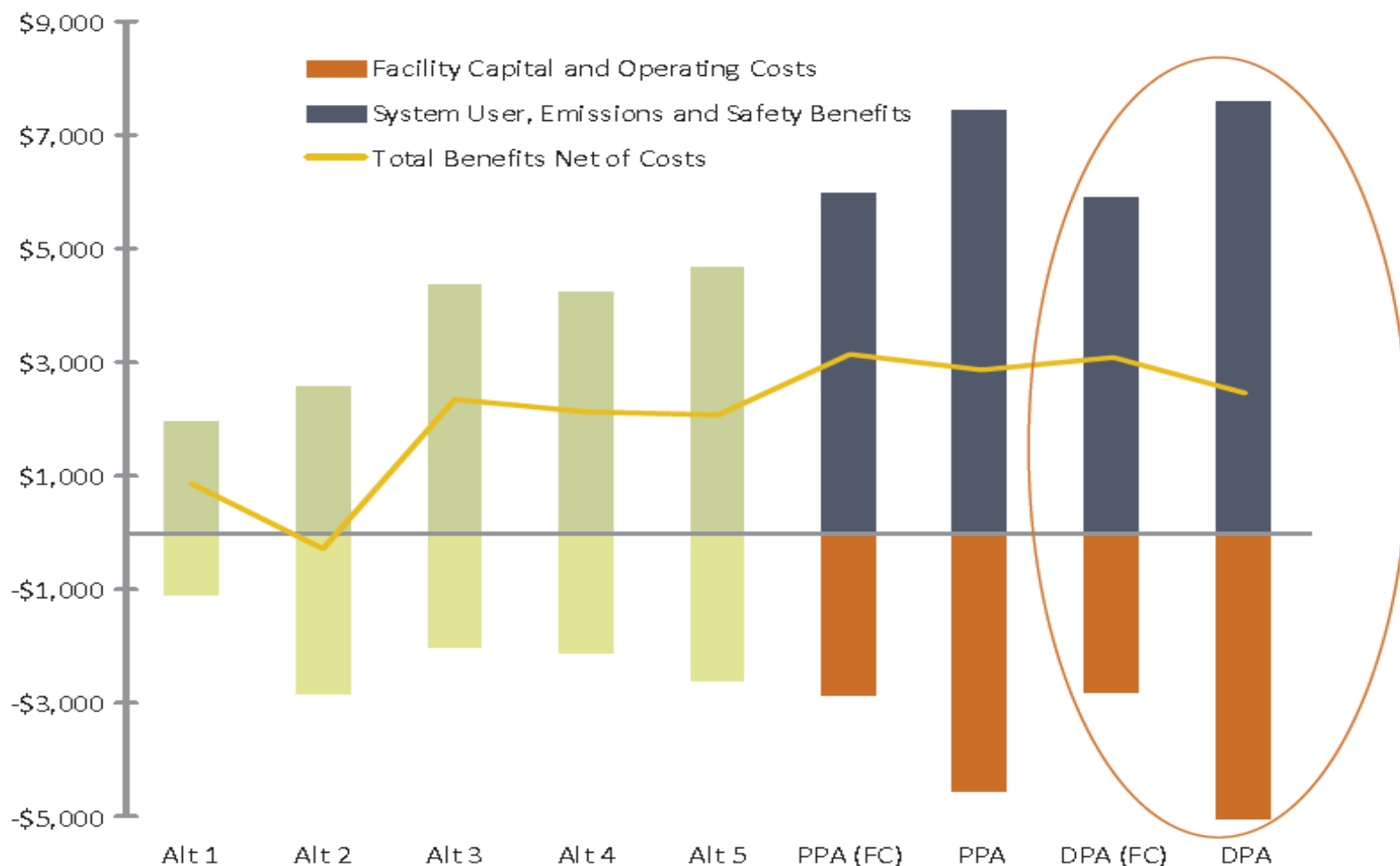


Source: PSRC Destination 2040 Plan



# Plan Alternatives Quantitatively Compared

**2040 Benefits and Costs of the Alternatives (millions of 2008 dollars)**



Source: PSRC Destination 2040 Plan



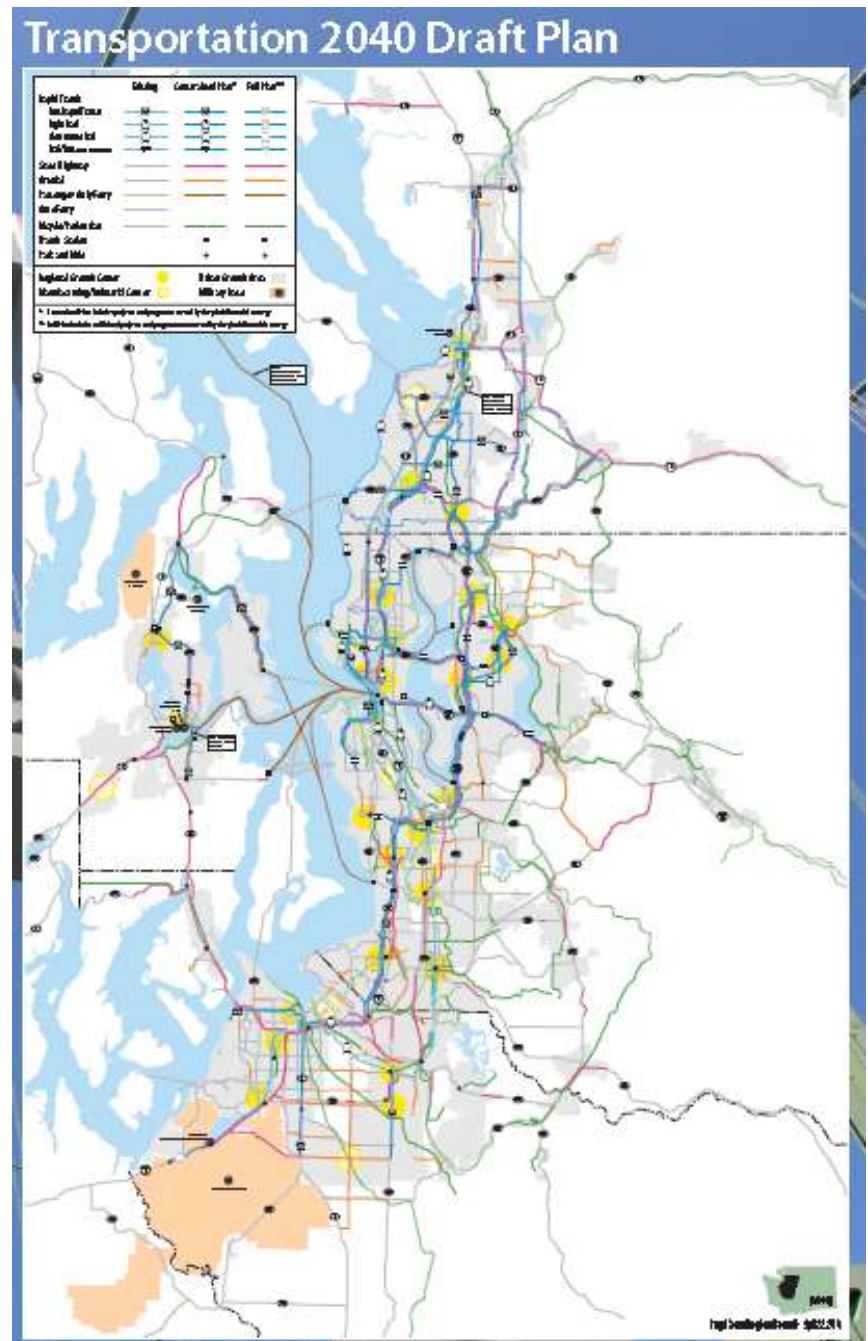
## Detailed Plan Emerges from PSRC Process

Includes roads,  
railroads, ferries, bike  
& walk trails.

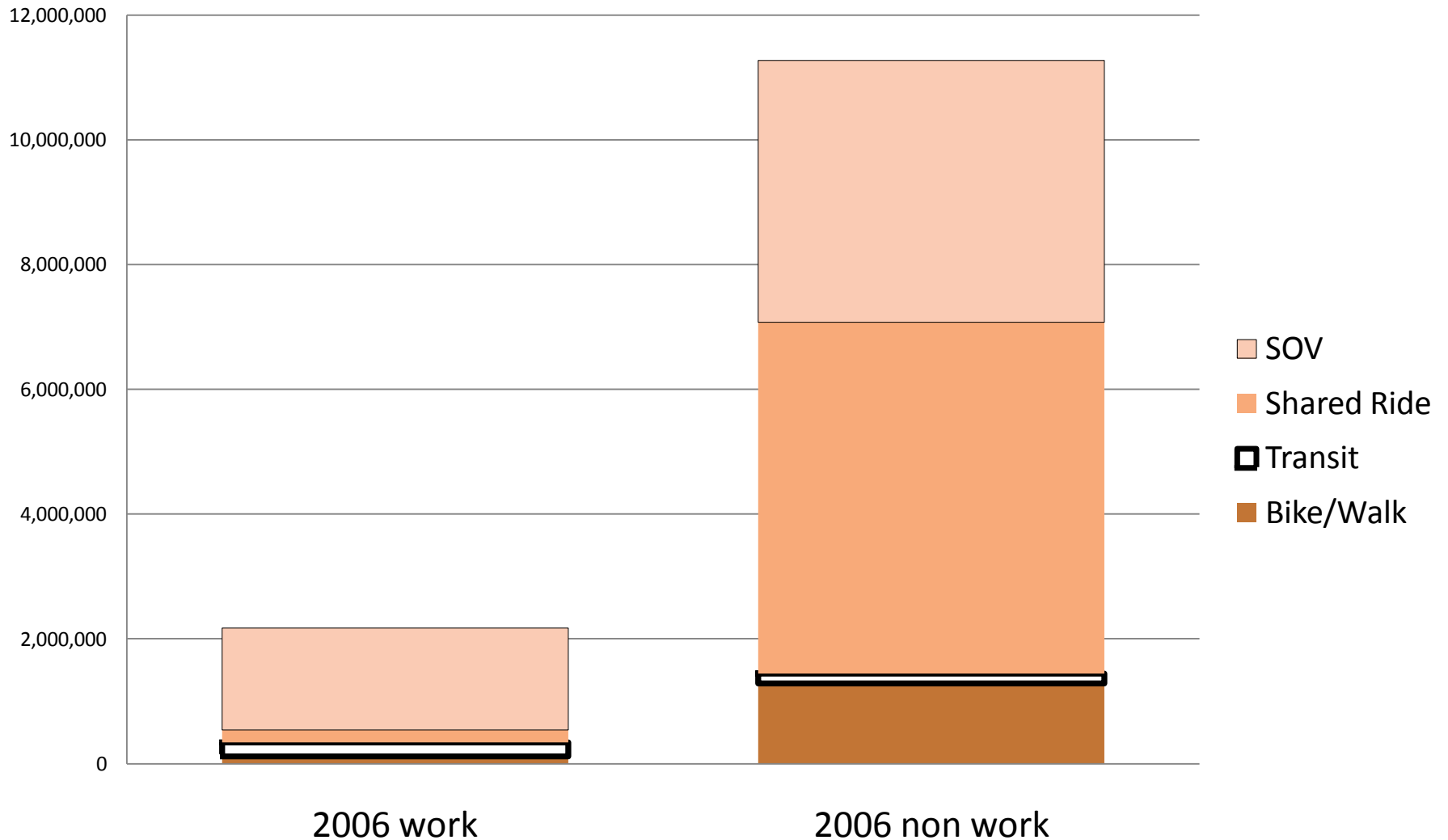
Includes a pro forma funding plan.

All Federal, state, and local investments must be included in the plan.

Source: PSRC Destination 2040 Plan

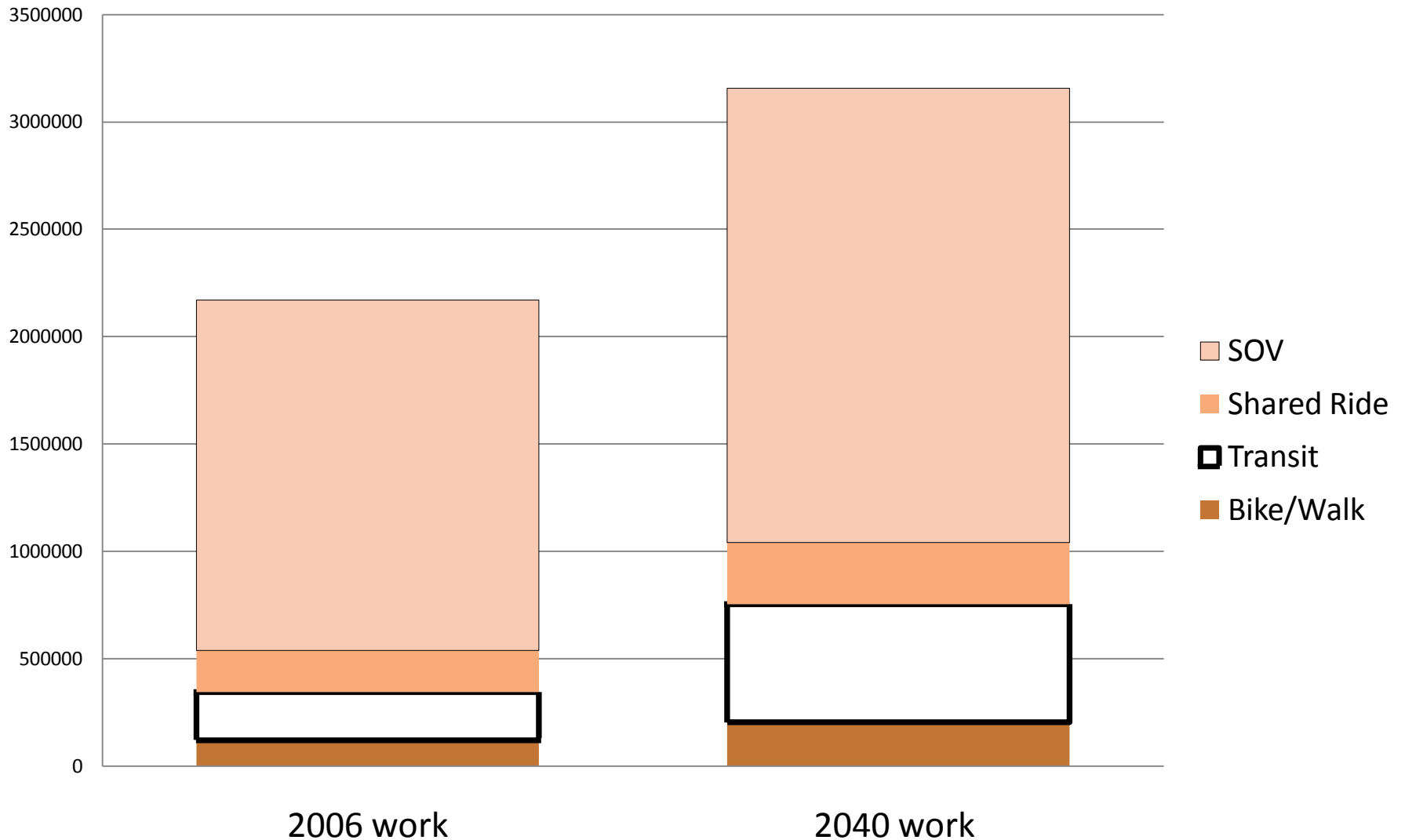


# Daily Trips in 2006, by Mode



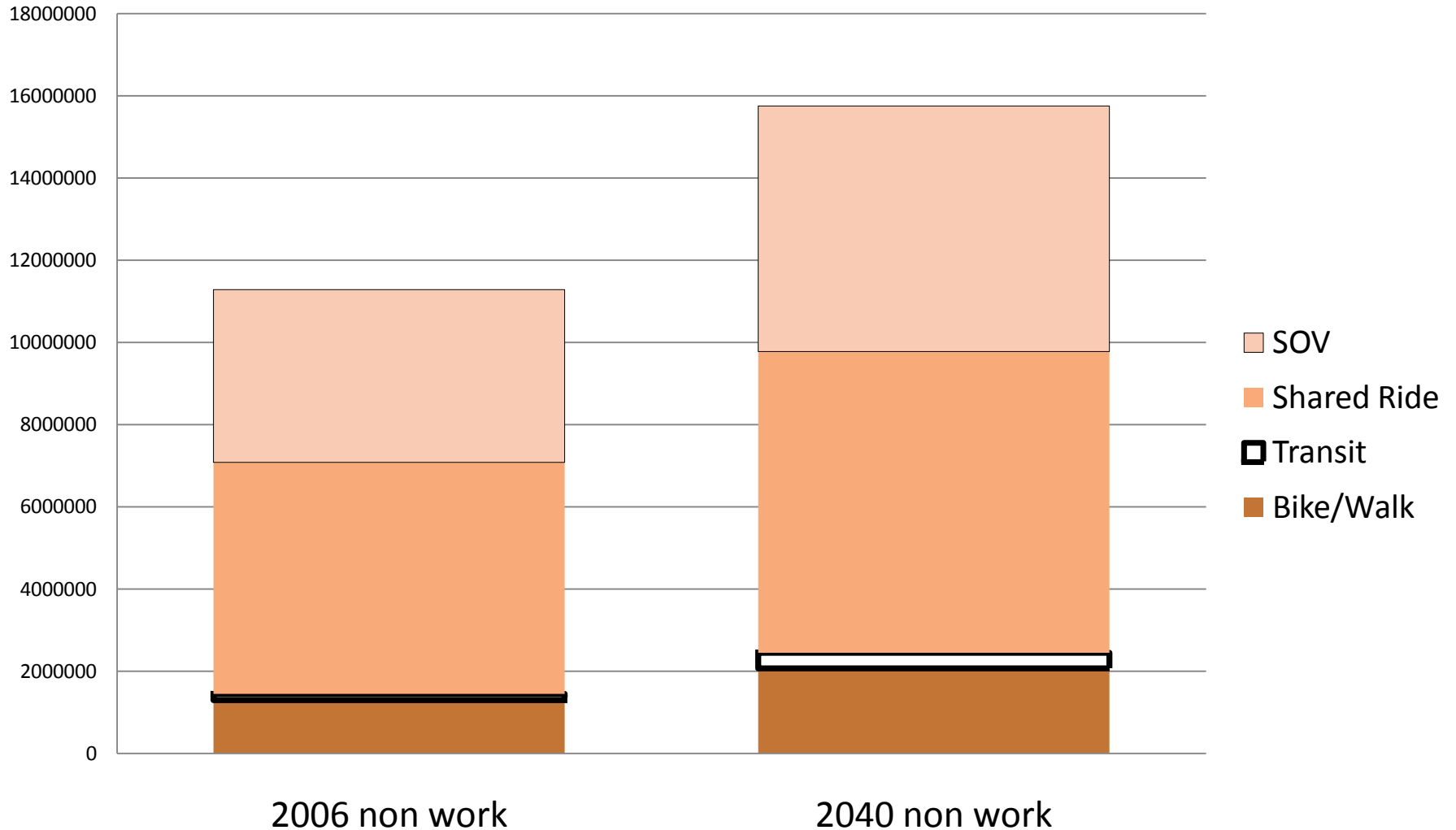
Source: Coalition for Effective Transportation Alternatives (CETA) from PSRC data

# 30 Year Planned Growth, Daily Work Trips, by Mode



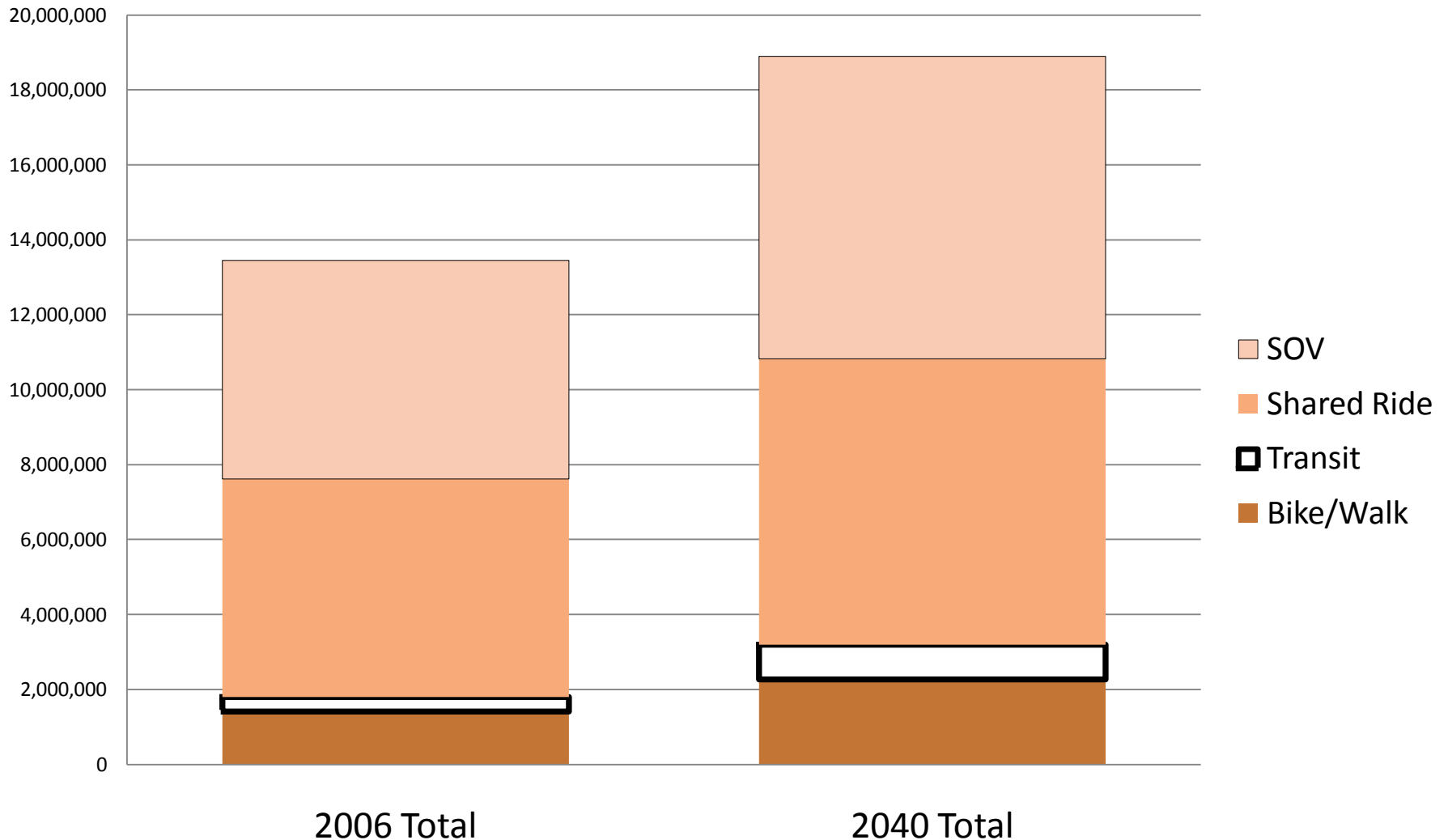
Source: Coalition for Effective Transportation Alternatives (CETA) from PSRC data

# 30 Year Planned Growth, Non Work Trips, by Mode



Source: Coalition for Effective Transportation Alternatives (CETA) from PSRC data

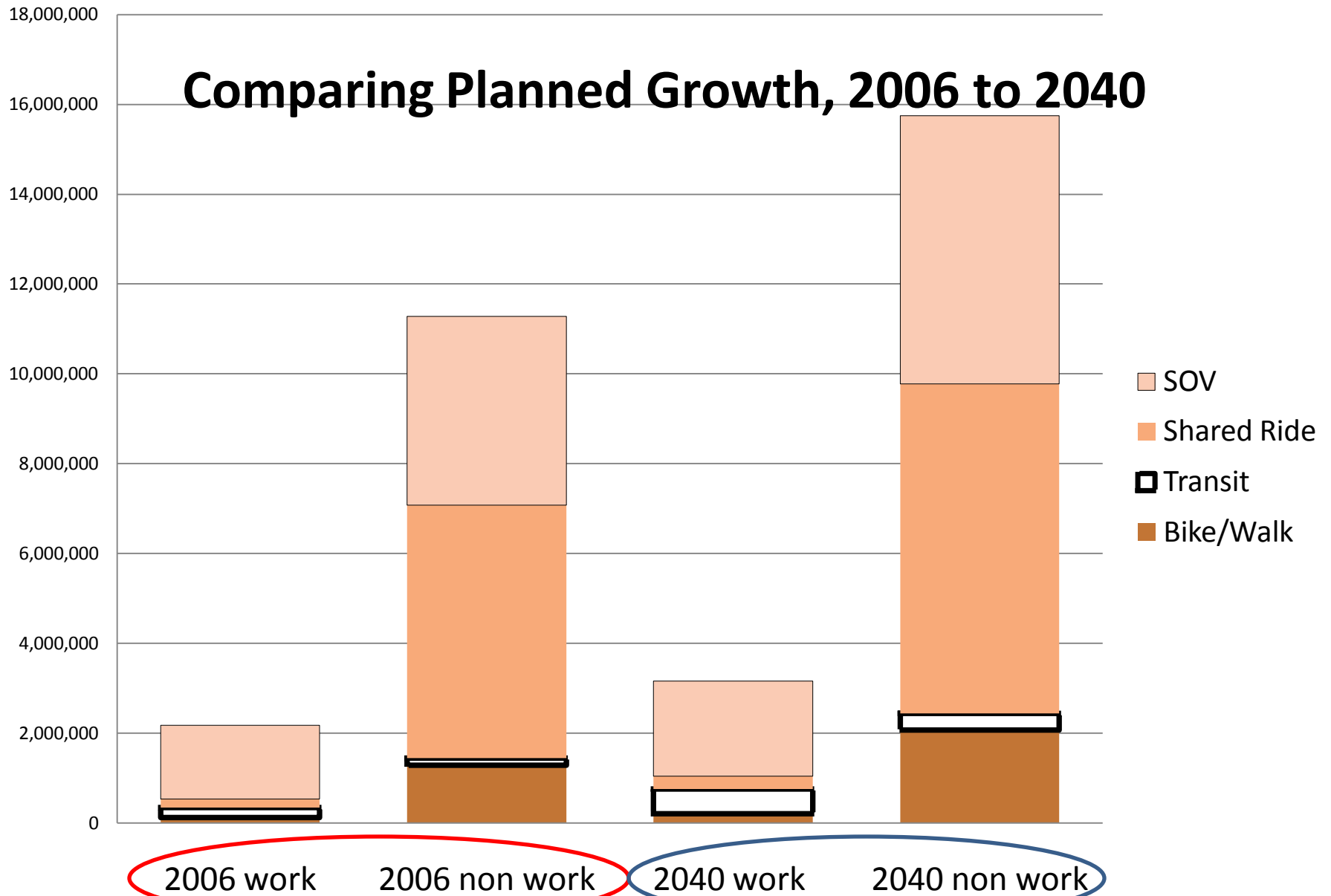
# 30 Year Planned Growth, Daily Total Trips, by Mode



Source: Coalition for Effective Transportation Alternatives (CETA) from PSRC data



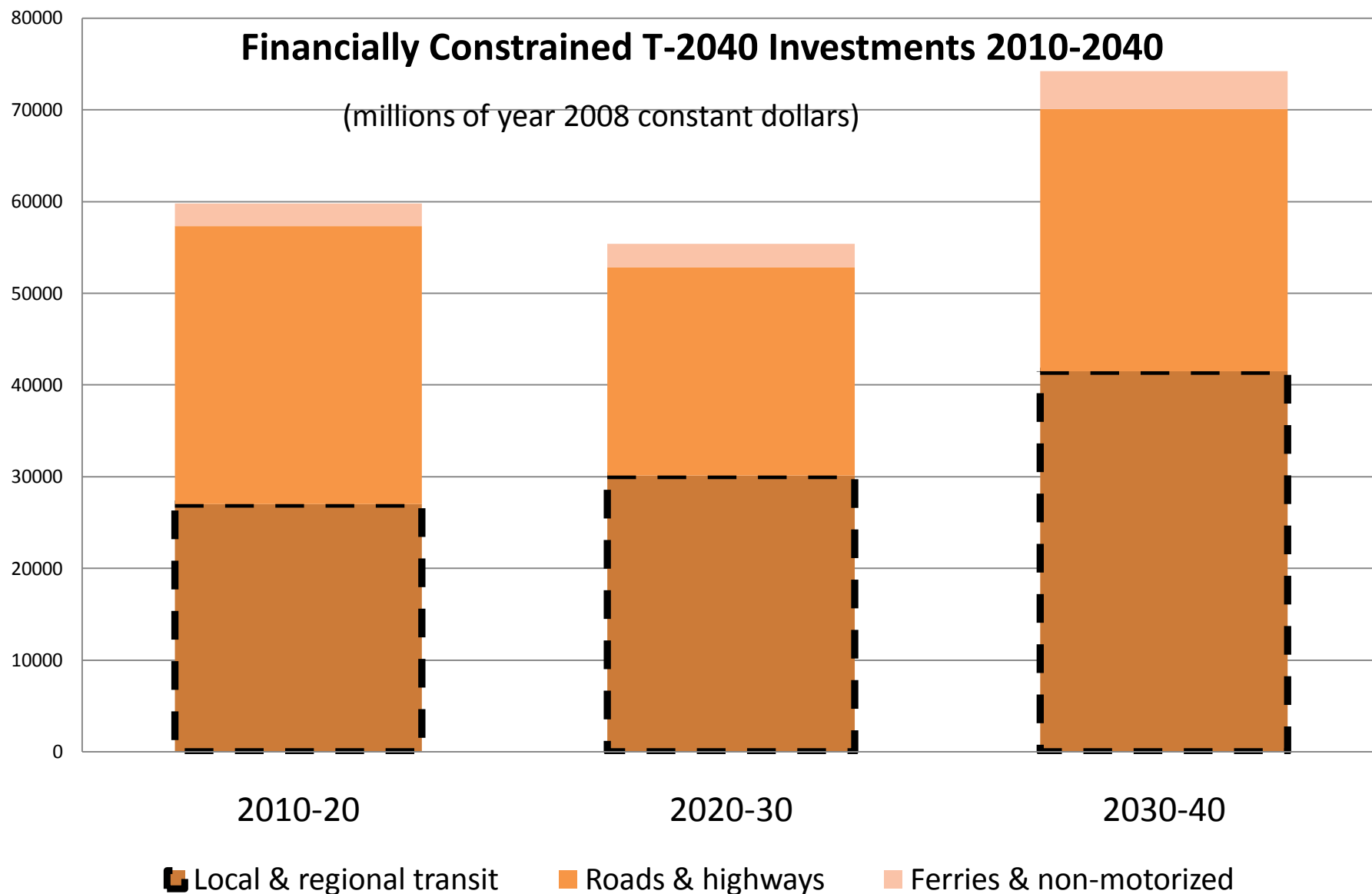
# Comparing Planned Growth, 2006 to 2040



Source: Coalition for Effective Transportation Alternatives (CETA) from PSRC data

## Financially Constrained T-2040 Investments 2010-2040

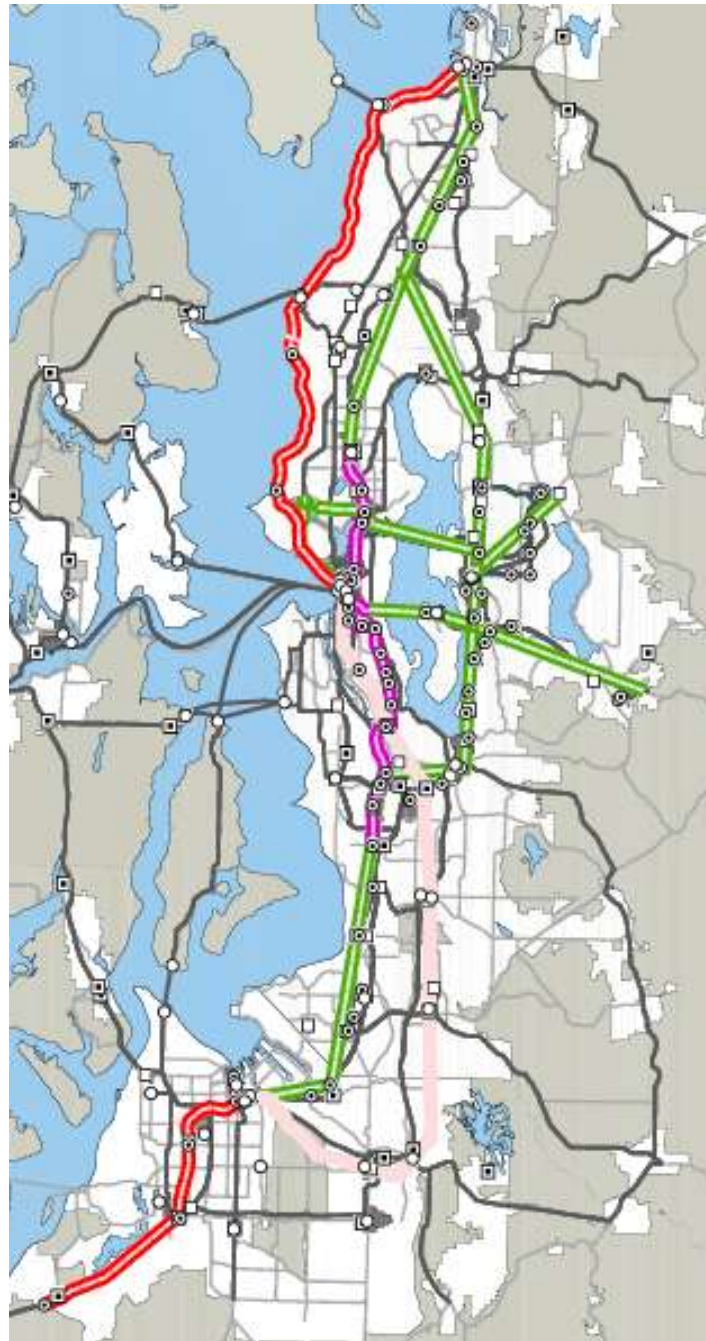
(millions of year 2008 constant dollars)



Source: Coalition for Effective Transportation Alternatives (CETA) from PSRC data

Seattle  
transportation  
leaders want to  
build a 200  
mile urban  
mass transit rail  
network.

Map from PSRC



# Seattle is Building a Subway

Seven mile  
twin tube  
bored  
tunnel for  
light rail.

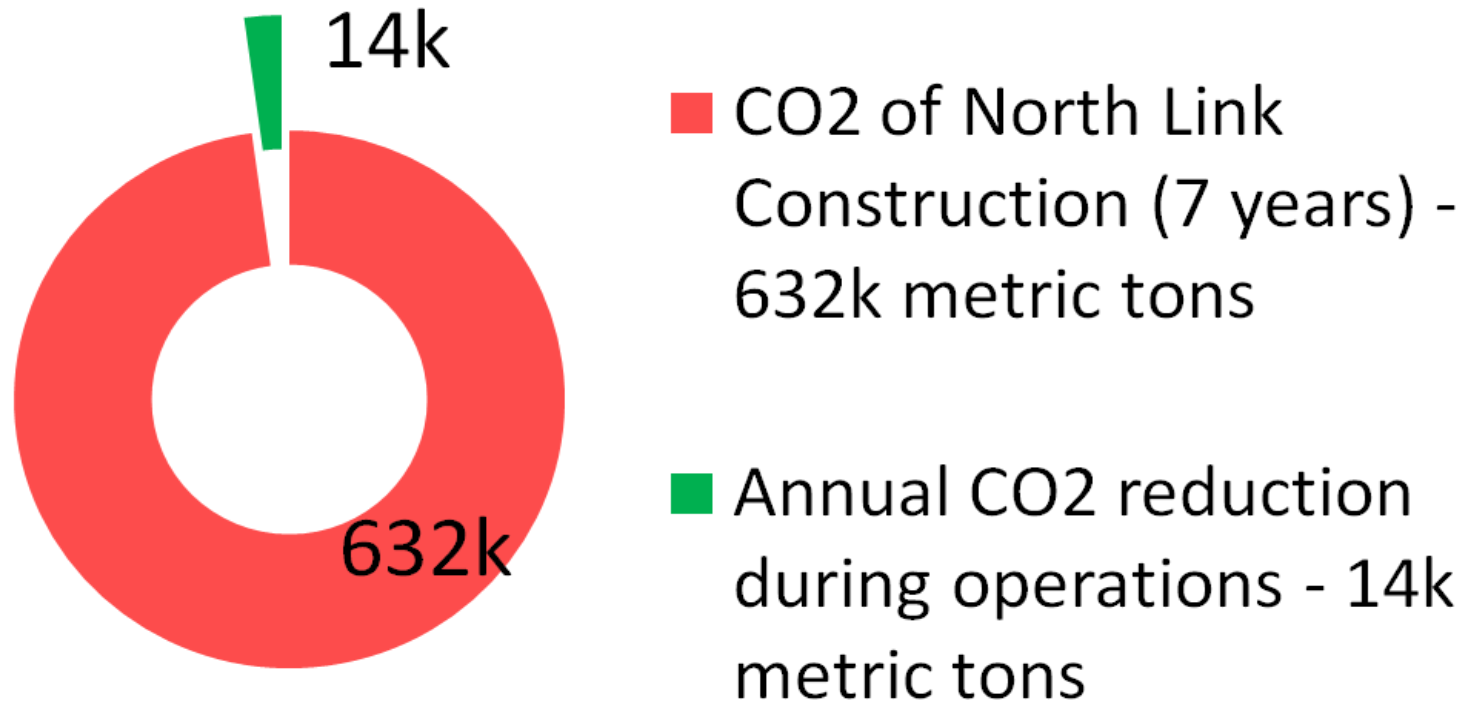
Map from Sound Transit



Phase Two

Phase One

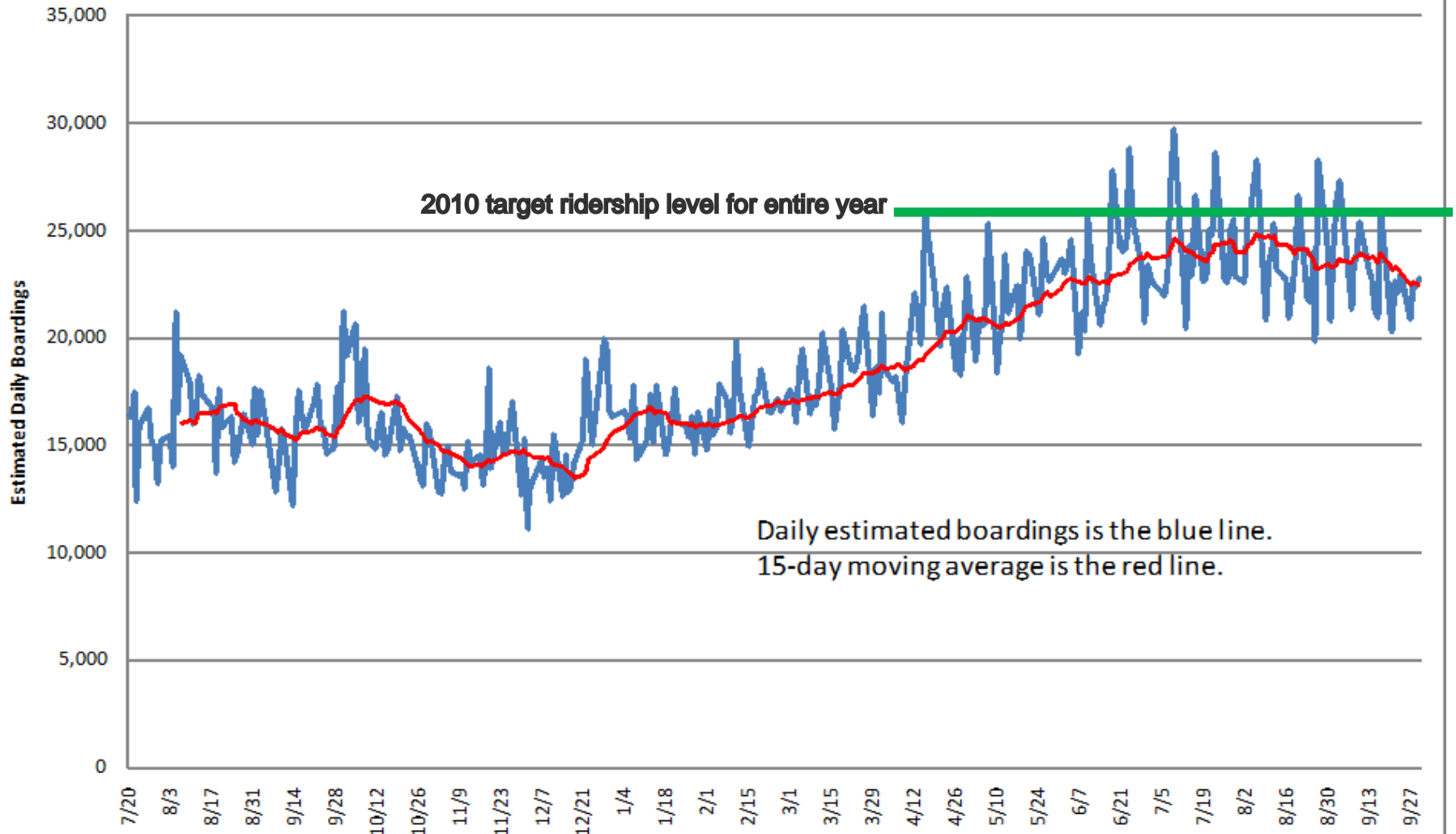
# CO2 Greenhouse Gas Generated by Light Rail Tunnel Construction



Source: North Link Record of Decision



# Seattle Light Rail Daily Boardings Non-Holiday Weekdays July 2009 Through September 2010

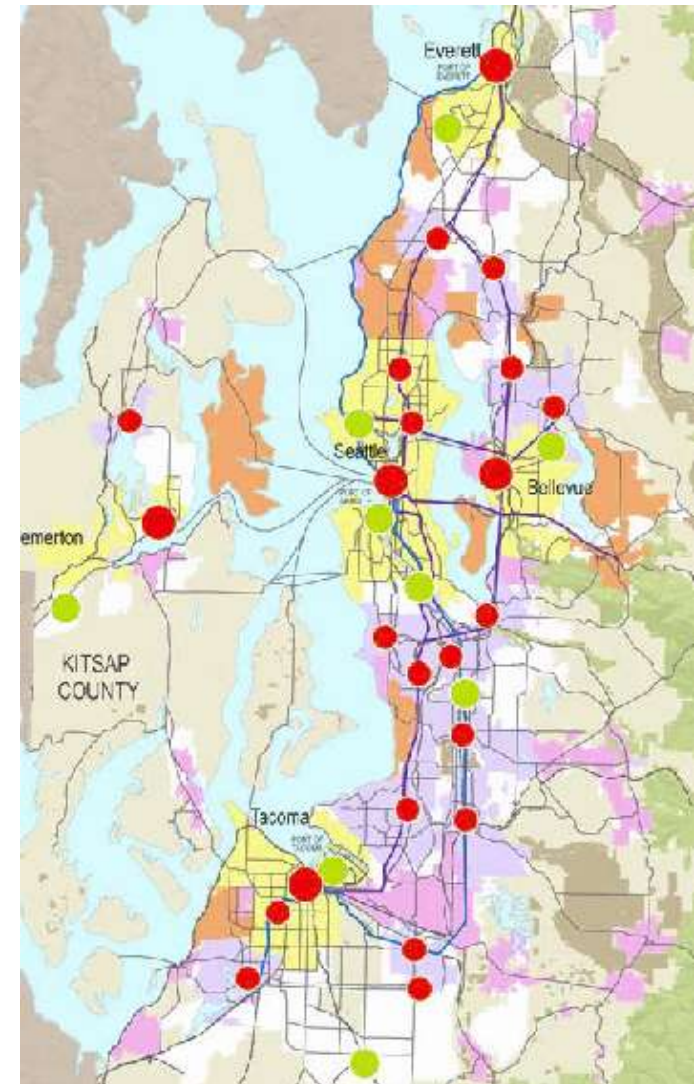


Source: Public Interest Transportation Forum chart using data from Sound Transit.

# Rail-Transit-Oriented Development (TOD)

**Pedestrian-friendly urban centers connected by light rail service are meant to increase the transit market share.**

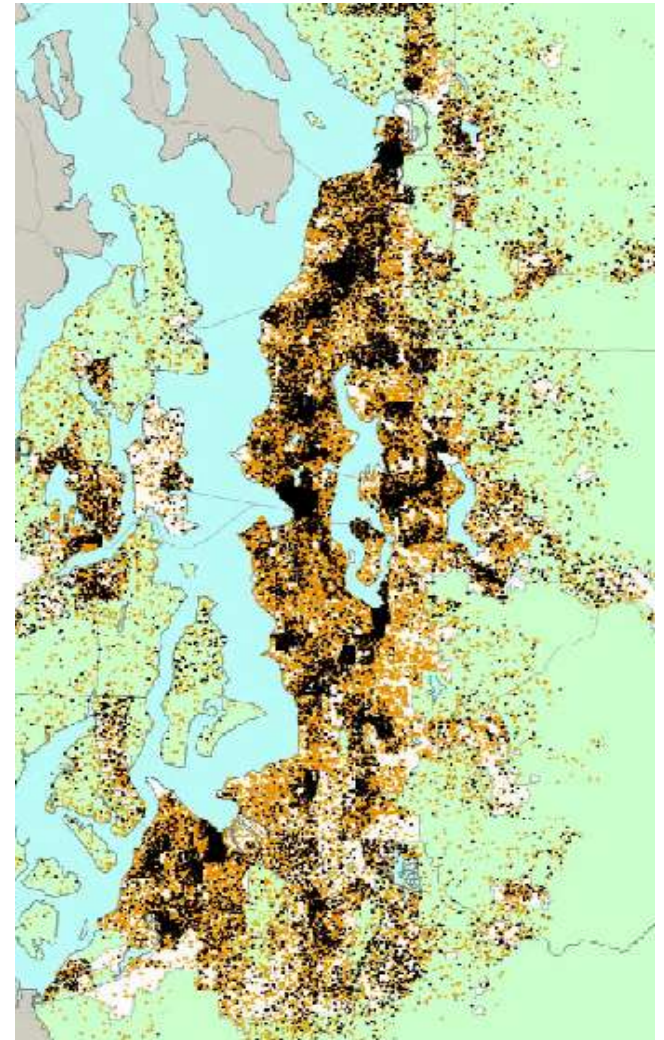
Map source: PSRC, Destination 2040



# Problem with the TOD Theory

**Future growth is not going to fit neatly into high-density TOD zones near train stations!**

Map source: PSRC, Destination 2040



# **Access to Jobs via Public Transit**

**% of jobs the average household could access within  
30 minutes by transit**

Take a guess – what would over 200 miles of urban rail transit with a coordinated bus system feeding customers to train stations accomplish in the fraction of jobs brought within 30 minutes by transit to the average household?

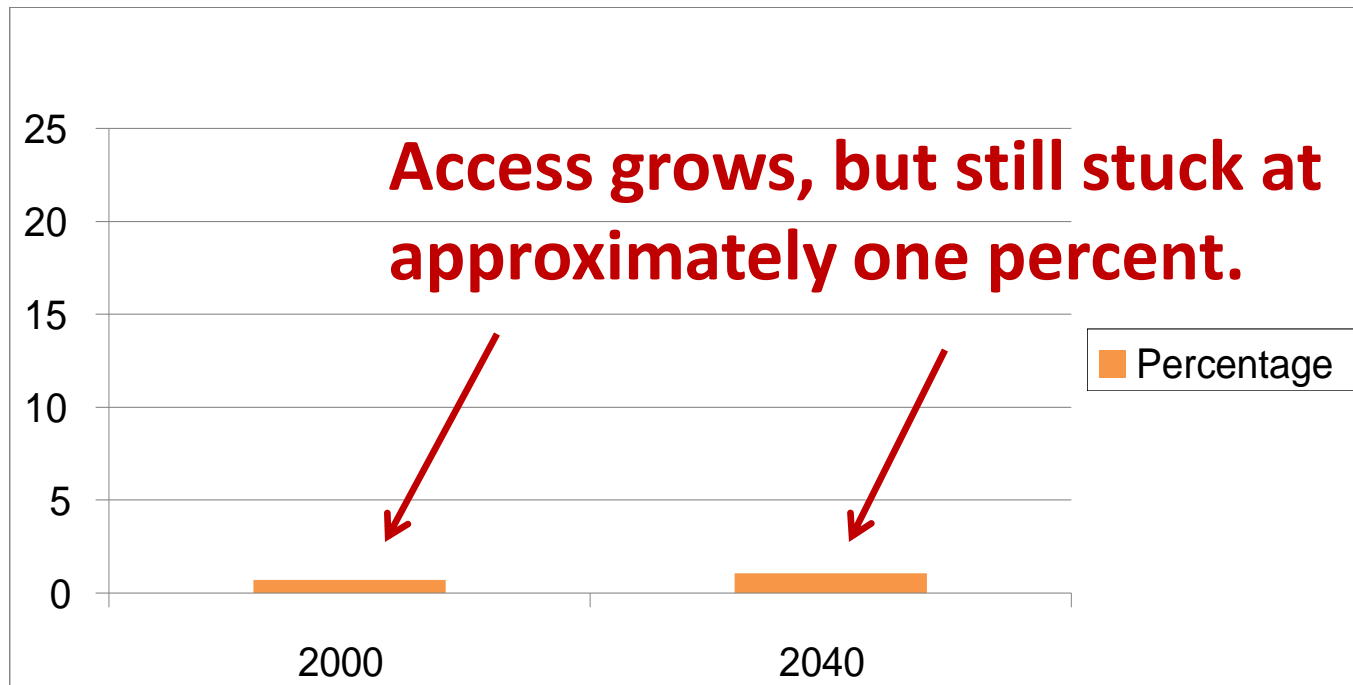
50% ?

40% ?

30% ?

***By 2040...***  
**Access to Jobs via Public Transit**

**% of jobs the average household could access within  
30 minutes by transit**





# **Livability is the new Goal: The choice to use cars much less.**

- **Live close to what you really want.**
- **BUT, household members often have different jobs, schools, recreational interests, widely dispersed**
- **Most people don't shop exclusively at the corner grocer anymore.**
  - **We like having many choices in what we buy**
  - **Not milk but 10 kinds of milk**
- **Many don't have one doctor, but multiple specialists**
  - **None selected by the criterion of distance**

Source: Suggested by presentation from Alan Pisarski

# The options exist now to achieve “livability” if we choose

## TO GO TO THE NEAREST

- JOB
- SHOPPING
- DOCTORS
- HOUSE OF WORSHIP

HOW MANY DO?

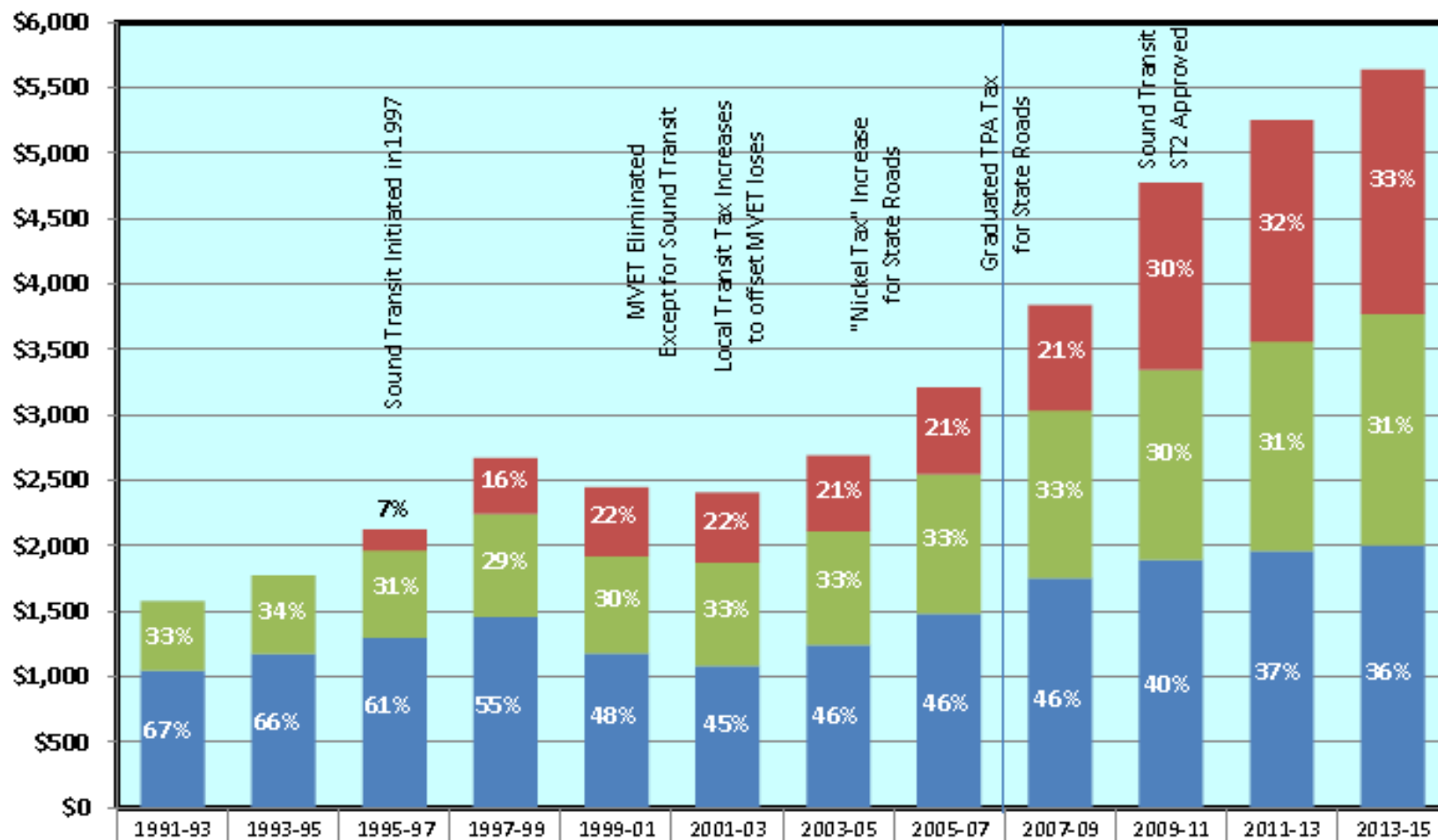
## TO MOVE SO THAT YOU

- ARE NEARER WORK
- ARE NEARER MEDS
- ARE NEARER SHOPS
- ARE NEARER OTHER THINGS YOU VALUE

HOW MANY DO?

# Transportation Tax Revenue -- Puget Sound Region

Biennial Tax Revenue (YOI \$millions)

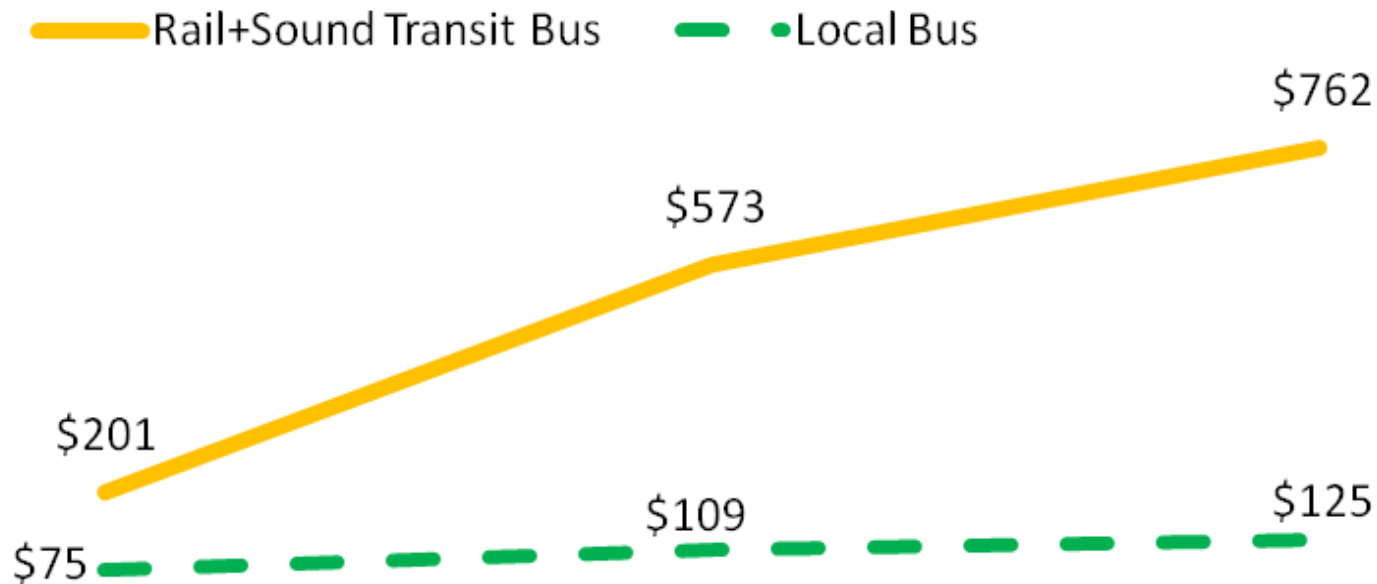


	1991-93	1993-95	1995-97	1997-99	1999-01	2001-03	2003-05	2005-07	2007-09	2009-11	2011-13	2013-15
Total Sound Transit	0	0	159	427	526	534	575	662	803	1,431	1,693	1,867
Total Local Transit	524	596	667	787	741	793	873	1,067	1,285	1,454	1,604	1,768
Total Roads - Region	1,049	1,174	1,296	1,457	1,178	1,081	1,239	1,479	1,749	1,890	1,956	2,004

Chart 4

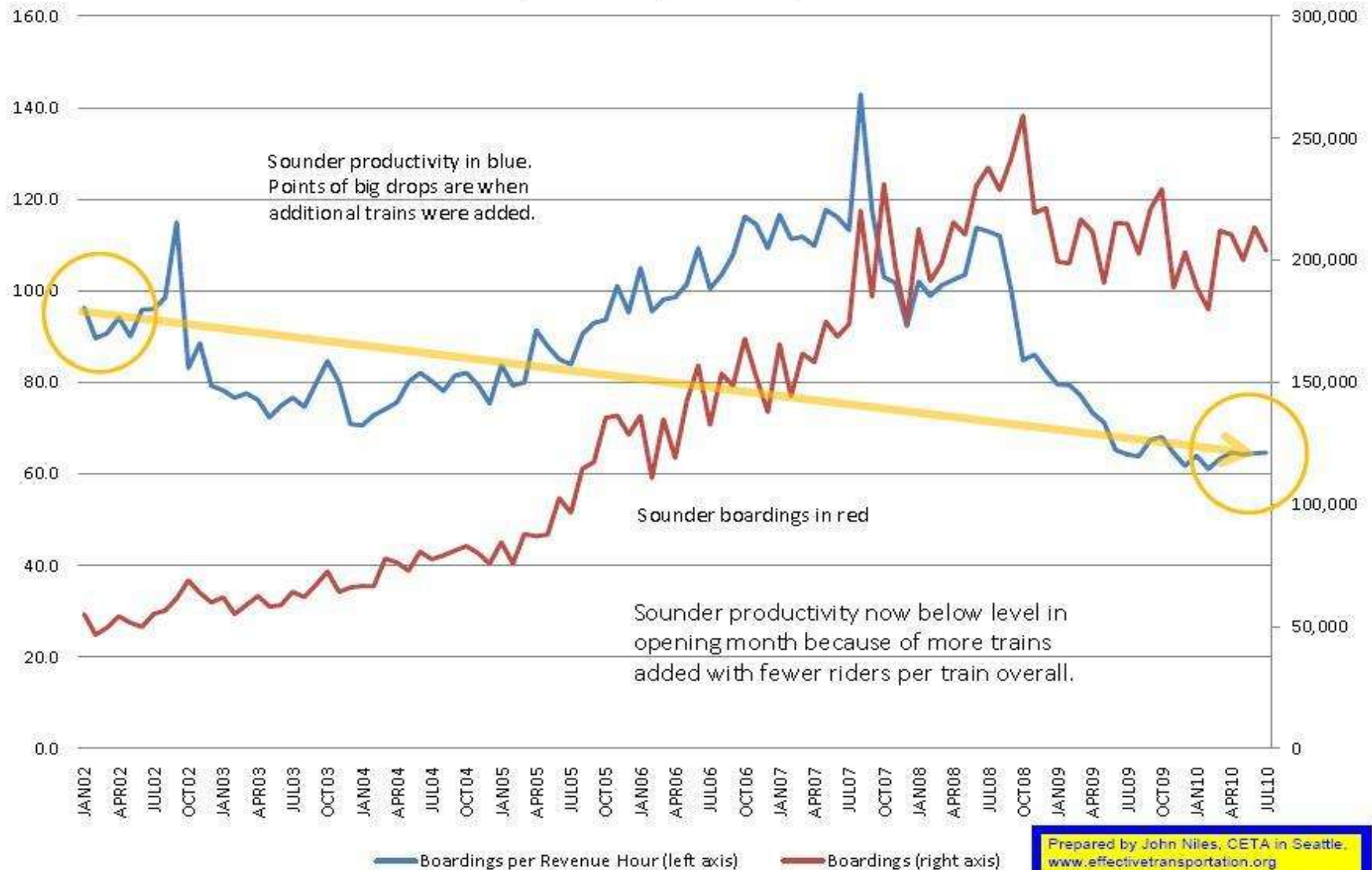
■ Total Roads - Region
 ■ Total Local Transit
 ■ Total Sound Transit

# Investment (\$000) per Daily Transit Boarding as Planned by PSRC



2040 Baseline Boardings    Incremental Boardings in 2040 Preferred Alternative, financially constrained    Incremental Boardings in 2040 Preferred Alternative, unconstrained

## Sounder Commuter Rail, Monthly Data Reported to U.S. Government



Source: Public Interest Transportation Forum chart using data from Sound Transit.



# Seattle region has comparatively high transit market share for commuting

## Top 15 U.S. Metropolitan Statistical Areas Ranked by Number of Workers Age 16 and Older Who Commuted to Work by Public Transportation: 2009

Rank	Metropolitan statistical area	Used public transportation	
		Number	Percent
1	New York-Northern New Jersey-Long Island, NY-NJ-PA . .	2,673,447	30.5
2	Chicago-Naperville-Joliet, IL-IN-WI . . . . .	506,221	11.5
3	Washington-Arlington-Alexandria, DC-VA-MD-WV . . . . .	404,829	14.1
4	Los Angeles-Long Beach-Santa Ana, CA . . . . .	360,028	6.2
5	San Francisco-Oakland-Fremont, CA . . . . .	304,111	14.6
6	Boston-Cambridge-Quincy, MA-NH . . . . .	283,582	12.2
7	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD . . . . .	256,987	9.3
8	Seattle-Tacoma-Bellevue, WA . . . . .	147,955	8.7
9	Atlanta-Sandy Springs-Marietta, GA . . . . .	92,326	3.7
10	Miami-Fort Lauderdale-Pompano Beach, FL . . . . .	85,771	3.5
11	Baltimore-Towson, MD . . . . .	82,119	6.2
12	Minneapolis-St. Paul-Bloomington, MN-WI . . . . .	78,837	4.7
13	Portland-Vancouver-Beaverton, OR-WA . . . . .	63,877	6.1
14	Pittsburgh, PA . . . . .	62,928	5.8
15	Houston-Sugar Land-Baytown, TX . . . . .	60,547	2.2

Source: U.S. Census Bureau, American Community Survey, 2009.

# Buses Go Everywhere!

## This?

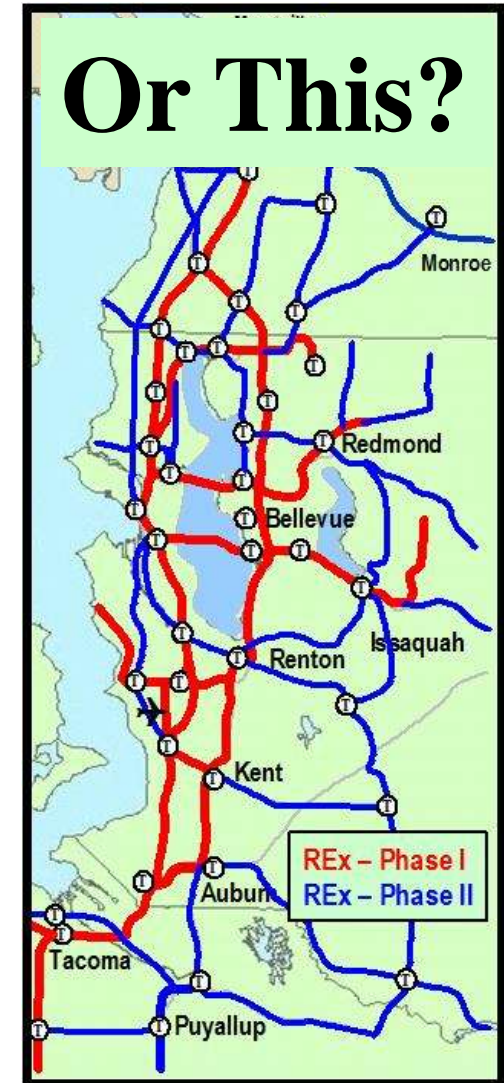


<-- A rail “spine” with bus feeders and time consuming transfers for \$141 billion that overlays existing Express Bus services

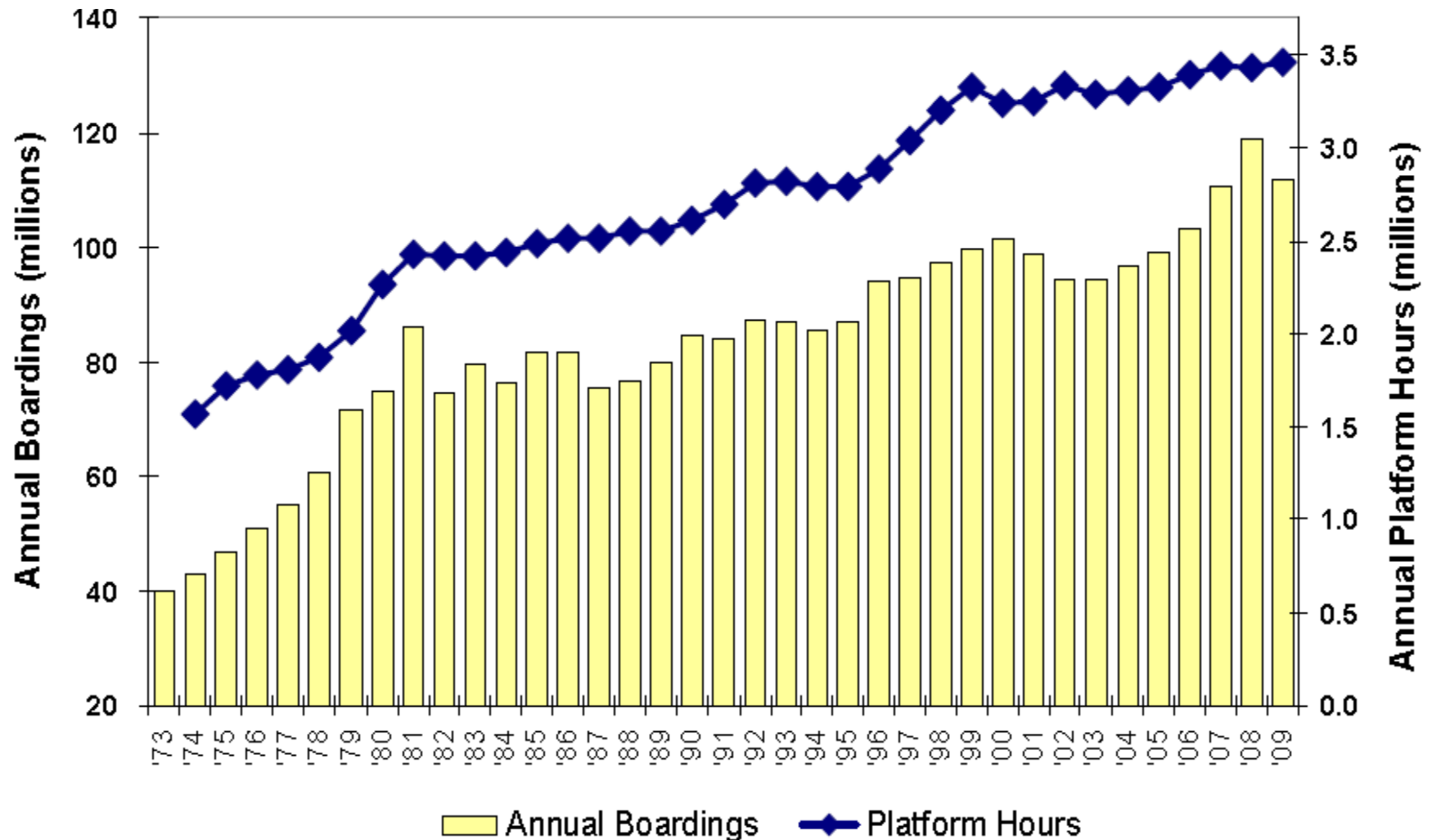
A truly regional “Web” of express bus routes serving the entire region and providing new transit services for those not served today for 1/5<sup>th</sup> the cost?

--->

## Or This?

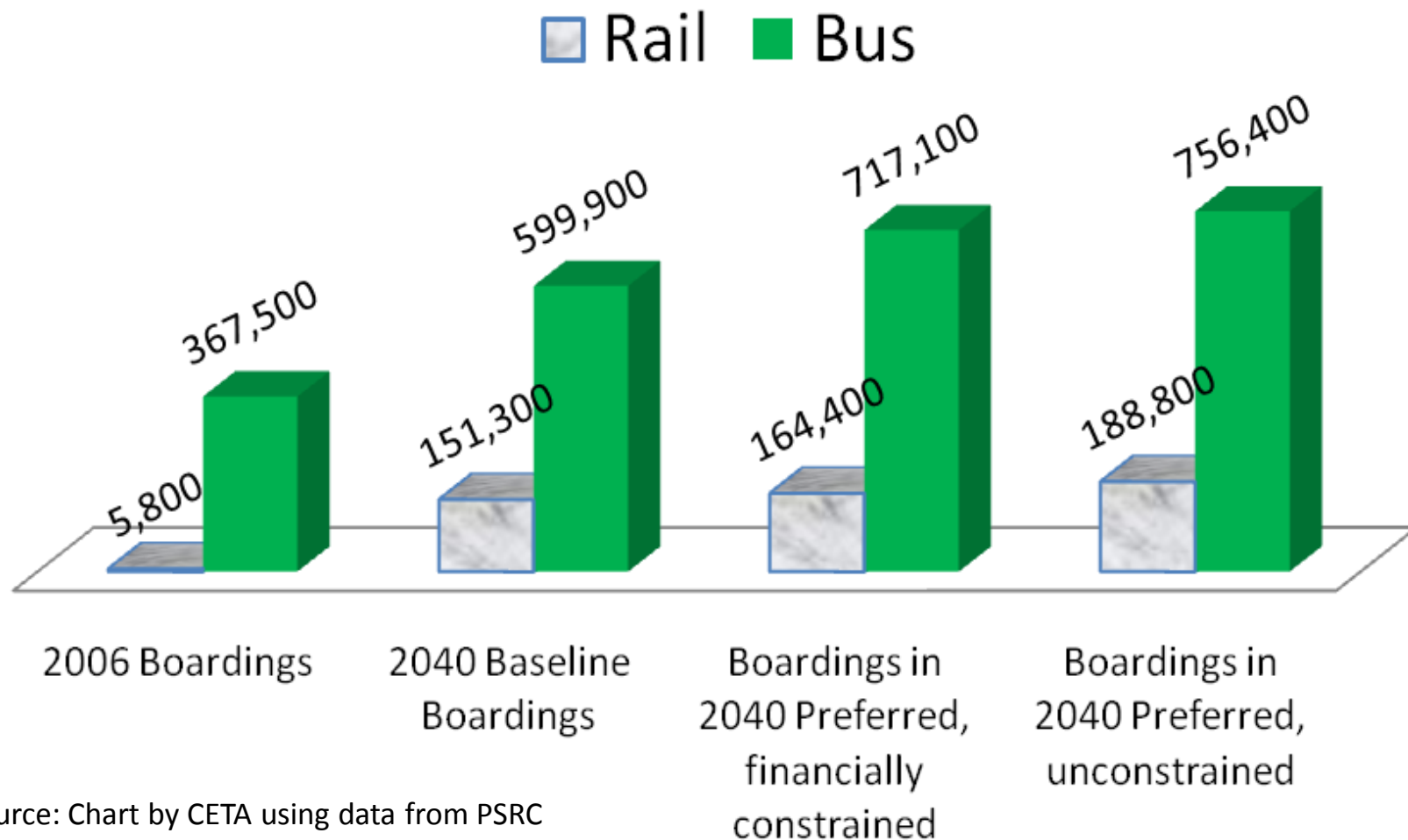


# Metro Transit Boardings & Bus Hours 1973 to 2009

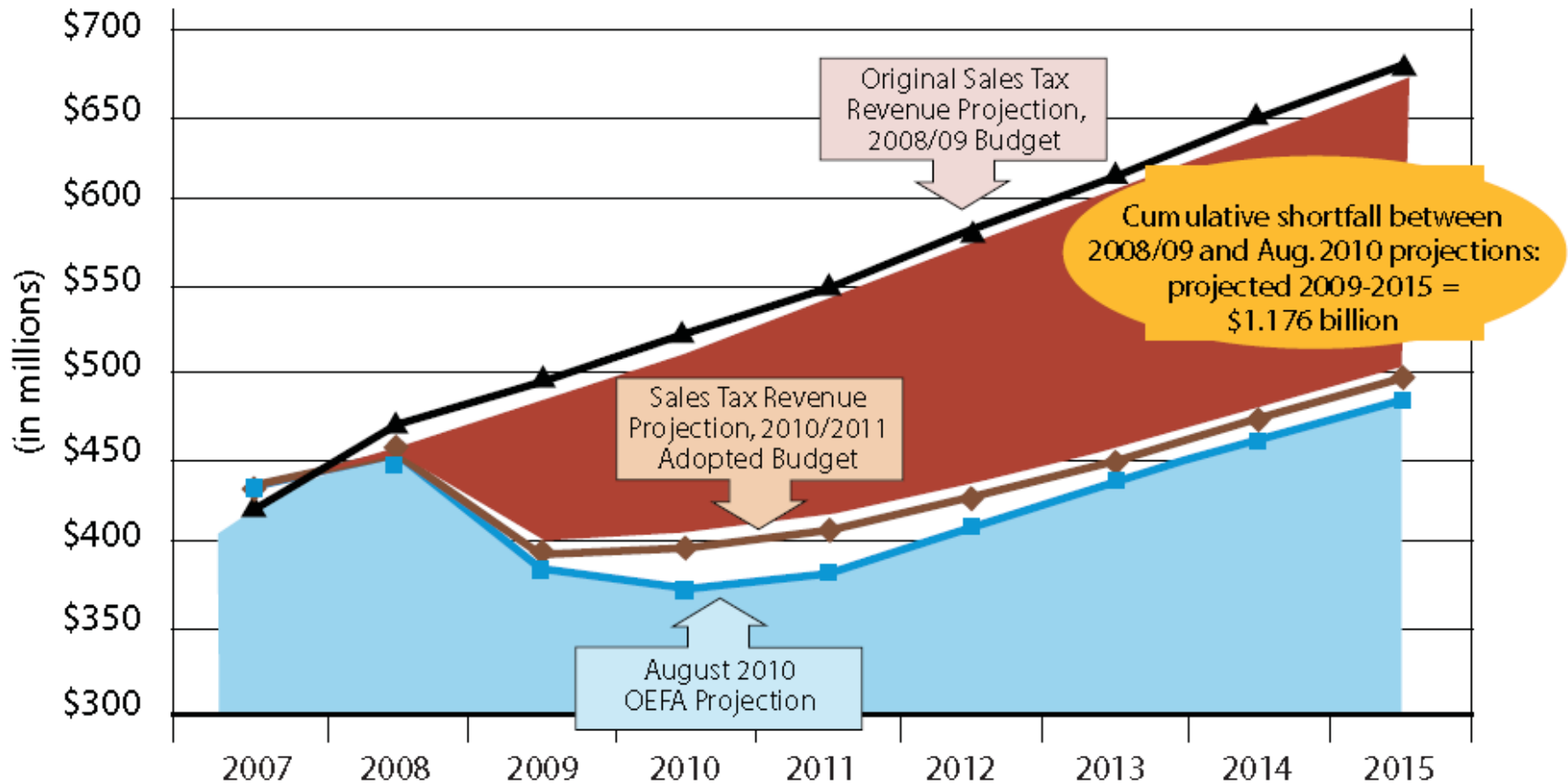


Source: King County Metro

# Daily Transit Boardings by Mode as Planned by PSRC



# King County Metro Transit Projected Sales Tax Revenue Shortfall



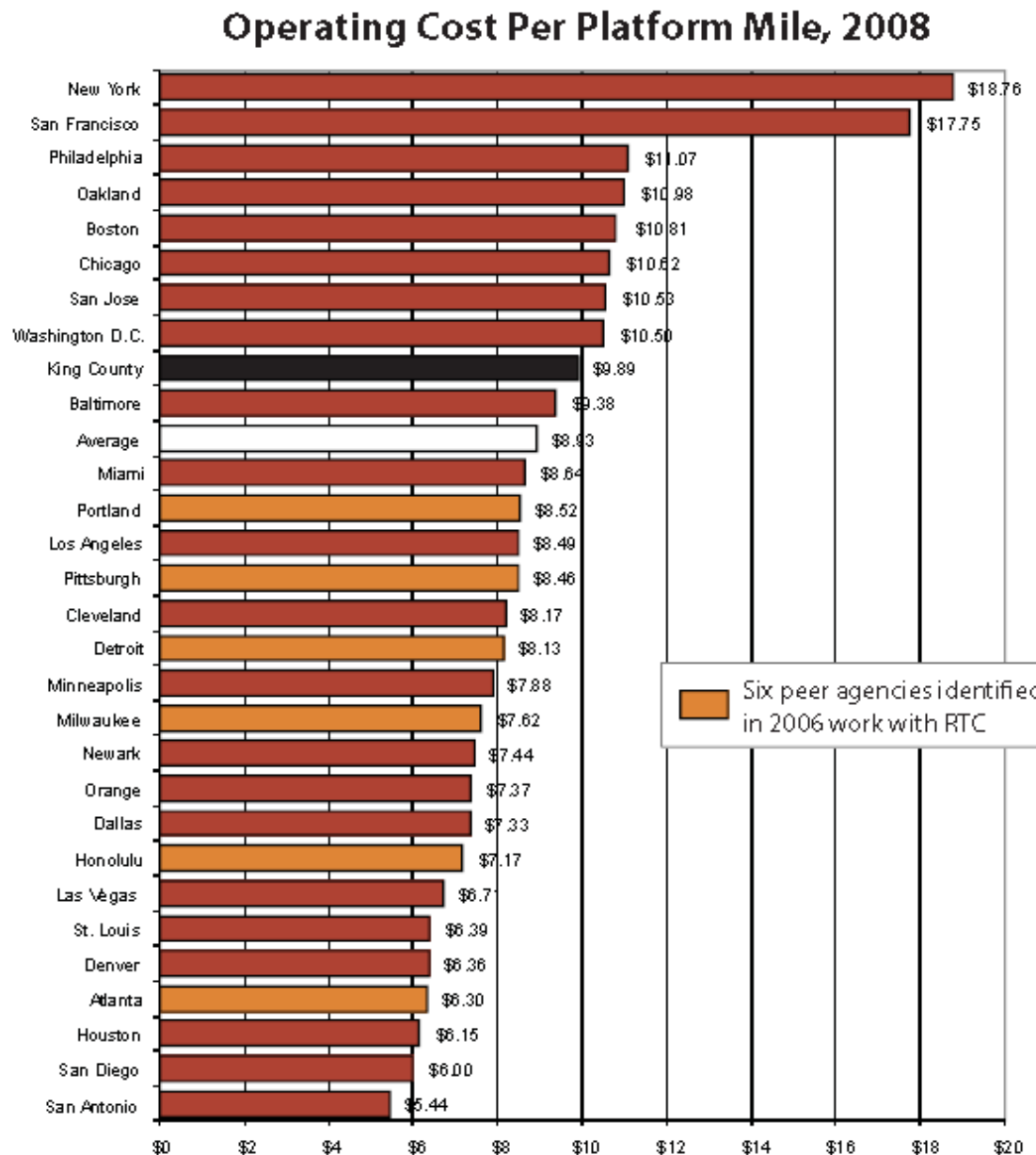
Source: King County Metro



# Examining the cost of bus service

Example of King County Metro, compared to transit agencies across the USA

Source: King County Metro



# Going Beyond the Bus

## Public Transit Mode A

### Vanpools

- 193,000 passenger trips per day by 2030
- \$2.5 billion (2030, YOE)
- Users pay 80-100 percent of operating costs

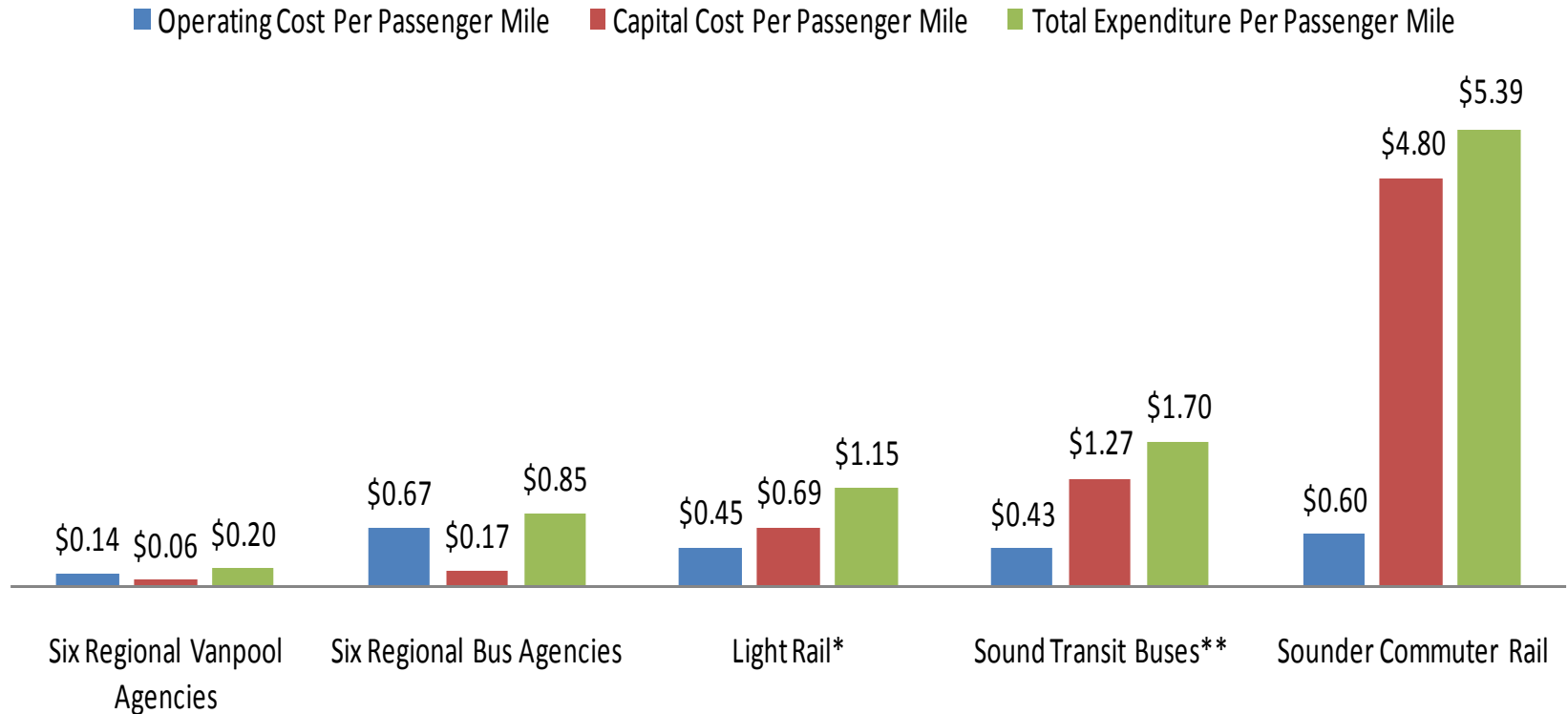
## Public Transit Mode B

### Light rail

- 163,000 passenger trips per day by 2030
- \$23 billion (2030, YOE)
- Users pay 20-40 percent of operating costs

# Vanpools

## Expenditure per passenger mile, 2000-2007



Source: National Transit Database and Island Transit officials

\* Data totaled from light rail systems in San Jose, Los Angeles & Portland

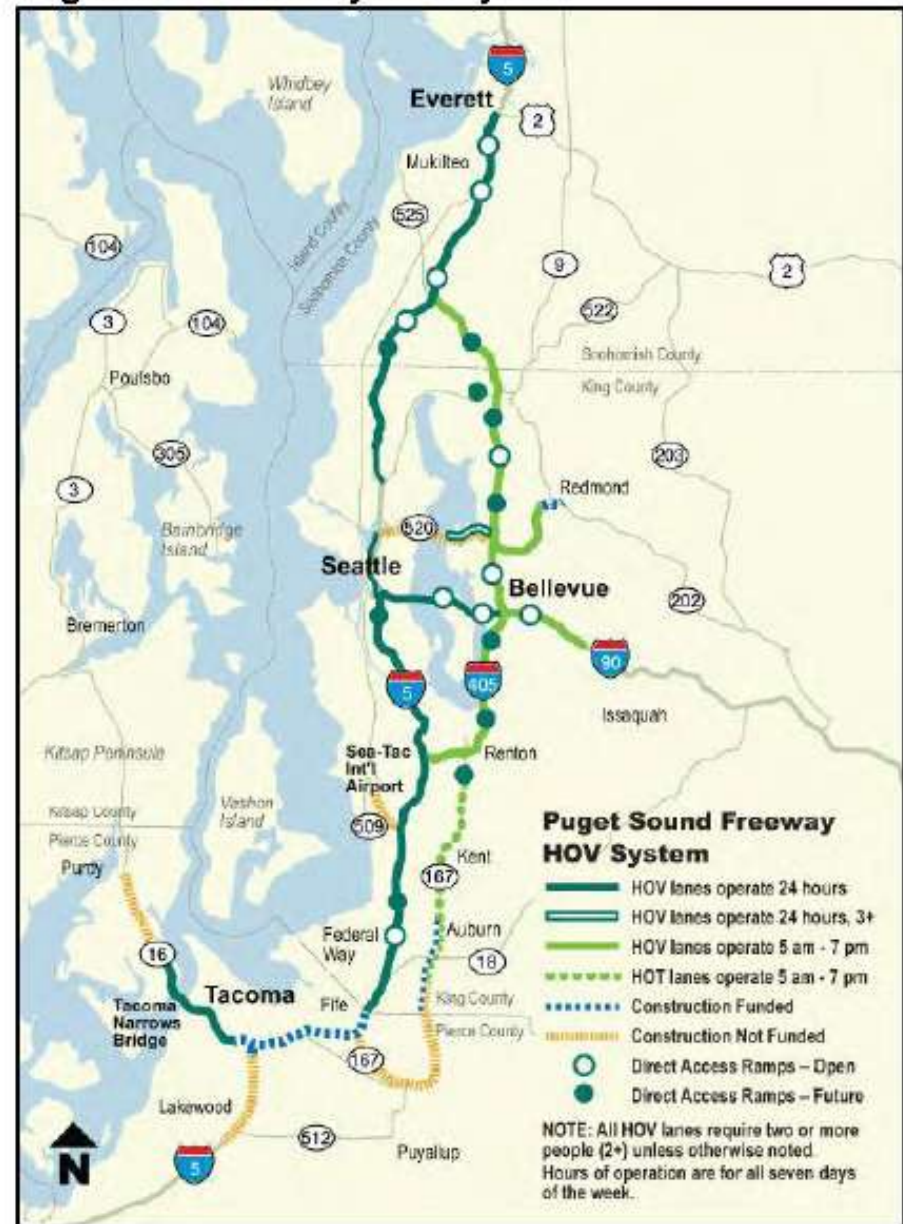
\*\* Excludes data for purchased transportation

Data from Mike Ennis at Washington Policy Center

# Regional Emphasis on High Occupancy Vehicle Lanes

HOV lanes move about 35% of the people who use this area's freeways in only 19% of the vehicles. The average HOV lane carries more than 1½ times as many people as the average "regular" lane

Puget Sound Freeway HOV System



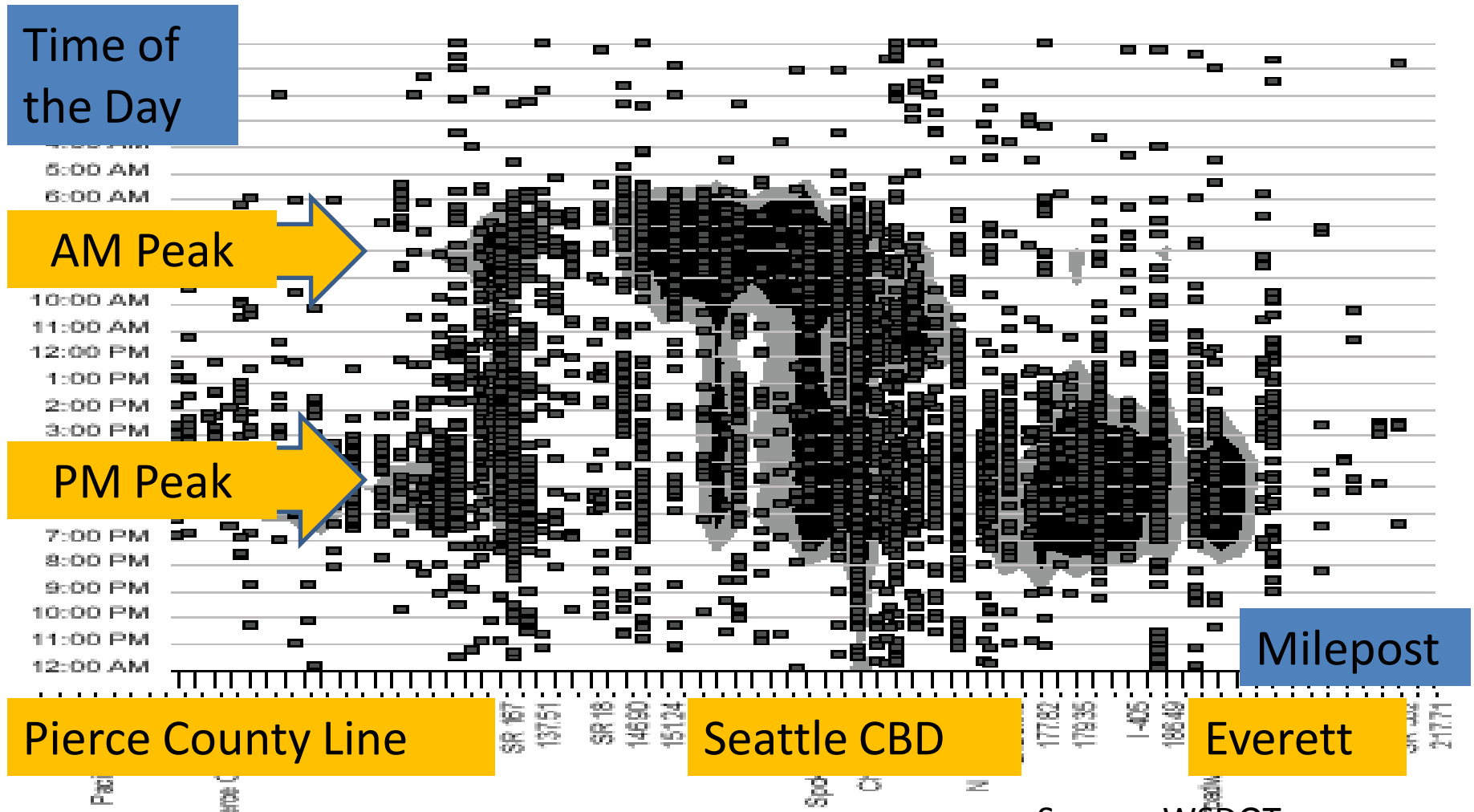
Source: WSDOT, 2009

# Active Traffic Management on I-5 South of Seattle Downtown



Picture by [tmcinfo.blogspot.com](http://tmcinfo.blogspot.com)

# Congestion leads to rear-end collisions and even more congestion!

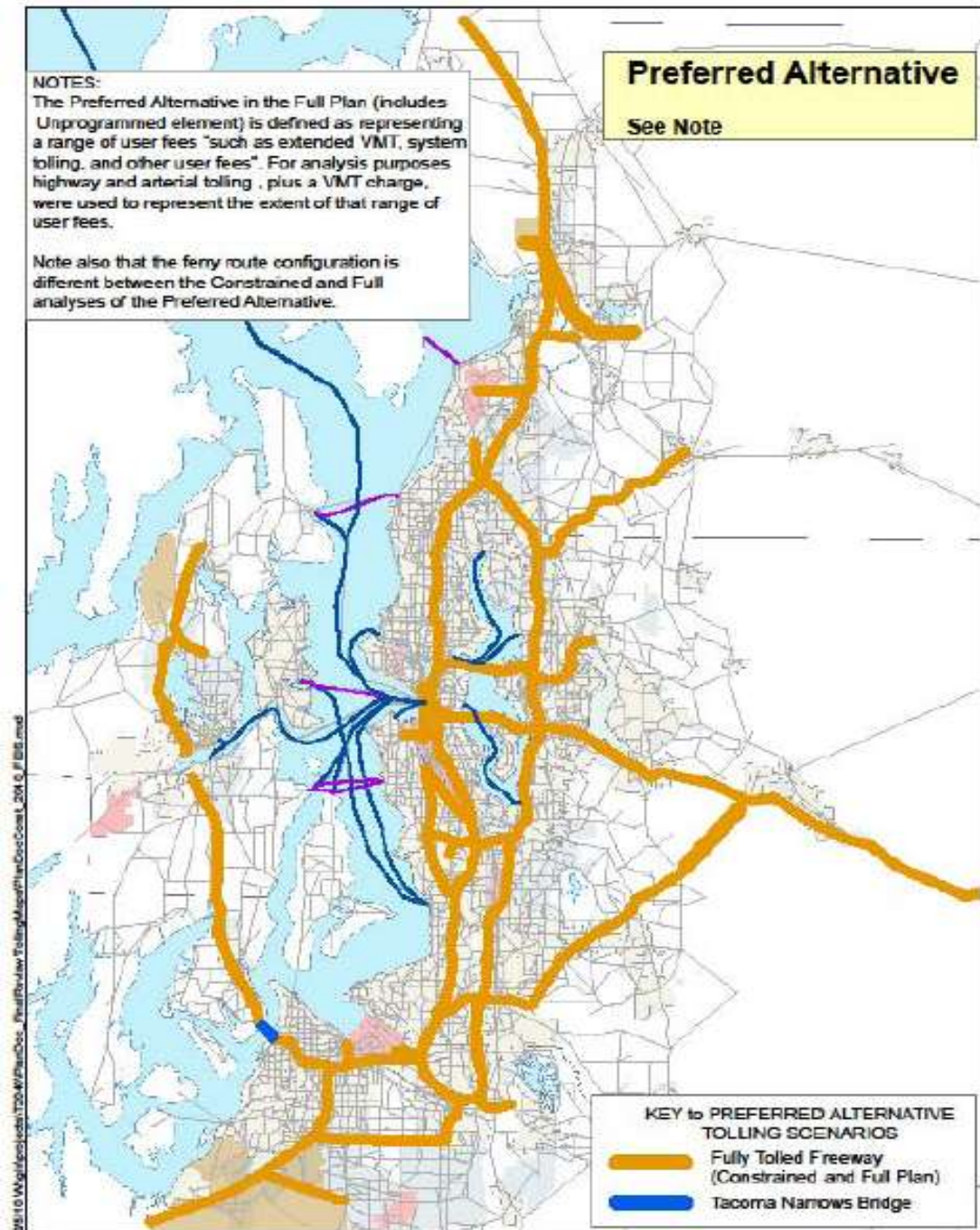


Source: WSDOT



# PSRC Plan Assumes Road Use Fees on All Expressways Implemented in the 2030s.

Source:  
PSRC Destination 2040 Plan



Why car usage dominates buses & trains.  
“Love affair” or “addiction” is not irrational!

- door-to-door, any origin, any destination
- controlled, flexible routing & stops
- controlled, flexible start & arrival times
- private, customized space while traveling
- perceived higher safety & security
- ease of bringing family, friends, & cargo
- emotional sensations - control, style, wealth

# Green Vehicles Now Arriving



Picture of the all-electric Nissan Leaf from the Nissan web site.

# Global Telematics' Alternative Plan

- Promote ridesharing, van pooling, cycling, and commute trip reduction.
- Active, intelligent, telematics-based traffic management as practiced in Europe.
- Electronic road user fees providing incentives for smoothly moving traffic flows
- Focus on low-emission and zero-emission vehicles

# Thank You Very Much!

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- jniles@alum.mit.edu
- <http://www.globaltelematics.com>
- [http://twitter.com/jn\\_seattle](http://twitter.com/jn_seattle)