

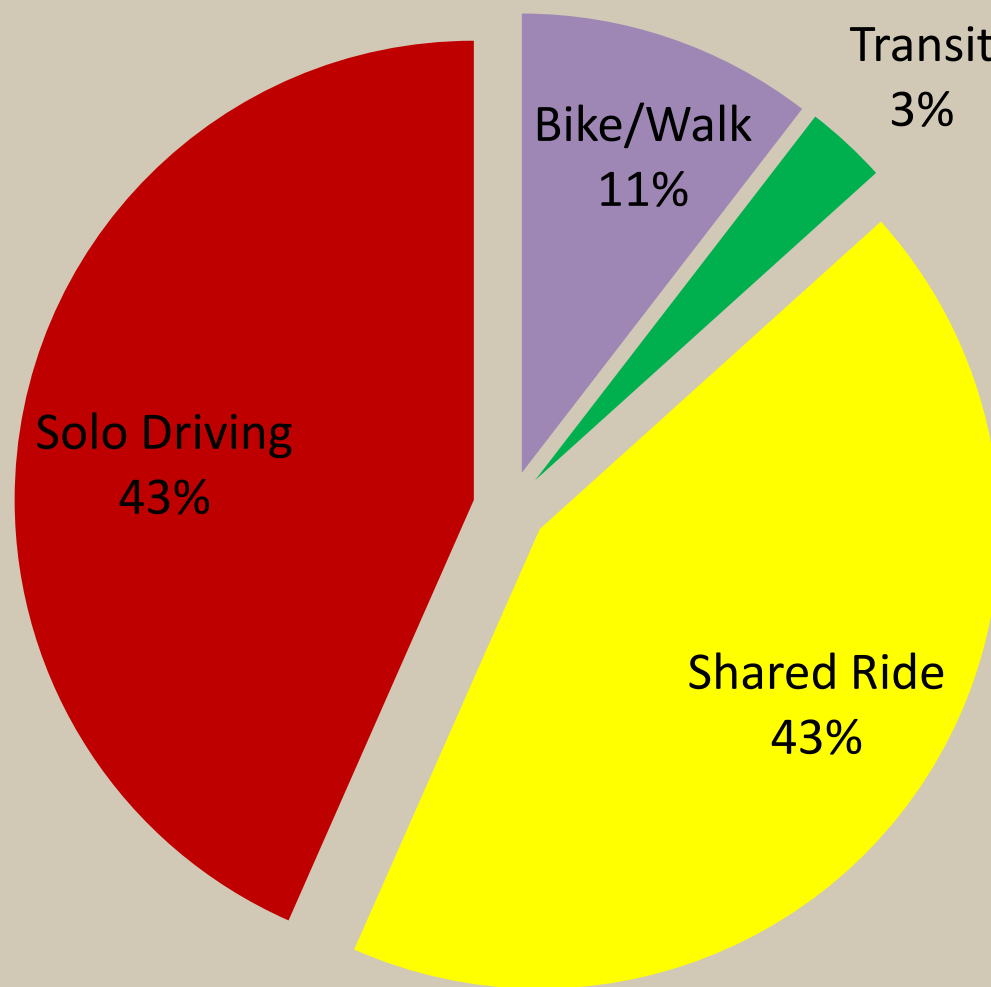
The Future of Roads, Automobiles, and Public Transit



Picture by tmcinfo.blogspot.com

John Niles, President, Global Telematics,
For Eastside Transportation Association
June 20, 2012

Mode Shares, Puget Sound Region, 2006

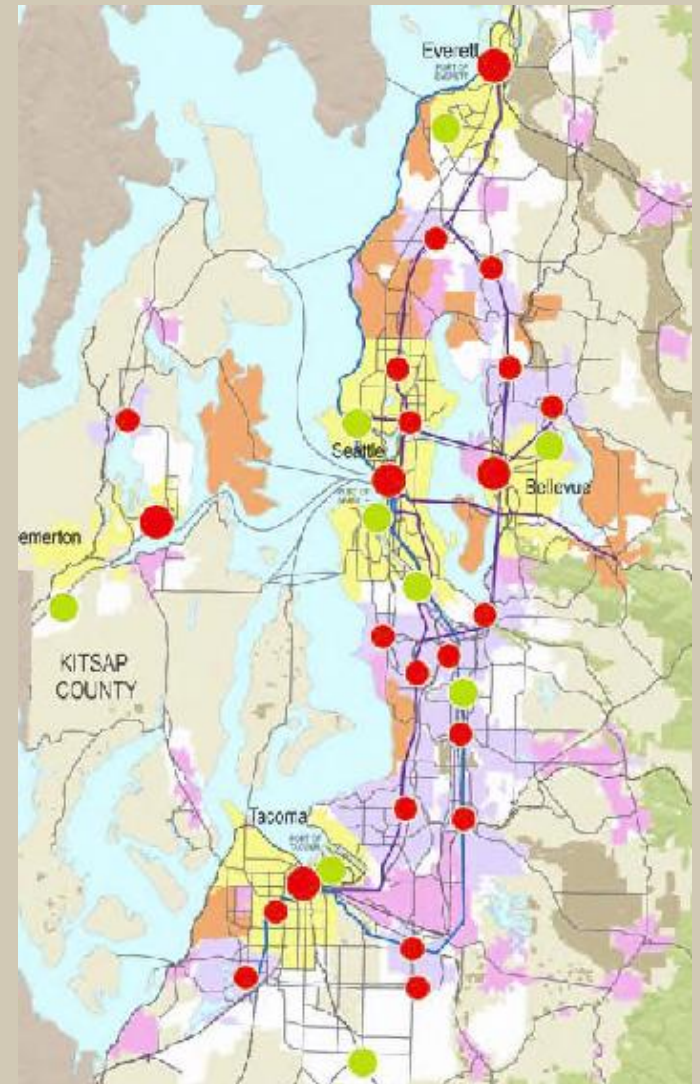


Data source: Puget Sound Regional Council, Metropolitan Transportation Plan

Rail-Transit-Oriented Development (TOD)

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

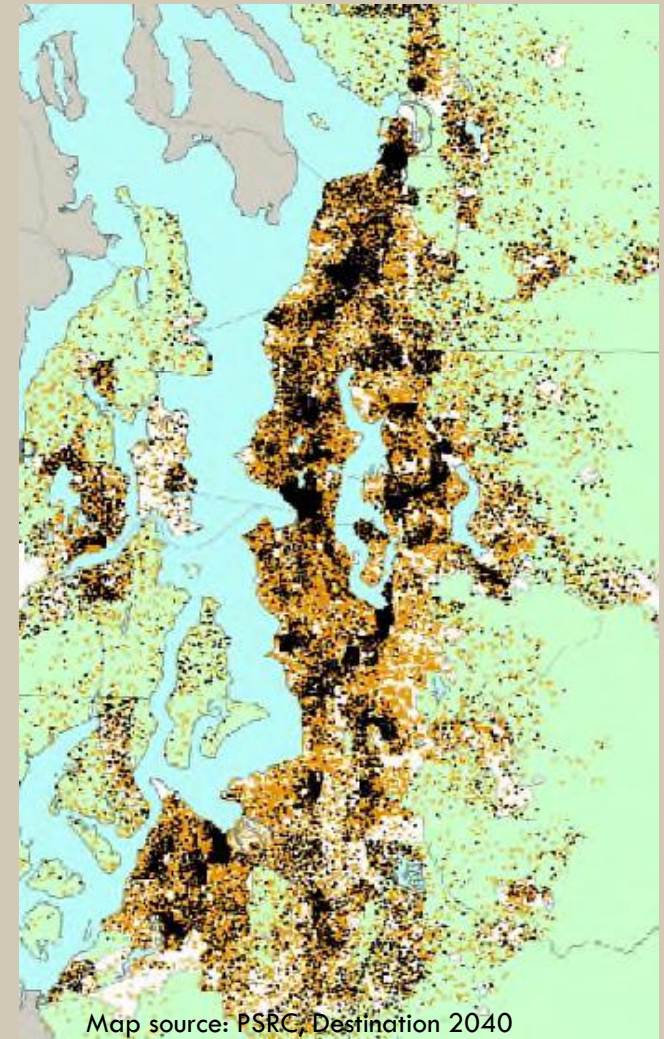
Map source: PSRC, Destination 2040



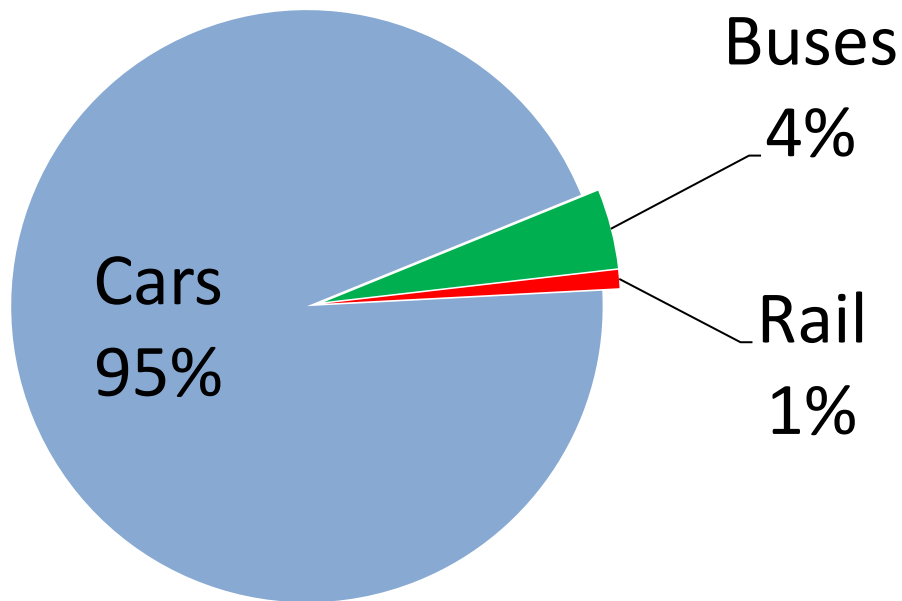
In Contrast, How the Region is Growing

Future growth does not necessarily fit neatly into high-density TOD zones near train stations!

Forecast 2040 residential & job growth

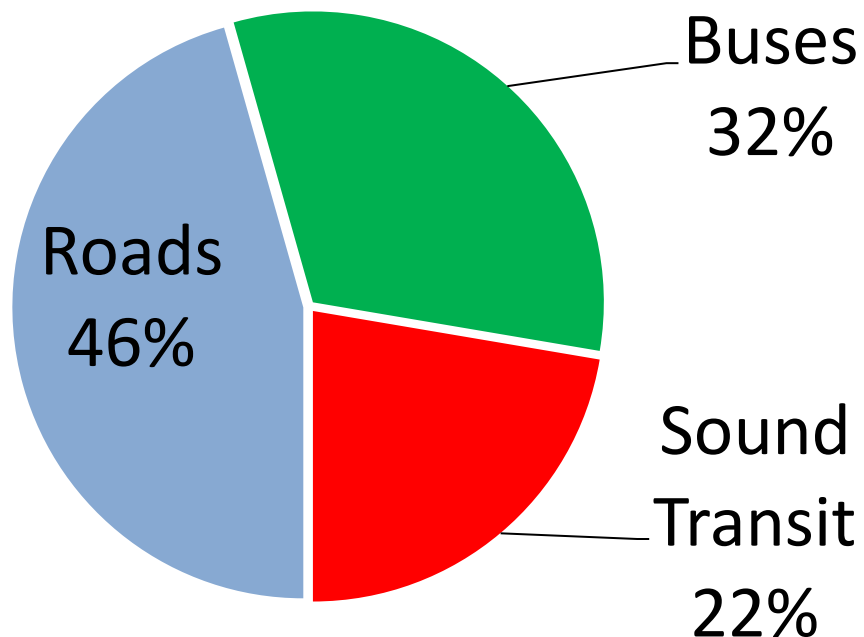


**17 Million Daily Trips
Expected in 2040
Divided by Mode**



Data for both charts from: Puget Sound Regional Council. Motorized land travel only.

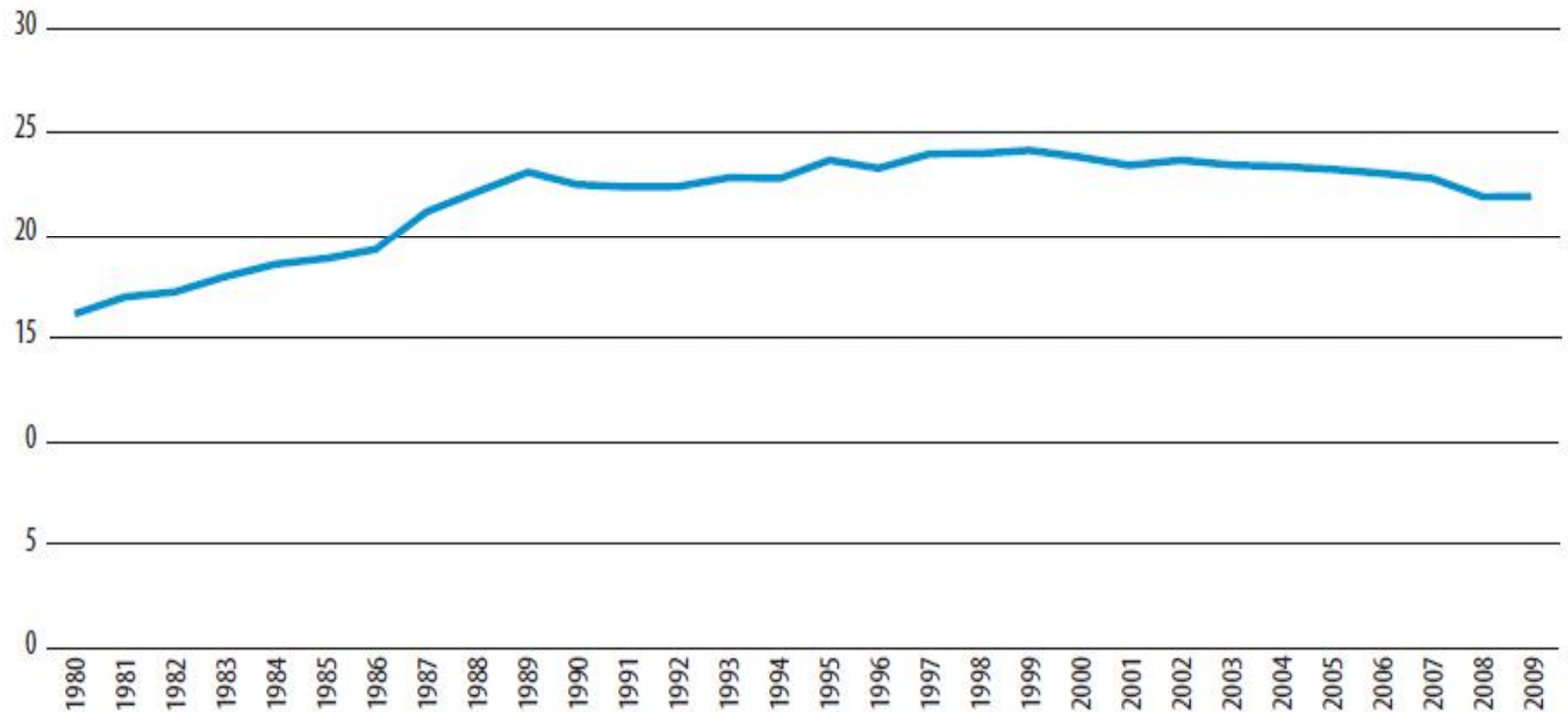
**\$179 Billion Spending
From Now Until 2040
Divided by Mode**



**Official
Approved
Plan**

Regional VMT Per Capita Now Declining

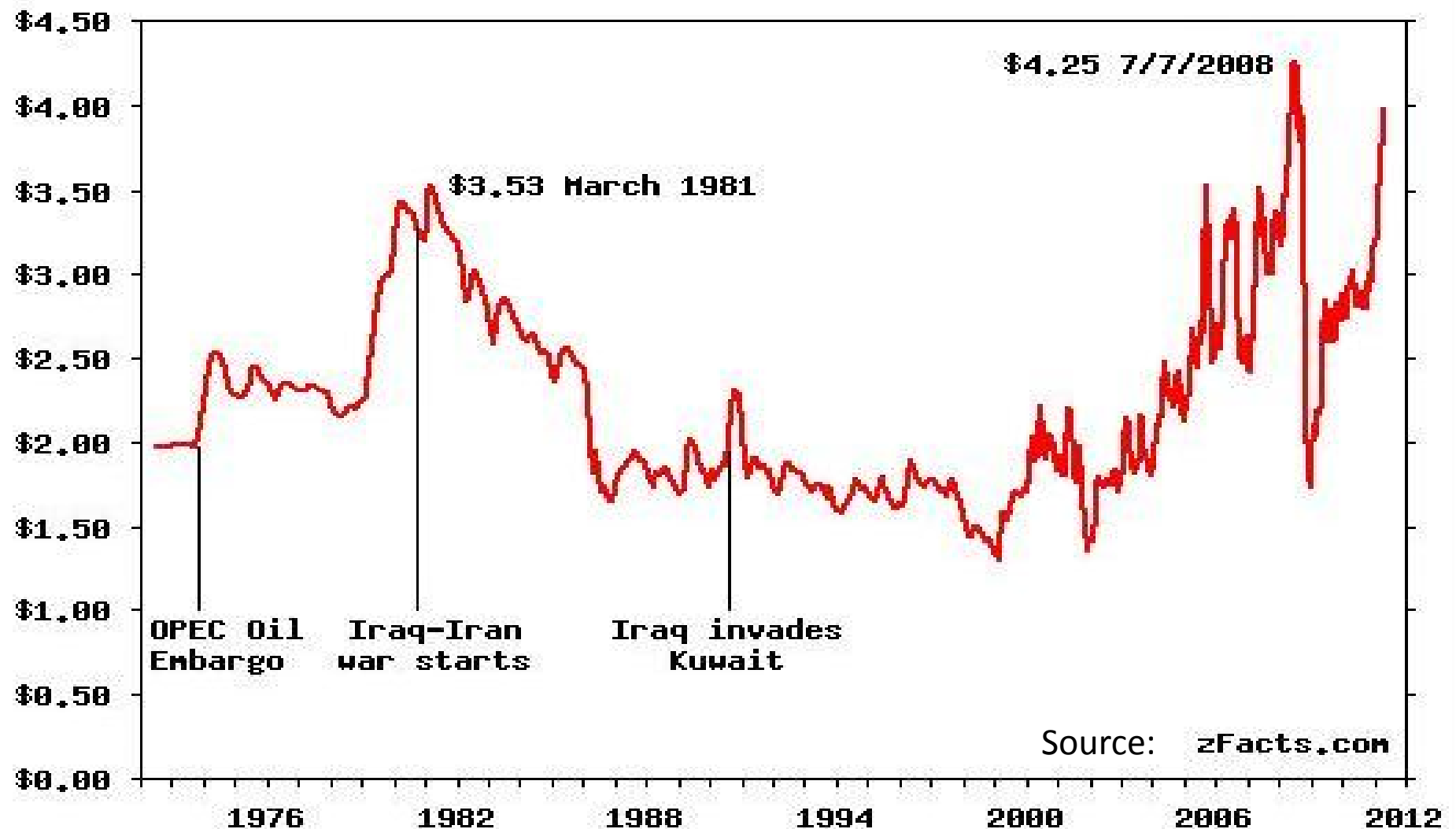
Figure 2. Daily VMT per Capita



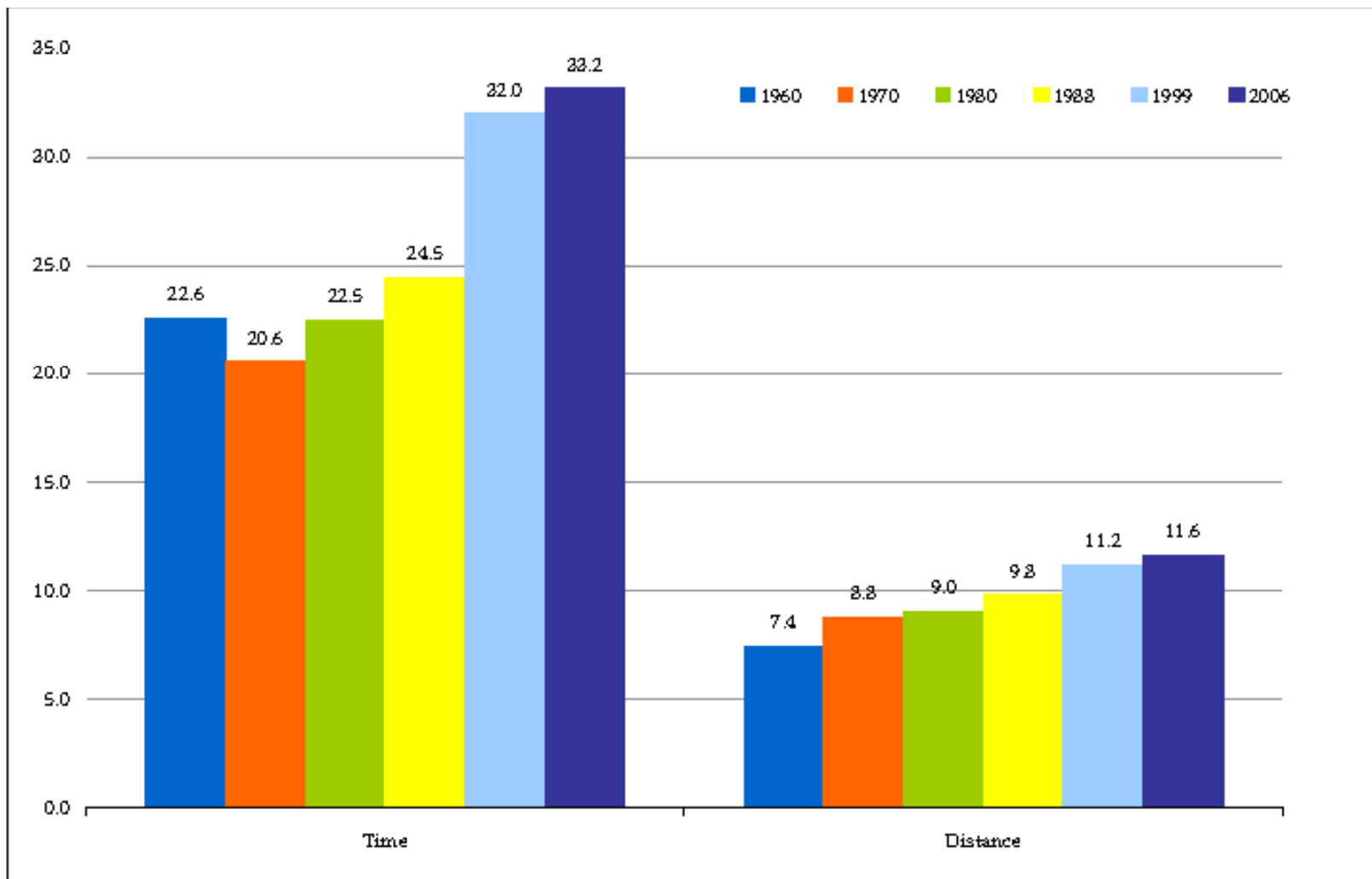
Source: Puget Sound Regional Council

U.S.A. Gasoline Prices

Regular Gasoline Price in Today's Dollars (5/2/2011)



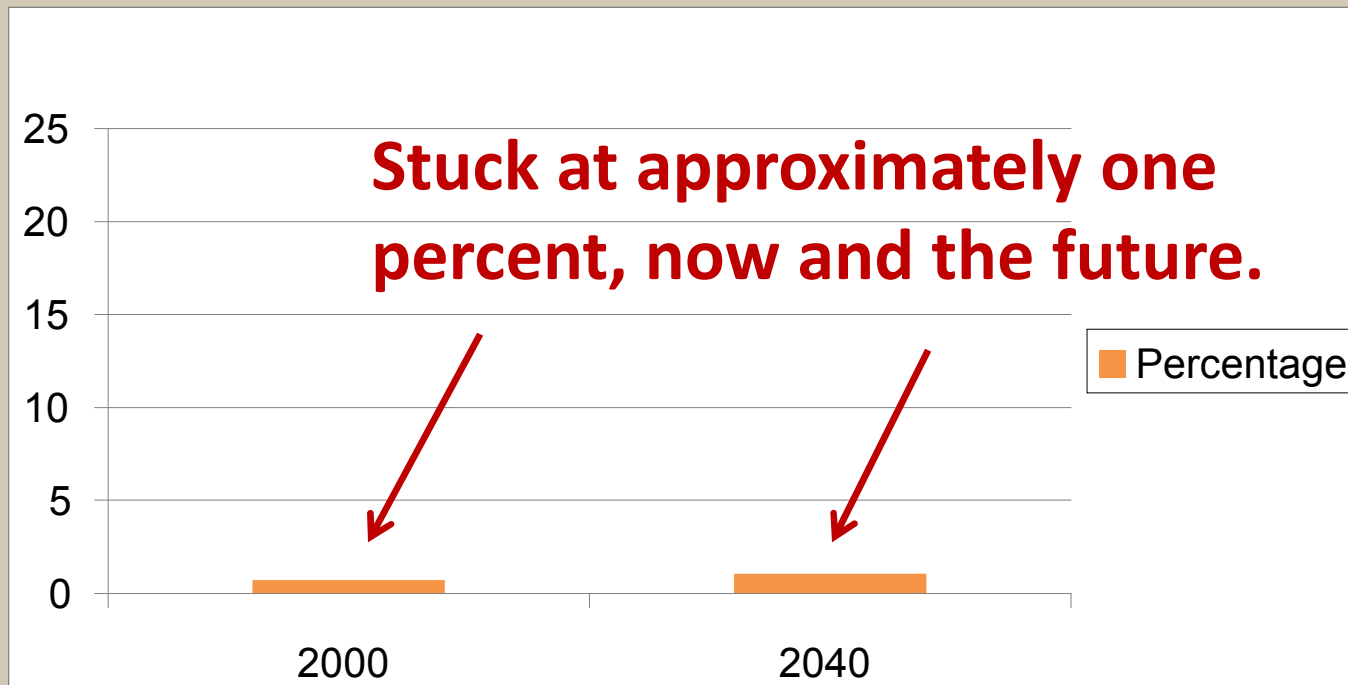
Commuting Distance & Time



Source: PSRC Household Travel Survey

Access to Jobs via Public Transit

% of regional jobs the average household can access within 30 minutes by transit



Source: PSRC Vision 2040 Draft Supplemental EIS, page II-29

Late News: City of Vancouver, Canada “aims for two thirds of trips by bicycle by 2040”

Vancouver is continuing its push to reduce car traffic in the city, with an ambitious goal to have two-thirds of all trips made by foot, bike or transit by 2040, up from 40 per cent in 2008.

The goal was outlined Monday in the second phase of the city's \$1-million transportation plan, which cites walking as the top priority, followed by cycling, transit and taxis, as part of a city "roadmap" to build more dense, walkable neighbourhoods.

....

"It's key that we build complete communities where most of the services that are needed are within a five-kilometre walk to promote a cycling and pedestrian community," said city planner Jerry Dobrovolny.

-- By Kelly Sinoski, *Vancouver Sun*, June 19, 2012.

Vancouver Region is Car Dependent and Building Infrastructure to Accommodate



Source: <http://www.earthcam.com/clients/britishcolumbia/portmann/>

Vietnam as Example of Demand for Mobility

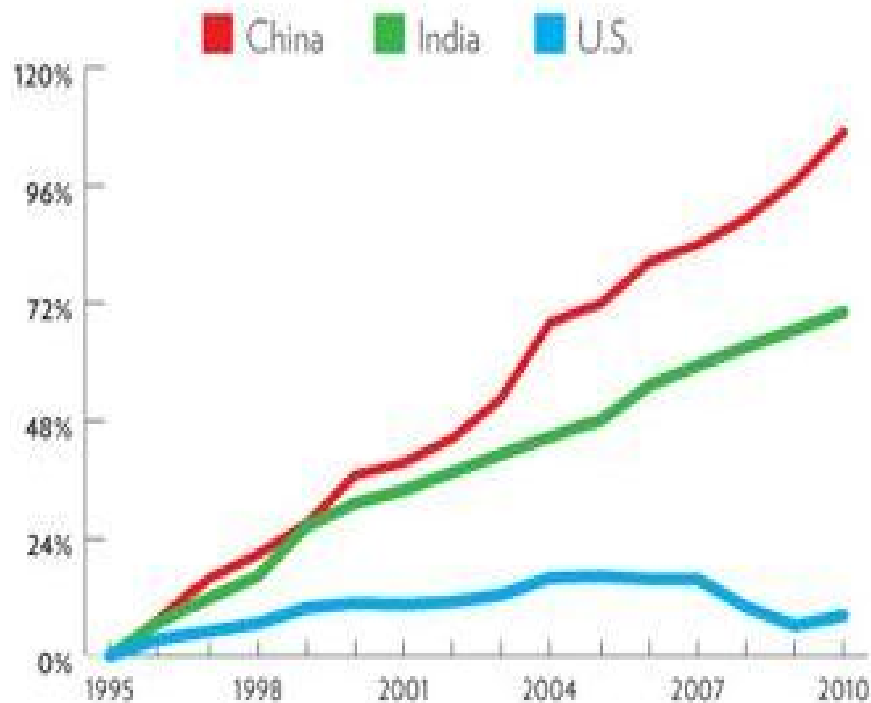


Source: Camera phone video by John Niles in Saigon, 2011

China & India Have a Taste for Cars

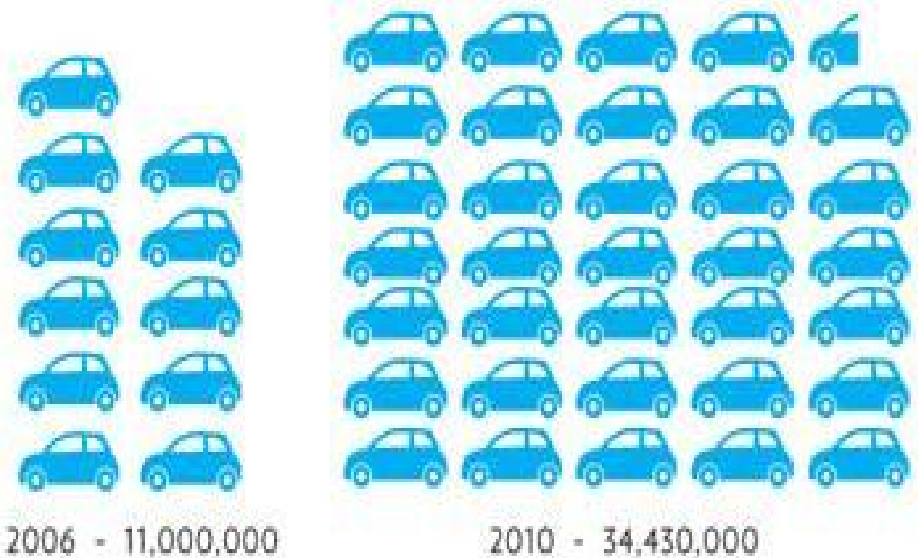
GLOBAL OIL CONSUMPTION IS SOARING

Cumulative growth in total oil consumption



SOURCE: EIA

CHINA TRIPLED ITS NUMBER OF CARS—AND ITS GAS NEEDS—IN JUST 4 YEARS



The number of cars in the U.S. grew by 10 percent in that time

SOURCE: 2011, WARD'S AUTOMOTIVE GROUP,
A DIVISION OF PENTON MEDIA INC.

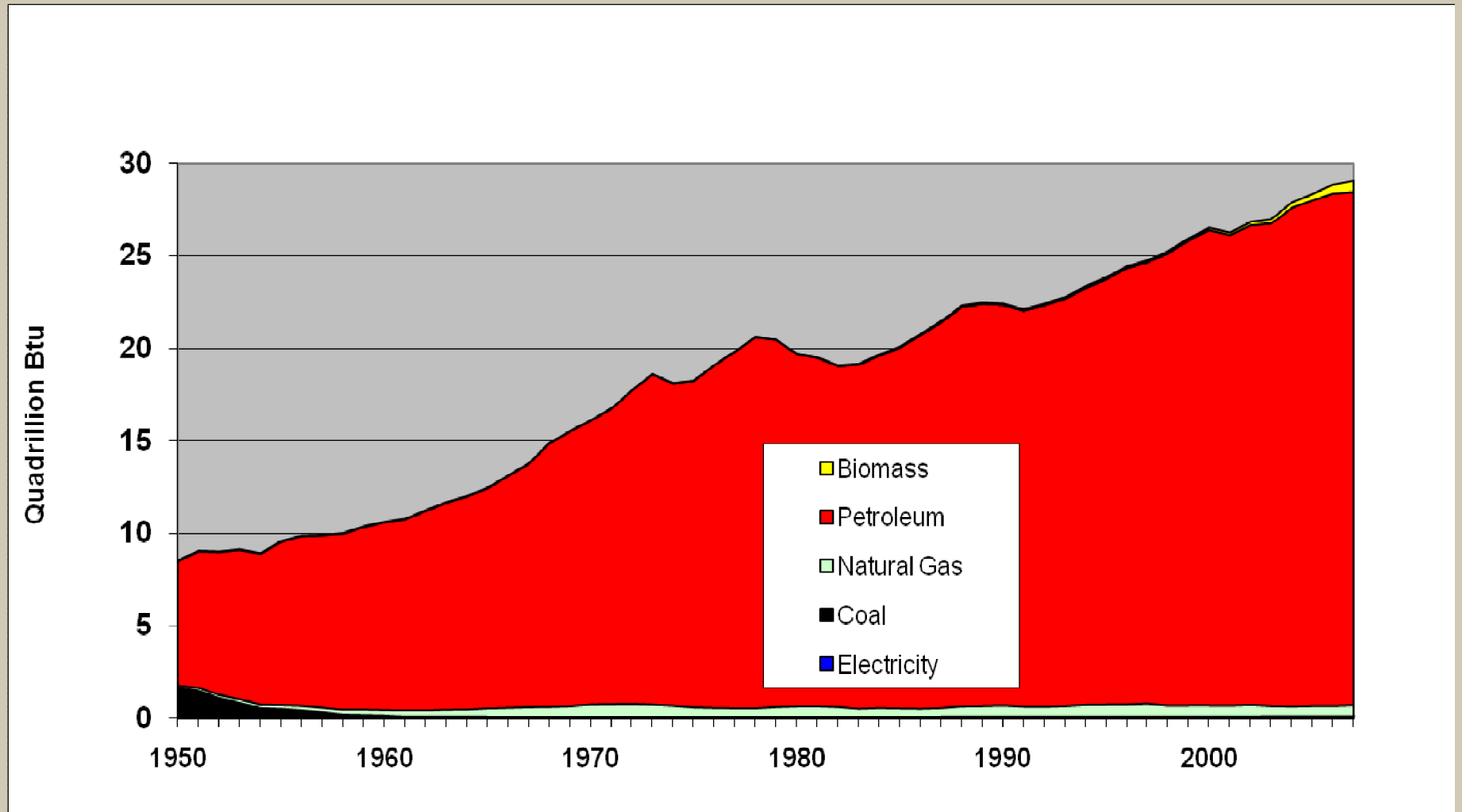
Posted at whitehouse.gov

Why automobile usage is popular:
“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
- protection from heat, cold & rain
- ease of bringing family, friends, & cargo
- emotional sensations - control, style, wealth

Source: Global Telematics

Transportation Energy Mostly Oil



Source: Steve Marshall at Center for Advanced Transportation and Energy Solutions

Oil Dependence in Transportation is Bad

- Harms national security, the economy and the environment
- Oil imports = \$1 billion a day
- Half of U.S. trade imbalance from oil imports
- Burning oil is USA's largest man-made cause of GHG and urban pollution.
- Annual U.S. military cost to protect world oil supply lines exceeds \$80 billion.

Source: Steve Marshall at Center for Advanced Transportation and Energy Solutions

Part of What Oil Costs Us



December 18, 2001 - After an early morning round of flight operations, an F/A-18 Hornet awaits the next round of combat flight operations aboard the USS John C. Stennis (CVN 74). Stennis and her embarked Carrier Air Wing Nine (CVW-9) are supporting Operation Enduring Freedom. U.S. Navy photo by Photographer's Mate 3rd Class Jayme Pastoric

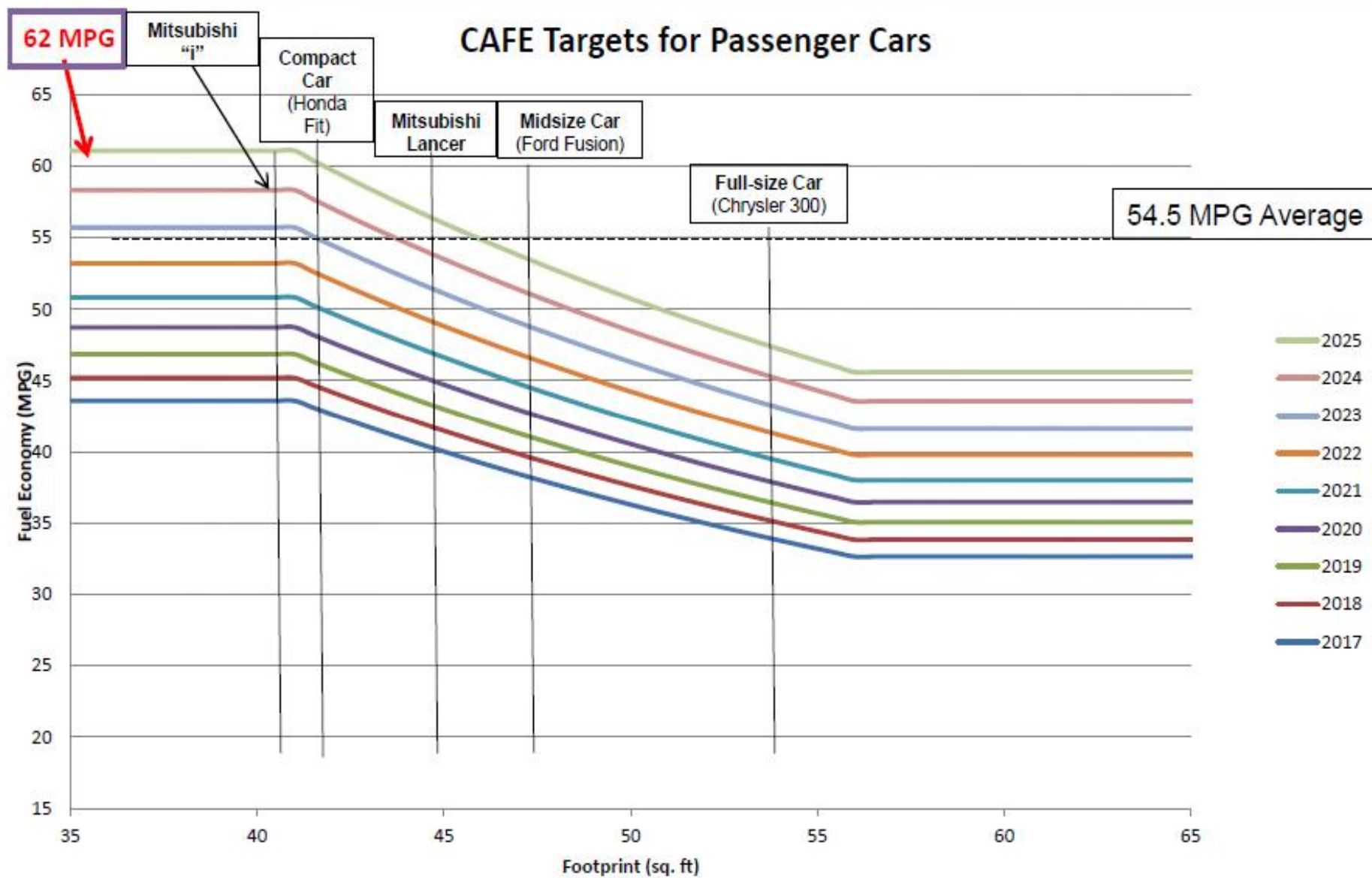
Photos from the U.S. Navy

Electric Vehicles to the Rescue



Photos from car companies: top row, Ford; bottom row: Nissan and General Motors

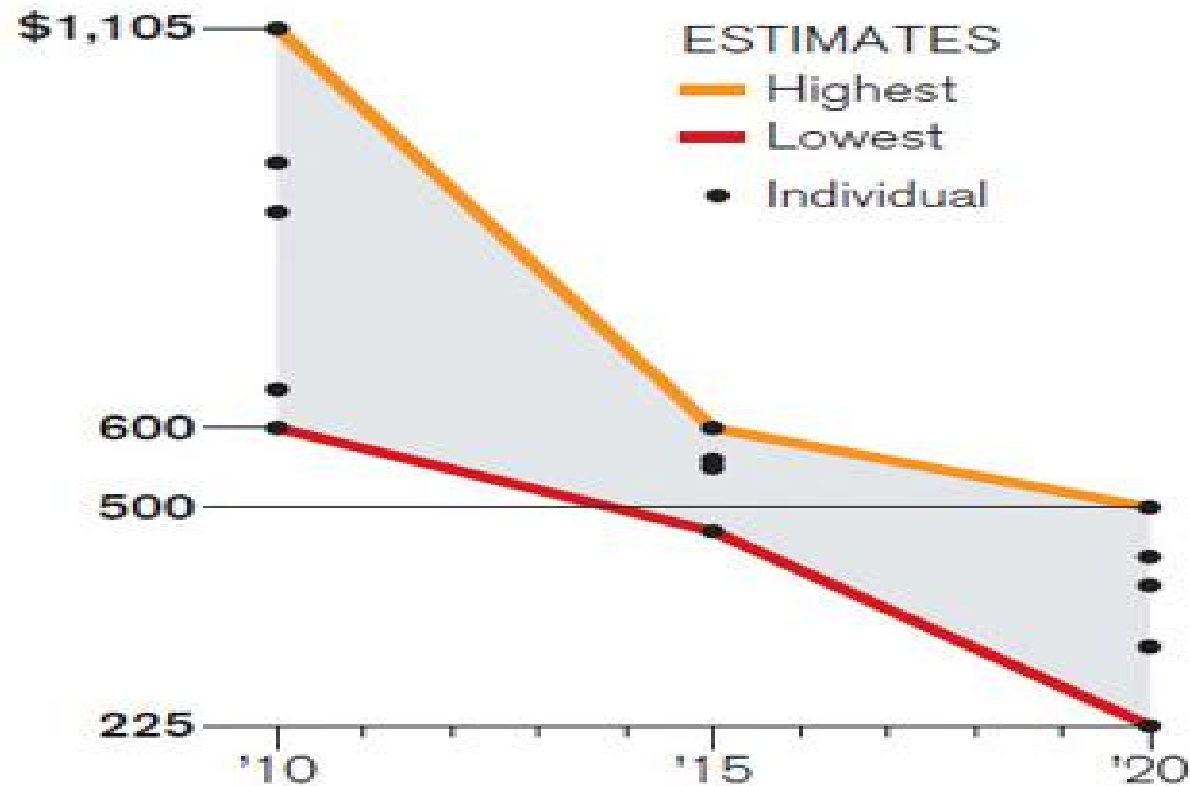
Passenger Car Standards 2017 – 2025MY



Source: Mitsubishi chief engineer David Patterson

Battery Progress

Estimates of electric-vehicle battery costs
\$ per kilowatt-hour



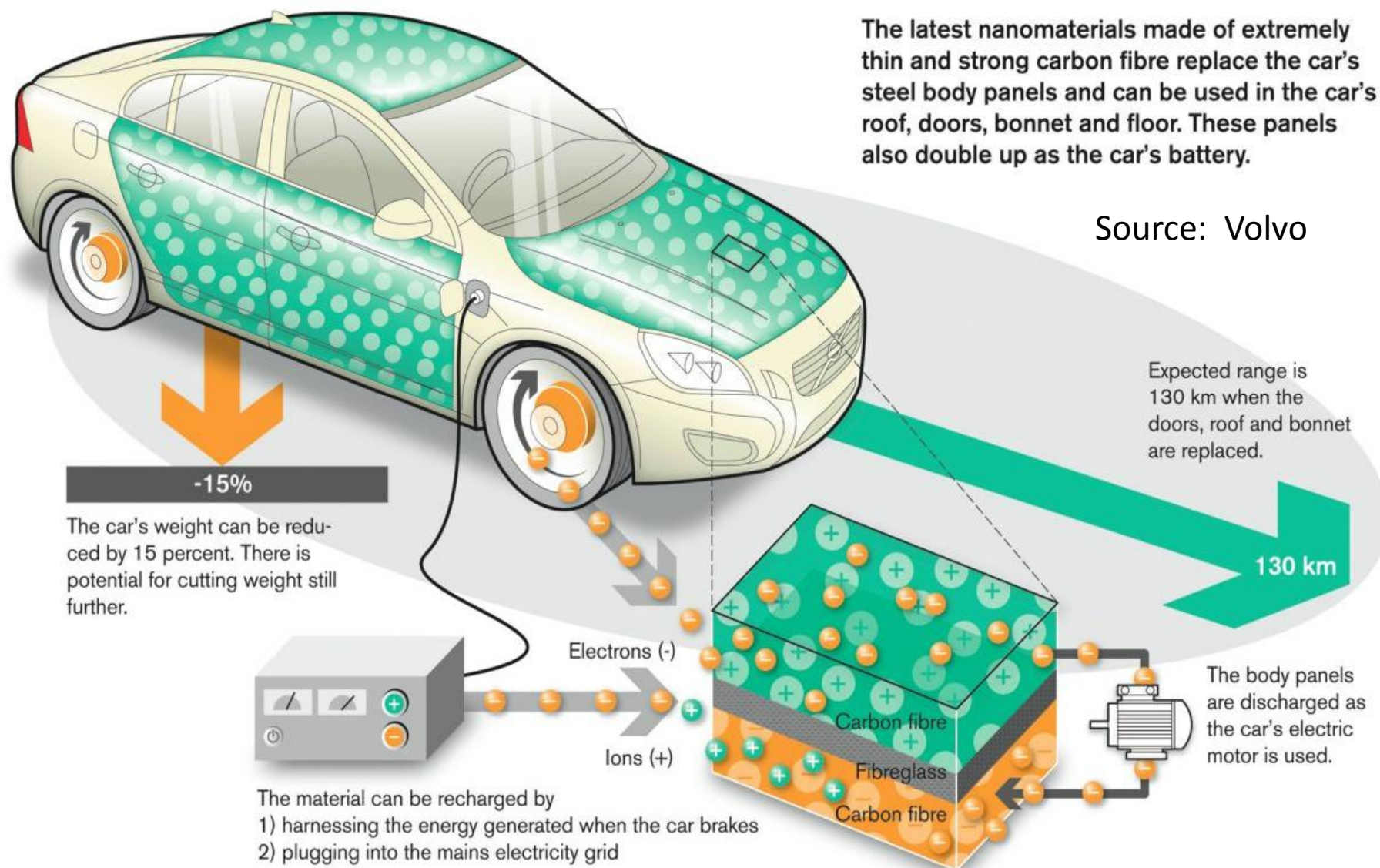
Sources: Advanced Automotive Batteries, Boston Consulting Group, Deutsche Bank, Electrification Coalition, National Research Council, and Pike Research

Source: *Technology Review*, January 2012

The car's body panels serve as a battery

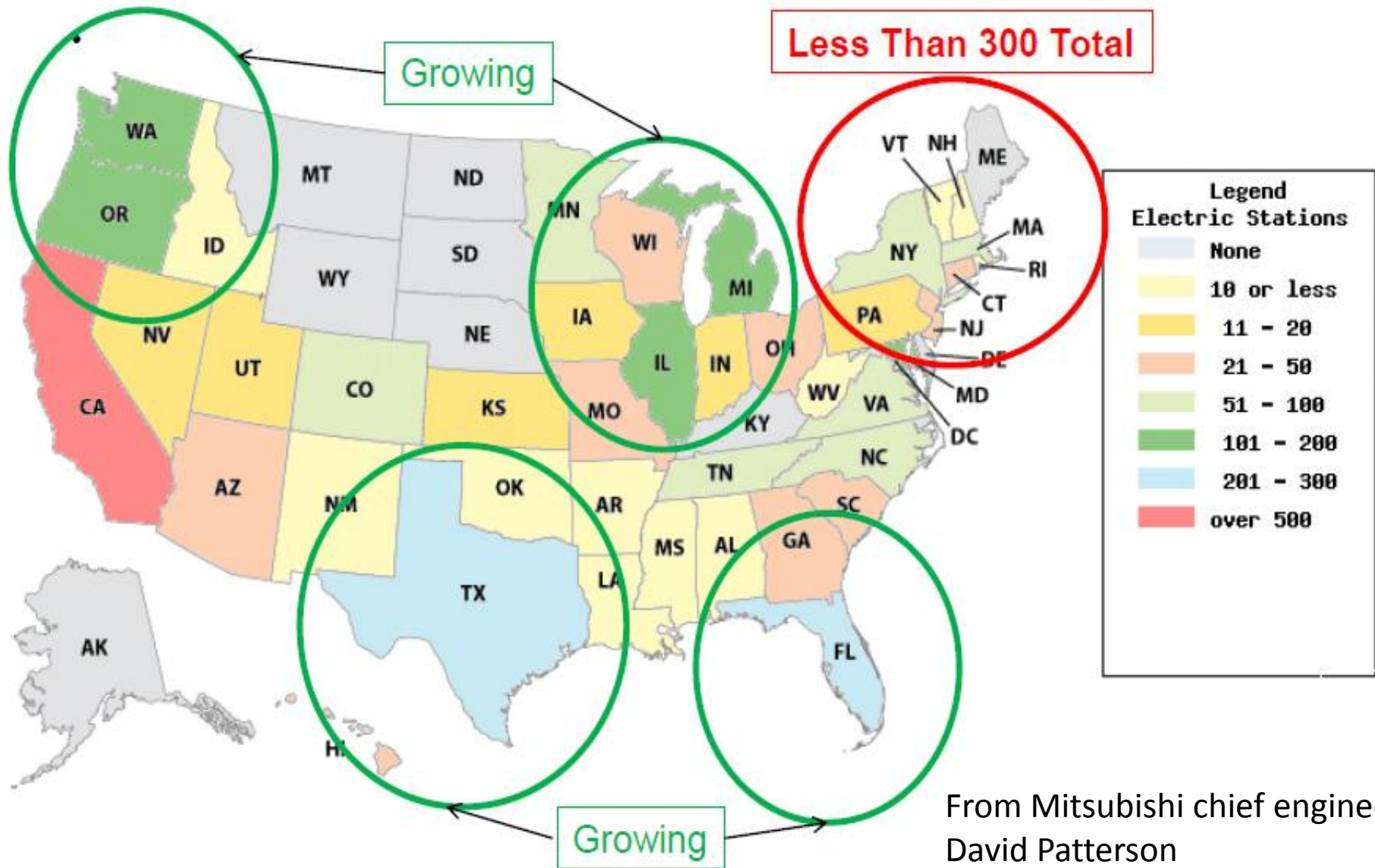
The latest nanomaterials made of extremely thin and strong carbon fibre replace the car's steel body panels and can be used in the car's roof, doors, bonnet and floor. These panels also double up as the car's battery.

Source: Volvo



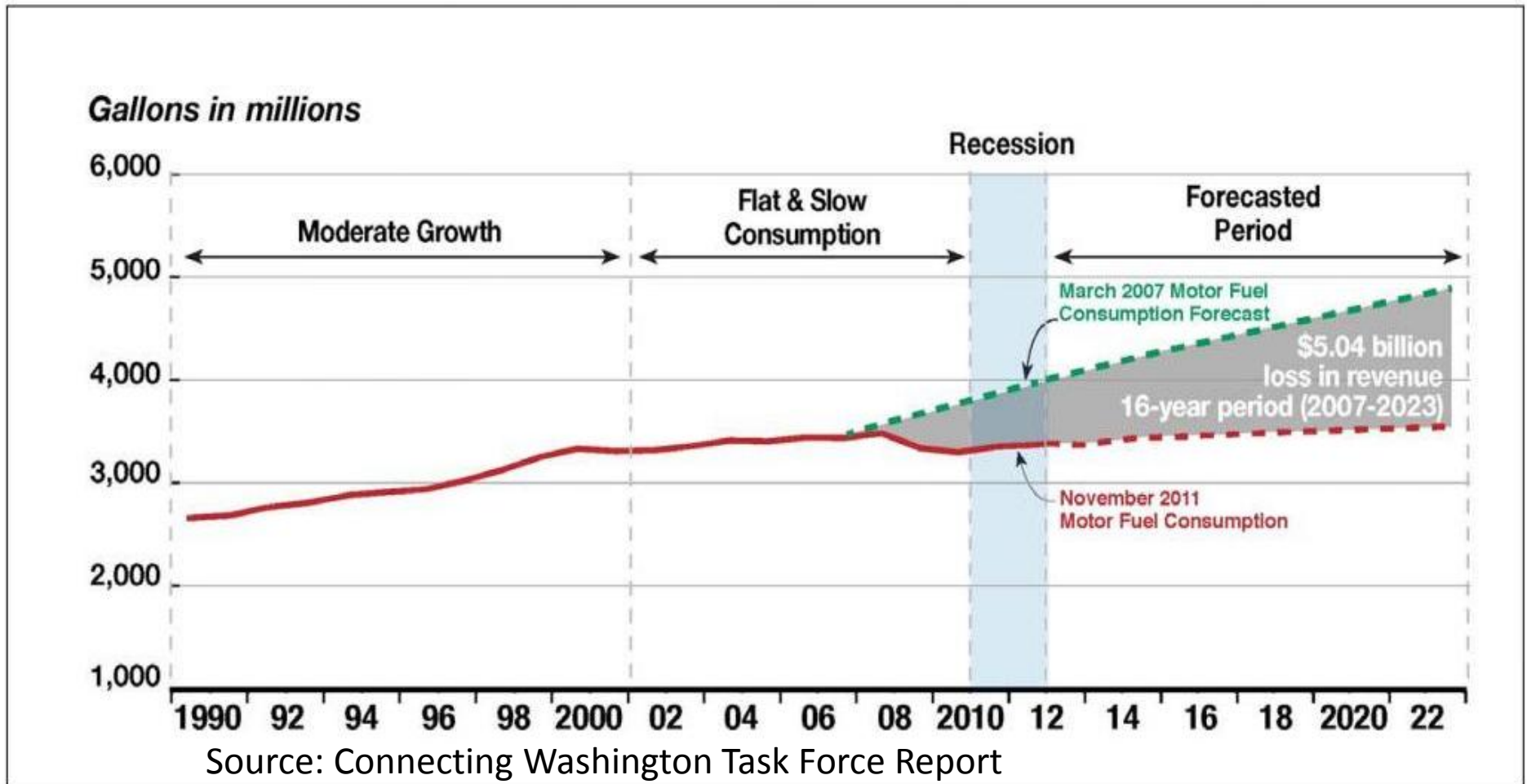
<http://www.volvocars.com/intl/top/about/news-events/pages/default.aspx?itemid=209>

Public Infrastructure Support – Improving?



Washington State Motor Fuel Consumption

Increased fuel efficiency and changes in driving habits have reduced forecasts of future state fuel tax revenue.

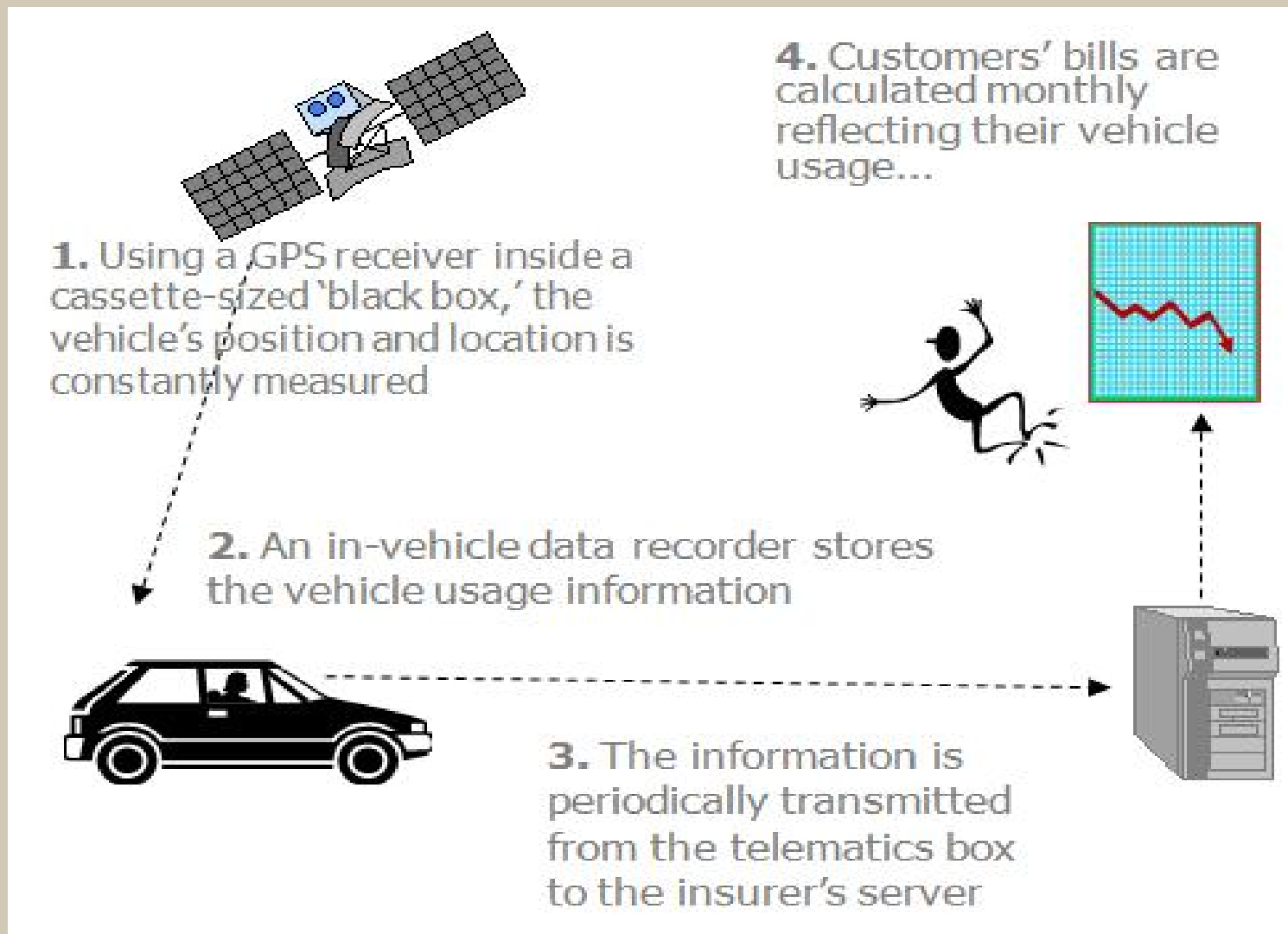


Connecting Washington Task Force Recommendation:

However, in the longer term, higher standards of vehicle fuel efficiency, the emergence of electric vehicles, changes in development patterns and other factors will continue to erode the viability of the fuel tax

Therefore, the Task Force urges the Legislature to support the exploration of ... a **direct user fee that is based on miles traveled**, wear-and-tear on the roadways, or other direct impact upon the transportation system, allowing the system to be managed and funded as a statewide transportation utility with rates based upon use.

Car Insurance Through Telematics



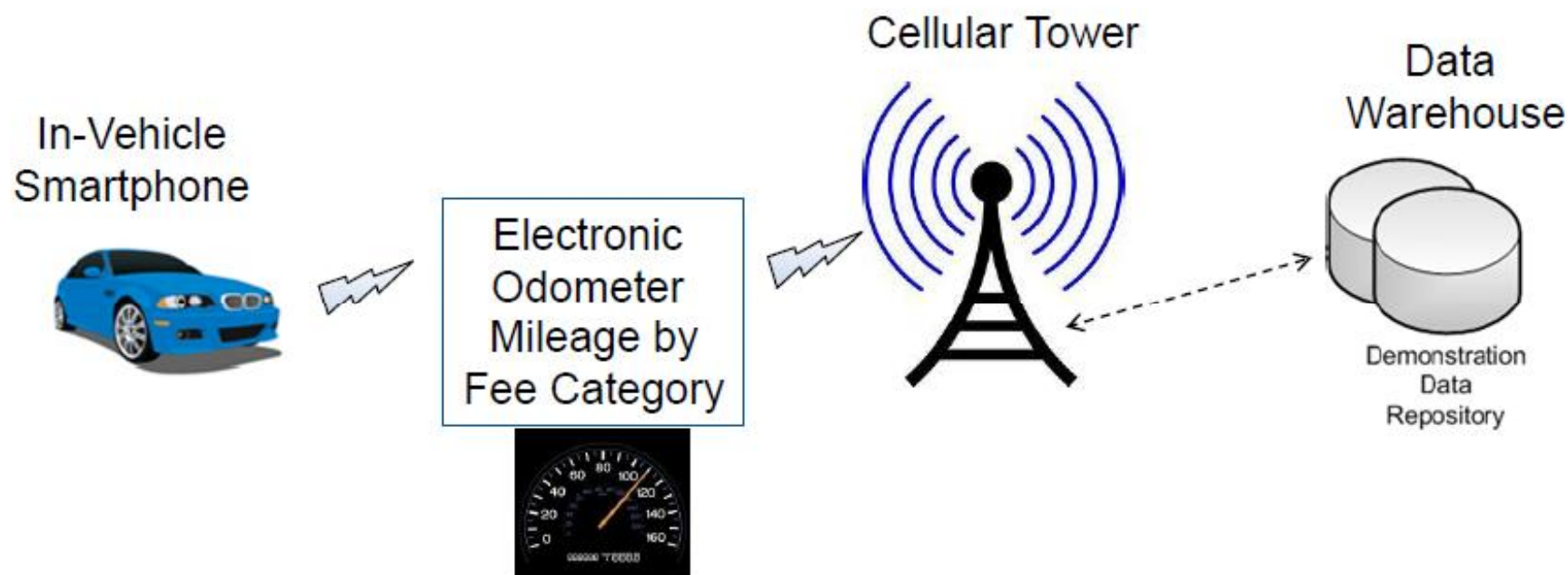
Source: <http://www.hcltech.com/automotive/insurance-telematics>

Central Puget Sound VMT Fee Arithmetic

- \$2.94 billion annual government transportation spending (non-transit)
- 29.1 billion annual vehicle miles traveled
- \$2.94 divided by 29.1 is 10 cents/vehicle mile

System Concept

Source: Presentation by Battelle on the Minnesota VMT charging pilot program.



GPS Position is NOT being transmitted for the Fee Assessment

What Does a Participant See?



Source: Presentation by Battelle on the Minnesota VMT charging pilot program.



Solution: Motorists Select Their Version of Simple

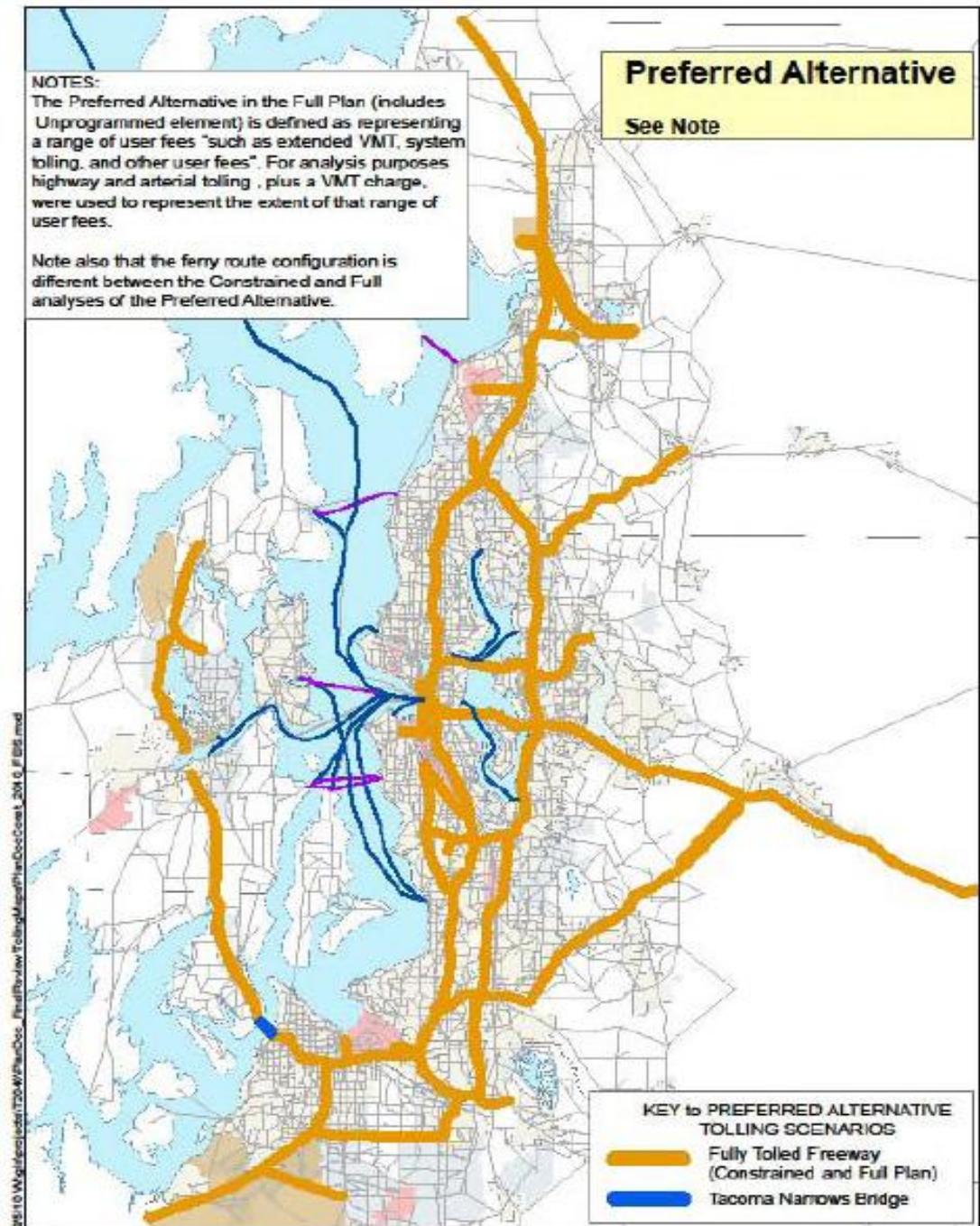
Choose Reporting Method From Four Potential Options

1. **Flat Annual Tax.** Purchases unlimited mileage
2. **Self Reporting.** Periodic reporting of mileage via on-line form
3. **Electronic Reporting from Odometer.** Wireless transfer of mileage data directly from odometer
4. **Electronic Reporting from Advanced OBU.** Wireless transfer of mileage data from on-board unit with vehicle location capability



PSRC 2040 Metropolitan Transportation Plan includes road use fees on all expressways to be implemented by the 2030s.

Source:
PSRC Destination 2040 Plan

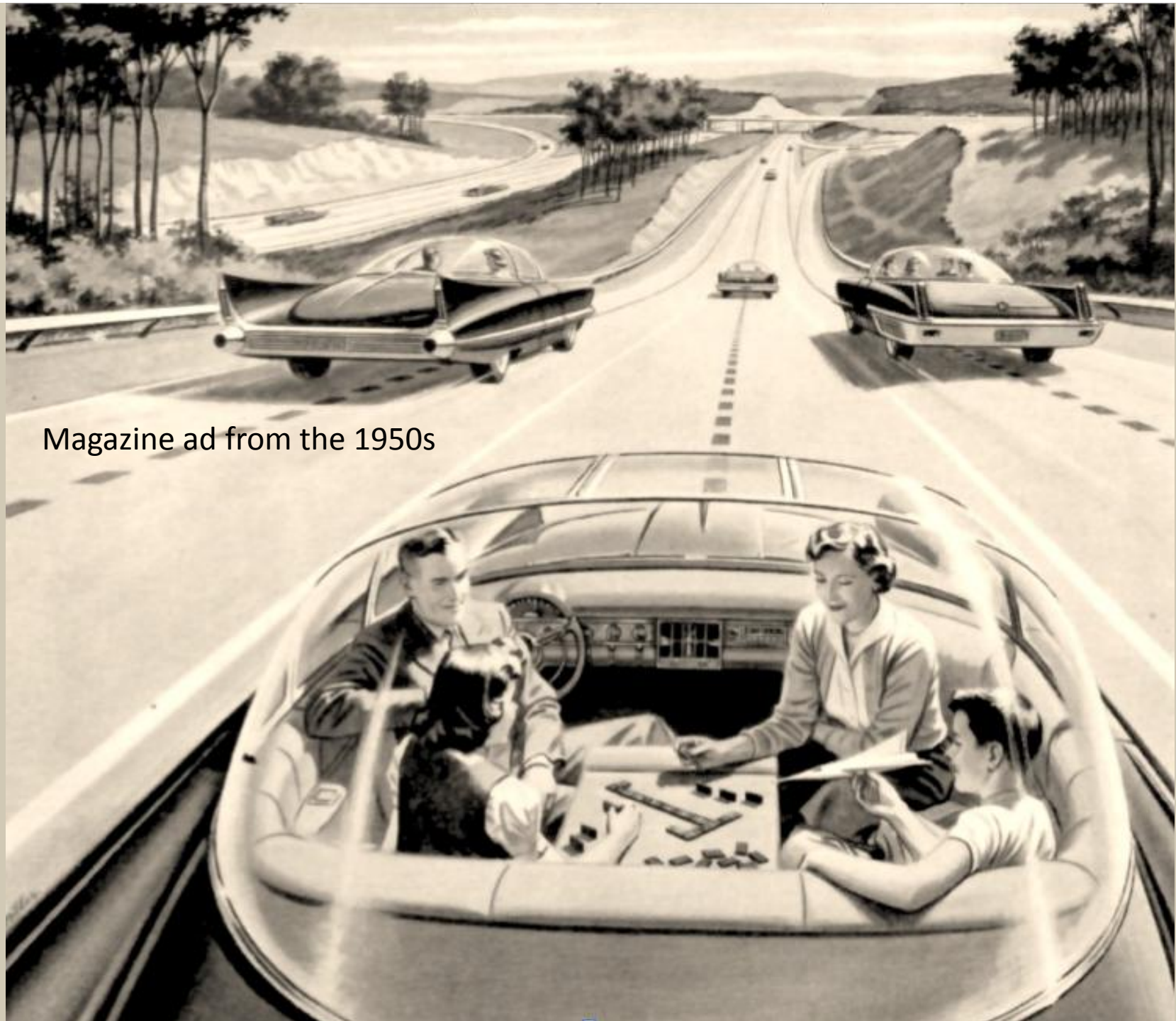


Could Our Cars Be Better?

Needed: Personal urban mobility without oil, accidents, and congestion

Solution: Electric, connected, increasingly automated vehicles. Eventually, autonomous.

•



Magazine ad from the 1950s

New Personal Mobility from GM



Source: Professor Steve Underwood, Connected Vehicle Proving Center
University of Michigan - Dearborn

Driver Assist Features Coming to Cars

The Hands-Free

Electronic steering in the future could be tied in to lane-keeping and other systems to automatically maintain a car's position within a lane.



Lane-keeping technology isn't designed to continue steering. Future systems

Source: WSJ reporting

- Self parking
- Adaptive cruise control
- Automatic braking
- Collision warning/avoidance
- Pedestrian detection
- Traffic sign recognition
- Lane keeping and departure warning
- Blind spot monitoring
- Night vision enhancement
- Driver monitoring

Blind-spot detection cameras can help cars to see the side and behind.



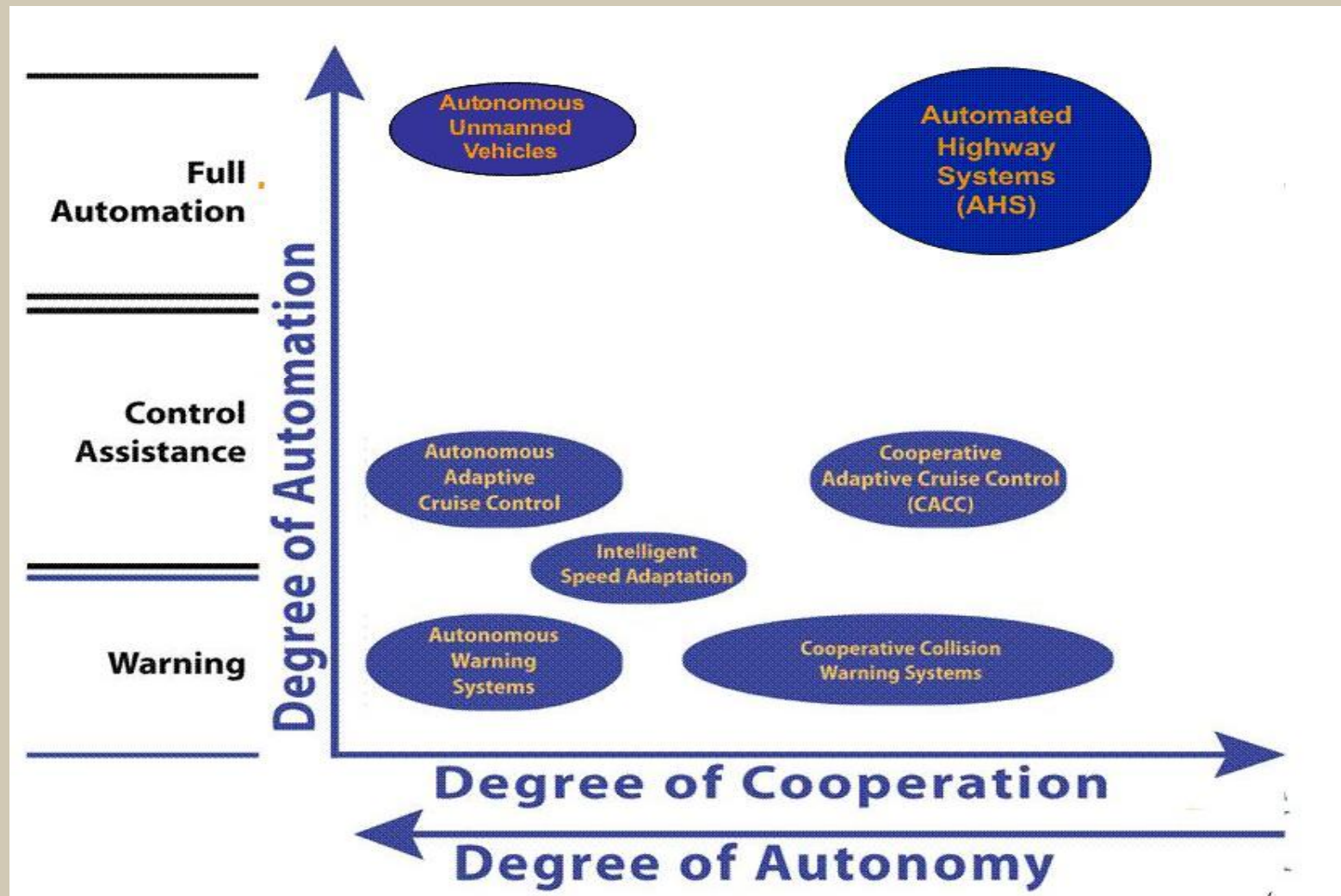
use the car.

Autonomous Vehicles Being Tested Now



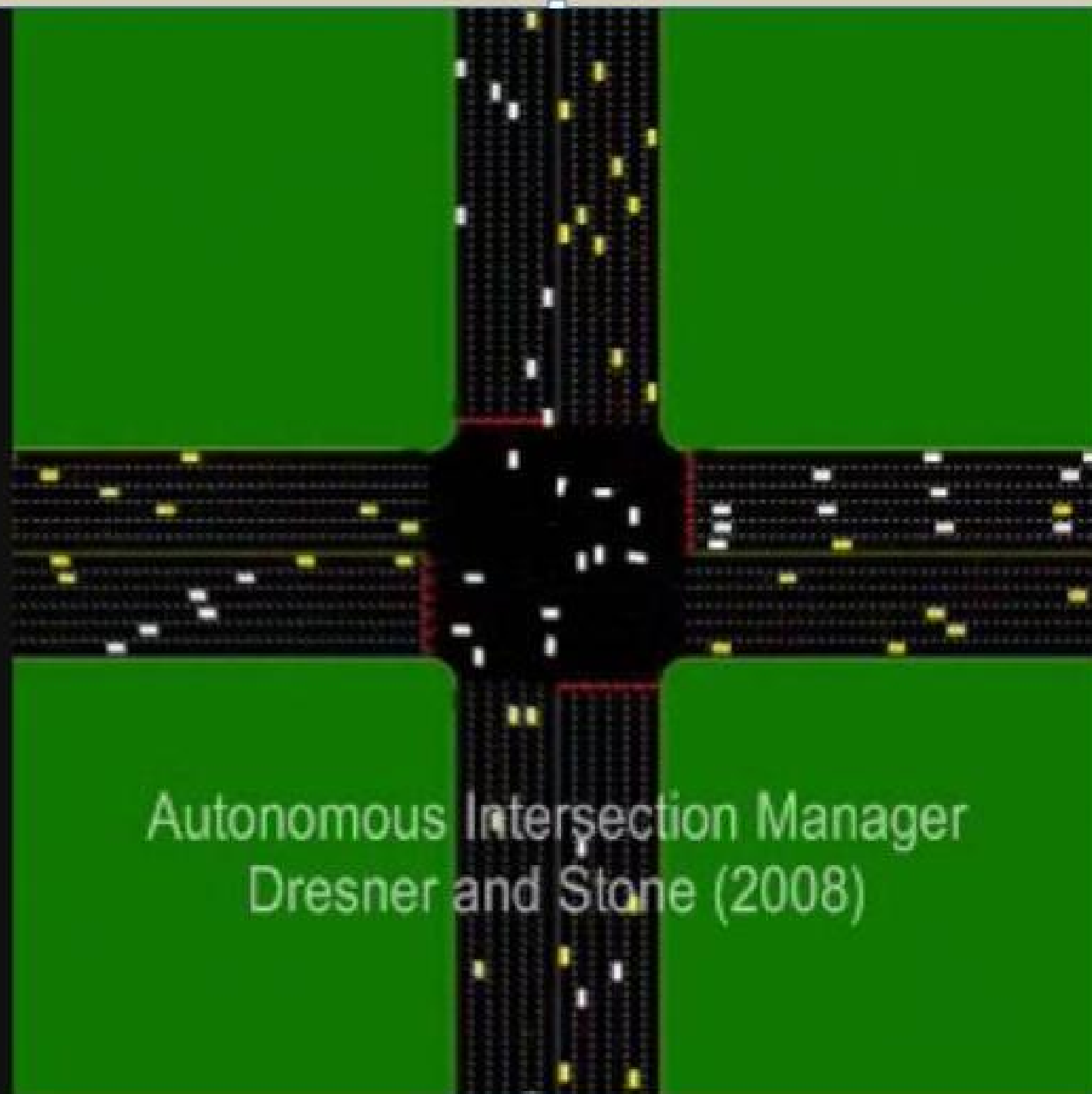
The Google autonomous vehicle

Automation – Autonomy - Cooperation



Source: Professor Steven Shladover, UC Berkeley

Testing, Testing, Testing

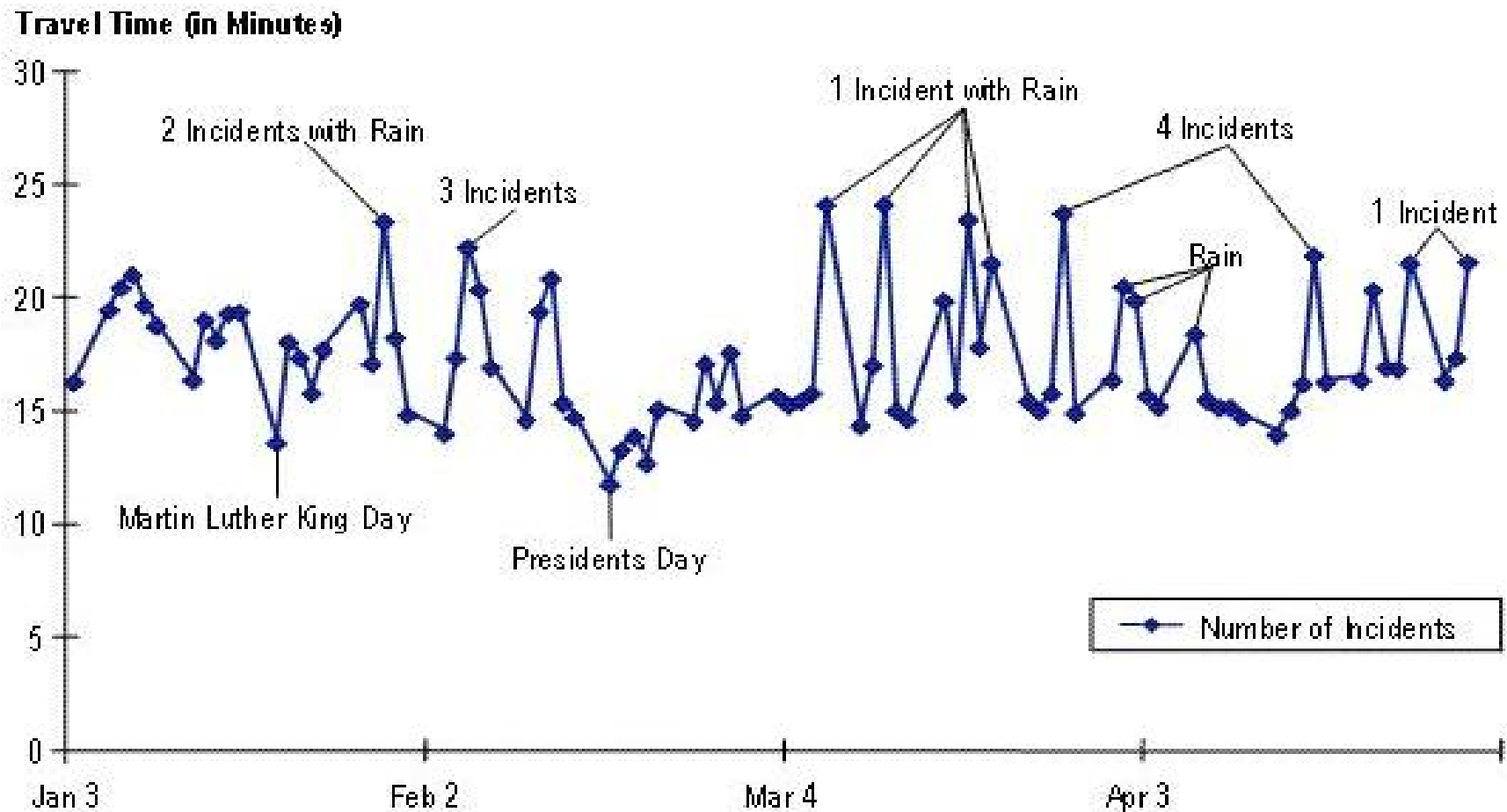


Autonomous Intersection Manager
Dresner and Stone (2008)

Accidents Lengthen Travel Time

Figure 2.6 Weekday Travel Times

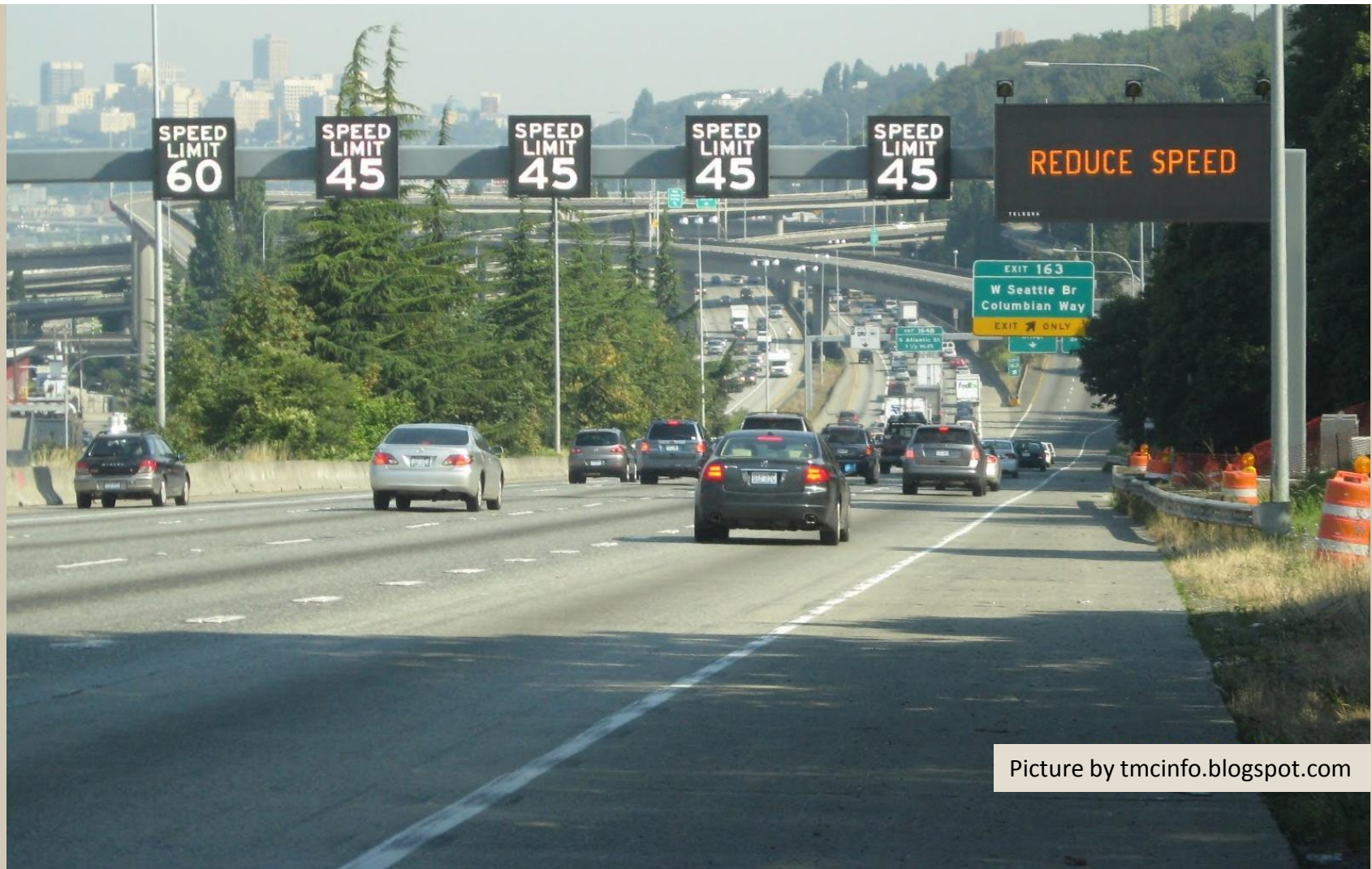
5:00-6:00 p.m., on State Route 520 Eastbound, Seattle, Washington



Source: WSDOT

2003

Active Traffic Management on I-5 South of Seattle Downtown



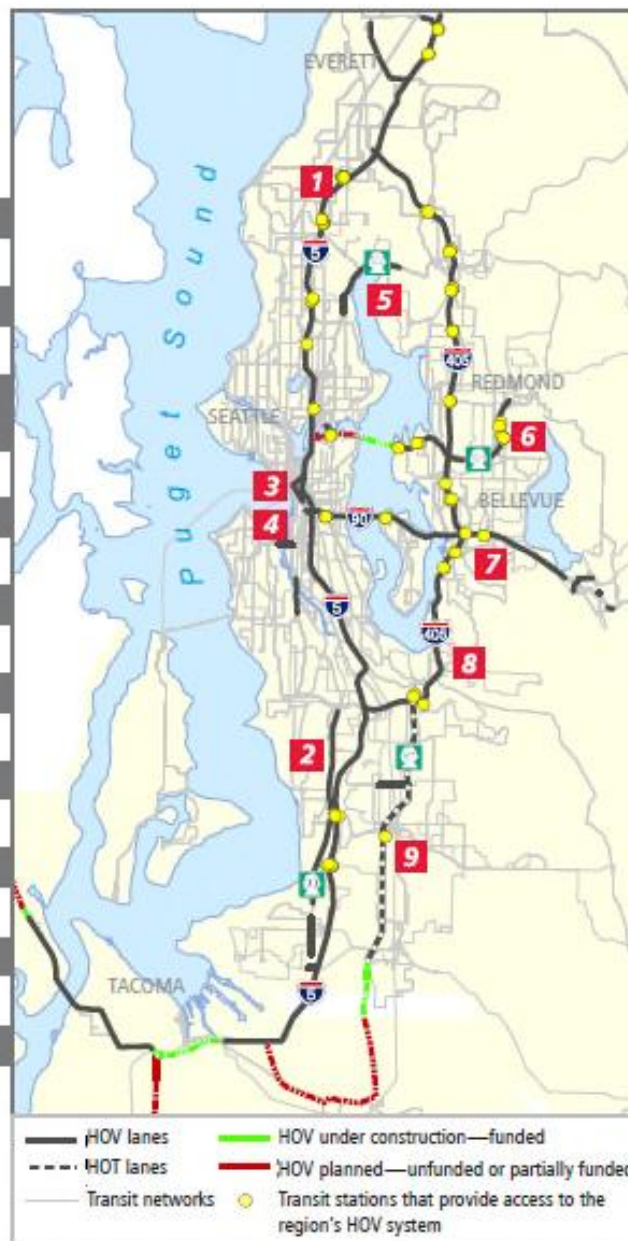
Picture by tmcinfo.blogspot.com

More than 200,000 transit passenger trips are taken daily on the Puget Sound region's HOV system

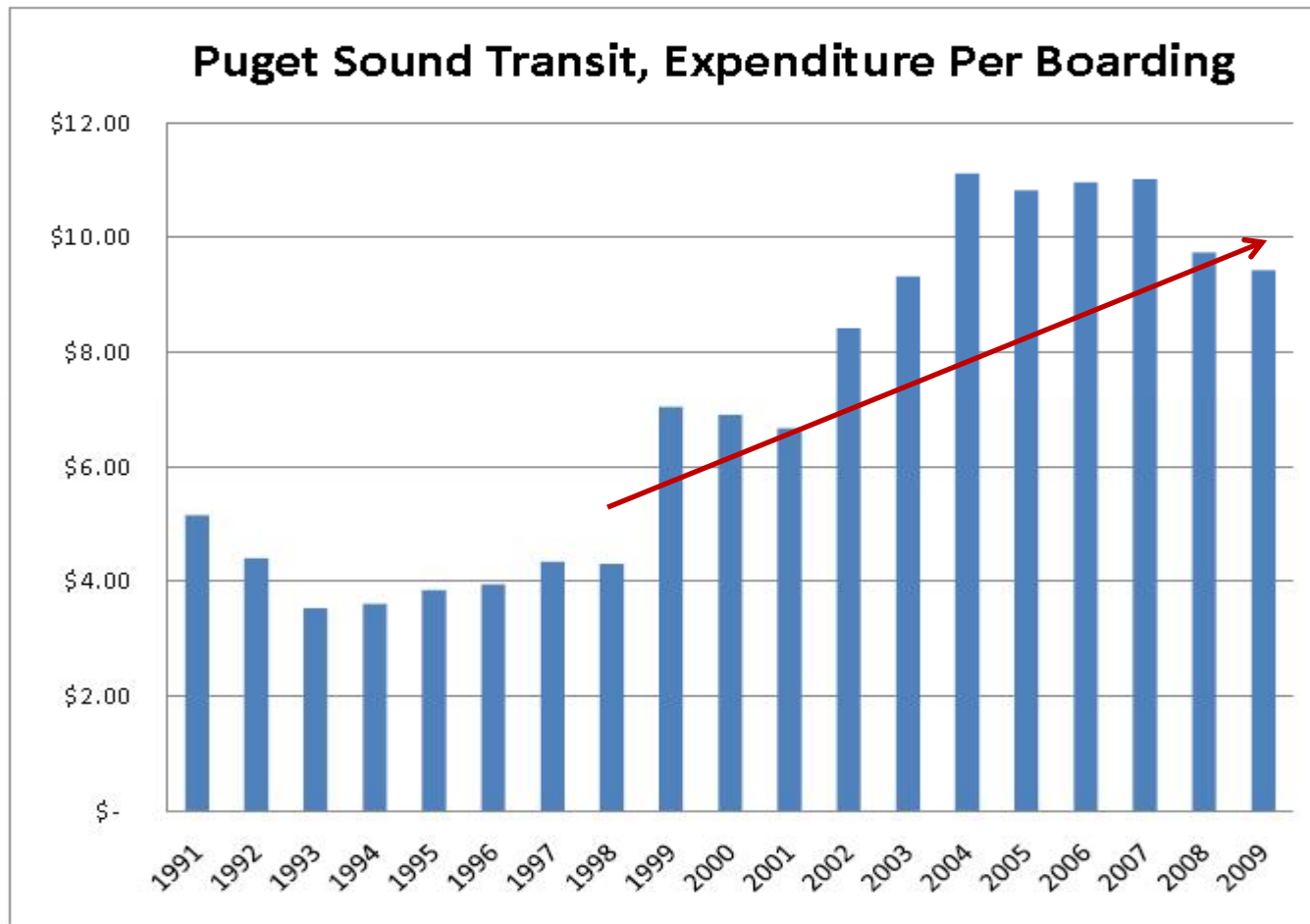
A network of 310 HOV lane miles in the region

Passenger trips daily on a specific corridor. A single trip may access multiple corridors. Passenger trips and lane-mile numbers are rounded.

- 1. I-5**
43,500 passenger trips, 80 HOV miles
- 2. SR-99**
30,000 passenger trips, 6.5 HOV miles
- 3. Downtown Seattle Transit Tunnel**
41,000 passenger trips, 3 HOV miles
- 4. E-3 Busway**
34,400 passenger trips, 3 HOV miles
- 5. SR-522**
11,800 passenger trips, 5 HOV miles
- 6. SR-520**
21,000 passenger trips, 13 HOV miles
- 7. I-90**
18,000 passenger trips, 35 HOV miles
- 8. I-405**
15,500 passenger trips, 65 HOV miles
- 9. SR-167**
2,200 passenger trips, 20 HOV miles
- Other arterials**
150,000 passenger trips, more than 16 HOV miles



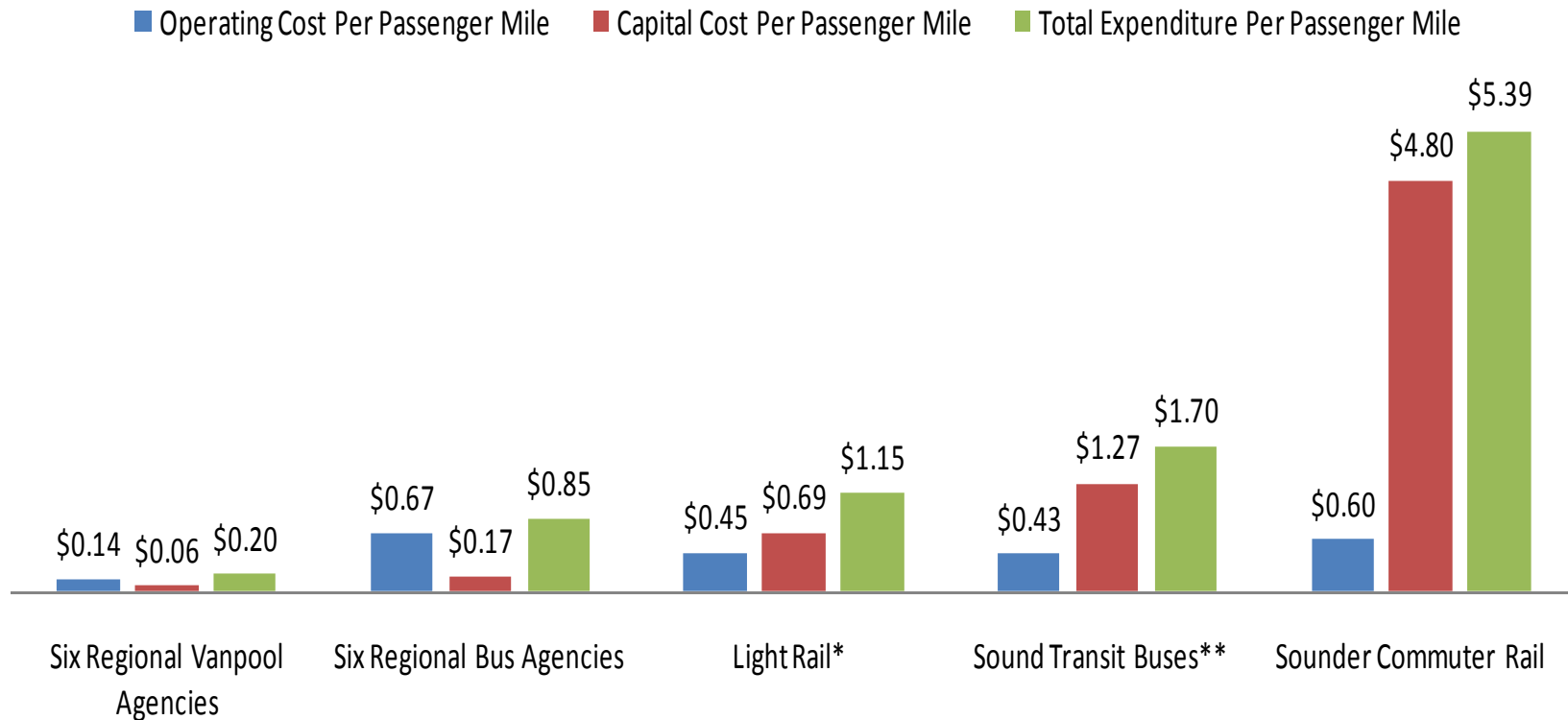
Transit Cost-Effectiveness Troubling



Data source: FTA National Transit Database. Charts by John Niles, CETA

Vanpools

Expenditure per passenger mile, 2000-2007



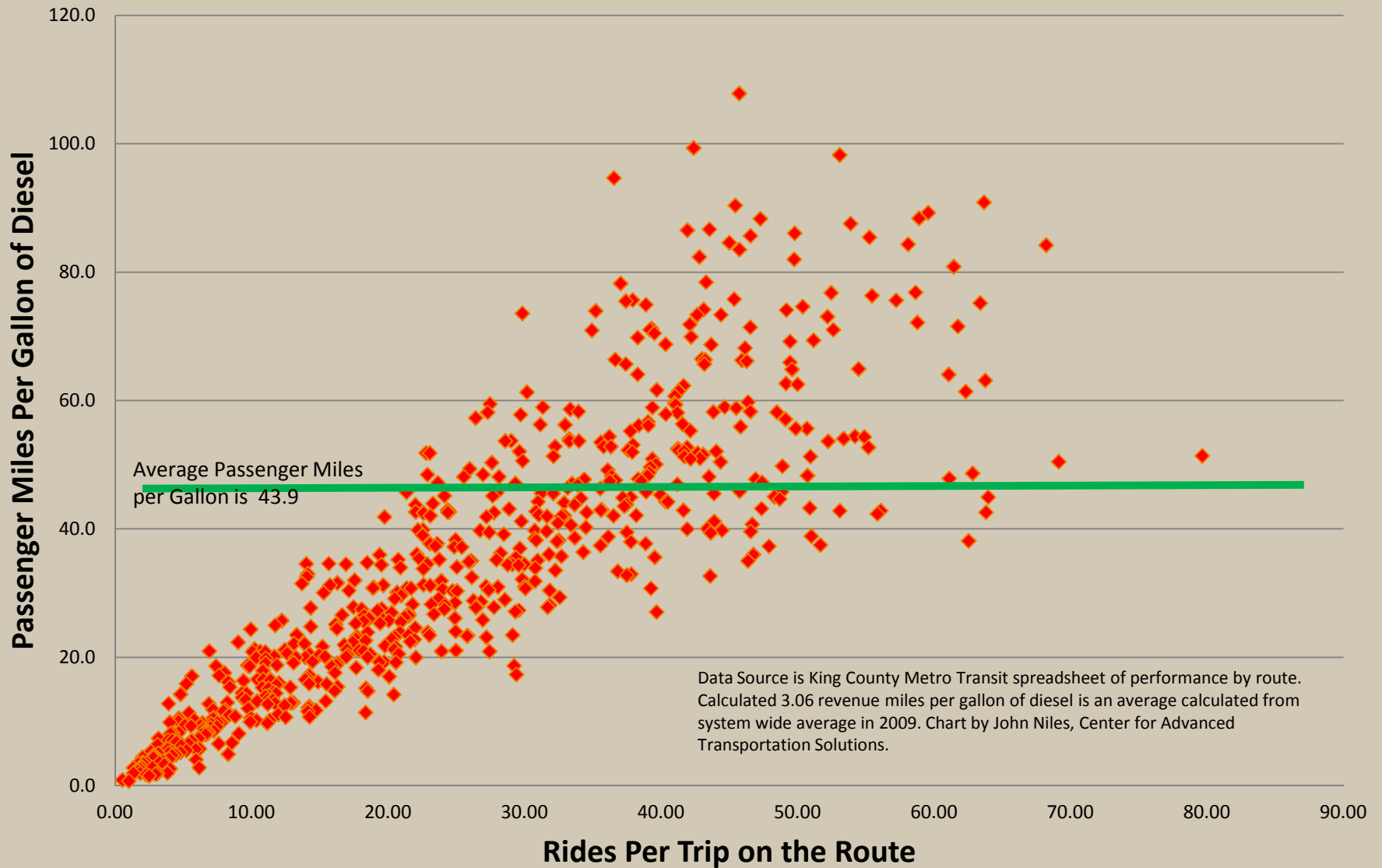
Source: National Transit Database and Island Transit officials

* 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

Passenger Miles Per Gallon for King County Metro Bus Varies by How Many Passengers Ride on a Route



Save September 7, 2012



Celebrating the 50th Anniversary of the Century 21 Exposition—the 1962 Seattle World's Fair

Conference on Beyond Oil: Transforming Transportation in Century 21

September 7, 2012 at the Seattle Center's McCaw Hall

Transforming Transportation: Moving People, Products and Ideas

Thank You!

- John@johnniles.com
- 206-781-4475
- Twitter: @JN_Seattle
- <http://johnniles.com>