

# The CATES/CVPC Report: A Policy Roadmap for a Large-Scale Transportation Demonstration Project

Eastside Transportation Association  
February 19, 2014

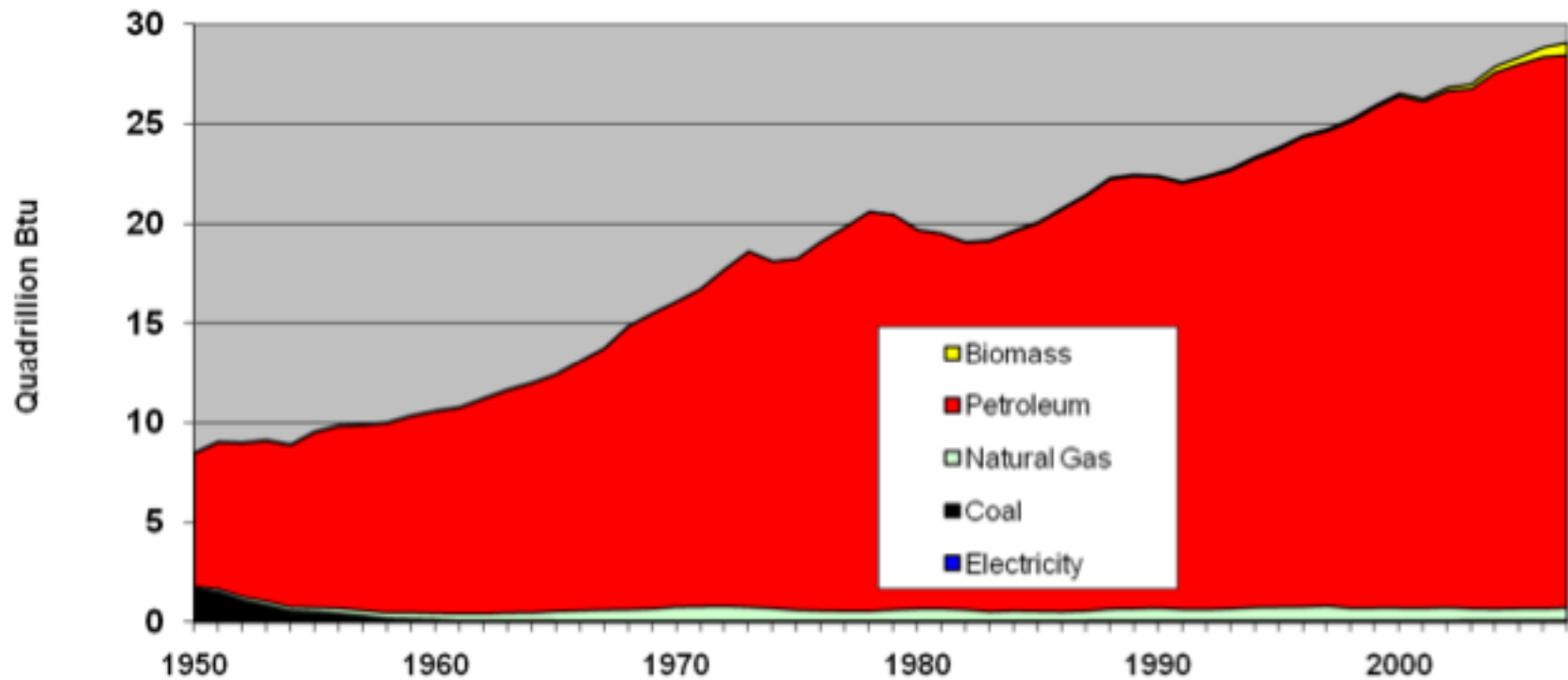
Steve Marshall  
[marshallsj@comcast.net](mailto:marshallsj@comcast.net)

CATES  
Center for Advanced Transportation and Energy Solutions

## Problem 1: Oil Dependence in Transportation

- Oil fuels 97 percent of U.S. transportation
- Oil harms national security, the economy and the environment
- Oil imports = \$1 billion a day
- Half of U.S. trade imbalance is from oil imports
- Burning oil is one of single largest causes of GHG emissions and urban pollution.
- The annual U.S. military cost to protect world oil supply lines exceeds \$80 billion.

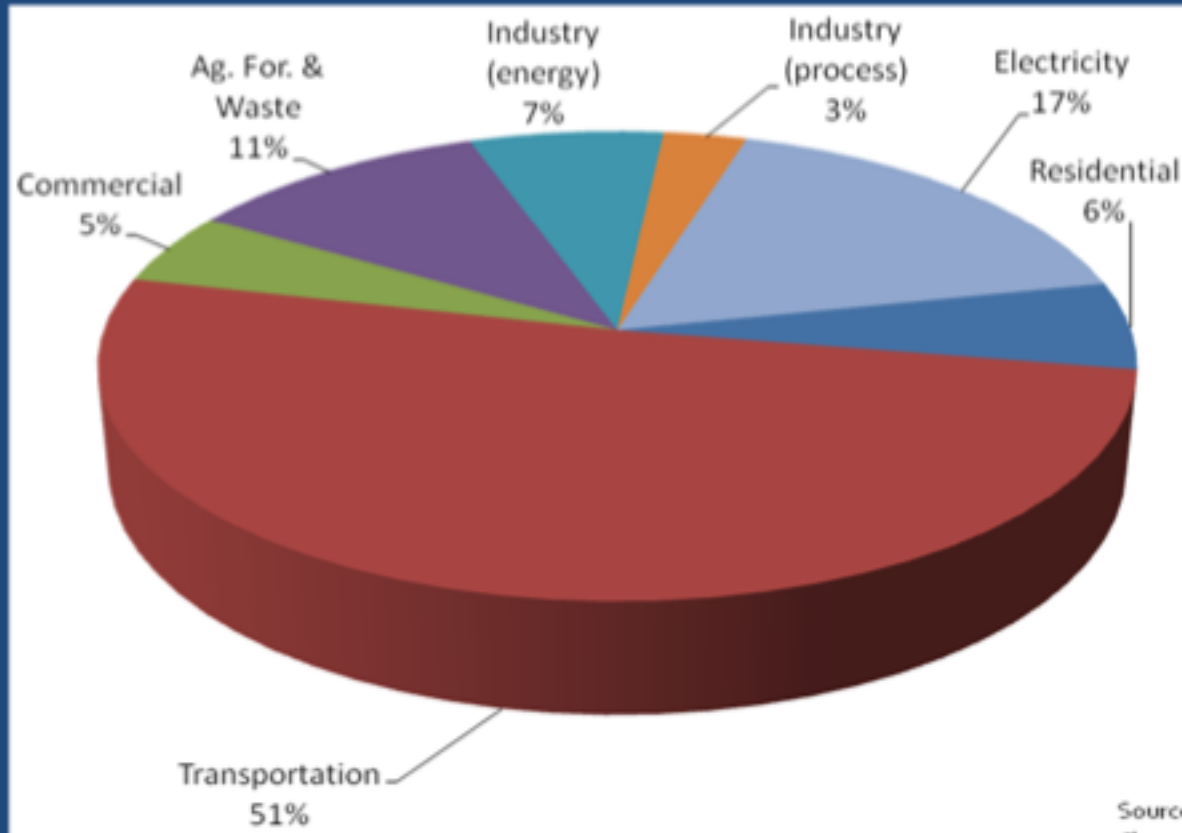
# U.S. Transportation Energy Use



The world economy is sitting on a powder keg of oil



# Transportation Produces 51% of Puget Sound Greenhouse Gas Emissions



Source: Puget Sound  
Clean Air Agency

## Problem 2: Collisions, deaths and injuries

- 33,000 U.S. road deaths last year
- One million worldwide road deaths a year
- Leading killer of U.S. children age 10–19.
- Sixth leading killer of all ages in U.S.
- Cost of U.S. vehicle deaths and injuries: Over \$230 billion a year.

## Problem 3: Congested Roadways

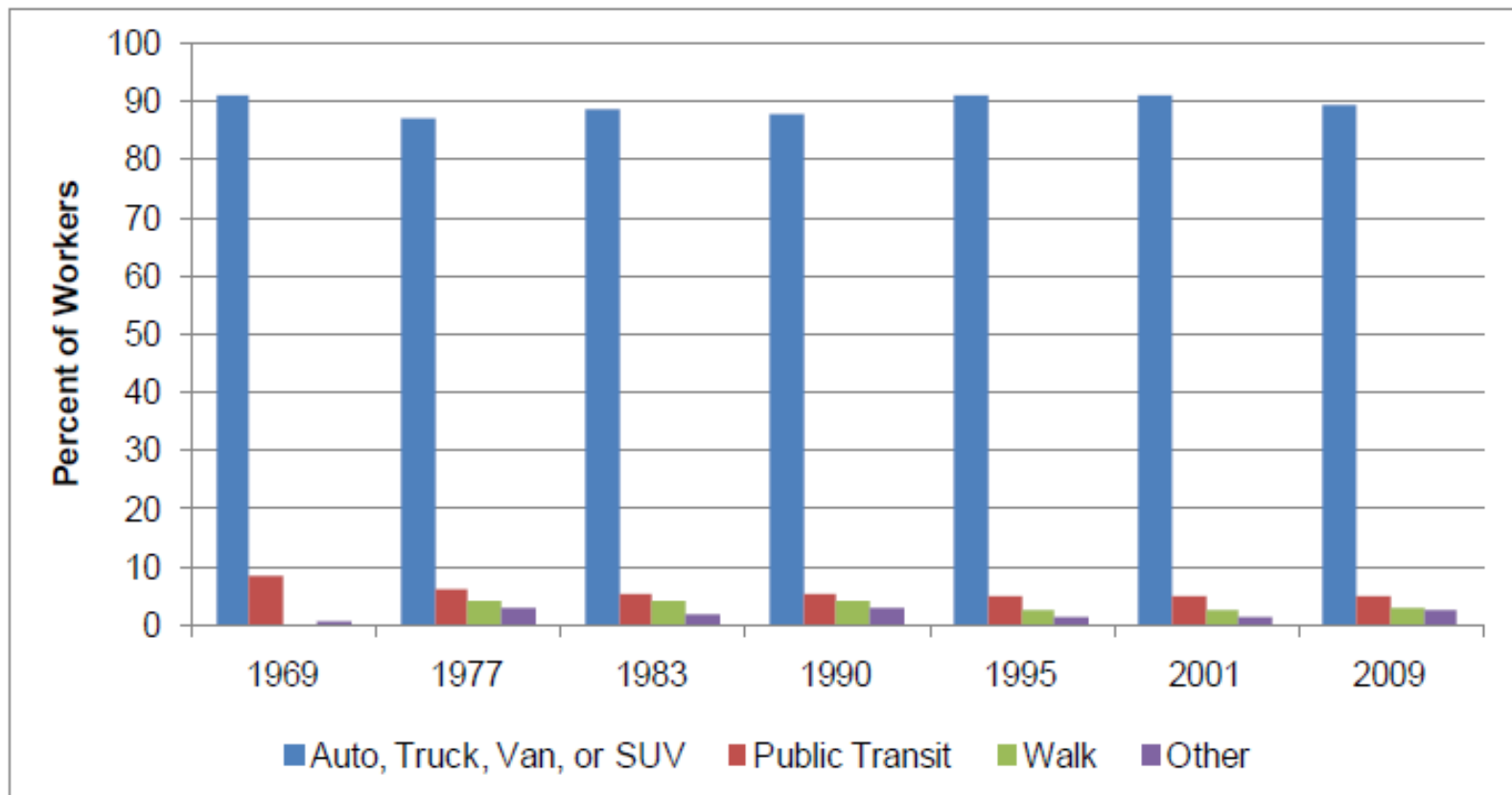
- Traffic congestion wastes time and fuel, damaging the economy and the environment.
- Urban pollution and greenhouse gas emissions increase dramatically in stop-and-go traffic.
- Time wasted in traffic congestion costs \$100 billion a year.
- Vehicle emissions cause more deaths than accidents.

## Problem 4: Low Use of Public Transit

- The percentage of daily trips on public transit has been low and flat.
- PSRC projects low transit use through 2040.
- Changing work and family patterns require more flexible transit options

# Low and Flat Transit Use

**Figure 10.** Trends in the Distribution of Workers by Usual Commute Mode  
1969, 1977, 1983, 1990 and 1995 NPTS, and 2001 and 2009 NHTS.



# The Future of Transportation in Two Parts

- Personal vehicles will be increasingly oil free, interconnected, and ultimately self-driving
- Personal vehicles will link to faster, more flexible public transportation options into core areas

# Part One: Smart , Connected, Increasingly Autonomous Electric and Alternative Fuel Vehicles

- Personal mobility—fundamentally different in the future.
- Transportation will be connected: vehicles and travelers will communicate with each other:
  - More productivity while traveling
  - More informed choices
  - Less congestion with fewer emissions
  - Fewer traffic accidents, deaths and injuries

# Electric vehicles

“To reduce oil dependence, nothing would do more good more quickly than making cars that would connect to the electric grid.”

David Sandalow, former Assistant Secretary for Policy and International Affairs, U.S. Department of Energy

# Self Driving Vehicles

- New technologies are now reducing driver error
- Fully autonomous vehicles will cut vehicle collisions by as much as 80%
- Will cut urban congestion and reduce pollution
- Can triple road capacity without the need to build more lanes.

# Assisted Driving Is Available Now

- 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

## 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 would...

Source: WSJ reporting

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

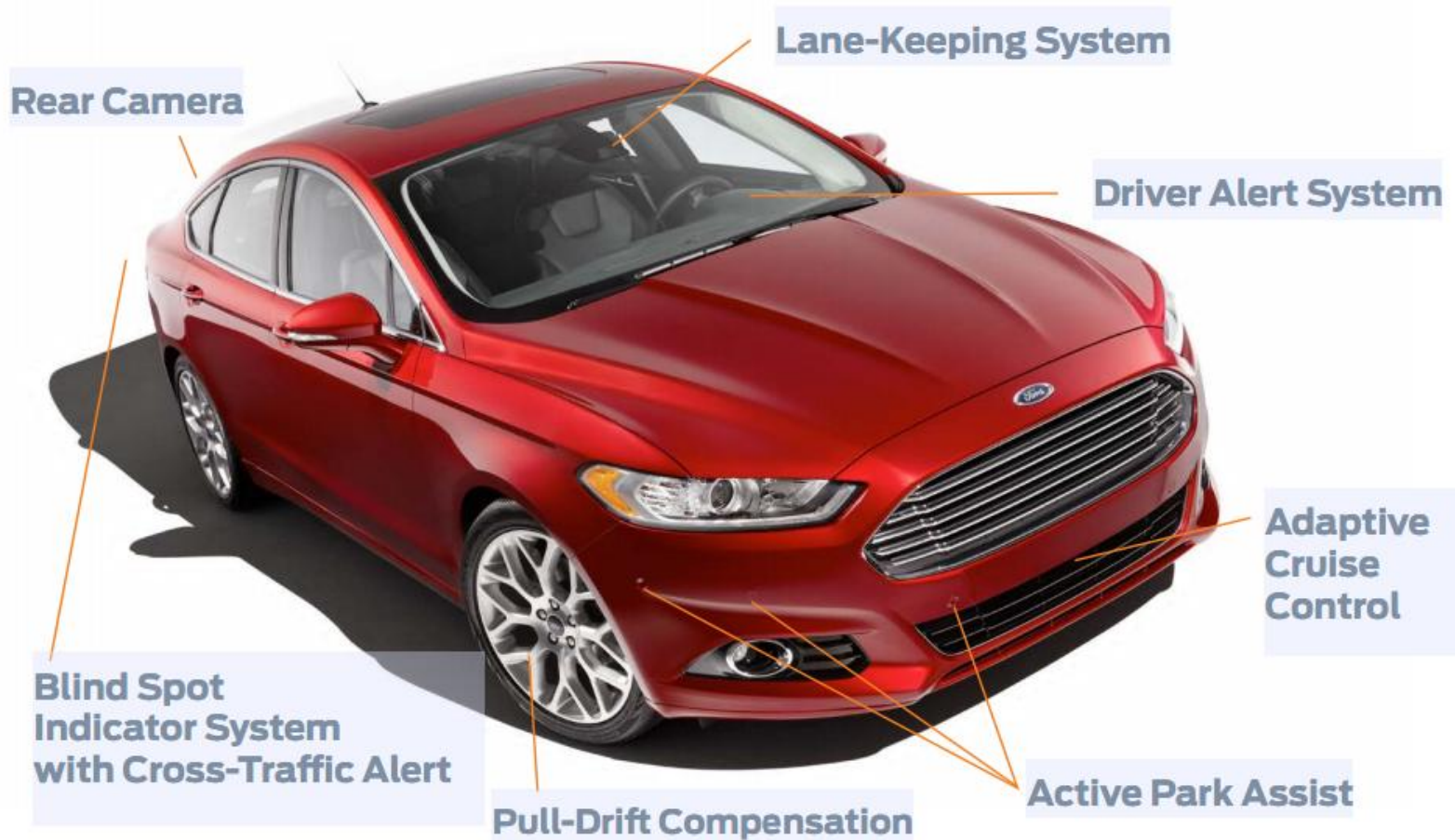


use collisions and stop the car.

The Wall Street Journal



## 2013 Ford Fusion: Driver-Assist Technologies



# Self-Driving Vehicles Are Coming



The Google autonomous vehicle

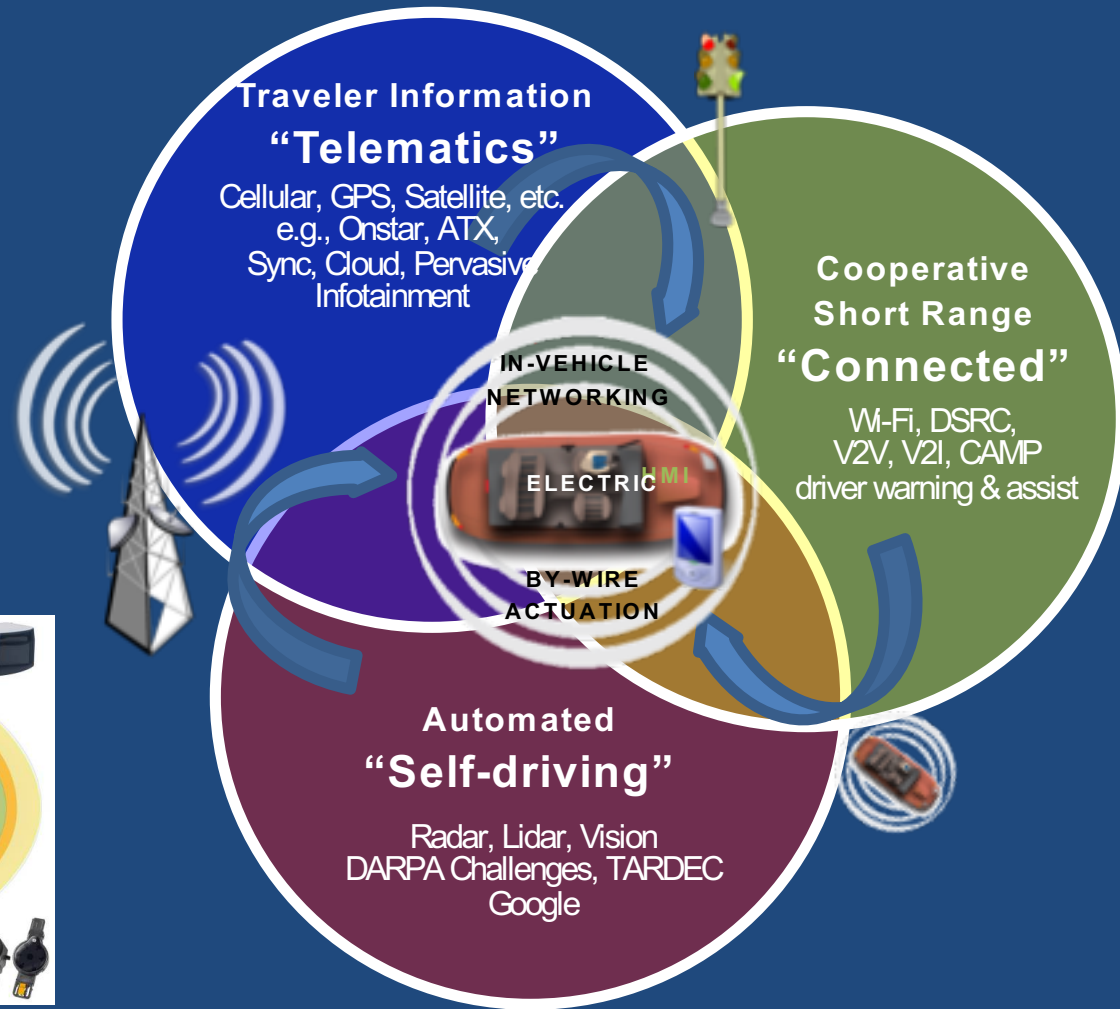
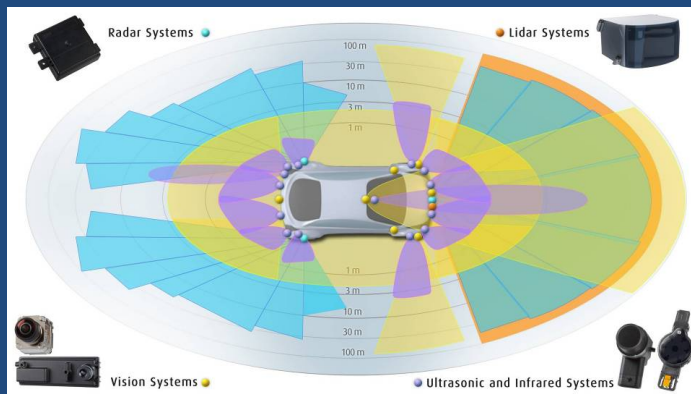
# Ford's Autonomous Test Car





# The emerging technology:

## Robotics & Communication



# Smart, Connected Passenger Vehicles

- Personal mobility will be transformed by smart systems
- Transportation will be connected: Vehicles and travelers will communicate with each other:
  - Less time stuck in traffic and more productivity while traveling
  - Less imported oil
  - Less congestion and emissions
  - More informed choices about how to travel
  - Fewer traffic accidents

## Part Two: Connecting Personal Vehicles to Public Transit

- Drivers will access transit, van pool and car pool information and reserve seats and parking
- Focus on most efficient public transit routes
- Eventual automated transit
- Use of virtual dedicated lanes to make full use of lane capacity

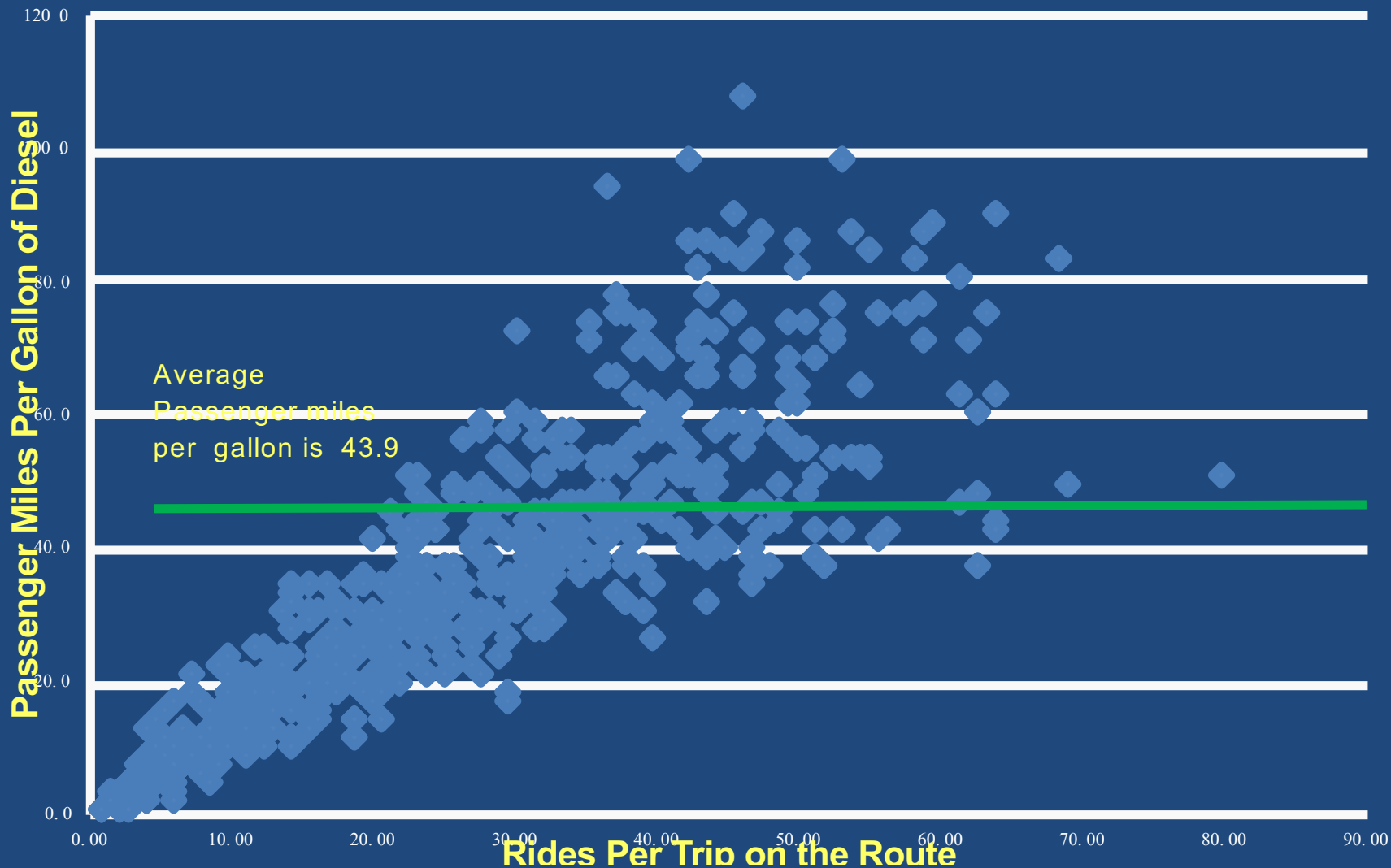
## Seattle Transit vs. Roadway Market Share

2008		1983	
Roadway	Transit	Roadway	Transit
<u>Share:</u>	<u>Share:</u>	<u>Share:</u>	<u>Share:</u>
97.2%	2.8%	97.6%	2.4%

Transit work trips = 10%; Transit non-work= 1%

PSRC's predicted total transit share for 2040= 5%

## Passenger Miles Per Gallon for KC Metro Buses



# New Urban Demographics

- 2011 Census shows increasing metro region dispersal
- Puget Sound demographic trends

# King County Metro's Nissan Leaf Vanpool



# Via Motors Extended Range Electric Van



# Uber, Lyft and RideShare



# Electric Car2Go Fleet in San Diego

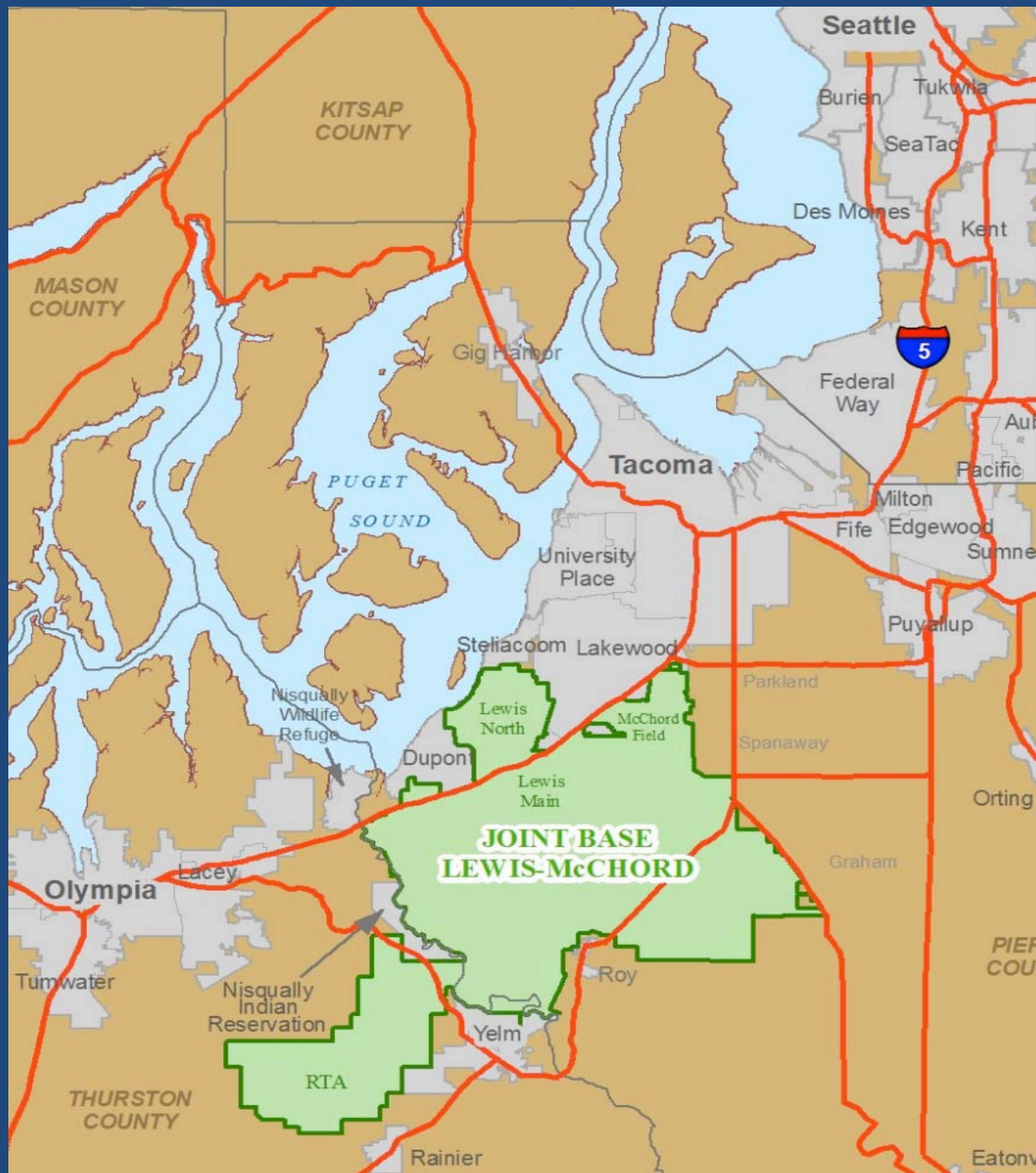


# Test Driving Future Transportation at JBLM: A Systems Approach

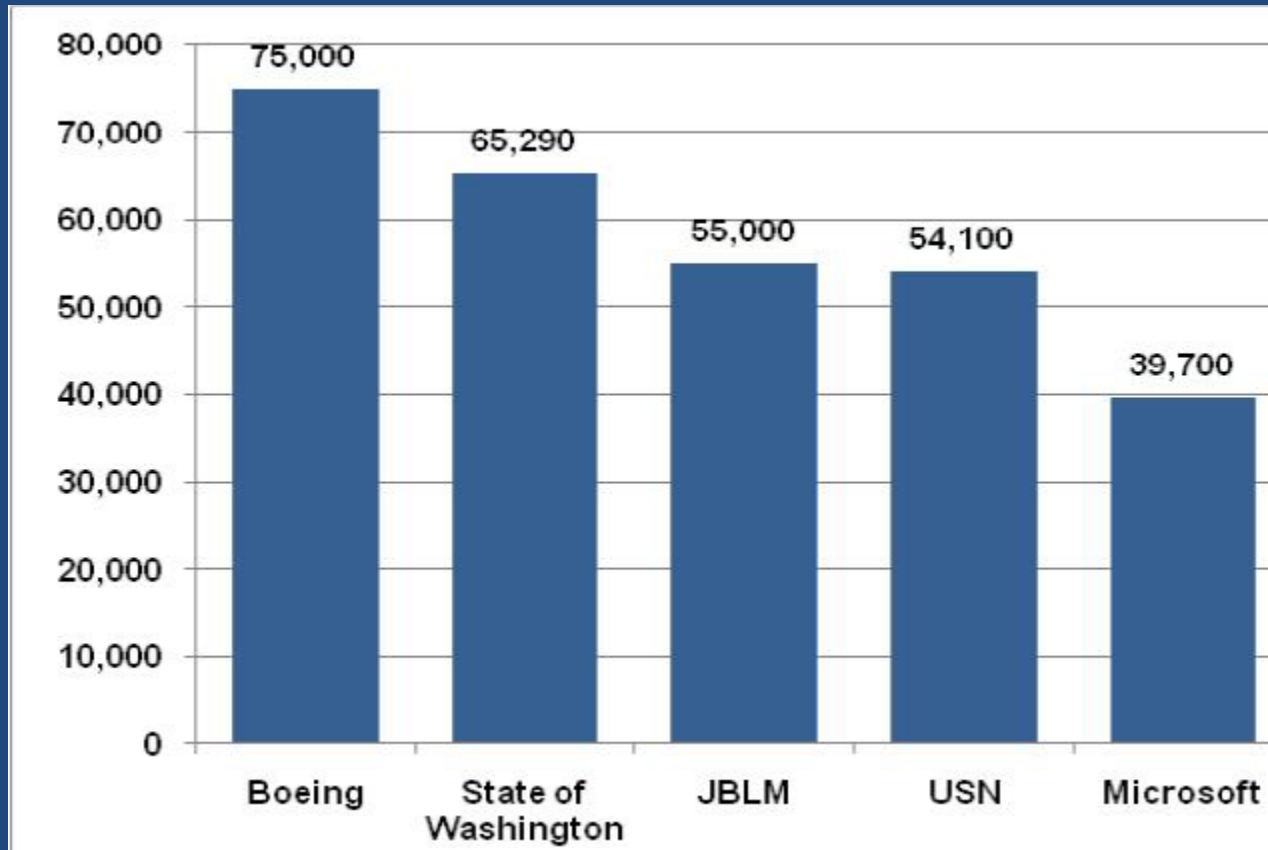
- DOE/DOD MOU
- HUD/EPA/DOT Sustainable Communities
- Executive Orders and GSA EV purchasing
- DOE/INL EV Project at JBLM
- USDOT EV Vanpool and I-5 funding
- EPA /USDOT Fuel Standards
- Inrix data connections
- Cisco, Microsoft, Verizon, Ford, GM, Nissan connected vehicles

# Joint Base Lewis-McChord's Top 3 Sustainability Goals

- AIR QUALITY
  - Reduce non-tactical motor vehicle air emissions 85% by 2025
- ENERGY
  - Reduce total energy consumption by 30% by 2015
  - Sustain all activities on post using renewable energy sources and generate all electricity on post by 2025
- SUSTAINABLE COMMUNITY
  - Create sustainable neighborhoods for a livable Fort Lewis community that enhances the Puget Sound Region



# JBLM is 3<sup>rd</sup> largest employer in state



# Additional JBLM Goals

- Complete transition from gasoline to EVs
- EV vanpool systems to and from base
- Autonomous shuttles on base
- Autonomous truck convoy testing
- EV batteries to back up critical circuits

# The Future of Transportation

- Better vehicles—cars without oil, accidents or congestion. Smart, connected, electric and ultimately self-driving.
- Better transit —connecting personal vehicles to public transit and other more flexible options into core areas..

Questions?

[marshallsj@comcast.net](mailto:marshallsj@comcast.net) for follow-up

206-909-2019