



U.S. DEPARTMENT OF ENERGY

# SMARTMOBILITY

Systems and Modeling for Accelerated Research in Transportation

## SMART Mobility – Advanced Fueling Infrastructure

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# New Transportation Paradigms

Shared, electric, connected, automated



Source: [www.mavendrive.com](http://www.mavendrive.com)



Source: [www.uber.com](http://www.uber.com)

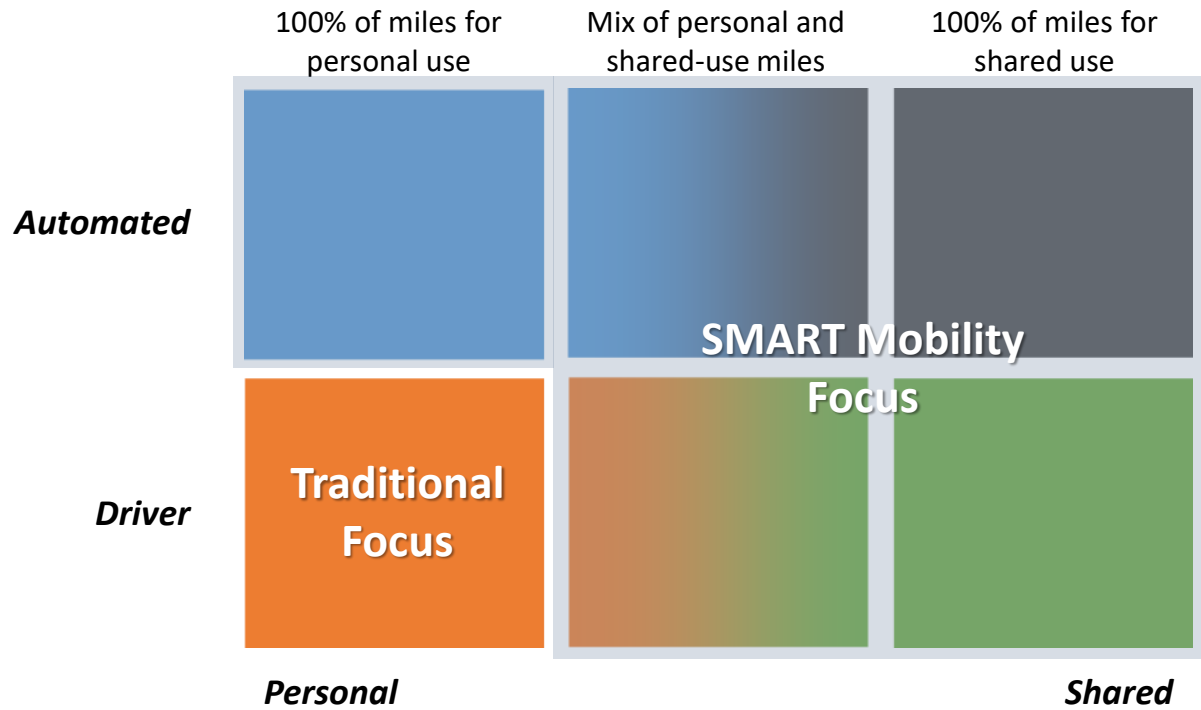


Source: [www.reachnow.com](http://www.reachnow.com)

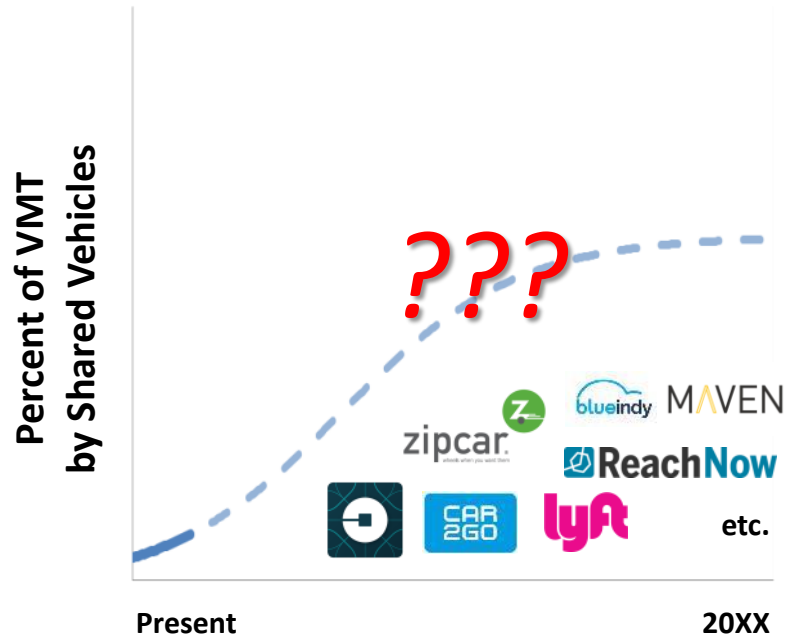


Source: [localmotors.com](http://localmotors.com)

# New Approach to Fuel Selection



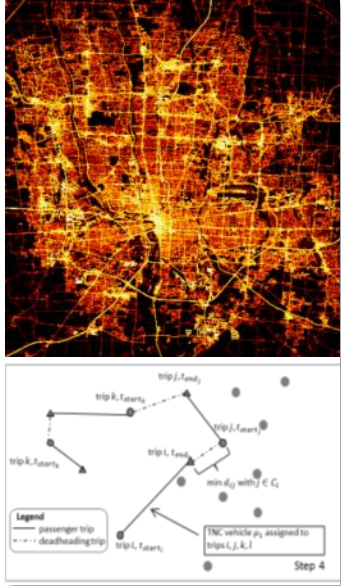
# Transportation Energy Impact



What percent of travel will be in shared vehicles?

What percent of travel will be powered by petroleum, electricity, hydrogen, and other fuels?

# Ride Hailing In Columbus, OH

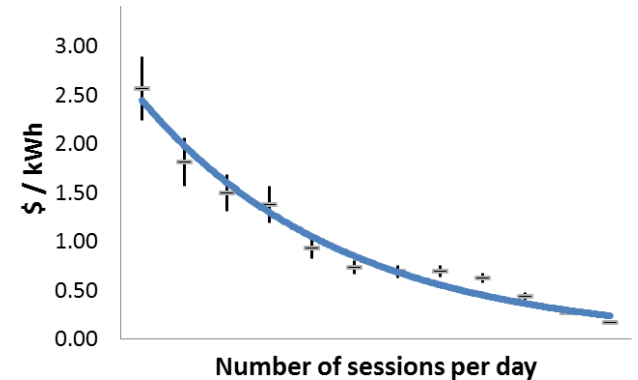


Compared travel in 5,000 real personal-use vehicles vs. same travel in simulated shared vehicles

Shared vehicles had:

- **29% more** miles driven
- **24% lower** average trip distance
- Need **2x more** fast chargers
- Use fast chargers **3.5x more**

*High fast charger utilization helps EV charger economics*



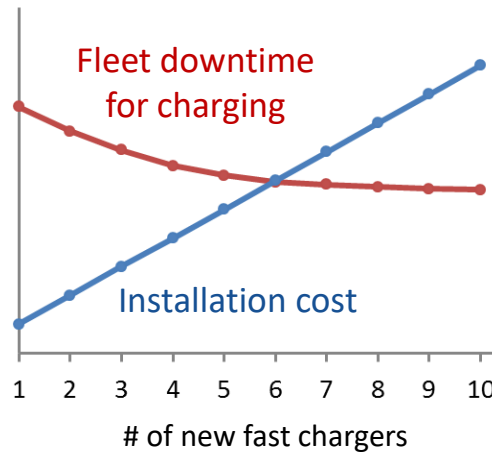
# Car Sharing in Seattle, WA



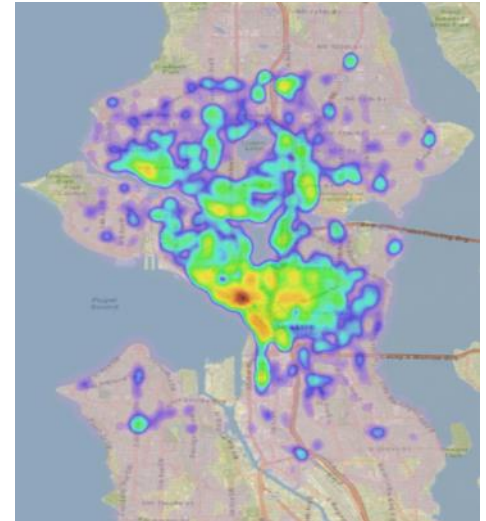
Source: www.reachnow.com



Free-floating model relies on fast charging network for BEVs



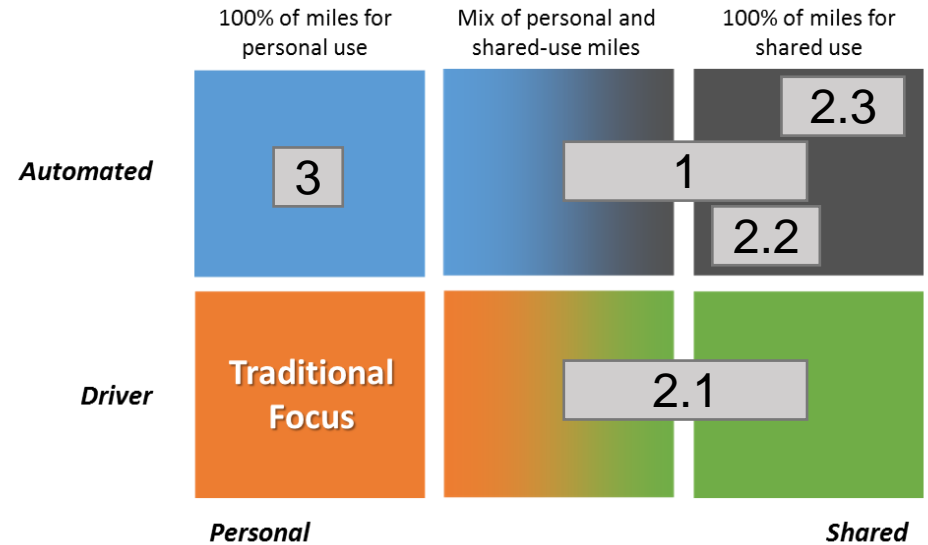
BEV parking density in Seattle



Source: INL

# Future AFI Pillar Tasks

- 1 Estimation of potential national benefits of advanced fueling infrastructure deployment for shared-automated mobility
- 2 Modeling and analysis of fueling infrastructure for future mobility scenarios
  - 2.1 Fuel selection of privately-owned ride-hailing vehicles
  - 2.2 Fuel selection in automated mobility districts
  - 2.3 Fuel selection for fully automated, commercially owned taxi fleet
- 3 Fueling decision making for CAVs



## Conclusion

- Advanced Fueling Infrastructure Pillar is focused on fuel selection and fueling infrastructure requirements for shared and shared-automated mobility
- First step in predicting future impacts is to understand differences in vehicle use patterns
- Preliminary findings show potential for high utilization of fueling infrastructure by shared mobility vehicles
- Sophisticated, system-wide analysis is required to understand opportunities for alternative fuel vehicles and fueling infrastructure