



Amy Myers Jaffe  
Executive Director  
Energy and Sustainability  
University of California - DAVIS

## Peak Oil Demand Scenarios: Testing Sensitivities to New Technologies

# Forces Impacting Long Term Oil Demand: Old vs. New

“Superior” Technologies  
Legislative and Tax Policy  
Urbanization  
Energy Efficiency (*energy per GDP declining*)  
Millennials Reject Vehicle Ownership  
Growth of Alternative Energy  
Elimination of Fuel Subsidies



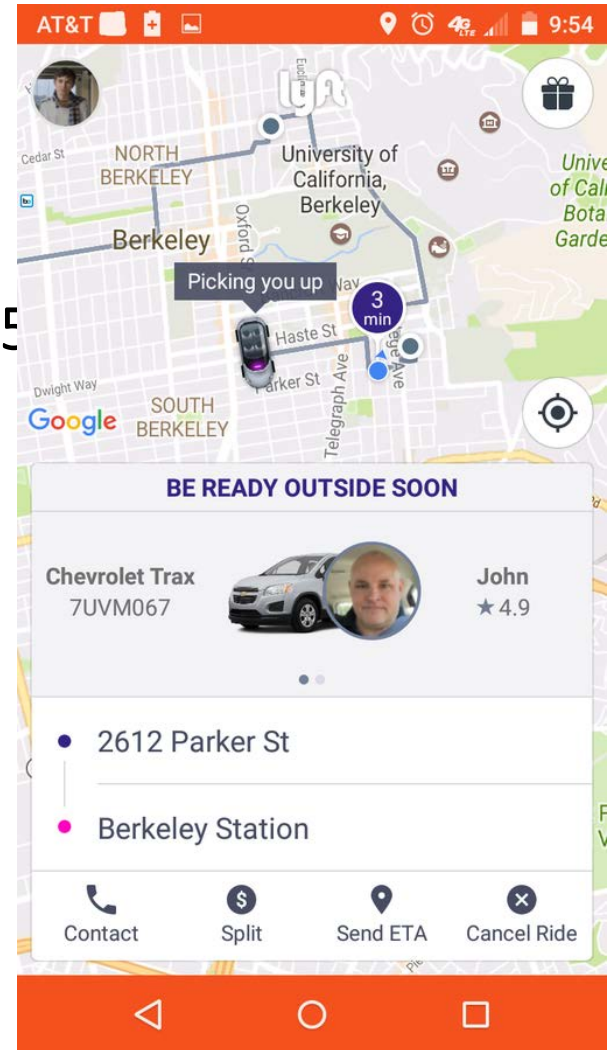
Population Growth  
Emerging Economy Expansion  
Expanding Global Middle Class

# Three Revolutions in Passenger Transport

1. Streetcars (~1890)
2. Automobiles (~1910)
3. Airplanes (~1930)
4. Limited-access highways (1930s....1950s)

## 2010+

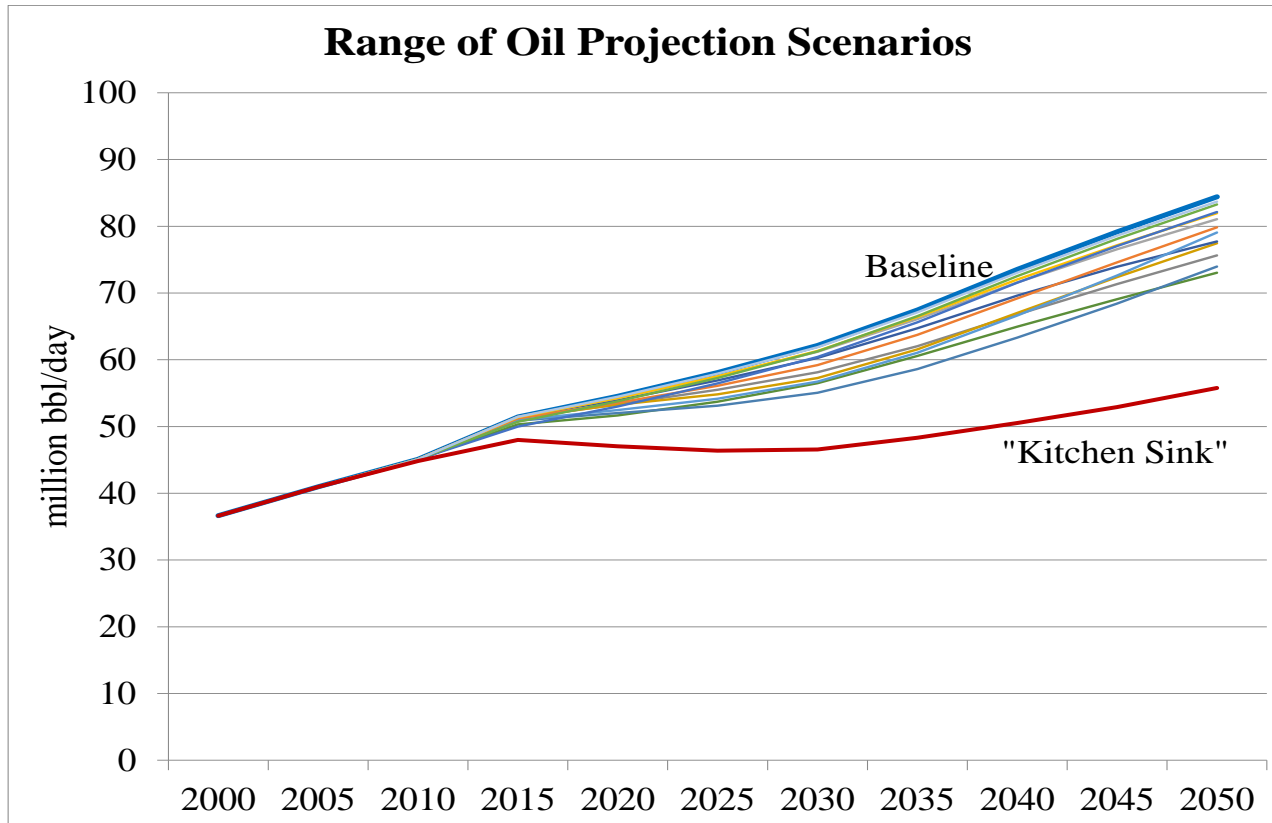
1. **Vehicle electrification**
  - low carbon vehicles and fuels
2. **Real-time, shared mobility**
  - less vehicle use
3. **Vehicle automation (2025?)**
  - Uncertain impacts



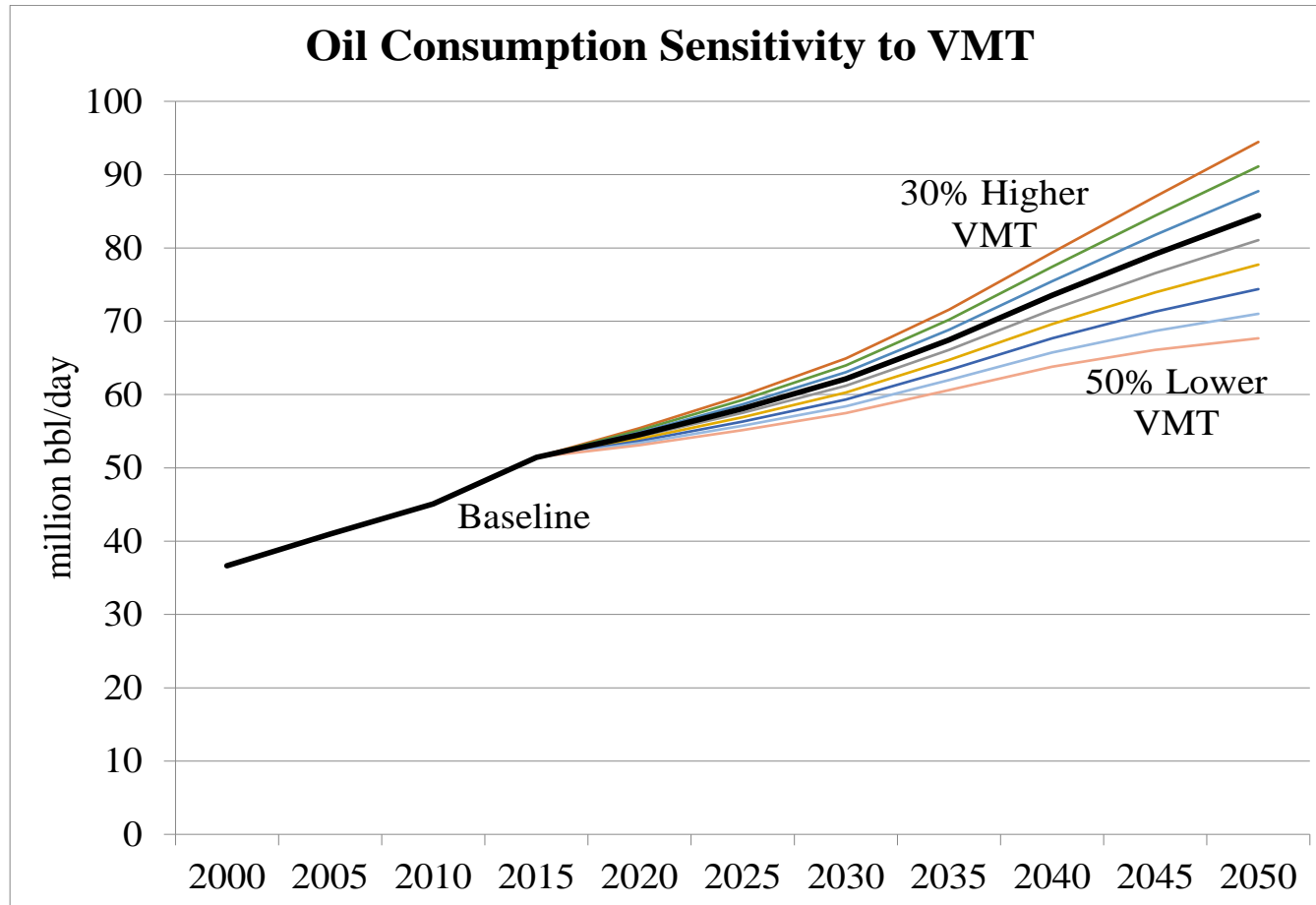
## I get it, it is hard to eliminate oil demand, but “peak” oil demand no longer viewed as impossible for 2020s or 2030s

	2040	% change	Notes
IEA New Policy	103	Up 14%	Fossil fuels remain 75%
IEA 2 Degrees	74.1	Down 19 %	
Statoil Renewal	79	Down 15%	EV growth = Oil less than 40% of transport
50% Battery cost decline scenario	74.6	Down 19%	EVs at close to 20% of all new car sales by 2030

# Just Technology: Scenario Outcomes per Inputs

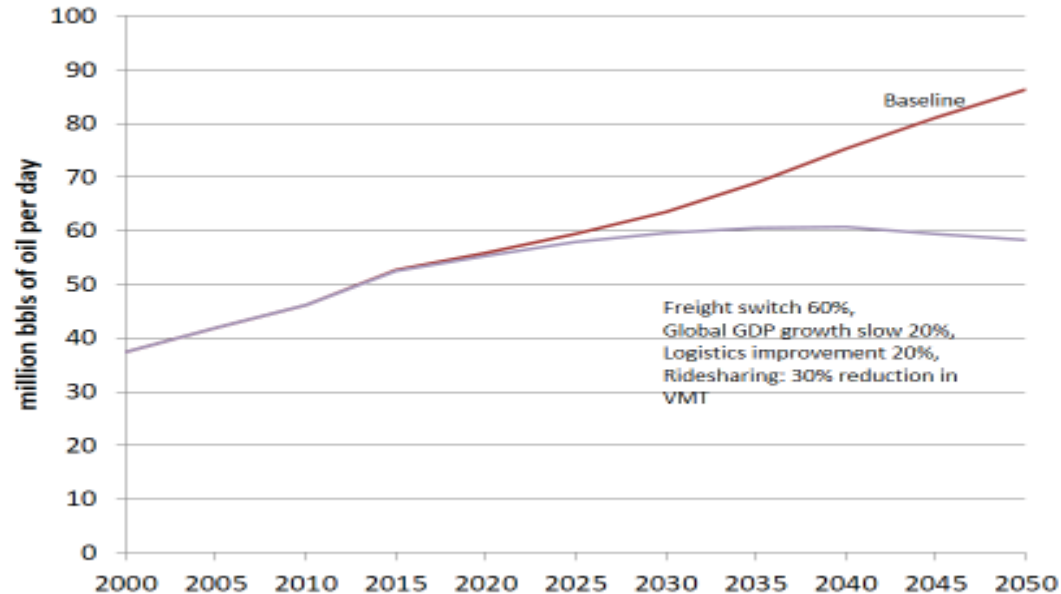


# Potential impact of increased shared mobility/autonomous vehicles: Oil consumption highly sensitive to changes in VMT



# What Does It Take to Peak Oil Consumption in Transport by 2040? A Technology-Oriented Scenario

Peak Oil Consumption can result from a modest road freight switch\*, a 20% lower GDP growth rate, a 20% more efficient freight and shipping, and 30% reduction in VMT



\* 60% of road freight vehicle sales non-petroleum fueled by 2050

Source: UC Davis analysis, IEA Transport Model

- **At least 60% of on-road trucking switches to alternative fuels**
- **20% Logistics improvement via digitization**
- **Ridesharing brings about a 30% reduction in VMT**

*(Scenario assumes a 20% slower growth in GDP than IEA BAU but adds no climate-oriented policies)*

# Peak Oil Demand Scenarios – Car-free Urban Areas

## Car-free urban areas

- Car stock is reduced proportional to the percentage of inhabitants living in urban centers
- MoMo regions are split into early, middle, and late adopters of the car-free city
- Phasing out of PLDV stock could also be interpreted as a ban on ICE in urban areas
- Literature on car-free urban centers is abundant, but I believe the most powerful documentation to support this scenario is the comprehensive list of car free urban areas in the world maintained by wiki:

[https://en.wikipedia.org/wiki/List\\_of\\_car-free\\_places](https://en.wikipedia.org/wiki/List_of_car-free_places)



# Car-free oil consumption

