Shared Mobility, Automation, & Transit's Role

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CTA & UC ITS Webinar

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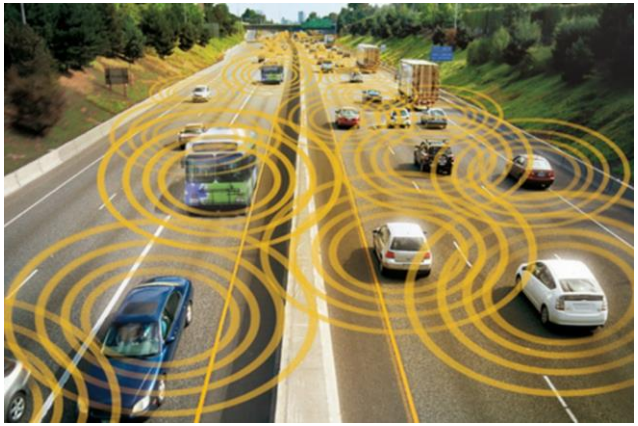
Vision of Future – Version 1



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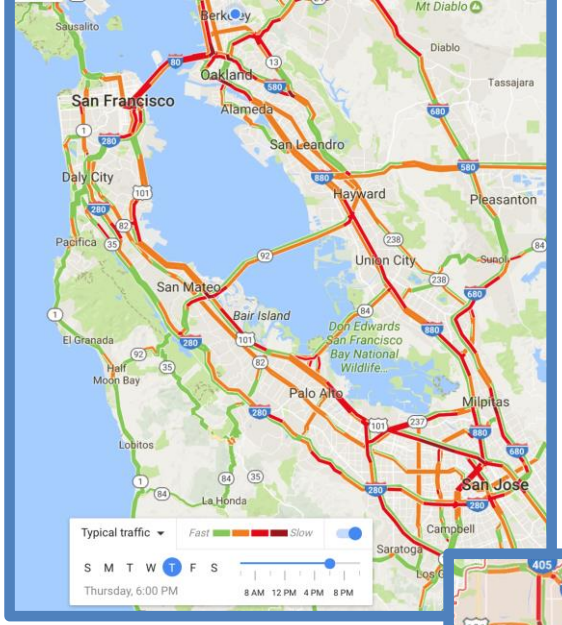
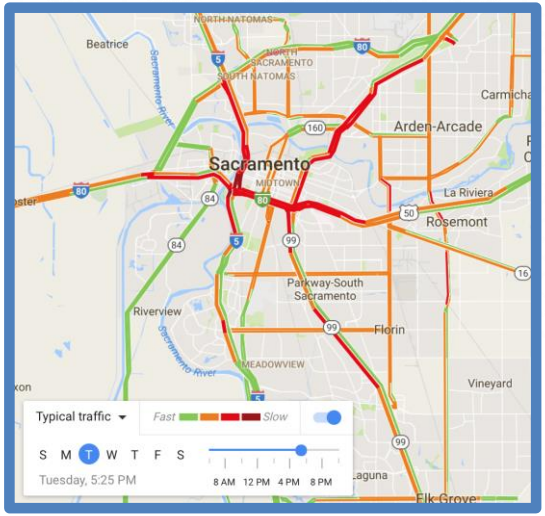
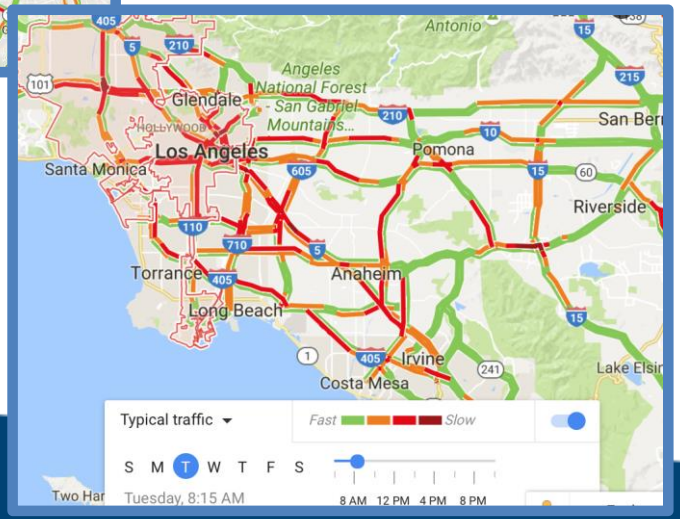
Current Reality







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Future Reality

- Automation will improve efficiency and safety, but not enough to relieve congestion.
- Opposing trends
  - Increasing population *(~30% increase in US by 2060 – census.gov)*
  - Increasing urbanization *(~30% increase in US by 2042 – usmayors.org; 2 mega US cities of 10 million plus today, 5 mega cities in 2042, 9 in 2060; 50 major US cities of 1 million plus today, 70 major cities in 2042)*
  - Increasing vehicle miles traveled per capita *(~50% increase in US since 1970—fhwa.dot.gov and dshort.com)*
- Requires behavior change even under optimistic technology scenarios *(Sager et al., 2011; Dray et al., 2012)*

Vision of Future – Version 2

Lyft president: Car ownership will "all-but end" in cities by 2025

"Peak car ownership in the US will occur around 2020 and will drop quickly after that… Automated mobility services could capture 2/3 of the US mobility market in 15-20 years"

PHOTO from www.seemoresystems.com

What do you imagine?

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Vision of the Future – Version 3

Autonomous

+ Clean

+ Connected

+ Shared rides

+ Right-sized

+ Equitable

(+ Priced)

Vision of the Future – Version 3

+ **P** riced
+ **A** utonomous
+ **C** lean & **C** onnected
+ **E** quitable
+ **R** ight-sized
+ **S** hared rides

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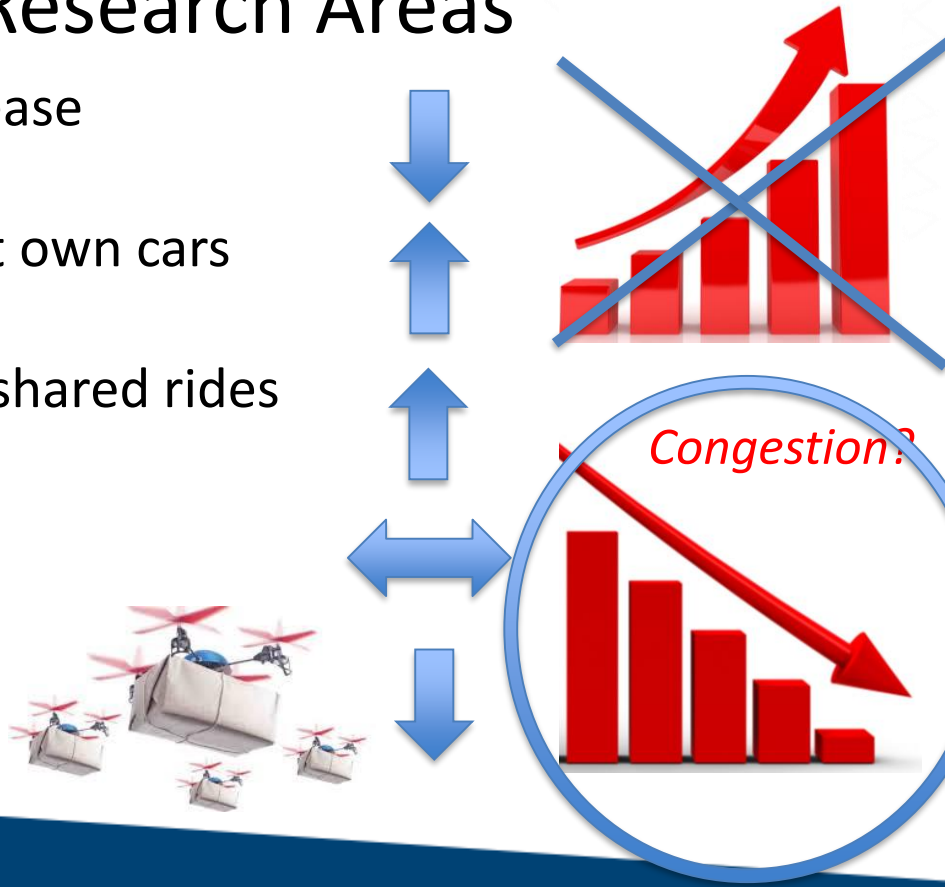
Critical Travel Behavior Research Areas

- Vehicle miles per person will increase
  … by how much?
- Larger proportion of people won't own cars
  … how much larger?
- Higher proportion of trips will be shared rides
  … how much more?
- Vehicles will change size
  … smaller or larger?
- On demand delivery is escalating
  … what traffic will this generate?



Critical Transit Research Areas

- AGENCY ROLE
  How to execute of the public agency mission to provide an “efficient and effective transportation system” within a public/private provider environment?
- COMPLEMENTARITY, COMPETITION, AND EQUITY
  How to best embrace the complementarity potential and encourage private innovation while ensuring that competition does not degrade mobility for less advantaged?
- INVESTING UNDER HIGH UNCERTAINTY
  Where, when, and how to invest? How to balance daily operational needs with long-term planning in an environment radically evolving over decades?
- GUIDING DYNAMIC EVOLUTION
  How to nudge behavior towards shared vehicles and shared rides? How to scale up these shared rides to larger vehicles? How to allow for radical innovation in high capacity vehicles?
- FUNDAMENTAL RETHINKING OF SPACE
  How to rethink roadway use & urban design: curb space, prioritization, reclaimed land, housing?
- EMBRACING EXPERIMENTATION
  How to ensure it is carefully, consistently, and independently evaluated to produce insight?

Broad Brush of Related Activities @ UC Berkeley

- Behavioral, societal, and system effects of shared mobility and automation (realized and potential)
- From Pilots (FTA Mobility on Demand Sandbox) to Mega-projects (bay bridge & third crossing)
- Fundamental technology development
  - Connected and automated vehicles, test beds, and field operational tests
  - Massive, clean energy infrastructures for transportation (fixed and mobile)
  - Information systems & Real-time corridor management systems with transit integration
- Traffic and operations
  - Evaluation and operation of mixed-traffic and priority lanes
  - Use of connected vehicle tech to enhance safety and increase throughput on urban streets
  - Optimization of shared ride systems and mobility on demand (e.g., ride matching algorithms)
- Urban planning
  - Transit-oriented development, zoning and value capture, mobility hubs, street redesigns, modeling/simulation
- Broader impacts
  - Equity, safety, public health, resilience, the economy
- Educating the workforce (undergraduate, graduate, and professional development)

Growing our collaborations – We're interested!

RESEARCH

- What do you think are the most challenging research questions? (I.e., your most pressing and difficult problems.)

EDUCATION

- How can we better educate the workforce?

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