The Mobility-enhancing Potential Of AVs: The Perspective of Latent Travel Demand

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• What is (latent) demand?
• How can we understand the (latent) demand brought about by AV technologies?
• Types of latent demand:
  - Redistributed
  - Suppressed demand
  - New demand
Demand for transportation

Transport demand is about the movement of people and goods.

It is considered a **derived demand**, which refers to demand for one good or service in one sector occurring as a result of demand from another.

Users of transport are primarily consuming the service because they wish to satisfy their needs (e.g. work, shopping, recreation) – or in the case of freight, the demand for goods.
Activities are realized in time and space and create transportation demand based upon:

- Tastes/preferences
- Constraints/resources
- Land use patterns
- Transportation options
- Costs
- Knowledge
Potential changes:

- Car ownership
- Residential location
- Destination choices
- Frequency of travel
- Timing of travel
- Mode choices

“What if we don’t change at all ... and something magical just happens?”
Potential changes:

• Car ownership
• Residential location
• Destination choices
• Frequency of travel
• Timing of travel
• Mode choices

Will the efficiencies of AVs *induce* more travel by automobile?
Demand for Activities

Redistributed demand

A *rearrangement* in space, time, destination, frequency and/or mode of the *existing realized demand* due to the relative changes in travel options, costs, preferences, land use, knowledge.

This represents our current approach to forecasting future travel needs.
Redistributed demand

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Redistributed Demand Effects of AVs

• Rearrangement of our current activities & travel
• Depends on attributes of AVs
  • costs, convenience, shared
• Use of current shared mobility can point to some anticipated changes due to driverless aspect
• Connected vehicles will have faster speeds
• Driverless + vehicle design leads to more activities while traveling
Suppressed Demand

*Suppressed demand* represents currently desired demand that is not realized because of a wide variety of constraints.

These can be previously *suppressed trips* that can now be realized, presumably due to changes in the transportation system or exogenous social, economic, cultural and technological drivers.
Demand models are estimated using data on observed trips.

What about unmade trips?
Suppressed Demand

- Poverty
- Activity schedule leads to time poverty (too busy)
- Scheduling conflicts
- Social exclusion
- Cultural barriers
- Lack of work experience or education
- Discrimination
- Housing costs limit choices
Realizing Suppressed Demand and AVs

- Depends on costs and access
- Higher incomes will likely realize more of their suppressed demand with AVs
- Use of Amazon, Uber Eats, Blue Apron are examples of how AVs may address suppressed demand
- Shared mobility, transit, microtransit
- Land use policies
- Freight delivery as a substitute
- What will our equity policy be?
New demand

- In addition to redistributing existing and activating suppressed demand, increased efficiencies can lead to increased (new) demand for activities and travel.

- This is difficult to assess because we may be unable to articulate “what if”.

Demand for Activities

- Work
- Leisure Maintenance

Demand for Travel
New demand

• In addition to redistributing existing and activating suppressed demand, increased efficiencies can lead to increased (new) demand for activities and travel.

• This is difficult to assess because we may be unable to articulate “what if”.

• So how do we think about new demand?
4. Aspirations & Intentions

1. Realized Activity & Travel Pattern

3. Tentative Planned Activities & Travel

5. Dreams, Desires Possibilities

6. Unimagined Activities

2. Scheduled Activity & Travel Agenda

Hypothetical

Constraints
What are the drivers of the demand for activities & travel?

• What motivates us?
• Might be important to understand how we might respond to new opportunities in the future
• Marketing discipline has made use of this research
• They induce demand for products
• What can we learn here?

Conclusions

Our current theories, data collection techniques, & analysis methods are inadequate to help with changing demand.

Theoretical exploration of the origins of demand from multiple disciplines could enrich and improve our efforts to plan for the future.

Understanding unmet needs and more fundamental human motivations & desires is needed to address suppressed demand &new.

Also, planning, policy, & investments can shape this demand (parallel session)…