Sustainable First and Last Mile Transport

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First/Last Mile Transport

Popular phrase:

The Uber-/Lyft-zation of last mile freight…

Not sure...maybe…

We can consider people as commodities that need to be picked-up and delivered

Thus…

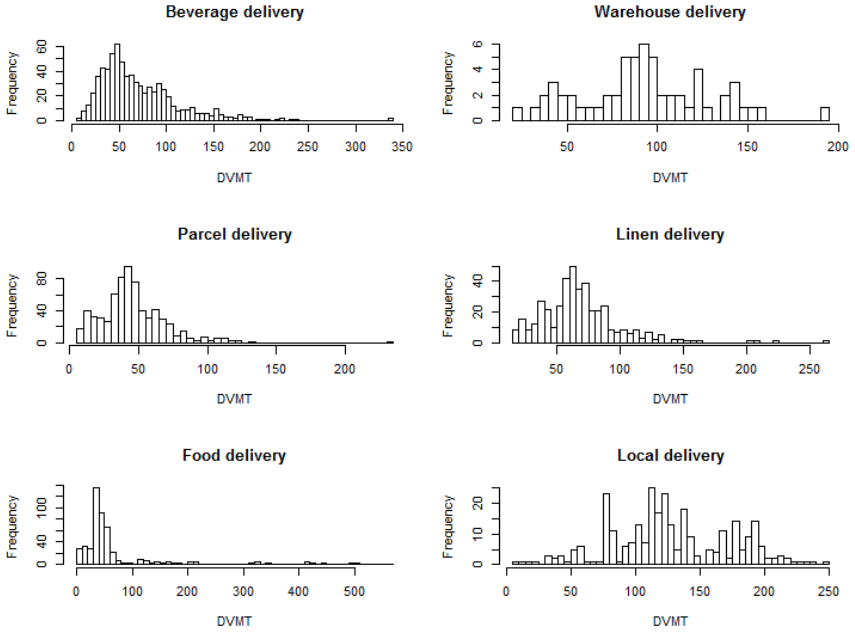
...I can probably use my hammer for this nail…

Related projects:

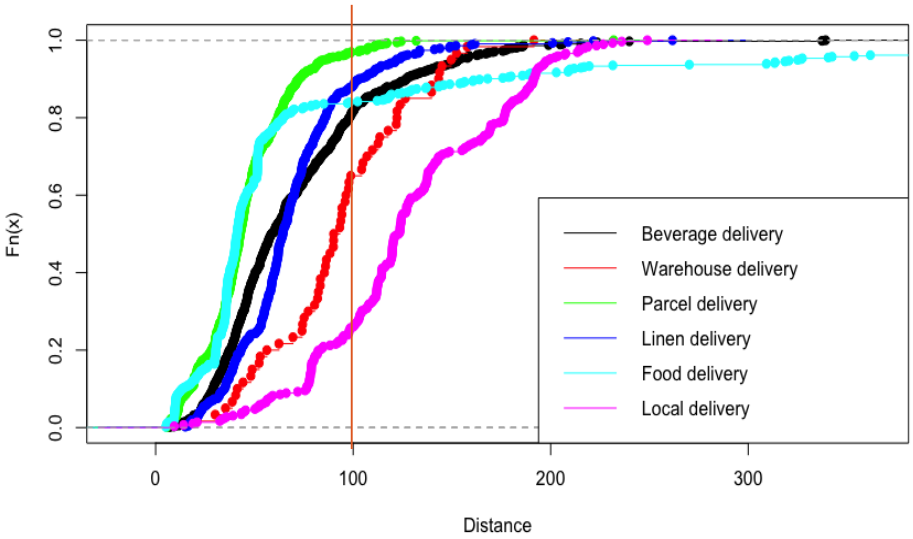
Last mile deliveries & ZEVs

First/last mile transit access program & TNCs/Autonomous Veh.

Last Mile Deliveries & ZEVs (Summary)



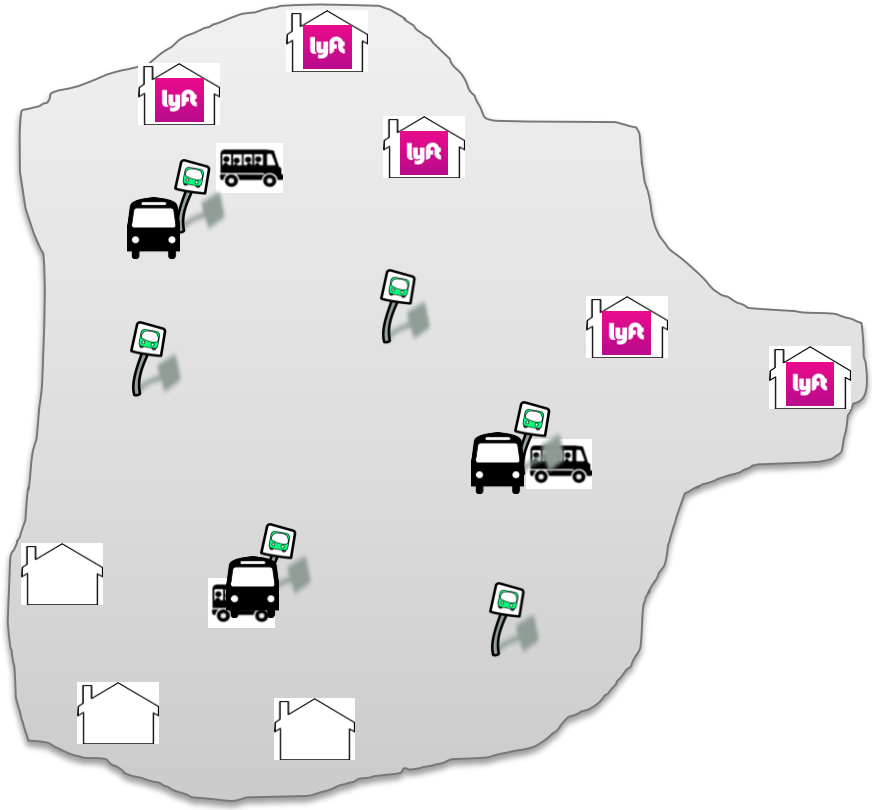
Daily VMT frequency histogram for all delivery vocations



Cumulative DVMT curve for all delivery modes

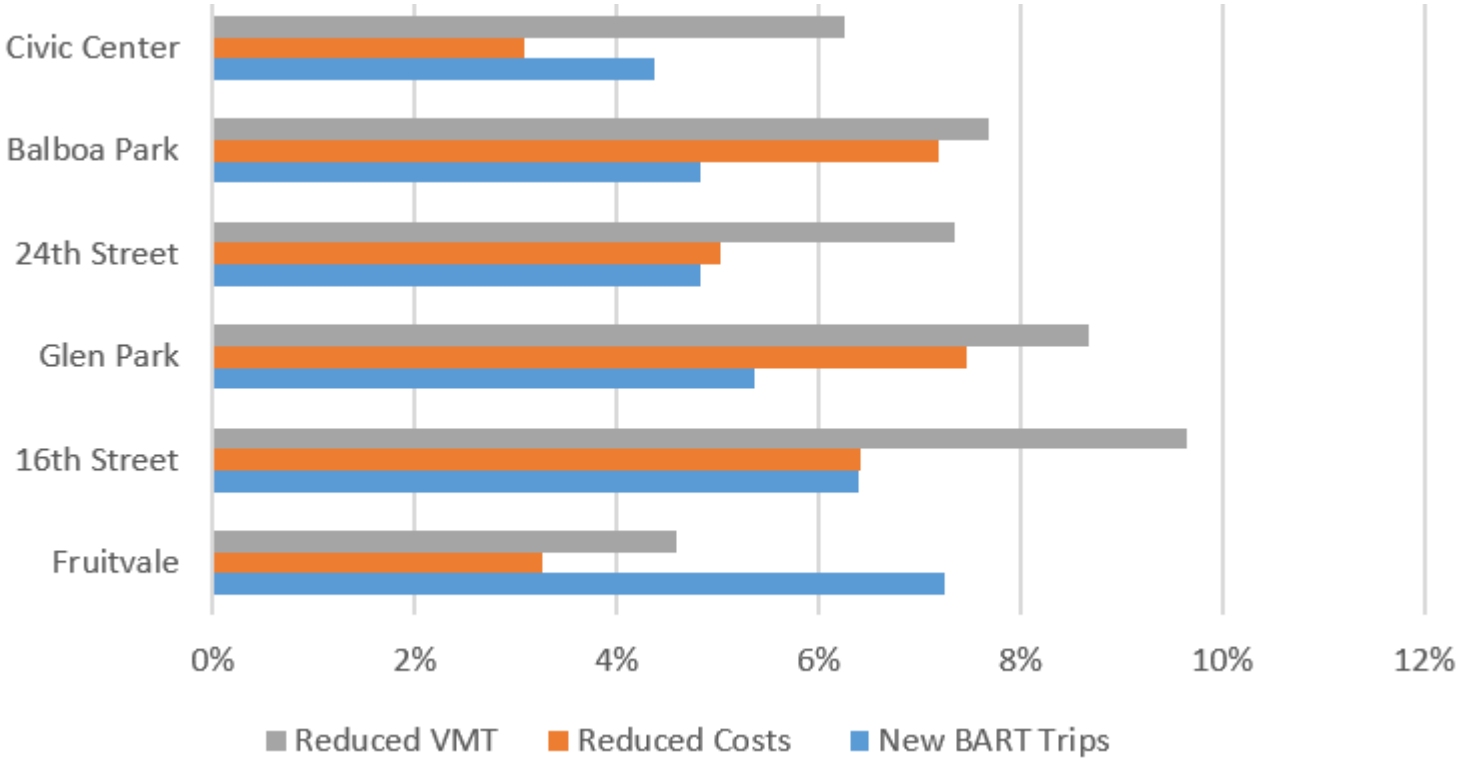
Impacts of Shared Mobility Services on First/Last Mile Transit Access Programs: Travel Demand, Energy and Emissions

Develop and integrate a first and last mile shared mobility service with San Francisco activity based model



Background (Alemi and Rodier, 2017)

- Potential savings in generalized costs and travel time
  - e.g., 25% of trips -> 20% cost reduction
  - e.g., 40% of trips -> 50% reduction in travel time
- Impacts per BART station (top 5)



Project Overview

Motivation

- Suburban area context and accessibility
- SOV and externalities

Objective

- Evaluation of the car sharing services potential to fill the first and last mile transit access gap

Methodology

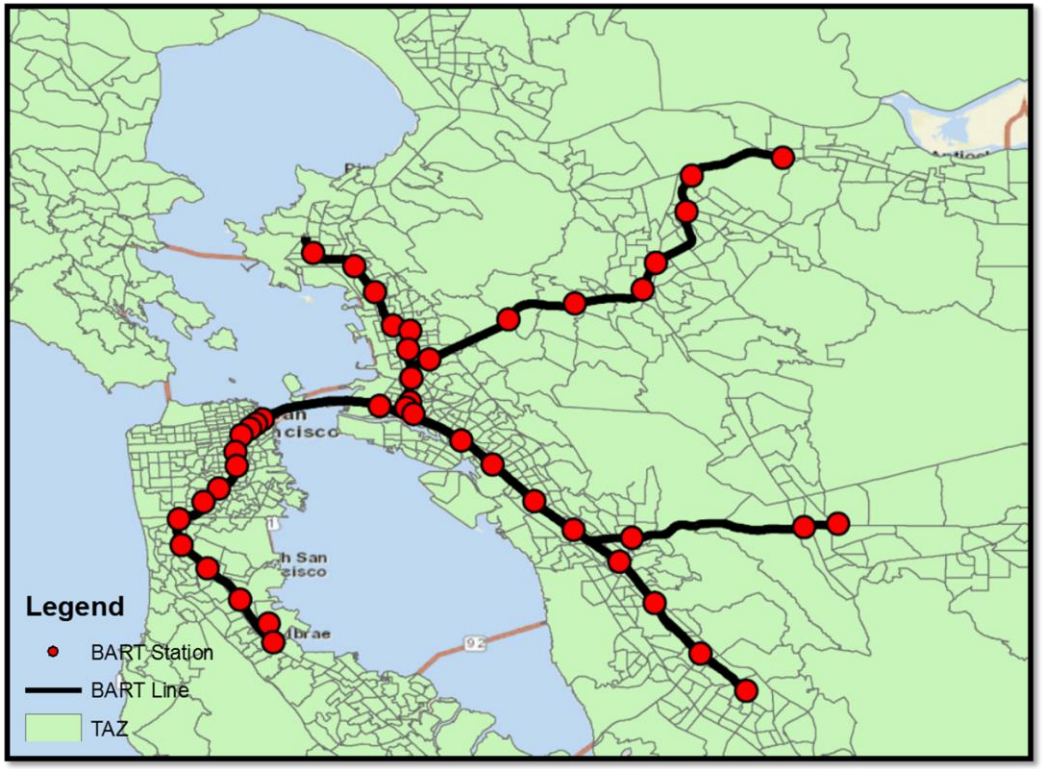
- Activity-based travel demand model (MTC-ABM)
- Dynamic traffic assignment MATSIM
- Continuous approximation models
- Scenario analysis

Case study

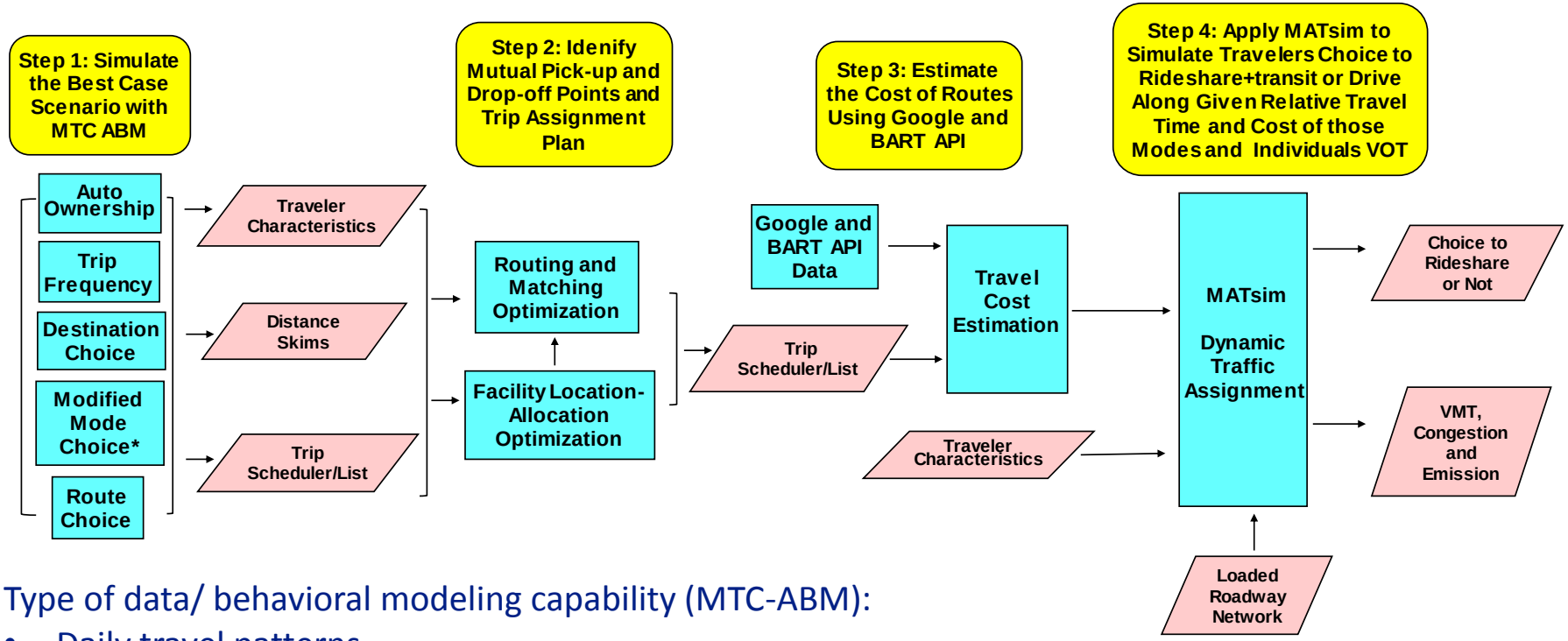
- BART in San Francisco Bay Area
- Morning peak hour work trips

~30% of TNC rides start or end near a transit station (Lyft et al., 2016)

In San Francisco, TNCs could complement transit (if high quality transit) (Rayle et al, 2014)



Modeling process



Type of data/ behavioral modeling capability (MTC-ABM):

- Daily travel patterns
- Estimates of willingness to pay and value of time
- Waiting and travel times
- Costs
- Etc.

MATsim – Only DTA capable model to use detailed travel activity patterns for large scale simulations.

BART wait times, in-BART travel times, and BART fares.

NEXT STEPS…

- Ongoing research project, will end at the end of the year
- Exploring the potential benefits of providing the service with the advent of autonomous and connected vehicles
- Expanding to develop a micro-transit system
- Extending the models to urban freight pick-up and drop-off activities