

The Rise of Transportation Alternatives

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Shared Transportation Services and Automated Vehicles

- In dense areas, shared services are playing an increasing role compared to individual ownership of cars
- Automated vehicles will be a (???) disruption to existing travel behavior and performance

A Working Definition of “Shared Services”

- New transportation services based on short term rental of transportation equipment (with or without an operator) by people who are “members” of a group

Example “Shared Services”

- Uber
- Lyft
- Sidecar
- Zipcar
- Car2Go
- Pronto Bike share
- Capital Bike Share

Why?

- Travel is an economic good
 - It follows the law of supply and demand
- When demand for travel is not effectively met, there is money to be made
- Potential for a market transaction exists

Why Shared?

- There are economic incentives to sharing a resource you own if you are not using it
- Sharing is advantageous if the economic benefit from sharing outweighs the risks (costs) of sharing
- Business models now exist that mitigate that risk and make revenue collection easy

Why Did Shared Services Arise?

- Traditional transportation services in dense urban environments often
 - Do not meet demand
 - Have poor characteristics
 - Travel time
 - Reliability
 - Availability
 - Cost
 - Flexibility
 - Service characteristics (comfort, seating, etc.)

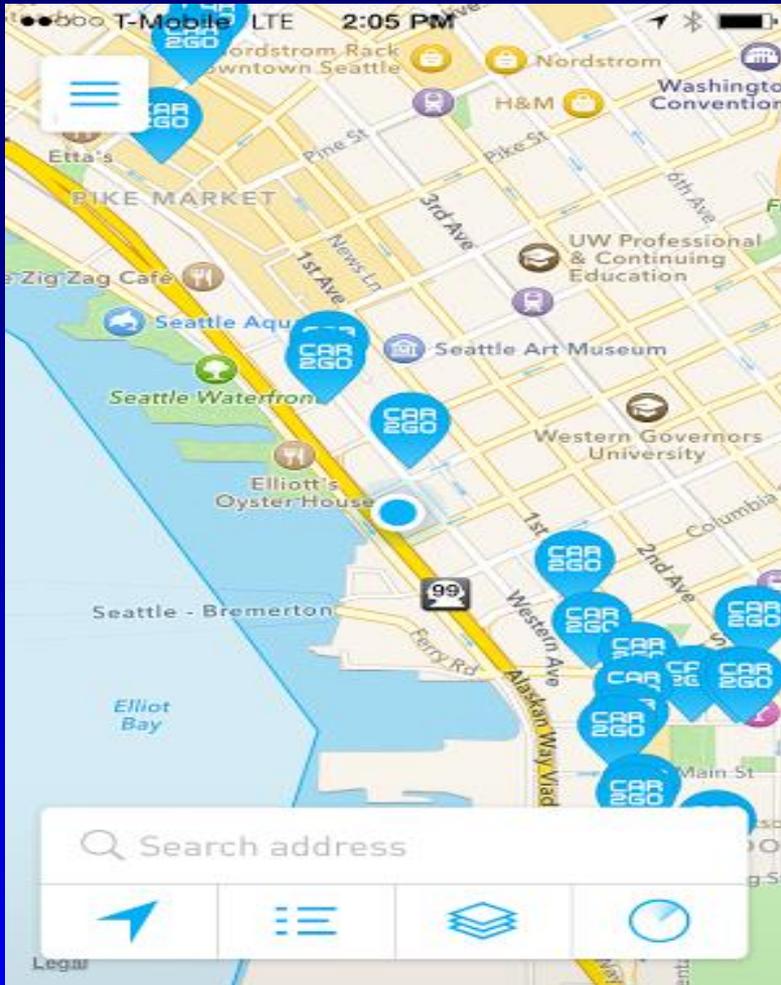
Why Did Shared Services Arise?

- Public service providers have been:
 - Resource constrained
 - Unable (or unwilling) to explore innovative new services
- Private providers see a place to make money
 - With a variety of business models

Why Shared Services Now?

- Modern technology effectively connects buyers to sellers of services
 - Identify that the services are available
 - Fuse data from many sources to create value to sell
 - Identify and provide trust for the buyer and seller
 - Transfer payment
 - Track assets

Connecting buyers and sellers creates new services



Car2Go



Bike Finder

Keys to Shared Services

- “Membership” allows collection and pre-trip review of key data
 - Identification
 - Picture (for security of staffed services)
 - Payment ability
 - Can include an up-front cash payment or deposit (better financial performance)

Keys to Shared Services

- Having these data:
 - Lowers financial risk to the group / firm
 - Lowers security risk
 - To the firm
 - To the operators (when paid operators are used)
 - To the users (when accepting a ride)

Types of Shared Transportation Services

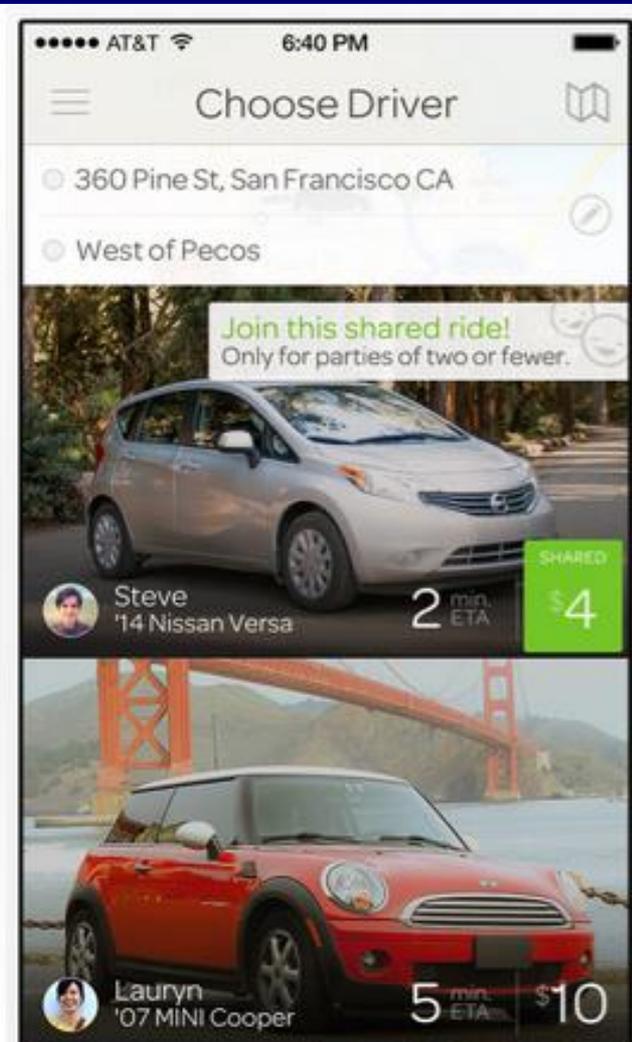
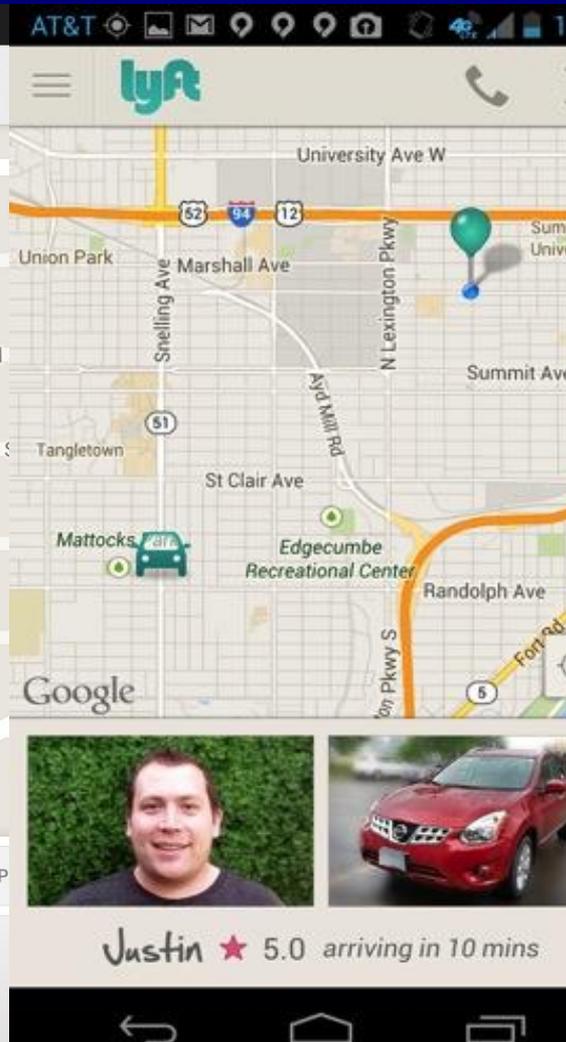
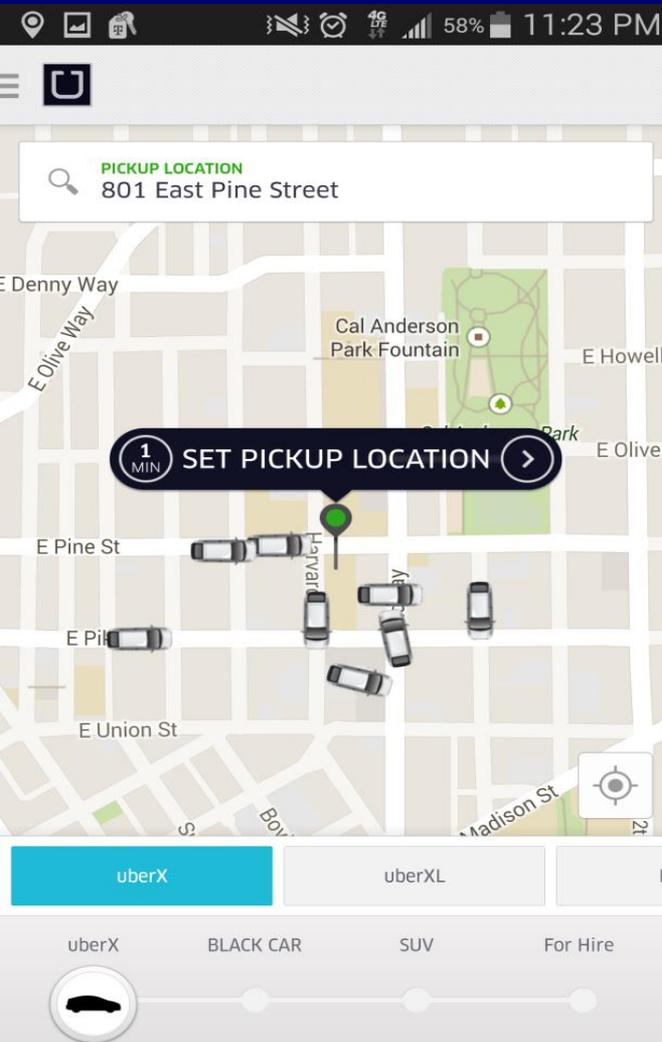
- Taxi services
- Paid on-demand carpool services
- Shared vehicles (cars)
- Bike share
- Shared parking
- T.B.D....

Taxi Services

Uber

Lyft

Sidecar



Taxi Services

- Reduce costs by avoiding many traditional expenses
 - Insurance,
 - Labor benefits
 - Taxi meter,
 - Medallion

Taxi Services

- Use innovative pricing models to generate more revenue as well
 - Sometimes at the expense of drivers
 - Sometimes at the cost (in return for service) of users
 - New: multi-user rides / split fares

Taxi Services

- Provide other customer focused attributes
 - Ability to choose drivers / riders
 - Ability to share rides
 - Often better information about pick-up availability
 - Often better hailing capabilities

Paid – On Demand Carpooling

- What Uber & Lyft say they are, but aren't
- Sharing a ride with someone actually going your way
- NOT a paid job for someone willing to use their car as a taxi

Paid – On Demand Carpooling

- Less widespread
 - Lacks significant incentive for drivers to participate
 - Money exchange is modest
 - Is it worth it for a driver to go out of their way to pick up a modest fare?
 - If you go to the effort, is there actually a person in need of a ride?

Paid – On Demand Carpooling

- Lack of drivers results in an inability to routinely provide rides to people who want them
 - This is a problem with Uber/Lyft services in low density areas
- Results in lack of use of the system
 - Results in people not offering rides

Paid – On Demand Carpooling

- Avego – now Carma
- Seattle test: Go520
 - Abandoned
 - Issues with government liability and other constraints
- Active in four US cities



Paid – On Demand Carpooling

- Most successful in the US in cities where
 - There are large travel time or financial incentives to be a carpool
 - Large point-to-point movements
 - (Same as SLUG lines)

Brings Up Density

- Most shared services require density of trip making to be financially competitive / viable
 - This tends to limit much of this activity to denser land uses

Changes How Cities May Grow

- The shared economy services increase the likelihood that people will choose to live in dense urban areas
 - In many cases they reduce the cost of living in these areas
 - While providing needed/desired and very flexible mobility

Shared Vehicles

- Short term vehicle rentals
- Excellent mechanism, (lower cost to the user) for meeting the occasional need for a car



Shared Vehicles

- Particularly useful in geographic areas where the fixed costs of owning a vehicle are high
 - And frequency of use is low
- In these situations, traditional car ownership results in a very high cost per use

Shared Vehicles

- “Sharing” the fixed costs of ownership greatly reduces the overall cost of car use
- Shared use can also increase flexibility in
 - the type of vehicle used
 - the location where vehicles are picked up and dropped off

Shared Vehicles

- Made possible by modern technology
 - Control access to vehicles
 - Limit access to specific individuals
 - Describe vehicle availability and location
 - Revenue collection
 - User interface
 - Ease of reservation
 - Speed of reservation, pick up, drop off, payment
 - Advertising existence of the service
 - Ease of joining

Shared Vehicles

- Different business models (in Seattle)

– Zipcar



– Car2Go



ZipCar

- Reserved parking spaces
 - Often in condo and apartment buildings, or commercial parking lots
 - Hourly and daily rates
- Return car to where you got it
- Designed to around “traditional” round trip car trips (e.g., going to the grocery store)

ZipCar

- Monthly or annual membership fee
- Multiple types and sizes of vehicles

Car2Go

- On-street parking
 - Included in the cost of the rental
- Registration fee
- Rate per minute
 - Maximum hourly charge
 - Maximum daily charge

Car2Go

- One type of vehicle



- Good for one-way trips

New Parking Services

- Started as information on the availability and cost of parking
- Systems have come from both
 - Public sector
 - Private sector

PIKE PLACE MARKET		OPEN SPACES
 Pike Place Pike Place Market	1531 Western Avenue	147
PIONEER SQUARE		OPEN SPACES
 Butler Garage Pioneer Square	114 James Street	OPEN
 1st and Columbia Pioneer Square	721 1st Avenue	121
 Stadium Place Pioneer Square	530 Occidental Avenue South	42

New Parking Services

- Law of supply and demand drives parking services in dense areas
- **Imagine** not just on-street and commercial parking but
Shared condo or driveway parking



New Parking Services

- Extended to reservations of private parking spaces (SPOTHero)

Latest Parking Space Rental App Hits the 'SPOT'

Instead of selling public parking, SPOT helps owners rent their space to people looking for a place to put their car.

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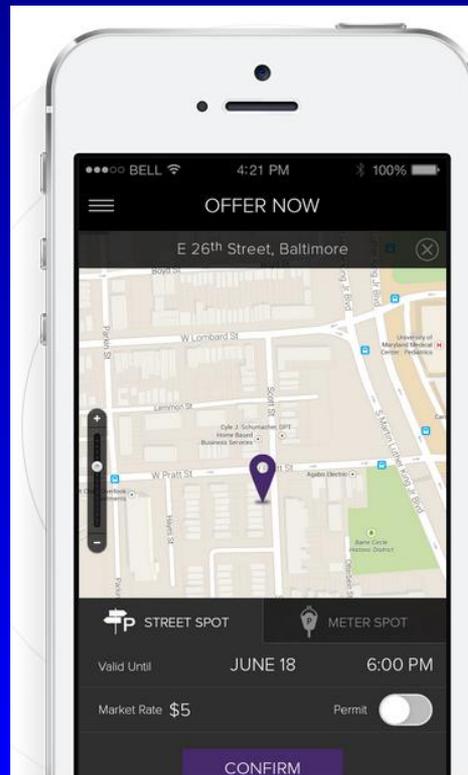
[Neighborhoods](#)

New Parking Services

- Can I sell my current public on-street space???

Haystack says
YES

Boston says
NO



OFFER YOUR SPOT FOR CASH

Help your neighbors by offering your street space before you head out with a simple tap. Cancel without penalty at anytime if nobody has taken your spot.

Level of Success???

A lot depends on the lawyers

And policy makers

Automated Cars



95 – 98% of Automated Car Functionality Exists Already

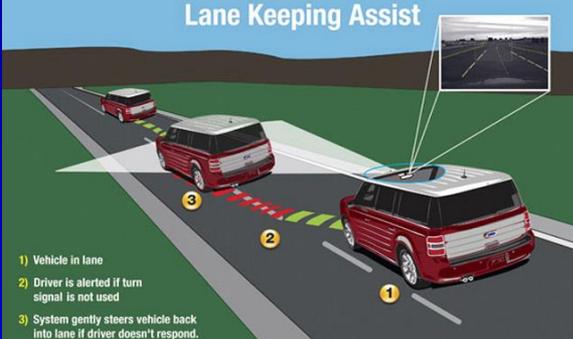
Automated Parking



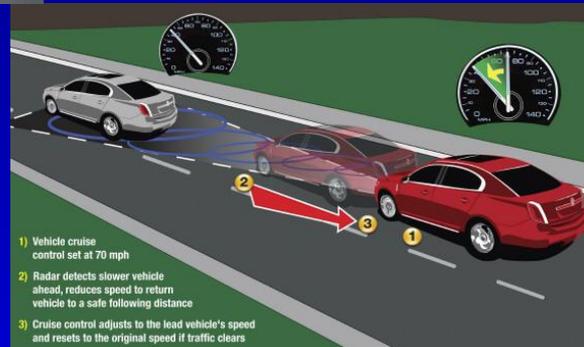
Automated Braking



Lane Keeping Assist



Lane Keeping



Station Keeping

Cruise Control



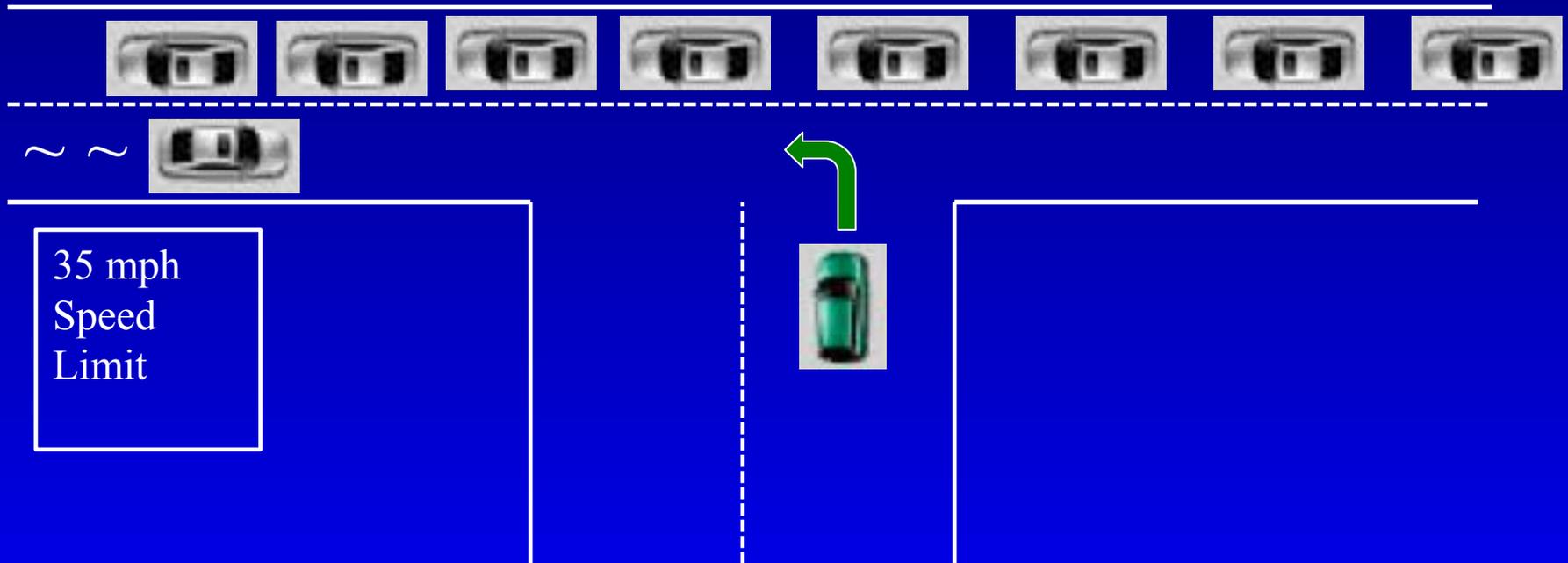
Navigation



BUT

Fully automated cars are still a ways off

How does an automated car make this left turn
when no other cars are automated?



Regulatory Decisions Will Shape Their Impact on Congestion & Travel Behavior

- Does a qualified driver need to be in the automated car?
- Can an individual own a fully automated car, or only companies with big liability insurance and reliable maintenance practices?



Different Policies / Different Outcomes

- If individuals own the cars, and they don't need a driver (the GM/Volvo model)
 - VMT and sprawl goes up
 - Lots of extra miles are driven (w/o people)
 - A much lower perceived cost of congestion

Different Policies / Different Outcomes

- If only Google & Uber own them (the Google model)
 - VMT goes down
 - Travel is priced per use
 - So perception of cost goes up

Other Issues

- Mixed operating environments
- Data collection (needed for liability)
 - Desired by Google for marketing
- Liability
 - Maintenance responsibilities / requirements

Questions?