Shared Automated Vehicles: Review of Business Models

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Overview

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- Current Shared Mobility Business Models
- Shared Mobility + Automation Developments
- Potential SAV Business Models (w/ high/full automation)
- Potential SAV Service Models (w/ high/full automation)
- Possible SAV Impacts
- Conclusion
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Introduction

- Over 30 companies worldwide developing AV technology
- Highly automated vehicles are coming, not an “if” but “when” and “how”
- Shared + Automated Vehicles (SAV) concept gaining traction
- What SAV business models might emerge?
- Review of existing shared mobility services

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## Current Shared Mobility Business Models

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<th>Peer-to-Peer Service Models (P2P)</th>
<th>For-Hire Service Models</th>
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<td>• Carsharing</td>
<td>• P2P Carsharing</td>
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Business-to-Consumer (B2C) Service Models

Carsharing:
Allows access to vehicles owned by carsharing companies as part of a shared fleet on an as-needed basis. Includes roundtrip and one-way carsharing.
Microtransit:
Service that employs shuttles or vans to pick up passengers with fixed
route/schedule or flexible route/schedule, depending on the service
Peer-to-peer (P2P) Service Models

P2P Carsharing
Service that employs privately-owned vehicles made available for shared use by an individual or member of a P2P carsharing company
Peer-to-peer (P2P) Service Models

Fractional Ownership
Multiple individuals lease a vehicle, and each pay a portion of the expenses for access to the shared vehicle.
Peer-to-peer (P2P) Service Models

Ridesharing
Service that facilitates shared rides between drivers and passengers with similar origins and/or destinations
For-Hire Service Models

Ridesourcing/TNCs:
Service that allows passengers to connect with and pay drivers who use their personal vehicles for trips facilitated through a mobile application.
Shared Mobility + Automation Developments

- SAV pilots are small-scale at present
- Uber in Pittsburgh
- nuTonomy in Singapore
- EasyMile, CityMobil2, Olli
Shared Mobility + Automation Developments

Bloomberg, 2016
Potential SAV Business Models (w/high/full automation)

- Putting futurist glasses on...

- Assumptions:
  - Level 4 or higher AVs
  - ODD = most public roads in a given city or metro area
  - Can legally operate unmanned
Shared Mobility Lines Begin to Blur

Non-automated shared mobility business models

- B2C
- For-Hire
- Hybrid B2C/P2P
- P2P

Highly/fully-automated SAV business models

- For-Hire service model blurs into B2C/P2P assuming high/full automation (no longer “hire” someone)
- Carsharing vs. pooling considering automation
Potential SAV Business Models (w/ high/full automation)

- Two main aspects define SAV business models:

  1) Vehicle Ownership
     - Business/Entity (B2C)
     - Individuals (P2P)
     - Hybrid Business/Individuals (B2C/P2P)

  2) Network Operator
     - Network operator controls fleet-level decisions
     - Same entity owns and operates or not
## Potential SAV Business Models (w/ high/full automation)

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<tr>
<th>Vehicle Ownership</th>
<th>Business (B2C)</th>
<th>Individuals (P2P)</th>
<th>Hybrid Business/Individuals (B2C/P2P)</th>
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<td>• Same entity owns and operates</td>
<td>• Third-party entity operates</td>
<td>• Same entity that owns (some) vehicles operates</td>
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<tr>
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<td>• Different entity owns and operates</td>
<td>• Decentralized peer-to-peer operations</td>
<td>• Third-party entity operates</td>
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B2C with Single Owner-Operator

Vehicle Ownership: Business/Entity (B2C)
Network Operator: Same entity owns and operates

- SAV fleet that is both owned and operated by the same organization

Example: B2C carsharing
B2C with Different Entities Owning and Operating

Vehicle Ownership: Business/Entity (B2C)
Network Operator: Different entity owns than operates

- SAV fleet with different owner than operator where two or more companies partner to provide services

Example: GM-Lyft partnership
P2P with Third-Party Operator

Vehicle Ownership: Individually-owned (P2P)
Network Operator: Third-party entity operates

- Individually-owned SAV network, with a third-party entity controlling network operations

- Example: ‘Tesla Network,’ P2P carsharing
P2P with Decentralized Operations

Vehicle Ownership: Individually-owned (P2P)
Network Operator: Decentralized peer-to-peer operations

- Individually-owned SAV(s) where operational aspects are not controlled by any one centralized third party and are instead decided upon by groups of individual owners

Example: Arcade City, fractional ownership
Hybrid Ownership with Same Entity Operating

**Vehicle Ownership:** Hybrid Business/Individuals (B2C/P2P)

**Network Operator:** Same entity that owns (some) vehicles operates

- Entity-owned SAV fleet that also may comprise of individually-owned AVs that join the network as-needed

**Example:** Ridesourcing/TNC mixed-ownership fleet
Hybrid Ownership with Third-Party Operator

Vehicle Ownership: Hybrid Business/Individuals (B2C/P2P)

Network Operator: Third-party entity operates

- Third-party that does not own SAVs themselves comprised of both individually-owned and entity-owned AVs on a shared network of vehicles which they operate

Example: Getaround/City CarShare recent partnership in Bay Area
Potential SAV Service Models (w/ high/full automation)

- **SAV Business Models Partially Influence Service Models via Vehicle Types Available**

- “Micro-sized” (1 or 2 pax) vehicles could become more commonplace
SAV Framework Limitations

- Many business/service models might emerge even in a single city or metro area
- Transition period of mixed SAV/non-AV fleets
- Some business/service models may become more dominant than others
- Depends on many factors, including: automation price and availability, regulation, land-use context, etc.
Possible SAV Impacts: Opportunities

• Increase vehicle occupancies
• Reduce per mile cost (over privately-owned vehicles)
• Unlock urban space dedicated to parking
• Downsize number of privately-owned household vehicles
• Reduce GHG emissions
Possible SAV Impacts: Challenges

- Increased VMT / induced demand
- Will people give up private ownership?
- Increased urban sprawl
- Congestion solved?
Conclusion

- SAVs have the potential to fundamentally change the transportation industry

- SAV impacts are uncertain at this time

- Business models, travel behavior preferences, and public policy are key components to SAV development
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