Optimizing Community Benefits with Shared Mobility

Susan Shaheen, Ph.D
Overview

- What is the Sharing Economy + Shared Mobility?
- Market Trends
- Impacts
- Some Partnerships
- Summary
- Acknowledgements
Sharing Economy

Not New....
Lots of Coverage

The sharing economy

On the internet, everything is for hire

STRANGERS CRASHED MY CAR, ATE MY FOOD AND WORE MY PANTS. TALES FROM THE SHARING ECONOMY

By Joel Stein
Lots of Confusion

CONFUSED?

PEER ECONOMY, ACCESS ECONOMY, GIG ECONOMY, SHARED CAPITALISM, COLLABORATIVE CONSUMPTION, SHARING ECONOMY, ON-DEMAND ECONOMY, CIRCULAR ECONOMY, THE MESH, HIPPIENOMICS, PEOPLE ECONOMY, SHARING ECONOMY, ENABLING ECONOMY, EMPOWERING ECONOMY, INSTANT GRATIFICATION ECONOMY, COLLABORATIVE ECONOMY...
The Sharing Economy

By Jeremiah Owyang
jeremiah@CrowdCompanies.com
@jpowyang, Dec 2014

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Shared Mobility Ecosystem

- Core & Incumbent Services
  - Car Rental
  - Liveries/Limos
  - Paratransit
  - Pedicabs
  - Public Transit
  - Shuttles
  - Taxis

- Innovative Services
  - Bikesharing
  - Carsharing
  - Courier Network Services
  - e-Hail
  - High-Tech Company Shuttles
  - Microtransit
  - P2P Bikesharing
  - P2P Vehicle Sharing
  - Ridesourcing/TNCs
  - Scooter Sharing

FHWA, Forthcoming
Carsharing Service Models

**Roundtrip Carsharing:**
Round trip, pay by the hour/mile, non-profit and for profit fleet models

**Peer-to-Peer Carsharing:**
Shared use of private vehicle typically managed by third party

**One-Way Carsharing:**
Pay by the minute, point to point, fleet operated, street parking agreements

**Fractional Ownership Carsharing:**
Individuals sublease or subscribe to a vehicle owned by a third party
North American Longitudinal Trends

Members

<table>
<thead>
<tr>
<th>Year</th>
<th>2006</th>
<th>2008</th>
<th>2010</th>
<th>2012</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>117,656</td>
<td>318,898</td>
<td>516,100</td>
<td>908,584</td>
<td>1,625,652</td>
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</tbody>
</table>

Vehicles

<table>
<thead>
<tr>
<th>Year</th>
<th>2006</th>
<th>2008</th>
<th>2010</th>
<th>2012</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3,337</td>
<td>7,505</td>
<td>10,420</td>
<td>15,795</td>
<td>24,210</td>
</tr>
</tbody>
</table>

Shaheen and Cohen, 2015
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### 2014 Membership: One-Way & Roundtrip

<table>
<thead>
<tr>
<th>Region</th>
<th>Round-trip</th>
<th>One-way</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>926,280</td>
<td>29,600</td>
</tr>
<tr>
<td>Europe</td>
<td>1,834,418</td>
<td>372,466</td>
</tr>
<tr>
<td>North America</td>
<td>1,179,930</td>
<td>445,722</td>
</tr>
<tr>
<td>South America</td>
<td>0</td>
<td>3,500</td>
</tr>
<tr>
<td>Oceania</td>
<td>50,000</td>
<td>700</td>
</tr>
<tr>
<td>Global</td>
<td>3,990,628</td>
<td>851,988</td>
</tr>
</tbody>
</table>

Shaheen and Cohen, 2015

© UC Berkeley, 2016
2014 Vehicles: One-Way & Roundtrip

<table>
<thead>
<tr>
<th>Region</th>
<th>Round-trip</th>
<th>One-way</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>20,199</td>
<td>145</td>
</tr>
<tr>
<td>Europe</td>
<td>39,904</td>
<td>18,043</td>
</tr>
<tr>
<td>North America</td>
<td>18,267</td>
<td>5,943</td>
</tr>
<tr>
<td>South America</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Oceania</td>
<td>1,500</td>
<td>24</td>
</tr>
<tr>
<td>Global</td>
<td>79,859</td>
<td>24,266</td>
</tr>
</tbody>
</table>

Shaheen and Cohen, 2015

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## World Carsharing Growth Rates

![Graph showing growth rates of carsharing members and vehicles from 2006-08 to 2012-14.]

<table>
<thead>
<tr>
<th></th>
<th>2006-08</th>
<th>2008-10</th>
<th>2010-12</th>
<th>2012-14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Members</strong></td>
<td>39%</td>
<td>32%</td>
<td>24%</td>
<td>64%</td>
</tr>
<tr>
<td><strong>Vehicles</strong></td>
<td>30%</td>
<td>28%</td>
<td>17%</td>
<td>55%</td>
</tr>
</tbody>
</table>

Shaheen and Cohen, 2015

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2008 North American Carsharing Survey: Key Findings

- Between **9 to 13 vehicles removed**, including postponed purchase
- **4 to 6 vehicles/carsharing vehicle sold** due to carsharing
- 25% sell a vehicle; 25% postpone purchases
- **27 - 43% VMT/VKT** reduction per year, considering vehicles sold and purchases postponed
- More users increased **overall** public transit and non-motorized modal use (including bus, rail, walking, and carpooling) than decreased it
2008 North American Carsharing Survey: Key Findings

- Reduction of 0.58-0.84 metric tons of GHG emissions per year for one household (mean observed and full impact)

- 34% - 41% reduction of GHG emissions per year for one household.

- $154 - $435 monthly household savings per U.S. member after joining carsharing

Martin et al. 2010
Bikesharing Service Models

Public Bikesharing:
Point to point, pay by the $\frac{1}{2}$ hr, fleet operated, docking stations

Closed Community Bikesharing:
Campuses and closed membership, mainly roundtrip, linking to carsharing

Peer-to-Peer Bikesharing:
Rent or borrow hourly or daily from individuals or bike rental shops

Worldwide: 955 cities with IT-based operating systems
- 1,165,200 bikes
- 940,850 bikes in China (and 390 cities)

U.S.: 87 cities with IT-based systems (61 programs)
- 30,750 bikes
- 3,200 stations

Source: Russell Meddin, 2015
# Member Understanding: Five Bikesharing Cities Across Three Nations

<table>
<thead>
<tr>
<th>Operator</th>
<th>City</th>
<th>Responses</th>
<th>Members (annual/seasonal)</th>
<th>Bikes</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIXI Montreal</td>
<td>Montreal</td>
<td>1102</td>
<td>49217</td>
<td>5000</td>
<td>400</td>
</tr>
<tr>
<td>BIXI Toronto</td>
<td>Toronto</td>
<td>1015</td>
<td>4185</td>
<td>1000</td>
<td>400</td>
</tr>
<tr>
<td>Nice Ride Minnesota</td>
<td>Minneapolis-St Paul</td>
<td>630</td>
<td>3500</td>
<td>1325</td>
<td>145</td>
</tr>
<tr>
<td>GreenBIKE SLC</td>
<td>Salt Lake City</td>
<td>72</td>
<td>N/A</td>
<td>65</td>
<td>12</td>
</tr>
<tr>
<td>EcoBici</td>
<td>Mexico City</td>
<td>3349</td>
<td>70100</td>
<td>3530</td>
<td>261</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>6168</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As a result of my use of bikesharing, I drive a personal vehicle (e.g., car, SUV, etc.) ...

**Minneapolis Saint-Paul**, N = 620
- Much more often: 44%
- More often: 49%
- Less often: 0%
- Much less often: 9%
- About the same: 29%
- Did not drive before/after: 14%

**Salt Lake City**, N = 72
- Much more often: 0%
- More often: 0%
- Less often: 0%
- Much less often: 6%
- About the same: 38%
- Did not drive before/after: 8%

**Montreal**, N = 1095
- Much more often: 19%
- More often: 23%
- Less often: 0%
- Much less often: 10%
- About the same: 16%
- Did not drive before/after: 51%

**Toronto**, N = 993
- Much more often: 10%
- More often: 12%
- Less often: 0%
- Much less often: 16%
- About the same: 24%
- Did not drive before/after: 37%

**Mexico City**, N = 3329
- Much more often: 1%
- More often: 0%
- Less often: 32%
- Much less often: 21%
- About the same: 19%
- Did not drive before/after: 25%

Changed driving, not due to bikesharing.
### What is the primary reason that you are using the rail LESS because of bikesharing?

<table>
<thead>
<tr>
<th>Response Categories</th>
<th>Montreal</th>
<th>Toronto</th>
<th>Minneapolis-Saint Paul</th>
<th>Salt Lake City</th>
<th>Mexico City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower cost and faster travel</td>
<td>25%</td>
<td>48%</td>
<td>0%</td>
<td>0%</td>
<td>28%</td>
</tr>
<tr>
<td>Just lower cost</td>
<td>5%</td>
<td>9%</td>
<td>7%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Too many connections (not have to transfer)</td>
<td>3%</td>
<td>2%</td>
<td>7%</td>
<td>0%</td>
<td>6%</td>
</tr>
<tr>
<td>Just faster travel</td>
<td>14%</td>
<td>14%</td>
<td>14%</td>
<td>40%</td>
<td>12%</td>
</tr>
<tr>
<td>Improve travel time reliability</td>
<td>4%</td>
<td>7%</td>
<td>0%</td>
<td>60%</td>
<td>6%</td>
</tr>
<tr>
<td>Want to get exercise</td>
<td>31%</td>
<td>8%</td>
<td>50%</td>
<td>0%</td>
<td>17%</td>
</tr>
<tr>
<td>Public transit vehicle is crowded</td>
<td>6%</td>
<td>6%</td>
<td>0%</td>
<td>0%</td>
<td>18%</td>
</tr>
<tr>
<td>No space for my bike, which I use to connect</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>I consider it safer to travel with bikesharing</td>
<td>1%</td>
<td>0%</td>
<td>7%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>1%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
<td>3%</td>
</tr>
<tr>
<td>Other, please specify:</td>
<td>8%</td>
<td>5%</td>
<td>14%</td>
<td>0%</td>
<td>3%</td>
</tr>
</tbody>
</table>

**Total N**
- Montreal: 631
- Toronto: 491
- Minneapolis-Saint Paul: 14
- Salt Lake City: 5
- Mexico City: 577

Shaheen et al., 2014
Bikesharing Impacts: Summary

- Member survey indicates modal shift away from most modes (auto and public transit); impacts vary across cities by city size
  - Shifts from public transit occur more prominently in downtown core of larger cities.
  - In cities with less transit intensive infrastructure, bikesharing appears to facilitate modest increase in public transit.
- Evidence also suggests that bikesharing provides better access and egress to transit in the less dense urban periphery of larger cities.
- Limited bikesharing helmet use
Scooters: Fill Niche Between Bikes and Cars

Scooter Sharing:
An operator-owned fleet of motorized scooters made available to users by the hour or minute
Ridesharing Service Models

Carpooling:
Grouping of travelers into a privately owned vehicle, typically for commuting

Vanpooling:
Commuters traveling to/from a job center sharing a ride in a van

Real-Time Ridesharing Services:
Match drivers and passengers, based on destination, through app before the trip starts
Traditional Ridesharing

- Grouping of travelers into common trips by private auto/van (e.g., carpooling and vanpooling)

- Historically, differs from ridesourcing in financial motivation and trip origin/destination

- 662 ridematching services in the U.S. and Canada (24 span both countries)
  - 612 programs offer carpooling
  - 153 programs offer vanpooling
  - 127 programs offered carpooling and vanpooling

Chan and Shaheen, 2011
For-Hire Vehicle Access 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.

**Street Hail:**
Hailed with a raised hand or by standing at a taxi stand or specified loading zone.

**E-Hail:**
Hailed by dispatching a for-hire driver using a smartphone application.
Some Ridesourcing/E-Hail: Market Trends

- Sidecar ceases operations
- Lyft: 195 cities; over 315,000 drivers
- Uber: 68 countries; over 360 cities; hundreds of thousands of drivers signing up globally per month
- Easy Taxi: 18 countries; 400 cities
- Veriphone (formerly Curb): 60 cities; 90 cab companies; over 35,000 taxis
- mytaxi: 5 countries; 20 cities
- Flywheel: 6 cities; over 5,000 drivers
Shared Mobility Partnerships with Public Transit

- Uber/Lyft and DART (Dallas) – Public transit riders access Uber and Lyft through the “Events and Offers” section of DART’s GoPass mobile ticketing app
  - Promotion offering new DART users $20 ride credit
- Uber and MARTA (Atlanta) – Transit riders access Uber through MARTA mobile app
  - Promotion offering new MARTA users $20 ride credit
- VTA (Silicon Valley) - VTA launched FLEX pilot, a fleet of flexible route shuttles dispatched using a smartphone app
Delivery Services

Courier Network Services (CNS):
By sharing vehicles and combining point-to-point private user trips with delivery, opportunity for quicker and more efficient deliveries
Summary

- Growing ecosystem of services in mobility + sharing economy
- Long history of shared mobility – dating to as early as 1940s with ridesharing and carsharing
- Over 1.6 M members and 24,210 carsharing vehicles in the US as of October 2014
- Bikesharing: 86 cities in the U.S. 30,750 bikes and 3,200 stations as of October 2015
- Ridesharing: ~662 vanpool/carpool services in U.S. and Canada
- Ridesourcing/TNCs and e-Hail growing in the U.S.
- Shared mobility services: more understanding needed
Acknowledgements

- Mineta Transportation Institute, San Jose State University
- California Department of Transportation
- Adam Cohen, Elliot Martin, Nelson Chan, and Matt Christensen, TSRC, UC Berkeley
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