



UNIVERSITY OF CALIFORNIA *Berkeley*  
**Transportation Sustainability**  
RESEARCH CENTER

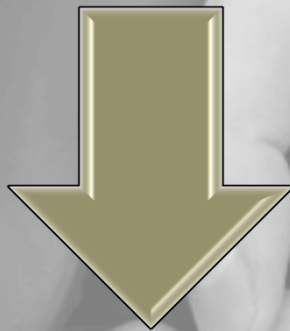
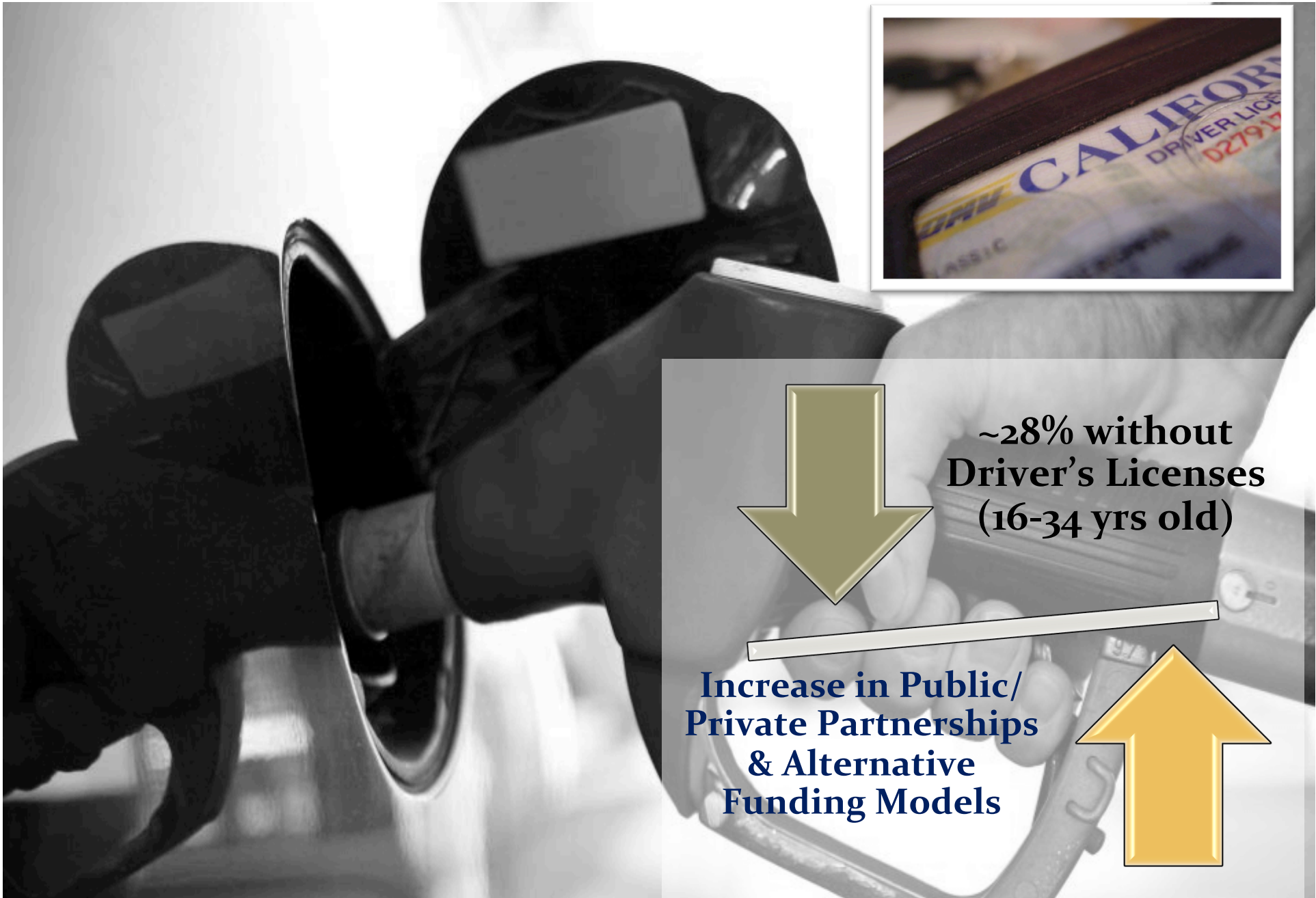
SHARED-USE MOBILITY: TRENDS &  
OPPORTUNITIES FOR MULTI-MODAL  
INTEGRATION

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University of California, Berkeley  
World Collaborative Mobility Conference, Bern, Switzerland  
May 7, 2014

# OVERVIEW

- Some trends / recent studies
- Access vs. ownership & sharing economy
- Shared-use mobility services
- Current understanding of impacts
- Mobility management – emphasis on complete trip
- Acknowledgements





**~28% without  
Driver's Licenses  
(16-34 yrs old)**



**Increase in Public/  
Private Partnerships  
& Alternative  
Funding Models**



**U.S. Trends**

**Declining revenues, licensed drivers**



The trend is clear:

Access trumps possession.

Access is better than **ownership**

- Kevin Kelly

Paradigm Shift?

Access trumps ownership

# Decline In Traditional Ownership Model Of Material Goods Rise In Renting, Subscription & Pay-Per-Use



New Models

Subscription & Membership vs. Ownership



Users are looking to transportation to meet multiple needs beyond getting to their destination



User Behaviors & Preferences

Convenience & Cost First, Green Is A Perk



## A New Direction

Our Changing Relationship with Driving  
and the Implications for America's Future

**U.S. PIRG**  
Education Fund

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## A New Way to Go

The Transportation Apps and Vehicle-Sharing  
Tools that Are Giving More Americans  
the Freedom to Drive Less



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Recent U.S. Studies

Changes in Driving & Role of Apps, Sharing



# MILLENNIALS & MOBILITY:

UNDERSTANDING  
THE MILLENNIAL  
MINDSET



TCRP J-11 Study

Understanding Millennials Living in Urban  
Areas





**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

ValleyMetro.org

**Ridesharing**

Evolving system of services and operators

# RIDESHARING IN NORTH AMERICA: A SNAPSHOT (July 2011)

- 612 carpooling services
- 153 vanpooling services
- 127 services offer both carpooling & vanpooling
- Includes both online and off-line programs



Chan and Shaheen, 2011



**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

**Carsharing**

There are many flavors of carsharing



**Scooter Sharing:**  
Round trip or one way, pay by the hour  
Smartphone access, operator fleet

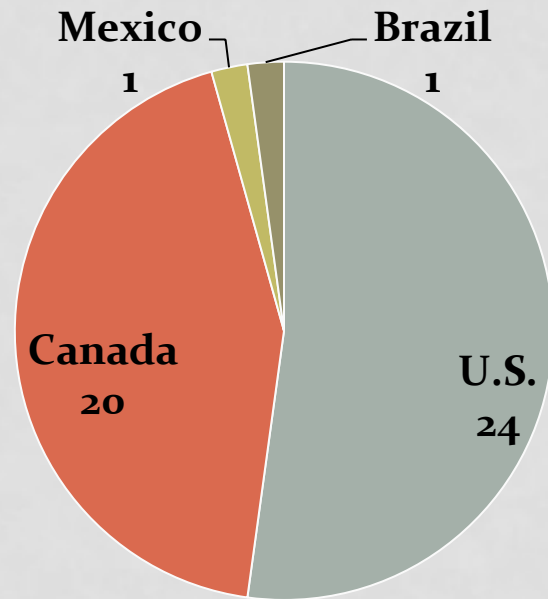
**Scooter Sharing**

Fills the niche between cars and bicycles

# CARSHARING STATISTICS: AMERICAS

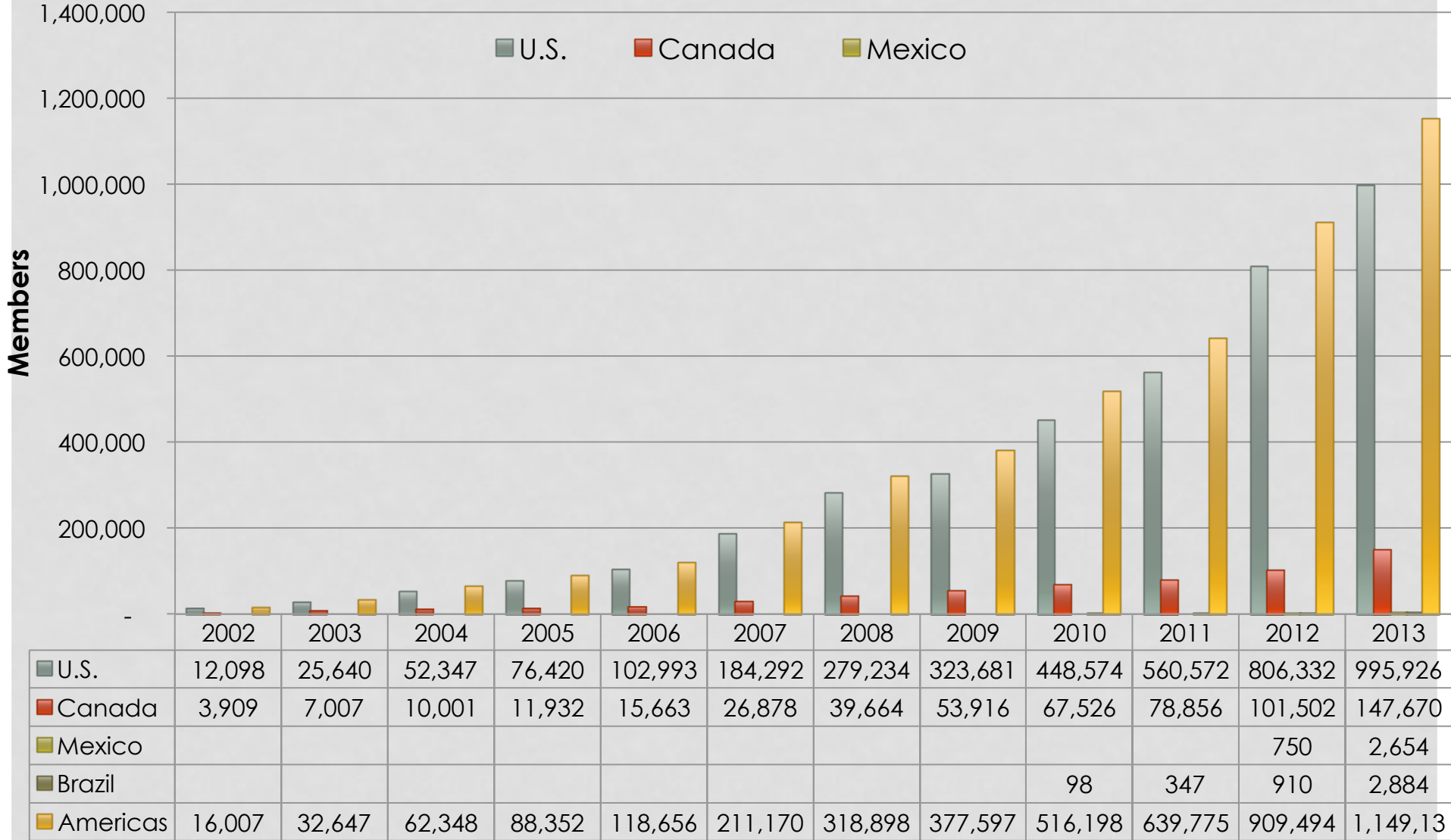
as of July 2013

46 operators, excluding PVS/p2p operators



Shaheen, 2013

# CARSHARING MEMBERSHIP GROWTH: AMERICAS

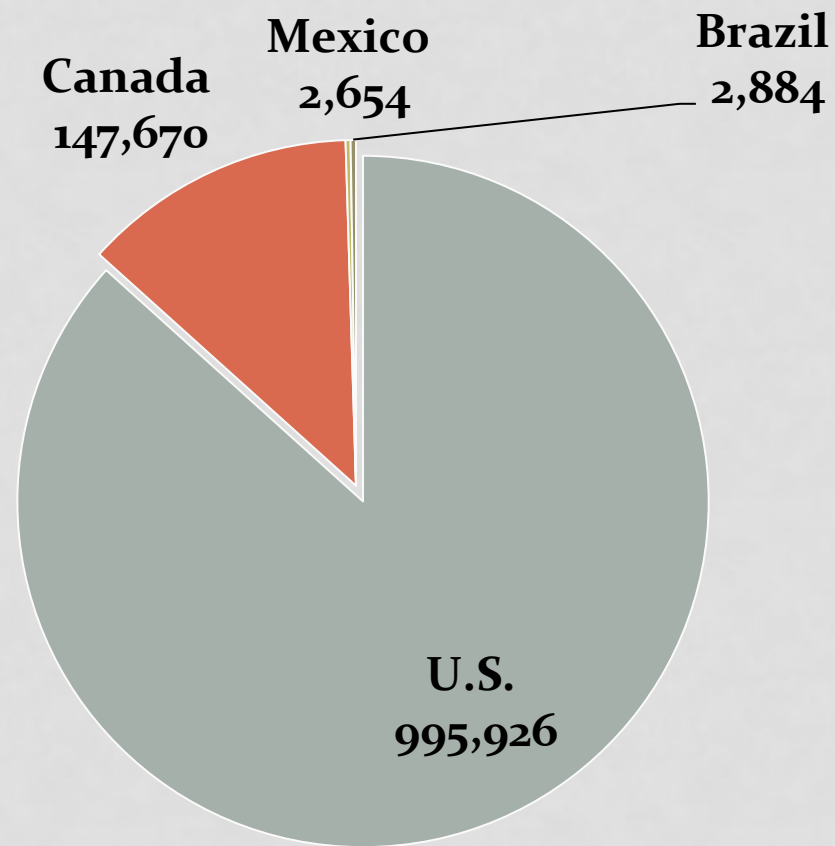


Shaheen, 2013

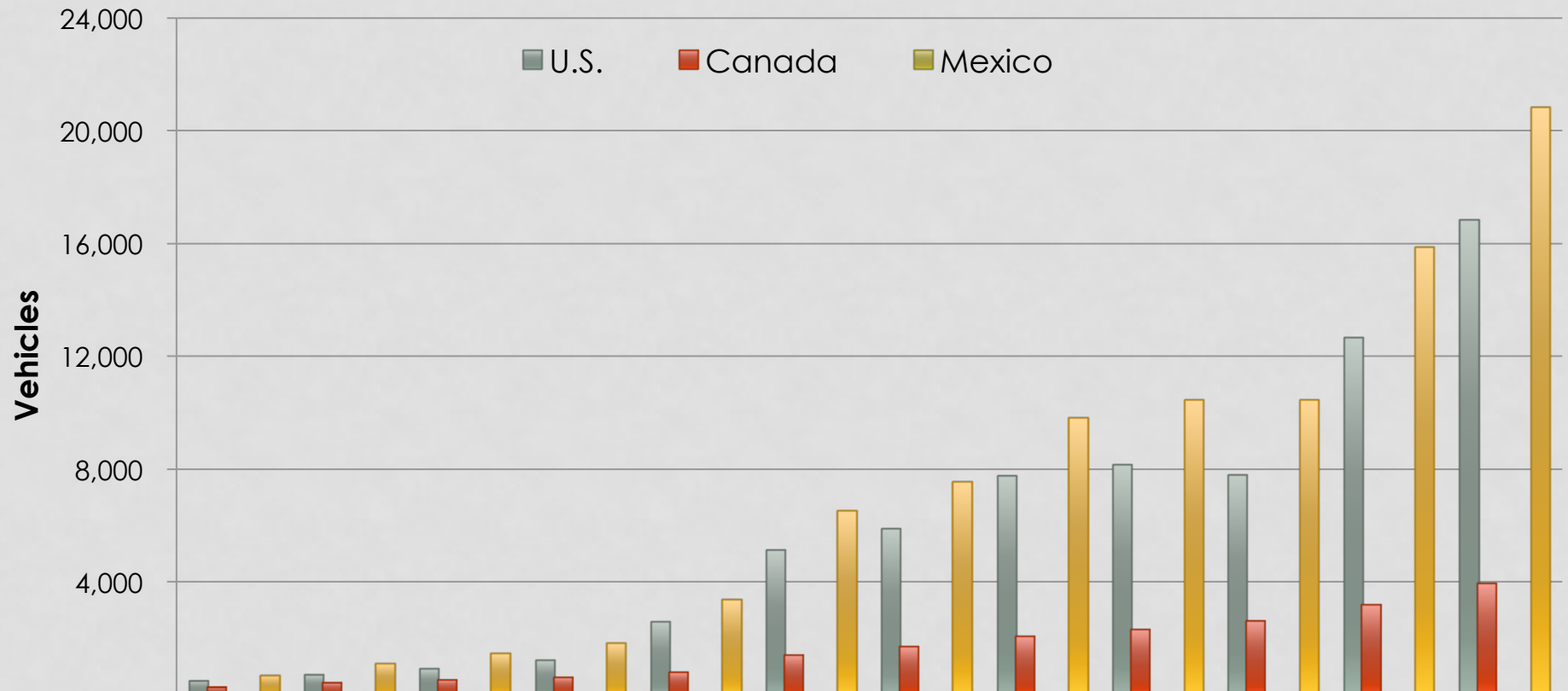
# CARSHARING STATISTICS FOR THE AMERICAS

as of July 2013

Almost 1.15 million members (excludes PVS/p2p members)



# CARSHARING VEHICLE GROWTH: AMERICAS



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
U.S.	455	696	907	1,192	2,561	5,104	5,840	7,722	8,120	7,776	12,634	16,811
Canada	231	397	521	599	779	1,388	1,667	2,046	2,285	2,605	3,143	3,910
Mexico											18	40
Brazil									12	18	58	46
Americas	686	1,093	1,428	1,791	3,340	6,492	7,507	9,768	10,417	10,399	15,853	20,807

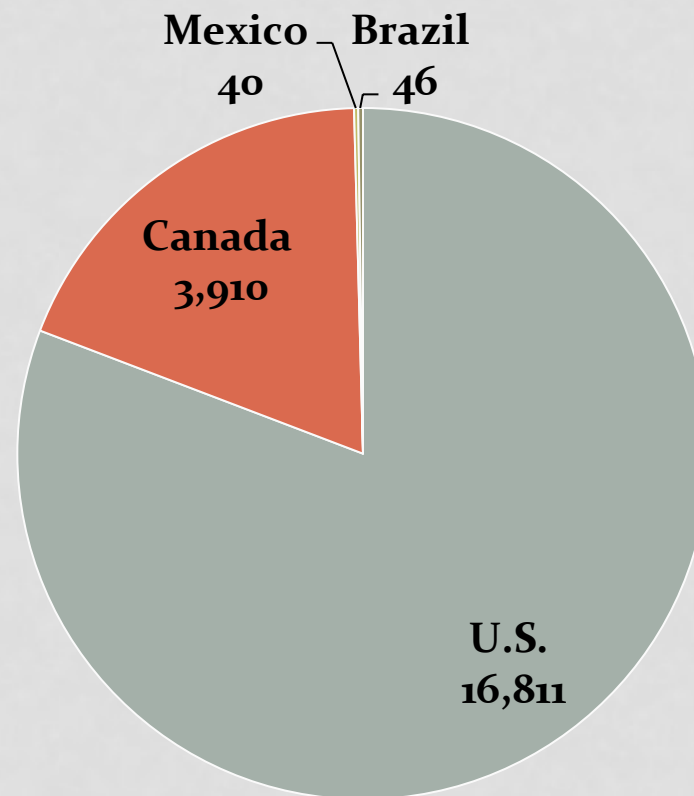
Shaheen, 2013



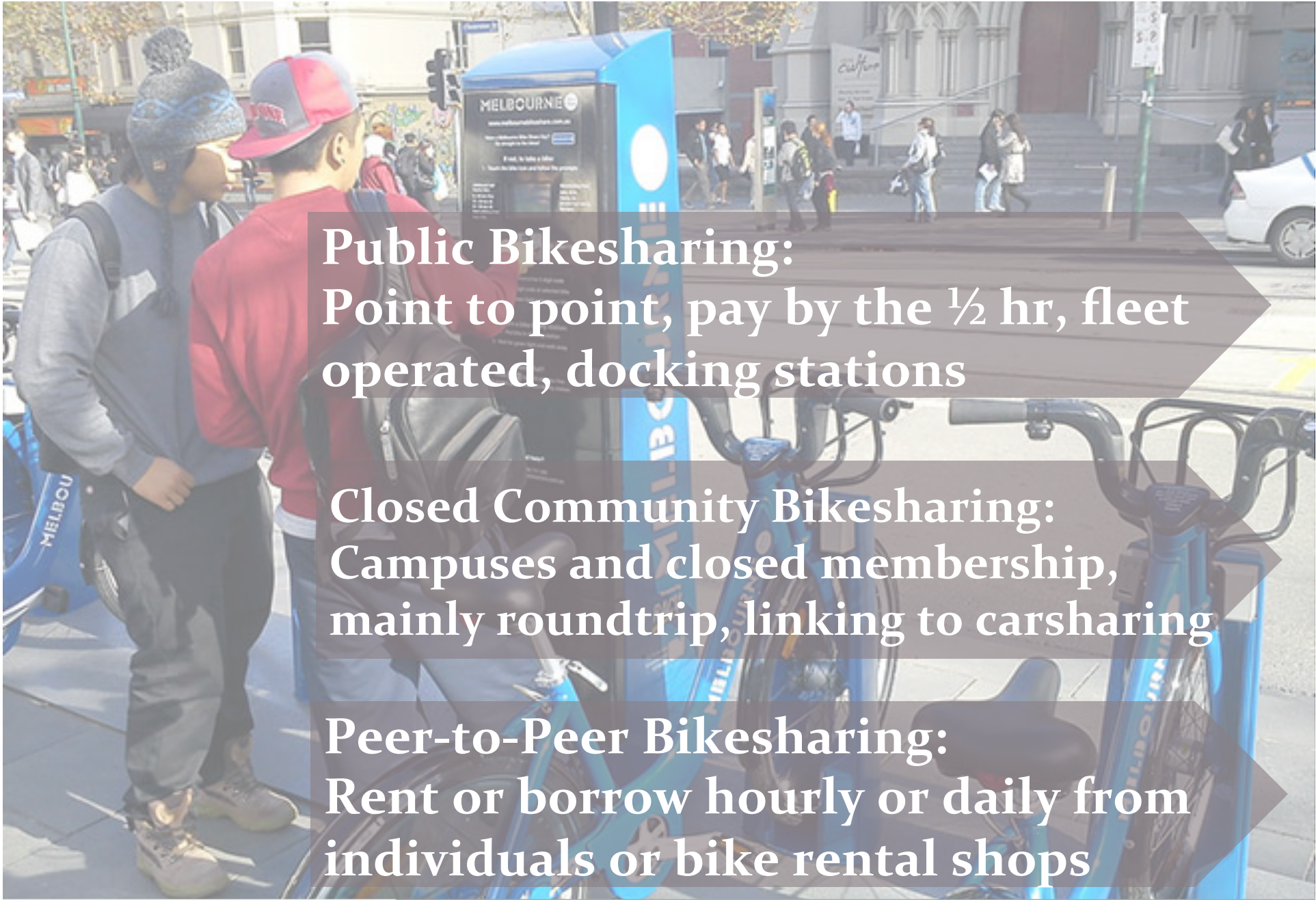
# CARSHARING STATISTICS FOR THE AMERICAS

as of July 2013

Over 20,800 vehicles (excludes PVS/p2p vehicles)



Shaheen, 2013



**Public Bikesharing:**  
Point to point, pay by the ½ 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

**Bikesharing**

Growing exponentially in urban centers

# WORLDWIDE & US BIKESHARING: March 2014

- 714 cities with IT-based operating systems
- 740,000 bikes
- 35,000 stations
- 10 new city programs since January 2014
- US: 41 cities with IT-based systems & 4 universities
  - 19,600 bikes
  - 2,000 stations

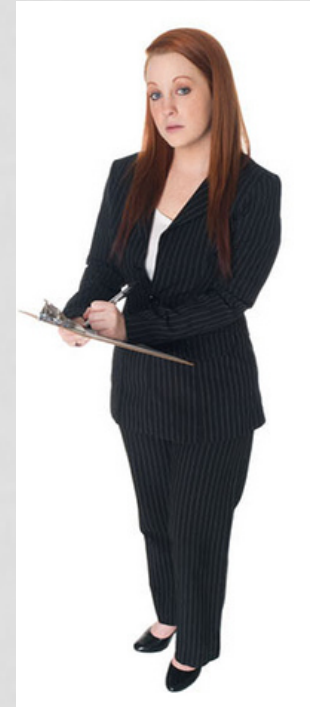
Source: Russell Meddin, 2014



# 2008 N. AMERICAN CARSHARING SURVEY

- Survey implemented from Sept. to Nov. 2008
- ~9,500 completed surveys; analysis based on 6,281 hhds
- Completion rate ~80%
- Online survey challenging
  - Took between 10 to 15 minutes for most respondents to complete

Martin, Shaheen, Lidicker, 2010



# PARTICIPATING ORGANIZATIONS



## American

- City CarShare
- CityWheels
- Community Car
- Community Carshare of Bellingham
- Igo
- PhillyCarShare
- Zipcar



## Canadian

- AutoShare
- Communauto
- Co-operative Auto Network
- VrtuCar
- Zipcar

# N.A. VEHICLE HOLDINGS: KEY FINDINGS

- Between 9 to 13 vehicles removed, including postponed purchase
- 4 to 6 vehicles/carsharing vehicle sold due to carsharing
- Most shift due to 1 car households becoming carless
- Second largest shift, 2 car households become 1 car households
- 25% sell a vehicle; 25% postpone purchase
- Net CO<sub>2</sub> reduction of 27% observed and 43% full impact (average)



# 2013 N. AMERICAN BIKESHARING STUDY

- 23 operator interviews in the US, Canada, & Mexico
- IT-based bikesharing program growth tracking (including planned programs)
- Surveys with members of 5 public bikesharing systems in Spring/Summer 2013
- 2013 operational data analysis from Nice Ride MN



# 2013 MEMBER SURVEY: DEMOGRAPHICS

Compared to general population bikesharing users tend to be...

- Wealthier
- More educated
- Younger
- Caucasian
- Male





# MEMBER SURVEY: 2013

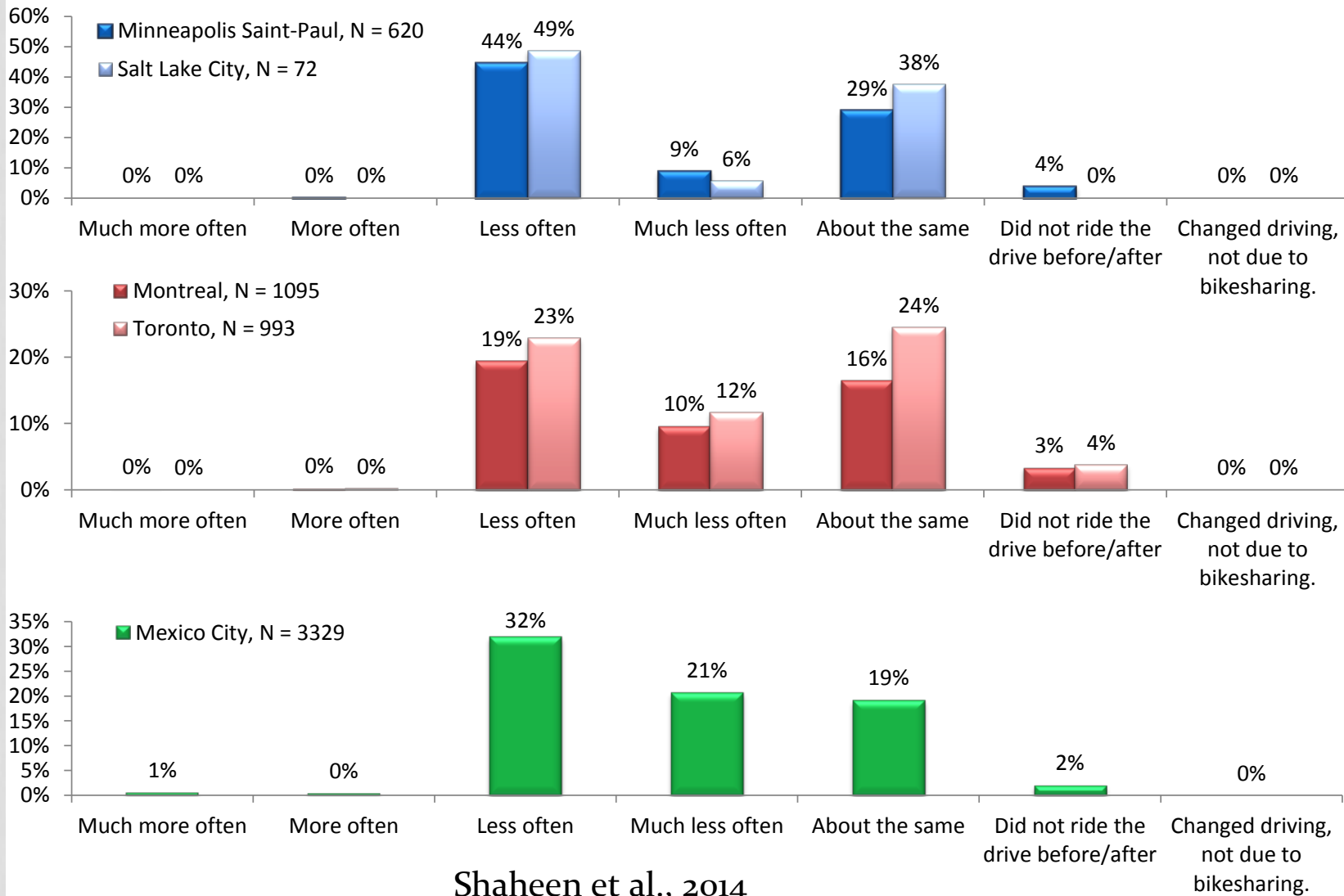


Operator	City	Responses	Members (annual/seasonal)	Bikes	Stations
BIXI Montreal	Montreal	1102	49217	5000	400
BIXI Toronto	Toronto	1015	4185	1000	400
Nice Ride Minnesota	Minneapolis- St Paul	630	3500	1325	145
GreenBIKE SLC	Salt Lake City	72	N/A	65	12
EcoBici	Mexico City	3349	70100	3530	261
Total		6168			

# CHANGE IN DRIVING

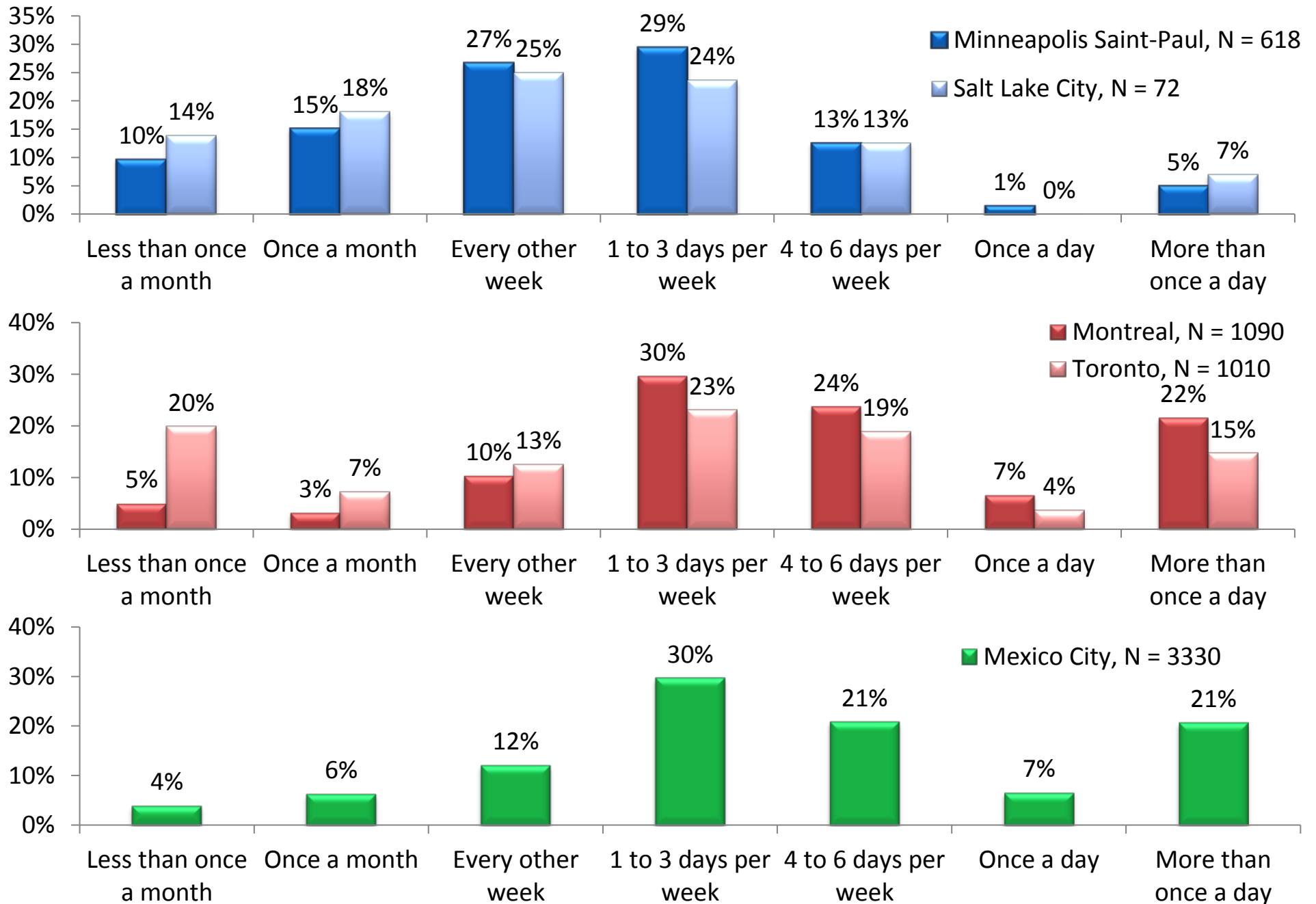


As a result of my use of bikesharing, I drive a personal vehicle (e.g., car, SUV, etc.) ...



Shaheen et al., 2014

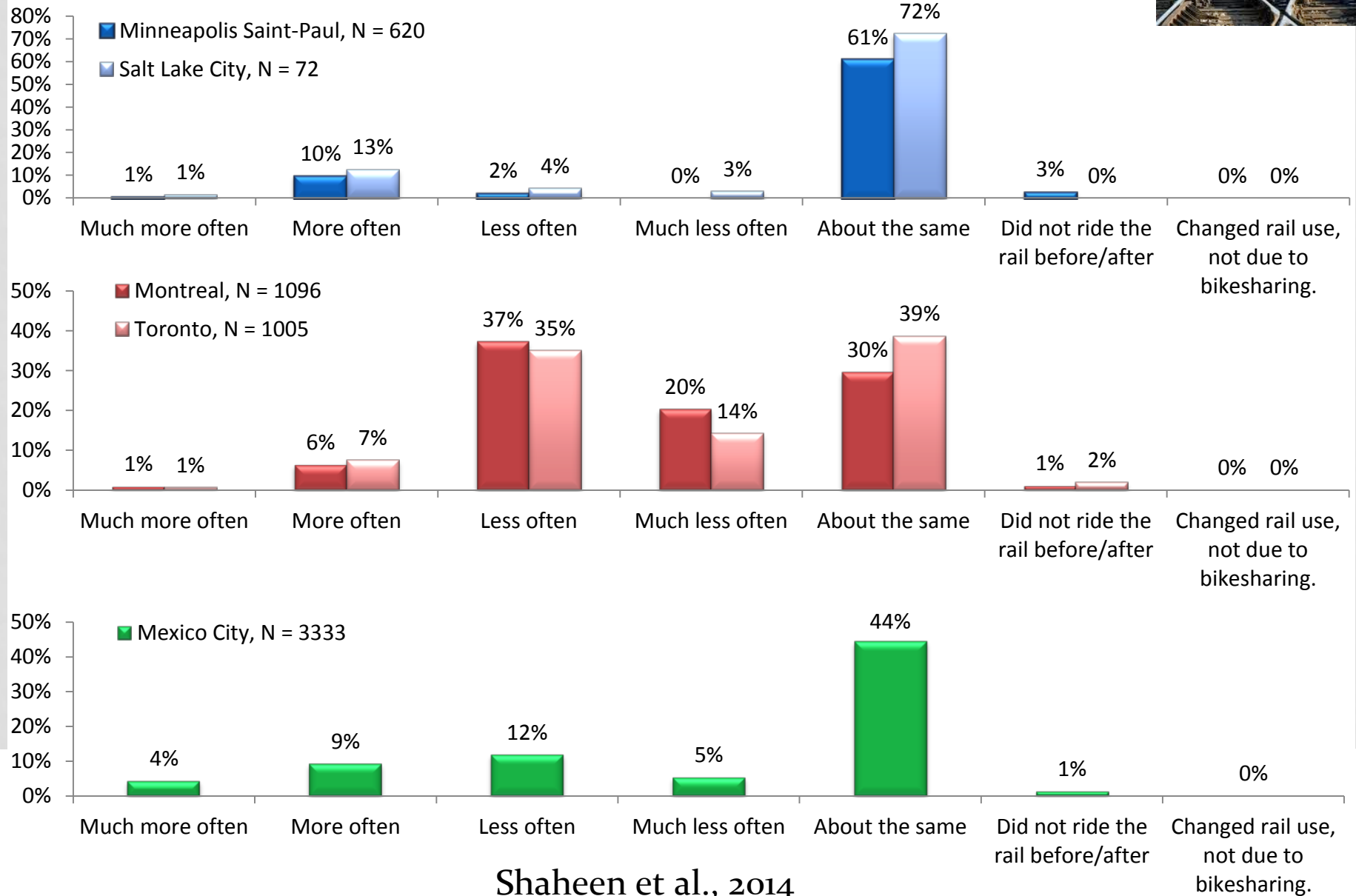
## Currently, how often do you check out a bikesharing bicycle?



# CHANGE IN URBAN RAIL



As a result of my use of bikesharing, I use urban rail...



Shaheen et al., 2014

***What is the primary reason that you are using the rail LESS because of bikesharing?***

<b>Response Categories</b>	<b>Montreal</b>	<b>Toronto</b>	<b>Minneapolis-Saint Paul</b>	<b>Salt Lake City</b>	<b>Mexico City</b>
Lower cost and faster travel	25%	48%	0%	0%	28%
Just lower cost	5%	9%	7%	0%	2%
Too many connections (not have to transfer)	3%	2%	7%	0%	6%
Just faster travel	14%	14%	14%	40%	12%
Improve travel time reliability	4%	7%	0%	60%	6%
Want to get exercise	31%	8%	50%	0%	17%
Public transit vehicle is crowded	6%	6%	0%	0%	18%
No space for my bike, which I use to connect	0%	0%	0%	0%	2%
I consider it safer to travel with bikesharing	1%	0%	7%	0%	2%
Not applicable	1%	2%	0%	0%	3%
Other, please specify:	8%	5%	14%	0%	3%
<b>Total N</b>	<b>631</b>	<b>491</b>	<b>14</b>	<b>5</b>	<b>577</b>

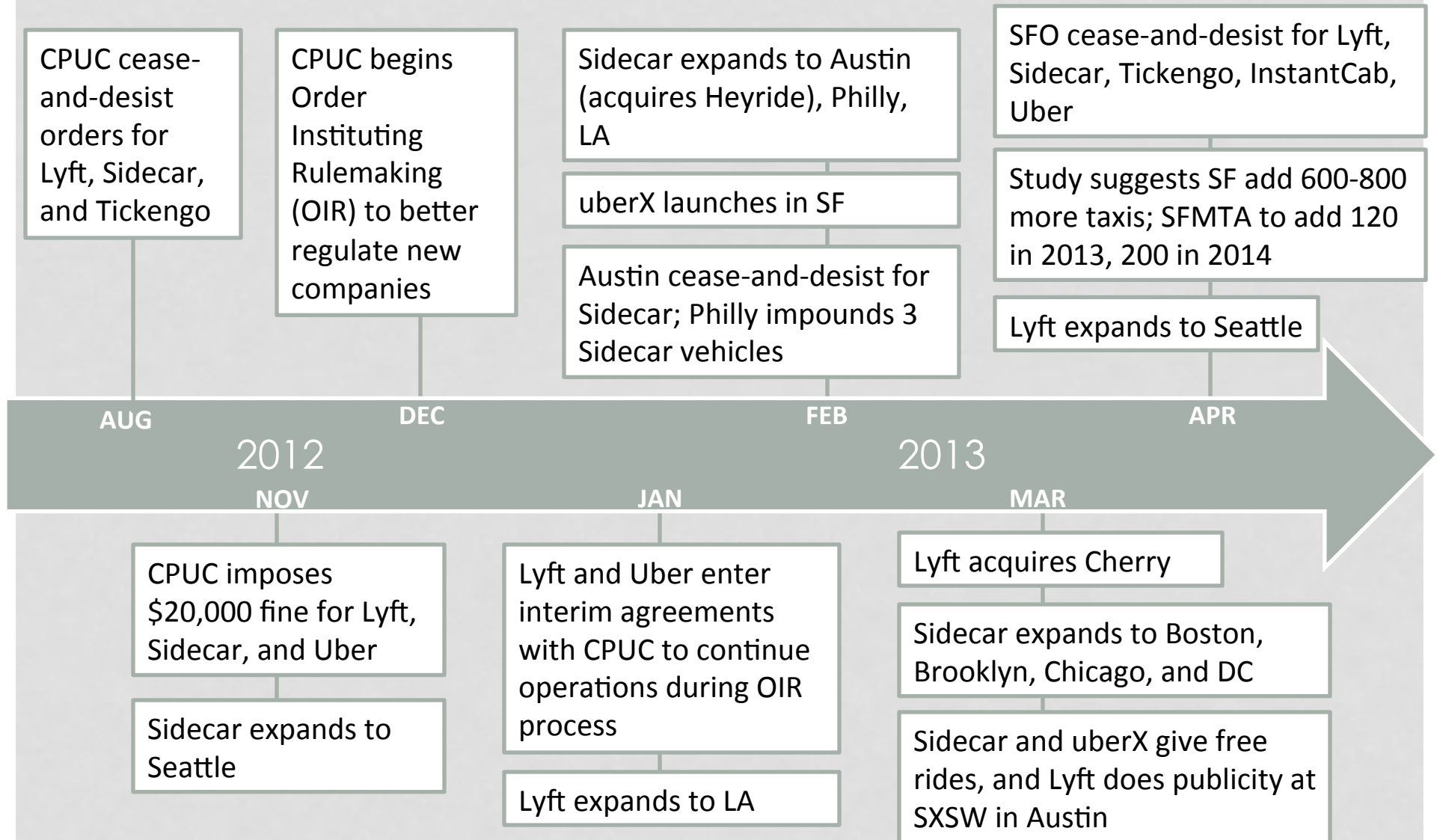


**Transportation Network Company:  
Prearranged trips, App to pay and  
connect passengers with drivers  
who use their personal vehicles**

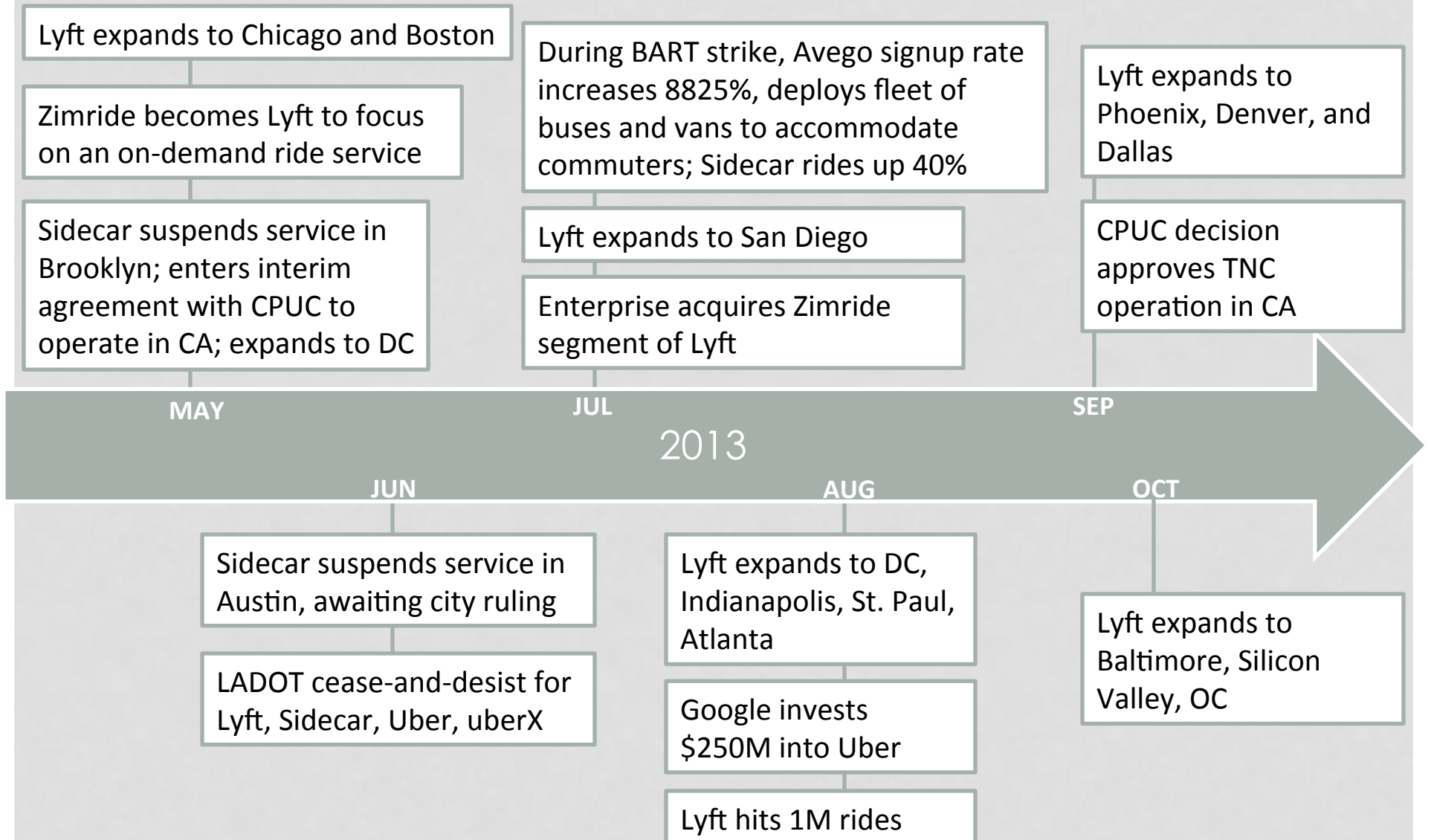
**Transportation Network  
Companies**

A new category of transportation  
services; need for study

# RECENT DEVELOPMENTS: TNCS



# RECENT DEVELOPMENTS: TNCS (CONT'D)







**Corporate Regional Shuttles:**  
Employer-funded regional transit, closed systems, limited stops

**Local Shuttles:**  
Employer or development agreement service, door-to-door, closed systems, workplace to transit hub

**Shuttle Services**

Growing system of local and regional shuttles

Privately-Owned Vehicles



Public Transit, Rail, Bus, Ferry



Regional & Intercity Services: Rail, High-Speed Rail, Air



Shared Mobility Services



Employer Shuttles, Jitneys, Commercial Deliveries



Taxi, Limousine & Transportation Network Companies

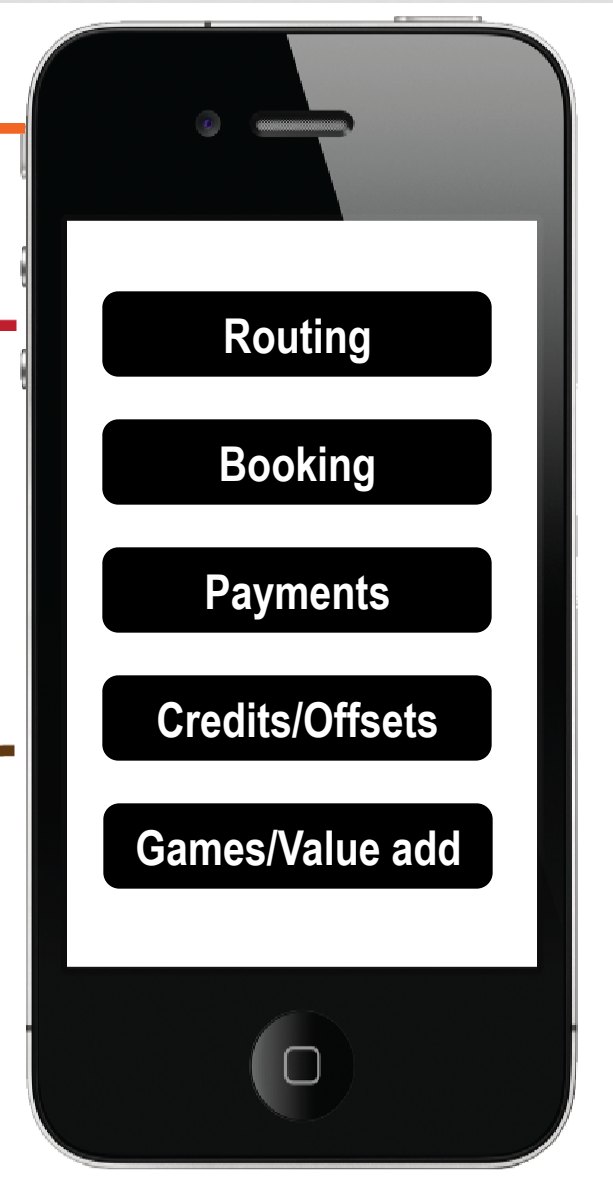
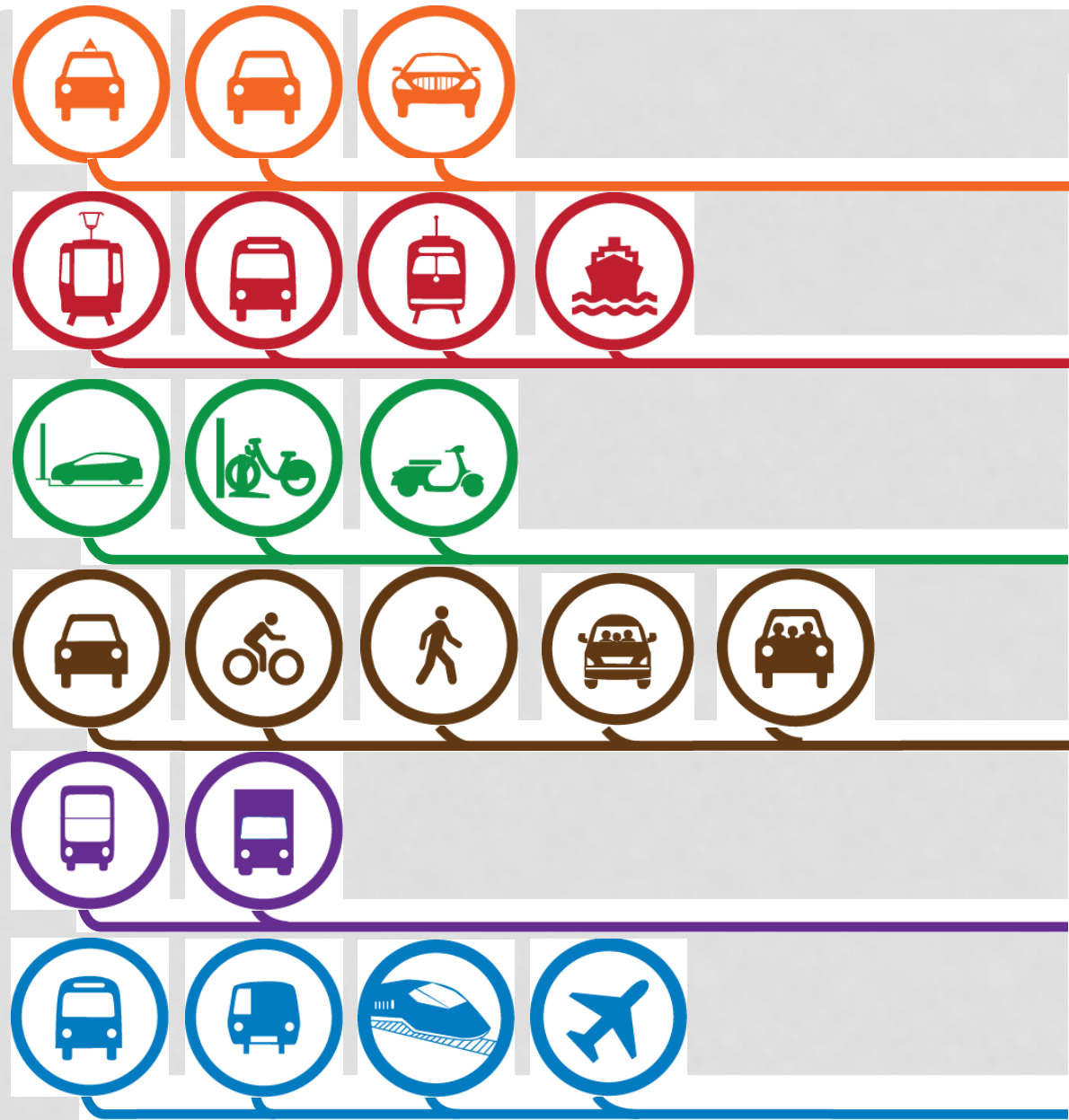


Timothy Papandreou, 2013

Transportation  
Today

Multiple modes, little or no integration

## User Experience



Timothy Papandreou, 2013

Mobility Mgmt.

What the user needs digitally



Timothy Papandreou, 2013

Shared Mobility  
Vision

What the user needs physically

# PRIMARY CHALLENGES TO MULTI-MODAL INTEGRATION

- Technology barriers
- Lack of integration with existing transportation systems
- Skepticism about multi-modality
- Age-dependent travel patterns
- Equity (banked vs. unbanked)
- Payments & profit sharing
- Others



# RECENT DEVELOPMENTS IN URBAN MOBILITY

## RideScout

- RideScout is an app that provides real-time on-demand information on available ride options—public, private, and social—that can get you from point A to point B.
- Included modes: bus, rail, taxi, car2Go, Sidecar, bikesharing, and others



## TransitScreen

- TransitScreen provides a live, real-time display of all transportation options at a specific location
- Includes rail, subway, bus, train, public bikesharing, and carsharing
- Available in 12 regions in the US



# DEVELOPMENTS IN URBAN MOBILITY

## IGO Carsharing & Chicago Transit Authority (CTA)

- In 2009, IGO and CTA launched the first card to bridge public transit & carsharing
- 20% of IGO users reported increase in public transit usage with new smartcard



## AutoCard - Bremen, Germany

- Integrated carsharing into the public transportation system via AutoCard
- Developed multi-modal nodes for smooth interchange called Mobil.punkt
- Around 11 cars removed from the street for every carsharing vehicle



# ACKNOWLEDGEMENTS



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- Sharon Feigon, Alternative Transportation for Chicagoland
- Russell Meddin, Philadelphia Bike Share





[www.tsrc.berkeley.edu](http://www.tsrc.berkeley.edu)