Trends and Trajectory of Shared Mobility

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AP020 Strategy Day
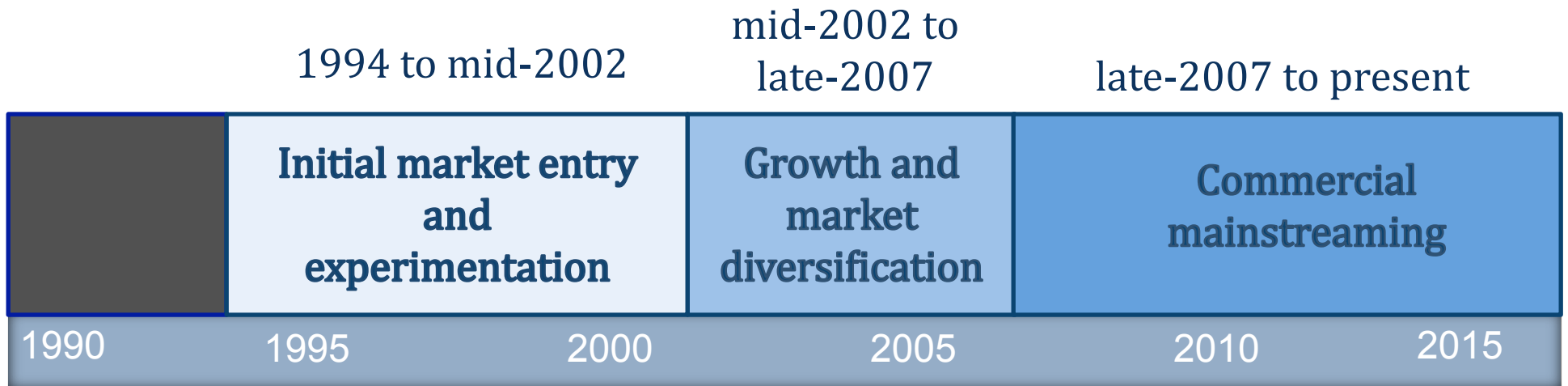July 19, 2013

Overview

- Carsharing
  - History
  - Worldwide and North America Growth
  - Personal Vehicle Sharing
  - Autonomous Vehicles

- Public Bikesharing
  - History
  - Worldwide and North American Growth
  - North American Operations

- Ridesharing / Ridematching
  - History and Current Status

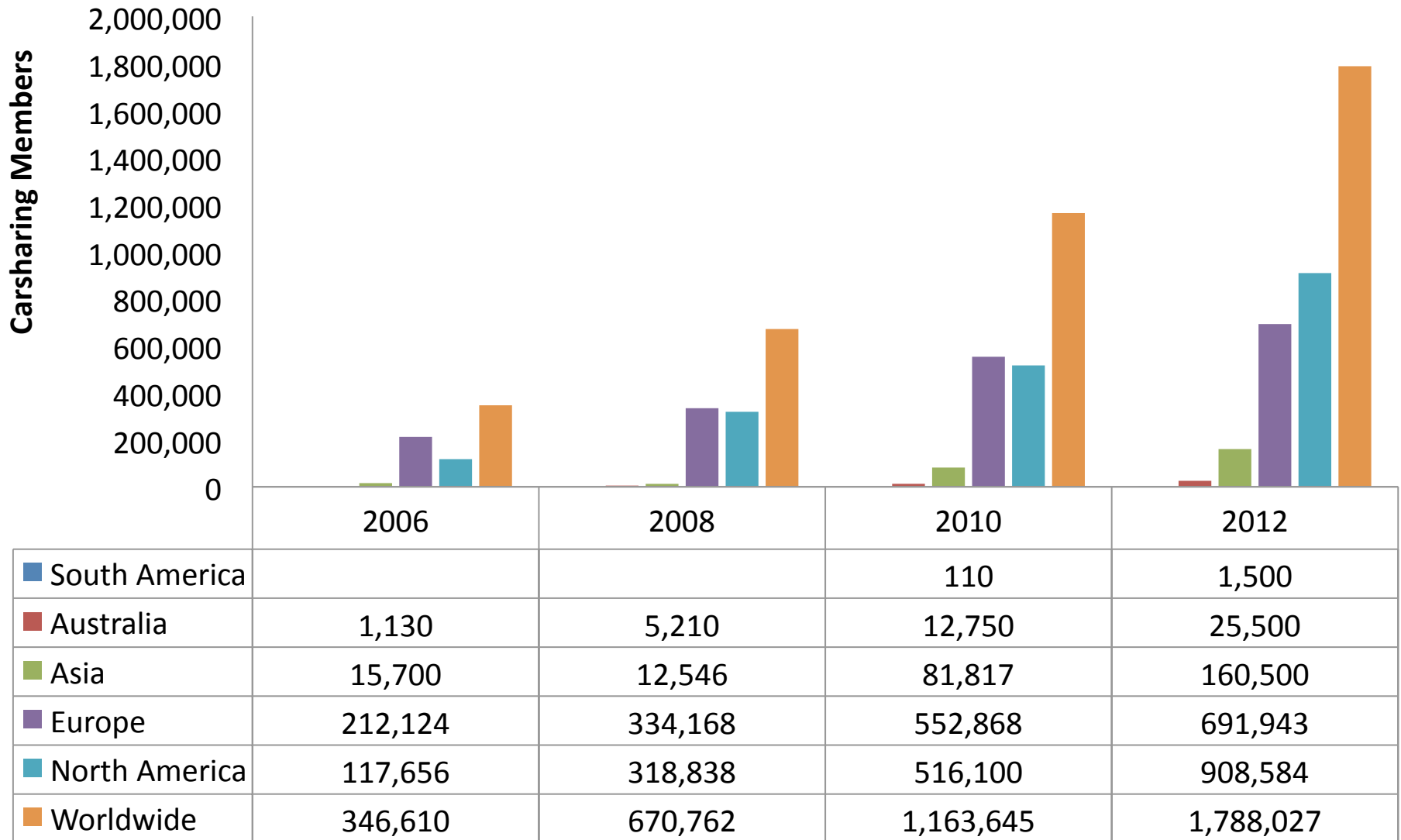**Transportation Sustainability** RESEARCH CENTER
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CARSHARING

Carsharing Phases in North America

1994 to mid-2002

mid-2002 to late-2007

late-2007 to present

	Initial market entry and experimentation	Growth and market diversification	Commercial mainstreaming
1990	1995 2000	2005	2010 2015

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Worldwide & Regional Membership (2006-2012)

Carsharing Members (y-axis): 0 – 2,000,000

	2006	2008	2010	2012
■ South America			110	1,500
■ Australia	1,130	5,210	12,750	25,500
■ Asia	15,700	12,546	81,817	160,500
■ Europe	212,124	334,168	552,868	691,943
■ North America	117,656	318,838	516,100	908,584
■ Worldwide	346,610	670,762	1,163,645	1,788,027

Worldwide & Regional Fleets (2006-2012)
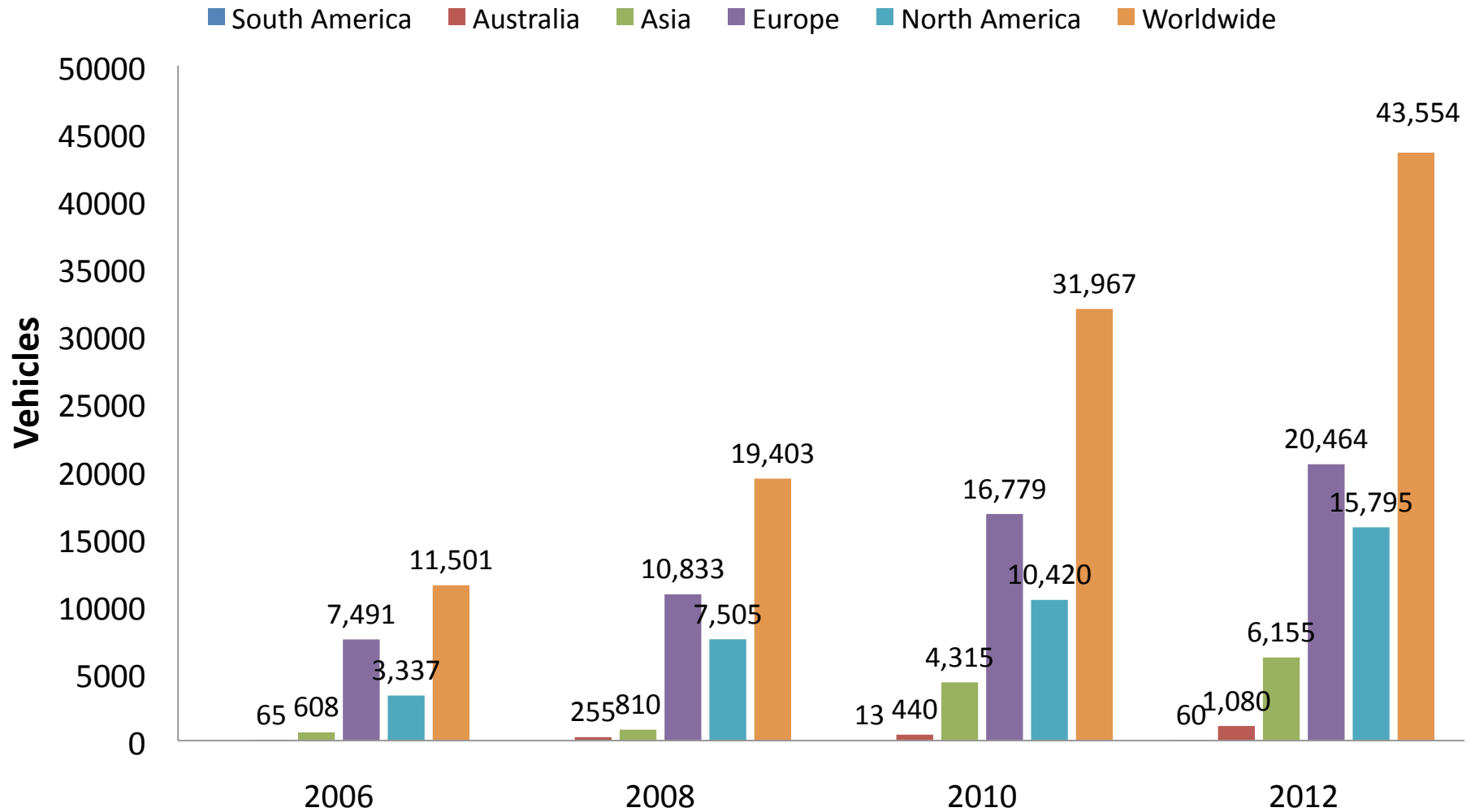
Legend: South America, Australia, Asia, Europe, North America, Worldwide

Y-axis: Vehicles (0 to 50000)

2006: 65, 608, 7,491, 3,337, 11,501
2008: 255, 810, 10,833, 7,505, 19,403
2010: 13, 440, 4,315, 16,779, 10,420, 31,967
2012: 60, 1,080, 6,155, 20,464, 15,795, 43,554

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2012 Worldwide Census

	Members	Vehicles	Ratio
Asia	160,500	6,155	26.1
Australia	25,500	1,080	23.6
Europe	691,943	20,464	33.8
North America	908,584	15,795	57.5
South America	1,500	60	25.0
Worldwide	1,788,027	43,554	41.1

North American Member Growth
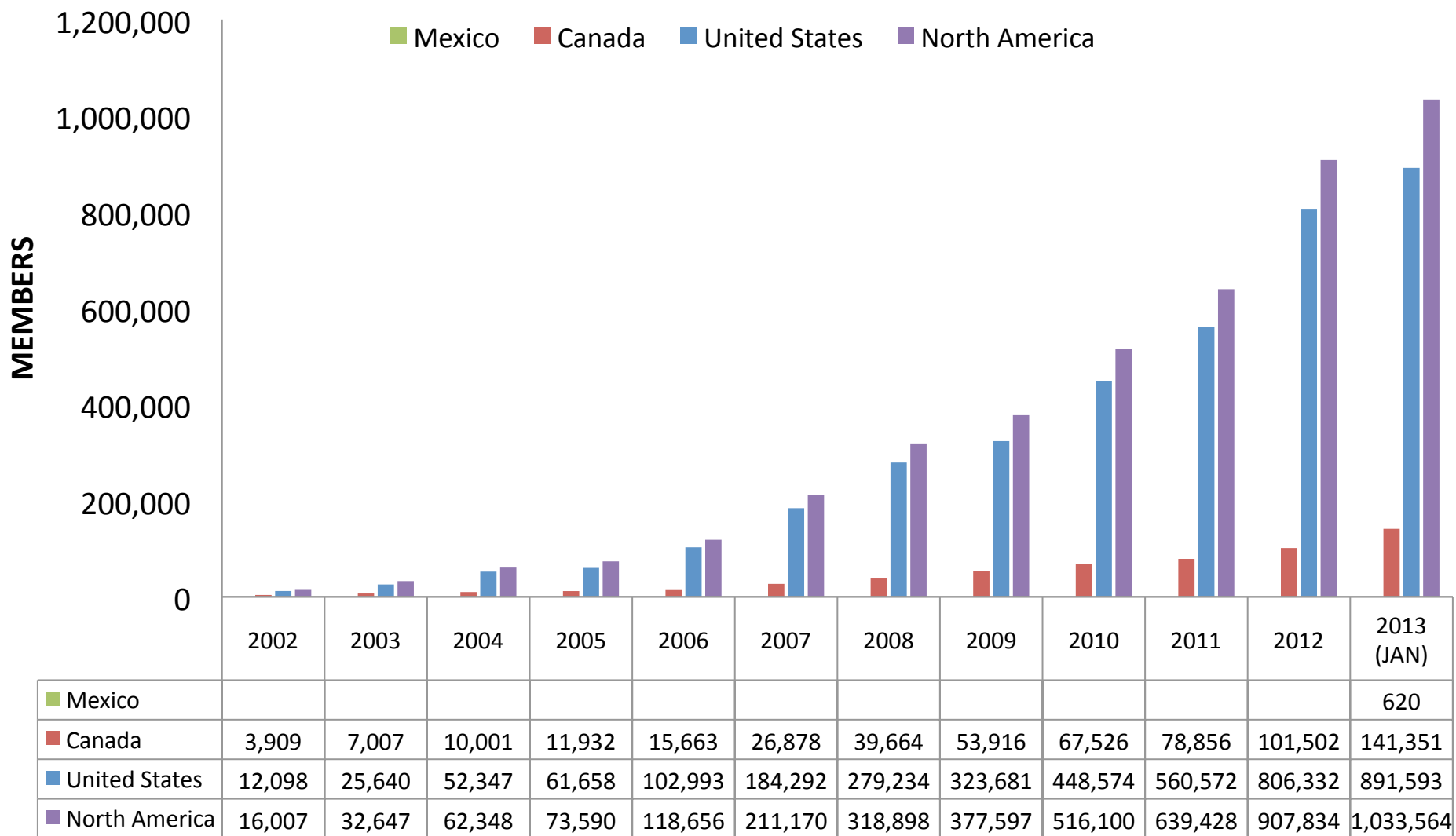
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013 (JAN)
■ Mexico												620
■ Canada	3,909	7,007	10,001	11,932	15,663	26,878	39,664	53,916	67,526	78,856	101,502	141,351
■ United States	12,098	25,640	52,347	61,658	102,993	184,292	279,234	323,681	448,574	560,572	806,332	891,593
■ North America	16,007	32,647	62,348	73,590	118,656	211,170	318,898	377,597	516,100	639,428	907,834	1,033,564

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North American Vehicle Growth
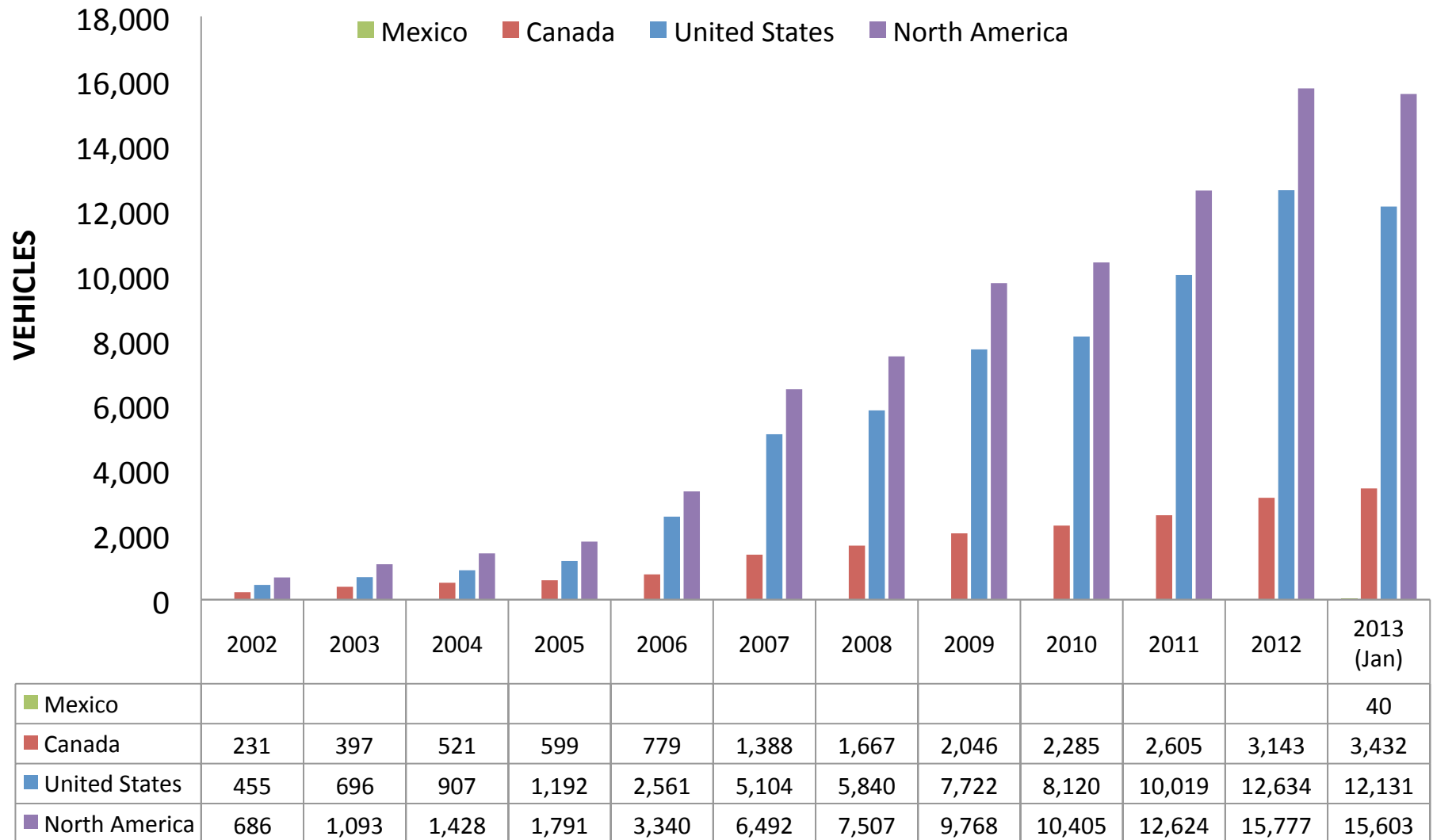
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013 (Jan)
■ Mexico												40
■ Canada	231	397	521	599	779	1,388	1,667	2,046	2,285	2,605	3,143	3,432
■ United States	455	696	907	1,192	2,561	5,104	5,840	7,722	8,120	10,019	12,634	12,131
■ North America	686	1,093	1,428	1,791	3,340	6,492	7,507	9,768	10,405	12,624	15,777	15,603

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North American Vehicle Holdings: Key Findings

- Between 9 to 13 vehicles removed, including postponed purchase

- 4 to 6 vehicles/carsharing vehicle sold due to carsharing

- Largest shift: 1-car households becoming carless

- Second largest shift: 2-car households become 1-car households

- 25% sell a vehicle

- 25% postpone vehicle purchase

Source: Martin, Shaheen, Lidicker, 2010

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Carsharing Trends & Developments

- Continued membership growth

- Mergers and acquisitions

- Continued growth/expansion of multi-national operators, traditional car rental providers, automaker sponsored programs

- Notable developments in classic carsharing, one-way carsharing, and personal vehicle sharing
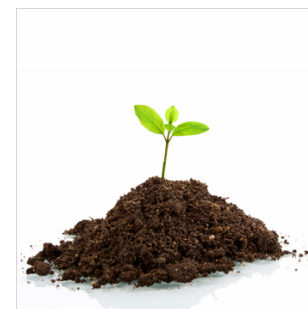
Personal Vehicle Sharing

Short-term access to privately-owned vehicles

➢ Personal vehicle sharing (PVS) models first seen in North America in 2001, eGOCarShare, RentMyCar

➢ Continues to increase in popularity

➢ North American PVS Operators (as of July 2013):
  ➢ 9 operating (8 fully-active, 1 in pilot phase)
  ➢ 3 planned
  ➢ 8 defunct

➢ 37 worldwide
  ➢ 32 fully active
  ➢ 5 in pilot phase
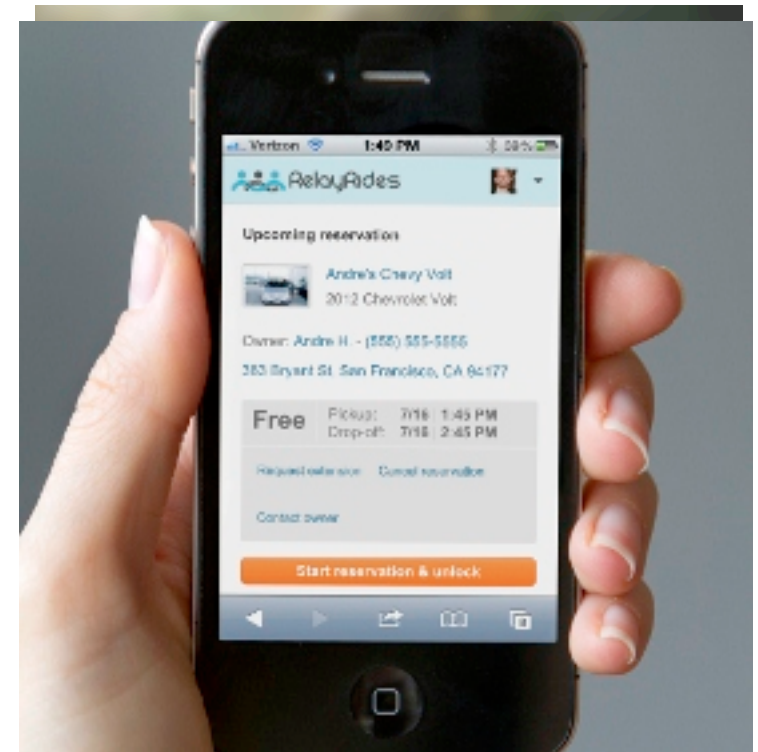
4 Types of Personal Vehicle Sharing

Fractional Ownership

- Individuals sub-lease or subscribe to vehicle owned by a third party

Hybrid P2P-Traditional Carsharing Model

- Individuals access vehicles by joining an organization that maintains its own fleet of vehicles, but also includes private autos, throughout a network of locations

P2P Carsharing

- Employs privately-owned vehicles made temporarily available for shared use by individual or members of P2P company

P2P Marketplace

- Enables direct exchanges between individuals via Internet

Autonomous Vehicles

- Carsharing/Autonomous Vehicle Synergies
  - Platform for introducing autonomous vehicle technologies, building consumer demand/appeal/confidence (e.g., BMW's DriveNow electric vehicles)
  - Autonomous vehicle sharing potentially new model for carsharing companies (e.g., taxi-like services)
  - P2P autonomous vehicle sharing potentially lowers ownership costs of expensive, technologically-advanced vehicles
  - Self-charging (EVs), parking assist, and driver assist (e.g., carsharing in retirement communities)

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GoGet - Australia

- Testing a base Yaris with sensors (3 radar, camera)
- Collecting data to model "real" human behavior and usage scenarios (trip data)
- Research partner: University of New South Wales
- Understand possible usage patterns and demand in the longer term and how to best optimize the vehicle in carsharing
- Start with partially autonomous vehicle (human in control)
- Goal: First fleet buyer in Australia of fully autonomous vehicles (5 years)

goget

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PUBLIC BIKESHARING

Bikesharing Generations

- 1st Generation: Free Bikes ("White Bikes")
  - Demonstration and provided increased mobility
- 2nd Generation: Coin-Deposit Systems
  - Emerged from a need to deter theft and incentivize return.
- 3rd Generation: Information Technology (IT) System
  - Provides real-time information; employs technology to assist in rebalancing demand
- 4th Generation: Demand-Responsive, Multi-Modal Systems
  - Mobile docking stations; smartcard integration with public transit; bike redistribution innovations; GPS tracking, touchscreen kiosks, and electric bikes

Worldwide Numbers: April 2013

- 539 cities with operating systems

- 462,880 bikes

- 22,750 stations

Source: Russell Meddin, 2013

U.S. Numbers: January 2013

- Data collection on-going; preliminary estimates:

- 884,442 Total Users (41,695 long-term users / 842,747 short-term users)

- 7,549 Bicycles / 800 Stations / 12,955 Docking Points

- Dock-to-bike ratio: 1.72

- Percentage Short-Term Users: 95.3%

Source: Shaheen and Cohen, 2013

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North American Program Launches (2007- May 2013)

					Bike Chattanooga	
			Capital Bikeshare		Charlotte B-Cycle	
			Chicago B-cycle		DecoBike Long Beach	
			EcoBici		Houston B-cycle	
			Denver B-cycle		Kansas City B-Cycle	
	Bikala		Des Moines B-cycle		Nashville B-Cycle	
	SmartBike D.C.		Nice Ride MN		Spokies	
2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Tulsa Townies		BIXI Montreal		BIXI Toronto		Anaheim Bike Nation
				Boulder B-cycle		Citi Bike
				Broward B-cycle		Fort Worth B-Cycle
				Capital BIXI		Greenville B-Cycle
				DecoBike Miami		SLC Bike Share
				Golden Community Bike Share		
				Hawaii B-cycle		
				Madison B-cycle		
				Hubway		
				Omaha B-cycle		
				San Antonio B-cycle		
				Spartanburg B-cycle		

Source: Shaheen and Cohen, 2013

Business Models

Business Model	Definition	Example
Non-Profit	• Goal of covering operational costs and expanding service • Start-up and operational funding typically are supported by grants, sponsorships, and loans	Denver B-cycle Denver, CO (Operational)
Privately Owned and Operated	• Owned and operated by a private entity • Operator provides all funding for equipment and operations • May have limited contractual agreement with public entities for rights-of-way	DecoBike Miami, FL (Operational)
Publicly Owned and Operated	• Owned and operated by a public agency or local government • Agency subsidizes bikesharing with system revenue	Golden Community Bike Share Golden, BC (Suspended)
Publicly Owned/ Contractor Operated	• Owned by a public agency or local government, responsible for funding and administering the system • Operations are contracted to a private operator	Capital Bikeshare Washington, D.C. (Operational)
Street Furniture Contract	• Operator permitted to operate in a jurisdiction in exchange for advertising rights, generally with street furniture • System funded through advertising revenue	SmartBike D.C. Washington, D.C. (Defunct)
Third-Party Operated	• Operated in partnership with local businesses in exchange for a percentage of the profit • Hybrid operation scheme that can be paired with other business model	Chicago B-cycle Chicago, IL (Defunct)
Vendor Operated	• Operated by the same company that designs and/or manufactures the system equipment (the vendor)	Bike Nation Anaheim Anaheim, CA (Operational)

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Current Bikesharing Innovations

- Integration of bikesharing with transit data
- Helmet dispensing options
- Dockless IT-based bikesharing
- Program reciprocity allowing visiting usage

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RIDESHARING / RIDEMATCHING

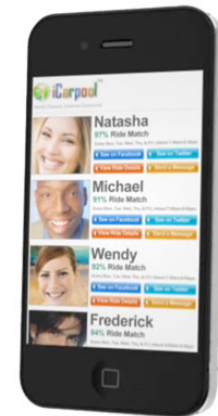# Phases of North American Ridesharing

| World War II car-sharing clubs | Major responses to energy crises | Early organized ridesharing schemes | Reliable Ridesharing Schemes | Technology-enabled ridematching |

When you ride ALONE you ride with Hitler!

Join a Car-Sharing Club TODAY!

STANDARD

IS YOUR NUMBER EVEN TODAY

CARPOOLS ONLY
2 OR MORE PERSONS PER VEHICLE

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Real-Time Ridematching Services

- Match drivers and passengers through a smartphone app just minutes before the trip is to take place

- Typically short, in-city trips

- Cashless payment through app, credit card on file

- Participants use rating system

- Differ from dispatch or e-hail models that do not require a destination

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