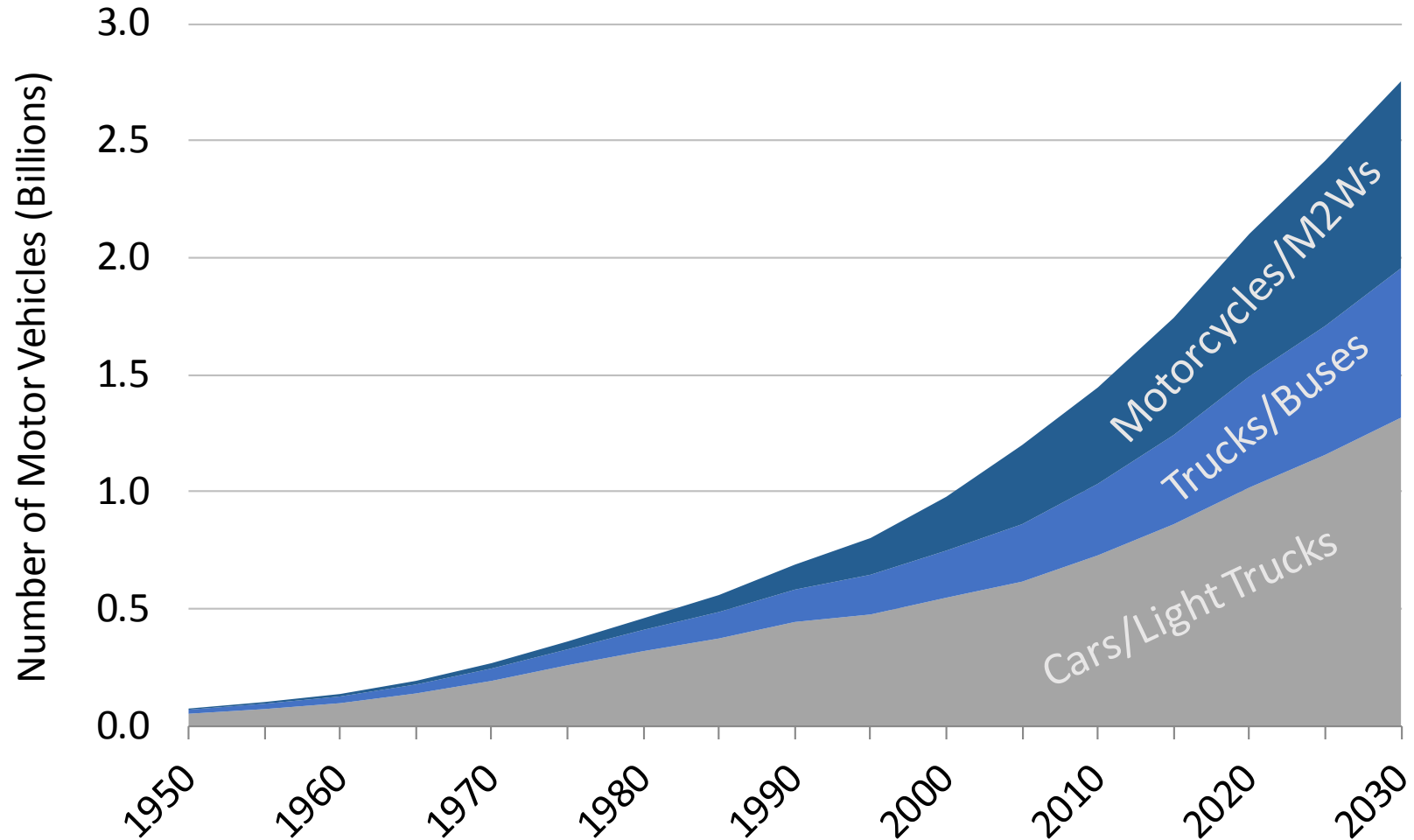


The Future of Travel Demand

Susan Handy

Presentation given at the USC Sol Price School of Public Policy
September 16, 2015

Soaring Global Demand for Vehicles



Why worry about this?

Transportation accounts
for $\frac{2}{3}$ of oil in US and
 $\frac{1}{2}$ in world



Transportation accounts
for $\frac{1}{4}$ of CO₂ emissions in
world



Why worry about this?



Pollution



Resiliency



Congestion



Equity



Sprawl



Safety

What to do about it?

Reduce the impact of driving



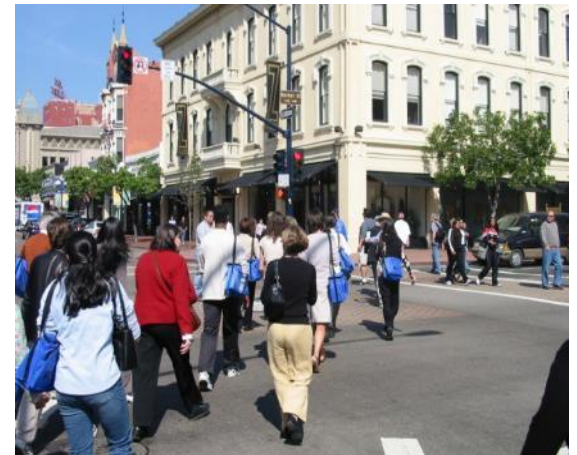
Vehicle and fuel technology



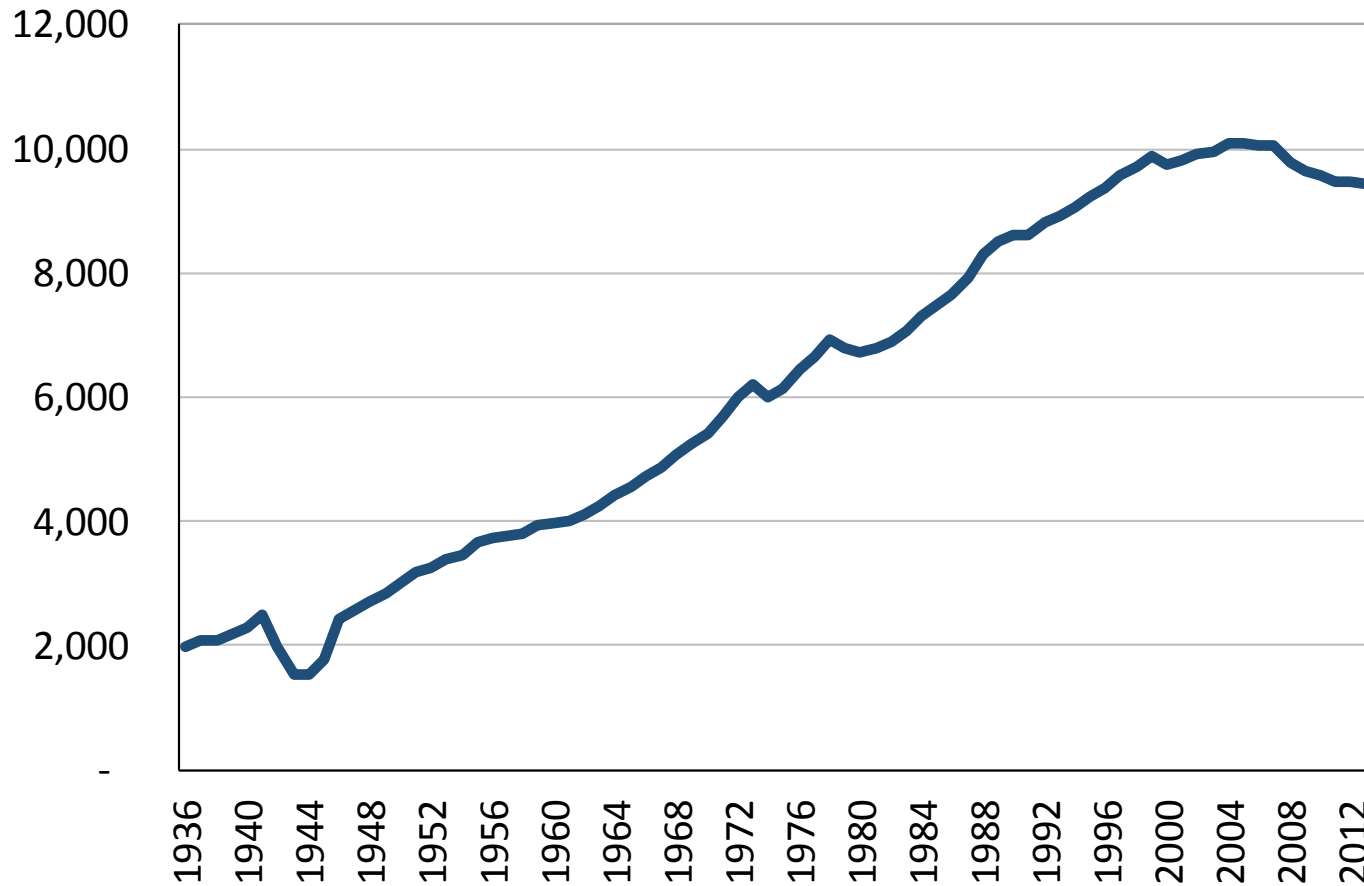
Infrastructure design



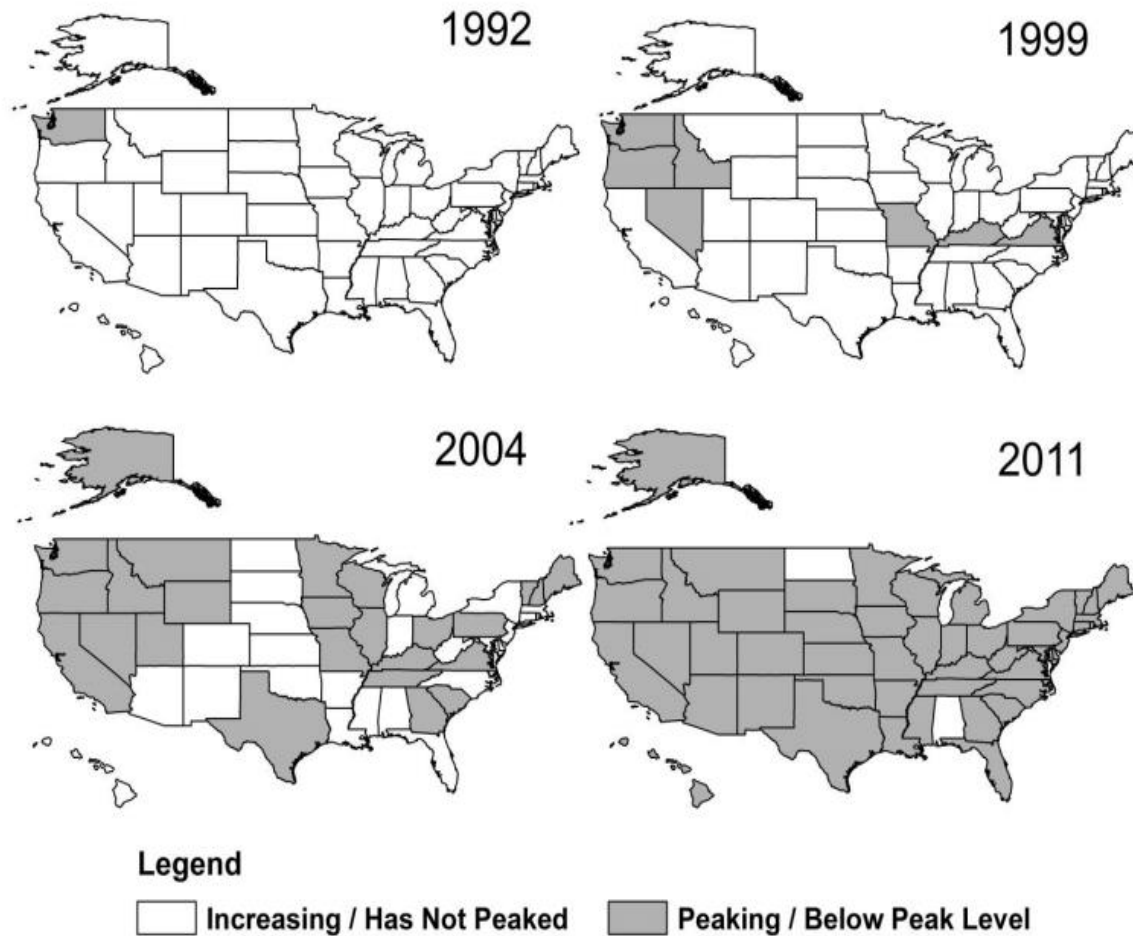
AND
get people
to do
something
other than
drive...



Annual VMT per Capita in U.S.

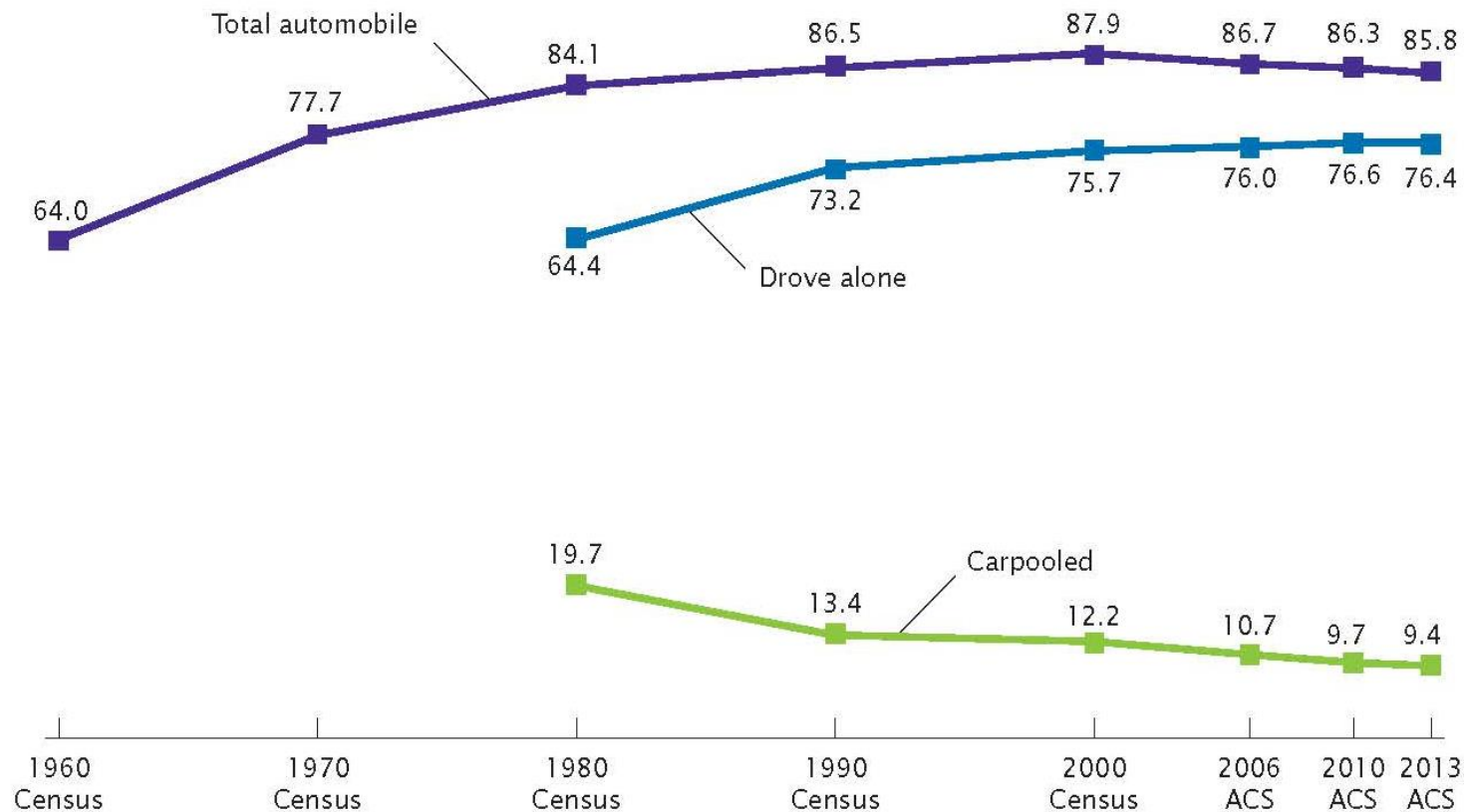


Peak in VMT per capita by state



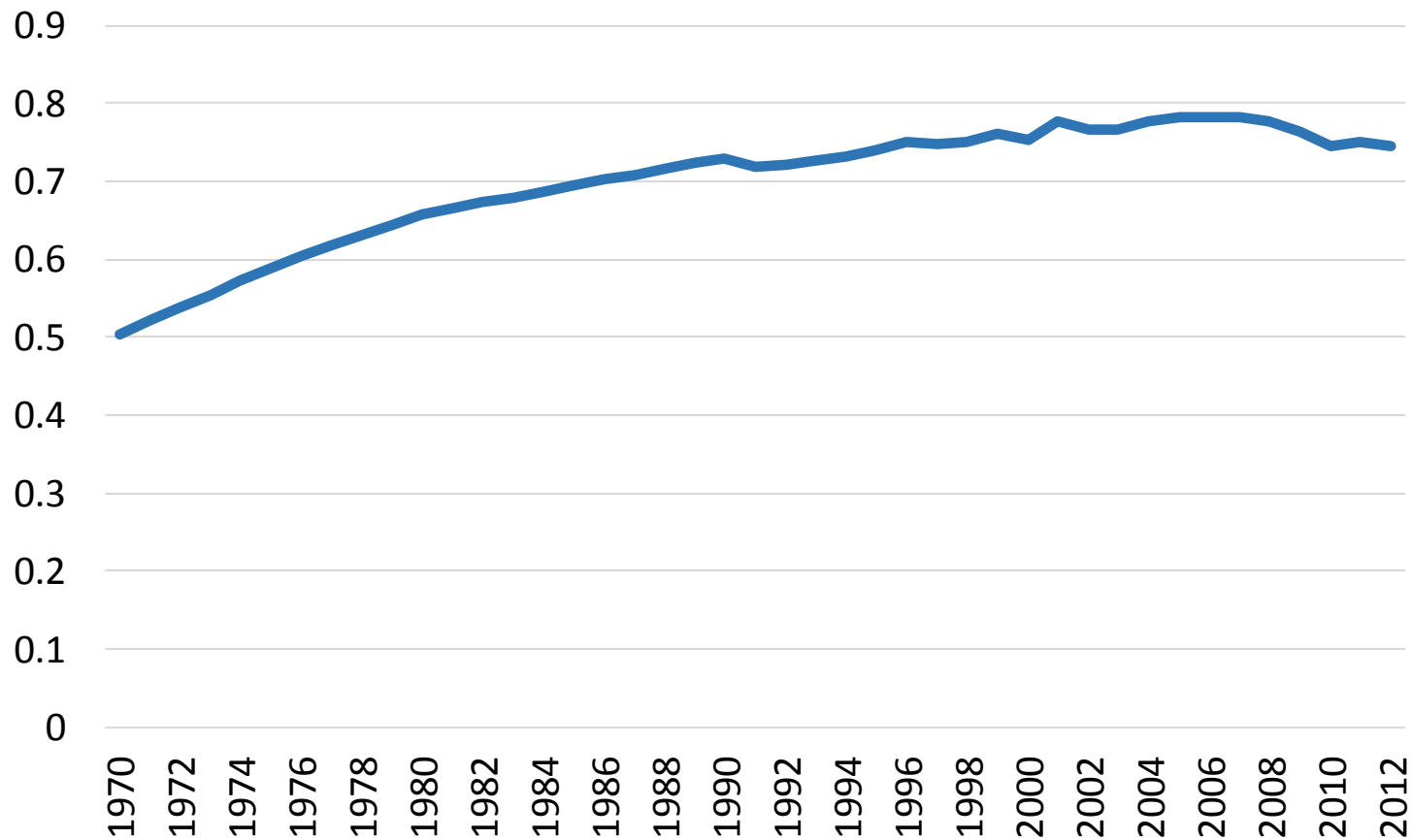
Map Created by T.J. Garceau, 2014. Base map layer from Esri.

Commuting by car



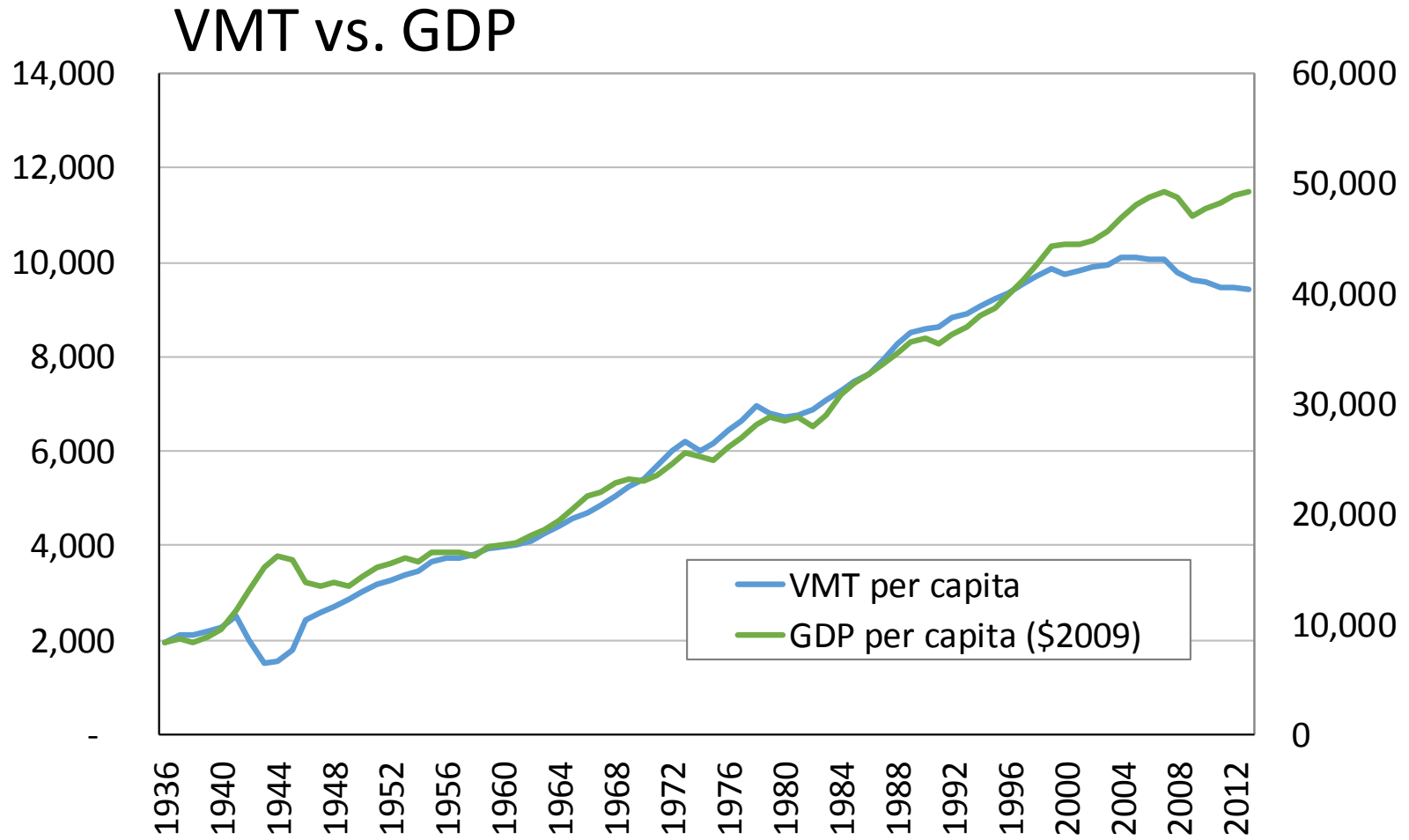
Sources: U.S. Census Bureau, 1960, 1970, 1980, 1990, 2000 Census; 2006, 2010, 2013 American Community Survey.

Registered vehicles per capita



Why?
Will it last?

It's the economy, right?



Or other factors?

- Income
- Fuel prices
- Traffic congestion
- Aging population
- Regional migration
- Back-to-the city
- Smartphones
- Others



Another way to look at it...



How do we as individuals
and households make
choices about travel?

How and why are these
choices changing?

Nested choices

Long-term Choices

Lifestyle
Residential
Location

Mid-term Choices

Driver's license
Auto ownership

Short-term Choices

Trip frequency
Trip destination
Mode choice

Choice process

Set of
choices
available



Qualities of
choices
available



Value placed
on different
qualities

Drive alone
Shared ride
Bus
Rail
Bicycle
Walk
Skateboard

Cost
Time
Comfort
Safety

Cost
vs.
Time
vs.
Comfort
vs.
Safety

Knowledge, perceptions

*Needs,
Constraints*

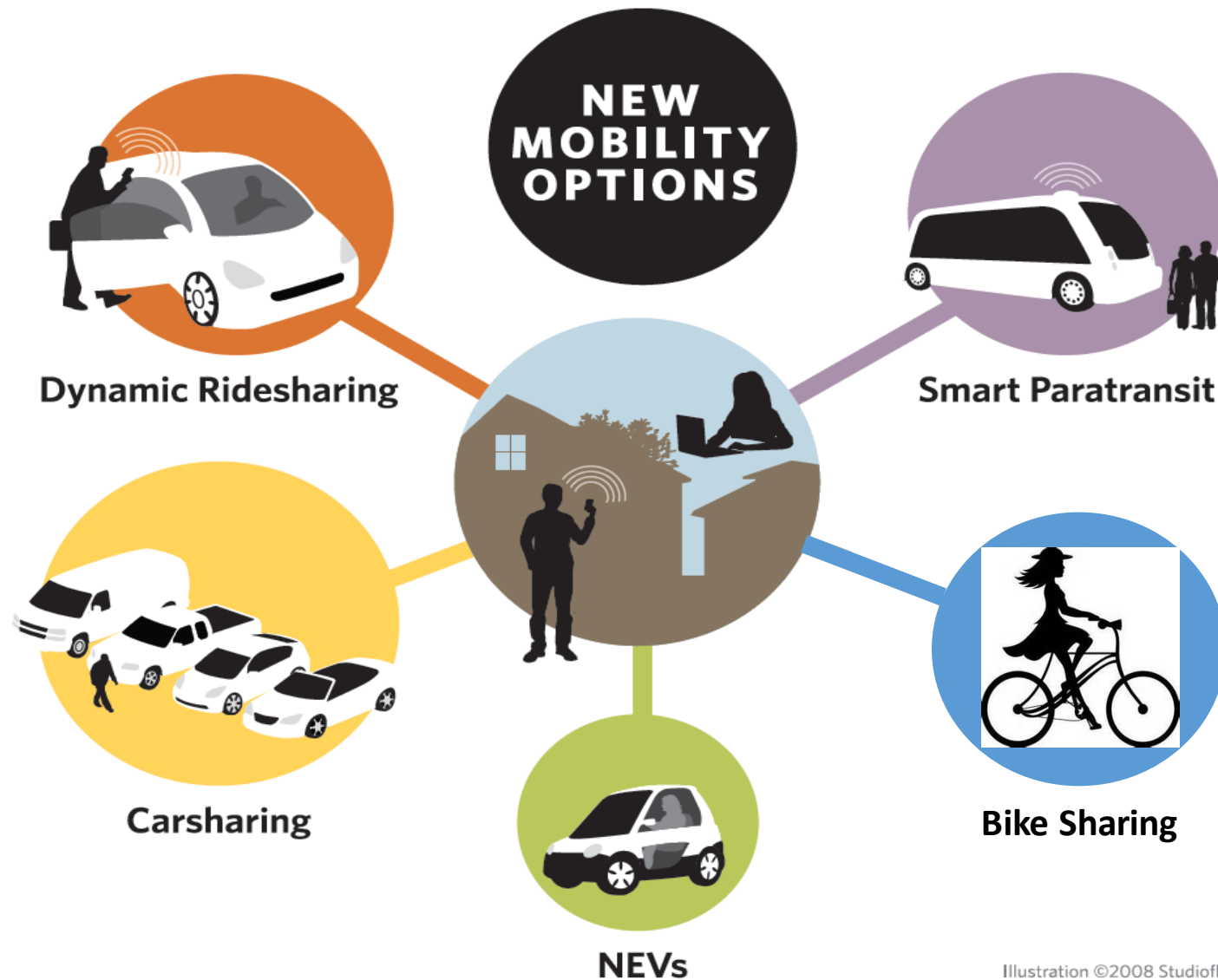
Changes in all cells

	Choice Sets	Choice Qualities	Value of Qualities
Long-term Choices	▲	▲	▲
Mid-term Choices	▲	▲	▲
Short-term Choices	▲	▲	▲

Changes in all cells

	Choice Sets	Choice Qualities	Value of Qualities
Long-term Choices	▲	▲	▲
Mid-term Choices	▲	▲	▲
Short-term Choices	▲	▲	▲

Expanding Traveler Choice



Bike sharing

45 operations in the U.S. as of Jan 2015



Transit complement or substitute?

Equity of access?

Micro-transit on demand

e.g Bridj, Chariot, Leap



Competing with public transit?
Getting people out of their cars?

Car access without ownership

Car-sharing – Transportation Network Companies



Owners getting rid of cars?

Non-owners driving when they otherwise wouldn't?

Car access without ownership

Ride-sharing – Transportation Network Companies



PHOTO: PAUL J. RICHARDS/AFP/GETTY



Sequential sharing – one at a time?

Concurrent rides – shared rides?

Going Driverless



Individually owned cars?
Shared cars individually used?
Shared cars with shared rides?

Changes in all cells

	Choice Sets	Choice Qualities	Value of Qualities
Long-term Choices	▲	▲	▲
Mid-term Choices	▲	▲	▲
Short-term Choices	▲	▲	▲

Are the “Millennials” different?



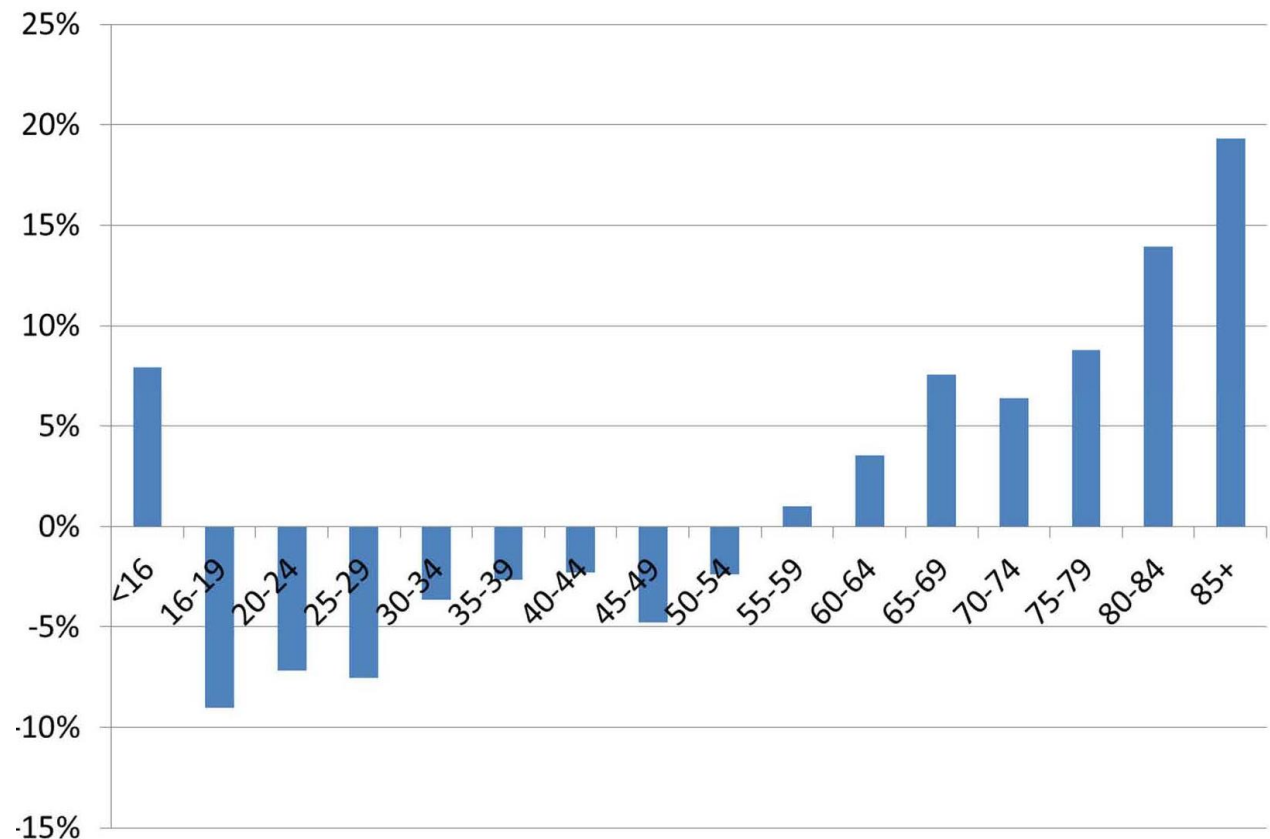
Example 1: Allison



Example 2: Hannah

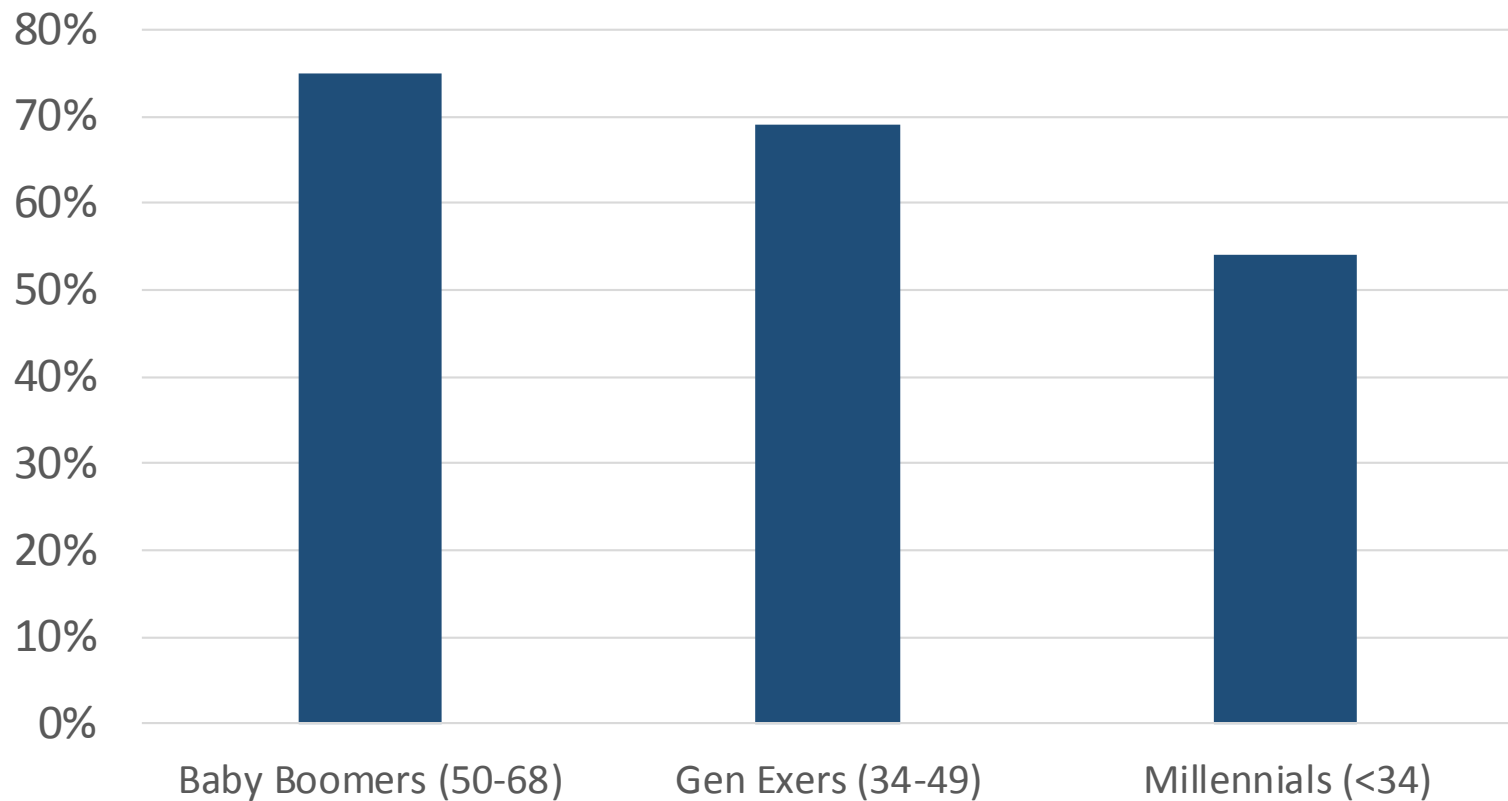
Driver's License Trends

Difference in licensing between 1995 and 2011 by age



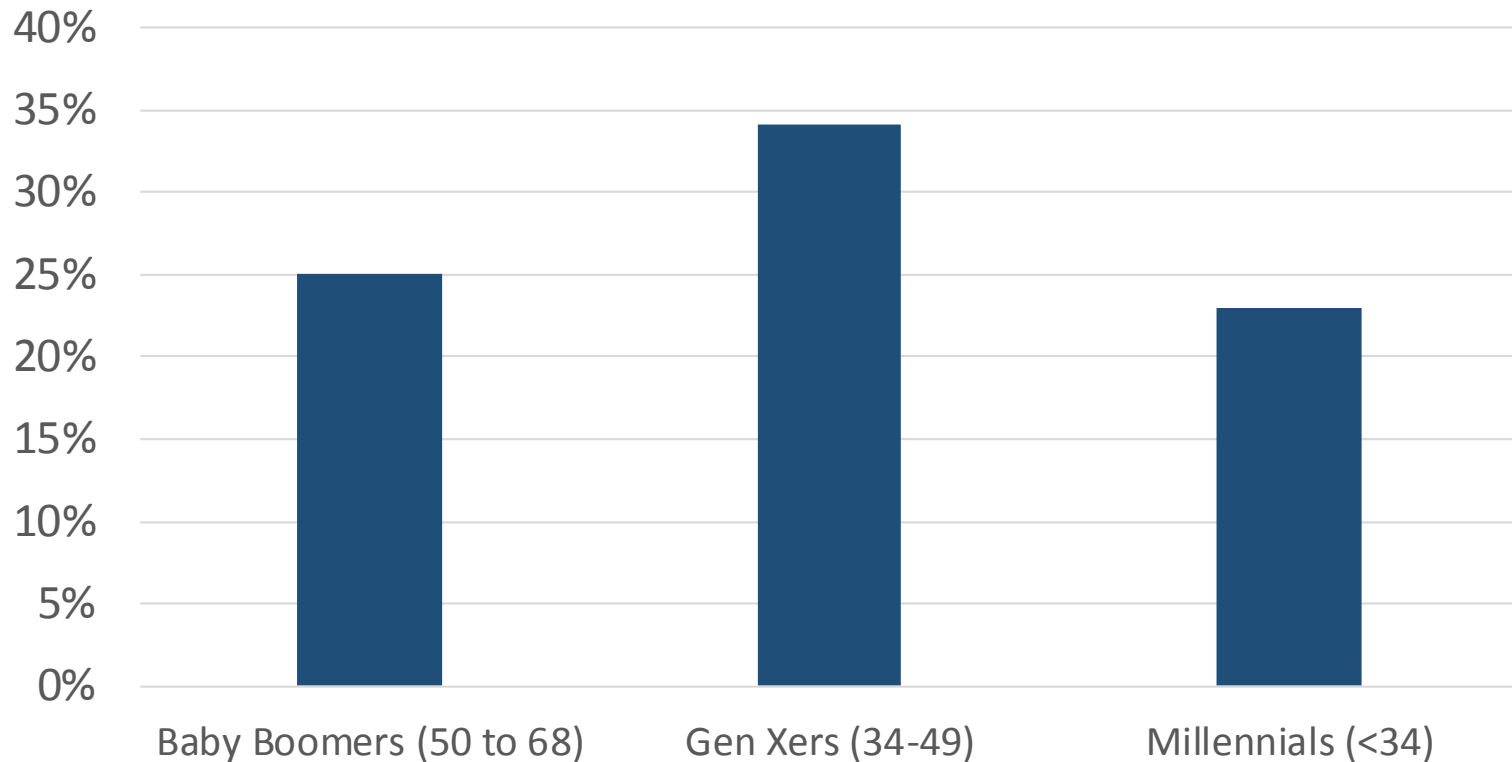
Driver's License by Generation

Got license within 1 year of eligible age



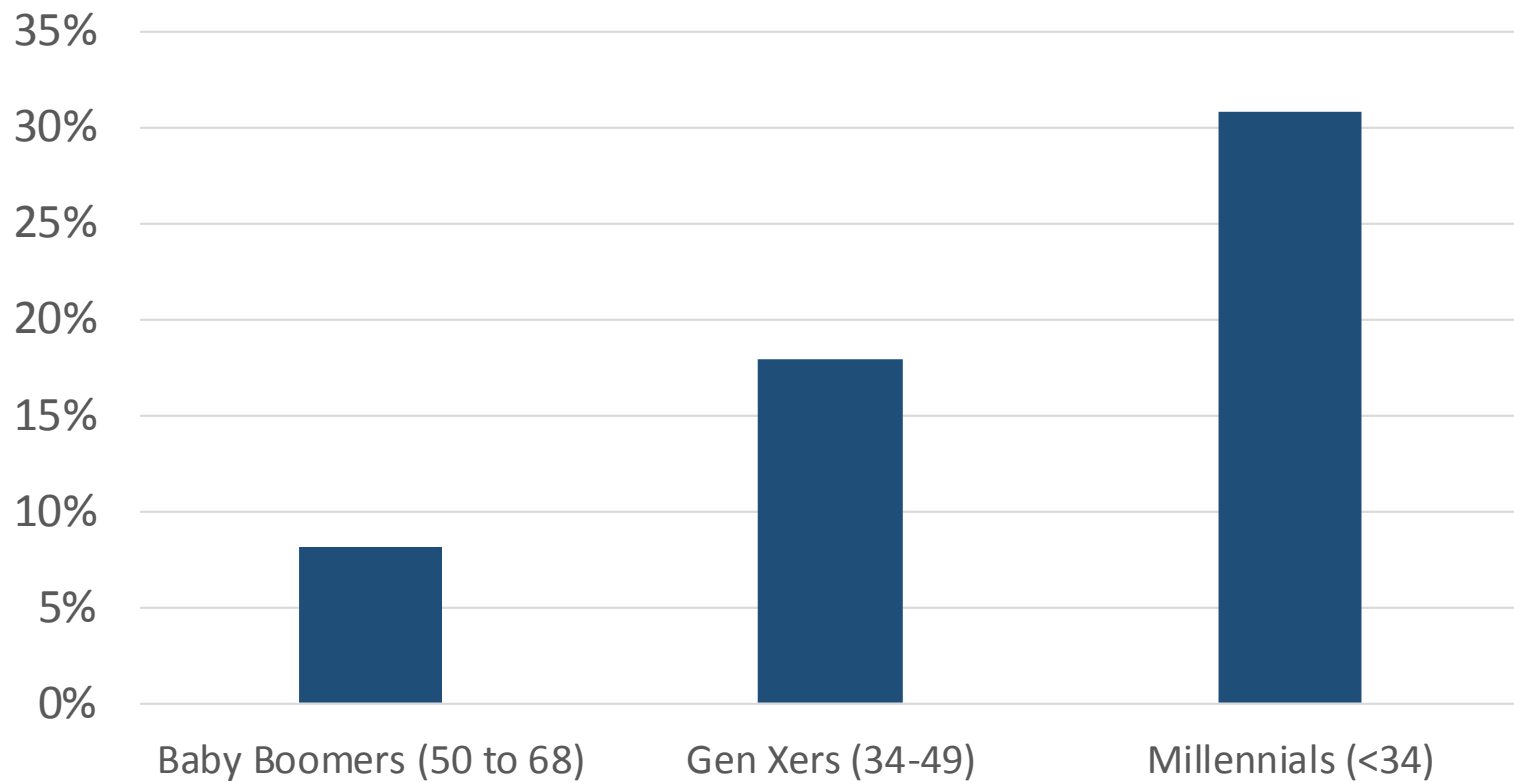
Driving License: Role of Attitudes

“Driving was the coolest way to get to school”



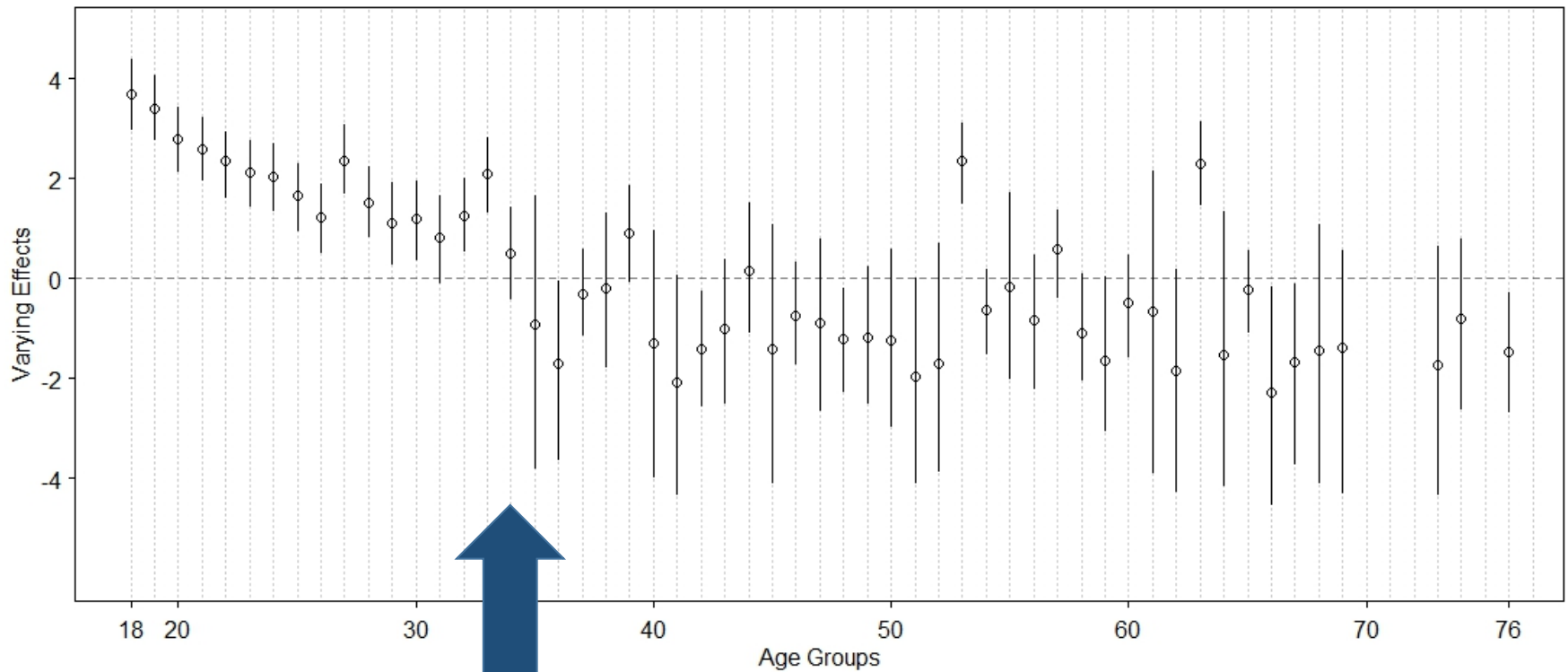
Driver's License: Role of Parents

“My parents were happy to drive me places”



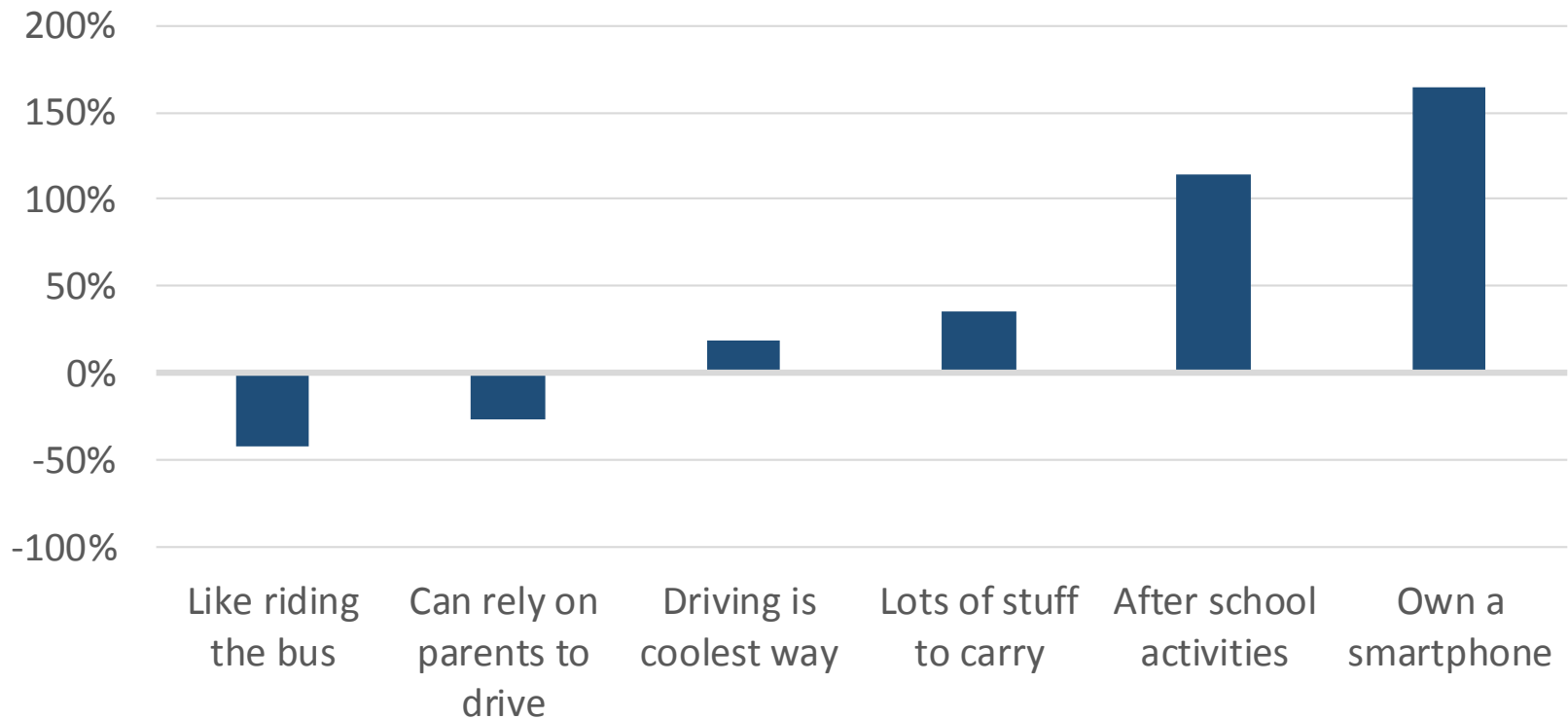
Driver's License

Effect of age after controlling for other factors



Driver's License for HS students

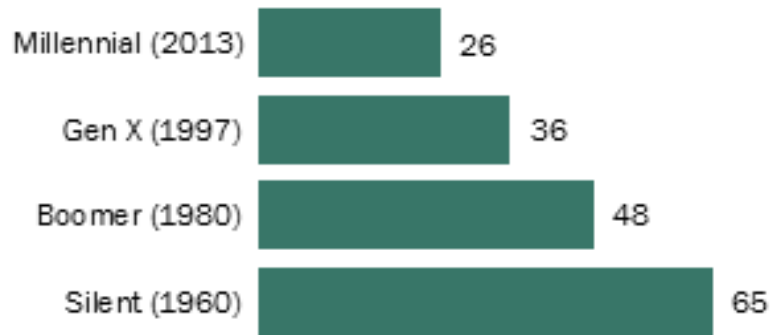
Odds of getting license on time



What else do we know...

The Decline in Marriage Among the Young

% married at age 18 to 32, by generation

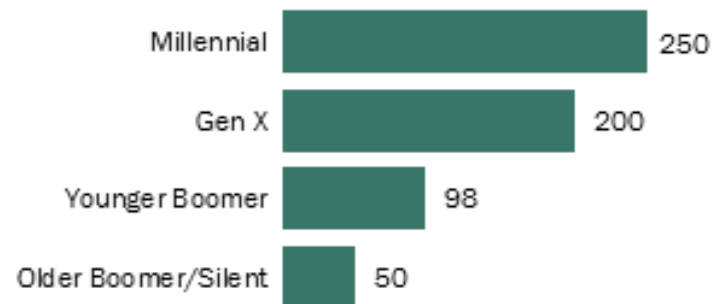


Source: Data from 1980, 1997 and 2013 are from the March Current Population Survey; 1960 data are from the 1960 Census

PEW RESEARCH CENTER

Generations, Facebook and Friends

Median number of friends



Note: Based on Facebook users, n=960. In 2013, "Younger Boomers" were ages 49 to 57, "Older Boomers" were ages 58 to 67 and "Silents" were ages 68 to 85.

Source: Pew Research Center's Internet Project survey, Aug. 7-Sep. 16, 2013

PEW RESEARCH CENTER

Millennials: the Generation that Walks the Talk



Walking More, Driving Less



83% of Millennials like walking, but only 71% like driving. This 12 point gap is a wider margin than any other generation. The gap for Baby Boomers is 2 points.



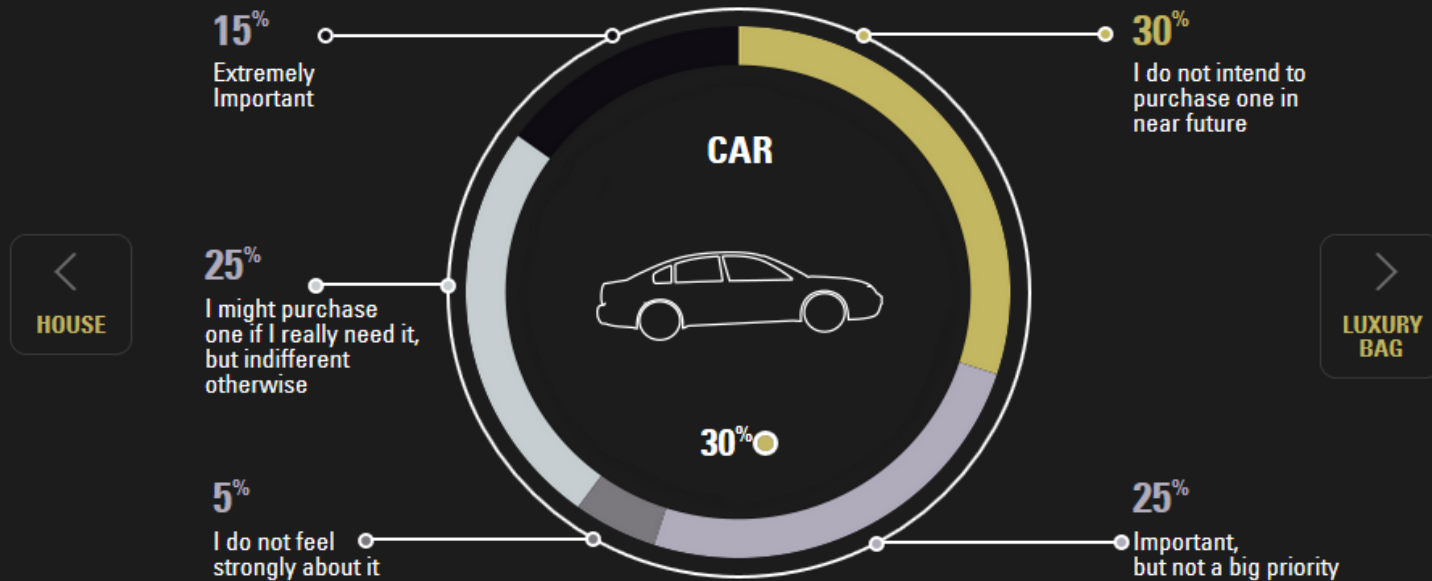
50% of Millennials prefer living within an easy walk of other places (compared to 43% of Gen X, 38% Baby Boomer and 30% Silent Generation)



51% of Millennials prefer living in attached housing (townhouse, condo) where they can walk to shops and have a shorter commute (compared to 44% of Gen X, 43% Baby Boomer and 41% Silent Generation)

THE HIERARCHY OF NEEDS

The must-haves for previous generations aren't as important for Millennials. They're putting off major purchases—or avoiding them entirely.

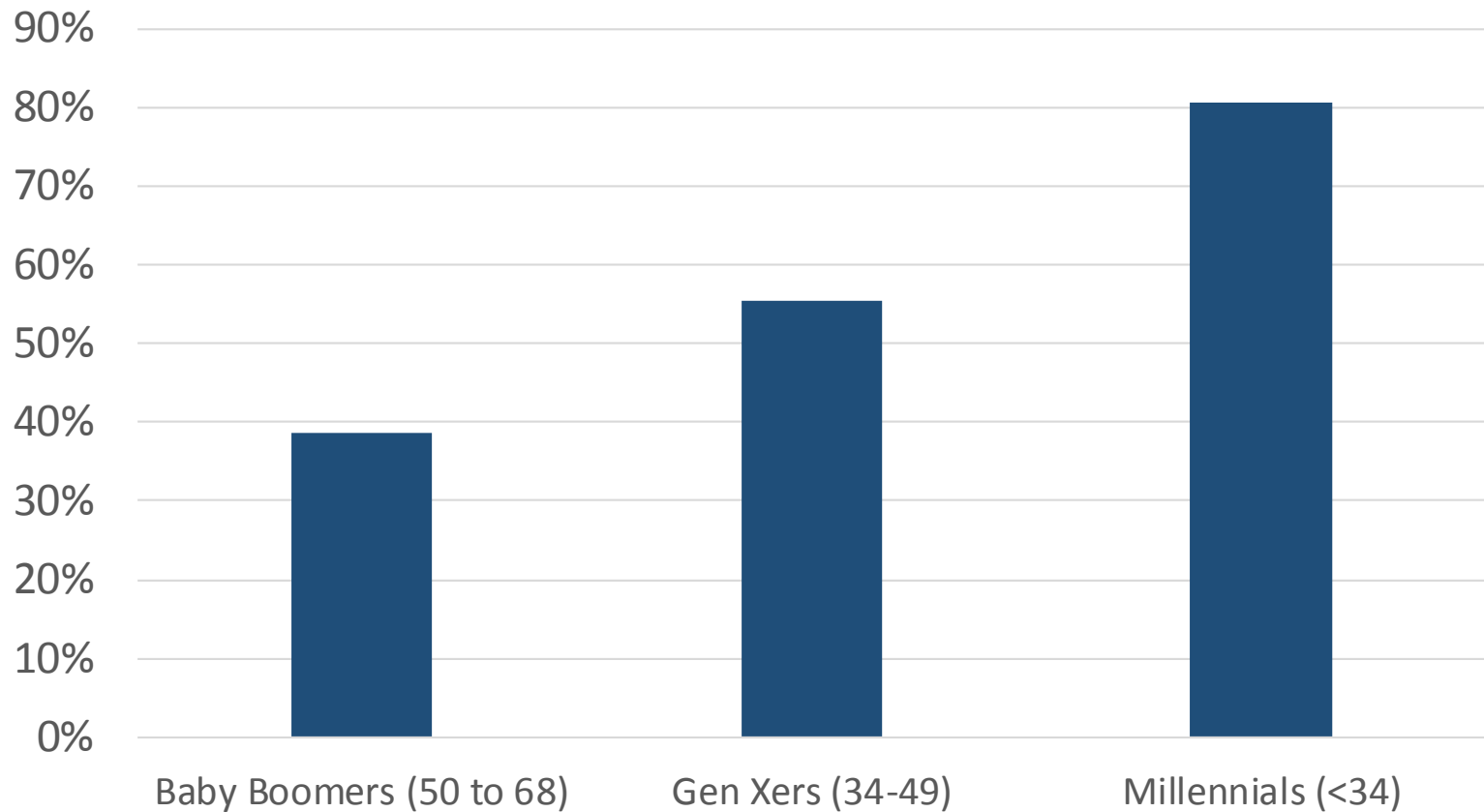


"How important is it for you to own the following?"

Source: Goldman Sachs Fortnightly Thoughts intern survey, 2013

Ride Sharing

Has used Über, Lyft, or other service



Bicycling culture



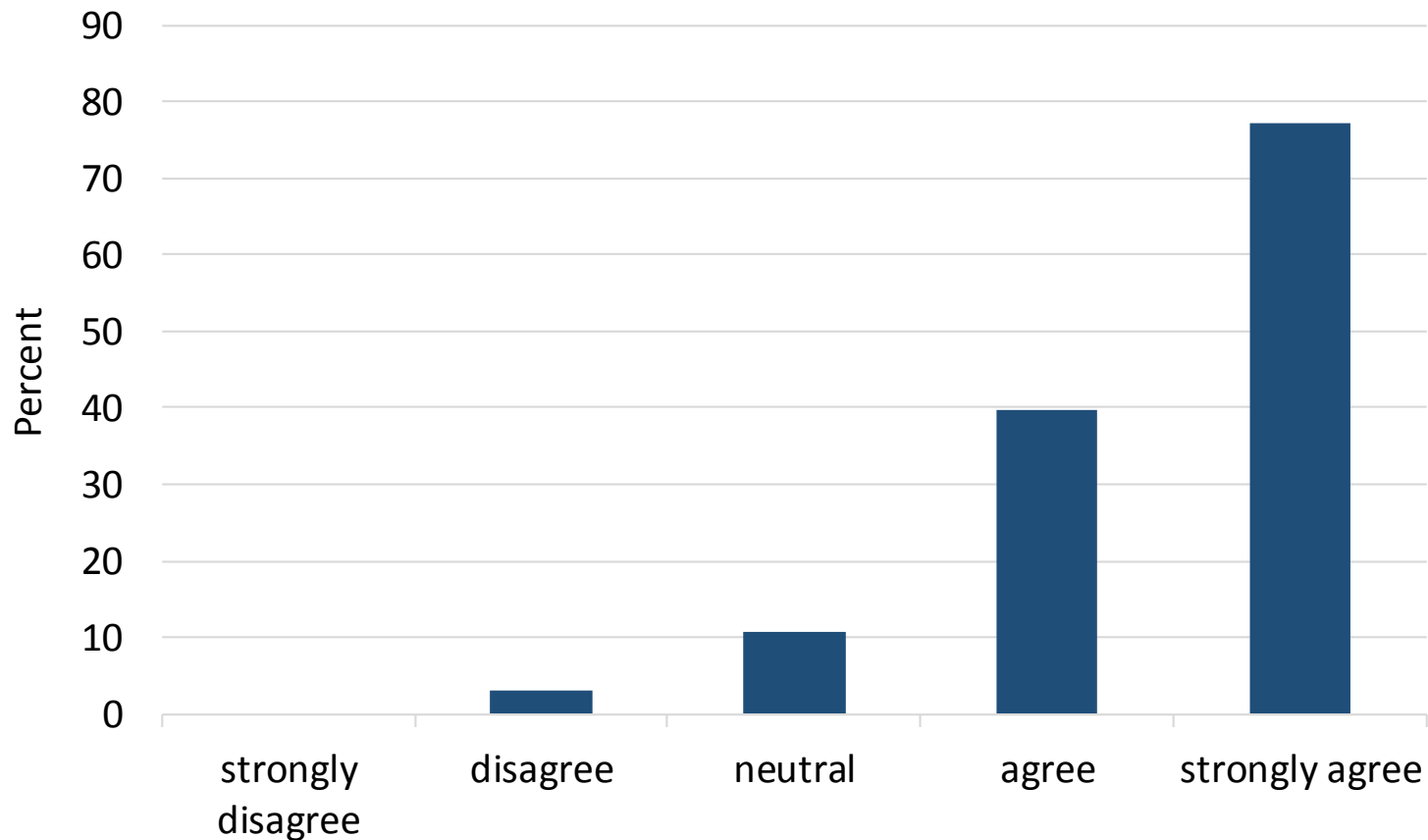
Riding away from a bar crawl



In Sickness and in Health, Long
After the Bike Is Due Back

The New York Times

Percent Biking Last Week vs. “I like riding a bike”

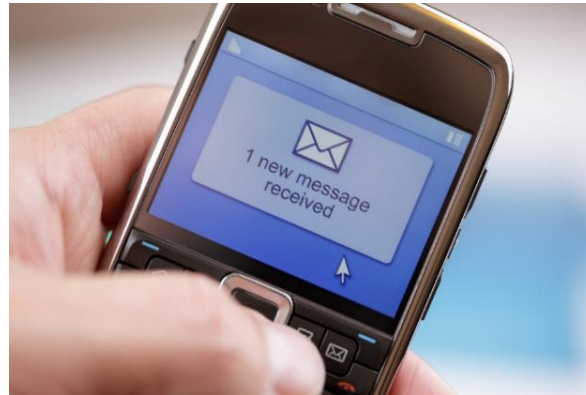


E-Bikes and Parents



“I love my bike. It’s my car!”

Smartphones and travel



Flexibility in
activities



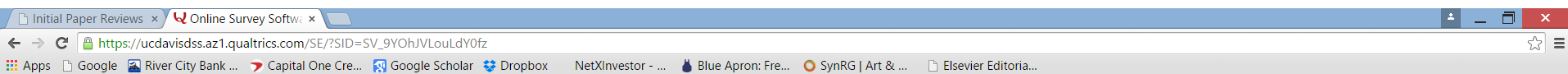
Flexibility in
travel



Productive
travel time

Millennials Survey

launching this week?



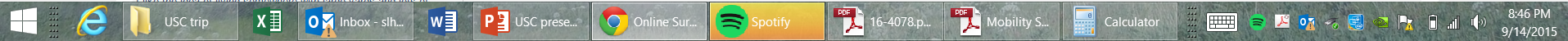
Section A: Your Opinions on Various Topics

To begin, we'd like to learn more about your opinions on [various issues related to transportation, residential location and lifestyles](#). This will help us understand your answers to later questions. We want your honest opinion on each statement in the next three tables (or your best guess, for topics you are not very familiar with) – **there are no “right” or “wrong” answers in this survey!**

Please choose the response that most closely fits your reaction to each of the following statements.

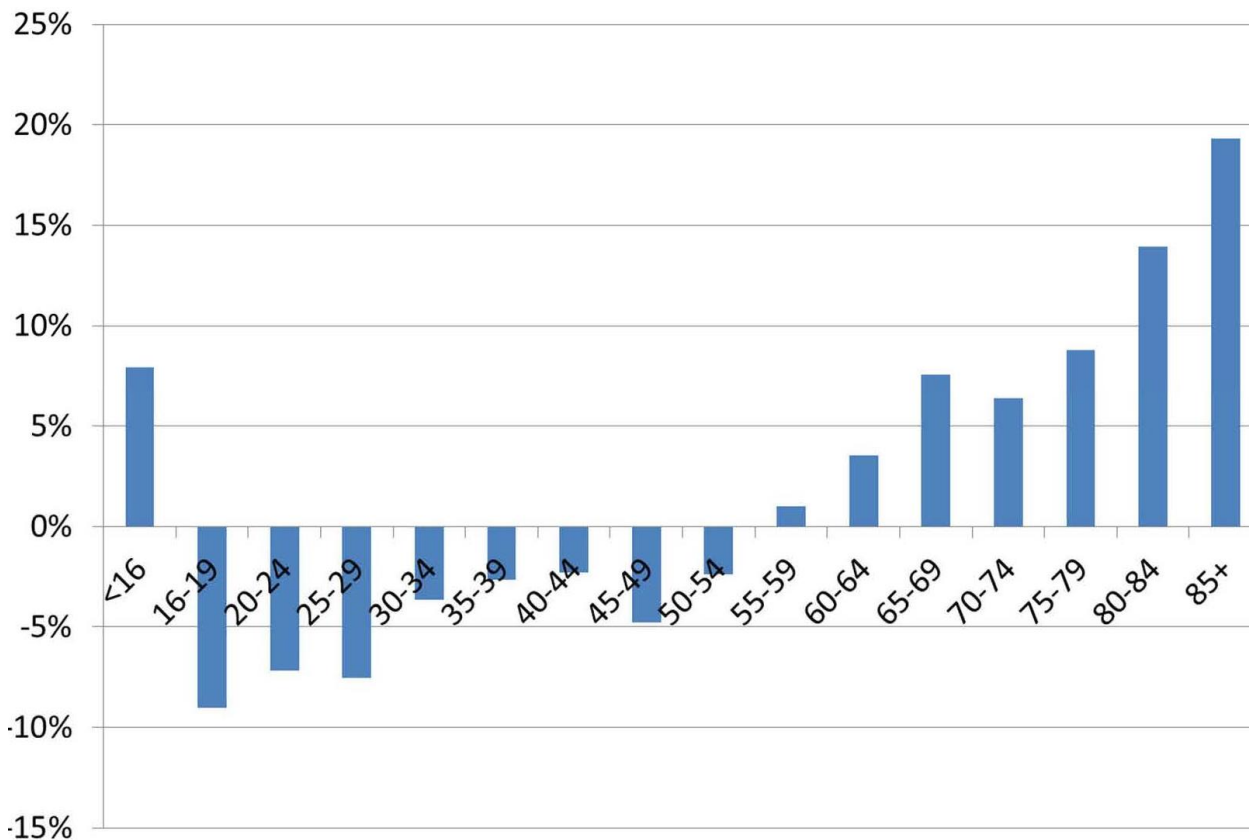
(1 of 3) Your opinions and preferences about [personal lifestyles](#) and [residential location](#)










	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I prefer to live close to transit, even if it means I'll have a smaller home and live in a more crowded area.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting regular exercise is very important to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like sticking to a routine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I prefer to live in a spacious home, even if it is farther from public transportation and many places I go to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individuals should generally put the needs of the group ahead of their own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It's best to finish one project before starting another.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I like the idea of having different types of businesses (such as stores, offices, restaurants, banks, library) mixed in with the homes in my neighborhood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The importance of exercise is overrated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It's pretty hard for my friends to get me to change my mind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having a family means you have to move to the suburbs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social media (e.g. Facebook) makes my life more interesting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Background music/radio/TV is too distracting for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I avoid doing things that I know my friends would not approve.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like the idea of living somewhere with large yards and lots of	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Driver's License Trends

Difference in licensing between 1995 and 2011 by age



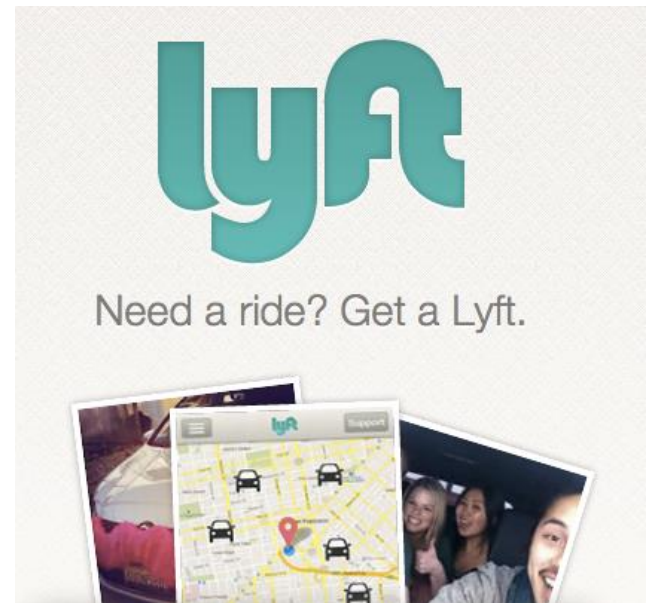
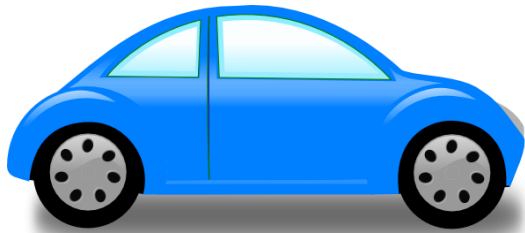
	Choice Sets	Choice Qualities	Quality Value
Long-term Choices			
Mid-term Choices			
Short-term Choices			

Implications for VMT?

How do choices stack-up?



What substitutes for what?



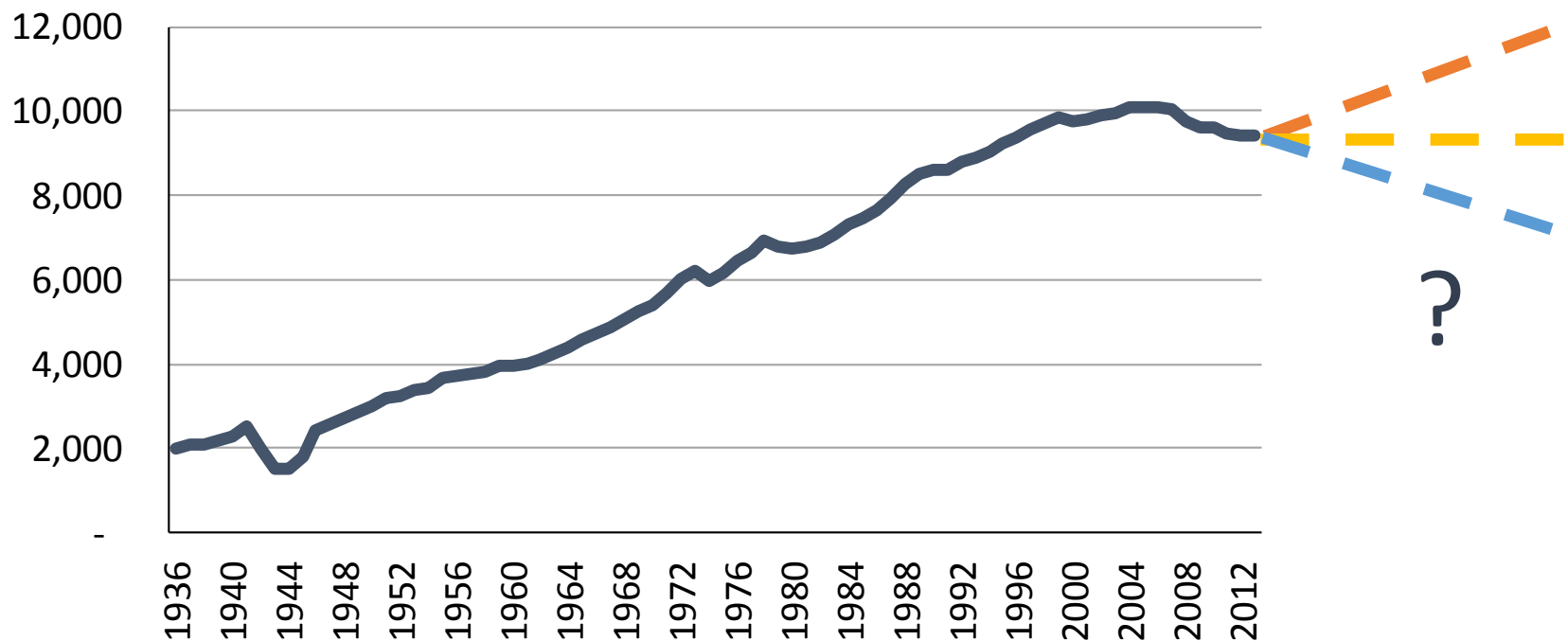
Will new options generate new travel?



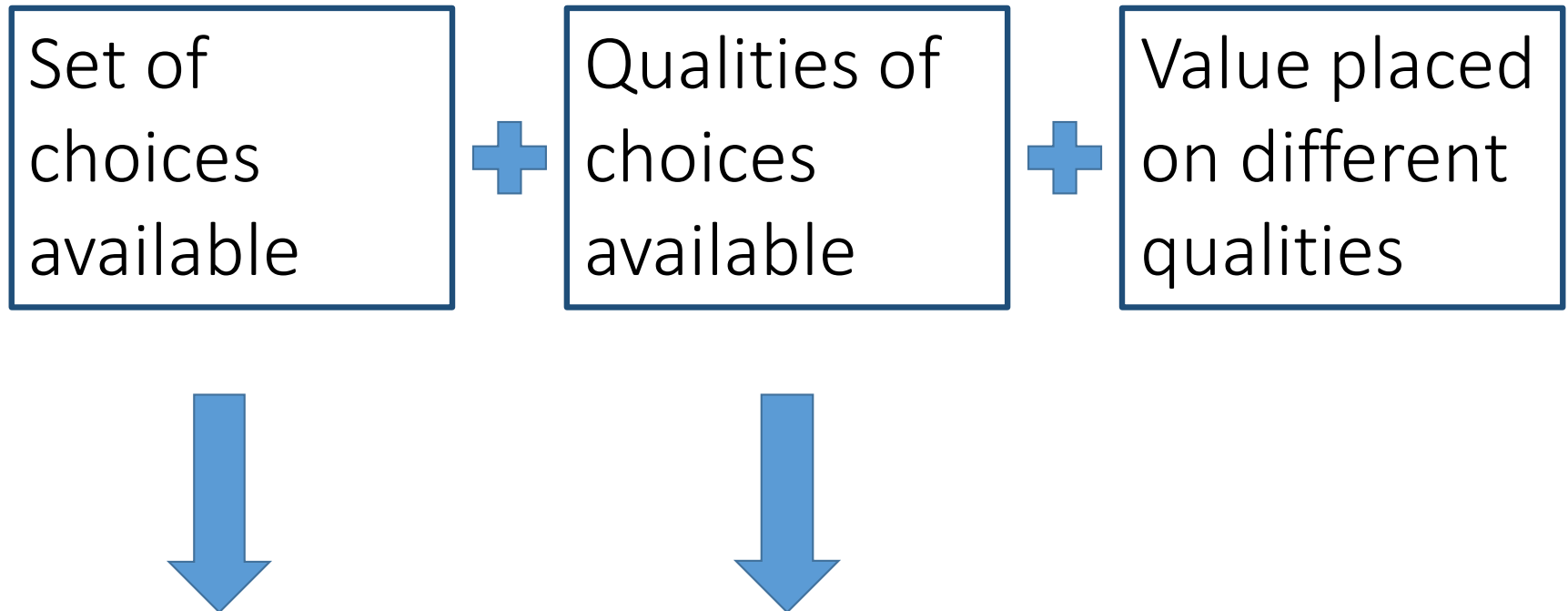
VMT in the future?

“The aggregate trends discussed do not allow us to forecast with any certainty the car use that we can expect in the future.”

– Goodwin and Van Dender, 2013



Things we can influence



By the tens of thousands, Portlanders preview their new car-free bridge

8/9/15



“With walkers and in strollers, on hopalongs and (in the case of quite a few happily panting dogs) on leashes, Portlanders packed a series of previews Sunday of Tilikum Crossing, the first bridge in the United States to carry buses, bikes, trains, streetcars and people walking but no private cars.”

Turns onto Market Street by private cars barred starting Tuesday

8/10/15



“Anyone hoping to cruise San Francisco’s motley main drag of Market Street, whether driving through or simply gawking, will likely have to do it aboard Muni, in a taxi, on a bicycle or on foot.”

L.A. will add bike and bus lanes, cut car lanes in sweeping policy shift

8/11/15



“City leaders say the plan reflects a newfound view that simply widening streets is no longer feasible or, in many cases, desirable. They contend that if even a small share of motorists change their travel behavior, choosing alternatives to the car, the city can make a big dent in the overall number of miles traveled.”

Tipping the balance



If the options are good enough...
If driving is bad enough...



Challenge: US resistance to driving impediments



Pricing



Restrictions

Not all vehicle trips
are “high value”!



The goal is
accessibility!



What it will ultimately take

A Paradigm Shift in Transport Planning

The Old Way:

Make it easier to drive



Focus on “level of service”
Planning for mobility

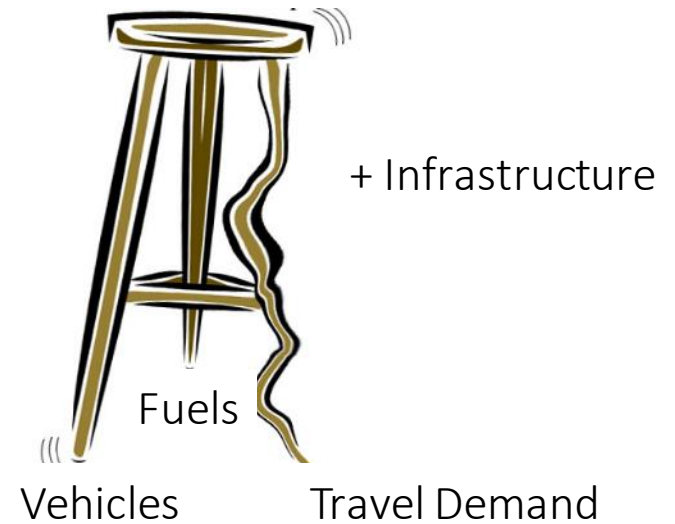
The New Way:

Make it easier to NOT drive



Focus on “livability”
Planning for accessibility

Transforming Transportation



Hard



Harder



Hardest!

Transforming Transportation



Hard



Harder



Hardest!