

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

TRANSPORTATION RESEARCH BOARD

Understanding Changes in Youth Mobility

Wednesday, September 6, 2017
2:00-3:30 PM ET



The Transportation Research Board has met the standards and requirements of the Registered Continuing Education Providers Program. Credit earned on completion of this program will be reported to RCEP. A certificate of completion will be issued to participants that have registered and attended the entire session. As such, it does not include content that may be deemed or construed to be an approval or endorsement by RCEP.



REGISTERED CONTINUING EDUCATION PROGRAM



Purpose

Discuss the changing mobility patterns of teens and young adults and the linkages to economic, social, and health effects.

Learning Objectives

At the end of this webinar, you will be able to:

- Understand the specific preferences and needs of this age group in order to make changes in the products and services offered in the transportation system



NCHRP 08-36, Task 132
UNDERSTANDING CHANGES IN YOUTH MOBILITY

Requested by:

American Association of State Highway and
Transportation Officials (AASHTO)
Standing Committee on Planning

A Webinar Presentation by

Matthew A. Coogan

Principal Investigator

and

Mark Bradley

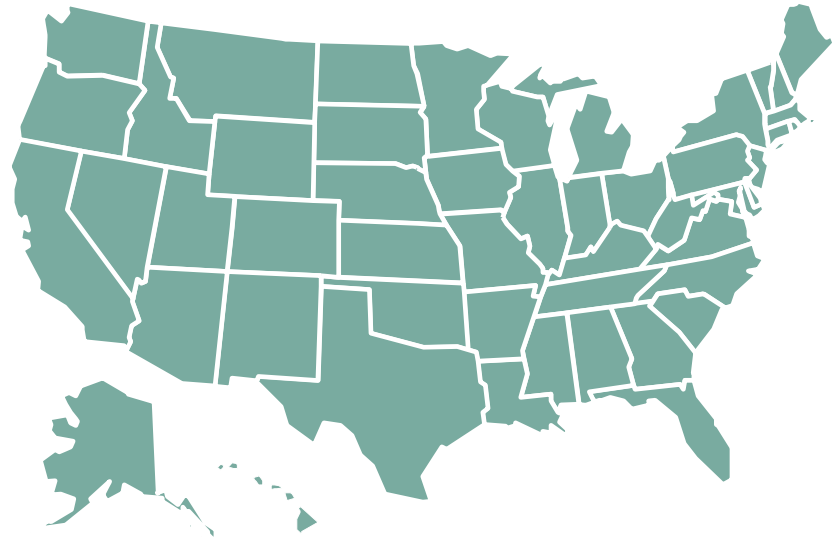
Director, RSG Inc.



NCHRP is a State-Driven Program

- Sponsored by individual state DOTs who

- Suggest research of national interest
- Serve on oversight panels that guide the research.

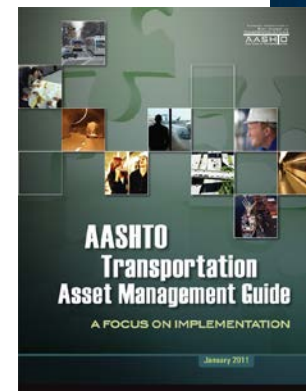
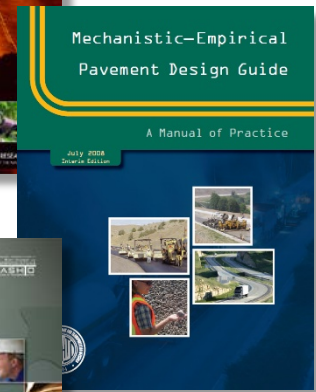
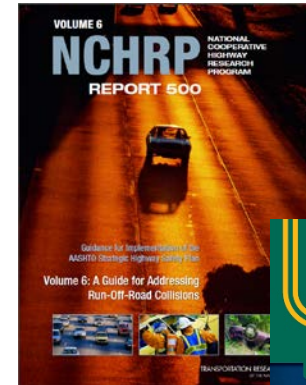


- Administered by TRB in cooperation with AASHTO and the Federal Highway Administration.



Practical, ready-to-use results

- Applied research aimed at state DOT practitioners
- Often become AASHTO standards, specifications, guides, syntheses
- Can be applied in planning, design, construction, operations, maintenance, safety, environment



Project Panel

NCHRP 08-Task 132

- Garth Banninga, Michigan DOT
- Dr. John Betak, Collaborative Solutions, LLC.
- Dr. Mark Burton, University of Tennessee
- Martin Kidner, P.E., Wyoming DOT
- Dana Knox, Florida DOT
- Dr. Jeremy Sage, Washington State University
- Penelope Weinberger, AASHTO

The project was managed by Larry Goldstein, NCHRP Senior Program Officer with assistance from Dr. Anthony Avery, Senior Program Assistant



Matthew A. Coogan

Principal Investigator

- Director, The New England Transportation Institute
- Former Undersecretary of Transportation, Commonwealth of Massachusetts
- Project Director, I-90/I-93 Project
- Co-founder of CONEG Task Force on High Speed Rail
- Principal Investigator for 12 CRP Projects



Agenda for the Webinar

- Review of objectives of the study – Coogan
- How the personal mobility of the youth suffered during the first decade of this century
 - Interpretation
- Analytical model of decline in VMT- Bradley
 - Interpretation
- How Millennials have different preferences than older groups in society—Coogan
 - Implications for the Planning Profession
 - Proposed further research



Research Team

- The Rand Corporation, Prime Contractor
 - Liisa Ecola, Project Manager
 - Charlene Rohr, Rand Europe
- RSG, Subcontractor
 - Tom Adler
 - Greg Spitz
 - Mark Bradley
 - Margaret Campbell
- Matthew Coogan, Principal Investigator
- Nelson Nygaard
 - Rachel Weinberger



Objectives of the Study

- ...to understand the extent to which the changes in travel behavior by the Millennial Generation do, and do not, represent a major issue for the leaders of the transportation sector.
- ...to better understand travel behavior of Millennial Generation in terms of their attitudes, beliefs, and preferences towards basic transportation decisions.



Objectives of the Study...

- “It is only by understanding the specific preferences and needs of this age group that transportation managers will be able to make changes in the products and services offered in the transportation system more generally.
- “The results of this study should allow state, regional and local practitioners to improve the process of planning, programming, and project development consistent with the needs and preferences of the younger generations.”



... to Find the Truth about Patterns of Youth



US: Stats Show Americans Not That Into Driving Anymore

Joan Lowy
Source: Associated Press
Created: August 29, 2013



The Rise of the Millennial Traveler

Why Car Companies Should Be Extremely Nervous About Millennials

DEREK THOMPSON | MAR 1 2013, 4:03 PM ET

Millennials: A Car Is A Social Device On Wheels

by Karl Greenberg, Jun 1, 2013, 12:56 PM

Comment (1) Recommend (2) Tweet (0)



It's aphoristic that younger people's appetite for cars is sagging. Facts detailed in numerous reports bear that out. I got on the phone with Sheryl Connelly, who leads global trends and futuring at Ford



Millennials in Motion

Changing Travel Habits of Young Americans and the Implications for Public Policy

U.S. PIRG
Education Fund

THE BIG STORY

AMERICANS DRIVING LESS AS CAR CULTURE WANES

US mobility for young adults falls to 50-year low

Many putting off big decisions in sluggish economy

By Hope Yen | ASSOCIATED PRESS | NOVEMBER 15, 2013



What is the Danger in Bad Information?

- “When the public believes that Millennials no longer drive in cars, no longer buy cars, and only wish to share cars, this implies that auto travel might suddenly grow out of favor.
- “When the public believes that Millennials do not want to live in the suburbs, and would not drive further to get a larger house, this implies that travel forecasts used in the planning and environmental analyses of new transportation investments are all wrong...”

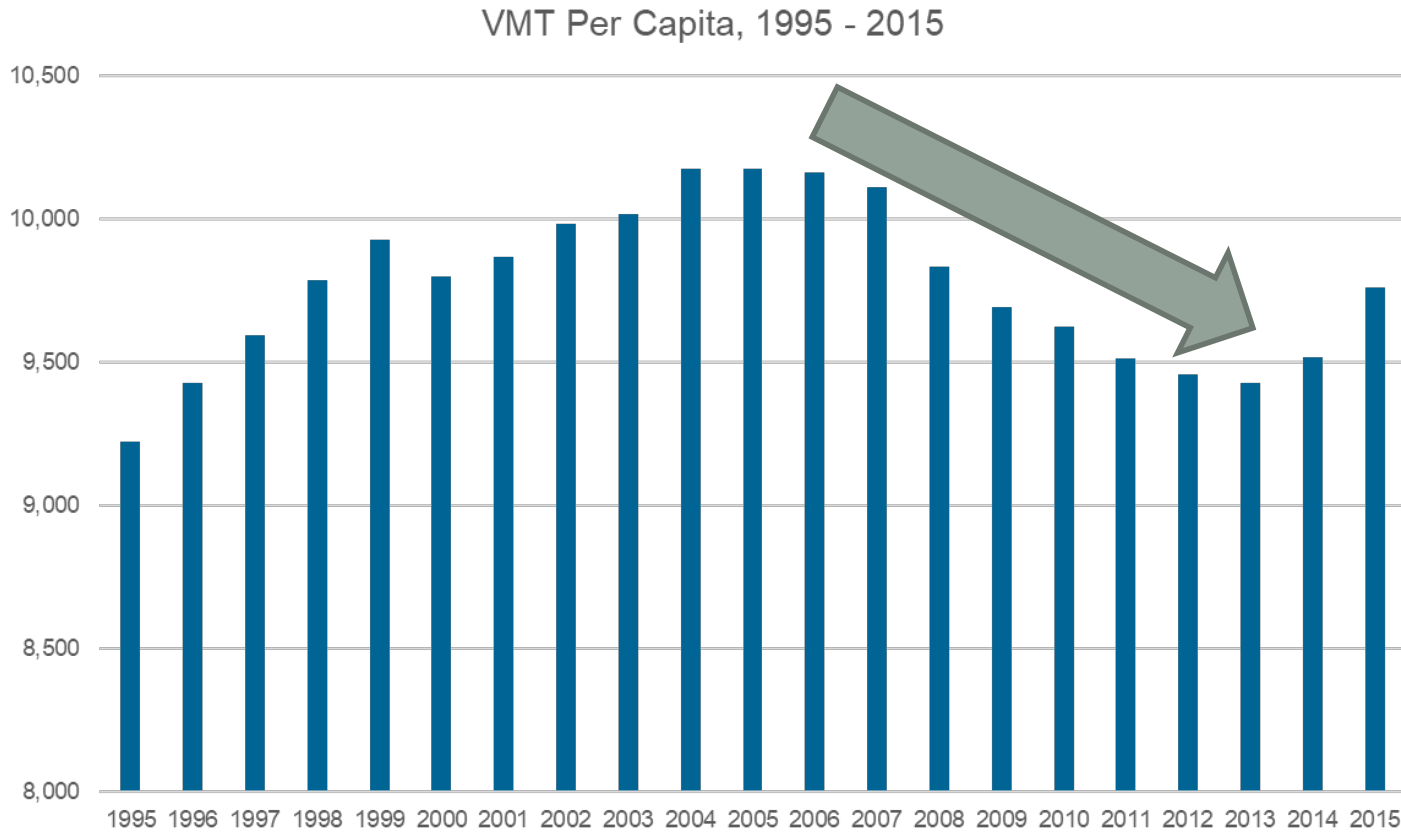


Summary of Research Approach

- Establish trends for overall patterns
- Use NHTS for detailed change by age group
 - Examine by demographic category
- Undertake Multivariate Analysis of Decline in VMT
 - Conclusion: something is left to be explained
- Examine differences in preferences by age group
- Develop implications for the future
 - Future research recommendations



The Overall Decline was Powerful



Source: FHWA

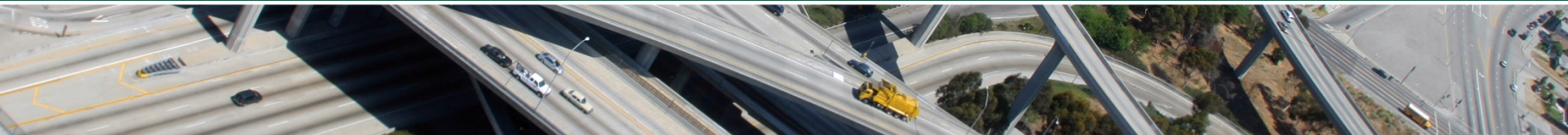
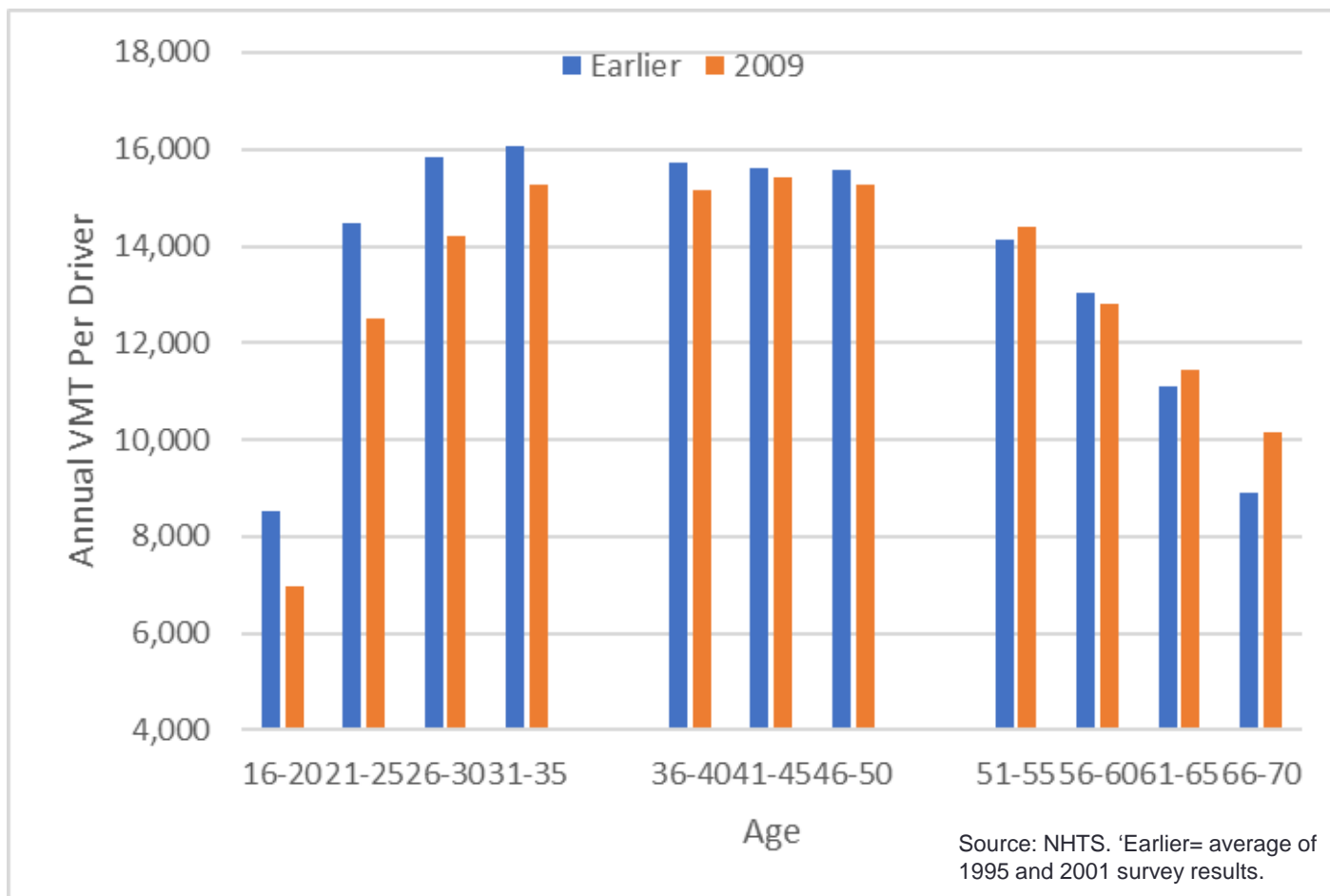


It was the Youth Who Decreased their VMT

- The fall in auto travel at the turn of the century (in this case 2001 to 2009) was most pronounced in youth, in male youth and in unemployed male youth.
- The decline was stronger for younger urban residents than for younger rural residents; low income rural residents lost more mobility than higher income rural residents.
- VMT decreased far more sharply for young people in the Midwest and South than for young persons in the Northeast.



Change in VMT by Age of Driver: The Driving Behavior of Youth Changed Most



Where Did the Trips Go?

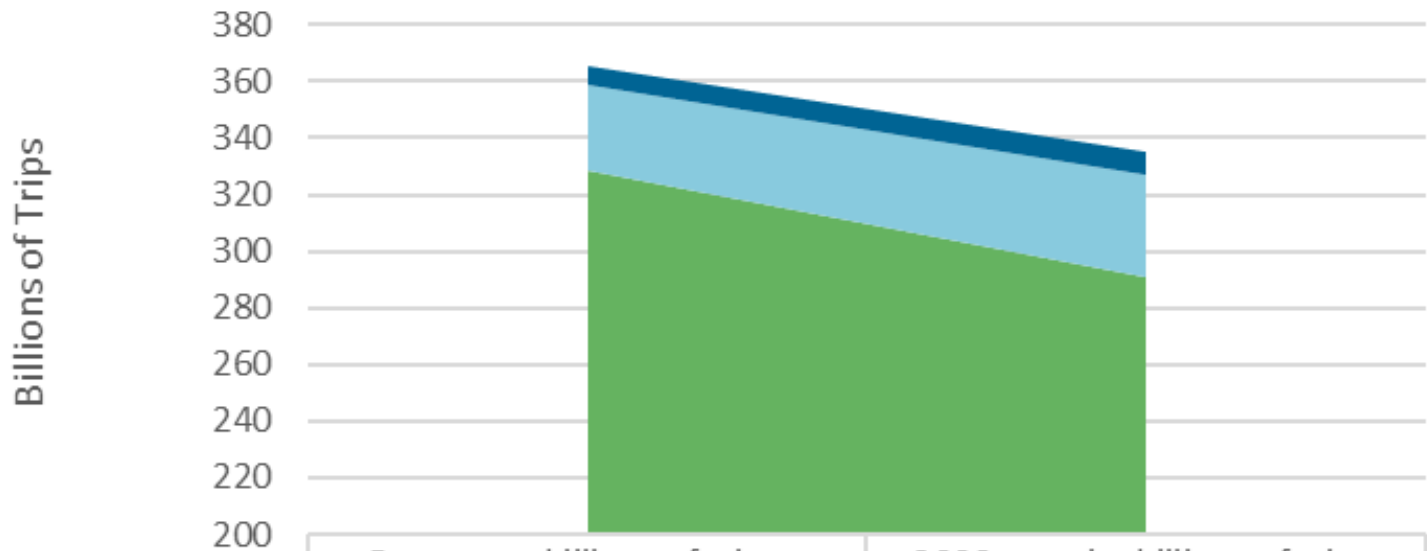


- The drop in VMT was *not* matched by an equivalent increase in walking and biking, which did, however, increase moderately.
- Transit trips per capita went up between 2001 and 2009, but not at scale to produce substitution of transit over auto.



Decline in Trips, 2001-2009, by Mode

Change in Trips by Mode, 2001-2009



	Base case- billions of trips	2009 actual - billions of trips
Transit	7.04	8.11
Walk plus bike	30.19	36.53
Auto	328.38	290.60

Source: Data from McGuckin from NHTS. "Base case" = 2001 trip rates applied to 2009 population



Factors Which *do not* Explain Change

- *Shift to walk or transit.* The change was in overall trip generation, not just a shift in modes.
- *Shift to carpools.* Between 2000 and 2010, the rate of carpooling actually declined, while the auto occupancy rate remained stable
- *General decrease in auto ownership rate.* In 2001 there were about .81 autos per person, which shifted slightly to .80 around 2009.
- *Rate of no-driver's license.* For those between 25-34, rate of driver's license holding had dropped by about 3%.
- *ICT replaces trips.* In short, *increased* levels of information technology use are associated with *increased* levels of travel, not the other way around.

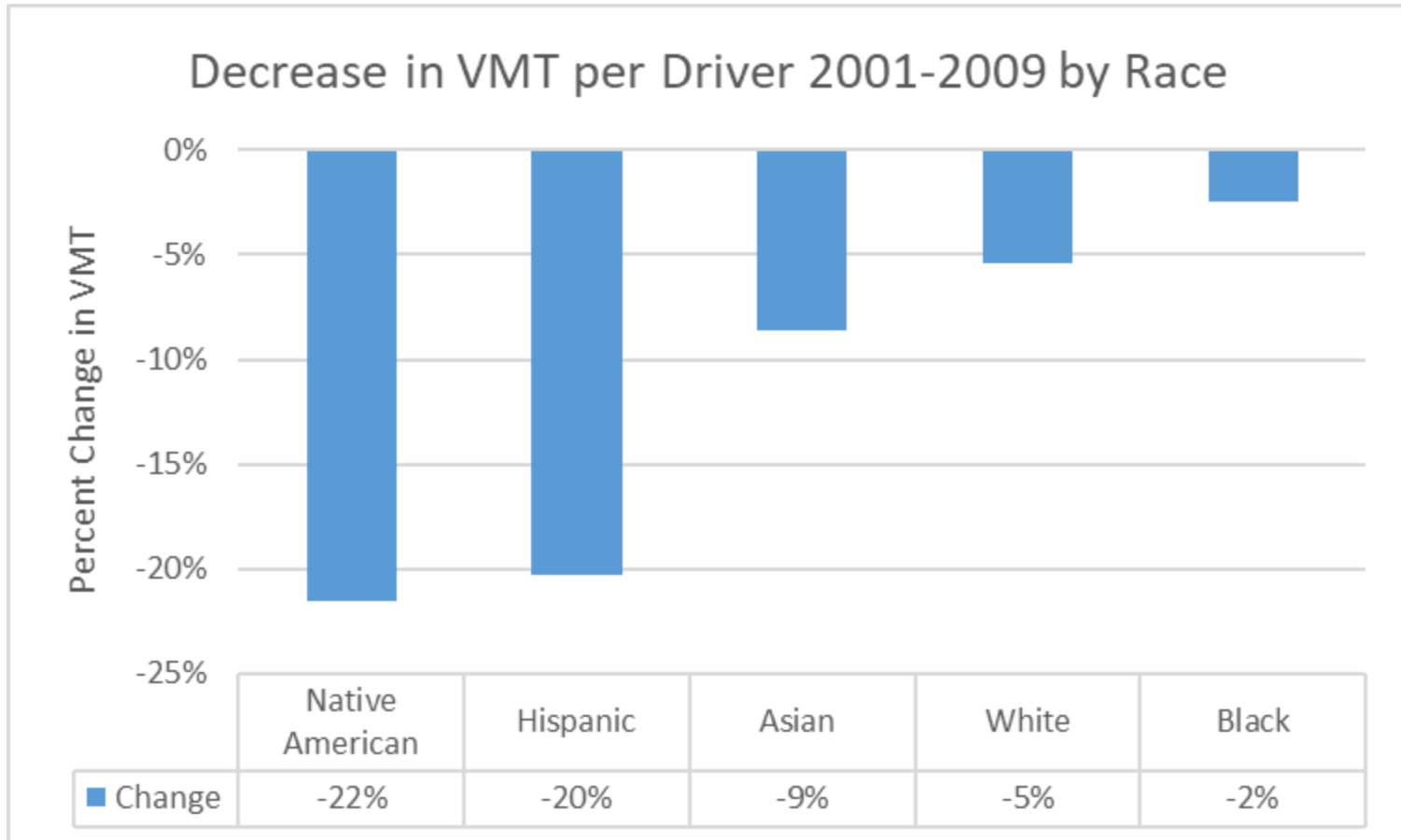


Factors Which *do* Explain Change

- *Race/ethnicity.* Native Americans and Hispanics fell over 20% in VMT, versus a decrease for whites of 5%.
- *Rate of zero-car household.* The portion of survey respondents living in zero-car households increased from 5.2% to 6.0%. For those between 25-34, the portion living in a zero-car household increased from 5.4% to 7.1% in 2009.
- *Expendable income.* By most reports, Americans in general had slightly less real purchasing power in 2009 than in 2001. There may be more to the economic and business impact on VMT than implied.



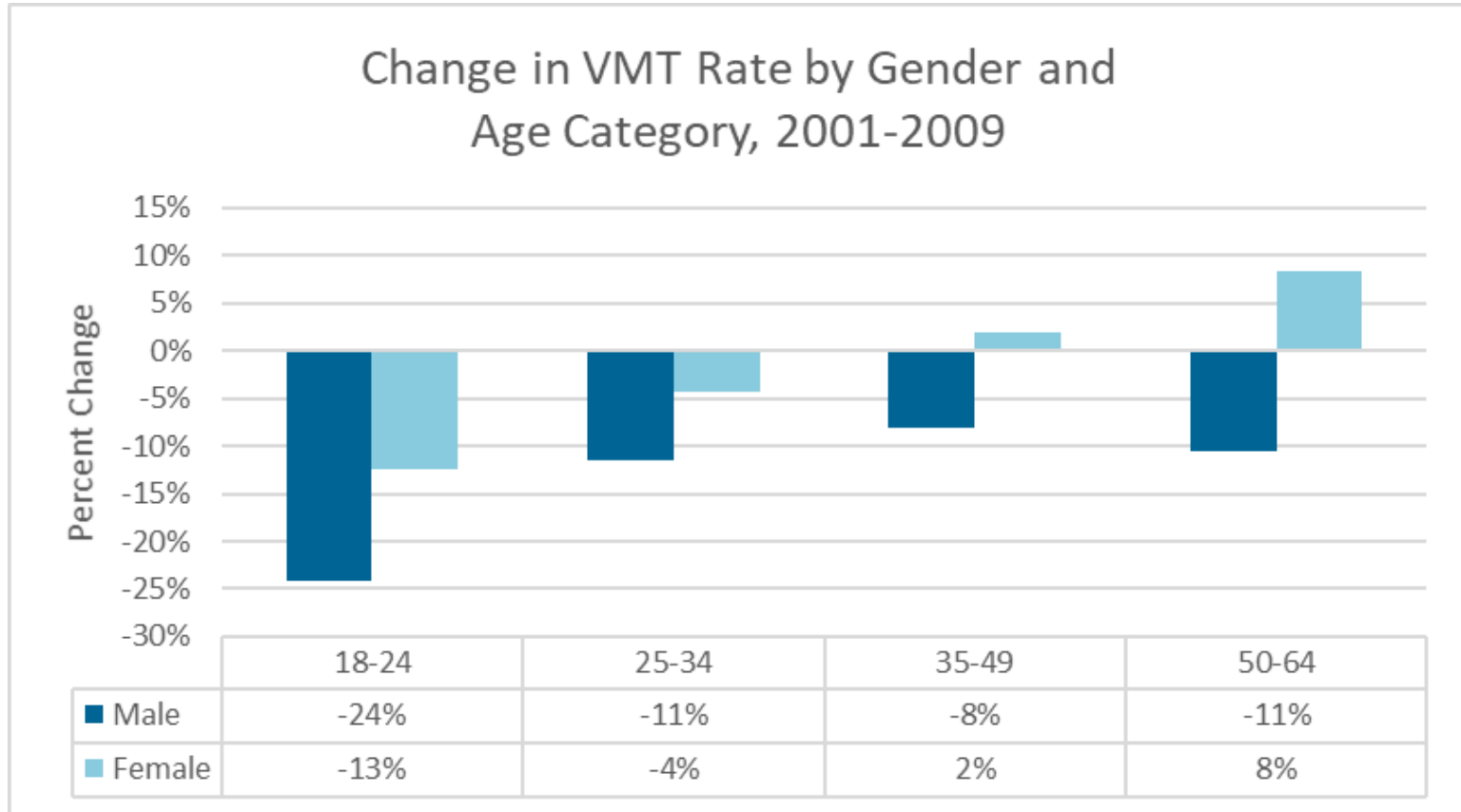
Minorities Suffered More Loss in VMT



Source: NHTS



Decline Was for the Young, and Male



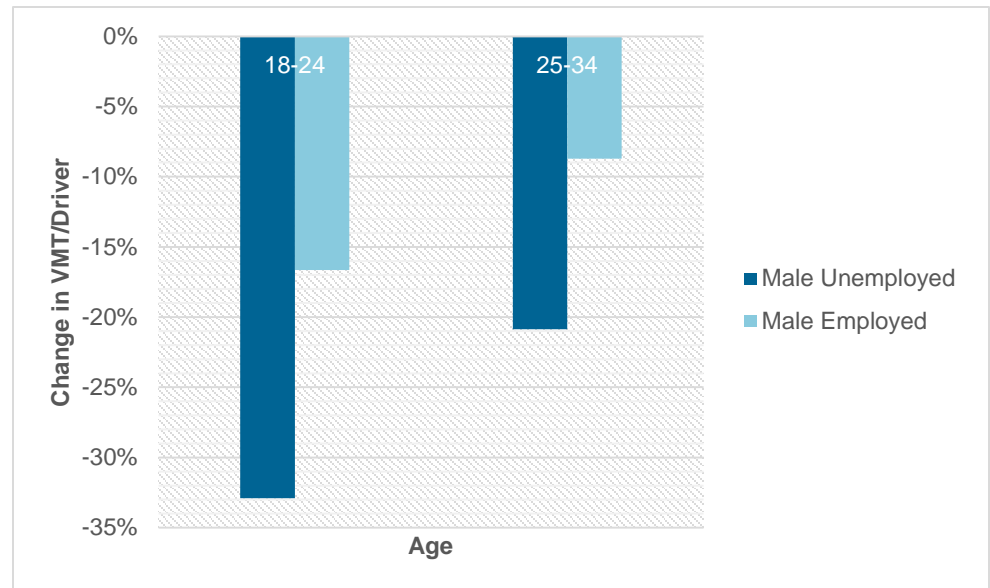
Source: NHTS



VMT Drop by Youth Employment Status (Compare 2009 with 2001)

- VMT for Unemployed males 18-24 dropped 33%
- VMT for Unemployed males 25-34 dropped 21%

Being unemployed in the recession of 2008- 2009 was associated with far less car driving than being unemployed in the year of 2001.



Source: NHTS



Examining the Decline in Travel: an Analytic Approach

- Next speaker

Mark Bradley

- Senior Director at RSG
- 35 years experience in travel demand modeling in the US and Europe
- Has had a key role on several CRP projects



Multivariate Analysis is Important...

- Different explanatory factors tend to be correlated with each other, so considering them simultaneously in analysis helps to determine their relative importance.
- **Key question:** Are there trends in Millennial travel behavior that cannot be explained by changes in observed factors (demographics, socio-economics, land use, etc.)?
- *Paraphrase: Has it all been due to the recession?*



Previous Published Work...

McDonald, N. C. (2015). " **Are Millennials Really the “Go-Nowhere” Generation?**" *Journal of the American Planning Association*.

- Regression using National Household Travel Survey (NHTS) data from 1995, 2001 and 2009.
 - Dependent variable: Miles traveled by auto (AMT) during the survey travel day, by adults age 19-42.
 - Independent variables: Age group, income, employment, gender, race/ethnicity, residence area type, driving license status, auto ownership, household composition, day of week.



Captured Different Trend Effects by Age Group

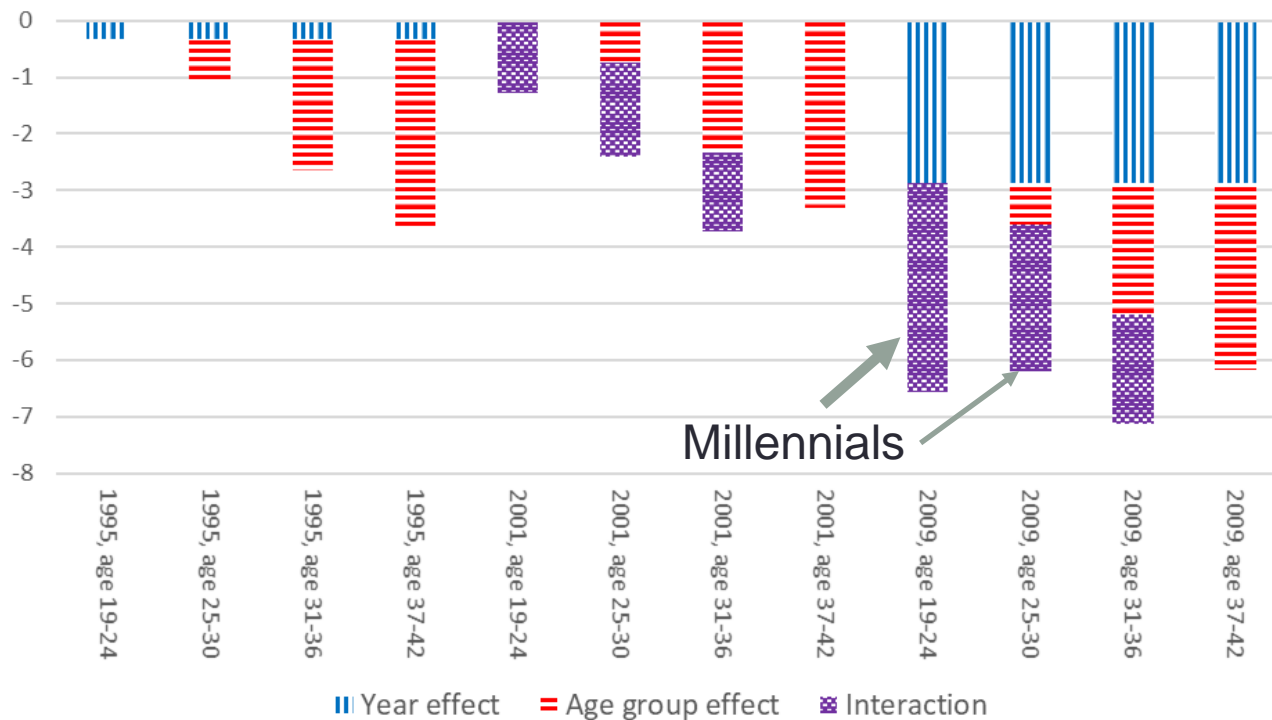
- Interactions between survey year and age sub-group
- “Millennials” are only in the 2009 data, in the youngest group(s)

YEAR / AGE	Age 37-42	Age 31-36	Age 25-30	Age 19-24
1995	Base for comparison	31-36 age effect	25-30 age effect	19-24 age effect
2001	2001 period effect	2001 period effect + 31-36 age effect + 2001 x 31-36 age interaction	2001 period effect + 25-30 age effect + 2001 x 25-30 age interaction	2001 period effect + 19-24 age effect + 2001 x 19-24 age interaction
2009	2009 period effect	2009 period effect + 31-36 age effect + 2009 x 31-36 age interaction	2009 period effect + 25-30 age effect + 2009 x 25-30 age interaction	2009 period effect + 19-24 age effect + 2009 x 19-24 age interaction



McDonald's Key Findings...

Relative effects of year, age group and interactions from McDonald regression model (in auto miles per day)



All else equal...

- 1995 and 2001 are very similar
- In 2009, less auto travel for all age groups (recession)
- In 2009, youngest age groups decreased auto travel the most.



Expanding on the Previous Research...

- Reproduced McDonald's results
- Tested additional explanatory variables
- Tested additional interaction variables
- Tested different model functional forms



Additional Explanatory Variables Explored by the Research Team...

- Parents with children in younger age categories (0-4, 5-15) >>> *higher Auto Miles of Travel (AMT)*
- People age 19+ living with their parents >>> *males lower AMT, females higher*
- Households with no cars >>> *lower AMT than using only cars/driver variable*
- People unemployed and looking for work >>> *lower AMT than other non-workers*
- At least some college education >>> *higher AMT*
- Block-group level land use categorization >>> *The more urban, the lower the AMT*
- *Changed the dependent variable from all auto miles traveled (AMT) to miles as an auto driver only (VMT).*
 - *The decrease in Millennial's auto use in 2009 was smaller for auto drivers than for passengers, but still significant.*



Additional Interaction Effects...

Lower auto use in 2009 compared to earlier years (all else equal) for specific groups:

- Males
- Non-employed
- No college education

However, these effects do not vary significantly by age group, and the interactions between age group and year (2009) remain significant.

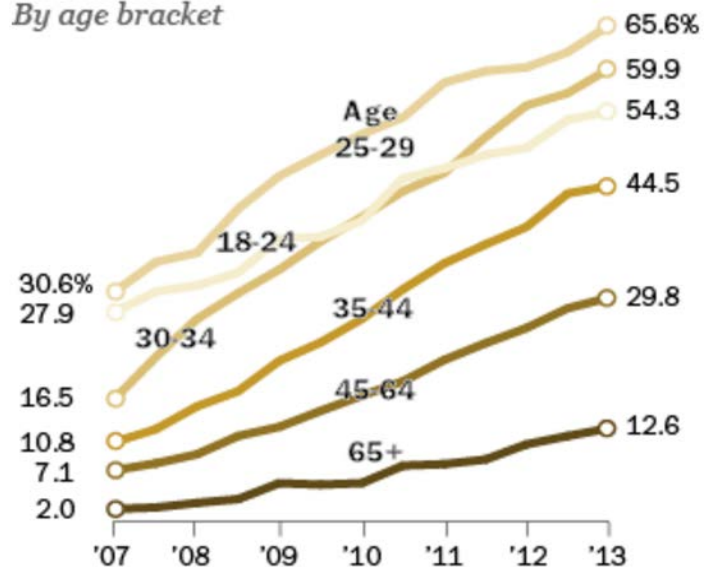


What about Cellphone-only Households?

- NHTS samples only included HH with landline telephones.
- In 1995 and 2001, cellphone-only HH were very rare, but by 2009 included over 1/3 of young adults.
- Analysis thus far does NOT indicate that young people in cell-only households travel substantially more miles by auto than other young people.

Percentage of Adults Living in Wireless-Only Households

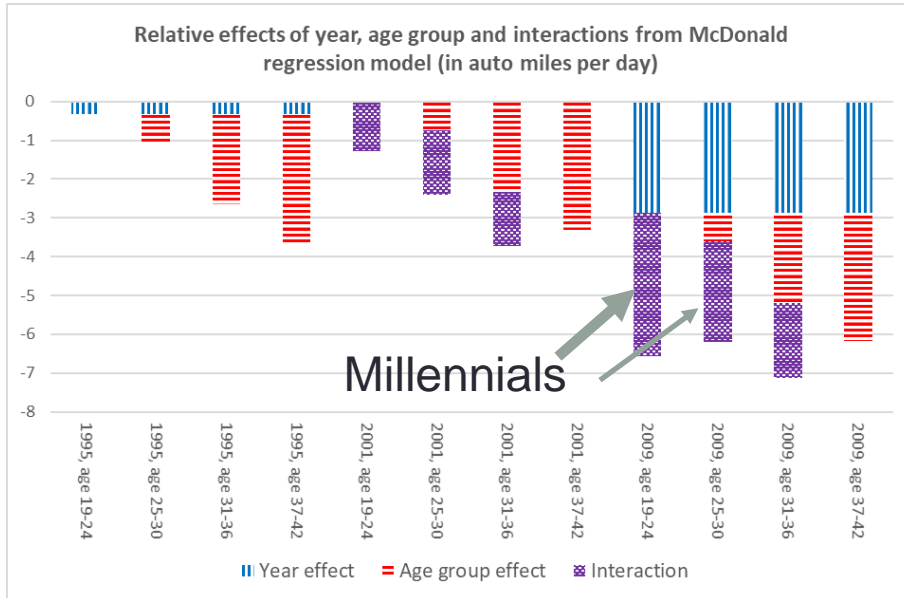
By age bracket



Source: DeSilver, Drew. (2013). "For most wireless-only households, look south and west". *Pew Research Center*.



Summary of the Analysis Findings...



Could not find another explanation for the decreasing trend in auto use by Millennials observed in NHTS data.

In travel demand modeling terms, the conclusion is that Millennials' underlying behavioral "preferences" toward auto use had shifted by 2009, relative to other age cohorts.

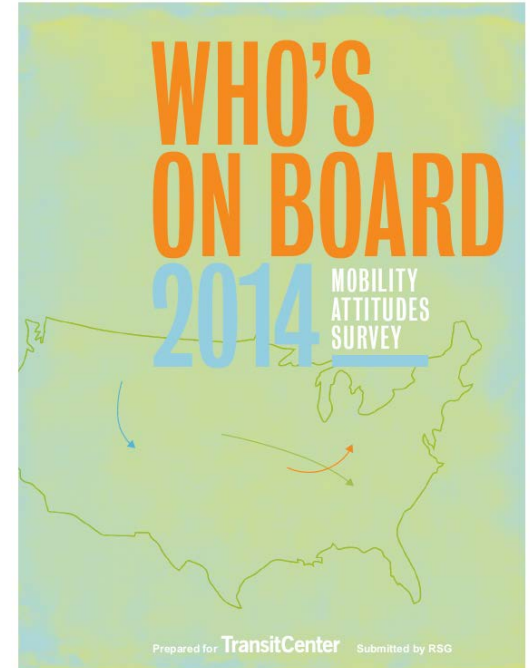
Matt will provide further discussion about some of the likely causes of those shifts....



Preferences and Attitudes of the Youth Market

- The NCHRP's study of preferences of the Youth Market is based on the 2014 TransitCenter survey.
- 11,000 participants from 46 metro areas
- Conducted by RSG, Inc.

See, "Who's on Board, Mobility Attitudes Survey" for more details about the survey.

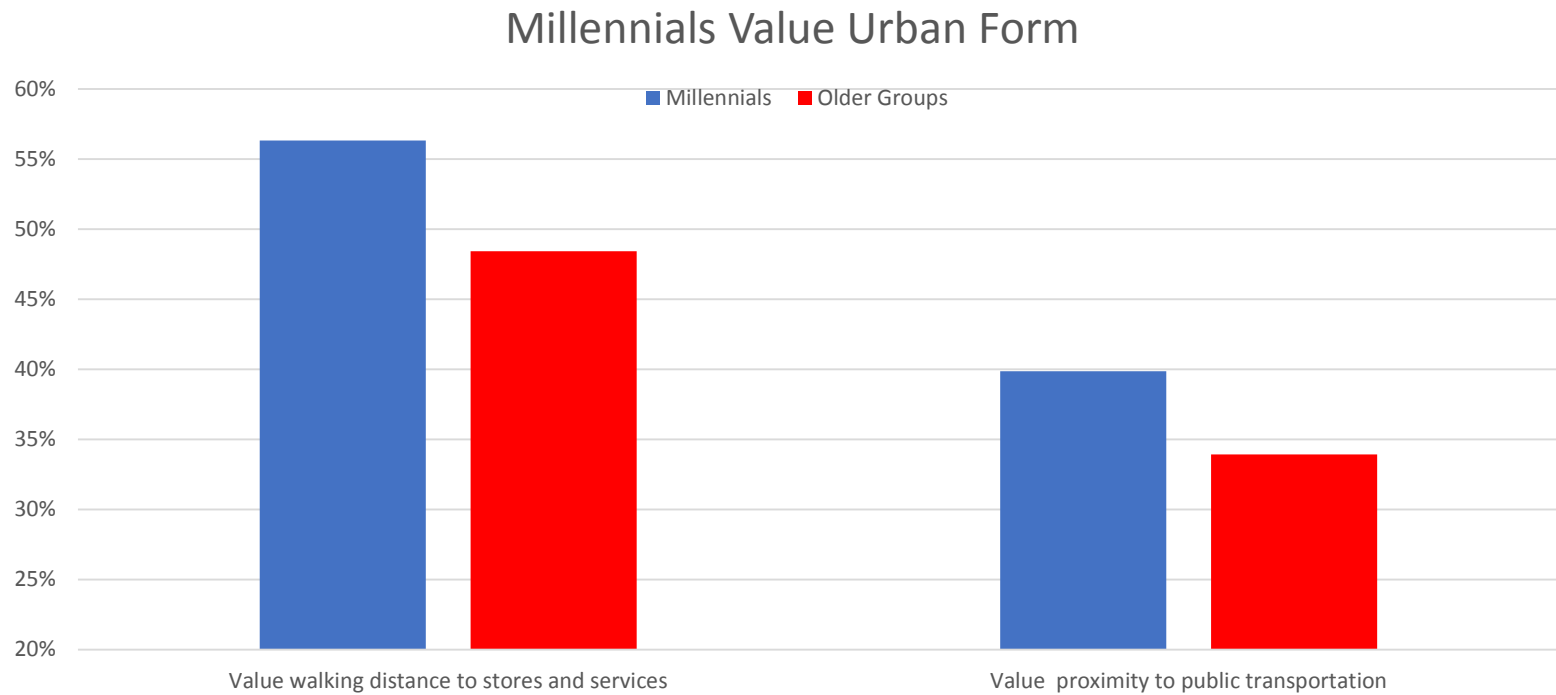


Attitudes Impacting the Future

- They have complex views about where they prefer to live
 - Higher preference for big city living than older groups
 - *But*
 - *Majority prefer to live in the suburbs for the child rearing years*
 - *Expect to like suburbs more as they age*



More than Older Groups, Millennials Value Urban Attributes

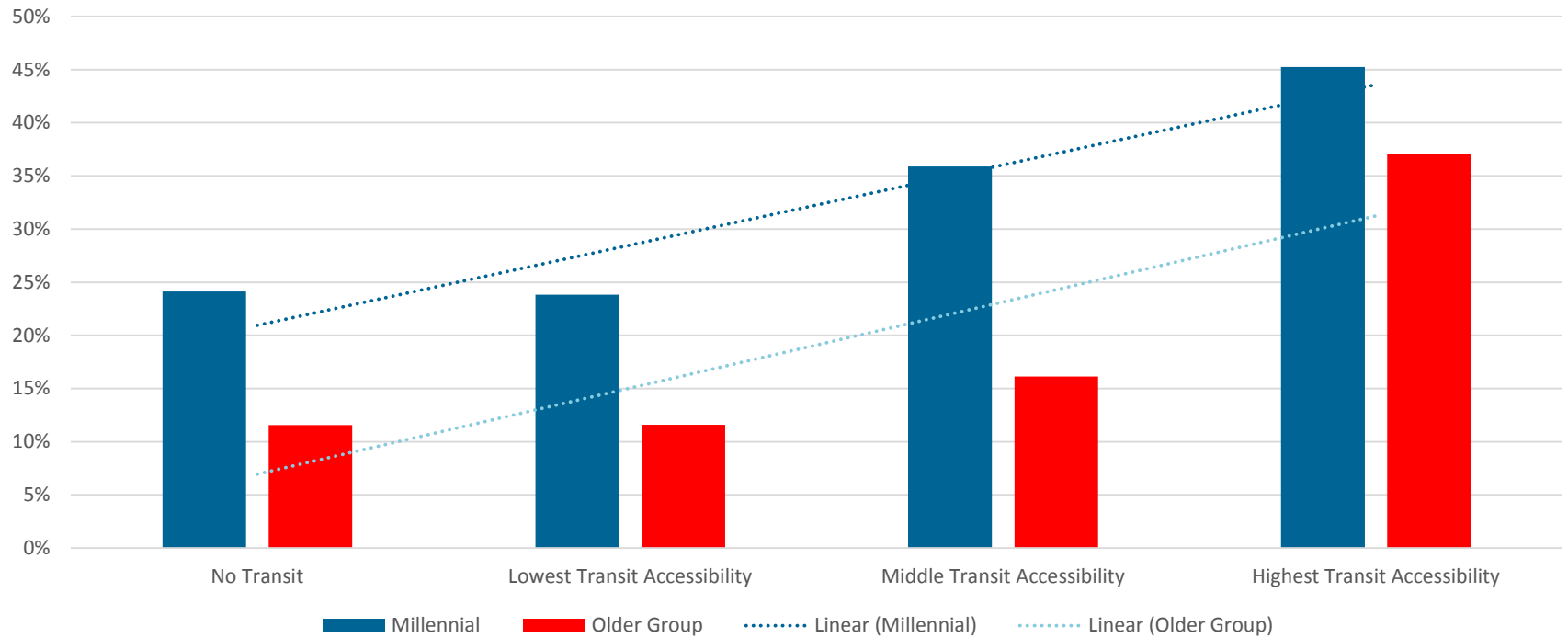


Source: RSG/ TransitCenter, 2014



More than Older Groups, Millennials Prefer 'Urban' as 'Ideal Location'

Urban is "Ideal Location" by Neighborhood Type

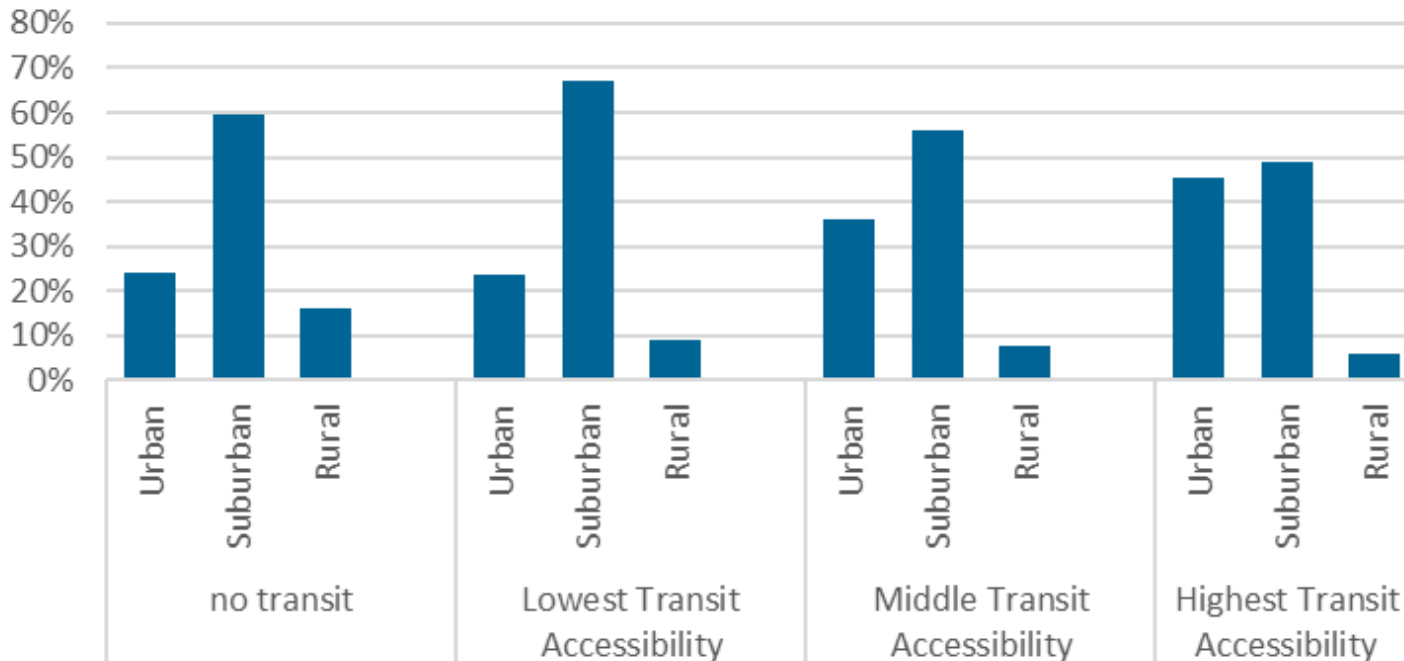


Source: RSG/ TransitCenter, 2014



But, Most Millennials Prefer the Suburbs as “Ideal Location”

“Ideal” Location, by Transit Accessibility, Millennial Group Only



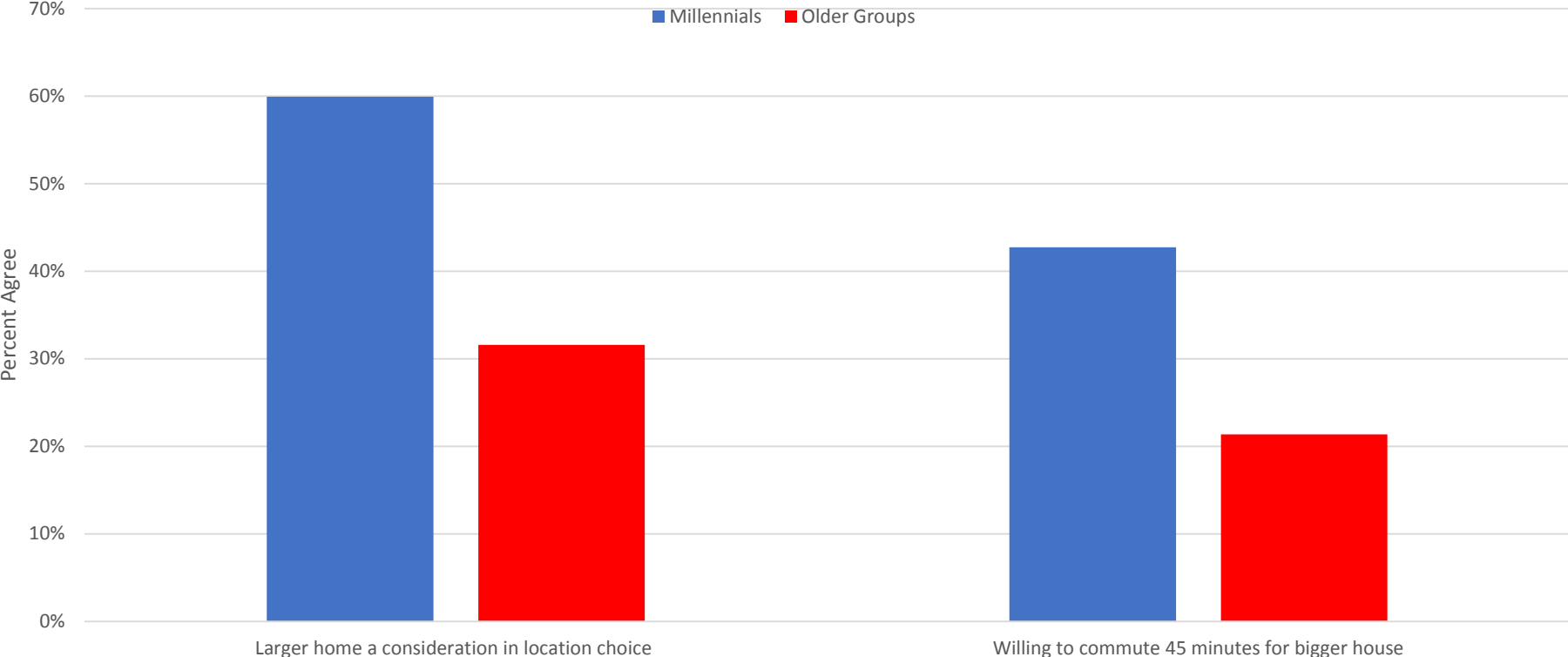
Suburbs ranked highest by Millennials for all neighborhood types

Source: RSG/ TransitCenter, 2014



Millennials Want Larger House More than Older Groups and Would Drive Farther to Attain It

Preference for Larger Home



Source: RSG/ TransitCenter, 2014



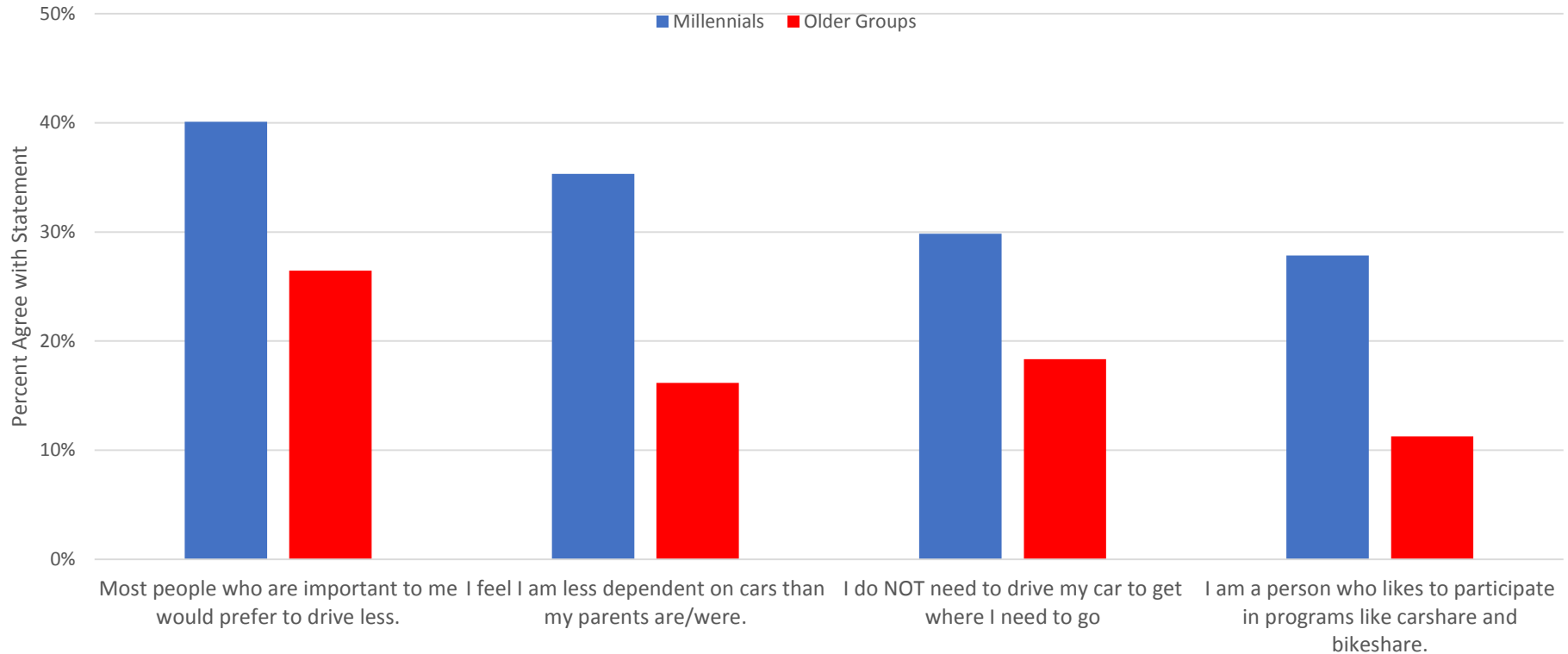
Age-based Differences in Preference-Orientation to the Auto

- Millennials are far more likely than older age groups to report being *less dependent* on cars than their parents were
- They like to share cars and bikes *more* than the older group.
- Millennials report *less* love for the freedom and independence from auto ownership than does the older group

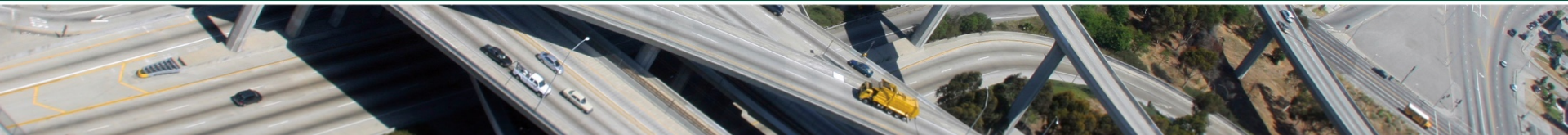


Millennials Report Less Auto-dependence than Older Groups

Lowered Auto Orientation

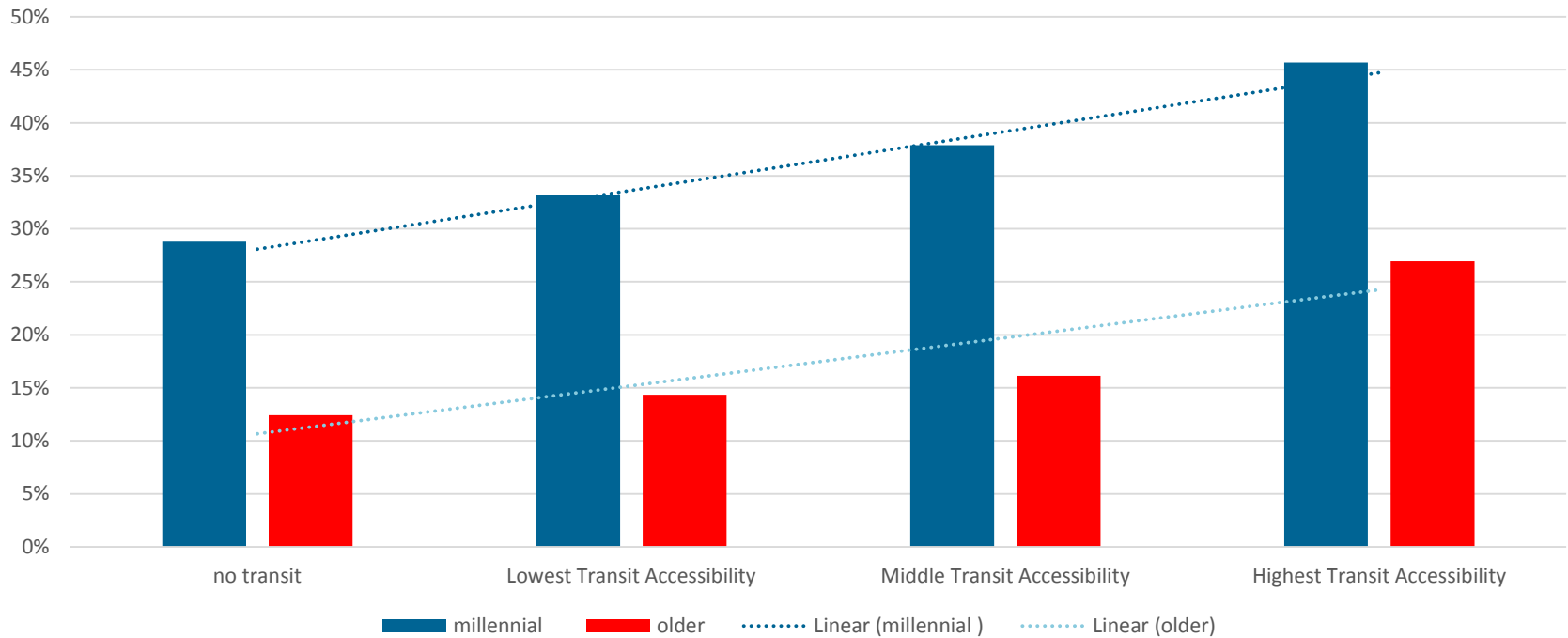


Source: RSG/ TransitCenter, 2014



Millennials More Likely than Olders to Report Less Dependence on Cars than Their Parents

I feel I am less dependent on cars than my parents are/were.



Source: RSG/ TransitCenter, 2014



Driving Less and Sharing More?

- Millennials have higher propensity *than older groups* to report that most friends would want to drive less
 - But,
 - *60% of Millennials do not report this*
- Millennials have higher propensity *than older groups* to like sharing...
 - But,
 - *70% of Millennials do not report this*



Interpreting the Attitudes of Millennials

- They have different preferences and attitudes towards transportation services than the older groups
 - More open minded about alternatives to automobile ownership
 - *But majority love the auto, and do not prefer to share or borrow*
 - *Expect to drive more as they age...*



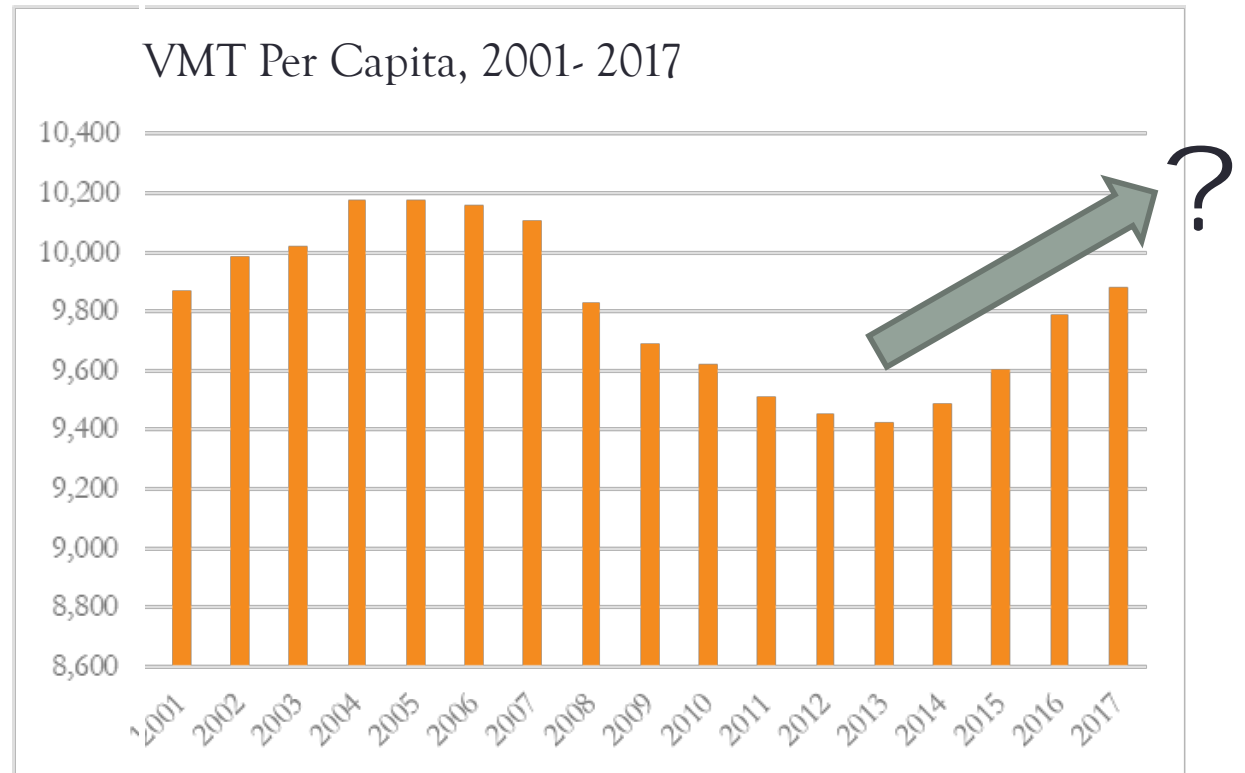
Implications for the Planning Profession?

- Millennial Generation preferences are more *pro-urban*, and less *auto-dependent* than the older groups...
- But, this should not be misinterpreted to suggest a reversal of dominant transportation preferences by this group
 - *Particularly* in terms of future location and future need for an auto-dependent lifestyle



Implications for the Planning Profession?

The analysis of the change in travel behavior should continue... given clear trends of recovery of trip generation rates



Source: FHWA, 2017 estimated



Research Proposed in this Report

Summarized from Page 74 of the NCHRP Report

- A major study of how demand for metropolitan auto travel *in the future* will be influenced by present youth market
 - a new survey on the relationship between attitudes/values and driving behavior,
 - advanced travel demand models specifically designed to incorporate such 'softer' variables as values, attitudes and preferences
 - a future scenario testing tool, to examine the relationship between alternative futures and the travel demand patterns associated with those scenarios.



Questions from the Webinar Participants?

- Back to Nancy



Today's Participants

- Nancy McGuckin, n_mcguckin@rocketmail.com
- Matthew Coogan, cooganmatt@aol.com
- Mark Bradley, Mark.Bradley@rsginc.com

Get Involved with TRB

- Getting involved is free!
- Join a Standing Committee (<http://bit.ly/2jYRrF6>)
 - Search for AFD50 (Standing Committee on Design and Rehabilitation of Concrete Pavements)
- Become a Friend of a Committee (<http://bit.ly/TRBcommittees>)
 - Networking opportunities
 - May provide a path to become a Standing Committee member
- For more information: www.mytrb.org
 - Create your account
 - Update your profile

97th TRB Annual Meeting: January 7-11, 2018

Take Part in the *Careers in Motion* Networking Fair



EVENT HOSTED IN PARTNERSHIP WITH:

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NEW

INDUSTRY EMPLOYERS AND WORKFORCE CHAMPIONS!

Join us at the **new** *Careers in Motion* Fair!

The *Careers in Motion* Fair is a networking event planned to support expansion of the multi-modal transportation workforce. The event will provide an opportunity for prospective employers from a wide range of sectors to meet with young to seasoned professionals interested in working for their organizations.

Event attendees will be conference registrants whose careers and professional interests span across multiple transportation-related disciplines. Hiring managers will be onsite to network and offer career information and advice. **TRB's Young Members Council will coordinate professional development programming and content.**

The *Careers in Motion* initiative helps serve the mission of TRB's new Diversity and Inclusion Task Force—to facilitate making diverse and inclusive involvement a core value for TRB staff, volunteers, contract awardees, projects, and the transportation communities TRB serves.

January 7, 2018 | 10:00 a.m. – 2:00 p.m. | Table Fee: \$1,250

Please contact Patrice Davenport at pdavenport@nas.edu

TRB TRANSPORTATION RESEARCH BOARD

<http://bit.ly/CareersInMotionFair>