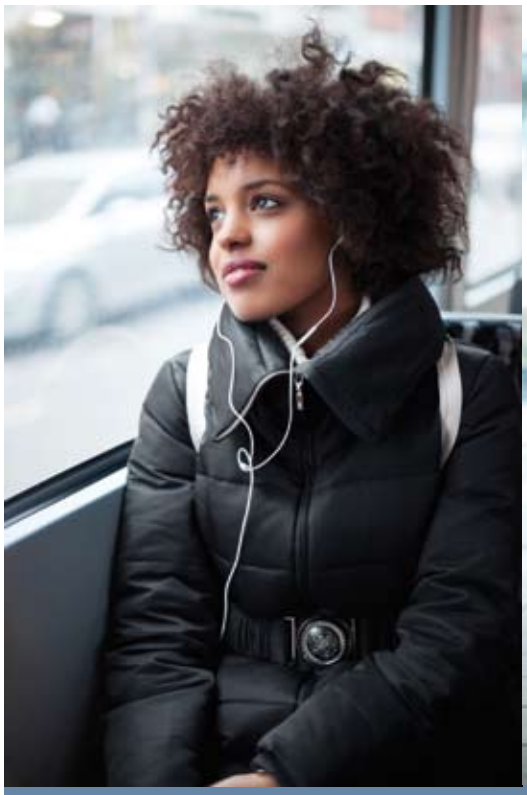

Millennials in Motion

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

ConnPIRG Education Fund

FRONTIER GROUP

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Executive Summary

Over the last decade—after 60-plus years of steady increases—the number of miles driven by the average American has been falling. Young Americans have experienced the greatest changes: driving less; taking transit, biking and walking more; and seeking out places to live in cities and walkable communities where driving is an option, not a necessity.

Academic research, survey results and government data point to a multitude of factors at play in the recent decline in driving among young people: socioeconomic shifts, changes in consumer preferences, technological changes, efforts by state governments and colleges to limit youth driving, and more.

Millennials (those born between 1983 and 2000) are the nation's largest generation, making their transportation needs particularly important. They have the most to gain or lose from the transportation investment decisions we make today, as they will be affected by those investments for decades to come. If Millennials drive fewer miles than previous generations as they age—and if future generations of young people follow suit—America will have an opportunity to reap the benefits of slower growth in driving. These include reduced traffic congestion, fewer deaths and injuries on the roads, reduced expenditures for highway construction and repair, and less pollution of our air and climate.

Several indicators—including continued decreases in per-capita driving across the whole U.S. population, the continued shift away from the use of cars for commuting by Millennials, and the consistency of Millennials' stated preferences for housing and transportation—suggest that it is unlikely that the trend toward less driving among Millennials during the 2000s has reversed thus far in the current decade. Moreover, many of the factors that have contributed to the recent decline in driving among young Americans appear likely to last. **Now is the time for the nation's transportation policies to acknowledge, accommodate and support Millennials' demands for a greater array of transportation choices.**

Millennials are less car-focused than older Americans and previous

generations of young people, and their transportation behaviors continue to change in ways that reduce driving.

- Between 2001 and 2009, the average number of miles driven by 16 to 34 year-olds dropped by 23 percent, as a result of young people taking fewer trips, shorter trips, and a larger share of trips by modes other than driving. Young Americans drive less than older Americans and use public transportation more, and often use multiple modes of travel during a typical day or week.

- In recent years, young people appear to have continued to shift away from driving:

    - Census data show that the share of 16 to 24 year-olds traveling to work by car declined by 1.5 percentage points between 2006 and 2013, while the share of young people getting to work by public transportation, on foot or by bicycle, or else working from home, had increased.

    - Young people aged 20 to 30 are less likely to move from central cities to suburbs than a decade ago.

    - Driver's licensing among young people has continued to decline. The percentage of high school seniors with driver's licenses declined from 85 percent to 73 percent between 1996 and 2010, according to the AAA Foundation for Highway Safety, with federal data suggesting that the decline has continued since 2010.

- Young people are not the only Americans who are driving less. The number of miles driven by the average American has declined nearly continuously since 2004. Americans now drive no more in total than we did in 2005 and no more on average than we did at the beginning of President Bill Clinton's second term in office.

There are many factors at play in the drop in driving among young Americans. Many of those factors—from high gas prices to tougher driver licensing laws—appear likely to last.

Socioeconomic shifts

- The Great Recession contributed to unemployment and falling incomes among young people. However, driving fell among both young people *with* jobs and those without during the 2000s, as well as among young people in households of various income levels, demonstrating that the decline in driving was caused by more than just the recession.

- Many of the driving-related socioeconomic changes linked to the recession—such as the increase in the number of Millennials "living in their parents' basements"—were already taking place for years or decades before the recession began, suggesting that a return to pre-recession patterns is not inevitable as the economy recovers.

    - Americans have been getting married later and having children later nearly continuously since the 1960s and have continued to do so during the first years of the recovery.

- While the number of young Americans living with their parents increased sharply during the Recession, the share of young people living in their parents' homes had been increasing even prior to the recession, and household formation among young people has remained slow during the recovery.

- Millennials reaching driving age today have no living memory of consistently cheap gasoline. Gasoline prices are projected to remain at historically high levels indefinitely, possibly leading Millennials to make long-term transportation and housing decisions that require less driving.

Lifestyle preferences

- Several studies have found a *generational cohort effect* among the Millennials—that is, today's young people drive less than previous generations of young Americans, even when economic and other factors linked to vehicle ownership or driving are taken into account.

- Millennials consistently report greater attraction to less driving-intensive lifestyles—urban living, residence in "walkable" communities, and openness to the use of non-driving modes of transport—than older generations.

Changing technology and transportation options

- The past decade has seen a technological revolution, with the widespread adoption of the smartphone and social media and, more recently, the creation of a wide variety of new technology-enabled transportation services, from bikesharing to real-time transit tracking apps.

- Young people have been the first to adopt many of these technologies and tools, and have been disproportionately attracted to alternatives such as bikesharing and "ridesourcing" (taxi-like services such as Lyft and Uber).

- Many of these technology-enabled services are relatively new and are currently in use by only a small percentage of people. But some (such as bikesharing and round-trip carsharing) have already been shown to lead to reductions in driving and vehicle ownership. Together, they could lay the groundwork for a new model of mobility that is less dependent on private car ownership.

Other steps that discourage driving

- Graduated driver licensing requirements adopted in recent years by state governments have likely played a small but important role in causing young people to delay or forgo getting a driver's license, potentially encouraging Millennials to develop less car-dependent transportation habits that they may carry with them as they age.

- Many colleges and universities have put in place deliberate strategies to reduce the number of students with cars on campus. With roughly 40 percent of 18 to 24 year-olds enrolled in higher education, such measures might play a role in reducing youth driving. They may also help young people to develop transportation habits that they carry with them after college.

The time has come for America to rethink its transportation investments to accommodate and encourage the Millennial generation in its desire for less car-intensive lifestyles. Policy-makers should:

- Factor lasting changes in driving habits among young people into transportation planning, starting now, to ensure that transportation investments serve the needs and desires of Millennials both today and in the decades to come.

- Incorporate uncertainty into transportation planning through the use of scenario analysis and other tools that ensure transportation investment decisions are consistent with the possibility that driving will continue to stagnate.

- Take advantage of the opportunity presented by Millennials' changing transportation preferences by expanding access to an array of transportation options, including public transportation, bicycling and walking. Reducing vehicle travel this way will save money by heading off the need to spend money on highway expansion, which currently costs the nation about $27 billion per year. Doing so will also ease congestion, reduce emissions of pollutants that harm public health and alter the climate, and save lives through avoided vehicle crashes.

For these reasons, *America should not just accommodate Millennials' desire to drive less, but actively encourage it.* Cities across the nation are leading the way by expanding public transportation options, building new bicycle and pedestrian infrastructure, and opening the doors for an array of innovative new technology-based transportation services. State and federal governments should assist and promote those efforts, while changing transportation policies and investment strategies that undermine the development of walkable communities with access to a variety of transportation choices.

Introduction

Over the last four years, there has been an explosion of interest in the Millennial generation and its changing relationship to driving. Since the first media stories describing the decline in car use among young people appeared in 2010,[1] there have been conferences, academic studies, frantic market research by automakers, and surveys of young people themselves, all aimed at getting to the bottom of two questions: Why are today's young people driving less than those of previous generations? And will those changes last?

The answers to those questions are critically important for shaping policy to serve the transportation needs of Millennials today and to make smart investments in transportation for the future.

There remain many unanswered questions about why Millennials are driving less than previous generations of young people. But in recent years a few things have come into clearer focus:

- The Millennials really are different—both from older generations alive today and from previous generations of young people.
- Multiple external factors are pushing Millennials to drive less. Some of those factors are temporary, but many are likely to last.
- The dip in driving among young people that took place in the 2000s is unlikely to have reversed thus far in the new decade.

The case for taking Millennnials' changing transportation habits seriously—and for beginning to factor those changes into public policy—is stronger than it was four years ago. As the United States deals with a shrinking pool of transportation funding, the growing need for maintenance and repair of our existing systems, and

The case for taking Millennnials' changing transportation habits seriously—and for beginning to factor those changes into public policy—is stronger than it was four years ago.

rising demands for more transportation choices, it is critical that public leaders understand those changes and factor them into transportation investment and policy decisions.

This paper—an update of the authors' 2012 report on changing driving trends among Millennials, *Transportation and the New Generation*—summarizes the growing body of knowledge about the changes that have occurred in young Americans' transportation attitudes and behaviors over the past decade. It is intended to help policy-makers and the public make better informed and more responsive transportation decisions.

The changing preferences and habits of the Millennial generation provide a golden opportunity to address many long-standing transportation problems, from traffic congestion to oil dependence and from car crashes to air pollution. The time has come for the United States to take advantage of that opportunity by shifting our transportation priorities in ways that provide a broader range of choices to Millennials and all Americans.

Regional Transit System (RTS) for the City of Gainesville, Florida

Who Are the Millennials and Why Do they Matter?

The Millennials—defined here as those Americans born between 1983 and 2000—are the largest generation in the United States.[2] Currently ranging in age from young teenagers to adults in their early 30s, the characteristics and preferences of the Millennials have been studied extensively by academics and market researchers and debated widely in the popular media.

While the transportation needs and desires of all generations of Americans are important for policy-makers to understand, the preferences and behaviors of the Millennials are particularly critical to grasp, for several reasons:

- **Millennials have present-day transportation needs that must be met.** Young Americans have specific transportation needs and preferences distinct from those of older Americans—needs that often receive less attention from policy-makers than the traditional need to address rush-hour highway congestion. By understanding what Millennials want from the transportation system and how they use it, policy-makers can ensure that the needs of young people are taken into account in transportation planning and policy-making.

- **How Millennials behave now may provide clues about how they will behave in the future.** The oldest Millennials are just a few years away from entering their peak driving years—the period from roughly age 35 to 55 that is the peak period for employment and child-rearing and, by extension, the period during which people make the greatest use of the transportation system. Millennials will almost certainly drive more miles per person as they age than they do today. The key question for transportation planning, however, is whether Millennials will drive more or less than their parents did at the same age.

- **How Millennials behave now may provide clues about how future young people will behave.** Millennials' transportation behaviors may be shaped by economic or other forces

that will also affect future generations of young people. Understanding those forces can provide important clues about future transportation needs.

- **Millennials have been early adopters of new technologies and practices.** From social media to bikesharing, young Americans have consistently been the first to embrace new technologies and tools with the potential to shape transportation behaviors. By studying how Millennials' behavior is affected by those new tools, we might learn about their effects once they are adopted by the broader population.

In this report, we summarize research on Millennials' present-day transportation attitudes and behaviors, the degree to which those behaviors differ from those of older Americans and those of previous generations, the external forces—many of them likely to last—that have helped shape their transportation choices, and the emerging role of new technologies.

The key question for transportation planning is whether Millennials will drive more or less than their parents did at the same age.

Millennials' Transportation Behaviors Differ from Those of Other Americans and from Prior Generations

Millennials use the transportation system differently than other Americans, relying less on cars and more on transit and biking, and frequently using multiple modes of travel as opposed to relying on a single mode. There is evidence that Millennials drive less than previous generations of young people—part of a broader shift in transportation patterns away from the steady increases in vehicle travel that characterized America's late 20th century Driving Boom.

Millennials' Daily Lives Are Less Car-Centered than Those of Older Americans

Young Americans experience different day-to-day transportation realities than other generations. Young Americans in the Millennial generation are:

- **Less dependent on cars.** When it comes to commuting to work or school, 77 percent of Millennials travel via car, compared with 92 percent of Generation Xers and 90 percent of Baby Boomers, according to a 2013 survey by the Urban Land Institute (ULI). The survey found that 10 percent of Millennials use cars, trucks or motorcycles less than once a week, compared with 5 percent of Generation X and 6 percent of Baby Boomers.[3]

- **More likely to use transit and active transportation.** The ULI survey found that 20 percent of Millennials take public transit once a week or more, compared with 7 percent of Generation Xers and 10 percent of Baby Boomers. A 2014 survey by TransitCenter found that those under 30 used transit roughly two to three times more frequently than those aged 30 to 60 in every region of the country.[4] Nearly one out of five Millennials (19 percent), according to the ULI survey, bikes at least once a week, compared with 16 percent of

Generation X and 12 percent of Baby Boomers.[5] (See Figure 1.)

- **Likely to be multimodal.** Millennials also have a propensity to combine several modes of transportation over the course of a day or a week. According to a survey of Millennials in six urban areas, 69 percent of respondents said they use multiple transportation modes to reach a destination at least a few times per week. Millennials in these cities average three modes per trip.[6] (Comparative statistics for older generations are unavailable.)

Millennials Are Less Car-Focused than Previous Generations of Young People

Millennials drive less and use transit and active modes of transportation more than previous cohorts of young people.

Between 2001 and 2009, according to the National Household Travel Survey—the federal government's periodic, detailed survey of transportation behavior in the United States—the average number of vehicle-miles traveled by young people

Figure 1. Millennials' Day-to-Day Transportation Experience Differs from Other Generations[7]

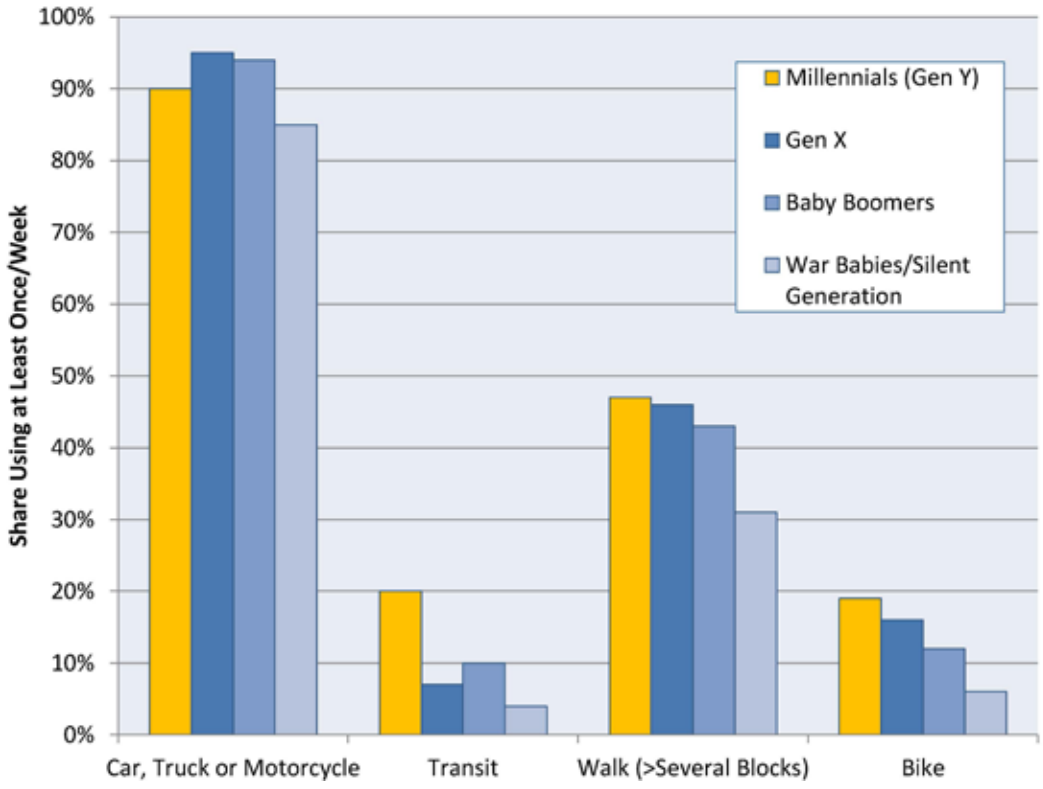
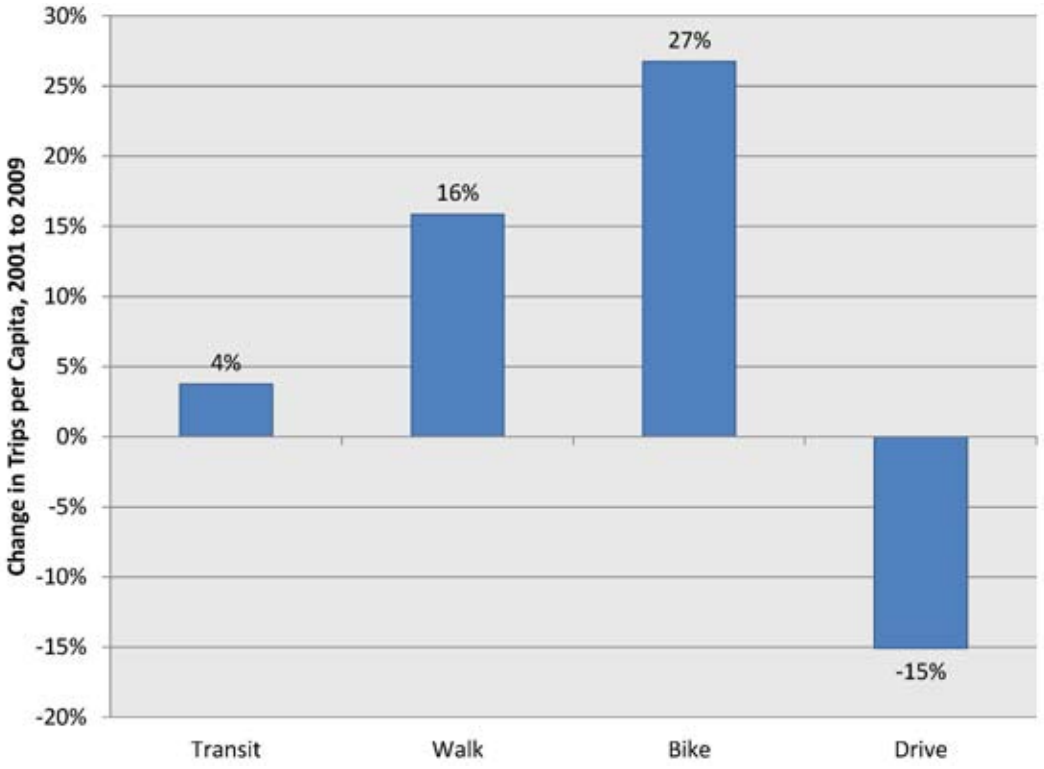


Figure 2. Change in Number of Trips per Capita among 16 to 34 year-olds, 2001 to 2009[12]



(16 to 34 year-olds) decreased from 10,300 miles to 7,900—a drop of 23 percent.[8] The decline in driving among young people resulted from several changes in transportation behavior):

- *Fewer car trips*: In 2009, young drivers took 15 percent fewer trips than young drivers took in 2001.[9]

- *Shorter car trips:* In 2009, the average trip length traveled by young drivers was 9.5 miles—a 6 percent drop from 10.1 miles, the average trip length in 2001.[10]

In addition, young Americans took more trips via non-driving modes of transportation. In 2009, 16 to 34 year-olds took 4 percent more transit trips per capita, 16 percent more walking trips and 27 percent more biking trips per capita than they did in 2001.[11] (See Figure 2.)

The decline in driving has been steepest among young American men—a common feature of the decline in per-capita driving in several nations over the last decade.[13] The average number of miles driven by 16 to 34 year-old men fell by 29.5 percent between 2001 and 2009, compared with a 13.4 percent decline among women.[14]

Young people are not only driving less, but fewer of them are driving at all. A study by researchers at the University of Michigan, citing Federal Highway Administration (FHWA) statistics, found that the proportion of 19 year-olds holding drivers licenses fell from 87 percent in 1983 to 70 percent

in 2010.[15] Other sources point to similar trends. A paper by the AAA Foundation for Traffic Safety reported that "periodic national surveys of high school seniors show a downward trend in licensing rates." In 1996, 85 percent of seniors reported having a license, compared with only 73 percent in 2010.[16]

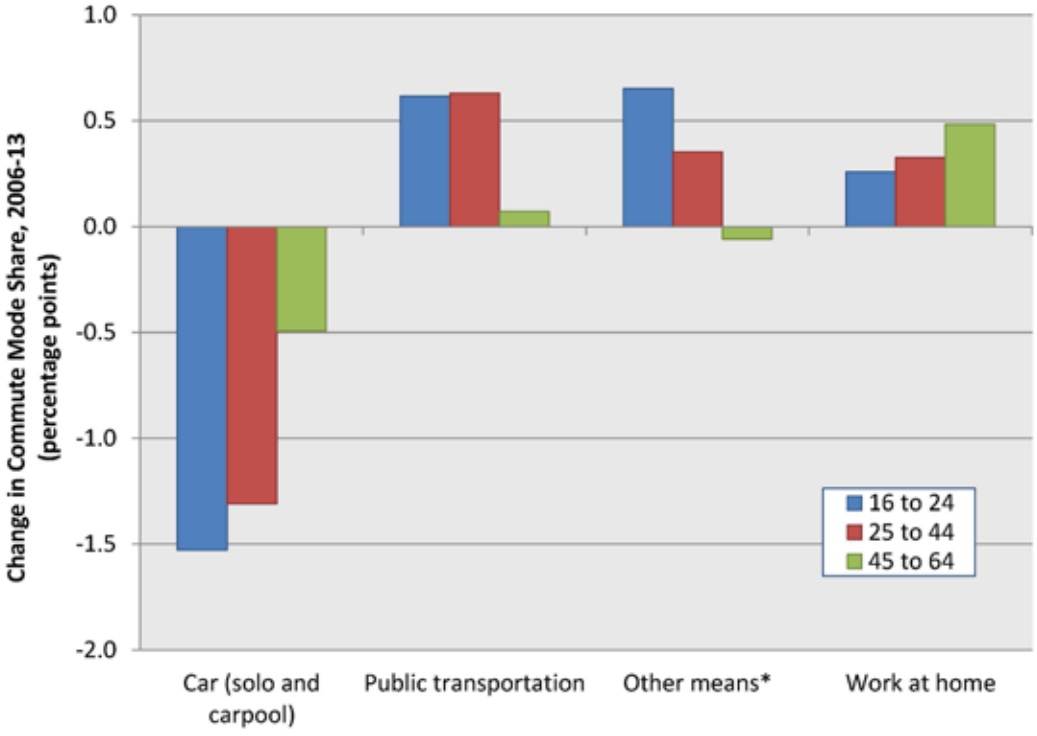
Millennials' Transportation Behaviors Continue to Change

The lack of a continuous national travel survey in the United States makes it impossible to estimate the change in the number of miles driven by young drivers since 2009. However, there are several indications that today's Millennials continue to drive less than previous generations of young Americans:

- Data from the Federal Highway Administration show that the number of 19 year-olds with driver's licenses has continued to fall, to 68 percent in 2012.[17]

- Young people continue to experience the greatest changes in their choice of commuting modes. Between 2006 and 2013, the percentage of commute trips undertaken by car (both alone and by carpool) by 16 to 24 year-olds dropped by 1.5 percentage points. By contrast, car commuting dropped, as a percentage of commutes, by 1.3 percentage points among 25 to 44 year-olds and by 0.5 percent-

Figure 3. Change in Commute Mode Share, 2006 to 2013, by Age Group[19]



* "Other means" includes walking, taxicab, motorcycle, bicycle or other unspecified means.

age points among those 45 years old and older. (See Figure 3.) About one-third of the decline in car mode share among 16 to 24 year-olds (0.5 percentage points) occurred between 2009 and 2013.[18]

- Areas with large youth populations have tended to experience greater changes over the last several years. College towns have consistently led the list of cities that have experienced the greatest surge in bicycle commuting since the mid-2000s.[20]

- Millennials aren't moving from cities to suburbs the way that previous generations did, a change with implications for the number of miles they drive. As has been the case for decades, more people of every age group continue to migrate from central cities to suburbs than vice versa (with cities continuing to grow as a result of migration from rural areas and abroad and natural increase—a greater number of births than deaths).[21] In 2012-13, 20 to 29 year-olds were less likely to move from city to suburb than vice versa than in any individual pair of years for which the Census Bureau has data since at least 1998.[22]

Millennials Have Led a Broader Shift in Transportation Behaviors among Americans

While young Americans have experienced the greatest changes in their transportation habits over the last decade, they are not the only ones who are driving less and using other modes of transportation more. The change in transportation behaviors among Millennials is part of a larger shift taking place across America as a whole.

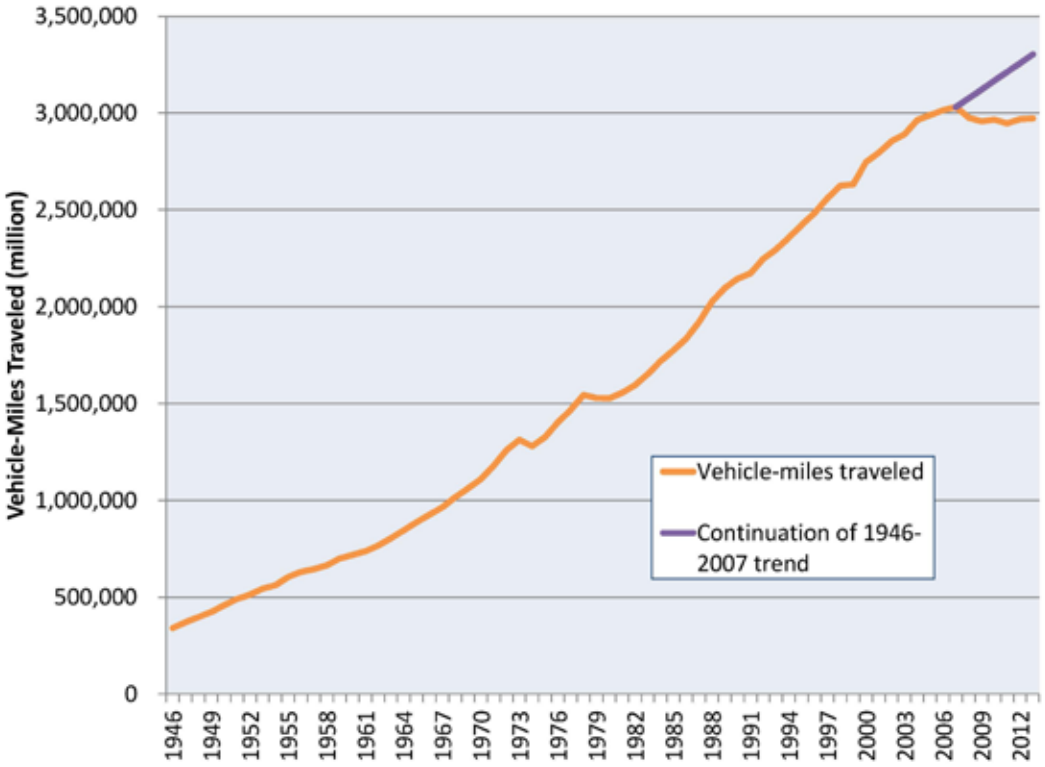
The past decade has seen the end of the "Driving Boom"—the era of steady, rapid growth in vehicle travel in the United States. Americans now drive no more miles in total each year than we did in 2005, and no more on average than we did at the end of Bill Clinton's first term as president.[24] (See Figure 4, next page.) In 2013, Americans drove 330 billion fewer miles—about 10 percent less—than they would have if the trends that prevailed from 1946 until 2007 had persisted. A smaller percentage of Americans is licensed to drive than in 2008.[25]

While most parts of the country have seen a decline in per-capita driving,[26] some areas saw driving peak earlier—and fall faster—than others. In Oregon, total vehicle-miles traveled (VMT) peaked in 2004 (as opposed to in 2007 nationally) and VMT per capita peaked in 1999 (as opposed to 2004 nationally).[27] And in Washington state, according to Federal Highway Administration data, per-capita VMT peaked back in the early 1990s.[28]

Some cities that have prioritized alternatives to driving have seen particularly steep declines in driving. In Portland, Oregon, a city that has long been committed to compact development and investments in transit and bicycling, VMT per driver declined 19 percent—from 21.1 to 17.1 miles per day—between 1994 and 2011.[29] In the Twin Cities of Minnesota, long ranked among the top cities for bicycling and the site of major recent investments in transit, the number of car trips decreased from 7.7 million to 6.3 million from 2000 to 2010.[30]

While cutting back on driving, Americans are increasing their use of other transportation modes. Public transportation ridership increased by 8 percent between 2005 and 2012—a period when VMT was

Figure 4. Vehicle-Miles Traveled in the United States[23]



essentially flat.[31] During roughly the same period, data from the U.S. Census Bureau's American Community Survey show increases in the share of Americans traveling to work via transit or bicycle, or on foot, as well as working from home.[32]

Recent local and state travel surveys show similar results.[33] The California Household Travel Survey found that walking, biking and public transportation more than doubled as a share of total trips from 11 percent to 23 percent between 2000 and 2010.[34] In Portland, Oregon, the mode share for walking and biking has increased from 2.9 percent to 4.2 percent from 1994 to 2011. And in the Twin Cities, transit trips increased as a percentage of all trips from 2.5 percent to 3.2 percent between 2000 and 2010.[35]

Meanwhile, the nation has seen a shift in residential patterns toward cities. In 2011, for the first time in more than nine decades, America's cities added population more quickly than their surrounding suburbs.[36] Central cities have continued to grow at rates rivaling or surpassing suburbs in the years since, an indication of the rapid resurgence of city living in some parts of the country.[37] During the 2000s, the core downtown areas of cities in large metropolitan areas (those with more than 2.5 million people) grew in population, with double-digit growth in the core areas of the largest metropolitan areas.[38]

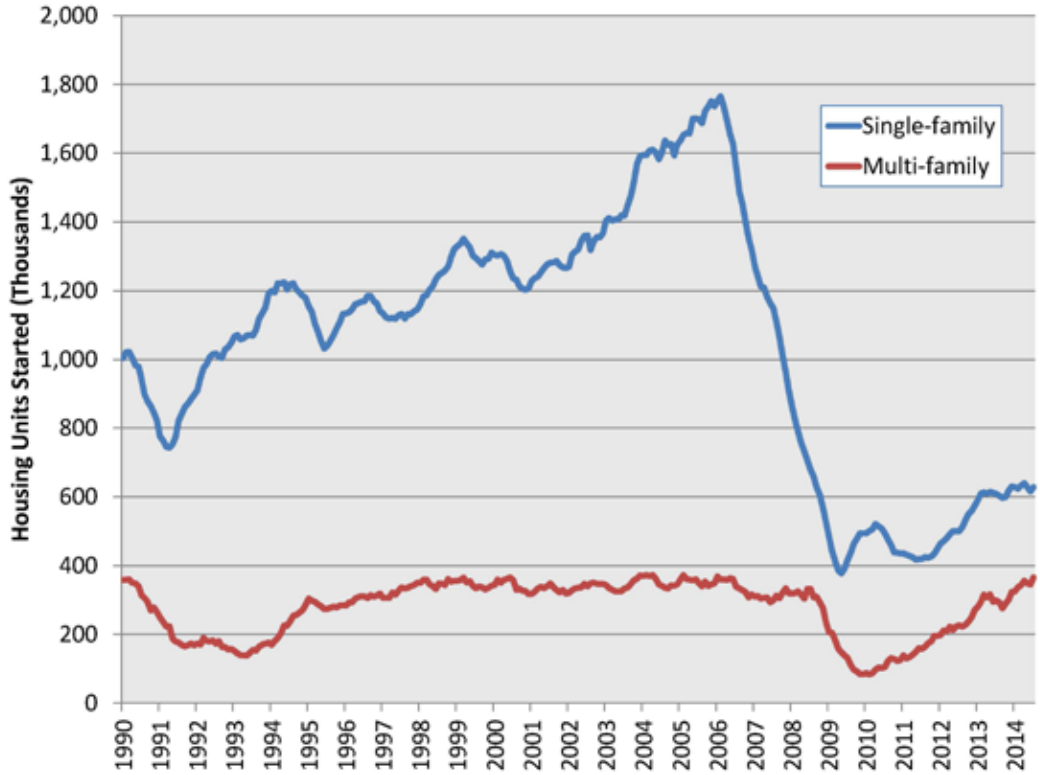
In part as a result of the enduring hangover from the late 2000s housing market collapse and the effects of demographic shifts,[39] the nation has seen a sea change in the types of

new housing being built. As of mid-2014, builders were constructing as many units of housing in multi-family buildings as they did prior to the Great Recession, but single-family housing starts remain mired well below the levels of construction typical of the 1990s and early 2000s.[40] An analysis of housing trends by the Kansas City Federal Reserve Bank concluded that construction of multi-family homes will likely continue to accelerate faster than construction of single-family homes.[41]

Much of this new multi-family housing is being built as "infill" in already developed areas, as opposed to in sprawling new communities on the metropolitan outskirts where people tend to drive more because destinations tend to be far apart and, often, few other transportation options exist. Between 2005 and 2009, three-fourths of large metropolitan regions saw a rise in infill housing development as compared to 2000-2004.[43]

The downtown areas of major cities have seen particularly rapid development. The population living within one mile of the nation's 10 most populous downtowns increased by 17 percent during the 2000s, nearly twice the rate of U.S. population growth.[44] Even cities that have struggled with overall population loss—such as Cleveland and Detroit—have experienced population growth in downtown areas, often led by young adults.[45]

Figure 5. Single-Family vs. Multi-Family Housing Starts (Six-Month Average, Seasonally Adjusted)[42]



The Millennial generation is not only less car-focused than older Americans by virtue of being young, but they also drive less than previous generations of young people.

Young Americans inhabit a day-to-day transportation reality different from those of older Americans. They use transit and active modes of transportation like biking and walking more and cars less. The Millennial generation is not only less car-focused than older Americans by virtue of being young, but they also drive less than previous generations of young people. Based on the numerous sources cited above, Millennials' transportation behaviors continue to change in ways that would suggest continued reductions in their reliance on cars and driving. Millennials have been contributors to, and leaders of, a broader trend away from steady increases in vehicle travel—a break from more than 60 years of steady increases in driving during America's "Driving Boom."

Why Millennials Are Driving Less

The world experienced by young people has changed dramatically in the last decade. Technologies and services that were virtually unheard of a decade ago—from smartphones and social media to carsharing and bikesharing—have become central to many young people's day-to-day lives. Higher prices for gasoline, more rigorous standards for driver licensing, and efforts by colleges and universities to discourage driving on campus have made it more costly and less convenient for young people to buy, own and operate vehicles. The Great Recession damaged the short- and long-term economic prospects of a generation of young people and fed a variety of trends—from later marriage and childbirth to rising student loan burdens—that had been gathering momentum for years or decades.

Since the publication of our 2012 report, *Transportation and the New Generation*, a great deal of research has sought to determine which of these factors have contributed to the recent decline in youth driving. In this section, we review much of that research. In the next section, we discuss the implications for the future.

Socioeconomic Changes

The 2007-2009 recession was the defining economic event in the lives of the Millennial generation, contributing to high youth unemployment,[46] delayed household formation,[47] and financial strain that rendered home and vehicle ownership unaffordable for many young people. The Great Recession struck at a time when many young people were already financially reeling from rising student debt.[48]

America's economy finally appears to be improving, including for young people.[49] But that does not necessarily mean that Millennials will revert to the driving habits of previous generations. Many of the socioeconomic trends attributed to the recession—from increased enrollment in higher education to an increase in the share of young people living in multi-generational households (e.g., "sleeping in their parents' basements"[50])—have been building for decades. Other shifts experienced by Millennials—such as higher gas prices—are unlikely to change in the long run. Moreover, the habits formed and coping mechanisms used by young people

during the Great Recession may have lasting effects on their behavior.

In addition, several researchers have identified a *generational cohort effect* in transportation behaviors among the Millennials—that is, they have found that Millennials are driving less for reasons that cannot be fully explained by economics or other factors typically associated with vehicle ownership and travel.

All of this suggests that any resurgence in driving among young Americans during the economic recovery could be slow, if it occurs at all.

It's Not Just the Economy

The Great Recession played a significant role in the decline in driving that has occurred over the last decade, but it is far from the only cause. Driving declined among young people for reasons that cannot be fully explained by the economic recession.

While the recent recession caused particularly steep increases in youth unemployment, and those without jobs drive less than those who are employed, the states and urban areas that experienced the biggest increases in unemployment during the recession were generally *not* those that experienced the greatest declines in VMT.[51] Moreover, between the recession years of 2001 and 2009, per-capita driving declined by 16 percent among 16 to 34 year-olds *with jobs*. This decline in driving among both employed and unemployed young people—coupled with the fact that per-capita driving in the United States as a whole began to fall in 2004, well before the onset of the Great Recession—suggests that much more than the recession was at play.[52]

And, indeed, several researchers studying changes in youth driving behaviors have found that the economy and other factors traditionally associated with vehicle use cannot explain the entire shift in transportation behavior among Millennials:

- While the economy played a major role in the decline in youth driving, according to researchers at the University of California, Los Angeles, today's young people are driving less than previous generations did at their age, even when economic factors are taken into account.[53] The researchers found that "the youngest cohorts … appear to be making somewhat fewer trips (-4%) and traveling considerably fewer miles (-18%) than was the case for previous generations at the same stage in their lives, all else equal."[54]

- A study by researchers at McGill University of transportation trends in Montreal found that recent cohorts of young people were more likely to take public transportation than previous generations, even after other factors known to influence transit use are taken into account.[55]

- A report by TransitCenter found that those under age 30 who are parents of school-age children are more likely to take transit than parents over age 30, even when household income is taken into account. The researchers concluded that "this is evidence of a true change in attitudes toward public transportation."[56]

- Even a study by the Highway Loss Data Institute that largely attributed the decline in youth driver "exposures" (number of young drivers with auto insurance) to unemployment found that a small portion of the decline in teen driving between 2006

and 2012 could not be explained by the factors studied, which included changes in youth unemployment, graduated driver licensing laws (see page 26), and population.[57]

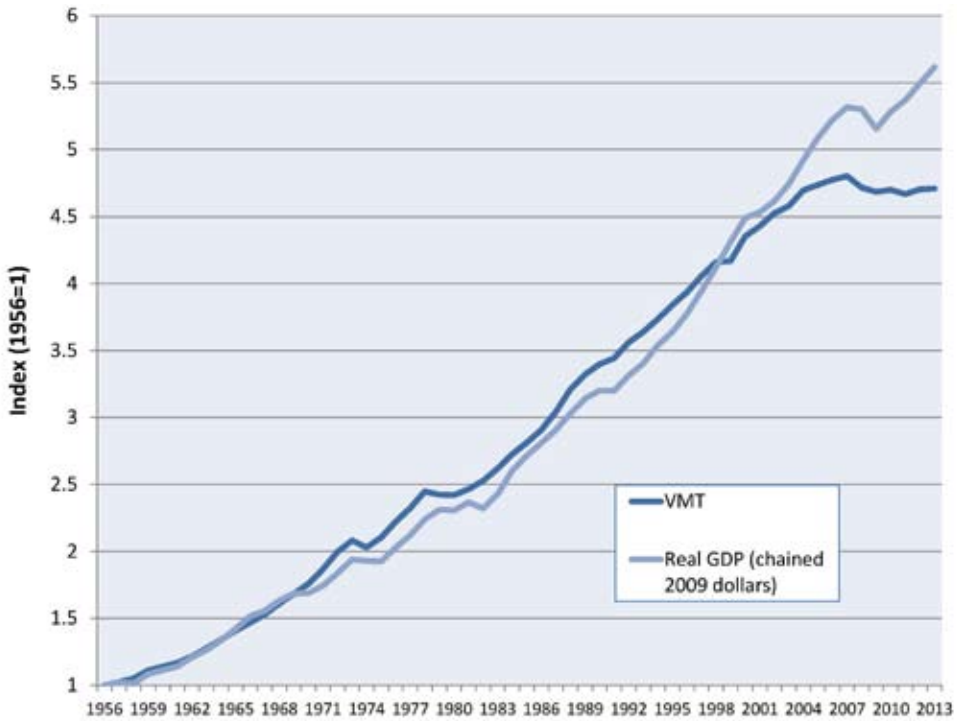
These data—along with the continued fall in per-capita driving among Americans in general since the economic recovery that began in 2009—suggest that the economic turmoil caused by the recession was not

Diverging Trends in Economic Growth and Growth in Driving

For decades, economic growth (as measured in gross domestic product, GDP) and growth in the number of miles driven on American roads moved upwards in lockstep. (See Figure 6.) Since the beginning of the 21st century, however, the trends have diverged—while real (inflation-adjusted) GDP increased by 6 percent between 2007 and 2013, total VMT declined by about 2 percent.[58]

A return to robust economic growth may yet result in a resurgence in driving among young people and Americans as a whole. But the economy has technically been in recovery for five years and no such resurgence has yet occurred.

Figure 6. Trends in Growth of Real Gross Domestic Product and Vehicle-Miles Traveled[59]



the only cause of the fall in driving among young people.

Changing Timing of Life Stages

One way in which the Great Recession may have affected youth driving is by discouraging young people from making life changes that are traditionally associated with increased levels of driving, such as entering the workforce, forming new households, and having children.

European researchers have explored the implications of changing timing of life stages on declines in youth driving there, which mirror those in the United States. German researchers have found that recent socioeconomic changes in the lives of young people—including reductions in income, increases in the number of young people enrolled in higher education, increased residence in metropolitan areas, and an increase in single-person households, which are less likely to own vehicles—account for about two-thirds of the reduction in car ownership that has occurred there in recent years. Similar socioeconomic factors have been responsible for about one-third of the drop in vehicle ownership among young people in Great Britain.[60] Dutch researchers have hypothesized that delays in the achievement of life stages could be responsible for the bulk of the decline in youth driving in the Netherlands, and have suggested that the result might not be a reduction in the number of miles driven by Dutch youth over their lifetimes, but rather a delay in when that driving occurs to later in life.[61]

The German and British studies—as with the studies of changes in youth driving in North America—find that there is a significant share of the recent decline in youth driving that cannot be explained by these factors. But changes in the timing of life stages have likely contributed to the decline in driving among Millennials.The Great Recession led to a dramatic drop in the rate at which young people—aged 18 to 34—formed new households.[62] However, several of these shifts in life stages are actually longer-term trends that were accelerated, not initiated, by the economic downturn.

- **Delayed or forgone marriage** – The estimated median age at first marriage increased from 27.5 years old to 29 years old among men, and from 25.6 to 26.6 years old among women between 2007 and 2013. However, delays in marriage are nothing new; Americans have been getting married later on a nearly continuous basis dating back to the mid-1960s.[63] Young Americans are also forgoing marriage to a degree unknown to their parents' generation. By 2010, 28 percent of U.S. adults had never been married, compared with 15 percent in 1960.[64] And by 2014, fewer than half of U.S. adults were currently married, the lowest percentage in the history of government record-keeping and far lower than the 72 percent of Americans who were married in 1960.[65]

- **Delayed childbirth** – The average age of first-time mothers increased from 25 years old in 2006 to 25.8 years in 2012. Again, however, the trend toward later childbirth is one of long standing: in 1970, the age of the average first-time mother was 21.4 years.[66]

- **College enrollment** – The percentage of 18 to 24 year-olds enrolled in undergraduate or graduate study has also been rising for years—between 2001 and 2011, the number of full-time college students increased by 38 percent while the traditional college-

age population of the U.S. increased by only 11 percent.[67]

The decision to enroll in college may have effects that last beyond graduation. The average amount of student loan debt borne by graduates of public colleges increased by 35 percent between 2001-02 and 2011-12.[68] Research has found that student loan debt has a significant impact on young people's decisions to live with parents and on homeownership rates among young people.[69]

- **Residence in parent's home** – One of the most publicized effects of the Great Recession has been increased residence of Millennials in their parents' homes. And, indeed, the share of young people living in their parents' homes did increase sharply during the Recession. Again, however, the increase in the share of young people living with their parents was an extension of a previous trend, not a new trend initiated by the recession. Among 18 to 34 year-olds, the percentage living in their parents' homes had already been increasing between 2000 and 2006, before the recession began.[70] And the share of both 18 to 24 year-olds and 18 to 34 year-olds living in the parental home had increased between 1960 and 2000.[71]

The Great Recession undoubtedly resulted in significant declines in household formation among young people—declines that likely inhibited many Millennials from achieving life stages typically associated with more driving. As the economy improves, some Millennials who delayed marriage, childbirth or the establishment of an independent household will likely take those steps. However, in many cases, the Great Recession accentuated trends that had already been in place for decades. As a result, the ongoing economic recovery may not result in a full "reset" to pre-recession patterns of household formation.

Indeed, homeownership rates and head-of-household rates for young people have continued to *decline* since the end of the Great Recession, suggesting a slow return to previous patterns of homeownership and household formation among young people.[72]

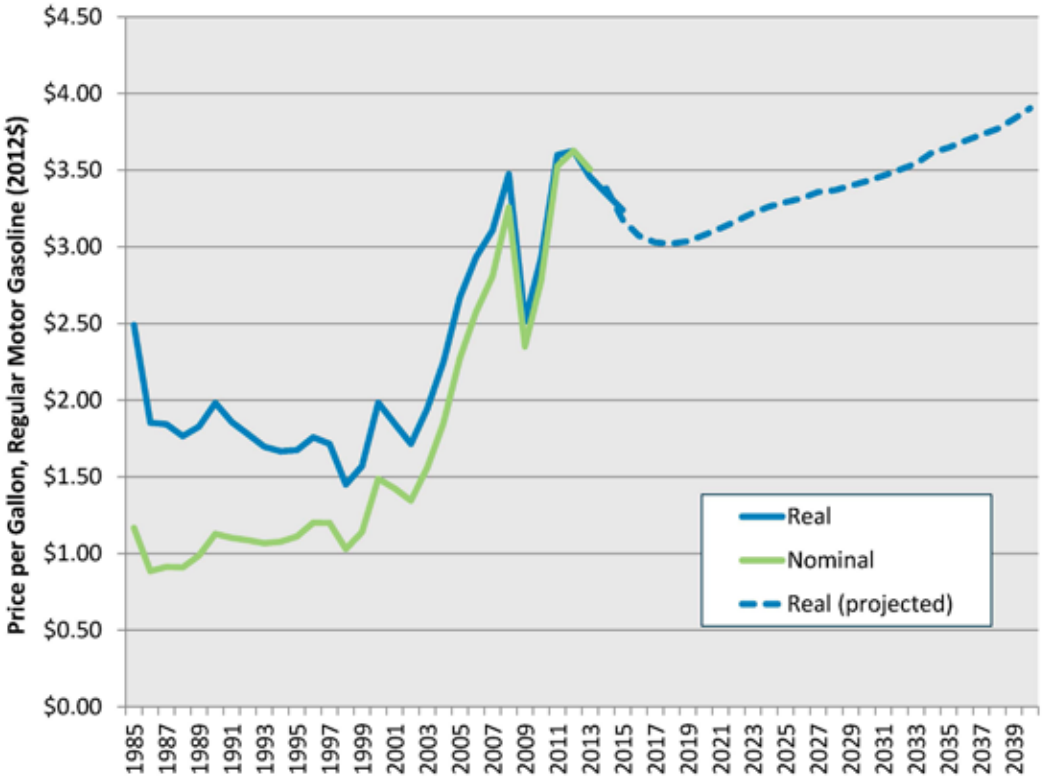
A World of High Gasoline Prices

Millennials who are reaching driving age in 2014 have no conscious memory of a world of consistently cheap gasoline. In 2002, when today's Millennials were between two and 19 years of age, the average price of gasoline in the United States was $1.39 per gallon ($1.84 in today's dollars).[73] In July 2006, nominal gasoline prices hit $3 per gallon for the first month ever. As of August 2014, it had been more than three and a half years since gasoline prices had fallen *below* $3 per gallon in any month.[74] Government and industry experts forecast that gasoline prices are likely to remain at the higher levels of the recent past as far as the eye can see.[75] (See Figure 7, next page.)

Economics research tells us that individuals change their transportation behaviors far more dramatically in response to long-run changes in factors such as fuel prices than in response to short-term volatility.[77] The reason is that the most consequential choices individuals make that affect their transportation behaviors—where to work, where to live, what primary mode of transportation to use—are typically changed only infrequently.

Unlike older Americans, who may be "locked in" to transportation behaviors either as a result of previous life decisions

Figure 7. Historical and Projected Gasoline Prices[76]



or simply force of habit, Millennials are entering adulthood with the opportunity to reshape their lives around the expectation of high gas prices. There is significant survey evidence that suggests that the expense of driving is a leading transportation consideration for young Americans:

- A survey by Zipcar found that 53 percent of 18 to 34 year-olds attribute high costs of car ownership as a reason why owning a car is difficult, a higher percentage than any other age group.[78]

- An AAA Foundation for Traffic Safety study found the high cost of gasoline to be the third most-important factor (behind not owning a car and being able to get around without a car) why young people did not obtain driver's licenses before their 18th birthday.[79]

- Among Millennial respondents to a Smart Growth America/Rockefeller Foundation survey, 64 percent said that the expenses associated with owning a car were an important reason for choosing to live in a place where transportation is not dependent on cars. [80]

- A 2014 survey by Deloitte found that cost was the top factor influencing U.S. Millennials' decision to own a car. More than three-quarters of U.S. Millennials who don't own or lease a car reported that they cannot currently afford to own one.[81]

Millennials are entering adulthood with the expectation that driving will be costly. As Millennials begin to benefit from economic recovery, car ownership will likely become possible for more young Americans. But recent surveys suggest that the cost of car ownership remains heavy on the minds of Millennials. The emergence, however, of new forms of shared-use mobility (see page 30) could provide many Millennials with an opportunity to avoid the cost of vehicle ownership while maintaining access to mobility by car.

Lifestyle Preferences

As noted above, research in North America and abroad indicates that not all of the change in driving habits among young people can be chalked up to the economy. Much of the popular media discussion of changing driving behaviors among young people has focused on the impact of changing consumer preferences for cars and housing. Some have posited that the current generation of youth no longer shares Americans' reputed "love affair with the car."

There is ample evidence from survey research that the transportation and housing preferences of young Americans differ from those of older Americans. This, in and of itself, is important: transportation decision-makers need to understand the needs and preferences of young people so that they can be adequately served by the transportation system.

The survey data, however, generally shed less light on the degree to which the Millennials are less car-oriented than previous generations were at a similar age, largely because comparable survey responses from previous generations of young people are unavailable. However, Millennials' reported preferences for transportation and housing are at least consistent with—if not proof of—a shift in preferences relative to previous generations.

Attitudes about Cars and Driving

The attitudes of Millennials towards car ownership and driving differ markedly from those of older Americans.

- **Young Americans are less interested in owning or relying on cars –** Only 62 percent of U.S. Millennials choose driving in a car they own as their preferred mode of transportation, as opposed to 81 percent of other generations, according to a survey by Deloitte.[82] Nearly a third of Millennials responding to the survey reported being willing to give up their personal vehicles, *three times* more than other generations. The Deloitte research team concluded that "while their cost consciousness and initial desire for a vehicle may be strong, [Millennial] consumers appear more fickle—many will abandon vehicle ownership altogether, even at a higher cost, for a more convenient option."[83]

- **Young Americans have other priorities that compete with car ownership** – A survey conducted by Zipcar asked respondents which of four technologies (car, television, computer/tablet and mobile phone), were it to be lost, would have the greatest negative impact on their lives. Only 26 percent of 18 to 34 year-olds said that losing a car would have the greatest negative effect, compared with 33 percent of 35 to 44 year-olds, 49 percent of 45 to 54 year-olds and 44 percent of those 55 and up.[84] In a survey of 18 to

39 year-olds by University of Michigan Transportation Research Institute scholars, 26.9 percent of unlicensed respondents said they were "too busy or [had] not enough time to get a driver's license."[85]

- **Young Americans' "love affair with the car" may be ebbing** – A survey by the National Association of Realtors found that 49 percent of respondents under 40 felt neutral toward or disagreed with the statement, "For me, car is king. Nothing will replace my car as my main mode of transportation." This is compared to 36 percent for respondents over 50.[86] Another survey found that the percentage of Americans under 25 agreeing with the statement, "to me, cars are simply transportation" increased from 27 percent in 1998 to 36 percent in 2013.[87] Focus group research in Australia suggests that cars may not be the social status symbol they once were, though for young people they remain a symbol of maturity.[88]

Attitudes about Transit and Other Transportation Modes

Survey research shows that Millennials are generally open to the use of modes of transportation other than driving in privately owned vehicles, in some cases more so than older Americans. Young people also tend to prioritize the availability of multiple transportation options.

Nearly one-third—31 percent—of Millennials say they want their main modes of transportation to be buses, bicycling or carsharing.[89] In a national poll, 26 percent of people aged 18 to 40 said state governments should have transit and bicycle-pedestrian projects as an "extremely high priority"—twice the percentage of people over 50.[90]

Millennials see transportation alternatives as effective substitutes for driving. Among Millennials who use carshare or bikeshare programs in America's 10 largest cities, 81 percent said they used the programs because they have "the same advantages of owning a car or bike without the cost and inconvenience associated with such."[91]

Attitudes about Residential Location and Lifestyle

As noted above, today's young Americans are less likely to move from cities to suburbs than previous cohorts of young people—a phenomenon that tracks with the increase in the number of young people living in cities in other countries, such as Germany and Great Britain.[92]

Millennials are more likely than older Americans to report wanting to live in an urban area or in a walkable neighborhood (including walkable suburban neighborhoods) with convenient access to a variety of amenities and transportation options.

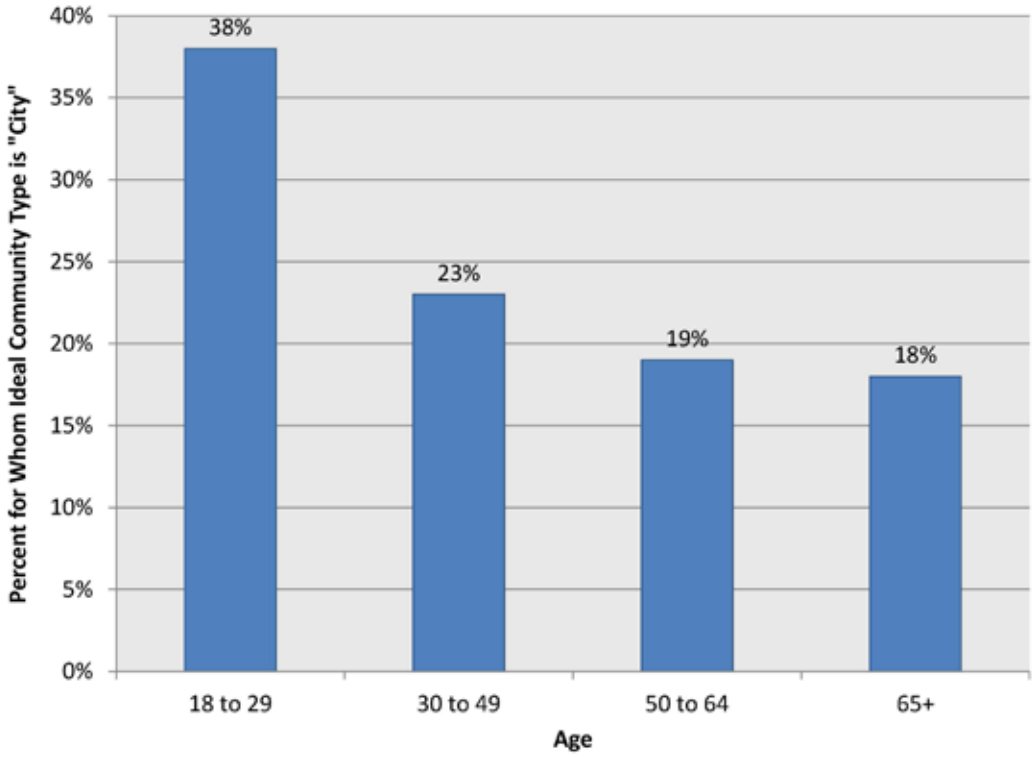
- **Young Americans are more likely to prefer city living** – A 2014 survey by Pew Research Center found that 38 percent of 18 to 29 year-olds prefer to live in cities compared with 24 percent of all age groups.[93] (See Figure 8.) A similar survey by TransitCenter found that 32 percent of those under age 30 identified city neighborhoods (residential or downtown) as their "ideal" neighborhood types compared with 16 percent of those over age 30.[94] A 2013 survey by ULI found that 21 percent of 18 to 34 year-olds who were likely to move reported that they would like to relocate to a big city. Only 12 percent of Generation X and 10 percent of Baby Boomers who were likely to move shared the desire to move to a

large urban area.[95] According to the same survey, 41 percent of those aged 18-30 described themselves as "city" people, as opposed to 34 percent of those surveyed in their 30s.[96]

- **Young people prefer walkable communities –** Young people also desire to live in walkable communities, regardless of whether they are described as urban. A survey by the American Planning Association found that more than half (56 percent) of Millennials desire to live in walkable communities with nearby amenities.[97] Three times more Millennials, according to the survey, would rather live in a suburb with walkable amenities than a suburb where people drive most places.[98] A survey by Deloitte found that 67 percent of U.S. Millennials report that they prefer to live in a neighborhood that "has everything within walking distance."[99] Nearly half of U.S. Millennials (47 percent) stated that they would be willing to relocate closer to work in order to reduce their commute.

- **Young Americans prefer communities with many transportation options** – A Rockefeller Foundation/ Transportation for America survey of 18 to 34 year-olds living in 10 major American cities found that 80 percent said that being able to "live in a place where I don't need to rely on a car to get around" is important. [100] According to a survey by the Urban Land Institute, more than half of all Americans (51 percent) and 55 percent of

Figure 8. Percentage of People Preferring to Live in a City, By Age (Data from Pew Research Center)[102]



Millennials prefer to live in communities with transportation options.[101]

Attitudes about the Environment

Driving less is often seen as an important step to reduce one's personal environmental impact. Some Millennials report that they drive less in part for environmental reasons. However, environmental concerns generally rank well below issues of cost, convenience and ownership of a vehicle in determining how many miles people will drive.

According to a survey by Zipcar, 39 percent of Millennials report driving less in order to protect the environment.[103] In the American Public Transportation Association's survey of Millennials in six U.S. cities, one-third said that their concern for the environment influences their transportation decisions.[104] However, it was only the fifth most-common factor influencing those choices.[105] A 2014 survey by TransitCenter found environmental concern the least commonly cited factor for why young people use transit of six factors considered.[106]

Surveys of young people overseas have arrived at similar conclusions. A survey of young people in Australia ranked environmental concerns fifth among dominant attitudes about driving and public transportation—however, the study did not find a statistically significant difference between the stated level of environmental concern of those who held driver's licenses and those who did not.[107] British researchers, meanwhile, found that only 1 percent of British adults aged 17 to 29 cited environmental concerns as their reason not to have a driver's license.[108]

When asked, many U.S. Millennials report that environmental concerns have played a role in their decision to reduce their amount of driving. However, it is likely that environmental concerns play a supporting rather than leading role in shaping Millennials' transportation habits.

Higher Hurdles for Youth Driving

Young people today must surmount greater hurdles than previous generations of young people when taking to the roads. The cost of driving (see page 21) is clearly one such hurdle, but others include the adoption of graduated driver licensing (GDL) laws by states over the last several decades and the actions of college campuses to reduce the number of students driving to and around campus.

Graduated Driver Licensing

Graduated driver licensing (GDL) requirements typically require additional training for young drivers, and gradually escalate driving privileges in a series of steps over time. Enacted predominantly in the 1990s due to the higher crash rates among younger drivers, GDL programs are credited with saving large numbers of lives and often require gaining extensive driving experience in order to attain full, unsupervised driving privileges.[109]

A small but meaningful share of young people consistently mentions GDL laws or the cost and hassle of obtaining a driver's license more generally as a reason for delaying or forgoing acquisition of a driver's license:

- A 2013 survey conducted by the AAA Foundation for Traffic Safety found that, among those who had not obtained a driver's license by the age

of 18, the expense of getting a driver's license was mentioned by 26 percent of respondents as a "very important" or "somewhat important" reason for not obtaining a license, along with special requirements for getting a license at a young age (23 percent), and not wanting a special restricted license (21 percent).[110] These factors, however, were far less important than not having a car, being able to get around without a car, and the cost of gasoline and driving as motivating factors in not obtaining a license.[111]

- Challenges related to obtaining a driver's license are frequently cited as factors by young people explaining why they do not have them. A survey conducted by researchers at the University of Michigan found that being "too busy" or having "not enough time to get a driver's license," was the most cited reason for not having a license among non-drivers aged 18 to 39, and was a bigger factor among younger members of that age group.[112]

- A study by the Highway Loss Data Institute concluded that GDL laws were responsible for about 8 percent of the decline in youth car insurance "exposures" between 2006 and 2012.[113]

- A study by researchers at University of California, Los Angeles, found that the strictness of a state's driver licensing requirements was correlated with increased rates of transit commuting and decreased rates of solo automobile commuting among youth aged 15 to 26.[114]

- Survey research in Australia identified the cost and difficulty of obtaining a driver's license as significant factors among those young people who intended to obtain licenses in the near future.[115]

- The cost of learning to drive was cited in British research as a leading factor in failing to get a driver's license.[116]

Colleges Discourage Vehicle Owbership

More than 40 percent of Americans between the ages of 18 and 24 are enrolled in undergraduate or graduate school in the United States.[117] The travel habits of those students—both while they are on campus and during times away from school—can therefore have a meaningful impact on overall youth VMT.

In recent years, colleges and universities have instituted strategies to reduce the number of students who use cars on campus. They have done so for a variety of reasons: to avoid the expense of building on-campus parking garages, to free up land for other facilities, to reduce congestion on campus and in surrounding communities, and to reduce their environmental footprint.

Among the steps colleges have taken to reduce student driving are:

- **Free and reduced-cost transit:** As of 2011, 61 percent of large colleges surveyed in North America provided reduced-fare passes for students and/or employees.[118] Some universities have gone further by supporting free transit open to the entire community. The University of North Carolina, for example, supports free transit for the entire Chapel Hill Transit system, a move that contributed to a doubling of the share of students who use transit.[119]

- **Support for carsharing:** Universities have encouraged the use of carsharing as an alternative for keeping a vehicle on campus, with more than half of large colleges now providing the service.[120] Zipcar, the nation's leading round-trip carsharing service, reported in late 2013 that it operated more than 300 campus carsharing locations in North America, with Enterprise Rent-a-Car operating an additional 82 locations.[121]

- **Encouragement of bicycling:** Many colleges also encourage students to bicycle on campus, supporting bike-sharing systems and investing in bike lanes, bike racks and other infrastructure. Some campuses go so far as to give free bicycles to some first-year students and provide valet bike parking at football games.[122] Many of the nation's leading bicycling cities are college towns. In cities such as Davis, California, and Boulder, Colorado, more than 10 percent of all workers commute by bicycle.[123] College towns are also among those that have seen the greatest growth in bicycle commuting over the last decade.[124]

College and university efforts to reduce driving may have several impacts. First, and most obviously, they may serve to reduce the number of miles driven while students are on campus. By reducing the usefulness of car ownership, these efforts may encourage students to drive less during the summer and at other times when they are away from school. Finally, life at a college or university can provide a model of a "car-free" or "car-light" lifestyle that students may wish to replicate after they have left school.

Changing Technology and Transportation Options

The past decade has seen a revolution in technology, characterized by soaring use of mobile, location-aware, internet-connected devices, such as smartphones and tablets. Technology can have multiple impacts on transportation decision-making:

- The availability of technology may enable young people to substitute virtual activity for activities that might once have required a physical trip. Or, conversely, it might enable or encourage trips that otherwise might not occur.

- Technology might enable the creation of new transportation options.

- The ability to stay connected while in travel might make certain types of transportation more attractive.

Does Technology Substitute for or Complement Vehicle Travel?

The availability of technology might reduce driving by reducing the number of young people who feel compelled to obtain a driver's license, or by reducing the number of trips taken by young people who have licenses.

Research into the question of whether technological advances have reduced driver licensure has produced conflicting results, with studies showing that activity on the Internet is correlated with *higher* (rather than lower) rates of licensure,[125] and that Internet availability is linked with lower rates of driver licensure among residents of 15 countries.[126] An analysis by researchers at UCLA of data from the National Household Travel Survey found that there is no link between reductions in driving among

young people and the use of "information and communications technologies."[127]

Few, if any studies, however, have yet examined the links between more recent technological innovations (smartphones, social media, etc.) and youth driver licensure or driving. Such studies (at least in the United States) would be difficult since the most recent National Household Travel Survey did not ask about the use of these new tools—and, in fact, it took place so long ago that many of those tools were *only* in widespread use among young people.

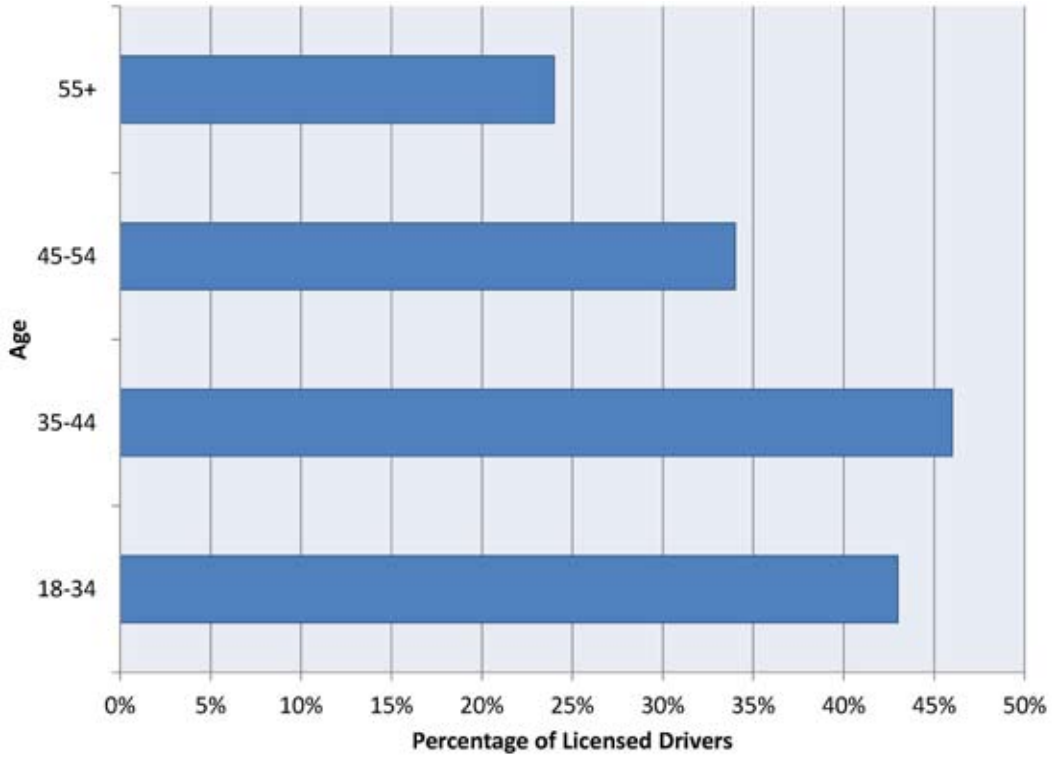
Survey data suggest that at least some young people use these more recent technological innovations as a substitute for some social trips. (See Figure 9). In addition, telecommuting, or working from home, has become more prevalent among young workers, as it has among all Americans. Telecommuting has been shown to reduce vehicle travel, though the magnitude of its impact varies across studies.[128]

The degree to which recent technological innovations substitute for or augment driving, therefore, remains unclear, but it is a factor that deserves further study.

Emerging Transportation Services and Apps

Over the last five years, a wide variety of new technology-enabled transportation services and tools have emerged on the marketplace, joining traditional round-trip carsharing (which launched in the U.S. in the late 1990s) in providing alternative forms of mobility that are less reliant on privately owned vehicles.

Figure 9. Percentage of Licensed Drivers Reporting that they "Sometimes Choose to Spend Time with Friends Online Instead of Driving to See Them" (Zipcar Survey)[129]



The impact of these new transportation services on vehicle ownership and driving is still not fully understood. There is strong evidence supporting the notion that traditional round-trip carsharing tends to reduce the number of miles driven and vehicle ownership in most cases, and emerging evidence that bikesharing does as well, though to a more limited degree.[130] The effects of newer forms of shared mobility—including one-way carsharing (e.g. car2go) and "ridesourcing" services such as Lyft and Uber—are just beginning to be understood. It is possible that some of these new services may increase VMT in the short run (by providing access to new forms of automobile-based mobility) but reduce VMT in the long run (by increasing the number of zero-car and one-car households).

Beyond question, however, is the fact that most of these services have been disproportionately adopted and embraced by younger people:

- A recent study of "ridesourcing" (Lyft/Uber/Sidecar) users in San Francisco found that more than 50 percent were between the ages of 25 and 34 and more than two-thirds were under 35. The age demographic of ridesourcing users was younger even than taxi users, which in turn, are younger than the San Francisco population as a whole.[131]

- A survey of users of the Capital Bikeshare system in Washington, D.C., found that 55 percent of annual members and 43 percent of short-term users were between 25 and 34. The age demographic of bikeshare users was found to be younger than that of area bicyclists in general.[132]

- A 2010 study of carsharing demographics and impacts found that 38 percent of U.S. carsharing members were between 20 and 30 years of age, while an additional 30 percent were between 30 and 40 years old.[133]

While relatively new, these transportation options are increasingly important to a growing number of Millennials and others. According to a 2013 survey by Zipcar, 24 percent of Millennials said that transportation apps (such as Lyft) reduced the need to own a car, compared with 20 percent of 35 to 44-year-olds and 23 percent of 45 to 54-year-olds.[134] Nine percent of Millennials who live in large cities reported that they use short-term rental car (such as carsharing) and bikesharing services at least a few times per month.[135]

The growth of technology-enabled transportation services in the United States has been brisk—bikesharing and ridesourcing were virtually unheard of in 2010 and now exist in many major American cities, while carsharing has expanded dramatically and diversified in terms of its business models. It is too soon to assess the impact of these new services on driving among young people, but the potential exists for these new services to provide an affordable alternative model of mobility to private car ownership for an emerging generation struggling to pay off student loan debt and gain a foothold in the post-recession economy.

Mobile Connectivity, Real-Time Information and Public Transportation

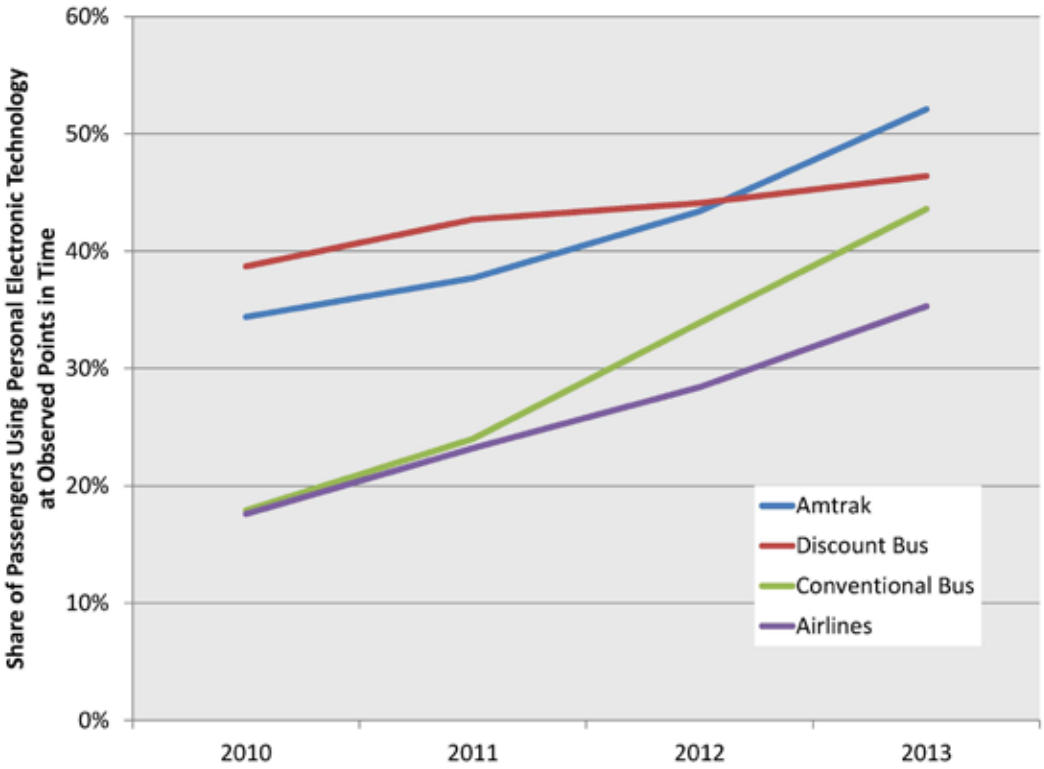
The advent of mobile technology provides the potential to make some modes of transportation—such as public transit—both more efficient through the provision of real-time public transportation arrival and departure information, and more valuable by enabling people to remain connected while in transit.

Drivers have benefited from satellite global positioning system (GPS) navigation technologies for years, but it has only been in the last several years that parallel services have been available to transit riders. In an increasing number of cities, transit riders can use smartphone apps to navigate the transit system, plot routes, and even find out at what time the next bus or train will arrive.

The availability of real-time transit data has been shown to improve the rider experience and, in limited studies, to contribute to modest increases in ridership.[136] These studies are not age-specific, but Millennials put a strong value on mobile connectivity and real-time information. A survey conducted for the American Public Transportation Association found that 55 percent of Millennials surveyed in selected cities would like to see real-time updates from their transit agency within the next 10 years and the same percentage desire Wi-Fi or 3G/4G connectivity while in transit.[137] The survey further found that public transportation was the form of transportation most likely to allow for online socializing and for promoting connection to the community.[138]

The use of mobile devices is also becoming increasingly ubiquitous on public transportation. Researchers at DePaul University have collected data for several years on the use of mobile technology on intercity transport modes. By 2013, more than half of Amtrak passengers were observed using personal electronics technologies. Conventional buses, such as Greyhound, saw the largest increase in use of such devices—from 17.9 percent to

Figure 10. Passengers Using Personal Electronic Technology in Intercity Travel[140]



43.6—between 2010 and 2013. (See Figure 10, previous page.)[139]

In terms of use in intracity public transportation, 22 percent of smartphone users report using their phones while on public transportation. Disconcertingly, however, 60 percent report using the devices while driving. [141]

A 2014 survey by TransitCenter found that the availability of wi-fi on transit was a relatively unimportant factor in spurring transit ridership among all age groups, including young people, compared with features such as travel speed, reliability and cost. People under 30 ranked wi-fi availability ninth of 12 possible improvements that would induce them to ride transit more—however, those over 30 ranked wi-fi dead last among the 12 factors. Interestingly, people under 30 ranked the availability of more parking at transit stations as the factor least likely to induce them to ride transit.[142]

Making Sense of Changing Driving Trends and Their Implications for the Future

The 2000s saw a marked decrease in the average number of miles traveled by young Americans. It is unlikely that those trends have reversed, given the continued decreases in per-capita driving across the whole U.S. population, the continued shift away from the use of cars for commuting by Millennials as reported in U.S. Census Bureau data, and the consistency of Millennials' stated preferences for housing and transportation.

The authors' 2012 report, *Transportation and the New Generation*, suggested several reasons for the decline in driving among young people. In recent years, research in the United States and around the world has shed additional light on the potential contributing factors. Among the factors that are likely to have some role in the decline in driving are the following:

- The **Great Recession** resulted in temporary economic trauma to young people and their families that inhibited some from starting households or purchasing cars and reduced the amount of employment-related commuting among youth. But many of **the long-term socioeconomic shifts**—such as delayed household formation and increased pursuit of higher education—that are commonly attributed to the recession have been occurring for decades and there is no guarantee they will fully reverse once the economy has recovered.

- Several studies have shown a **generational cohort effect** among Millennials, finding that today's young people drive less than previous generations of young people, even after statistically accounting for other factors such as economic effects.

- **High gasoline prices,** and the high cost of driving in general, are regularly cited by young people as a major reason for why they choose not to obtain a driver's license or own a car. Gasoline prices have remained at historically high levels for four years and are projected to remain high for the foreseeable future.

- **Preferences for living in walkable neighborhoods**, often in urban centers, and openness to the use of **non-driving modes of transportation** have been well documented among Millennials. Today's young adults are less likely than those of a generation ago to leave cities for suburban areas, and repeatedly express a greater appetite for city living and living in walkable neighborhoods than older Americans.

- Increasingly stringent **driver licensing requirements and graduated driver licensing systems** raise the cost and reduce the short-term reward of pursuing a driver's license for young people. A small but significant number of young people without licenses report that these requirements have played a role in their decision to delay or forgo driving.

- **Environmental awareness** may play a contributing role in some Millennials' decisions to drive less, but it is likely not a decisive factor for many.

- The advent of **new technologies—** particularly portable, Internet-connected, location-aware devices such as smartphones—can contribute to reductions in driving in several ways: by allowing people to do virtually what they once did in person, by making non-driving modes of transportation relatively more attractive than driving, and by spawning new transportation services that substitute for driving or for vehicle ownership. Young people are the most wirelessly connected generation, report that they substitute virtual connectivity for some trips, and are often the most likely to take part in new transportation services such as bikesharing and ridesourcing (e.g. Lyft and Uber). The implications of recent technological advances for driving are not fully understood, but the potential impacts for reducing vehicle ownership in the future are profound.

- **Colleges and universities** have taken steps to reduce the number of students who drive to and from campus or who store vehicles on campus, by promoting carsharing, bicycling and other alternatives to private car use. As college students make up a significant share of 18 to 24 year-olds, reduced vehicle use by students could translate into lower vehicle use in the short term and potentially a large increase in the number of adults habituated to car-light lifestyles.

The list of potential contributors to the recent decline in driving among young people is long, and there is, as yet, no clear sense of which factors have been the most important in contributing to the decline.

We do not, however, need to know precisely how to attribute the recent decline in driving among Millennials before taking action to factor those changes into transportation planning and policy.

Incorporating Lasting Changes into Transportation Planning

Even if external conditions change in ways that encourage driving, the transportation habits learned by Millennials may prove difficult or slow to break. Habit is an important—if infrequently studied—

shaper of transportation behaviors.[143] Research in Great Britain suggests that commuting behaviors are fairly stable over time, with changes in commuting mode mainly occurring with major "life stage" events (such as moving house, changing jobs, etc.).[144] Other research validates that these major life events (and, by extension, change in ownership of vehicles, etc.) happens less frequently as people age, particularly after the age of 30.[145] Similar research in France and Japan has found significant impacts of life-stage events on changes in mobility choices, though they are not the most important factor.[146]

A study of transit use patterns in Montreal found that rates of transit use tend to plateau in the early 30s, suggesting that increases in transit use among groups reaching that age are likely to persist over time. The same study also suggested that drops in the percentage of people with driver's licenses (particularly men) caused by graduated driver licensing requirements imposed in the late 1990s have resulted in prolonged declines in the number of people in those cohorts licensed to drive in later years.[147]

In short, at least part of the recent decline in driving among Millennials is likely to be lasting, representing a "New Normal" to which transportation policy and planning should adapt. With the first members of the Millennial generation now reaching their early 30s, it should soon be possible to predict the degree to which the changes in driving habits exhibited by Millennials will persist over time. Government officials—especially in areas with large populations of young people—should begin to reshape their transportation policies and investment strategies to reflect these changes.

Using Scenario Planning to Incorporate Uncertainty

While many of the changes that have contributed to the reduction in youth driving are likely to be permanent, the long-term effects of other changes are more uncertain. How will the economic recovery affect the transportation and location decisions of the Millennials? Will Millennials' preference for walkable and urban neighborhoods persist as they age and be carried over to future generations of young people? Will new technology-enabled transportation tools such as ridesourcing and carsharing revolutionize mobility for millions or will they only serve small niche markets in major cities?

The answers to these questions are uncertain. Transportation planners, however, frequently fail to incorporate sources of uncertainty into the forecasts they use to calculate and communicate the costs and benefits of transportation investments to the public, instead relying on outdated information and assumptions that do not reflect the post-Driving Boom world.

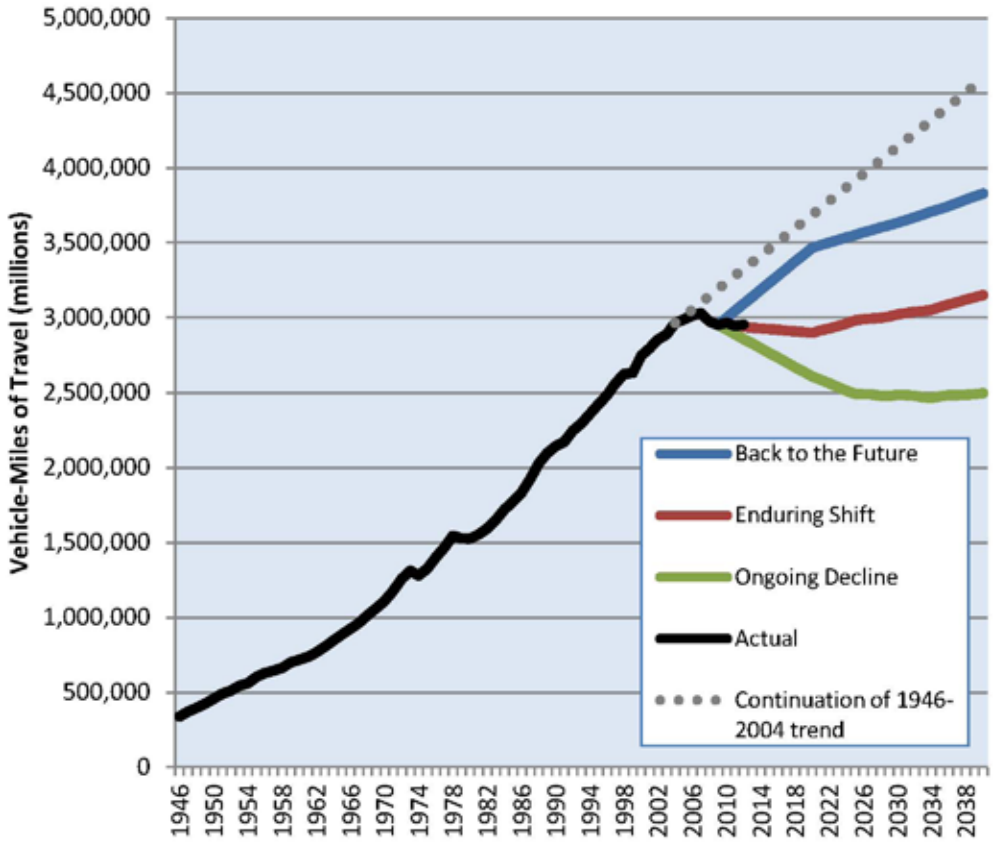
Scenario planning tools enable local, state and federal decision-makers to make decisions based on a series of "what-if" questions. What if the declines in youth driving that took place during the 2000s were to be magically erased? Or what if the changes we witnessed in youth driving behaviors during the 2000s were only the beginning of a broader set of changes—unleashed by new technology and changing values—that lead to further reductions in driving in the future?

The authors' 2013 report, *A New Direction*, evaluated a series of scenarios based on the durability of changes in driving behaviors among youth and others during the 2000s—a "Back to the Future" scenario that saw driving behaviors revert to 2004 patterns, an "Enduring Shift"

scenario that reflected the continuation of existing trends, and an "Ongoing Decline" scenario that assumed that the changes in driving that took place during the 2000s were merely harbingers of even bigger changes ahead. The trajectories of these three scenarios—and their relation to historical trends in VMT during the "Driving Boom" era—are shown in Figure 11, below.

Transportation experts have developed new, more sophisticated tools to help enable states and metropolitan areas to evaluate the effects of multiple scenarios of economic and technological development on vehicle travel in their areas.[149] Transportation agencies should make use of those tools, and begin to prioritize transportation investments that are viable and valuable under a variety of scenarios of future driving. Massive highway expansion projects, with few exceptions, are unlikely to fit that bill. Rather, strategies that make more efficient use of existing infrastructure—such as transportation demand management—keep existing infrastructure in a state of good repair, and expand access to public transportation and other transportation options are likelier to deliver a sound return on investment amid an atmosphere of uncertainty about the future demand for driving.

Figure 11. Vehicle-Miles Traveled Under Three Scenarios of Future Growth[148]



Seizing the Opportunity to Reduce the Impacts of Driving

Transportation experts and policy-makers tend to view the implications of changing driving trends within the "predict and provide" framework of traditional transportation planning. That is, it is assumed that demand for transportation is determined by a series of independent factors and that the job of transportation planners is to supply the optimal amount of service or capacity to meet that demand.

However, we know from decades of experience that transportation investments don't just accommodate demand; they shape it. Numerous studies have documented that highway expansion projects usually fail to deliver anticipated reductions in congestion because they spur new development on the urban fringe and encourage people to take trips they otherwise would not have taken—an effect known as *induced demand*.[150] The same principal applies to investments in transit, bicycling and walking infrastructure.

America's reliance on cars is the source of numerous, major societal problems, from fossil fuel dependence to global warming, from air pollution to deaths and injuries from crashes, and from traffic congestion to the crushing financial burden vehicle ownership imposes on many households without access to other transportation choices. With members of the Millennial generation and others expressing the desire to live in walkable communities with access to multiple transportation options, the nation has an opportunity to make significant strides towards reducing congestion, improving transportation system efficiency, and reducing the external impacts of driving—if only we can realign public policy to support Americans in realizing those desires.

Cities across the country are already taking action to capitalize on the increased demand for transportation options among Millennials—expanding bicycling infrastructure, adding late-night transit service, providing access to and appropriate regulation for carsharing and ridesourcing providers, and encouraging residential development in areas where Millennials and others increasingly want to live. State and federal officials should retool transportation policies to encourage—rather than undermine—those moves toward an efficient and sustainable transportation system.

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