



Transportation and the New Generation

Why Young People Are Driving Less
and What It Means for Transportation Policy

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Executive Summary

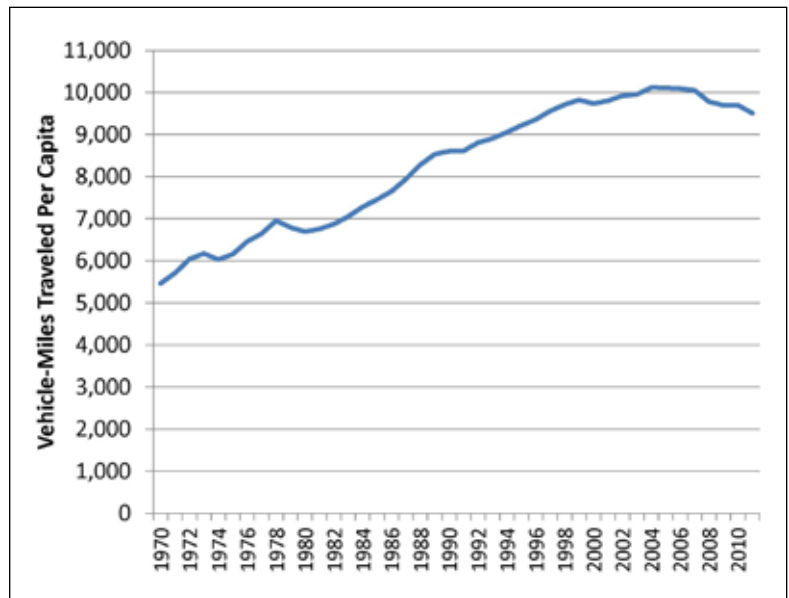
From World War II until just a few years ago, the number of miles driven annually on America's roads steadily increased. Then, at the turn of the century, something changed: Americans began driving less. **By 2011, the average American was driving 6 percent fewer miles per year than in 2004.** (See Figure ES-1.)

The trend away from driving has been led by young people. **From 2001 to 2009, the average annual number of vehicle-miles traveled by young people (16 to 34-year-olds) decreased from 10,300 miles to 7,900 miles per capita—a drop of 23 percent.** The trend away from steady growth in driving is likely to be long-lasting—even once the economy recovers. Young people are driving less for a host of reasons—higher gas prices, new licensing laws, improvements in technology that support alternative transportation, and changes in Generation Y's values and preferences—all factors that are likely to have an impact for years to come.

Federal and local governments have historically made massive investments in new highway capacity on the assumption that driving will continue to increase at a rapid

and steady pace. The changing transportation preferences of young people—and Americans overall—throw those assumptions into doubt. The time has come for transportation policy to reflect the needs and desires of today's Americans—not the worn-out conventional wisdom from days gone by.

Figure ES-1: Vehicle-Miles Traveled Per Capita Peaked in 2004



America's young people are decreasing the amount they drive and increasing their use of transportation alternatives.

- According to the National Household Travel Survey, from 2001 to 2009, the annual number of vehicle-miles traveled by young people (16 to 34-year-olds) decreased from 10,300 miles to 7,900 miles per capita—a drop of 23 percent.
- In 2009, 16 to 34-year-olds as a whole took 24 percent more bike trips than they took in 2001, despite the age group actually shrinking in size by 2 percent.
- In 2009, 16 to 34-year-olds walked to destinations 16 percent more frequently than did 16 to 34-year-olds living in 2001.
- From 2001 to 2009, the number of passenger-miles traveled by 16 to 34-year-olds on public transit increased by 40 percent.
- According to Federal Highway Administration, from 2000 to 2010, the share of 14 to 34-year-olds without a driver's license increased from 21 percent to 26 percent.

Young people's transportation priorities and preferences differ from those of older generations.

- Many young people choose to replace driving with alternative transportation. According to a recent survey by KRC Research and Zipcar, 45 percent of young people (18-34 years old) polled said they have consciously made an effort to replace driving with transportation alternatives—this is compared with approximately 32 percent of all older populations.

- Many of America's youth prefer to live places where they can easily walk, bike, and take public transportation. According to a recent study by the National Association for Realtors, young people are the generation most likely to prefer to live in an area characterized by nearby shopping, restaurants, schools, and public transportation as opposed to sprawl.
- Some young people purposely reduce their driving in an effort to curb their environmental impact. In the KRC Zipcar survey, 16 percent of 18 to 34-year-olds polled said they strongly agreed with the statement, "I want to protect the environment, so I drive less." This is compared to approximately 9 percent of older generations.

The trend toward reduced driving among young people is likely to persist as a result of technological changes and increased legal and financial barriers to driving.

- *Technology:*
 - Communications technology, which provides young people with new social networking and recreational possibilities, has become a substitute for some car trips.
 - Improvements in technology make transportation alternatives more convenient. Websites and smart phone apps that provide real-time transit data make public transportation easier to use, particularly for infrequent users. Meanwhile, technology has opened the door for new transportation alternatives, such as the car-sharing and bike-sharing services that have taken root in numerous American cities.

- Public transportation is more compatible with a lifestyle based on mobility and peer-to-peer connectivity than driving. Bus and train riders can often talk on the phone, text or work safely while riding, while many state governments are outlawing using mobile devices while driving. Currently, 35 states have outlawed texting while driving, and nine states have outlawed hand-held cell phone use while driving. These bans may not be enough to ensure safety—in December 2011 the National Transportation Safety Board recommended banning cell phone use while driving entirely.
 - *Changes in driving laws:* From 1996 to 2006, every state enacted Graduated Drivers' Licensing (GDL) laws. GDL laws, which are designed to keep young people safe, also make obtaining a driver's license more challenging. Young people must now take more behind-the-wheel training (which is more expensive), fulfill additional requirements for permits, and once they are allowed to drive, they are often restricted to driving in the daytime without passengers. GDL laws are likely to remain in effect—and continue to be a deterrent to young people to apply for licenses—because they have been successful in keeping young drivers safe.
 - *Increased fuel prices:* Increased fuel prices have made driving more expensive, reducing the frequency with which people—especially younger people with less disposable income—travel in cars. The average cost for filling up the tank in 2001 was \$1,100 for the year (in 2011 dollars). With gasoline prices soaring since then, filling up the same tank today costs \$2,300. While gasoline prices often fluctuate, they are unlikely to return to the low levels of 1980s or 1990s. According to the U.S. Energy Information Administration's projections, gas prices are expected to increase by 26 percent from 2010 to 2020.
- The recession has played a role in reducing the miles driven in America, especially by young people. People who are unemployed or underemployed have difficulty affording cars, commute to work less frequently if at all, and have less disposable income to spend on traveling for vacation and other entertainment. **The trend toward reduced driving, however, has occurred even among young people who are employed and/or are doing well financially.**
- The average young person (age 16–34) with a job drove 10,700 miles in 2009, compared with 12,800 miles in 2001.
 - From 2001 to 2009, young people (16 to 34-years-old) who lived in households with annual incomes of over \$70,000 increased their use of public transit by 100 percent, biking by 122 percent, and walking by 37 percent.
- America has long created transportation policy under the assumption that driving will continue to increase at a rapid and steady rate. The changing transportation preferences of young people—and Americans overall—throw that assumption into doubt. **Policy-makers and the public need to be aware that America's current transportation policy—dominated by road building—is fundamentally out-of-step with the transportation patterns and expressed preferences of growing numbers of Americans. It**

is time for policy-makers to consider the implication of changes in driving habits for the nation's transportation infrastructure decisions and funding practices, and

consider a new vision for transportation policy that reflects the needs of 21st century America.

Introduction

In the years after World War II, Americans' love affair with the car reached full flower.

To the post-war generation, cars were a symbol of maturity, prosperity and freedom. Acquiring a driver's license was a "rite of passage" for young people—something that was ideally done as close to one's sixteenth birthday as possible. Owning (or at least having access to) a car was a young person's ticket to freedom, friends and adventure. For American families, a car was also a ticket to the "good life" in the suburbs, away from crowded and increasingly troubled cities.

America's post-war leaders—and those in the generations that followed—satisfied Americans' demand for mobility by car by engaging in the greatest road-building endeavor the world had ever seen, at great public expense. They embarked on the largest public works project in human history up until that point, the construction of more than 40,000 miles of Interstate

highways.¹ And that grand road-building project has continued even up to the present day—since 1980, American road builders have constructed an average of more than 22,000 new lane-miles every year.²

Times have changed, however. The open road that once beckoned to an earlier generation of young people has been slowly replaced by congested highways traversing a landscape of suburban sprawl. Once a symbol of freedom and America's can-do spirit, the automobile has become for many a financial straitjacket that limits life options, as well as a symbol of the nation's enduring dependence on oil. Urban living—whether in cities, older suburbs, or new mixed-use neighborhoods—is getting a serious look by many young people anxious to avoid long commutes, be close to friends and activities, and lessen their environmental impact. Meanwhile, the emergence of the Internet, mobile technologies and social networking has upended the way Americans, especially younger

Americans, interact with each other and the world.

There is now little room for doubt: many Americans' transportation needs and desires are changing. And they are changing fastest among the people who have the most to gain or lose from the investments we make in new transportation infrastructure: the young. This report documents the many ways in which young people are changing their transportation behavior and their desires for the future—and argues that

many of those changes are here to stay.

An earlier generation of American leaders embraced and worked toward a vision of a more mobile America linked by highways and automobiles. Today, for better and for worse, we are living their legacy.

Will America's policy-makers have the dexterity, the vision and the courage to meet these changing needs—and by so doing, put America on a path to a cleaner, more resilient transportation system that is less dependent on oil?

The Trends: Today's Youth Drive Less and Use Transportation Alternatives More

During the second half of the 20th century, the total number of miles driven in America steadily increased. Then, at the turn of the century, the trend changed. Americans now drive less than we did in the mid-2000s—both in absolute and per-capita terms.

Today's youth are leading this decline in vehicle-miles traveled. Some young people do not drive at all because they either do not own a car or do not have a license. Those who do drive are taking fewer trips and driving shorter distances. At the same time, more young people are instead choosing to walk, bike or take public transportation, or to stay connected using mobile technologies instead of traveling.

Today's Youth Drive Less

Between 1970 and 2004, the number of vehicle-miles traveled per capita increased by an average of 1.8 percent annually, and the total number of vehicle-miles traveled increased by an average of 2.9 percent annually.³

Since the mid-2000s however, the number of miles driven in America—both total and per capita—has fallen. Since 2004, the average number of vehicle-miles driven per capita has decreased by 6 percent. (See Figure 1.) And since 2007, when Americans' total vehicle travel peaked, the total number of miles driven in America has fallen 2.3 percent. (See Figure 2.) Americans as a whole drove fewer miles in 2011 than they drove in 2004.⁴

Today's youth lead the decline in vehicle-miles traveled. While Generation X (age 35-49) and the Baby Boomers (age 50-65) have seen modest drops in the distance they travel in cars, Generation Y (age 16-34) is now driving significantly less than young generations have in prior decades. According to the National Household Travel Survey (NHTS), between 2001 and 2009, the average number of vehicle-miles traveled by young people (16 to 34-year-olds) decreased from 10,300 miles to 7,900 miles per capita—a drop of 23 percent.⁷ The National Household Transportation Survey shows that this is the result of:

Figure 1: Vehicle-Miles Traveled Per Capita Peaked in 2004⁵

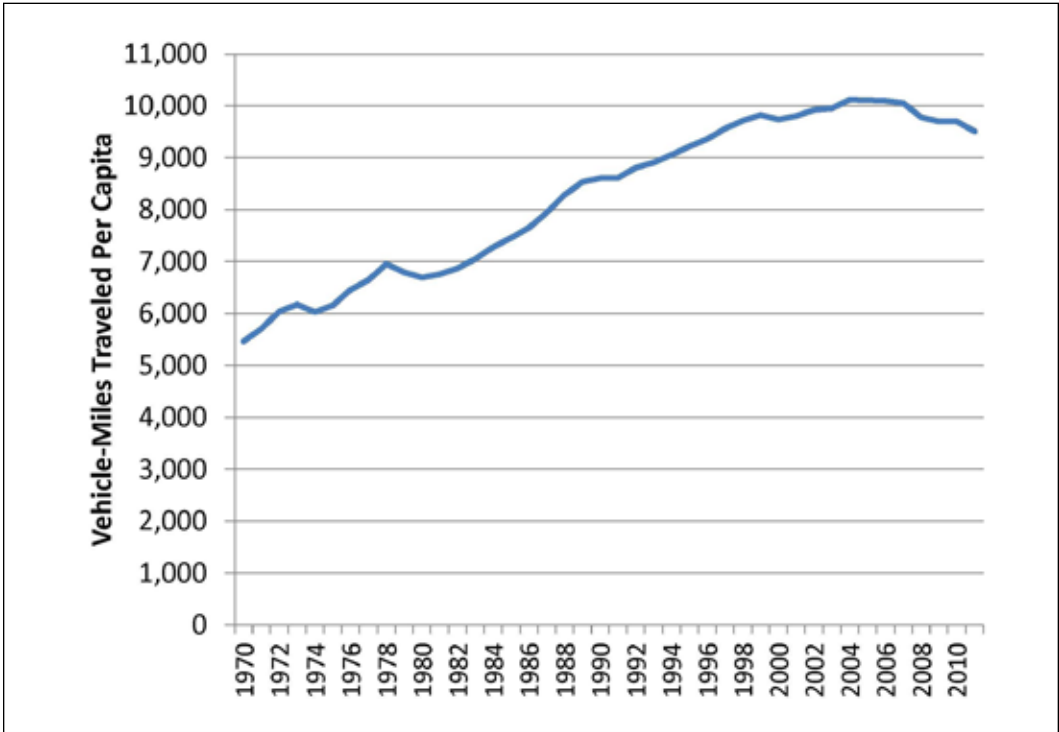
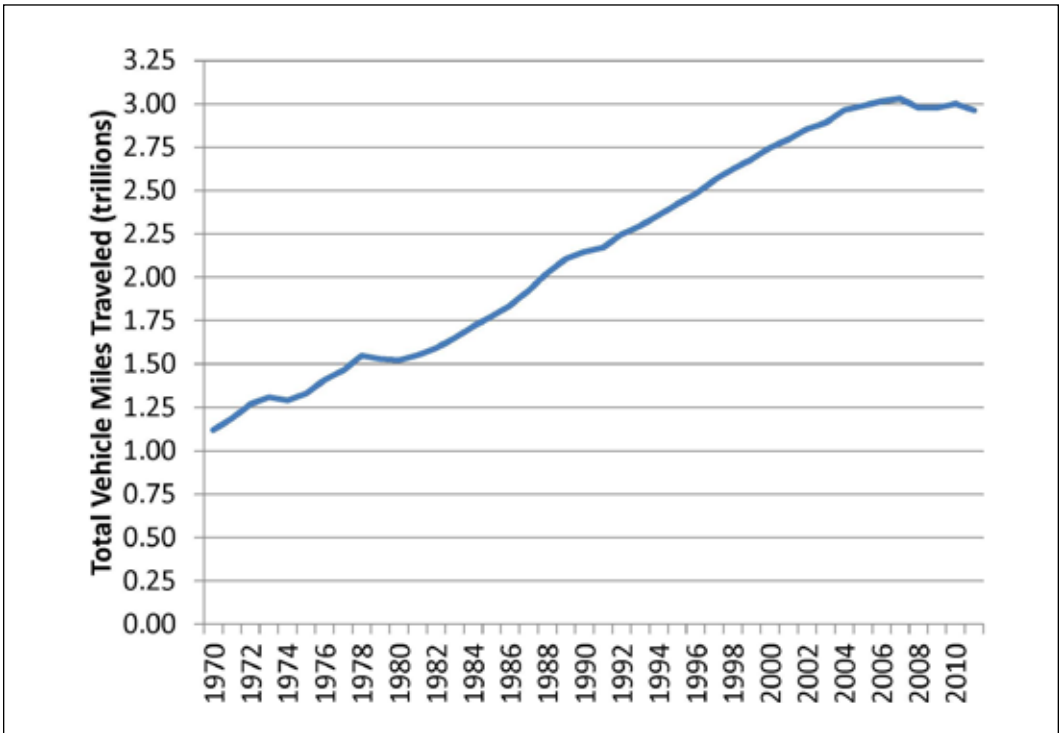


Figure 2: Total Vehicle-Miles Traveled Peaked in 2007⁶



- *Fewer car trips per driver:* In 2009, young drivers took 15 percent fewer trips than young drivers took in 2001.⁸
- *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 2001.⁹

In addition, fewer young people are on the road in the first place because fewer hold licenses. According to the Federal Highway Administration, from 2000 to 2010, the percentage of 14 to 34-year-olds without licenses increased from 21 percent to 26 percent.¹⁰ For more information on licensing rates for young people, see page 11.

Today's Youth Increasingly Use Transportation Alternatives

Young people are traveling less in cars, but they are increasingly using alternative forms of transportation. According to the NHTS, the average young person took 25 more trips and traveled 117 more miles on alternative transportation (including biking, transit, and walking) in 2009 than the average young person traveled in 2001.¹⁴

Biking: In 2009, 16 to 34-year-olds as a whole took 24 percent more bike trips than they took in 2001, despite the age group actually shrinking in size by 2 percent.¹⁵

Walking: In 2009, 16 to 34-year-olds walked to destinations 16 percent more frequently than did 16 to 34-year-olds in 2001.¹⁶

Young People in Other Countries Have Also Reduced Their Driving

Decreased driving among young people is not unique to America, but rather a phenomenon becoming characteristic of developed countries. In a 2011 study by the University of Michigan Transportation Research Institute, researchers found that of the 14 countries studied other than the United States, seven developed countries—Sweden, Norway, Great Britain, Canada, Japan, South Korea and Germany—showed a recent decrease in the percentage of young people with driver's licenses. The other seven countries—Finland, Israel, The Netherlands, Switzerland, Spain, Latvia and Poland—many of them less developed, showed an increase in the percentage of young people with licenses.¹¹

In addition to licensing rates, driving rates have also fallen in many developed countries. Vehicle-miles traveled have either leveled off or fallen in Western European countries including Belgium, Denmark, France, Germany, Italy, The Netherlands and Spain.¹² Although data on driving rates for young people are not easily available, the German Income and Expenditure survey shows that the share of young households without cars in Germany increased from 20 percent to 28 percent from 1998 to 2008.¹³

Public transit: Between 2001 and 2009 the annual number of passenger miles per capita traveled by 16 to 34-year-olds on public transit increased by 40 percent.¹⁷ Young people have played a significant role in driving up the total number of passenger miles traveled on transit. From 2001 to 2009, the annual number of passenger miles traveled increased by 10 billion, more than 60 percent of which came from 16 to 34-year-olds.¹⁸

According to the Bureau of Transportation Statistics, heavy rail (subway) and light rail ridership across the country has been steadily increasing over the last decade, even as automobile travel has stagnated.¹⁹ (See Figure 3.)

Today's Youth Avoid or Postpone Buying Cars and Acquiring Driver's Licenses

Not only are many Americans—including young Americans—making fewer and shorter trips in their cars, but an increasing number are not driving at all—either because they do not have a car or do not have a license.

The Number of Vehicles on the Road Has Stagnated

People are putting fewer cars on American roads. Every year, several million Americans buy and register new automobiles

Figure 3: Heavy and Light Rail Ridership Increases Across the US²⁰

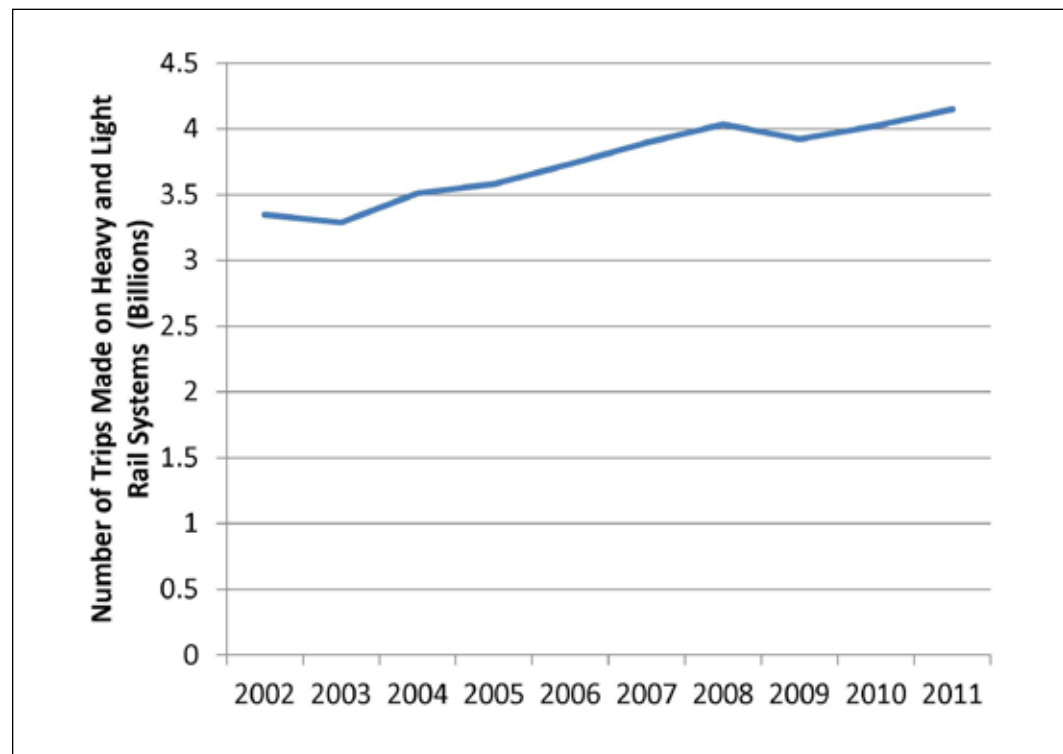
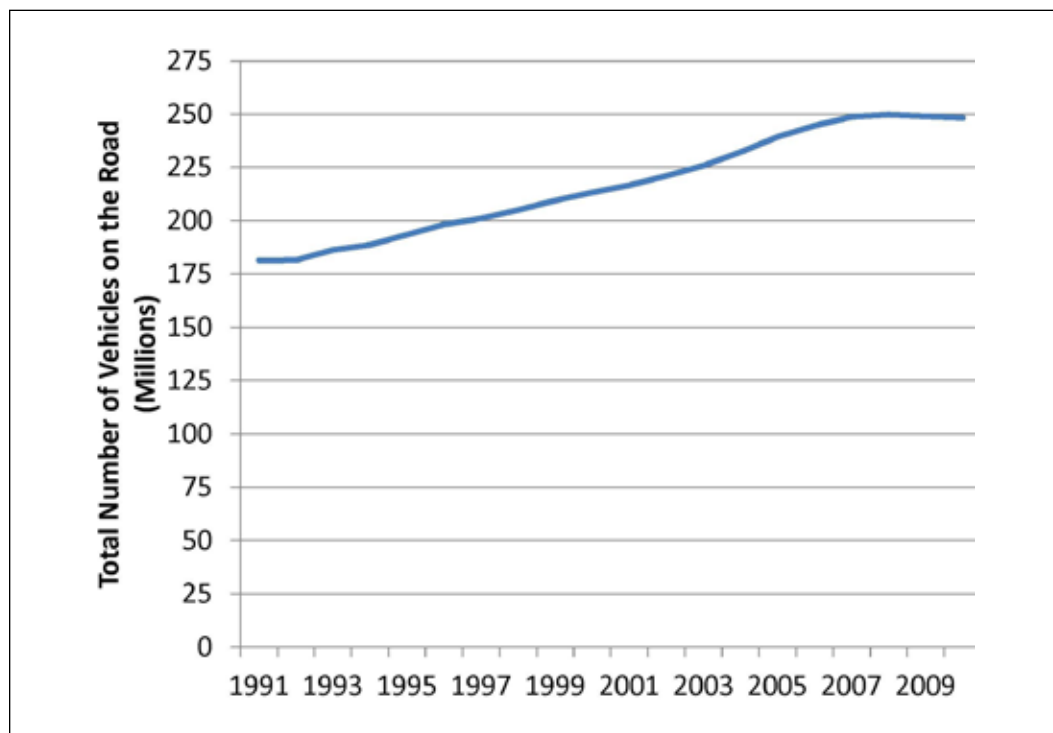


Figure 4: The Total Number of Vehicles On the Road Has Plateaued Since 2006²²



while several million simultaneously retire old ones. Historically, the number of automobiles on the road has steadily increased because newly registered automobiles outnumbered retired automobiles. Since 2006, the number of vehicles on America's roads has hit a plateau after decades of growth.²¹ (See Figure 4.)

The Number of Young Licensed Drivers Has Decreased

A growing number of young Americans do not have driver's licenses. According to the Federal Highway Administration, from 2000 to 2010, the share of 14 to 34-year-olds without a license increased from 21 percent to 26 percent.²³ (See Figure 5.)

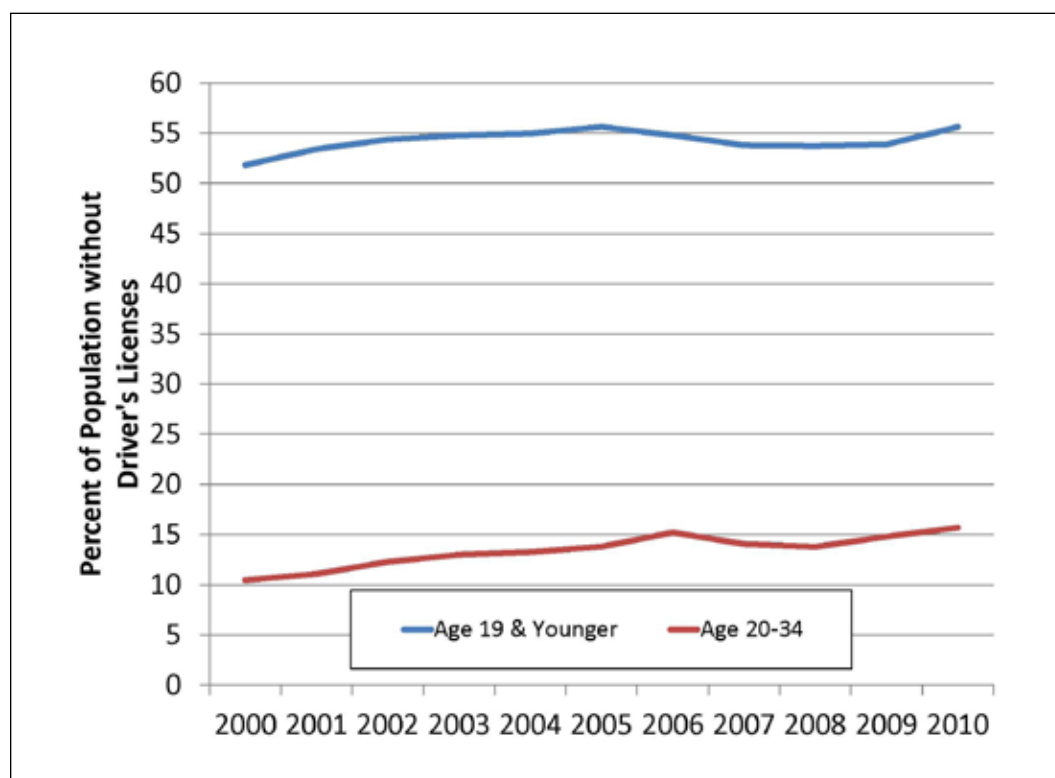
The increase in young people without driver's licenses is not limited to age groups affected by Graduated Drivers Licensing (GDL) laws (age 14-19). (For more information on GDL laws, see page

22.) The percentage of people between the ages of 20 and 34 without licenses has also increased. The number of 20 to 34-year-olds without a driver's license increased from 10.4 percent to 15.7 percent between 2000 and 2010. (See Figure 5.)

Americans Move to More Urban Areas with More Transportation Alternatives

Many Americans, including young people, are seeking to move to places that have alternative transportation options. For decades, people migrated from central cities to distant suburbs and exurbs where transportation was dependent on automobiles. Recently, however, there has been an increase in movement back to densely-

Figure 5: The Share of Young People Without Driver's Licenses Has Increased²⁴



populated urban cores where people can walk, bike and take public transit instead of driving. There has also been an increase of interest in walkable, mixed-use developments in suburban communities. Some people living in these communities, especially those in Generation Y, do not own cars. According to the Bureau of Transportation Statistics, households in urban areas are 2.5 times more likely not to possess a car than households in rural areas.²⁵

The rising demand for homes in centrally-located locations is being met through the revitalization of aging urban areas in major cities as well as the reconstruction of downtown and single-use (e.g. retail) areas into mixed-use walkable and transit-oriented developments in smaller cities. This transformation has already taken place in several cities. Arlington County in Virginia, Bellevue in Washington, and Pasadena in California have all replaced

strip malls with mixed-use developments that have access to public transit.²⁶

This increase in downtown construction is clearly demonstrated by trends in building permits. In the decades before this shift back to downtown areas, the number of building permits in exurbs and far-lying suburbs dramatically outnumbered the number of permits in inner cities. However, a recent study by the U.S. Environmental Protection Agency of 50 metropolitan areas shows that the proportion of building permits in central city neighborhoods has significantly increased in recent years. In nearly half of the metropolitan areas, the share of new residential building permits in urban core communities dramatically increased. For example, in the New York City metropolitan area, the central city's share of residential building permits increased from 15 percent in the early 1990s to 48 percent in the mid-

2000s.²⁷ Over the same time period, the central city's share of building permits in Chicago increased from 7 percent to 27 percent and the central city's share in Portland, Oregon, increased from 9 percent to 26 percent.²⁸

The increased demand for property in inner cities and mixed-use suburban areas is also evident in housing prices. Whereas in the late 1990s, the most expensive housing was in the outer-lying suburbs, today's most expensive housing has shifted to walkable inner cities and inner suburbs. According to a real estate analysis by Christopher Leinberger, professor at the Graduate Real Estate Development Program at the University of Michigan, some of today's most expensive neighborhoods in metropolitan areas are walkable multi-use communities, such as Capitol Hill in Seattle, Virginia Highland in Atlanta, and

German Village in Columbus (OH)—communities that were all dilapidated 30 years ago.²⁹

The age groups leading this migration to inner-cities and mixed-use suburbs are those nearing retirement (Baby Boomers) and young adults (Generation Y). Many baby boomers, who no longer need multi-room houses and backyards (because their children have moved out), have begun moving to homes that are smaller and in locations that have easily-accessible societal amenities.³⁰ Young adults have begun leaving their parents' homes to move into "vibrant, compact, and walkable communities full of economic, social, and recreational activities," according to the Brookings Institution.³¹ An estimated 77 percent of young people (age 18-35) plan to live in urban centers.³²

Young People's Priorities and Preferences Are Leading Them to Drive Less

Many members of Generation Y have reduced their driving because they choose to take transportation alternatives instead of cars to school, work and recreation, and because many have chosen to live in ways that require less time behind the wheel of a car. Growing evidence—both anecdotal and quantitative—suggests that some of this change is being driven by shifts in young people's priorities and preferences, shifts that could very well persist as Generation Y ages.

Young People Choose to Replace Driving with Alternative Transportation

Across America, a growing number of young people make a conscious effort to take transit instead of cars to get to school, work and friends' houses.

Many young people do not prioritize learning to drive. According to Tom Pecoraro, owner of I Drive Smart, a Washington area drivers' education program, quoted in the *Washington Post*, "Driving is

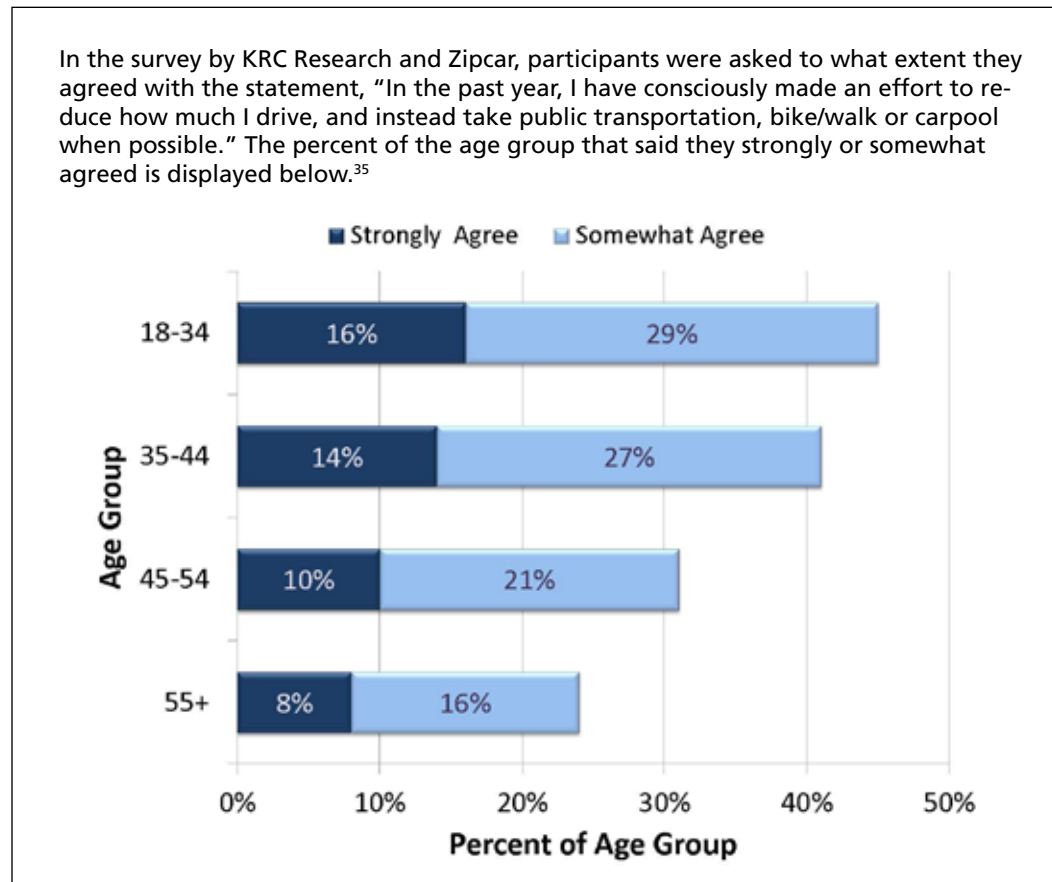
really important to a lot of the kids in the culture, but it is not the central focus like it was 25 years ago."³³ Instead, young people choose to spend time on their studies, extracurricular activities and social media.

Recent polls have also documented this shift away from driving and toward alternative transportation. According to a recent survey by KRC Research and Zipcar, 45 percent of young people (18-34 years old) reported to have made a conscious effort in the previous year to reduce their driving—this is compared with approximately 32 percent of the rest of the population.³⁴ (See Figure 6.)

Young People Want to Live in Places with Transportation Alternatives

Many people, especially those in Generation Y, increasingly prefer to live in places where they can get around without getting in a car. People want to move to places where they can walk to amenities such as

Figure 6: Young People Have Made a Conscious Effort to Reduce Their Driving



grocery stores, restaurants, and houses of worship, and have nearby access to public transportation. These preferences contrast with the preferences of older and past generations, many of whom strongly valued living in suburban single family homes with transportation dependent on automobiles.

Living in a place that is walkable and transit-oriented has become increasingly popular in recent years, even outside of city centers. For example, Arlington Heights in Illinois, which moved to transit-oriented development ahead of many other places in America, has become a cherished place to live. The suburb, located 25 miles northwest of Chicago, has 77,000 residents, a combination of single-family and multi-family homes, and a number of amenities

within walking and biking distance that makes driving less necessary.³⁶ According to a *Chicago Tribune* article, what residents enjoy about Arlington Heights, among other qualities, is its mobility. Residents say that Arlington Heights’ “family-friendly melding of top-ranked schools, an outstanding park district, convenient access to Chicago and revived downtown represent an appealing mix.”³⁷ The city’s Metra commuter rail station, located downtown, is three blocks from the library (which is visited by 2,600 people a day³⁸), four blocks from a recreational park, and is surrounded by restaurants, shops, schools, theaters and other amenities³⁹—and the Metra commute to downtown Chicago takes only 50 minutes.⁴⁰

National surveys and polls have also



Passengers at Arlington Heights Station on the Union Pacific-Northwest Metra Line. Credit: City of Arlington Heights

documented the popularity of living in places with smart growth and transit-oriented development among young people.

- According to a survey by the National Association for Realtors, conducted in March 2011, 62 percent of people ages 18-29 said they would prefer to live in an area with smart growth (defined as a place with a mix of single family houses, apartments, and condominiums, with stores, restaurants, libraries, schools and access to public transportation nearby) as opposed to sprawl. The proportion of young people who preferred to live in smart growth neighborhoods was between four and 11 percentage points higher than all other age groups.⁴¹ (See Figure 7.)

Figure 7: Young People Prefer to Live in Smart Growth Neighborhoods

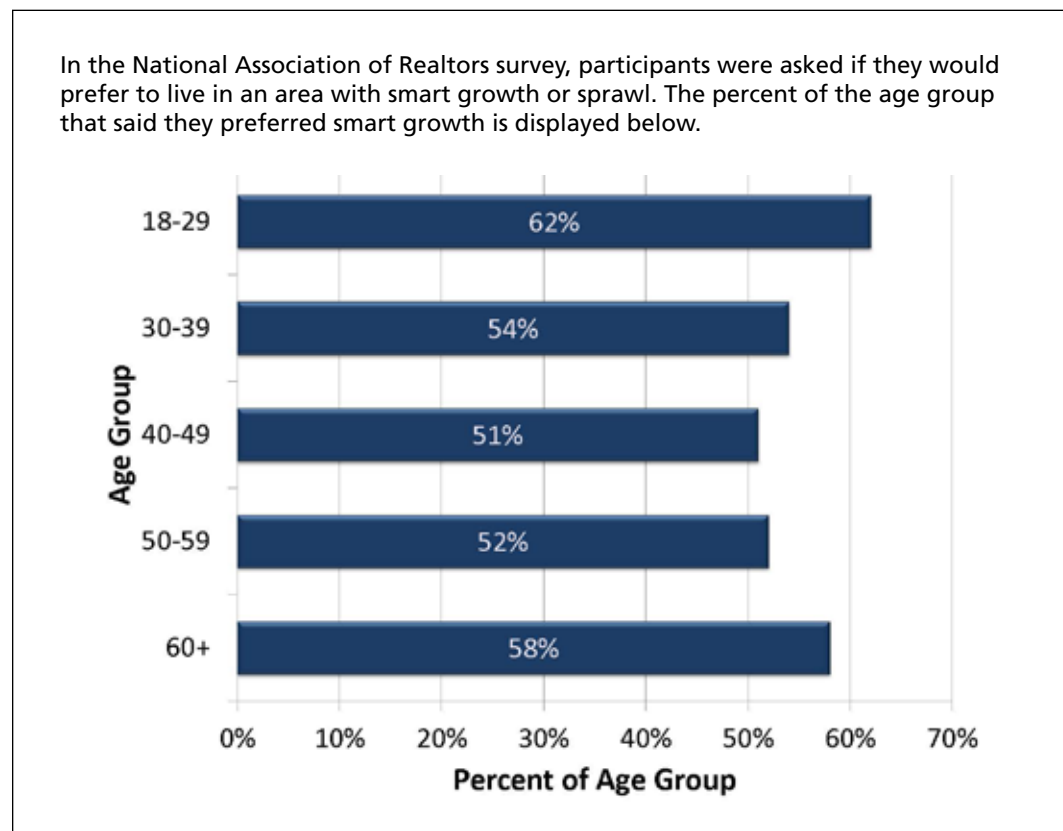
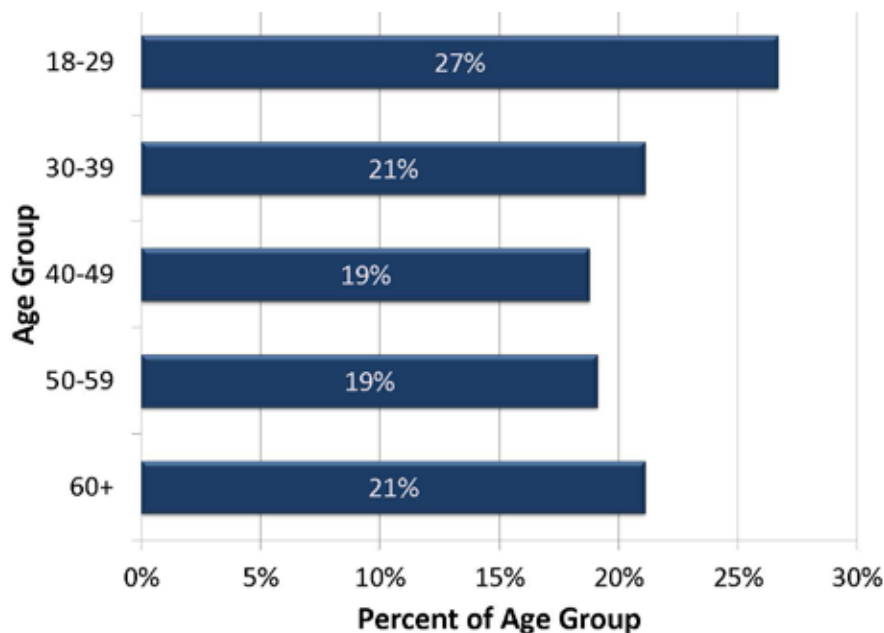


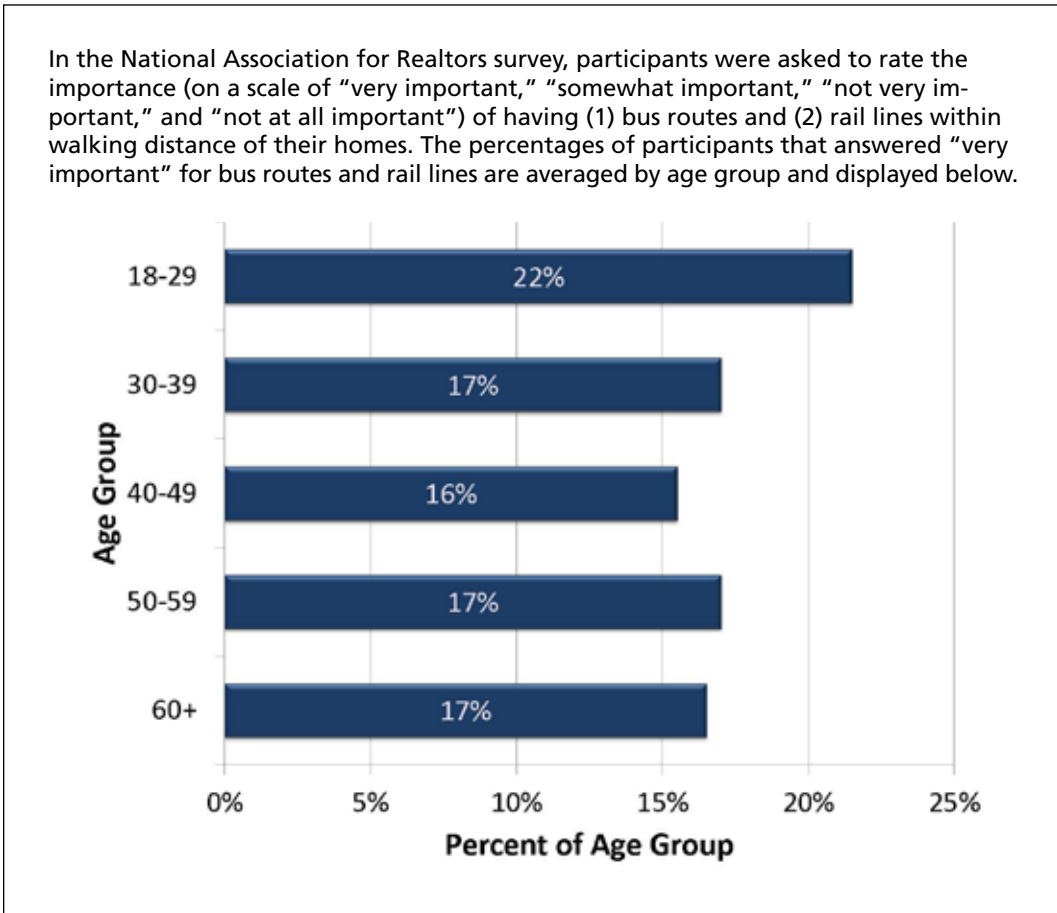
Figure 8: Young People Most Value Social Amenities within Walking Distance

In the National Association for Realtors survey, participants were asked to rate the importance (on a scale of “very important,” “somewhat important,” “not very important,” and “not at all important”) of having nine specific social amenities (e.g., restaurants) within walking distance of their homes. The percentages of participants that answered “very important” for each amenity are averaged by age group and displayed below.



- In a survey by the Urban Land Institute in 2011, nearly two-thirds of 18 to 32-year-olds polled said living in communities that were walkable was either essential (14 percent) or preferable (50 percent).⁴²
- In the same survey, people between the ages of 18 and 29 were at least 25 percent more likely than older populations to highly value having bus routes and rail lines within walking distance of their homes. (See Figure 9.)
- In the National Association for Realtors survey discussed above, people between the ages of 18 and 29 valued having social amenities—such as grocery stores, restaurants and doctors’ offices—in walking distance more than people in other age groups.⁴³ (See Figure 8.)

Figure 9: Young People Most Value Bus Routes and Rail Lines within Walking Distance



The Trend Toward Reduced Driving Among Young People Is Likely to Persist

Transportation investments last for decades. So it is important for transportation policy-makers to understand whether trends such as the recent decline in driving are temporary or are likely to be long-lasting.

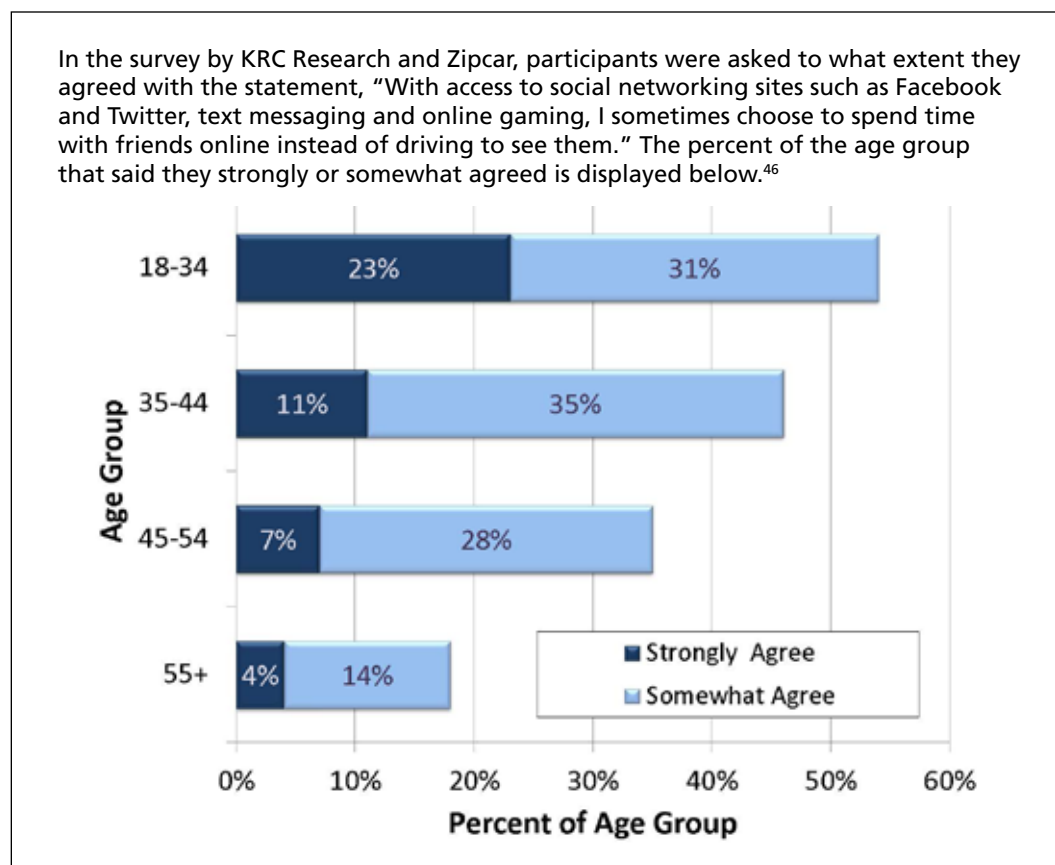
While temporary factors such as the recession have contributed to the decline in driving, the shift in transportation attitudes and behaviors among young people appears likely to persist as they get older and as new people reach driving age. Social networking sites, smart phones and other new communications innovations not only provide an alternative to driving in their own right but they also provide a platform for transportation services such as real-time transit information and car- and bike-sharing services that did not exist a decade or two ago. Legal barriers, such as recent Graduated Drivers' Licensing laws that now require potential drivers to take more behind-the-wheel training and restrict young people's driving behavior will also likely act as a continued barrier to driving. Other young people avoid driving because increased fuel prices have made driving more expensive—a situation that is unlikely to change markedly in the foreseeable future.

Communication Technology Substitutes for Driving and Supports Alternative Transportation

Improvements to and expanded accessibility of communications technology reduce the number of trips taken in cars. Social networking technology has become a substitute for some types of car trips. Websites and smart phone apps, which did not exist 20 years ago, provide real-time transit data (e.g. Nextbus) and make public transportation easier to use, particularly for infrequent users. Meanwhile, technology advances have also facilitated the growth of car-sharing and bike-sharing services, enabling users to reserve, pay for, and locate cars or bikes anytime of the day.

Today's communications technology used for social networking has become a substitute for some car trips. Younger people today value constant interconnectivity to their peers through websites and mobile phone applications, social networking platforms (Facebook, Twitter, Foursquare), instant messaging software, cell phones and video chatting platforms

Figure 10: Young People Substitute Driving with Social Networking Platforms



(Skype). Some young people who spend time interacting with friends through communications technology have less time and desire to drive to see someone.

Communicating through these new technologies has decreased the necessity for young people to use cars. Michelle Wei, for example, from Herndon, Virginia, who did not get her license until she was a senior, was content without driving because of the social media available to her. She claims, in an article in the *Washington Post*, "If I couldn't get a ride to see my friend who lives a town over, I could talk on IM . . . or Skype." The digital world, she said, "made it very easy not to drive."⁴⁴

Ms. Wei is not alone—a recent survey by Zipcar and KRC Research found that many young people substitute social networking for driving. According to the

survey, 54 percent of young people polled strongly or somewhat agreed with the statement that "I sometimes choose to spend time with friends online instead of driving to see them." That compares with only 18 percent of Baby Boomers (age 55+).⁴⁵ (See Figure 10.)

Websites and smart phone applications that provide real-time transit data, such as Nextbus, make public transportation easier to use, particularly for infrequent users. Real-time transit data allow riders to see when the next bus, train, or subway will arrive, how long the trip will take, and what transfers will be necessary on the journey. Twenty years ago, public transportation was most accessible to experienced riders, who knew the routes, schedules, and frequencies. Even then, buses, trains and subways that were late would waste passenger time.

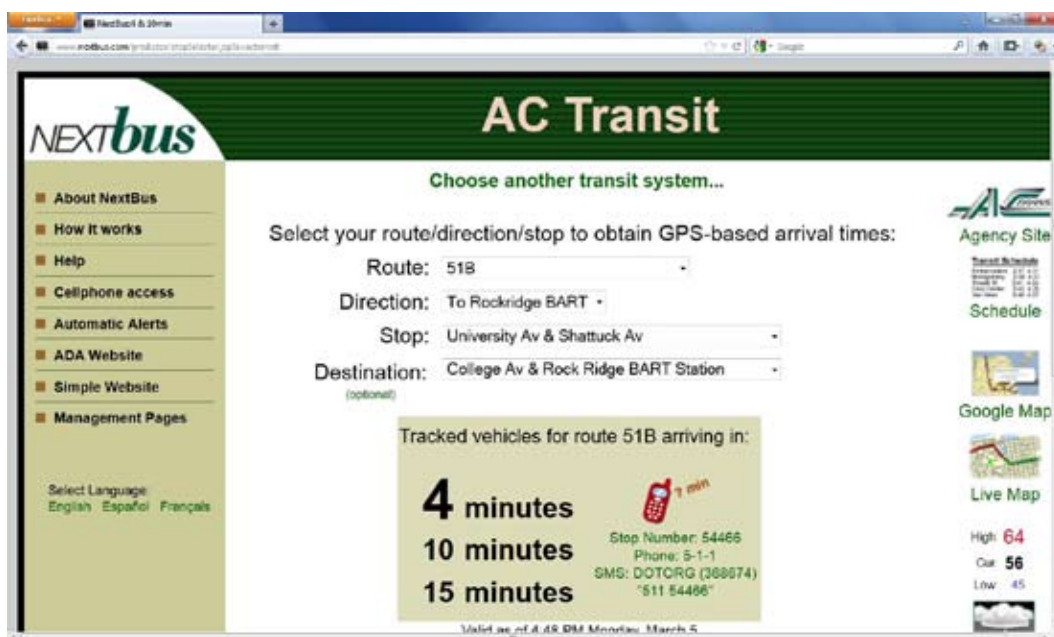
With real-time transit technology, public transportation is just as accessible to the first-time traveler as the experienced rider, and people waste less time waiting for their bus, train or subway.

Real-time transit data have become increasingly accessible in recent years. Not only have transit operators made available real-time transit data, but some companies (e.g. Nextbus, Google through Google Maps) have begun to aggregate the real-time data from different systems into one location. Nextbus, for example, has aggregated real-time transit data from systems across the country, and over the past few years they have expanded rapidly. From 1996, when Nextbus was founded, to 2008, the company was able to grow to cover 40 transportation systems. In the past three years, Nextbus has rapidly expanded and now covers 82 transportation systems.⁴⁷ Today, passengers can use Nextbus, both on the Internet and on a smart phone, to find their next ride in cities across the country, from Seattle to Los Angeles to Boston.⁴⁸ (See Figure 11.)

Technology has also led to the creation of transportation options that did not exist 15 or 20 years ago. With car-sharing services such as Zipcar, for example, the Internet and smart phone applications allow users to reserve, pay for and locate cars easily, at any time of the day. Then, Radio Frequency Identification (RFID) technology allows car-sharing users to open the car doors with digital cards, removing the hassle and cost of having to pick up keys.⁴⁹ The availability of car-sharing services such as Zipcar enables some people to avoid purchasing a vehicle of their own—saving money that can then be spent on commutes and trips via alternative transportation and reducing the temptation to drive at times other than when it is strictly necessary.

Technology also makes bike-sharing programs possible and convenient. In the past two years, numerous cities, including Boston, Chicago, Denver, Des Moines, Honolulu, Miami Beach, New York, San Antonio and Washington D.C. have launched bike share programs.⁵⁰

Figure 11: Nextbus Provides Real-Time Transit Data



These programs have been made possible and convenient by the advent of different technological applications. With technology that is now widespread and common, bike-sharers can look up the availability of bikes near them, ride to work, school or to go shopping, and be automatically billed for their ride time with their key signature.

On the other hand, despite efforts by automakers to integrate new technology into new vehicles, mobile technology and driving still often don't mix. GPS systems have made it somewhat easier for drivers to find their way to their destinations and avoid traffic, and voice recognition software integrated with cars' computer systems make it somewhat easier to make calls and text while driving, but the universe of interactive activities available to drivers is necessarily limited by the fact that they need to pay attention to the road. Bus and train riders can typically talk, text or work safely while riding. Driving while talking on a cellphone, texting or working on a laptop or smartphone, however, can be dangerous. States are increasingly enacting laws that make driving while talking on the phone or text messaging a misdemeanor. Currently, 35 states have outlawed texting while driving, 12 of which were enacted recently in 2010, and nine states have outlawed handheld cell phone use while driving.⁵¹ Some safety experts believe that even these measures do not go far enough—in December 2011, the National Transportation Safety Board recommended a complete ban on cell phone use while driving, due to the dangers of distracted driving.⁵²

The technological changes of the last 20 years—particularly the advance of mobile communications technology—have made transportation alternatives more appealing relative to driving, especially for the younger people who have embraced those technologies with enthusiasm.

Driver's License Restrictions Postpone Young People from Obtaining Licenses

Between 1996 and 2006, every state one but one enacted Graduated Drivers' Licensing (GDL) laws.⁵³ GDL laws, which are designed to keep young people safe, also make obtaining a driver's license more challenging. To get a license today, young people must take more behind-the-wheel training (which is more expensive), fulfill additional requirements for permits, and, once they are allowed to drive, they often are restricted to driving in the daytime and without passengers.

Over the past 15 years, states have put restrictions on young people acquiring licenses. Up until the mid-1990s, acquiring a license was relatively simple—drivers could get their licenses when they were 16 or younger, with only a short restrictive period (permit), and a few hours of training. Then in 1996, to keep young drivers safe, Florida enacted the first comprehensive Graduated Driver Licensing (GDL) program.⁵⁴ GDL programs have three stages of licensing (learner's permit, intermediate license, full licensure) to gradually introduce driving privileges to young drivers, ensuring that they have all the skills to drive safely once they are on the road.⁵⁵ In the five years after Florida enacted its GDL law, 42 other states enacted similar laws, and by 2006, all states had some GDL rules in place.⁵⁶

GDL laws have become a deterrent for some young people contemplating acquiring a license. Not only do GDL laws decrease young people's mobility in the first months and years when they start driving, but the process of getting a full license is longer and more expensive—up to 60 hours of driving practice with an adult and \$600 for driving courses.⁵⁷ According to Rob Foss, director of the Center for the Study of Young Drivers at the University

Will GDL Laws Lead to a Prolonged Reduction in Driving?

GDL laws reduce young people's driving during the first few years they are eligible to drive. But GDL laws may have a longer lasting impact. Recent research at the University of Michigan Transportation Research Institute found that the percentage of licensed drivers among people who were 20 to 44 years old in 1983 did not increase as those people aged—in other words, according to the study, “for all practical purposes, for the cohorts born between 1939 and 1963, *all those who wanted to get a driver's license did so by age 20.*”⁶² (emphasis in original)

Should this finding prove to be true for today's young people—which is very uncertain—changes in driver's licensing laws that delay the acquisition of a license could potentially have long-lasting repercussions for driving behaviors later in life.

of North Carolina, these hurdles and restrictions have caused much of the decline in the number of licensed 16-year-olds.⁵⁸ To many teenagers, studying and extracurricular activities are a greater priority than the tens of hours of behind-the-wheel practice and high cost necessary to receive a license.⁵⁹

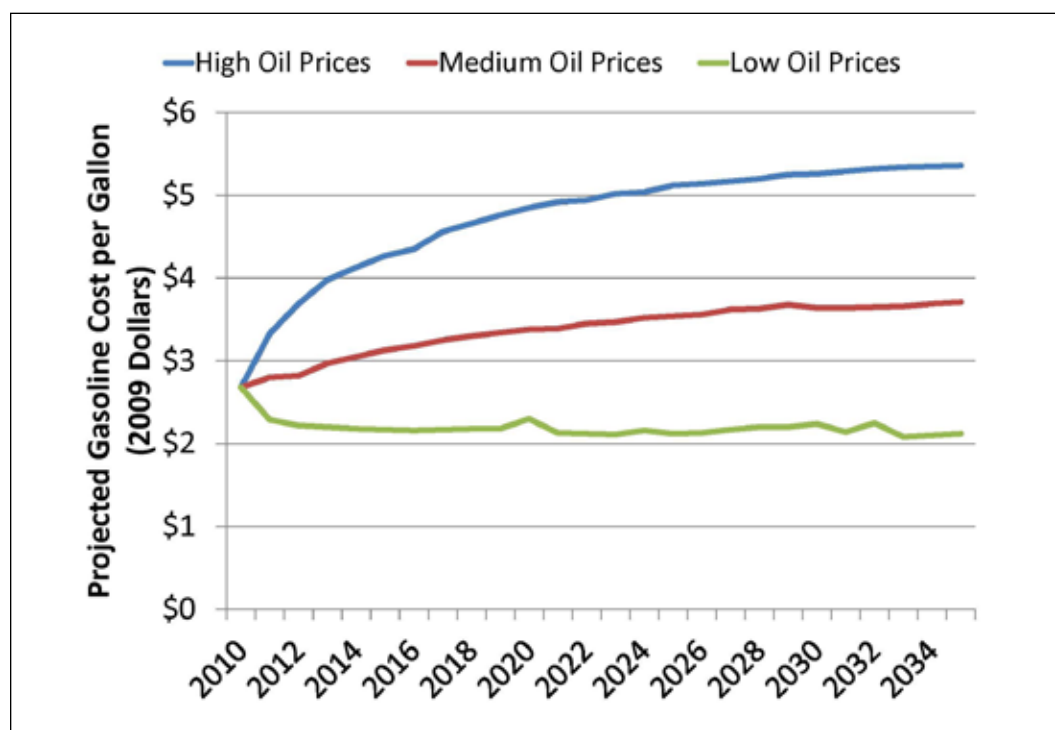
GDL laws are likely to remain in effect because they have been successful in keeping young drivers safe. From the years between 1993 and 1995, to the years between 2003 and 2005, fatal crashes involving 16-year-old drivers decreased 23 percent.⁶⁰ According to a report by Preusser Research Group, the most effective provision in keeping young drivers safe is the extension of the time period in which they must be supervised, which restricts young drivers' mobility and deters them getting a license.⁶¹ Since GDL laws' successes make them unlikely to be rolled back by state legislatures, they will likely continue to be a deterrent for young people considering applying for licenses.

Increased Fuel Prices Push People to Cheaper Transportation Alternatives

Increased fuel prices have made driving more expensive, reducing the frequency with which people—especially younger people with less disposable income—travel in cars. The average cost for filling up the tank in 2001 was \$1,100 for the year (in 2011 dollars).⁶³ With gasoline prices soaring to \$3.50 on average since then, filling up the same tank today costs \$2,300—more than twice as expensive and a serious deterrent for drivers to get behind the wheel.⁶⁴

While gasoline prices will fluctuate in the future, they are unlikely to return to the low levels of 1980s or 1990s, and unless the United States accelerates its adoption of electric vehicles, it will likely be more expensive to fill up the tank in the future than it is today. According to the U.S. Energy Information Administration's projections, gas prices are expected to increase by 26 percent (adjusted for inflation) from 2010 to 2020.⁶⁵ (See Figure 12.)

Figure 12: Gasoline Prices Will Remain High Or Increase In the Future⁶⁶



Note: "High Oil Prices" refers to \$200 per barrel (in 2009 dollars). "Medium Oil Prices" refers to \$125 per barrel. "Low Oil Prices" refers to \$50 per barrel.

Some Young People Reduce Their Driving to Protect the Environment

Some young people purposely live in ways that reduce their driving as a way to fulfill their personal commitment to a cleaner environment. Driving in cars releases dangerous gases that cause global warming, create smog and make ambient air dirty and unsafe to breathe. In a survey by Zipcar and KRC Research, 16 percent of 18 to 34-year-olds polled said they strongly agreed with the statement "I want to protect the environment, so I drive less." This is compared to approximately 9 percent of older generations.⁶⁷ (See Figure 13.)

The Trend Toward Reduced Growth in Driving Will Likely Persist Even When the Economy Rebounds

The recession has played a role in reducing the miles driven in America, especially by young people. People who are unemployed or underemployed have difficulty affording cars, commute to work less frequently (if at all), and have less disposable income to spend on traveling for vacation and other entertainment.

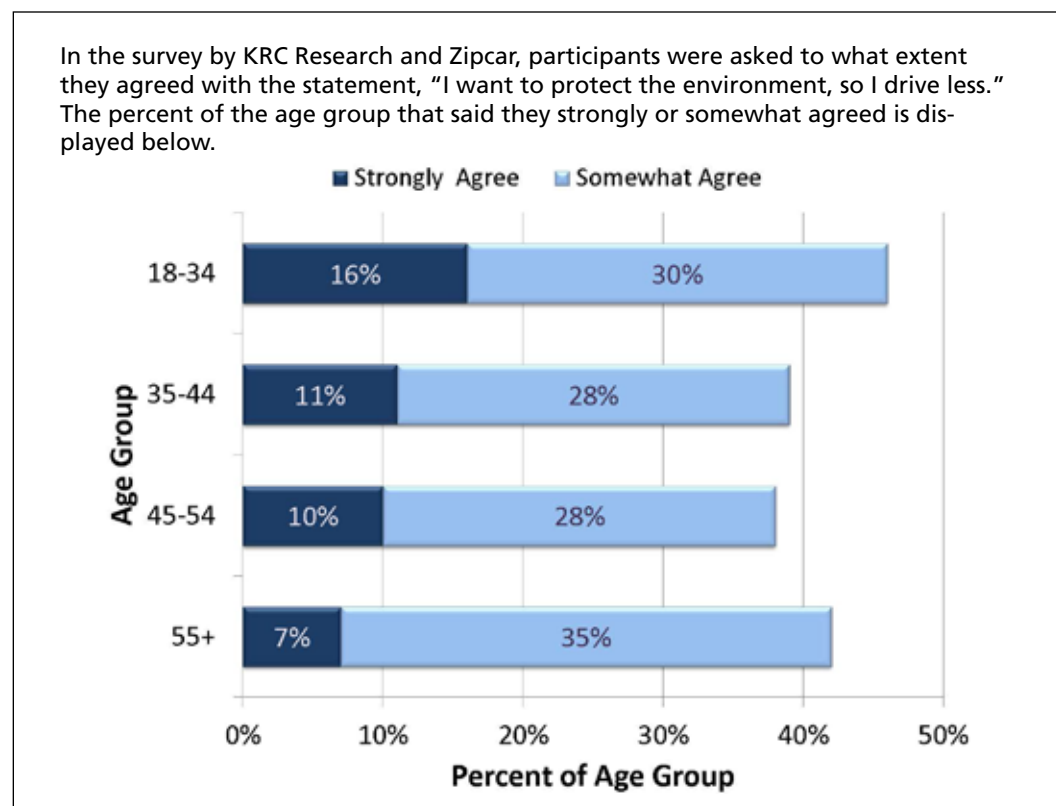
It is possible that driving will increase somewhat as the economy rebounds. But the long-term, sustained, upward growth in vehicle travel that characterized the United States for decades is likely at an end—economic recovery or not—due to

the fundamental shifts in external conditions and consumer preferences detailed in this report.

The current recession has hit young adults the hardest. Many statistics and reports document the recession's particular impact on Generation Y:

- According to the Bureau of Labor Statistics, in 2011 the unemployment rate was 24.4 percent among 16 to 19-year-olds, 14.6 percent among 20 to 24-year-olds, and 10.3 percent for 25 to 29-year-olds, as compared to 8.9 percent for the country as a whole.⁶⁹
- According to a 2010 report by the Pew Research Center, young people are more likely than older people to have recently lost a job (10 percent for people 29 and younger, 6 percent for people 30 and older).⁷⁰
- According to the same Pew report, the proportion of 18 to 29-year-olds employed full time fell 9 percent (from 50 percent to 41 percent) from 2006 to 2010, whereas the proportion of 30 to 64-year-olds employed full time fell only marginally (65 percent to 63 percent for 30-45 year olds, and 54 percent to 53 percent for 46-64 year olds).⁷¹
- According the Project on Student Debt, two-thirds of college seniors who graduated in 2010 had student loan debt, averaging \$25,250.⁷²
- According to Fidelity Investments, the typical member of Generation Y holds at least three credit cards, and one in five cards has a balance of over \$10,000.⁷³

Figure 13: Young People Reduce Their Driving to Protect the Environment⁶⁸



The economic recession has consequently pushed car ownership outside the economic reach of many young adults. In America, the average annual cost of owning and operating an automobile is \$8,776.⁷⁴ With such a high percentage of young people unemployed, and many of those employed still struggling to make ends meet, car ownership is simply not viable. In the Zipcar/KRC Research survey, 80 percent of 18 to 34-year-olds stated that the high cost of gasoline, parking and maintenance made owning a car difficult (in comparison, approximately 72 percent of people ages 35 and older found owning a car difficult).⁷⁵

However, many young Americans who cannot afford cars would continue to drive less and take alternative transportation even if they could, for the following reasons:

- Young people who have the funds today to afford cars are still increasing their use of transportation alternatives. From 2001 to 2009, young people (16-34 years old) who lived in households with incomes of over \$70,000 per year increased their use of public transit by 100 percent, biking by 122 percent, and walking by 37 percent.⁷⁶
- Young people who have jobs today drive less than young people who had jobs before the recession. The average young person (ages 16 to 34) with a job drove 10,700 miles in 2009, compared with 12,800 miles in 2001.⁷⁷
- Young people who have jobs today take public transportation more than young people who had jobs before the recession. Among young people who are employed, the number of miles traveled via public transit has increased 25 percent from 2001 to 2009.⁷⁸
- Americans started to drive less before the recession. The miles driven per capita in America first dropped in 2005—three years before the start of the recession.⁷⁹

The economic recession has forced a large number of young people to delay purchasing an automobile and/or reduce the amount they drive. Economic recovery will bring some of those young people back onto the roads. But the fundamental forces that are driving many Americans—especially young people—to change their transportation behaviors will remain.

Implications for Transportation Policy

America's transportation policies have long been predicated on the assumption that driving will continue to increase. The changing transportation preferences of young people—and Americans overall—throw that assumption into doubt. Transportation decision-makers at all levels—federal, state and local—need to understand the trends that are leading to the reduction in driving among young people and engage in a thorough reconsideration of America's transportation policy-making to ensure that it serves both the needs of today's and tomorrow's young Americans and moves the nation toward a cleaner, more sustainable and economically vibrant future.

Transportation infrastructure decisions have long-lasting implications. Highways, transit lines and sidewalks have useful lives measured in decades—and sometimes centuries. To make the best of limited resources, transportation planners must anticipate trends 10, 20 or 40 years into the future.

Since World War II, the vision the U.S. government has had of the future has been one of consistent increases in driving. In 2000, for example, the U.S. Energy

Information Administration projected that by 2010, the total number of vehicle-miles traveled on America's roads would reach 3.4 trillion.⁸⁰ However, in 2010, decreased driving rates caused the vehicle-miles traveled to total just less than 3 trillion miles—a difference of 11 percent.⁸¹

The shift away from six decades of increasing vehicle travel to a new reality of slow-growing or even declining vehicle travel has potentially seismic implications for transportation policy. It calls into question the wisdom of our current transportation investment priorities as well as the sources of revenue used to pay for those priorities. It creates both a multitude of new opportunities as well as difficult challenges.

The data in this report suggest a possible future in which:

- The demand for transportation overall stagnates due to the substitution of mobile technologies for some transportation services and the emerging consumer preference for walkable, less auto-dependent forms of development.

- The demand for automobile transportation—both absolutely and as a share of overall transportation demand—stagnates or declines due to the improved competitive position of transportation alternatives on measures of quality, convenience and cost.
- The demand for transportation alternatives increases for the same reasons.

It is much too early to conclude that this vision of the future will become reality. But it is at least as plausible a vision of the future as one based on an expectation that the trend toward ever-increasing amounts of driving that has characterized the last 60 years will resume.

Such a shift in future transportation trends would shake the foundations of transportation policy-making. For example, to meet the demand for alternative transportation, federal, state and local governments would need to prioritize investment in public transportation, bike lanes, sidewalks and other transportation alternatives. To meet the demand for walkable neighborhoods in close proximity to

transit, government officials would need to ensure that land-use and transportation policies were aligned to support the development of these communities. To compensate for the declines in gas-tax revenues, decision-makers would need to find alternative sources of funding for road and bridge maintenance or boost the gasoline tax to levels that may further discourage driving.

Again, it is far too early to say that this vision will become reality. As the old saying goes, it's difficult to make predictions, especially about the future.

But policy-makers and the public need to be aware that America's current transportation policy-making and financing structure is fundamentally out-of-step with both the nation's current needs and the expressed preferences of growing numbers of Americans. It is well beyond the scope of this report to address the policy implications of shifting youth transportation trends in detail—though we hope to return to this issue in future work. It is clear, however, that we urgently need to consider a new vision for transportation policy that reflects the needs of 21st century America.

Notes

1 Federal Highway Administration, *Interstate FAQ*, downloaded from www.fhwa.dot.gov/interstate/faq.htm, 7 March 2012.

2 Federal Highway Administration, *Highway Statistics 2009, Table VMT-422*, 29 February 2012.

3 Vehicle-miles traveled: Federal Highway Administration, *Historical Monthly VMT Report*, 3 May 2011; Note: for all references in this report to population and per capita statistics, the following citations are used. For population data for 1900-1999 see U.S. Census Bureau, *Historical Population Estimates: July 1, 1900 to July 1, 1999*, 28 June 2000. For population data for 2000-2010 see U.S. Census Bureau, *GCT-T1: Population Estimates*, downloaded from factfinder2.census.gov, 17 November 2011. For population data for 2011 see U.S. Census Bureau, *Monthly Population Estimates for the United States: April 1, 2010 to January 1, 2012*, downloaded from www.census.gov/popest/data/national/totals/2011/index.html, 10 February 2012.

4 2010 and prior: Federal Highway Administration, *Historical Monthly VMT Report*, 3 May 2011; 2011: Federal Highway

Administration, *Traffic Volume Trends*, December 2011.

5 2010 and prior: Federal Highway Administration, *Historical Monthly VMT Report*, 3 May 2011; 2011: Federal Highway Administration, *Traffic Volume Trends*, December 2011; Note: The vehicle-miles traveled per capita in 2004 and 2005 are nearly the same, and the peak year may vary between 2004 and 2005 depending on which datasets within the Federal Highway Administration are used.

6 See note 4.

7 10,300 miles in 2001 and 7,900 miles in 2009 were derived by dividing the total vehicle miles traveled by the total number of persons age 16-34 for 2001 and 2009, per the Federal Highway Administration, *National Household Travel Survey*, downloaded from nhts.ornl.gov/det, 21 November 2011.

8 15 percent fewer trips derived by dividing the number of vehicle trips per driver in 2009 by the number of vehicle trips per driver in 2001 for 16 to 34-year-olds, per the Federal Highway Administration, *National Household Travel*

Survey, downloaded from nhts.ornl.gov/det, 21 November 2011. The vehicle trips per driver in 2001 and 2009 were derived by dividing the total number of vehicle trips by the total number of drivers for 16 to 34-year-olds for each year.

9 The average trip lengths in 2001 (10.1 miles) and in 2009 (9.5 miles) were derived by dividing the total vehicle miles traveled by the total number of vehicle trips for each year for 16 to 34-year-olds, per the Federal Highway Administration, *National Household Travel Survey*, downloaded from nhts.ornl.gov/det, 21 November 2011.

10 Federal Highway Administration, *Highway Statistics 2010—Table DL-20*, September 2011.

11 Michael Sivak and Brandon Schoettle, University of Michigan Transportation Research Institute, *Recent Changes in the Age Composition of Drivers in 15 Countries*, October 2011.

12 Todd Litman, Victoria Transport Policy Institute, *The Future Isn't What It Used To Be: Changing Trends and their Implications For Transport Planning*, 6 November 2011.

13 Tobias Kuhnimhof, Institute for Mobility Research, Matthias Wirtz, Institute of Transport Studies, Karlsruhe Institute of Technology, and Wilko Manz, STRATA GmbH, *Lower Incomes, More Students, Decrease of Car Travel by Men, More Multimodality: Decomposing Young Germans' Altered Car Use Patterns*, 2012.

14 25 more trips was derived by subtracting the trips on alternative transportation made per person in 2001 from the trips made per person in 2009 for 16 to 34-year olds using data from the Federal Highway Administration, *National Household Travel Survey (NHTS)*, downloaded from nhts.ornl.gov/det, 21 November 2011. For both 2001 and 2009, the total number of trips on alternative transportation was calculated by adding

the total number of bike person trips, transit person trips and walk person trips for 16 to 34-year-olds per the *NHTS*. The total number of alternative transportation trips for each year was then divided by the number of 16 to 34-year-olds for each year, which gives the total number of alternative transportation trips per person. 117 more miles was derived by subtracting the number of miles traveled on alternative transportation per person in 2001 from the number of miles traveled on alternative transportation per person in 2009. For both 2001 and 2009, the total number of miles traveled on alternative transportation was calculated by adding the miles traveled by bike, transit and walking for 16 to 34-year-olds per *NHTS*. The total number of miles traveled on alternative transportation for each year was then divided by the number of 16 to 34-year-olds for each year, which gives the alternative transportation miles per person.

15 24 percent more bike trips was derived by dividing the number of bike trips taken in 2009 by the number of bike trips taken in 2001 for 16 to 34-year-olds, per the Federal Highway Administration, *National Household Travel Survey*, downloaded from nhts.ornl.gov/det, 21 November 2011.

16 16 percent more frequently was derived from dividing the trips taken per capita in 2009 by the trips taken per capita in 2001, using data from the Federal Highway Administration, *National Household Travel Survey*, downloaded from nhts.ornl.gov/det, 21 November 2011. The trips taken per capita in 2001 and 2009 were derived by dividing the total number of person trips walked by the total number of persons for that year for 16 to 34-year-olds, per the *NHTS*.

17 40 percent increase in the number of miles traveled on public transit is derived by dividing the number of miles traveled on transit per capita in 2009 by the number of miles traveled on transit per capita in 2001 for 16 to 34-year-olds, using data from the Federal Highway Administration, *National*

Household Travel Survey, downloaded from nhts.ornl.gov/det, 21 November 2011. The number of miles traveled on transit per capita for 2001 and 2009 is derived by dividing the total number of person miles traveled on transit by the number of persons for 16 to 34-year-olds for that year. Note: the number of trips taken by young people on public transit did not increase dramatically.

18 10 billion derived by subtracting the total passenger miles traveled in 2001 from the total passenger miles traveled in 2009 for all ages, per Federal Highway Administration, *National Household Travel Survey*, downloaded from nhts.ornl.gov/det, 21 November 2011. More than 60 percent derived by subtracting the total passenger miles traveled in 2001 from the total passenger miles traveled in 2009 for 16 to 34-year-olds, and dividing the difference by 10 billion, per the *NHTS*.

19 The Bureau of Transportation Statistics also reports on the ridership rates for bus lines, which has stayed relatively constant over the past ten years. Research and Innovative Technology Administration, Bureau of Transportation Statistics, *Transit Ridership*, February 2012.

20 Research and Innovative Technology Administration, Bureau of Transportation Statistics, *Transit Ridership*, February 2012.

21 National Automobile Dealers Association, *NADA Data: State of the Industry Report 2011*, downloaded from www.nada.org/nadadata, 26 March 2012; National Automobile Dealers Association, *Economic Impact of America's New-Car and New-Truck Dealers 2002*, downloaded from www.nada.org/nadadata, 26 March 2012.

22 Ibid.

23 See note 10.

24 Ibid.

25 Research and Innovative Technology

Administration, Bureau of Transportation Statistics, *Figure 32 – Proportion of Households Without Vehicles by Household Type: 2001, 2003*.

26 Christopher Leinberger, “The Death of the Fringe Suburb,” *New York Times*, 25 November 2011.

27 U.S. Environmental Protection Agency, *Residential Construction Trends in America's Metropolitan Regions, 2010 Edition*, January 2010.

28 Ibid.

29 See note 26.

30 Patrick Doherty and Christopher Leinberger, “The Next Real Estate Boom; How housing (yes, housing) can turn the economy around,” *Washington Monthly*, November 2010.

31 Ibid.

32 Ibid.

33 Donna St. George, “Teens not the driving force they used to be; Able to connect in ways that don't involve four wheels, many are postponing licenses,” *The Washington Post*, 24 January 2010.

34 KRC Research, *Millennials & Driving; A Survey Commissioned by Zipcar*, November 2010.

35 Ibid.

36 Jeffrey Steele, “A family-friendly burb; Arlington Heights lively, walkable with a diverse housing stock,” *Chicago Tribune*, 2 April 2010.

37 Ibid.

38 Ibid.

39 “Four blocks from a recreational park, and is surrounded by restaurants, shops, schools, theaters and other amenities” is

deduced from Google Maps, downloaded from *maps.google.com*, 15 January 2012.

40 Metra, *Union Pacific/Northwest Line* (schedule), downloaded from *metrarail.com/metra/en/home/maps_schedules/metra_system_map/up-nw/schedule.full.html*, March 6 2012.

41 Beldon Russonello & Stewart LLC, *The 2011 Community Preference Survey; What Americans are looking for when deciding where to live*, prepared for the National Association of Realtors, March 2011.

42 M. Leanne Lachman and Deborah L. Brett, Urban Land Institute, *Generation Y: America's New Housing Wave*, 2011.

43 See note 41.

44 See note 33.

45 See note 34.

46 See note 34.

47 Note: Nextbus covers transportation systems in America and Canada.

48 Nextbus, *Company History*, downloaded from *news.nextbus.com/about-us-2/company-history*, 6 March 2012.

49 Zipcar, *after one year, zipcar drives transportation change in Baltimore* (press release), 6 March 2012.

50 Boston, Chicago, Denver, Des Moines, Honolulu, Miami Beach, New York, and San Antonio: Wendy Koch, "Cities roll out bike-sharing programs," *USA Today*, May 9 2011; Washington D.C.: Capital Bikeshare, *District of Columbia and Arlington Launch Regional Bike Sharing Program* (press release), 21 May 2010.

51 National Highway Traffic Safety Administration (NHTSA), *Distraction*. gov, *State Laws*, downloaded from *www.distraction.gov/content/get-the-facts/state-laws.html*, 5 February 2012.

52 National Transportation Safety Board, *No call, no text, no update behind the wheel: NTSB calls for nationwide ban on PEDs while driving* (press release), 15 February 2012.

53 Barry Sweedler, "History and Effects of Graduated Licensing and Zero Tolerance," in Transportation Research Board of National Academies, *Transportation Research Circular: Young Impaired Drivers: The Nature of the Problem and Possible Solutions*, Number E-C132, June 2009.

54 Allan Williams, "The Fall and Rise of Graduated Licensing in North America" in the Transportation Research Board of National Academies, *Transportation Research Circular: Implementing Impaired Driving Countermeasures: Putting Research into Action: Number E-C072*, January 2005.

55 National Highway Traffic Safety Administration (NHTSA), *Traffic Safety Facts: Laws: Graduated Driver Licensing System* (fact sheet), April 2004.

56 See notes 53 and 54.

57 See note 33.

58 Ibid.

59 Ibid.

60 See note 53.

61 David Preusser and Julie Tison, "GDL then and now," *Journal of Safety Research*, 2007.

62 Michael Sivak and Brandon Schoettle, University of Michigan Transportation Research Institute, *Recent Changes in the Age Composition of U.S. Drivers: Implications for the Extent, Safety, and Environmental Consequences of Personal Transportation*, June 2011.

63 \$1,100 to fill up the tank in 2001 derived by multiplying the average price of gasoline on 15 October 2001 (\$1.309 dollars/gallon, per Research and Innovative

Technology Administration, Bureau of Transportation Statistics, Multimodal Transportation Indicators, *Motor Fuel Prices: Retail Gasoline Prices*, October 2011) by average amount of fuel consumed per vehicle per year, (661 gallons, per Federal Highway Administration, *Highway Statistics 2009*, Table VM-1, April 2011), which equals \$865.25 (2001 dollars). \$865.25 in 2001 dollars is equivalent to \$1,048.15 in 2011 dollars, per the Bureau of Labor Statistics *CPI Inflation Calculator*, available at www.bls.gov/data/inflation_calculator.htm, 19 March 2012.

64 \$2,300 to fill up the tank today derived from multiplying the average price of gasoline on 17 October 2011 (\$3.476 dollars/gallon, per Research and Innovative Technology Administration, Bureau of Transportation Statistics, *Multimodal Transportation Indicators: Motor Fuel Prices: Retail Gasoline Prices*, October 2011) by the average amount of fuel consumed per vehicle per year (661 gallons; see note 63), which equals \$2,297.64.

65 U.S. Energy Information Administration, *Annual Energy Outlook 2011: Components of Selected Petroleum Product Prices, United States, Reference case*, downloaded from www.eia.gov/oiaf/aeo/tablebrowser, 12 March 2012. Note: “Gas Prices” refers to what the Energy Information Administration defines as End-User Price for Motor Gasoline (All Sectors).

66 U.S. Energy Information Administration, *Annual Energy Outlook 2011: Components of Selected Petroleum Product Prices, United States, Reference case, High oil price, Low oil price*, downloaded from www.eia.gov/oiaf/aeo/tablebrowser, 12 March 2012. Note: “Gasoline Prices” refer to what the Energy Information Administration defines as End-User Price for Motor Gasoline (All Sectors).

67 See note 34.

68 Ibid.

69 Bureau of Labor Statistics, *Employment Calculator*, downloaded from www.bls.gov/data/#employment, 6 March 2012. Note: “8.9 percent for the country as a whole” pertains to workers above the age of 16. All percentages are not seasonally adjusted.

70 PewResearchCenter, *Millennials; A Portrait of Generation Next: Confident. Connected. Open to Change.*, February 2010.

71 Ibid.

72 Project on Student Debt, *Student Debt and the Class of 2010*, November 2011.

73 Christine Dugas, “Generation Y’s steep financial hurdles: Huge debt, no savings,” *USA Today*, 23 April 2010.

74 Research and Innovative Technology Administration, Bureau of Transportation Statistics, National Transportation Statistics, *Table 3-17: Average Cost of Owning and Operating an Automobile*, 13 April 2011.

75 See note 34.

76 100 percent increase for public transit derived by dividing the person miles traveled in 2009 by the person miles traveled in 2001 for 16 to 34-year-olds in households with incomes above \$70,000, per Federal Highway Administration, *National Household Travel Survey*, downloaded from nhts.ornl.gov/det, 21 November 2011; 122 percent increase for biking derived by dividing person miles traveled by bike in 2009 by the person miles traveled by bike in from 2001 for 16 to 34-year-olds in households with incomes above \$70,000, per *NHTS*; 37 percent increase for walking derived by the dividing the person miles traveled by walking from 2009 by the person miles traveled by walking in 2001 for 16 to 34-year-olds in households with incomes above \$70,000, per *NHTS*.

77 Miles driven by young people with jobs in 2001 and 2009 calculated by dividing the total vehicle miles traveled by the number of 16 to 34-year-olds with

jobs for each year, per Federal Highway Administration, *National Household Travel Survey*, downloaded from nhts.ornl.gov/det, 21 November 2011.

78 25 percent derived by dividing the total person miles traveled on transit in 2009 by the total person miles traveled on transit in 2001 for 16 to 34-year-olds with jobs, per Federal Highway Administration, *National Household Travel Survey*, downloaded from nhts.ornl.gov/det, 21 November 2011.

Note: while the number of miles traveled via public transit has increased, the number of trips has decreased 16 percent.

79 Robert Puentes and Adie Tomer, Brookings Institution, *The Road . . . Less Traveled: An Analysis of Vehicle Miles Traveled Trends in the U.S.*, December 2008.

80 Energy Information Administration, *Annual Energy Outlook 2000: With Projection to 2020*, December 1999.

81 Federal Highway Administration, *Historical Monthly VMT Report*, 3 May 2011.

