

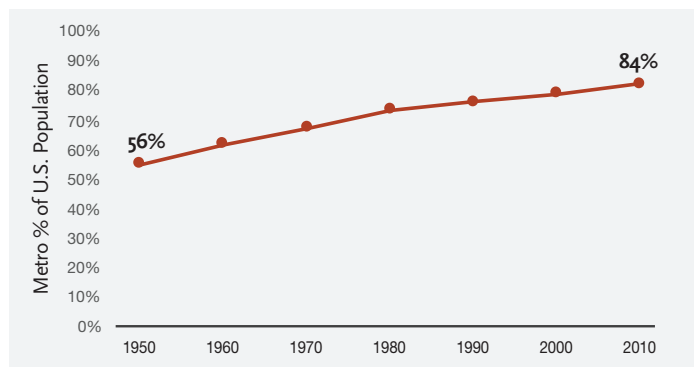
The population of the United States is expected to grow by nearly 100 million people by 2060, and if recent trends continue, the vast majority of these people will reside within urban environments. Many are postulating what features might characterize the future of mobility and how this might affect vehicle ownership and fuel demand.

To better understand the potential of future markets, it is instructive to understand historical forces that have shaped the market to date. "Urbanization: The Effect of Urban Development on U.S. Vehicle Travel and Fuel Demand," evaluates more than 100 years of urban development in the United States from the perspective of individual mobility. Analyzing public data ranging from the late 19th century through the early 20th century, this publication demonstrates that there is a very close relationship between transportation capabilities and community development.

Will this traditional relationship survive as the U.S. and other modern economies prepare for an increase in urban living? Will transportation options dictate where people live, or has modern society turned a corner and evolved to a point where living conditions will dictate mobility options? This publication provides great insight to help frame the discussion and elevate our understanding of human behavior as it relates to residence and mobility choices. Some key findings include:

People are migrating to urban population centers. According to the U.S. Census Bureau, the percentage of Americans living in metro population centers has increased from 56% in 1950 to 84% in 2010. It is reasonable to assume that the expected population growth will increase the percentage of Americans residing in metro areas.

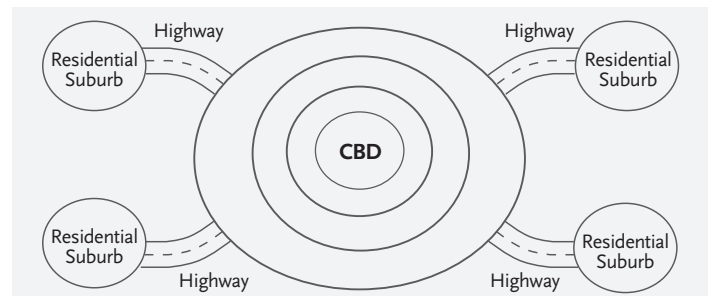
U.S. Metro Residents (1950–2010)



(Source: U.S. Census Bureau)

Transportation options have spurred community development. Over the years, residents have consistently moved further away from city centers. This has been facilitated by advancements in transportation—people tend to live within the bounds by which they can travel via reliable transportation options within one hour. As mobility choices became more reliable and faster, population centers spread. With the evolution from horse and buggy, to more efficient but directionally limited rail, to the advent of personal automobiles, population centers began to expand to the limits of the transportation options available for the time. By 2013, there were two vehicles per American household and 1.16 vehicles per driver. This has facilitated suburban growth and greatly expanded the physical size of metro areas.

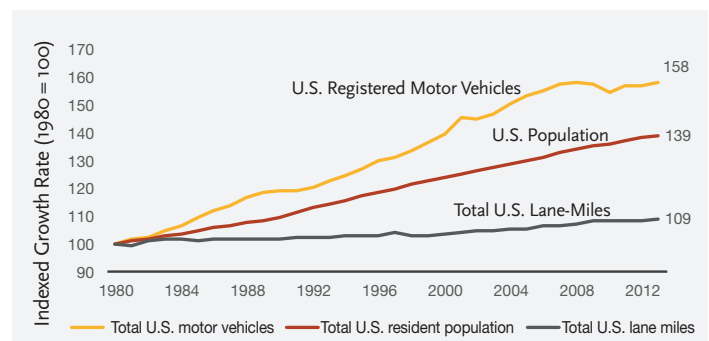
Transportation Advancements Enabled Residential Sprawl from Central Business Districts



(Early 20th Century: Rail and Streetcar Suburbs, "Fight to the Suburbs" (1945–1980))

Urban living leads to greater congestion. The influx of new residents to metro areas could swell urban population numbers in the next 40 years, contributing to additional issues related to congestion. The data show larger communities have experienced greater increases (by orders of magnitude) in travel delays than smaller ones. The underlying challenge is that the U.S. has not increased lane miles consistent with the increase in vehicle registrations, largely because in metro areas there most often is not enough room to add lane miles.

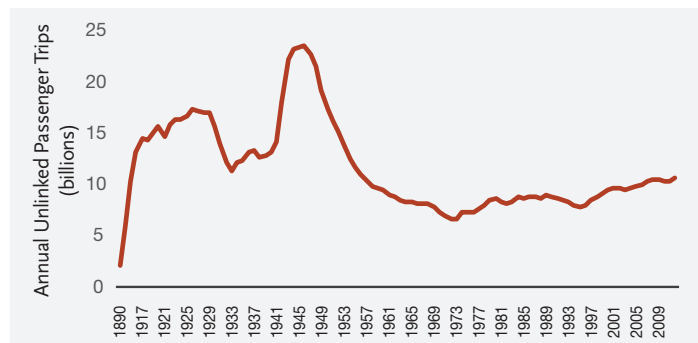
Demographic Overview of Congestion



(Sources: Federal Highway Administration; U.S. Census Bureau)

Transit options have not presented a solution. Some have suggested that additional options regarding mass transit could help mitigate the congestion associated with metro areas, but history does not demonstrate that this is a long-term viable solution. In the mid-1940s, transit ridership dropped precipitously and has not regained momentum since plateauing in the early 1970s. Despite some limited “revivals” in some metro areas, for the most part transit does not appear to represent a solution for U.S. residents.

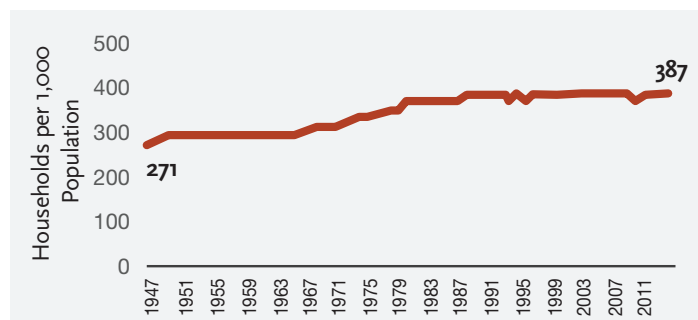
U.S. Transit Ridership, All Modes, 1890 - 2012



(Source: APTA)

New urban planning contradicts historical U.S. living trends. New development plans seek to locate residents in mixed use environments, close to shopping and transit options to their occupations. But there are several historical challenges that could undermine these initiatives. First, the American household has decreased in size and the number of single-person dwellings has increased, a phenomenon known as “social sprawl.” This means additional dwellings are required to accommodate more people. Second, Americans historically prefer large, single-family dwellings that require more space than urban development can accommodate. And third, the record levels of vehicle ownership indicate that many Americans would be hesitant to part with their personal freedoms of mobility to live in a transit-oriented community.

Households in the United States



(Source: U.S. Census Bureau)

About the Author

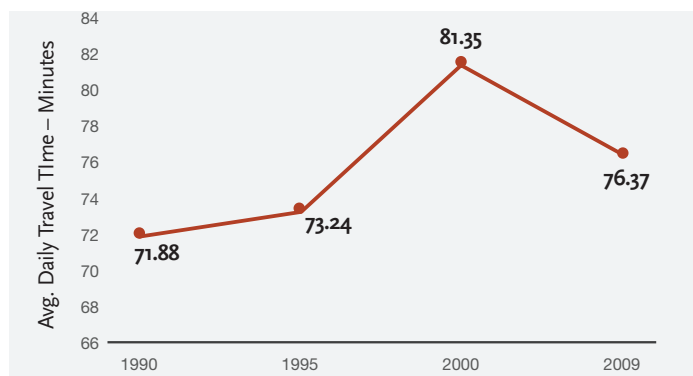
This report was prepared for the Fuels Institute by Hart Schwartz, research associate of Clarify Consulting & Research, LLC. He can be reached at hschwartz@clarifyconsulting.com.

The Future of Mobility

The trends of the past 150 years paint the picture of independent American consumers who value personal freedom of mobility and may resist a transition to a new paradigm. This is important to understand as the U.S. seeks to address growing challenges with mobility in an ever increasing metro environment. New market entrants—like shared mobility, ride hailing and car sharing services—present the potential to address some of these challenges by minimizing the need for individual vehicle ownership. History indicates this will require a substantive change in consumer behavior, but could make urban living less onerous in terms of mobility.

Meanwhile, autonomous vehicles present a very different opportunity for future residents. Americans today spend close to 80 minutes each day driving to and from work. Autonomous vehicles may significantly increase the “acceptable” commute duration because the “driver” can multitask in a safe, personal environment without having to access mass transit. This could further expand the physical definition of a metro area.

Average Daily Travel Time - Drivers Only



(Source: NHTS, 2009 Summary Trends)

The future of mobility is far from certain and the options seeking to influence the direction of market evolution are multiple, but the historical trends of American living and driving behavior are strong indicators of the challenges that stand in front of a shift in the personal mobility paradigm. “Urbanization: The Effect of Urban Development on U.S. Vehicle Travel and Fuel Demand” is an essential resource to the discussion, providing historical context to personal mobility in the United States.

About the Fuels Institute

Founded by NACS in 2013, the Fuels Institute is a nonprofit tax-exempt social welfare organization under section 501 (c) (4) of the Internal Revenue Code. We are dedicated to evaluating issues affecting the vehicles and fuels markets. We commission comprehensive, fact-based research projects that are designed to answer questions, not advocate a specific outcome. Our reports address the interests of industry stakeholders—from business owners making long-term investment decisions to policymakers considering legislation and regulations that affect these markets.