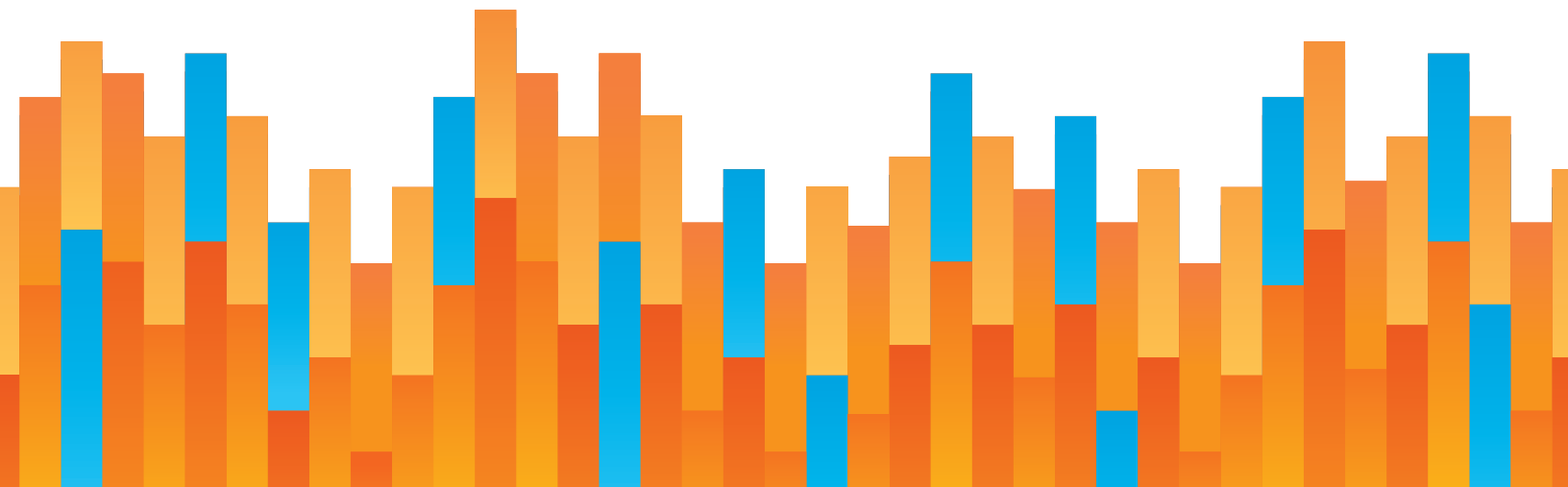




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THE NEW WORKFORCE AND HOW TRANSPORTATION PLANNING AND POLICY CAN PREPARE FOR THEM

by Alan E. Pisarski
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PART 1

INTRODUCTION: DEMOGRAPHY IS DESTINY

Senator Daniel Patrick Moynihan was fond of quoting August Comte in saying “Demography is destiny.” Never has this been truer than in the present era. Social, economic, and technological change have forged the most difficult period in the past 50 years for discussing the future, much less making forecasts. Yet today’s policies need to serve future infrastructure needs. Specifically, transportation planning and policies demand a solid grasp of demographic trends and their consequent geographic effects on businesses and the workforce. This brief examines these trends, integrating them into a list of 10 defining trends that should inform transportation policy and provide key approaches to transportation strategies.

PART 2

REPLACING THE BABY BOOMER WORKFORCE

The reduction of the baby boomers in our workforce and the inability to replace them in the near future—both in terms of numbers and skills—will be a major challenge for public policymakers. Even though college graduation rates are near an all-time high, there are not enough working age group members entering the workforce to make up for the baby boomers retiring.

Immigration of high-skilled workers could help close—though not eliminate—that gap. However, based on recent immigration trends, only 137,000 of the roughly 1.2 million annual legal immigrants migrate to the U.S. specifically for their career skills.¹ Close to half of all immigrants are immediate relatives of U.S. residents; these immigrants may or may not be highly skilled.² Given the current political polarization over immigration, any major increase in immigration is unlikely. Additionally, businesses are likely to attempt to engage more post-retirement workers, more women workers, more rural workers, and perhaps more lower-skilled workers.

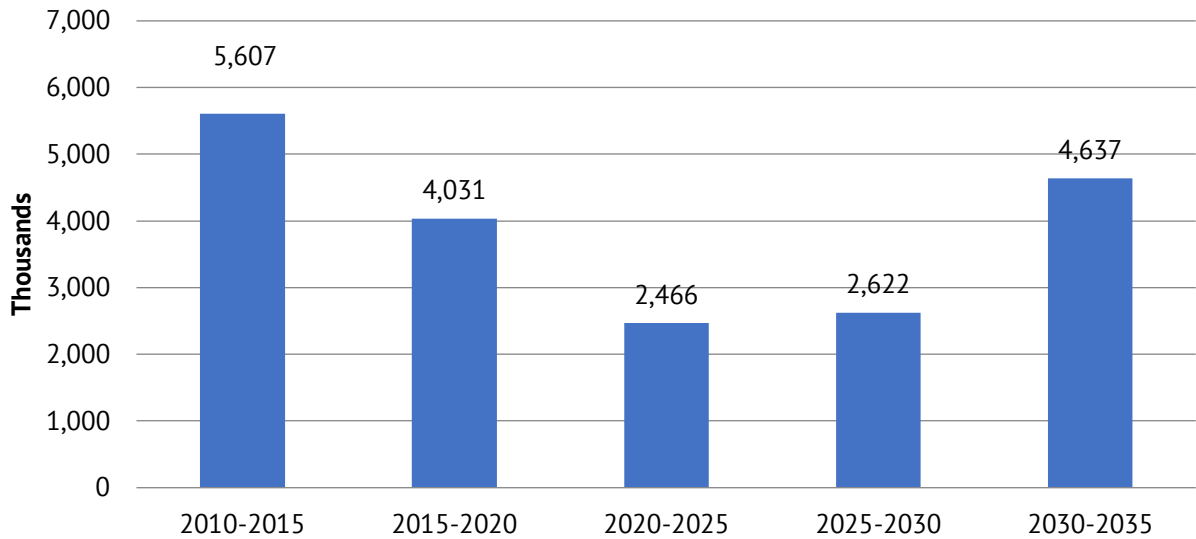
Figure 1 shows the size of each five-year cohort entering the workforce. U.S. Census population projections show that the U.S. is forecast to add fewer workers in the whole 2020–2030 decade than in the five years of 2010–2015. This also means that this slower-growing working population will be called upon to support a much larger share of the

¹ "Persons Obtaining Lawful Permanent Resident Status By Sex: Fiscal Year 2016." Department of Homeland Security. *dhs.gov*. 18 December 2017. Web. <https://www.dhs.gov/immigration-statistics/yearbook/2016/table9>, 18 January 2018.

² *Ibid.*

dependent population, which will largely be elderly due to the retirement of the baby boomers.

FIGURE 1: U.S. 18-64 WORKFORCE AGE GROUP CHANGE FORECAST



Source: U.S. Census Bureau 2014 Projections

To contend with a shrinking workforce, businesses will need to compete for workers, and are therefore more likely to cater to their needs. So who are these workers and what do they need from transportation planners?

PART 3

WHO IS THE NEW WORKFORCE AND HOW DO THEY TRAVEL?

Until about 1960 the majority of married American women either did not work outside the home or worked in traditional female jobs such as teaching or nursing. As a result female commute patterns differed significantly from male patterns. However, given the availability of jobs in the booming post-World War II economy as well as changing social norms, more women entered the workforce, many choosing male-dominated fields. As women's workforce participation grew and women entered traditionally male fields, the differences in commuting continued to decrease. After decreasing steadily since 1960, significant work travel differences between men and women are today at an all-time low.³

Table 1 shows there is parity for driving alone and increasing parity for most other modes by comparing male and female travel patterns by percentage. For every 100 male travelers, the table shows the percentage of women who choose a mode compared to men. For example, the 100% figure in Drove Alone in 2016 shows that the percentage of women who drove alone to work was the same as men. The only mode with a big difference among the sexes is bicycling to work, at 45%, indicating that only 45 women cycle to work for every 100 men.

³ "Mode to Work by Race and Ethnicity." U.S. Census. "2016 American Community Survey." *factfinder.census.gov*, 2017. Web. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_1YR_S0801&prodType=table. February 2018.

TABLE 1: RATIO OF WOMEN CHOOSING MODE COMPARED TO MEN

	1990	2010	2016
Drove alone	97%	101%	100%
Carpooled	103%	96%	98%
Bus or trolley bus	166%	126%	112%
Subway or elevated	121%	109%	110%
Railroad	77%	81%	81%
Bicycle	30%	40%	45%
Walked	106%	94%	97%
Worked at home	130%	103%	113%

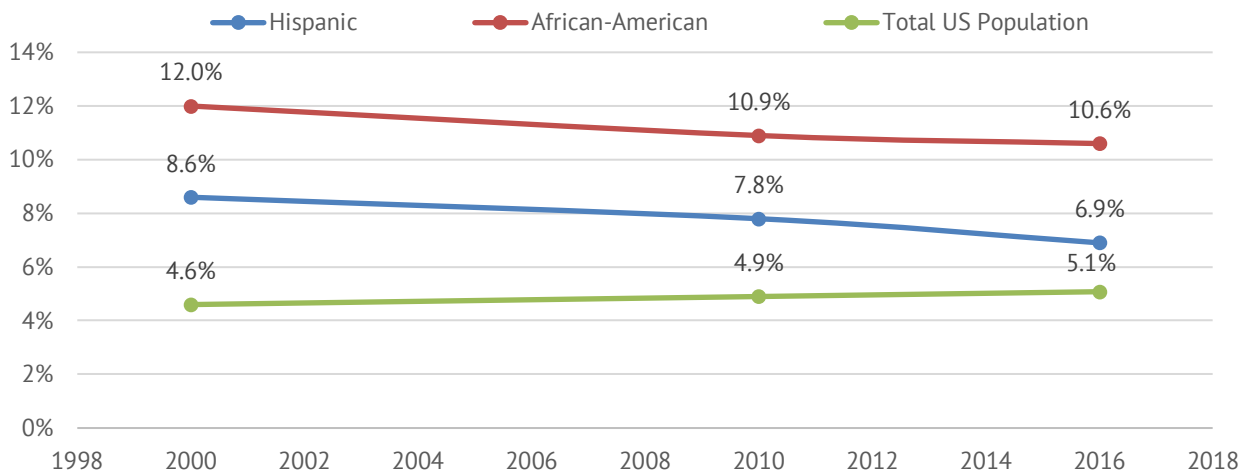
Source: U.S. Census Bureau, Decennial Census and *American Community Survey*

It's not just women who increasingly drive to work. Historically, due to lower wealth, minorities were far more likely to ride transit. However, that too has changed. Figure 2 shows the percentage of commuters taking transit to work. As recently as 2000, the spread among All, African American and Hispanic was more than 7% (12%–4.6%). Yet by 2016 the spread had decreased to nearly five percentage points (10.6%–5.1%).⁴

The decreasing difference among gender, racial, and ethnic groups in mode choice indicates a growing equality throughout the U.S. These differences are decreasing in every mode. This growing homogeneity is a positive trend that reflects increasing mobility among minorities. While some policymakers may be concerned with growing car access and the number of solo commuters increasing, the changes reflect an increase in the wealth of minorities, which is a major social and economic positive.

⁴ Ibid.

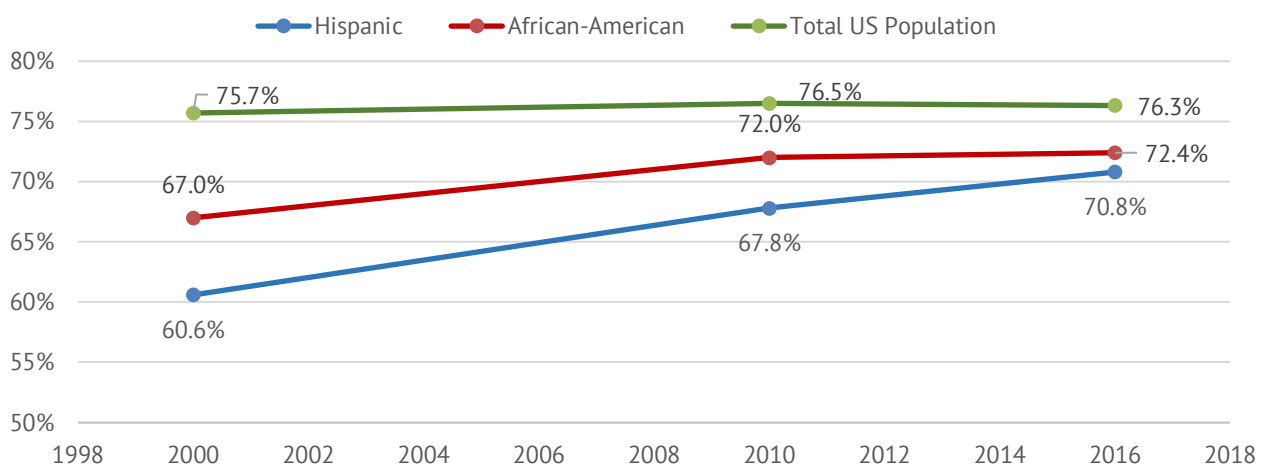
FIGURE 2: PERCENT OF U.S. WORKERS TAKING TRANSIT TO WORK



Source: U.S. Census Bureau, Decennial Census and American Community Survey

As expected, as minorities’ use of transit falls, their rate of driving to work rises. Figure 3 shows the percentage of commuters driving alone to work. While there was a 15% spread among All, African American, and Hispanic as recently as 2000, the spread in 2016 was fewer than 6%.⁵ A nine-percentage points improvement in just 16 years is a significant change.

FIGURE 3: PERCENT U.S. WORKERS WHO DRIVE ALONE TO WORK

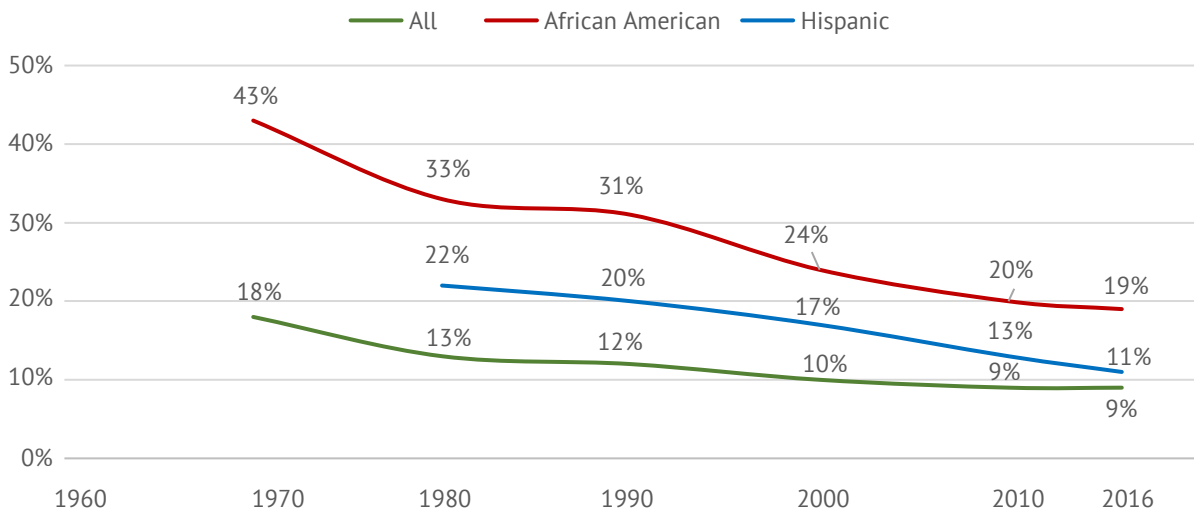


Source: U.S. Census Bureau, Decennial Census and American Community Survey

⁵ Ibid.

As individuals become wealthier, their families have access to better transportation. Figure 4 shows the number of households with no vehicle. Note that in 1970 there was a spread of 25% between the African American and All groups. By 2010 that spread had decreased to 11% with Hispanics 4% higher than All.⁶ Also note that a smaller and smaller cohort of minorities and All have no household vehicle. This suggests that once women and minorities attain enough wealth, they tend to purchase a vehicle rather than ride transit. In future travel, dominant factors will be work status, age, income, education and location, rather than race, ethnicity or sex. Vehicle ownership is ubiquitous; only 9% of households have no vehicle. Further, only 4% of households with workers have no vehicles. Hispanic and African American auto ownership levels have almost reached White auto ownership levels. While still not equal currently, we are likely to see parity in 10 to 20 years.

FIGURE 4: PERCENT U.S. HOUSEHOLDS WITH NO VEHICLE



Source: U.S. Census Bureau, Decennial Census, *American Community Survey*

⁶ Ibid.

PART 4

TRANSPORTATION METRICS OF THE NEW WORKFORCE

Clearly the new workforce is highly mobile and increasingly composed of women and minorities who drive to work alone. With the anticipated decline in workforce growth from 2020 to 2030, a key concern will be the availability of skilled workers, or any workers, due to a declining workforce population. Businesses are likely to compete for workers by locating closer to where workers live. Transportation will need to connect employers with greater access to the available potential workforce, and conversely, access to job choices for job searchers.

Traditionally, one of the most important transportation metrics has been a business' or employee's commuter shed: the number of employees or employers 30 minutes away or less during rush hour. Since most commuters prefer not to drive more than 30 minutes one-way to work, employers try to locate within a 30-minute drive of most employees and employees try to locate within a 30-minute drive of most employers.⁷ These locations allow employers to choose from a large number of workers and allow workers to choose from a large number of employers.

⁷ Feigenbaum, Baruch. "Increasing Mobility in Southern California: A New Approach." Reason Foundation. 2015. Web. https://reason.org/wp-content/uploads/2015/11/southern_california_mobility_plan.pdf, 18 January 2018.

However, given the lack of workers and the advent of technology, location is not as important for certain job types. The fastest growing commute mode is not driving alone or taking transit—it is working at home. As computer-based employment proliferates, the share of workers working at home exceeds the share taking transit in most U.S. metro areas.⁸ Often those who work at home don't need to be near anything except the internet, a highway and an airport.

Further, if there are more jobs than employees, certain regions are likely to prosper while others wither. Employers will move to where the workers are located or want to be located. Major and large metro areas (those with two million or more residents) will continue to grow due to the larger aggregations of jobs and workers in the regional commuter shed. Certain businesses with jobs that require customer contact and need to be close to their supply chains will continue to locate in big cities.⁹ As metro area jobs expand to the suburban periphery, more job opportunities will become accessible to exurban workers.

At the same time, the increase in working at home will allow those who work in technology and certain professional service jobs to live anywhere based on amenities, often in college or resort areas. These areas will also benefit due to expanded medical services provided to retirees. Already many smaller regions are rated as the best places to live.¹⁰

The following section provides a basic background of the three top commute modes: highways, transit and work-from-home. It also examines commute patterns and freight.

⁸ A distinction needs to be recognized here between working at home (a standard Census code category for various modes of access to work, typically a person who has no other place of work) and telecommuting—a popular term with very broad, ill-defined meanings. Someone who stays home one day to get work done, or has a schedule where they work four days a week at their regular place of work and one day or so at home would be said to telecommute.

⁹ O'Sullivan, Arthur. *Urban Economics*. New York, NY: McGraw Hill, 2006. 80-94. Print.

¹⁰ "U.S. News and World Report Best Places to Live." *usnews.com*, 7 February 2017. Web. <https://realestate.usnews.com/places/rankings/best-places-to-live>, 18 January 2018.

PART 5

TRANSPORTATION MODE SHIFTS FOR HIGHWAYS, TRANSIT AND WORK-AT-HOME

5.1

TRANSPORTATION MODES

Highways: Commuting by car is the dominant mode in the United States. Vehicle-miles traveled (VMT) has grown approximately 2.0% annually over the past five years as the country has recovered from the Great Recession.¹¹ Due to existing widespread ownership of vehicles, and a limited number of people coming of driving age, future growth is expected to be lower, about 1%–1.5% per year.¹² As a result, maintaining the country’s highway system should be relatively easy, once we solve the investment backlog. The share of commuting by solo driver has been stable at about 76% since 2000. Carpooling has declined sharply, about 50%, since 1980. However, carpooling rebounded slightly in 2016 as two major occupations of carpoolers—construction and manufacturing—rebounded from the recession.

¹¹ Polzin, Steve. “So Much for Peak VMT.” *planetizen.com*. 8 March 2016. Web. <https://www.planetizen.com/node/84877/so-much-peak-vmt>, 18 January 2018.

¹² “Federal Highway Administration Conditions and Performance Report.” Federal Highway Administration. *fhwa.dot.gov*. 20 Dec. 2016. Web. <https://www.fhwa.dot.gov/policy/2015cpr/>, 18 January 2018.

Transit: Transit share has been relatively stable over the past five years at about 1.5% of all surface transportation travel. Transit’s share is highest for commuting, at about 5%, although recent ridership declines could change that. Only four metro areas—New York City, Washington D.C., Chicago and San Francisco—have shares of transit greater than 10%. More than 40% of all U.S. transit usage is in the New York metro area. More than 60% of all transit usage is in the four largest metro areas—New York City, Washington D.C., Chicago and San Francisco. Typically, using transit takes longer than driving. The average work travel-time on transit is roughly double that of automobiles.¹³ With the increase in telecommuting and ridesharing, transit usage is expected to decrease.

Work-at-Home: Working at home is the fastest growing “mode” of travel to work; it has tripled in use since 1980 to become the third largest “commute” mode along with transit.¹⁴ Its 5% mode share is currently as large as transit.¹⁵ Those who work at home often enjoy flexible schedules. As the competition for workers increases, more businesses will offer flexible schedules. Outside of New York City, commuters are 1.5 times more likely to work at home than to take transit.¹⁶ Working at home has a higher share than transit in most metro areas, with the exceptions of some college towns and the six legacy rail regions.¹⁷ (The legacy rail regions of New York City, Chicago, San Francisco, Boston, Philadelphia and Washington, D.C. developed largely around rail and have a different spatial structure than most other U.S. regions).

The employment sectors that work from home have changed over time. Originally, farmers were the main occupation represented. As the country urbanized, daycare providers became the number one work from home occupation. Today, computer software-related activities have one of the highest shares of working from home. These cohorts have different transportation needs.

5.2

COMMUTING PATTERNS

Commuting patterns have changed over the past 50 years. Prior to 1970, the dominant commuting flow was from suburbs to a centralized downtown. Today, the dominant flow in most metro areas is from suburb to suburb. Downtowns have less than 20% of all metro-area jobs.¹⁸

¹³ Updated data by author of American Community Survey data.

¹⁴ Ibid.

¹⁵ Ibid.

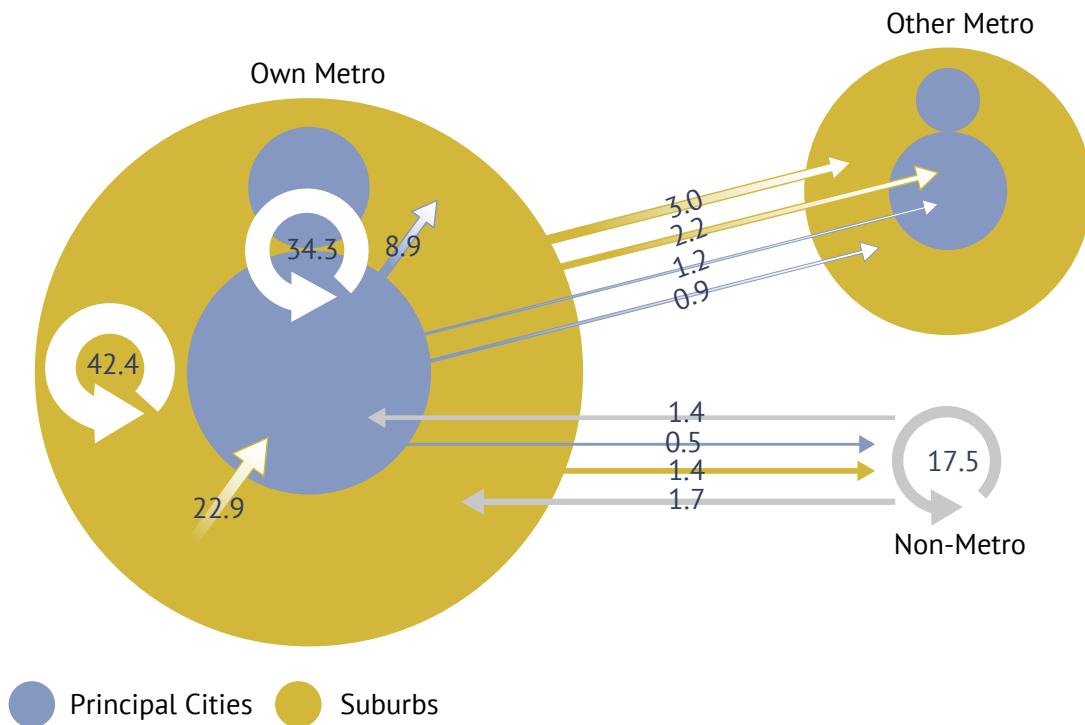
¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Cox, Wendell. “Suburbs Dominate Jobs and Job Growth.” *newgeography.com*. 25 May 2016. Web. <http://www.newgeography.com/content/005264-suburbs-continue-dominate-jobs-and-job-growth>. 18 January 2018.

A coarse measure of the trend is shown in the following figure from 2011. The Census Bureau “principal city” definition includes the core central city of a metro area, but also suburban cities that exceed 250,000 in population or have more than 100,000 jobs.¹⁹ Therefore, a substantial portion of the 34.3 million in the figure are workers living and working in a suburban principal city. One of the fastest growing trends is workers leaving their residence county to work in another county. This now stands at above 27% and has more than quadrupled since 1960.²⁰

**FIGURE 5: NATIONWIDE U.S. COMMUTE PATTERNS
(NUMBER OF COMMUTERS IN MILLIONS)**



Source: *Commuting in America 2013*. Brief 15. Commuting Flow Patterns.

¹⁹ “Geographic Terms and Concepts—Core Based Statistical Areas and Related Statistical Areas.” U.S. Census Bureau. *census.gov*. 2010. Web. https://www.census.gov/geo/reference/gtc/gtc_cbsa.html, 12 February 2018.

²⁰ “Commuting in America 2013.” Brief 15, updated.

5.3

FREIGHT

While moving passengers is a critical function of a highway network, moving freight is just as important. Freight is projected to grow faster than passengers for at least the next 20 years.²¹ The value of commodities being shipped will increase faster than overall tonnage growth. High-value goods that tend to be outputs such as computers and smartphones are forecast to grow much more quickly than low value goods that tend to be inputs such as coal and steel. The products with a greater value per ton (smartphones versus coal) will more likely travel in fast and controlled modes such as air and truck. Overall, cargo will be less sensitive to costs. High value goods typically have very high inventory costs so it is in the interest of the owner to move goods quickly and safely. Having the products sitting on a ship or train can be expensive. At the same time the higher costs of transportation are typically a smaller percentage of the goods' overall cost.

²¹ Hu, Patricia and Rolf Schmitt. "Freight Facts and Figures 2017." Federal Highway Administration Bureau of Transportation Statistics. *bts.dot.gov*. May 2017. Web. https://www.bts.dot.gov/sites/bts.dot.gov/files/docs/FFF_2017.pdf, accessed 12 February 2018.

PART 6

DEFINING TRENDS

Overall there will be 10 defining trends of the next 10 years that will challenge planners and policymakers.

#1 As there will be very limited domestic growth and limited skilled immigration in the traditional workforce age group, employers will need to attract more women, rural residents and older residents into the labor force. Policymakers must find a way to increase the labor force participation rate and expand workers' access to jobs.

#2 Employment will become more specialized. Since attracting skilled workers will be challenging, larger commuter sheds, which allow employers access to more potential employees, will be key. Reducing congestion in major metro areas and creating broader access in exurban and rural areas will be increasingly important.

#3 The U.S. economy will transition to a services-based, worker-supply-driven world. Employers will locate where skilled workers live, mostly in amenities-based environments. Unskilled workers will follow skilled workers, particularly employees in medical services who will follow the elderly, wherever they choose to be. Substantial growth in major metro areas, college towns, and resort areas is expected.

#4 Good supply chains and logistics will be a strategic national advantage. But state and local governments will make logistics a priority as well. There will be tension between state goals and interstate commerce requirements.

#5 The biggest differences in travel behavior will result from occupation, income, education and geography. Differences based on race, ethnicity and sex will continue to decrease.

#6 Major metro areas and large metro areas (those over two million people) will continue to grow larger. Job/worker ratios in the central city and suburbs will continue to move toward one. Many residents will live in the central city and work in the suburbs or live and work in different suburbs.

#7 Work schedules will be more flexible. More employees will work from home and more will work more variable hours per week.

#8 The traditional automotive modes (drive alone, transit, etc.) will give way to tech-assisted semi-modes, but change will be slow. As autonomous vehicles develop, who owns the vehicles will help shape policy.

#9 Autonomous vehicles will expand personal autonomy and access to opportunities for all, but will generate job dislocations.

#10 As a result, planning and making policy will be very challenging. Freight flows, worker access and economic opportunities will be the focus areas of planning. Overcoming infrastructure backlogs will be more significant than responding to expected future growth. Planning must be flexible to account for growing uncertainty, specifically around autonomous vehicles. Reorienting statewide and metropolitan planning around scenario planning that considers many different futures is one way to provide a flexible planning framework.

PART 7

POLICY RECOMMENDATIONS FOR THE FUTURE

In this volatile context public policies must be guided by some bedrock principles. Preserving interstate commerce should be the driving force of national surface transportation policy. This means enhancing our domestic economic (and military) mobility and international competitiveness. The following policy recommendations will strengthen the federal transportation program:

- Ensure federal surface transportation policy has a focus on that which is national in scope and federal in responsibility. The states and local governments should shoulder the remaining responsibilities.
- Focus federal policy on modernizing/upgrading the Interstate System to serve current and future demand.
- Ensure that freight receives the same or higher priority focus as passenger travel; highways versus transit debates are diverting us from more significant challenges, such as serving elderly populations and enhancing economic productivity. The transit versus highways issue is really a trivial part of transportation and has become highly partisan.

- Focus on transportation providing access to jobs for potential workers, access to workers by employers, access to medical services, and access to social and economic opportunities. For example, in medical services a key measure could be the percentage of population that can reach a major medical facility in under 30 minutes. Forcing the public to behave in ways that make it convenient for the public sector to serve taxpayers has major negative economic and social consequences.
- Promote vehicle access for minority employees. While minority vehicle usage is close to average vehicle usage, there is still a gap. Such a policy will bolster economic productivity and minority participation in the middle class.
- Promote autonomous vehicle usage by limiting regulations and passing new legislation only when it is absolutely necessary. Basic safety regulations are important, but the biggest problem is existing legislation that prevents the operation of autonomous vehicles.

ABOUT THE AUTHOR

Alan E. Pisarski has been an independent writer and consultant in the fields of transportation research, policy and investment analyses for the past 35 years. Prior to that he served in the Office of the Secretary USDOT under the assistant secretary for policy, and was responsible for producing policy information for the secretary and secretarial officers and as deputy director for planning at DOT and the National Transportation Policy Study Commission.

He is invited frequently to testify in the Congress and in state legislatures, and gubernatorial commissions regarding economic and demographic factors that define travel demand, infrastructure investment requirements and public policy. He has served the nation as advisor and author in each of the major national planning and policy activities since the inception of the U.S. DOT. His work has been reviewed and reported in all of the nation's media and translated into at least six languages. Internationally he has represented the United States on the Group of Experts in Transport Statistics of the UN/ECE, chaired its subcommittee on energy and transportation, and as a consultant to the USAID, the World Bank, the United Nations, the Organization for Economic Cooperation and Development, the European Union, the World Tourism Organization and the European Tourism Commission.

He was named, in the first group to be so honored, as an Academy Associate of the National Academy of Sciences. The Academies' Transportation Research Board honored him with the Distinguished Lecture in 1999 and the WN Carey Award in 2007 for Lifetime Distinguished Service and Leadership in Transportation Research. The American Road and Transportation Builders named him among the top 100 in the field in the 20th century. He has been invited to lecture and instruct in approximately 20 universities in the United States, Europe and Asia.

