SUSTAINABLE MOBILITY & AUTONOMOUS TECHNOLOGY

“Many drivers experience new automotive technologies for the first time in rental vehicles ... I have no doubt that the U.S. car rental industry will be an early adopter and will be able to help introduce autonomous driving technology to millions of consumers – just as we have done with anti-lock braking, stop-start technology, hybrid electric vehicles and all of the other new technologies.”

SUSAN LOMBARDO
SENIOR VICE PRESIDENT OF VEHICLE ACQUISITION AT ENTERPRISE HOLDINGS
2016 WOMEN’S INDUSTRY NETWORK EDUCATIONAL CONFERENCE

In thousands of communities of all sizes, Enterprise Holdings’ highly accessible network provides hourly, daily and weekly car rentals as cost-effective and consumer-friendly modes of local transportation. As a result, Enterprise Holdings sponsored a special 2017 report titled “Driving Forward: The Future of Urban Mobility,” published by the Wharton Initiative for Global Environmental Leadership (IGEL). Enterprise was a natural sponsor for the report, since it not only operates the largest fleet in the world but also has more than 6,400 neighborhood and airport rental locations located within 15 miles of 90 percent of the U.S. population.
In fact, Enterprise Rent-A-Car, National Car Rental and Alamo Rent A Car customers are logging more than 25 billion miles throughout the world every year. And many of those miles are driven locally in their very own communities and mostly in late-model, fuel-efficient vehicles — making local car rental one of the most effective and sustainable mobility options today.

For example, thousands of Enterprise customers rent vehicles regularly, although they rely on mass transit during the week in large urban markets, or simply cannot afford to purchase or maintain a vehicle on their own.

Many consumers, businesses and government agencies in the United States, Canada and the UK also rely on their local Enterprise network to deliver car-sharing technology’s speed and flexibility when it makes sense.

In addition, Enterprise Rideshare and vRide vanpooling programs address local as well as national needs by reducing traffic congestion, parking requirements and carbon emissions, while providing commuters with a smarter, better way to get to work.

Enterprise Rideshare — the fourth largest U.S. public transit provider in passenger miles today — also helps control annual transportation expenses by using volunteer drivers, which is much more cost-efficient than hiring paid drivers (such as ride-hailing companies).

**SELF DRIVING CARS**

Enterprise Holdings’ fleet of “virtual cars” is well-positioned to quickly and efficiently introduce millions of consumers to new fuel and vehicle technology, especially as transportation infrastructure and alternatives, including autonomous vehicles, evolve in the future.

As a result, in late 2016, Enterprise Holdings submitted comments on the National Highway Traffic Safety Administration’s (NHTSA) Federal Automated Vehicles Policy. Among other things, Enterprise Holdings urged NHTSA to recognize the rental industry and fleet management operators as key stakeholders in the development of state and federal policies.

As TheInformation.com news site reported in early 2017: “Enterprise, a 60-year-old company that owns and rents more cars in the U.S. than anyone else, is gaining newfound attention in Silicon Valley and Detroit, judging by conversations with tech executives lately. The reason is simple: Enterprise is one of the few companies that can manage large fleets of cars at scale. That’s a skill likely to be in demand as more companies launch ride-sharing services using self-driving cars.”

**STRATEGIC MOBILITY PARTNERS**

Enterprise Holdings always looks for strategic partnerships with public-policy leaders and key organizations who share our interest.
in advancing sustainable mobility and in broadening discussions about the automotive value chain.

For instance, Enterprise Holdings partners with the Corporate Eco Forum, the Department of Energy’s Clean Cities initiative, the National League of Cities’ Sustainable Cities Institute and the Association for Commuter Transportation (ACT) – as well as travel organizations like the Global Business Travel Association (GBTA) and World Travel and Tourism Council (WTTC) – to help incorporate sustainability goals into comprehensive, long-term local transportation planning. Other examples include:

2011

National Summit on Energy Security, which brought together CEOs, military leaders and policymakers in 2011 to address the intensifying threats posed by our nation’s dependence on petroleum.

2012

The Danforth Plant Science Center hosted a panel discussion featuring General Motors and Enterprise Holdings in 2012 that focused on the future of the passenger vehicle – from biofuel research to public policy issues.

2014

Enterprise Holdings participated in a 2014 SXSW Eco panel discussion on the role that public and private transportation providers play in meeting demands for sustainable mobility in urban markets. This conversation which included Susan Shaheen, a researcher from the University of California-Berkeley Transportation Sustainability Research Center, plus a peer-to-peer car sharing advocate and a well-known automotive reporter – focused on how to best provide access to more local, sustainable transportation options.

2015

At the 2015 Sustainability Speaker Series at the University of Nevada, Las Vegas, Enterprise Holdings shared how it is implementing corporate sustainability into the Enterprise Rent-A-Car brand and throughout its fleet.

Later that same year, at the International Car Rental Show, Enterprise Holdings participated in a panel discussion, “The Convergence of Car Sharing and Car Rental,” which highlighted the industry’s important role in the evolution of urban mobility.

We also participated in another 2015 panel discussion during the Disrupting Mobility Summit, stressing how consumer needs are changing and the importance of enhancing access to transportation options in local communities.

2016

Enterprise Holdings submitted comments on the National Highway Traffic Safety Administration’s (NHTSA) Federal Automated Vehicles Policy.

2017

More recently, Enterprise participated in a panel discussion – "Navigating Risk throughout the Mobility Ecosystem" – at the 2017 CES (Consumer Electronics Show) and helped address how autonomy technology, cyber threats and other risks and liabilities may impact emerging mobility opportunities.

Enterprise also moderated a panel discussion about “The Changing World of Transit Benefits” at the Association for Commuter Transportation’s (ACT) Public Policy Summit in Washington, D.C. The session explored the potential impact of tax reform on commuter benefit programs, plus common-sense efforts to further expand transit benefits at the grassroots level.

Consider that we essentially ‘share’ more than a million vehicles a week in the United States. So when you talk about scale and the ability to meet public transportation needs for the long term, fleet size obviously is a significant factor from an operational and financial perspective.

GREG STUBBLEFIELD
EXECUTIVE VICE PRESIDENT
AND CHIEF STRATEGY OFFICER
AT ENTERPRISE HOLDINGS

2015 GBTA CONVENTION

Risk throughout the Mobility Ecosystem” – at the 2017 CES (Consumer Electronics Show) and helped address how autonomy technology, cyber threats and other risks and liabilities may impact emerging mobility opportunities.

Enterprise sponsored a panel discussion, “Preparing for Autonomous Vehicles on Our Roads,” an event that was part of Infrastructure Week 2017 in Washington, D.C. and jointly hosted by the National League of Cities and the National Association of Regional Councils.

Enterprise also moderated a panel discussion about “The Changing World of Transit Benefits” at the Association for Commuter Transportation’s (ACT) Public Policy Summit in Washington, D.C. The session explored the potential impact of tax reform on commuter benefit programs, plus common-sense efforts to further expand transit benefits at the grassroots level.
Special Report

Driving Forward: The Future of Urban Mobility
INTRODUCTION

Driving Forward: The Future of Urban Mobility

The future of transportation could not be more exciting. Autonomous vehicle technology, car-sharing, car-hailing, and other cutting edge developments, are driving the next stage of urban mobility. Car rental companies and automakers are all pivoting to put long-lasting stakes in this new world.

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Boomers and millennials are defying expectations about where they live and how they get around. Meanwhile, car manufacturers and dealers are anticipating what consumers will want in the decades ahead.

Auto Ownership: New Options for Urban Dwellers 4
People who want to forgo owning a car have never had greater access to more transportation options — local car rentals, car sharing, ride-hailing, vanpooling and city bikes.

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From Autonomous Vehicles to Public Transit
The future of transportation may combine autonomy with an expanded public transit system into a single mobility solution.

SPONSORS

Wharton’s Initiative for Global Environmental Leadership (IGEL) and Enterprise Holdings have partnered with Knowledge@Wharton to create this special report.
Driving Forward: The Future of Urban Mobility

Cars have been at the heart of American culture for more than a century. Until recently, getting a license and buying a car were considered rites of passage, and the car you chose was widely regarded as an expression of your identity, reflecting your priorities and revealing your status.

All that is now changing. The advent of car sharing, ride-hailing and self-driving vehicles presages a radical transformation in consumer behavior. The future of personal transportation will be determined by technological advances, informed by the needs and desires of the people who use them. Our understanding of who those consumers are and what choices they are likely to make is changing in surprising ways.

Car-loving boomers are headed for cities

Consider baby boomers, the generation born between 1946 and 1964. They may no longer be the largest generation in the U.S. (their kids, the 19- to 35-year-old millennials, now outnumber them slightly), but boomers are likely to continue playing a major role in shaping the future of the auto industry and the rapidly evolving "sharing economy."

Given the boomers' affection for cars, it's not surprising that adults over 50 bought nearly two-thirds of the new cars sold in the U.S. in 2011, according to an AARP study. Unlike earlier generations, today's seniors "are refusing to follow their parents' lead and go quietly into the car-buying night," according to a 2013 article in Bloomberg News. In fact, nearly 93% of Americans between 60 and 64 had driver's licenses in 2011, up from only 84% in 1983.

What is surprising is that seniors are participating in the well-documented mass migration to urban centers. Despite the common assumption that millennials will dominate the urban landscape in the coming years, recent studies suggest that boomers are also locating there in droves. "Instead of migrating south en masse to retirement communities in the Sunshine State or the wilds of Arizona," wrote Realtor.com, "more and more baby boomers — a particularly urban-savvy group of Americans — are moving back to the metro areas they abandoned when they began raising families."

"Millennials have a lower rate of car ownership than previous generations at their age."

—Sam Abuelsamid, Navigant Research

And these older urbanites are anything but sedentary. Rather than retiring, 87% say a shorter commute to work is a major reason for their move to the city, according to a recent Zipcar study. Moreover, when they are not working, the study said, "An overwhelming 90% are seeking to boost their cultural experiences, with easy access to a variety of restaurants, shops and fitness facilities."

All this activity makes urban boomers active consumers. "Between 2015 and 2030, the 60-plus age group in the United States, for instance, is projected to contribute 40% or more of consumption growth in categories such as personal care, housing, transportation, entertainment, and food and alcoholic beverages," reported a 2016 study by the McKinsey Global Institute titled "Urban World: The Global Consumers to Watch."

For boomers who keep their cars in the city, ride-hailing offers a valuable source of income. A 2015 Uber study found that nearly a quarter of its drivers were older than 50. For many, the primary motivation is extra income, often
needed to supplement retirement savings. But there are other benefits as well.

Uber driver Maureen Mahon, 59, enjoys the flexibility and sociability of the work. “I meet businessmen, college kids on their way out for the night, folks going to parties, pretty much the whole range,” she told The New York Times. “You can drive as much or as little as you like. If the weather’s bad or you have a doctor’s appointment, you just don’t turn on the app.”

Personal car sharing, too, is becoming attractive to some urban car-owning boomers. Moreover, peer-to-peer car sharing firm Getaround has formed partnerships with car manufacturers to provide members with discounts on new car purchases.

“Millennials buy cars more pragmatically. ... They are forever going to be more on the pragmatic car-as-commodity, car-as-appliance part of the equation.”

–John Paul MacDuffie, Wharton

Of course, many of those who move to urban centers are likely to give up their cars in the process. Paul Eisenstein, publisher of The Detroit Bureau and a contributor to CNBC, said that in today’s congested cities, “car ownership is viewed more as a hassle than an entitlement.” Suburbanites may feel stranded without a car in the garage, but for people living in higher-density environments, according to Scott Kelley, a post-doctoral fellow at the University of Michigan’s Energy Institute, “it’s becoming more convenient to not have a car. In fact, we’re already seeing some shift away from private ownership in dense urban centers.”

While taxis are the traditional choice for carless boomers making short trips within the city limits, the growing presence of car-sharing and ride-hailing services is just as likely to appeal to seniors, said Wharton management professor John Paul MacDuffie. “I don’t see those at the more elderly end of the spectrum — at least if it’s suburbanites coming into the city — being turned off by the techie-ness of it. I see them actually liking it if it solves a problem for them.” A recent Zipcar study supports his view: 69% of urban boomers surveyed said mobile apps make their lives easier, and 81% were users of Facebook.

MILLENNIALS TAKE A PRAGMATIC VIEW OF CARS

Until recently, automakers had feared the inevitable loss of the boomer market. Millennials, the boomers’ children, have seemed far less interested in cars than their parents. “In 2009 and 2010, there was a lot of consternation in the auto industry about this problem,” said Sam Abuelsamid, a senior research analyst at Navigant Research.

But it turned out that the concern was largely misplaced. According to an article in Wards Auto, the weak sales were less a reflection of the generation’s attitudes toward cars and more the result of the Great Recession and the younger generation’s lack of resources. Millennials are only now entering their peak car-buying years, the article said.

In March 2016, the Associated Press reported that “millennials — especially the oldest ones — are these days buying cars in big numbers. They just had a late start.” The article pointed out that in California, the country’s biggest car market, millennials outpaced boomers for the first time as car buyers. Millennials’ share of the new-car market jumped to 28% in 2015.

Like their parents, millennials appear to be defying conventional expectations. Fortune points out that too many have mistaken the presence of millennials in cities as an indication that they prefer urban living. According to the 2016 National Association of Realtors Home Buyer and Seller Generational Trends study, a growing share of homebuyers are millennials, and more of them are purchasing single-family homes in suburbia.

But not everyone is convinced that millennials are necessarily headed for suburbia and car ownership. “They’re living in cities more frequently than their parents,” Abuelsamid said, adding that millennials have “a more flexible lifestyle enabled by technology” and “don’t have the need or the desire to own a car, even though they increasingly have the financial ability.” That may change, he noted, but it’s too soon to tell.

University of Michigan’s Kelley agreed: “It appears that younger people are willing to treat transportation as an on-demand service, rather than paying the fixed price of owning a car.” But cities, he said, “have sprawling suburban areas around them,” and how mobility will change there is still not clear. According to a recent McKinsey report on disruptive trends in the auto industry, in rural areas “private-car usage will remain the preferred means of transport by far.”

What is clear at this point, Abuelsamid said, is that millennials have a lower rate of car ownership than
previous generations at their age. Some see a generational shift at work. Wharton’s MacDuffie postulated that “millenials buy cars more pragmatically. Maybe they missed that moment as teenagers when you deeply fall in love with cars, or a car, or personal autonomous transportation. And they are forever going to be more on the pragmatic car-as-commodity, car-as-appliance part of the equation.”

Zoë Hoster, a Wharton MBA candidate, agreed. “My generation grew up with a much more ambivalent relationship to cars than previous generations. A lot of us were just shuttled around by parents in the backseat of cars; we grew up taking public transportation to school.”

In addition, many experts point to the fact that millennials have grown up in the so-called “sharing economy” and appear to be comfortable with car-sharing and ride-hailing. That perception is borne out by Getaround’s demographics. According to co-founder and vice president Jessica Scorpio, owners who rent out their cars are concentrated in the 25 to 45 age group. Renters skew younger, at 19 to 40 years old.

Whether millennials ultimately continue their move to the suburbs and car ownership or gravitate, along with their parents, back to cities and alternative modes of mobility, remains to be seen. All that seems certain is that it is difficult to predict the future car-buying patterns of Americans, especially when the auto industry itself is going through such profound changes.

THE FUTURE OF CAR BUYING

While there may come a day when people no longer buy cars, that outcome is far from certain. In fact, U.S. car sales in 2015 beat the record set 15 years ago, according to The Wall Street Journal. But while consumers’ appetites for cars may remain strong for some time, their shopping and buying habits have already changed in significant ways.

One definite trend is that a growing number of consumers prefer to start the buying process online. Social media is playing an increasingly important role. According to a 2013 study by Dealer.com and GfK Automotive Research, 84% of car shoppers are on Facebook and 24% of them have used Facebook as a resource for making their vehicle purchases. More generally, 38% of consumers say they will consult social media in making their next car purchase.

For the third year in a row, the annual Automotive Social Media Trends Study found that car buyers ranked social networks as more important than dealerships’ websites in their auto selection process. And social media is only one of the ways today’s auto consumers shop online. Sites like Edmunds.com and Cars.com also rank high among the resources consumers consult before ever setting foot in a dealership.

According to Digital Air Strike’s 2015 Automotive Social Media Trends Study, 75% of car buyers found Internet research, including social media and review sites, to be the most helpful medium when selecting a car dealership. And it’s not just dealerships that people are researching online. A recent survey released by CDK Global found that 83% of car shoppers expected “online buying technology would help them narrow down their vehicle choice and determine what is affordable.” Eighty percent said they would likely configure a payment online.

Customers who rent a car from Enterprise Holdings’ brands are 55% more likely ... to purchase a new vehicle within six months of their rental.

Eventually, consumers may visit dealers to test drive a car before making their final decision and completing the purchase online. “Factory showrooms make sense, with the emphasis on ‘show,’” said The Detroit Bureau’s Eisenstein, “so people can go try out a car and then buy it online.”

Indeed, both car rentals and car-sharing offer test-drive opportunities. In 2013, Polk conducted a study for Enterprise Holdings, the largest car rental company in the world and operator of the Enterprise Rent-A-Car, National Car Rental and Alamo Rent A Car brands. The study found that customers who rent a car from Enterprise Holdings’ brands are 55% more likely than the average consumer to purchase a new vehicle within six months of their rental. Polk’s analysis revealed that 1.2 million new cars (out of 11.4 million in retail sales) were purchased by consumers within 180 days of renting from an Enterprise Holdings brand. “People do rent cars now to try out vehicles,” says Eisenstein. “And I’m sure more people will do that in the future.”

Joe Hinrichs, Ford’s president of the Americas, concurred, saying in a 2016 interview with Automotive News: “We have great relationships with our daily-rental companies. ... It’s good business. Customers get a chance to experience our vehicles.”
OWNING A CAR, while still attractive for many reasons, may not be nearly as much fun as it once was — especially in densely populated urban corridors. “For most of the population in large cities, it doesn’t make sense to own a car,” said Sam Abuelsamid, a senior research analyst at Navigant Research. “In Manhattan, for instance, you have the option of the subway, taxis or rental cars, and now there’s even greater flexibility with ride-hailing, car-sharing, city bikes and more.”

Every year, Americans spend 14.5 million hours in bumper-to-bumper traffic and $23 billion ($126 per driver) on repairing and driving their cars on poorly maintained roads. Just hunting for a free parking spot on urban streets takes an average of 20 minutes, said Donald Shoup, a professor of urban planning at UCLA. According to one estimate, owning and maintaining a car (with parking, gas, tolls and servicing) in a crowded place like Manhattan can cost $8,400 annually. And, on average, that car is going to sit idle 90% to 95% of the time.

Some analysts counter that ownership is too deeply imbued in the American psyche to disappear easily. With almost 17,000 franchised car dealers employing more than a million people and selling 17.5 million vehicles a year, car ownership is also deeply entrenched in the country’s economy.

Still, there’s no denying the disruptive forces at work today. McKinsey identifies four: electrification (the shift to hybrid, battery electric and fuel-cell technology); autonomous driving (from driver assistance to full self-driving); diverse mobility (the influence of the “sharing economy”); and connectivity (new possibilities with traffic services and the vehicle-to-vehicle communication that enable autonomy).

Much has been written about how ride-hailing services, such as Uber and Lyft, have been capitalizing on these new realities. There are two billion mobile phone users, and eight million of them are now using Uber while more than 631,000 are using Lyft. An estimated 13 million to 15 million Americans are now using ride-hailing, and 20% to 25% of new smartphone users have downloaded the Uber app (with 3% using it every week for rides and the average distance traveled is less than 15 miles).

In addition, car-sharing, from both peer-to-peer startups and new services offered by automakers and established rental companies, is having an impact on the urban market. According to the Boston Consulting Group, by 2021, “35 million users will book 1.5 billion minutes of driving time each month [through car sharing] and generate annual revenues of €4.7 billion [$5 billion].… Car sharing will reduce worldwide vehicle sales by approximately 550,000 units by 2021, and cause a net revenue loss to OEMs [original equipment manufacturers or automakers] of €7.4 billion [$7.9 billion].” Europe will be the largest market in that time frame, followed by Asia-Pacific and North America.

THE ENVIRONMENTAL FOOTPRINT OF “SHARING”

According to Auto Rental News, “The car-sharing market has grown from a largely subsidized, university research-driven experiment into a full-fledged for-profit enterprise, owned...
primarily by traditional car rental companies and auto manufacturers."

The environmental impact of car-sharing depends on how car-sharing services are used. A 2016 analysis by the Stanford Social Innovation Review concluded “that the service of car-sharing cannot be deemed green or not green on its own.” While some users may give up cars, others were previously carless (58% of them, according to a University of California, Berkeley study cited by the Review). In fact, the customers surveyed “joined car sharing to gain access to personal automobiles.” They also increased their total travel after joining a service. As a result, said the Review, “The impact of transportation use is determined by the distance traveled and the efficiency of the transportation.”

In other words, when those who don’t own cars use car-sharing services, they gain access to jobs and services (benefiting the economy) but also increase the overall vehicle miles traveled, at some cost to the environment. When car owners jettison their vehicles after joining a service, it’s a clear win for the environment.

The good news is that the available evidence shows that car-sharing is having a positive environmental effect. By 2030, McKinsey reported, 10% of global car sales could be shared vehicles. Membership in car-sharing services has grown 30% annually between 2011 and 2016. Susan Shaheen, who directs Innovative Mobility Research at the University of California, Berkeley, said that a 2008 survey by her team found an overall decline in public transit use among car-sharing members, but it also found “substantial increases in non-motorized and sustainable travel — walking, bicycling and traditional carpooling.”

For all the recent attention focused on new car-sharing and ride-hailing services, however, the fact is that vanpooling (one of the oldest shared mobility options) is probably the greenest choice of all. Enterprise’s recent purchase of vRide, a 40-year-old vanpooling company serving commuters, to complement its existing vanpooling business is an indication of ongoing growth in this market. Together, these two Enterprise services account for 12,100 vehicles and more than 100,000 riders, thereby eliminating more than 2.4 billion miles driven annually.

CAR RENTAL STILL GROWING

In reality, there isn’t much difference between local car rental and local car sharing at all — in both cases, consumers are hiring the car they need, whether it’s for an hour, a day, a week or longer. Car sharing represents the technological evolution of local car rental in the neighborhood market and takes it to the next level.

During the 2015 “Differentiating Brands in a Sharing Economy” panel discussion at the Global Business Travel Association (GBTA) Convention in Orlando, Enterprise’s chief strategy officer Greg Stubblefield explained: “Consider that we essentially ‘share’ more than a million vehicles a week in the United States. So when you talk about scale and the ability to meet public transportation needs for the long term, fleet size obviously is a significant factor from an operational and financial perspective.”

Car rental revenue in the U.S. remains 12 times larger than ride-hailing revenue, reports travel research firm Phocuswright. Far from contracting, U.S. rental vehicle revenue has increased from $20.5 billion in 2010 to a record $28.4 billion in 2016, reported Auto Rental News. And Enterprise Holdings customers alone logged more than 25 billion miles globally last year.

Car rental companies are also adopting new retail technology that appeals to tech-savvy customers.

The allure of local car rentals is being driven by a number of factors. One is convenience. The concept of bringing vehicles close to where people live and work — a core principle of car sharing — has been part of the DNA at Enterprise since 1957, when the company launched a new business model that located cars outside of airports. Its cars are strategically and conveniently situated at nearly 6,000 neighborhood locations throughout the U.S. In 1997, Enterprise trademarked the term Virtual Car®, after recognizing the strength and energy of local car rentals.

Another attraction is the chance a rental provides to try out cars equipped with new technology. One Enterprise survey revealed that young drivers use rental cars as “extended test drives” to prepare themselves for ownership. Some 68%, for example, said they first accessed the new technology very important to them in rental cars. More than half (53%) said they chose a rental based on a need to try something new.

Car rental companies are also adopting new retail technology that appeals to tech-savvy customers. “Rental Car Companies Have Gotten So Good that Even Millennials Like Them,” the Los Angeles Times headlined in 2015. One way rental companies are changing with the times is with software. Instead of the traditional lines at the rental counter, customers are met by sales associates holding tablets. The app shows the availability and location of cars (even their condition) in real time and, with prefilled
reservation forms in-hand, associates can take customers directly to their rentals.

New ride-hailing services are here to stay, but so is car rental. David Wyshner, president and chief financial officer of Avis Budget Group, noted in a fourth-quarter 2015 earnings call that his company sees “minimal overlap” between the use of car rentals and ride-hailing services. “One-day rentals represent only 3% of our rental day volume and under 50-mile transactions also represent only 3% of our rental days,” said Wyshner.

What’s more, the company’s one-day rentals actually went up in 2015 — including in cities where Uber and Lyft are well established. In analyzing 2015 trends, Avis also noted that 97% of its renters drive more than 50 miles, which would make ride-hailing an expensive alternative. “The net result,” Wyshner said, “is that the data simply don’t support the argument that the growth of ride-hailing is coming at the expense of car rental.”

FLEET MANAGEMENT WILL BE CRITICAL

Ride-hailing and peer-to-peer car sharing use technology to connect people to transportation. That’s a vastly different business model than traditional car sharing and rentals, which demand management and maintenance of large auto and truck fleets. “The ability to know when to sell, how to sell and have the distribution relationships, that has taken decades to build,” said Enterprise’s Stubblefield.

Jessica Caldwell, executive director of strategic analytics at Edmunds.com, said that experienced rental companies will be better positioned to run large sharing fleets. “Uber has mastered the use of on-demand apps, but managing a fleet of vehicles and all that entails is institutional knowledge that rental car companies have. There’s a lot of logistics.”

According to Paul Eisenstein, publisher of The Detroit Bureau and a contributor to CNBC, “It’s difficult right now to form clear conclusions [about] anything on car sharing and ride-hailing, because we’re still in the early-adopter stage. In the long term, we may indeed see certain demographic groups truly switch from private ownership to shared alternatives, but at the moment, the people who are doing so are highly motivated early adopters.” How those changes will ultimately play out is still a matter of conjecture, but automakers are already reacting to customers’ shifting tastes and eagerly exploring what lies ahead.

“Uber has mastered the use of on-demand apps, but managing a fleet of vehicles and all that entails is institutional knowledge that rental car companies have.”

– Jessica Caldwell, Edmunds.com
THERE IS GROWING EVIDENCE THAT TOMORROW’S URBAN CARS WILL BE “SAFE, GREEN AND CONNECTED,” Mary Gustanski, Delphi’s vice president of engineering, recently told Car Talk. “We’re going to see more electrification, and the electric car will merge with automated driving and the connected car.”

Electric vehicles (EVs) now hold just a 1% share of the global fleet on the road, but it could comprise 15% to 35% of total global new vehicle sales by 2040, according to IHS Markit. Worldwide sales are up more than 1,000% since 2010. In Europe and China, where regulation encourages plug-ins, EVs could be more than half of new passenger vehicle sales by 2040 — the same time fully autonomous cars are expected to rule the roads.

CARS THAT DRIVE THEMSELVES
The auto industry is moving toward the self-driving car; and semi-autonomous cars — able to operate hands-off, but with a driver behind the wheel — are already on sale. According to Deloitte, the shift to take our hands off the wheel “could occur more quickly and at greater scale than many are prepared for, especially in densely populated areas.” Cities will probably be the first laboratories for autonomous technology.

Will these vehicles simply replace our current private cars? Maybe not. With cities in the vanguard, we seem to be evolving toward a growing reliance on shared fleet cars. “We will primarily see autonomous cars in on-demand mobility fleets,” said Sam Abuelsamid, a senior research analyst at Navigant Research. “There’s a distinct possibility that consumers will never actually be able to buy them.”

As Abuelsamid pointed out, there are good reasons for fleet ownership of self-driving cars, including the fact that maintenance will be critical. “Once a car is sold to a consumer, the manufacturer no longer has control over which parts are put on that vehicle, and when we’re talking about the sensors that control the car, it’s critical that they not be replaced with cheap, off-brand parts,” he said. But poor-quality parts could also be outlawed by regulation.

Robin Chase, co-founder of Zipcar, argued that serving our transportation needs with fleets of autonomous electric cars is an ideal scenario for these reasons. “Simply eliminating the drivers from cars, and keeping everything else the same, will be a disaster,” she said. “If we share rides in shared cars, we will only need 10% of the cars we have today.... We have the ability to eliminate congestion, transform the livability of cities, make it possible to travel quickly and safely from A to B for the price of a bus ticket, improve the quality of our air, and make a significant dent in reducing carbon dioxide emissions,” she said.

“We will primarily see autonomous cars in on-demand mobility fleets.”
- Sam Abuelsamid, Navigant Research

“The footprint of the [U.S. car rental] industry stretches from coast to coast, and includes both airport and what we call the home-city market,” said Chris Brown, executive editor of Auto Rental News. “The fact is, the autonomous vehicle model most likely will be well suited for a pay-as-you-go system, especially on the local level. And this plays into car rental’s strengths of customer interface and management for the long term.”

Jack Nerad, an executive market analyst at Kelley Blue Book, agreed that fleets will be in the autonomous and electric vanguard. “In fleets, it works,” he said. “Cities are
a challenge, because space is at a premium, and there’s no place for apartment dwellers to charge. But fleets can be charged en masse at centralized locations.”

Gary Survis, a venture partner at Insight Venture Partners and a senior fellow at Wharton’s Initiative for Global Environmental Leadership (IGEL), said he believes that at least the early generation of autonomous cars will let their owners take the wheel when they want to, because the love of driving is still strong in today’s motorists. “A lot of research shows that, even with autonomous cars, people are still going to want to drive,” he said. “I don’t think that goes away.”

The good news is that despite infrastructure challenges, cities are committing to adding transit options, especially light rail. According to New Geography in 2014, it is “legacy” cities like New York, San Francisco, Chicago and Washington, D.C. with well-established subways and rail that account for 77% of transit commuting nationally. But that’s changing, as newcomers like Phoenix (which opened a 20-mile rail system), Dallas (93 miles in four lines), Salt Lake City (four new lines in one year), Denver (which realigned its downtown around the rail hub) and others become far more transit-friendly.

That said, automakers will remain a big part of future mobility, but they see their roles changing. Volkswagen, for instance, launched a new brand called MOIA, which is providing a ride-hailing commuter shuttle in Germany using electric vans. According to a 2016 article in the Financial Times, “[Automakers] are partly being pushed into it by Uber, which has made ride-hailing in cities so convenient and comparatively cheap that it may start to take the place of car ownership. ... Road transport becomes a utility, something that can be bought by volume, like gas, electricity and water.”

John Paul MacDuffie, a professor of management at Wharton, believes that in the near future, urban dwellers will “start each day figuring out where they need to go, and will put some options together that might be unique to that day, possibly combining public transit, car rentals, ride-hailing, car sharing and city bikes.”

MacDuffie also said that there is likely a market for “mobility services providers that can make it all work for you.” Ideally, that would mean the traveler would tell the provider where they wanted to go, and they would get a detailed itinerary with all the intermodal links worked out.

Automakers will remain a big part of future mobility, but they see their roles changing.

THE FUTURE OF TRANSPORTATION

“When it comes to urban transportation, there is a huge amount of disruption to what we consider the norms,” said Survis. “The whole question of auto ownership is being challenged by sharing services and the autonomous car.”

Survis said that accommodating self-driving cars will require cities to adjust their infrastructure — for instance, by adding special dedicated lanes, or geo-fenced areas. "The infrastructure for modern transportation in the urban environment demands major thinking and federal funding,” Survis said. “As the population continues to rise in our bigger cities, this should become a major priority.”

For Asia’s growing “megacities” (with populations above 10 million), new transportation models may not involve four wheels at all. A startup called Gogoro has sold 15,000 of its electric scooters in Taipei, Taiwan, and keeps them on the road with hundreds of battery swap stations. Founder Horace Luke said he plans to expand to other Asian megacities. The company also has a separate scooter-sharing operation in Berlin, Germany with Bosch as a partner.

In the U.S., Americans are responding to the renaissance in urban public transit investment. According to the American Public Transportation Association (APTA) Fact Book for 2015, “Since the early 1970s, public transportation has shown a long-term growth in ridership (60% since 1973). ... Bus ridership has grown 15% over that time period while heavy rail and light rail ridership have each more than doubled. ... Public transportation ridership has increased by over a billion trips each of the past two decades.” But more needs to be done, since the U.S. transit system is aging, and the population is expected to increase by 100 million by 2050.

That said, automakers will remain a big part of future mobility, but they see their roles changing."
Driving Forward: The Future of Urban Mobility

About IGEL
The Wharton-led, Penn-wide Initiative for Global Environmental Leadership (IGEL) promotes knowledge for business sustainability through world-class research, transformative teaching and constructive dialogue between top alumni, academic, corporate, government, and non-government organizations. IGEL is a hub for business and sustainability, connecting and leveraging academic capital at Penn to help business leaders of today and tomorrow to create more sustainable industries.
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November 22, 2016

Mark A. Rosekind
Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue SE
Washington, DC 20590

Submitted via regulations.gov


Dear Administrator Rosekind:

Enterprise Holdings, Inc., on behalf of itself and its network of affiliates operating the Enterprise Rent-A-Car, National Car Rental, Alamo Rent A Car brands and its Enterprise Fleet Management, car sharing, van pooling, car sales, truck rental and other transportation service businesses (collectively, Enterprise Holdings), is pleased to provide comments on the National Highway Traffic Safety Administration’s (NHTSA) Federal Automated Vehicles Policy (hereinafter, the Policy), as solicited by NHTSA and the Department of Transportation’s (DOT) Request for Comment published in the Federal Register on September 23, 2016.¹ Specifically, in these comments, Enterprise Holdings:

1. Encourages NHTSA to recognize the rental industry and fleet management operators as key stakeholders in the development of state and federal policies;
2. Cautions that new definitions of a vehicle “driver” that focus on the owner of a vehicle should not unintentionally expand liability to fleet owners;
3. Welcomes the effort to harmonize laws related to highly automated vehicles (HAVs) across jurisdictions;
4. Calls for safety standardization that will ensure reasonable policies are in place to enable fleet owners to provide safe vehicles to consumers;
5. Calls for NHTSA to ensure that any final framework or policy regarding HAVs preserves the right of vehicle owners to control and own the data generated by their vehicles; and
6. Urges NHTSA to clarify that important cybersecurity obligations are undertaken by the manufacturers and designers that are best positioned to carry them out.

As the largest rental car company in the world and the owner of over 1.9 million vehicles, Enterprise Holdings has a strong interest in the development and deployment of HAVs and related transportation technology. We believe that the Policy, published for comment by NHTSA in September 2016, expands the agency’s initial 2013 effort on automated vehicles. We

applaud NHTSA’s efforts to stay current with the rapidly developing HAV landscape and appreciate the agency’s flexible approach that supports innovation. Below, we provide additional detail and context for consideration.

I. Background on Enterprise Holdings

Enterprise Holdings is a 60-year old, family-owned company that operates the Enterprise Rent-A-Car, National Car Rental, and Alamo Rent A Car brands, among others. Enterprise Holdings is a total transportation service provider, offering a network of services that includes car rental, retail car sales, hourly car sharing, ridesharing or vanpooling, truck rental, ride matching, and, through our affiliate, Enterprise Fleet Management, full-service, mid-size fleet leasing. The company operates more than 9,000 locations across the globe, employs more than 95,000 people, and owns and operates more than 1.9 million vehicles, making Enterprise Holdings the owner of one of the largest vehicle fleets in the world.

II. Fleet Owners and Operators as HAV Stakeholders

Enterprise Holdings believes HAV technology is beneficial and inevitable. As NHTSA has acknowledged, the questions and issues that will arise during this process will be complex and will require considerable effort to solve. Input from key stakeholders will be critical to navigating the landscape ahead. The car rental industry purchased nearly two million vehicles in 2015, or one out of every nine new vehicles sold in the United States during that time. Given the sizeable role the rental industry plays in the nation’s vehicle fleet, we encourage NHTSA to recognize the rental industry as a key stakeholder in the development of federal HAV policy. The rental industry—with millions of the newest vehicles in its fleets and a customer base accustomed to experiencing new vehicles through rentals—will provide a valuable perspective as policymakers contemplate how to best integrate HAVs into existing fleets.

In this respect, we note that the Policy is ambiguous with regard to whether some or all of the guidance, standards, and reporting requirements apply to fleet owners, as they do for HAV manufacturers. For example, the Policy is unclear as to whether the agency considers those who operate HAVs to be covered by the Vehicle Performance Guidance.2 Additionally, the phrase “manufacturers and other entities” is used throughout the Policy, which could imply that a fleet owner would fall within the scope of the Policy. We urge NHTSA to resolve this ambiguity in favor of maintaining the current regulatory approach, that safety, security, and other performance inherent to the vehicle is the responsibility of the manufacturer of the vehicle, and not of the owner of the vehicle.

III. Definition of “Driver” and Expansion of Liability

We appreciate NHTSA’s recognition that liability rules and insurance requirements will need to be updated when considering their application to HAVs, which shift the concept of “driver” away from humans and toward the vehicle itself.3 For lower levels of automation where

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3 Id. at 45-46.
vehicles still incorporate a human driver, we encourage the agency to work with the states on developing a clear policy on driver qualifications necessary to operate an automated vehicle. As this definition of “driver” evolves, particularly as liability shifts from the human driver to the HAV itself, we ask that NHTSA clarify that vehicle ownership does not per se expand liability to the fleet owner in the case of fleet ownership. Such a clarification will promote the successful build-out of the HAV ecosystem. For liability purposes, fleet owners, such as rental companies, should not be regarded as the “driver” when vehicles are out of the fleet owner’s possession and control (such as vehicles that have been leased or rented).

On the question of assigning liability in the event of a crash, we appreciate NHTSA’s recognition of the states’ responsibility and authority in regulating motor vehicle insurance and liability. While we recognize the status quo, we encourage both the agency and states to avoid the unintentional application of vicarious liability to non-operational owners of HAV fleets, such as rental car and fleet management companies. Avoiding vicarious liability for fleet owners is particularly important given the widespread expectation that initial deployment of HAVs will be through a fleet-based approach. As such, we ask that the agency include the rental car and fleet management industries in any workshops, studies, or other stakeholder engagements regarding the establishment of guidelines for liability allocation, and work with the states to ensure consistency with regard to liability rules and insurance regulations. To that end, we support the suggestion in the Policy that states look to create a commission to study liability and insurance issues and to make recommendations, and we look forward to engaging on that matter.4

IV. Regulatory Harmonization

We appreciate NHTSA including in the Policy a section that sets forth a Model State Policy and that delineates between federal and state responsibilities.5 At the same time, NHTSA’s authority to promote and enforce vehicle safety should not be diluted. Enterprise Holdings strongly believes that NHTSA’s authority can and should be pressed more vigorously against state and local entities to clarify and direct that NHTSA alone is responsible for regulating HAV safety and performance. NHTSA will play a critical role in the deployment of HAVs and the subsequent evolution of the industry by helping to ensure that state and local governments refrain from legislating in ways that add redundant and potentially conflicting obligations on entities seeking to incorporate and adhere to NHTSA’s voluntary framework set forth in the Policy. We therefore urge NHTSA to bring consistency across states to prevent the emergence of a patchwork of state and local laws that would impede innovation and the widespread deployment of HAV technology.

As regulators and policymakers consider deployment models, we further urge NHTSA to establish a single framework addressing HAV technology, rather than separate sets of regulations addressing human-operated and driverless vehicles. As we have seen with the advent of ride-sharing, technology driven developments within an industry often are accompanied by new entrants seeking separate regulatory frameworks. Likewise, regulators may be asked to treat HAV-centric services and service providers differently from other providers. We believe that a

4 Id. at 46.
5 Id. at 39-44.
single framework will promote consumer and business interests alike and provide a more coherent set of rules and best practices.

V. Safety Standardization

Enterprise Holdings appreciates NHTSA’s attempt to advance a standardized “Vehicle Performance Guidance” for submitting a voluntary Safety Assessment letter for HAVs under the Policy. However, we would recommend further clarification to the framing of the Vehicle Performance Guidance. Specifically, item 9 of the 15-point assessment, Post-Crash Behavior, calls for “manufacturers and other entities” to have “a documented process for the assessment, testing, and validation of how their HAV is reinstated into service after being involved in a crash,” and that “if sensors or critical safety control systems are damaged, the vehicle should not be” put back into HAV service.6 We agree with NHTSA that inadequate maintenance of HAVs is a serious safety concern and note that there is a lack of industry-wide standards for sensor calibration, repair procedures, and validation processes to ensure that the automotive repair market can effectively maintain the safety of HAVs. To improve the efficacy of this element of the Guidance, we recommend that NHTSA add hardware and software sensor recalibration standards and guidelines as an additional item to include in the Safety Assessment letter to NHTSA. We further suggest that NHTSA make clear that maintenance and diagnostic data of core safety functions will be available to OEM and non-OEM repair facilities alike.

Our customers routinely adjust vehicle settings, and we note that it would be beneficial for manufacturers to provide a way for operators or subsequent owners to quickly restore a vehicle’s operating settings to factory defaults. Similarly, we believe that we can improve safety by requiring manufacturers to equip vehicles with clear indicators that vehicle settings have been altered from factory default. Such indicators would allow users and operators to be aware when a vehicle is outside a default state.

We commend the agency on highlighting the importance of consumer education and training. We agree with NHTSA that “proper education and training is imperative to ensure safe deployment of automated vehicles.”7 It is critical that consumers fully understand the capabilities and limitations of HAVs. For consumer-facing organizations, like rental companies, clear end-user educational materials are crucial to ensuring that HAVs are used safely and appropriately, and we recommend adding the development of these materials to the Guidance. We further encourage the agency to consider how those educational efforts will be provided to, or shared with, other stakeholders in the HAV ecosystem beyond manufacturers and dealerships to maximize the potential for consumer education and understanding.

VI. Data Ownership and Privacy

We support the agency’s efforts to address the issue of data ownership and privacy through this Policy and Guidance development process. As related to our business operations, Enterprise Holdings purchases vehicles from the manufacturer, and as a result owns and controls not only the vehicle itself, but also its equipment and the data generated by the vehicle, in

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6 Id. at 25.
7 Id. at 24.
accordance with the company’s privacy policies and applicable law. Maintaining ownership and control of the data generated by our vehicles is critical to improving customer safety, ensuring proper fleet maintenance, proper damage repairs, and effective operating of our businesses. NHTSA should make clear in the Policy that vehicle owners have control and ownership over data from the vehicle.

To this end, we highlight the important distinction between data that is necessary to ensure proper vehicle function (e.g., basic safety messages in vehicle-to-vehicle communications, crash notifications, repairs, cybersecurity logs, etc.) and data that may be used to enhance the driver’s comfort or experience. The agency should not consider these disparate data sets to be within one category. As a large fleet owner with many safety and compliance obligations, Enterprise Holdings must be able to maintain, service, and manage its fleet independently from the manufacturer, a function that would be difficult, if not impossible, if HAV data reverts to the sole possession and control of manufacturers. To avoid this outcome, we strongly urge NHTSA to preserve existing ownership and control rights over vehicle data.

Achieving the objective of preserving data rights for vehicle owners may require modifying how the agency proposes to define “third party” in the context of data sharing, and whether such data would have to be de-identified before being provided to a third party.8 We note with concern that, if NHTSA fails to specify that vehicle data belongs to owners, the agency could unintentionally enable auto manufacturers to create a closed market and limit information sharing and data access, which would have a negative impact on the ability of NHTSA and the broader HAV industry to fulfill the goals of the Policy and advance consumer safety. To be sure, such a data ownership structure would mean that applicable legal obligations regarding sensitive customer data (such as geolocation and GPS data) would apply to entities like Enterprise Holdings, as they would for less sensitive vehicle related data that Enterprise Holdings would collect and maintain (such as mileage, last oil change, fuel level, etc.).

VII. Cybersecurity

As a large fleet owner, we are concerned for the safety of passengers and the security of our fleet. To that end, Enterprise Holdings supports NHTSA’s call for a robust product development process based on a systems-engineering approach, including systematic and ongoing safety risk assessment for the HAV system and the broader transportation ecosystem. The Policy should call for manufacturers to provide for a systems approach to cybersecurity—for communications within the vehicle, between the vehicle and infrastructure, among multiple vehicles, and from the vehicle to the Internet. As manufacturers design and deploy HAVs, we want to ensure that responsibility for the security of the HAV rests with the manufacturer who has designed and engineered the entire vehicle system. The Policy suggests that operators—in addition to manufacturers—may have some cybersecurity responsibility for HAVs. However, it is unclear what the agency envisions that responsibility to be, and we seek clarification on this point as NHTSA considers modifications to the Policy in the weeks and months ahead. Specifically, we encourage the agency to align the cybersecurity requirements in the Policy with NHTSA’s recently published cybersecurity best practices, which was more limited in scope and

8 Id. at 18.
applied to “individuals and organizations manufacturing and designing vehicle systems and software.”

As a related matter, we recognize that proper maintenance of HAVs will likely involve periodic software updates to improve vehicle performance and patch vulnerabilities. Enterprise Holdings encourages NHTSA to work with the industry to develop a defined, timely, and consistent update cycle. Any proposed cycle should include assigning responsibility between the manufacturer and the vehicle owner for maintaining the proper software version on the vehicle. An approach that assigns responsibility for software patching to the vehicle owner must address the challenges for fleet owners in managing and deploying updates for such a large software inventory. In this respect, we strongly urge the agency to require remote over-the-air software updates in order to provide an easily scalable solution. NHTSA currently requires manufacturers to remedy defects for vehicles up to 15 years old, and we are concerned whether this 15-year limit will also apply to software, especially if software updates are necessary for vehicle operation, safety, or security.

Given the widespread discussion about a fleet-based approach for HAV deployment, we encourage the agency to consider ways for HAV manufacturers to incorporate consumer protection mechanisms for vehicles involved in fleet usage. For example, a central challenge for Enterprise Holdings is returning the vehicle to a “default” state that wipes personal data in the vehicle between rentals. For fleet deployments, NHTSA should encourage HAV manufacturers to develop mechanisms that automate or facilitate this process.

Finally, we note that there is a legitimate need to make maintenance and diagnostic data of core safety functions available to non-OEM repair facilities. This issue begs the question of how to segregate that data, but also keep it accessible. We urge NHTSA to give careful consideration to how to balance these competing priorities in light of the fact that, with almost 2 million vehicles, we will need adequate access to maintenance and repair providers.

* * *

We appreciate the opportunity to provide comments on NHTSA’s Federal Automated Vehicles Policy. Enterprise Holdings will continue to engage with NHTSA in developing and advancing this important initiative. Should you have any questions regarding any of the comments above, please contact me at 314.512.4123.

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Michael W. Andrew, Jr.
Senior Vice President & General Counsel
Enterprise Holdings, Inc.

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Special Report

Driving Forward: The Future of Urban Mobility
INTRODUCTION

Driving Forward: The Future of Urban Mobility

The future of transportation could not be more exciting. Autonomous vehicle technology, car-sharing, car-hailing, and other cutting edge developments, are driving the next stage of urban mobility. Car rental companies and automakers are all pivoting to put long-lasting stakes in this new world.

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Boomers and millennials are defying expectations about where they live and how they get around. Meanwhile, car manufacturers and dealers are anticipating what consumers will want in the decades ahead.

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People who want to forgo owning a car have never had greater access to more transportation options — local car rentals, car sharing, ride-hailing, vanpooling and city bikes.

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From Autonomous Vehicles to Public Transit
The future of transportation may combine autonomy with an expanded public transit system into a single mobility solution.

SPONSORS

Wharton’s Initiative for Global Environmental Leadership (IGEL) and Enterprise Holdings have partnered with Knowledge@Wharton to create this special report.
Driving Forward: The Future of Urban Mobility

**CARS HAVE BEEN AT THE HEART OF AMERICAN CULTURE FOR MORE THAN A CENTURY.** Until recently, getting a license and buying a car were considered rites of passage, and the car you chose was widely regarded as an expression of your identity, reflecting your priorities and revealing your status.

All that is now changing. The advent of car sharing, ride-hailing and self-driving vehicles presages a radical transformation in consumer behavior. The future of personal transportation will be determined by technological advances, informed by the needs and desires of the people who use them. Our understanding of who those consumers are and what choices they are likely to make is changing in surprising ways.

**CAR-LOVING BOOMERS ARE HEADED FOR CITIES**

Consider baby boomers, the generation born between 1946 and 1964. They may no longer be the largest generation in the U.S. (their kids, the 19- to 35-year-old millennials, now outnumber them slightly), but boomers are likely to continue playing a major role in shaping the future of the auto industry and the rapidly evolving "sharing economy."

Given the boomers’ affection for cars, it’s not surprising that adults over 50 bought nearly two-thirds of the new cars sold in the U.S. in 2011, according to an AARP study. Unlike earlier generations, today’s seniors “are refusing to follow their parents’ lead and go quietly into the car-buying night,” according to a 2013 article in Bloomberg News. In fact, nearly 93% of Americans between 60 and 64 had driver’s licenses in 2011, up from only 84% in 1983.

What is surprising is that seniors are participating in the well-documented mass migration to urban centers. Despite the common assumption that millennials will dominate the urban landscape in the coming years, recent studies suggest that boomers are also locating there in droves. “Instead of migrating south en masse to retirement communities in the Sunshine State or the wilds of Arizona,” wrote Realtor.com, “more and more baby boomers — a particularly urban-savvy group of Americans — are moving back to the metro areas they abandoned when they began raising families.”

“All this activity makes urban boomers active consumers. ‘Between 2015 and 2030, the 60-plus age group in the United States, for instance, is projected to contribute 40% or more of consumption growth in categories such as personal care, housing, transportation, entertainment, and food and alcoholic beverages,’ reported a 2016 study by the McKinsey Global Institute titled ‘Urban World: The Global Consumers to Watch.’"

For boomers who keep their cars in the city, ride-hailing offers a valuable source of income. A 2015 Uber study found that nearly a quarter of its drivers were older than 50. For many, the primary motivation is extra income, often...
needed to supplement retirement savings. But there are other benefits as well.

Uber driver Maureen Mahon, 59, enjoys the flexibility and sociability of the work. “I meet businessmen, college kids on their way out for the night, folks going to parties, pretty much the whole range,” she told The New York Times. “You can drive as much or as little as you like. If the weather’s bad or you have a doctor’s appointment, you just don’t turn on the app.”

Personal car sharing, too, is becoming attractive to some urban car-owning boomers. Moreover, peer-to-peer car sharing firm Getaround has formed partnerships with car manufacturers to provide members with discounts on new car purchases.

“Millennials buy cars more pragmatically. ... They are forever going to be more on the pragmatic car-as-commodity, car-as-appliance part of the equation.”

– John Paul MacDuffie, Wharton

Of course, many of those who move to urban centers are likely to give up their cars in the process. Paul Eisenstein, publisher of The Detroit Bureau and a contributor to CNBC, said that in today’s congested cities, “car ownership is viewed more as a hassle than an entitlement.” Suburbanites may feel stranded without a car in the garage, but for people living in higher-density environments, according to Scott Kelley, a post-doctoral fellow at the University of Michigan’s Energy Institute, “it’s becoming more convenient to not have a car. In fact, we’re already seeing some shift away from private ownership in dense urban centers.”

While taxis are the traditional choice for carless boomers making short trips within the city limits, the growing presence of car-sharing and ride-hailing services is just as likely to appeal to seniors, said Wharton management professor John Paul MacDuffie. “I don’t see those at the more elderly end of the spectrum — at least if it’s suburbanites coming into the city — being turned off by the techie-ness of it. I see them actually liking it if it solves a problem for them.” A recent Zipcar study supports his view: 69% of urban boomers surveyed said mobile apps make their lives easier, and 81% were users of Facebook.

**MILLENNIALS TAKE A PRAGMATIC VIEW OF CARS**

Until recently, automakers had feared the inevitable loss of the boomer market. Millennials, the boomers’ children, have seemed far less interested in cars than their parents. “In 2009 and 2010, there was a lot of consternation in the auto industry about this problem,” said Sam Abuelsamid, a senior research analyst at Navigant Research.

But it turned out that the concern was largely misplaced. According to an article in Wards Auto, the weak sales were less a reflection of the generation’s attitudes toward cars and more the result of the Great Recession and the younger generation’s lack of resources. Millennials are only now entering their peak car-buying years, the article said.

In March 2016, the Associated Press reported that “millennials — especially the oldest ones — are these days buying cars in big numbers. They just had a late start.” The article pointed out that in California, the country’s biggest car market, millennials outpaced boomers for the first time as car buyers. Millennials’ share of the new-car market jumped to 28% in 2015.

Like their parents, millennials appear to be defying conventional expectations. Fortune points out that too many have mistaken the presence of millennials in cities as an indication that they prefer urban living. According to the 2016 National Association of Realtors Home Buyer and Seller Generational Trends study, a growing share of homebuyers are millennials, and more of them are purchasing single-family homes in suburbia.

But not everyone is convinced that millennials are necessarily headed for suburbia and car ownership. “They’re living in cities more frequently than their parents,” Abuelsamid said, adding that millennials have “a more flexible lifestyle enabled by technology” and “don’t have the need or the desire to own a car, even though they increasingly have the financial ability.” That may change, he noted, but it’s too soon to tell.

University of Michigan’s Kelley agreed: “It appears that younger people are willing to treat transportation as an on-demand service, rather than paying the fixed price of owning a car.” But cities, he said, “have sprawling suburban areas around them,” and how mobility will change there is still not clear. According to a recent McKinsey report on disruptive trends in the auto industry, in rural areas “private-car usage will remain the preferred means of transport by far.”

What is clear at this point, Abuelsamid said, is that millennials have a lower rate of car ownership than
previous generations at their age. Some see a generational shift at work. Wharton’s MacDuffie postulated that “millennials buy cars more pragmatically. Maybe they missed that moment as teenagers when you deeply fall in love with cars, or a car, or personal autonomous transportation. And they are forever going to be more on the pragmatic car-as-commodity, car-as-appliance part of the equation.”

Zoë Hoster, a Wharton MBA candidate, agreed. “My generation grew up with a much more ambivalent relationship to cars than previous generations. A lot of us were just shuttled around by parents in the backseat of cars; we grew up taking public transportation to school.”

In addition, many experts point to the fact that millennials have grown up in the so-called “sharing economy” and appear to be comfortable with car-sharing and ride-hailing. That perception is borne out by Getaround’s demographics. According to co-founder and vice president Jessica Scorpio, owners who rent out their cars are concentrated in the 25 to 45 age group. Renters skew younger, at 19 to 40 years old.

Whether millennials ultimately continue their move to the suburbs and car ownership or gravitate, along with their parents, back to cities and alternative modes of mobility, remains to be seen. All that seems certain is that it is difficult to predict the future car-buying patterns of Americans, especially when the auto industry itself is going through such profound changes.

THE FUTURE OF CAR BUYING

While there may come a day when people no longer buy cars, that outcome is far from certain. In fact, U.S. car sales in 2015 beat the record set 15 years ago, according to The Wall Street Journal. But while consumers’ appetites for cars may remain strong for some time, their shopping and buying habits have already changed in significant ways.

One definite trend is that a growing number of consumers prefer to start the buying process online. Social media is playing an increasingly important role. According to a 2013 study by Dealer.com and GfK Automotive Research, 84% of car shoppers are on Facebook and 24% of them have used Facebook as a resource for making their vehicle purchases. More generally, 38% of consumers say they will consult social media in making their next car purchase.

For the third year in a row, the annual Automotive Social Media Trends Study found that car buyers ranked social networks as more important than dealerships’ websites in their auto selection process. And social media is only one of the ways today’s auto consumers shop online. Sites like Edmunds.com and Cars.com also rank high among the resources consumers consult before ever setting foot in a dealership.

According to Digital Air Strike’s 2015 Automotive Social Media Trends Study, 75% of car buyers found Internet research, including social media and review sites, to be the most helpful medium when selecting a car dealership. And it’s not just dealerships that people are researching online. A recent survey released by CDK Global found that 83% of car shoppers expected “online buying technology would help them narrow down their vehicle choice and determine what is affordable.” Eighty percent said they would likely configure a payment online.

Customers who rent a car from Enterprise Holdings’ brands are 55% more likely ... to purchase a new vehicle within six months of their rental.

Eventually, consumers may visit dealers to test drive a car before making their final decision and completing the purchase online. “Factory showrooms make sense, with the emphasis on ‘show,’” said The Detroit Bureau’s Eisenstein, “so people can go try out a car and then buy it online.”

Indeed, both car rentals and car-sharing offer test-drive opportunities. In 2013, Polk conducted a study for Enterprise Holdings, the largest car rental company in the world and operator of the Enterprise Rent-A-Car, National Car Rental and Alamo Rent A Car brands. The study found that customers who rent a car from Enterprise Holdings’ brands are 55% more likely than the average consumer to purchase a new vehicle within six months of their rental. Polk’s analysis revealed that 1.2 million new cars (out of 11.4 million in retail sales) were purchased by consumers within 180 days of renting from an Enterprise Holdings brand. “People do rent cars now to try out vehicles,” says Eisenstein. “And I’m sure more people will do that in the future.”

Joe Hinrichs, Ford’s president of the Americas, concurred, saying in a 2016 interview with Automotive News: “We have great relationships with our daily-rental companies… It’s good business. Customers get a chance to experience our vehicles.”
OWNING A CAR, while still attractive for many reasons, may not be nearly as much fun as it once was — especially in densely populated urban corridors. “For most of the population in large cities, it doesn’t make sense to own a car,” said Sam Abuelsamid, a senior research analyst at Navigant Research. “In Manhattan, for instance, you have the option of the subway, taxis or rental cars, and now there’s even greater flexibility with ride-hailing, car-sharing, city bikes and more.”

Every year, Americans spend 14.5 million hours in bumper-to-bumper traffic and $23 billion ($126 per driver) on repairing and driving their cars on poorly maintained roads. Just hunting for a free parking spot on urban streets takes an average of 20 minutes, said Donald Shoup, a professor of urban planning at UCLA. According to one estimate, owning and maintaining a car (with parking, gas, tolls and servicing) in a crowded place like Manhattan can cost $8,400 annually. And, on average, that car is going to sit idle 90% to 95% of the time.

Some analysts counter that ownership is too deeply imbedded in the American psyche to disappear easily. With almost 17,000 franchised car dealers employing more than a million people and selling 17.5 million vehicles a year, car ownership is also deeply entrenched in the country’s economy.

Still, there’s no denying the disruptive forces at work today. McKinsey identifies four: electrification (the shift to hybrid, battery electric and fuel-cell technology); autonomous driving (from driver assistance to full self-driving); diverse mobility (the influence of the “sharing economy”); and connectivity (new possibilities with traffic services and the vehicle-to-vehicle communication that enable autonomy).

Much has been written about how ride-hailing services, such as Uber and Lyft, have been capitalizing on these new realities. There are two billion mobile phone users, and eight million of them are now using Uber while more than 631,000 are using Lyft. An estimated 13 million to 15 million Americans are now using ride-hailing, and 20% to 25% of new smartphone users have downloaded the Uber app (with 3% using it every week for rides and the average distance traveled is less than 15 miles).

In addition, car-sharing, from both peer-to-peer startups and new services offered by automakers and established rental companies, is having an impact on the urban market. According to the Boston Consulting Group, by 2021, “35 million users will book 1.5 billion minutes of driving time each month [through car sharing] and generate annual revenues of €4.7 billion [$5 billion].... Car sharing will reduce worldwide vehicle sales by approximately 550,000 units by 2021, and cause a net revenue loss to OEMs [original equipment manufacturers or automakers] of €7.4 billion [$7.9 billion].” Europe will be the largest market in that time frame, followed by Asia-Pacific and North America.

Car sharing represents the technological evolution of local car rental in the neighborhood market and takes it to the next level.

THE ENVIRONMENTAL FOOTPRINT OF “SHARING”

According to Auto Rental News, “The car-sharing market has grown from a largely subsidized, university research-driven experiment into a full-fledged for-profit enterprise, owned
primarily by traditional car rental companies and auto manufacturers."

The environmental impact of car-sharing depends on how car-sharing services are used. A 2016 analysis by the Stanford Social Innovation Review concluded “that the service of car-sharing cannot be deemed green or not green on its own.” While some users may give up cars, others were previously carless (58% of them, according to a University of California, Berkeley study cited by the Review). In fact, the customers surveyed “joined car sharing to gain access to personal automobiles.” They also increased their total travel after joining a service. As a result, said the Review, “The impact of transportation use is determined by the distance traveled and the efficiency of the transportation.”

In other words, when those who don’t own cars use car-sharing services, they gain access to jobs and services (benefiting the economy) but also increase the overall vehicle miles traveled, at some cost to the environment. When car owners jettison their vehicles after joining a service, it’s a clear win for the environment.

The good news is that the available evidence shows that car-sharing is having a positive environmental effect. By 2030, McKinsey reported, 10% of global car sales could be shared vehicles. Membership in car-sharing services has grown 30% annually between 2011 and 2016. Susan Shaheen, who directs Innovative Mobility Research at the University of California, Berkeley, said that a 2008 survey by her team found an overall decline in public transit use among car-sharing members, but it also found “substantial increases in non-motorized and sustainable travel — walking, bicycling and traditional carpooling.”

For all the recent attention focused on new car-sharing and ride-hailing services, however, the fact is that vanpooling (one of the oldest shared mobility options) is probably the greenest choice of all. Enterprise’s recent purchase of vRide, a 40-year-old vanpooling company serving commuters, to complement its existing vanpooling business is an indication of ongoing growth in this market. Together, these two Enterprise services account for 12,100 vehicles and more than 100,000 riders, thereby eliminating more than 2.4 billion miles driven annually.

**CAR RENTAL STILL GROWING**

In reality, there isn’t much difference between local car rental and local car sharing at all — in both cases, consumers are hiring the car they need, whether it’s for an hour, a day, a week or longer. Car sharing represents the technological evolution of local car rental in the neighborhood market and takes it to the next level.

During the 2015 “Differentiating Brands in a Sharing Economy” panel discussion at the Global Business Travel Association (GBTA) Convention in Orlando, Enterprise’s chief strategy officer Greg Stubblefield explained: “Consider that we essentially ‘share’ more than a million vehicles a week in the United States. So when you talk about scale and the ability to meet public transportation needs for the long term, fleet size obviously is a significant factor from an operational and financial perspective.”

Car rental revenue in the U.S. remains 12 times larger than ride-hailing revenue, reports travel research firm Phocuswright. Far from contracting, U.S. rental vehicle revenue has increased from $20.5 billion in 2010 to a record $28.4 billion in 2016, reported Auto Rental News. And Enterprise Holdings customers alone logged more than 25 billion miles globally last year.

**Car rental companies are also adopting new retail technology that appeals to tech-savvy customers.**

The allure of local car rentals is being driven by a number of factors. One is convenience. The concept of bringing vehicles close to where people live and work — a core principle of car sharing — has been part of the DNA at Enterprise since 1957, when the company launched a new business model that located cars outside of airports. Its cars are strategically and conveniently situated at nearly 6,000 neighborhood locations throughout the U.S. In 1997, Enterprise trademarked the term Virtual Car®, after recognizing the strength and energy of local car rentals.

Another attraction is the chance a rental provides to try out cars equipped with new technology. One Enterprise survey revealed that young drivers use rental cars as “extended test drives” to prepare themselves for ownership. Some 68%, for example, said they first accessed the new technology very important to them in rental cars. More than half (53%) said they chose a rental based on a need to try something new.

Car rental companies are also adopting new retail technology that appeals to tech-savvy customers. “Rental Car Companies Have Gotten So Good that Even Millennials Like Them,” the Los Angeles Times headlined in 2015. One way rental companies are changing with the times is with software. Instead of the traditional lines at the rental counter, customers are met by sales associates holding tablets. The app shows the availability and location of cars (even their condition) in real time and, with prefilled
reservation forms in-hand, associates can take customers directly to their rentals.

New ride-hailing services are here to stay, but so is car rental. David Wyshner, president and chief financial officer of Avis Budget Group, noted in a fourth-quarter 2015 earnings call that his company sees “minimal overlap” between the use of car rentals and ride-hailing services. “One-day rentals represent only 3% of our rental day volume and under 50-mile transactions also represent only 3% of our rental days,” said Wyshner.

What’s more, the company’s one-day rentals actually went up in 2015 — including in cities where Uber and Lyft are well established. In analyzing 2015 trends, Avis also noted that 97% of its renters drive more than 50 miles, which would make ride-hailing an expensive alternative. “The net result,” Wyshner said, “is that the data simply don’t support the argument that the growth of ride-hailing is coming at the expense of car rental.”

“Uber has mastered the use of on-demand apps, but managing a fleet of vehicles and all that entails is institutional knowledge that rental car companies have.”

– Jessica Caldwell, Edmunds.com

FLEET MANAGEMENT WILL BE CRITICAL

Ride-hailing and peer-to-peer car sharing use technology to connect people to transportation. That’s a vastly different business model than traditional car sharing and rentals, which demand management and maintenance of large auto and truck fleets. “The ability to know when to sell, how to sell and have the distribution relationships, that has taken decades to build,” said Enterprise’s Stubblefield.

Jessica Caldwell, executive director of strategic analytics at Edmunds.com, said that experienced rental companies will be better positioned to run large sharing fleets. “Uber has mastered the use of on-demand apps, but managing a fleet of vehicles and all that entails is institutional knowledge that rental car companies have. There’s a lot of logistics.”

According to Paul Eisenstein, publisher of The Detroit Bureau and a contributor to CNBC, “It’s difficult right now to form clear conclusions [about] anything on car sharing and ride-hailing, because we’re still in the early-adopter stage. In the long term, we may indeed see certain demographic groups truly switch from private ownership to shared alternatives, but at the moment, the people who are doing so are highly motivated early adopters.” How those changes will ultimately play out is still a matter of conjecture, but automakers are already reacting to customers’ shifting tastes and eagerly exploring what lies ahead.
Tomorrow’s Transportation Ecosystem: From Autonomous Vehicles to Public Transit

THERE IS GROWING EVIDENCE THAT TOMORROW’S URBAN CARS WILL BE “SAFE, GREEN AND CONNECTED,” Mary Gustanski, Delphi’s vice president of engineering, recently told Car Talk. “We’re going to see more electrification, and the electric car will merge with automated driving and the connected car.”

Electric vehicles (EVs) now hold just a 1% share of the global fleet on the road, but it could comprise 15% to 35% of total global new vehicle sales by 2040, according to IHS Markit. Worldwide sales are up more than 1,000% since 2010. In Europe and China, where regulation encourages plug-ins, EVs could be more than half of new passenger vehicle sales by 2040 — the same time fully autonomous cars are expected to rule the roads.

CARS THAT DRIVE THEMSELVES

The auto industry is moving toward the self-driving car; and semi-autonomous cars — able to operate hands-off, but with a driver behind the wheel — are already on sale. According to Deloitte, the shift to take our hands off the wheel “could occur more quickly and at greater scale than many are prepared for, especially in densely populated areas.” Cities will probably be the first laboratories for autonomous technology.

Will these vehicles simply replace our current private cars? Maybe not. With cities in the vanguard, we seem to be evolving toward a growing reliance on shared fleet cars. “We will primarily see autonomous cars in on-demand mobility fleets,” said Sam Abuelsamid, a senior research analyst at Navigant Research. “There’s a distinct possibility that consumers will never actually be able to buy them.”

As Abuelsamid pointed out, there are good reasons for fleet ownership of self-driving cars, including the fact that maintenance will be critical. “Once a car is sold to a consumer, the manufacturer no longer has control over which parts are put on that vehicle, and when we’re talking about the sensors that control the car, it’s critical that they not be replaced with cheap, off-brand parts,” he said. But poor-quality parts could also be outlawed by regulation.

Robin Chase, co-founder of Zipcar, argued that serving our transportation needs with fleets of autonomous electric cars is an ideal scenario for these reasons. “Simply eliminating the drivers from cars, and keeping everything else the same, will be a disaster,” she said. “If we share rides in shared cars, we will only need 10% of the cars we have today.... We have the ability to eliminate congestion, transform the livability of cities, make it possible to travel quickly and safely from A to B for the price of a bus ticket, improve the quality of our air, and make a significant dent in reducing carbon dioxide emissions,” she said.

“We will primarily see autonomous cars in on-demand mobility fleets.”

- Sam Abuelsamid, Navigant Research

“The footprint of the [U.S. car rental] industry stretches from coast to coast, and includes both airport and what we call the home-city market,” said Chris Brown, executive editor of Auto Rental News. “The fact is, the autonomous vehicle model most likely will be well suited for a pay-as-you-go system, especially on the local level. And this plays into car rental’s strengths of customer interface and management for the long term.”

Jack Nerad, an executive market analyst at Kelley Blue Book, agreed that fleets will be in the autonomous and electric vanguard. “In fleets, it works,” he said. “Cities are
a challenge, because space is at a premium, and there’s no place for apartment dwellers to charge. But fleets can be charged en masse at centralized locations.”

Gary Survis, a venture partner at Insight Venture Partners and a senior fellow at Wharton’s Initiative for Global Environmental Leadership (IGEL), said he believes that at least the early generation of autonomous cars will let their owners take the wheel when they want to, because the love of driving is still strong in today’s motorists. “A lot of research shows that, even with autonomous cars, people are still going to want to drive,” he said. “I don’t think that goes away.”

Automakers will remain a big part of future mobility, but they see their roles changing.

THE FUTURE OF TRANSPORTATION

“When it comes to urban transportation, there is a huge amount of disruption to what we consider the norms,” said Survis. “The whole question of auto ownership is being challenged by sharing services and the autonomous car.”

Survis said that accommodating self-driving cars will require cities to adjust their infrastructure — for instance, by adding special dedicated lanes, or geo-fenced areas. “The infrastructure for modern transportation in the urban environment demands major thinking and federal funding,” Survis said. “As the population continues to rise in our bigger cities, this should become a major priority.”

For Asia’s growing “megacities” (with populations above 10 million), new transportation models may not involve four wheels at all. A startup called Gogoro has sold 15,000 of its electric scooters in Taipei, Taiwan, and keeps them on the road with hundreds of battery swap stations. Founder Horace Luke said he plans to expand to other Asian megacities. The company also has a separate scooter-sharing operation in Berlin, Germany with Bosch as a partner.

In the U.S., Americans are responding to the renaissance in urban public transit investment. According to the American Public Transportation Association (APTA) Fact Book for 2015, “Since the early 1970s, public transportation has shown a long-term growth in ridership [60% since 1973]. … Bus ridership has grown 15% over that time period while heavy rail and light rail ridership have each more than doubled. … Public transportation ridership has increased by over a billion trips each of the past two decades.” But more needs to be done, since the U.S. transit system is aging, and the population is expected to increase by 100 million by 2050.

The good news is that despite infrastructure challenges, cities are committing to adding transit options, especially light rail. According to New Geography in 2014, it is “legacy” cities like New York, San Francisco, Chicago and Washington, D.C. with well-established subways and rail that account for 77% of transit commuting nationally. But that’s changing, as newcomers like Phoenix (which opened a 20-mile rail system), Dallas (93 miles in four lines), Salt Lake City (four new lines in one year), Denver (which realigned its downtown around the rail hub) and others become far more transit-friendly.

That said, automakers will remain a big part of future mobility, but they see their roles changing. Volkswagen, for instance, launched a new brand called MOIA, which is providing a ride-hailing commuter shuttle in Germany using electric vans. According to a 2016 article in the Financial Times, “[Automakers] are partly being pushed into it by Uber, which has made ride-hailing in cities so convenient and comparatively cheap that it may start to take the place of car ownership. … Road transport becomes a utility, something that can be bought by volume, like gas, electricity and water.”

John Paul MacDuffie, a professor of management at Wharton, believes that in the near future, urban dwellers will “start each day figuring out where they need to go, and will put some options together that might be unique to that day, possibly combining public transit, car rentals, ride-hailing, car sharing and city bikes.”

MacDuffie also said that there is likely a market for “mobility services providers that can make it all work for you.” Ideally, that would mean the traveler would tell the provider where they wanted to go, and they would get a detailed itinerary with all the intermodal links worked out.
Driving Forward:
The Future of Urban Mobility

About IGEL
The Wharton-led, Penn-wide Initiative for Global Environmental Leadership (IGEL) promotes knowledge for business sustainability through world-class research, transformative teaching and constructive dialogue between top alumni, academic, corporate, government, and non-government organizations. IGEL is a hub for business and sustainability, connecting and leveraging academic capital at Penn to help business leaders of today and tomorrow to create more sustainable industries.
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November 22, 2016

Mark A. Rosekind
Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue SE
Washington, DC  20590

Submitted via regulations.gov


Dear Administrator Rosekind:

Enterprise Holdings, Inc., on behalf of itself and its network of affiliates operating the Enterprise Rent-A-Car, National Car Rental, Alamo Rent A Car brands and its Enterprise Fleet Management, car sharing, van pooling, car sales, truck rental and other transportation service businesses (collectively, Enterprise Holdings), is pleased to provide comments on the National Highway Traffic Safety Administration’s (NHTSA) Federal Automated Vehicles Policy (hereinafter, the Policy), as solicited by NHTSA and the Department of Transportation’s (DOT) Request for Comment published in the Federal Register on September 23, 2016.¹ Specifically, in these comments, Enterprise Holdings:

1. Encourages NHTSA to recognize the rental industry and fleet management operators as key stakeholders in the development of state and federal policies;
2. Cautions that new definitions of a vehicle “driver” that focus on the owner of a vehicle should not unintentionally expand liability to fleet owners;
3. Welcomes the effort to harmonize laws related to highly automated vehicles (HAVs) across jurisdictions;
4. Calls for safety standardization that will ensure reasonable policies are in place to enable fleet owners to provide safe vehicles to consumers;
5. Calls for NHTSA to ensure that any final framework or policy regarding HAVs preserves the right of vehicle owners to control and own the data generated by their vehicles; and
6. Urges NHTSA to clarify that important cybersecurity obligations are undertaken by the manufacturers and designers that are best positioned to carry them out.

As the largest rental car company in the world and the owner of over 1.9 million vehicles, Enterprise Holdings has a strong interest in the development and deployment of HAVs and related transportation technology. We believe that the Policy, published for comment by NHTSA in September 2016, expands the agency’s initial 2013 effort on automated vehicles. We

applaud NHTSA’s efforts to stay current with the rapidly developing HAV landscape and appreciate the agency’s flexible approach that supports innovation. Below, we provide additional detail and context for consideration.

I. Background on Enterprise Holdings

Enterprise Holdings is a 60-year old, family-owned company that operates the Enterprise Rent-A-Car, National Car Rental, and Alamo Rent A Car brands, among others. Enterprise Holdings is a total transportation service provider, offering a network of services that includes car rental, retail car sales, hourly car sharing, ridesharing or vanpooling, truck rental, ride matching, and, through our affiliate, Enterprise Fleet Management, full-service, mid-size fleet leasing. The company operates more than 9,000 locations across the globe, employs more than 95,000 people, and owns and operates more than 1.9 million vehicles, making Enterprise Holdings the owner of one of the largest vehicle fleets in the world.

II. Fleet Owners and Operators as HAV Stakeholders

Enterprise Holdings believes HAV technology is beneficial and inevitable. As NHTSA has acknowledged, the questions and issues that will arise during this process will be complex and will require considerable effort to solve. Input from key stakeholders will be critical to navigating the landscape ahead. The car rental industry purchased nearly two million vehicles in 2015, or one out of every nine new vehicles sold in the United States during that time. Given the sizeable role the rental industry plays in the nation’s vehicle fleet, we encourage NHTSA to recognize the rental industry as a key stakeholder in the development of federal HAV policy. The rental industry—with millions of the newest vehicles in its fleets and a customer base accustomed to experiencing new vehicles through rentals—will provide a valuable perspective as policymakers contemplate how to best integrate HAVs into existing fleets.

In this respect, we note that the Policy is ambiguous with regard to whether some or all of the guidance, standards, and reporting requirements apply to fleet owners, as they do for HAV manufacturers. For example, the Policy is unclear as to whether the agency considers those who operate HAVs to be covered by the Vehicle Performance Guidance. Additionally, the phrase “manufacturers and other entities” is used throughout the Policy, which could imply that a fleet owner would fall within the scope of the Policy. We urge NHTSA to resolve this ambiguity in favor of maintaining the current regulatory approach, that safety, security, and other performance inherent to the vehicle is the responsibility of the manufacturer of the vehicle, and not of the owner of the vehicle.

III. Definition of “Driver” and Expansion of Liability

We appreciate NHTSA’s recognition that liability rules and insurance requirements will need to be updated when considering their application to HAVs, which shift the concept of “driver” away from humans and toward the vehicle itself. For lower levels of automation where

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3 Id. at 45-46.
vehicles still incorporate a human driver, we encourage the agency to work with the states on
developing a clear policy on driver qualifications necessary to operate an automated vehicle. As
this definition of “driver” evolves, particularly as liability shifts from the human driver to the
HAV itself, we ask that NHTSA clarify that vehicle ownership does not per se expand liability to
the fleet owner in the case of fleet ownership. Such a clarification will promote the successful
build-out of the HAV ecosystem. For liability purposes, fleet owners, such as rental companies,
should not be regarded as the “driver” when vehicles are out of the fleet owner’s possession and
control (such as vehicles that have been leased or rented).

On the question of assigning liability in the event of a crash, we appreciate NHTSA’s
recognition of the states’ responsibility and authority in regulating motor vehicle insurance and
liability. While we recognize the status quo, we encourage both the agency and states to avoid
the unintentional application of vicarious liability to non-operational owners of HAV fleets, such
as rental car and fleet management companies. Avoiding vicarious liability for fleet owners is
particularly important given the widespread expectation that initial deployment of HAVs will be
through a fleet-based approach. As such, we ask that the agency include the rental car and fleet
management industries in any workshops, studies, or other stakeholder engagements regarding
the establishment of guidelines for liability allocation, and work with the states to ensure
consistency with regard to liability rules and insurance regulations. To that end, we support the
suggestion in the Policy that states look to create a commission to study liability and insurance
issues and to make recommendations, and we look forward to engaging on that matter.4

IV. Regulatory Harmonization

We appreciate NHTSA including in the Policy a section that sets forth a Model State
Policy and that delineates between federal and state responsibilities.5 At the same time,
NHTSA’s authority to promote and enforce vehicle safety should not be diluted. Enterprise
Holdings strongly believes that NHTSA’s authority can and should be pressed more vigorously
against state and local entities to clarify and direct that NHTSA alone is responsible for
regulating HAV safety and performance. NHTSA will play a critical role in the deployment of
HAVs and the subsequent evolution of the industry by helping to ensure that state and local
governments refrain from legislating in ways that add redundant and potentially conflicting
obligations on entities seeking to incorporate and adhere to NHTSA’s voluntary framework set
forth in the Policy. We therefore urge NHTSA to bring consistency across states to prevent the
emergence of a patchwork of state and local laws that would impede innovation and the
widespread deployment of HAV technology.

As regulators and policymakers consider deployment models, we further urge NHTSA to
establish a single framework addressing HAV technology, rather than separate sets of regulations
addressing human-operated and driverless vehicles. As we have seen with the advent of ride-
sharing, technology driven developments within an industry often are accompanied by new
entrants seeking separate regulatory frameworks. Likewise, regulators may be asked to treat
HAV-centric services and service providers differently from other providers. We believe that a

4 Id. at 46.
5 Id. at 39-44.
single framework will promote consumer and business interests alike and provide a more coherent set of rules and best practices.

V. Safety Standardization

Enterprise Holdings appreciates NHTSA’s attempt to advance a standardized “Vehicle Performance Guidance” for submitting a voluntary Safety Assessment letter for HAVs under the Policy. However, we would recommend further clarification to the framing of the Vehicle Performance Guidance. Specifically, item 9 of the 15-point assessment, Post-Crash Behavior, calls for “manufacturers and other entities” to have “a documented process for the assessment, testing, and validation of how their HAV is reinstated into service after being involved in a crash,” and that “if sensors or critical safety control systems are damaged, the vehicle should not be” put back into HAV service.6 We agree with NHTSA that inadequate maintenance of HAVs is a serious safety concern and note that there is a lack of industry-wide standards for sensor calibration, repair procedures, and validation processes to ensure that the automotive repair market can effectively maintain the safety of HAVs. To improve the efficacy of this element of the Guidance, we recommend that NHTSA add hardware and software sensor recalibration standards and guidelines as an additional item to include in the Safety Assessment letter to NHTSA. We further suggest that NHTSA make clear that maintenance and diagnostic data of core safety functions will be available to OEM and non-OEM repair facilities alike.

Our customers routinely adjust vehicle settings, and we note that it would be beneficial for manufacturers to provide a way for operators or subsequent owners to quickly restore a vehicle’s operating settings to factory defaults. Similarly, we believe that we can improve safety by requiring manufacturers to equip vehicles with clear indicators that vehicle settings have been altered from factory default. Such indicators would allow users and operators to be aware when a vehicle is outside a default state.

We commend the agency on highlighting the importance of consumer education and training. We agree with NHTSA that “proper education and training is imperative to ensure safe deployment of automated vehicles.”7 It is critical that consumers fully understand the capabilities and limitations of HAVs. For consumer-facing organizations, like rental companies, clear end-user educational materials are crucial to ensuring that HAVs are used safely and appropriately, and we recommend adding the development of these materials to the Guidance. We further encourage the agency to consider how those educational efforts will be provided to, or shared with, other stakeholders in the HAV ecosystem beyond manufacturers and dealerships to maximize the potential for consumer education and understanding.

VI. Data Ownership and Privacy

We support the agency’s efforts to address the issue of data ownership and privacy through this Policy and Guidance development process. As related to our business operations, Enterprise Holdings purchases vehicles from the manufacturer, and as a result owns and controls not only the vehicle itself, but also its equipment and the data generated by the vehicle, in

6 Id. at 25.
7 Id. at 24.
accordance with the company’s privacy policies and applicable law. Maintaining ownership and control of the data generated by our vehicles is critical to improving customer safety, ensuring proper fleet maintenance, proper damage repairs, and effective operating of our businesses. NHTSA should make clear in the Policy that vehicle owners have control and ownership over data from the vehicle.

To this end, we highlight the important distinction between data that is necessary to ensure proper vehicle function (e.g., basic safety messages in vehicle-to-vehicle communications, crash notifications, repairs, cybersecurity logs, etc.) and data that may be used to enhance the driver’s comfort or experience. The agency should not consider these disparate data sets to be within one category. As a large fleet owner with many safety and compliance obligations, Enterprise Holdings must be able to maintain, service, and manage its fleet independently from the manufacturer, a function that would be difficult, if not impossible, if HAV data reverts to the sole possession and control of manufacturers. To avoid this outcome, we strongly urge NHTSA to preserve existing ownership and control rights over vehicle data.

Achieving the objective of preserving data rights for vehicle owners may require modifying how the agency proposes to define “third party” in the context of data sharing, and whether such data would have to be de-identified before being provided to a third party. We note with concern that, if NHTSA fails to specify that vehicle data belongs to owners, the agency could unintentionally enable auto manufacturers to create a closed market and limit information sharing and data access, which would have a negative impact on the ability of NHTSA and the broader HAV industry to fulfill the goals of the Policy and advance consumer safety. To be sure, such a data ownership structure would mean that applicable legal obligations regarding sensitive customer data (such as geolocation and GPS data) would apply to entities like Enterprise Holdings, as they would for less sensitive vehicle related data that Enterprise Holdings would collect and maintain (such as mileage, last oil change, fuel level, etc.).

VII. Cybersecurity

As a large fleet owner, we are concerned for the safety of passengers and the security of our fleet. To that end, Enterprise Holdings supports NHTSA’s call for a robust product development process based on a systems-engineering approach, including systematic and ongoing safety risk assessment for the HAV system and the broader transportation ecosystem. The Policy should call for manufacturers to provide for a systems approach to cybersecurity—for communications within the vehicle, between the vehicle and infrastructure, among multiple vehicles, and from the vehicle to the Internet. As manufacturers design and deploy HAVs, we want to ensure that responsibility for the security of the HAV rests with the manufacturer who has designed and engineered the entire vehicle system. The Policy suggests that operators—in addition to manufacturers—may have some cybersecurity responsibility for HAVs. However, it is unclear what the agency envisions that responsibility to be, and we seek clarification on this point as NHTSA considers modifications to the Policy in the weeks and months ahead. Specifically, we encourage the agency to align the cybersecurity requirements in the Policy with NHTSA’s recently published cybersecurity best practices, which was more limited in scope and

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8 Id. at 18.
applied to “individuals and organizations manufacturing and designing vehicle systems and software.”

As a related matter, we recognize that proper maintenance of HAVs will likely involve periodic software updates to improve vehicle performance and patch vulnerabilities. Enterprise Holdings encourages NHTSA to work with the industry to develop a defined, timely, and consistent update cycle. Any proposed cycle should include assigning responsibility between the manufacturer and the vehicle owner for maintaining the proper software version on the vehicle. An approach that assigns responsibility for software patching to the vehicle owner must address the challenges for fleet owners in managing and deploying updates for such a large software inventory. In this respect, we strongly urge the agency to require remote over-the-air software updates in order to provide an easily scalable solution. NHTSA currently requires manufacturers to remedy defects for vehicles up to 15 years old, and we are concerned whether this 15-year limit will also apply to software, especially if software updates are necessary for vehicle operation, safety, or security.

Given the widespread discussion about a fleet-based approach for HAV deployment, we encourage the agency to consider ways for HAV manufacturers to incorporate consumer protection mechanisms for vehicles involved in fleet usage. For example, a central challenge for Enterprise Holdings is returning the vehicle to a “default” state that wipes personal data in the vehicle between rentals. For fleet deployments, NHTSA should encourage HAV manufacturers to develop mechanisms that automate or facilitate this process.

Finally, we note that there is a legitimate need to make maintenance and diagnostic data of core safety functions available to non-OEM repair facilities. This issue begs the question of how to segregate that data, but also keep it accessible. We urge NHTSA to give careful consideration to how to balance these competing priorities in light of the fact that, with almost 2 million vehicles, we will need adequate access to maintenance and repair providers.

* * *

We appreciate the opportunity to provide comments on NHTSA’s Federal Automated Vehicles Policy. Enterprise Holdings will continue to engage with NHTSA in developing and advancing this important initiative. Should you have any questions regarding any of the comments above, please contact me at 314.512.4123.

Michael W. Andrew, Jr.
Senior Vice President & General Counsel
Enterprise Holdings, Inc.

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