

WTF



WHAT THE **FUTURE** | SPRING 2018

MOBILITY

Will a driverless future be heaven or hell?

PAGE 06

What exactly will automated vehicles replace?

PAGE 10

When will the driverless future arrive?

PAGE 13

How would you react if your car started selling you things?

PAGE 16

Can electric vehicles thrive without automation?

PAGE 19

If cars are autonomous, what will we still want to walk to?

PAGE 22

Is being behind the wheel behind the times?

Autonomous vehicles are coming. In fact, to an increasing extent they are already here.

Residents of Phoenix see driverless minivans from Google's Waymo cruising around town like it's no big thing. But the future of mobility doesn't just impact our cars. It impacts how we live and how we work. If your job is in auto insurance you're already thinking about how AVs and potential changes to ownership structures will affect your industry. If you have a snack product for people on-the-go you are likely considering how fewer gas stations will impact sales. Parking garage operators and mechanics see that the writing on the wall is getting bigger. Urban planners are salivating about smart ways to improve our built environment.

Less obvious changes are coming, too. Say you're an emergency room doctor. In the not-too-distant future an AV might pull up with an unresponsive passenger. The car's been monitoring her vital signs and provides you with her medical history from an app on her phone. Or say you're in retail banking and you no longer get robbed because there's no way for a would-be thief to have a getaway car. Unless, of course, a black market of AV-hacks develops to let people drive "off-the-grid." Otherwise, car chases will be a thing of the past because police will order your AV to pull over and your AV will always comply. That assumes there would be a reason for police to pull over a vehicle. How would you get your AV to speed?

While it's fun (scary?) to think about these futures, the truth is that most people aren't idly pondering scenarios like this. That's what this issue of **What the Future** is all about: the human reaction to a future that's coming soon. Are we as a society ready for it? How do we want it to shake out? And what will that mean for all the industries impacted by it, which is to say every single industry?

America is, perhaps uniquely, a car culture. Muscle cars and motorcycles came to define freedom in a freedom-obsessed nation. Every facet of our landscape is shaped by the automobile, from the rise of highways and suburbs, to cultural touchstones like the Great American Road Trip. Americans self-identify as "car people," and most say that their identity is entwined with their transport.

It is here in this vital market that the autonomous future might be the hardest sell. Are we ready to move from the driver's seat to being passengers? Are Americans ready to replace the roar of the engine with the silence of electric vehicles? Can pickup and T-Bird-loving garage tinkers make the transition to a world where cars are often rendered as driver-free, personality-free pods?

While the gut response from many Americans and Canadians might be a firm "no," we see glimpses in the data about what could help sway opinion. From economics to ease of use to safety, there are features of the future we can all get behind.

As with any change this sweeping, the autonomous future will come with trade-offs. It will raise questions about safety, pricing, privacy, convenience, freedom and more. We will talk about these critical questions throughout this report. The answers are based on several sizable, exclusive global studies of attitudes and opinions. The surveys aren't about technology, but rather about the human reaction to it.

Whatever form it takes, change is coming. It will have as profound an impact on industries as the automobile had on blacksmithing and road-paving. So as you think about all of this, consider how the changes will impact your business and your family. What questions are you asking?

We're asking **What the Future?**



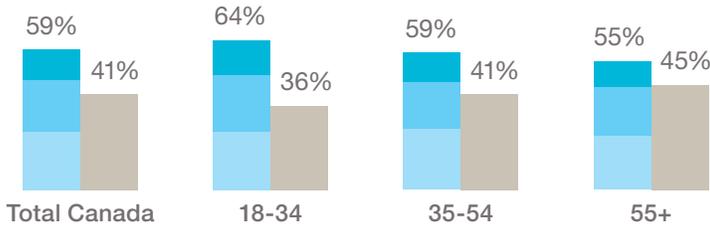
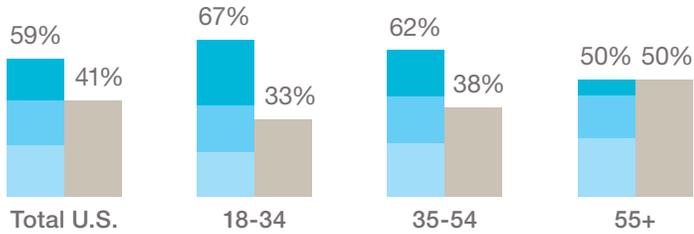
Oscar Yuan
is the president of
Ipsos Strategy3.

He advises Fortune 500 clients about the future of their industries and how to plan accordingly in the present.

We are car-centric people.

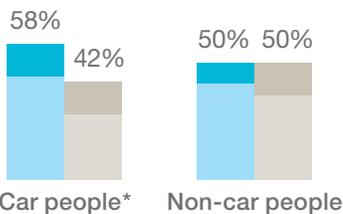
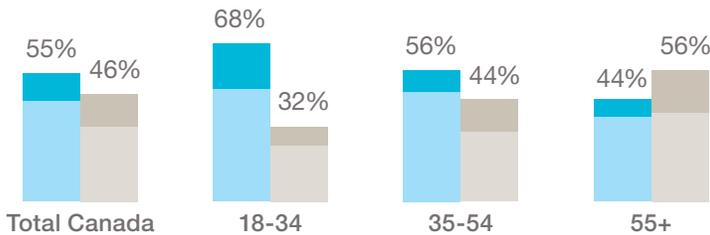
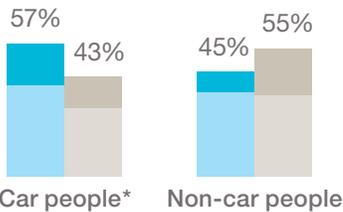
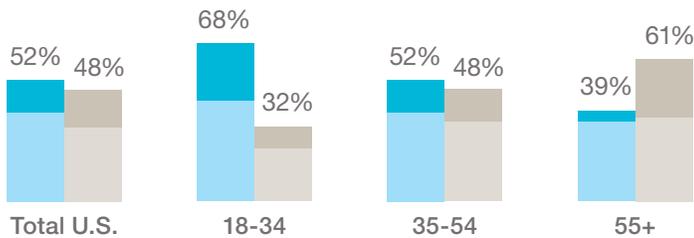
Do you consider yourself a car person or someone who is passionate about cars, trucks, motorcycles, or other vehicles you drive yourself?

■ Yes, very much
 ■ Yes, somewhat
 ■ Yes, a little
 ■ No, not at all



And what is your view of self-driving cars?

■ Very positive
 ■ Somewhat positive
 ■ Somewhat negative
 ■ Very negative



*Among people who consider themselves "car people" in the previous question

(Source: Ipsos surveys conducted between December 19 and 21, 2017 among 2,000 adults in the U.S. and between February 23 and 26, 2018 among 1,000 adults in Canada)

Editor's note

It's impossible to keep up with the news surrounding autonomous vehicles.

Every day a new trial launches from a traditional auto manufacturer or a tech company like Uber or Waymo. The corporate and technological momentum contributes to an air of inevitability. It seems that it's not a matter of if we'll have fully autonomous shared and personal cars, but when and what they'll look like.

What's generally missing from the conversation is a discussion of the human aspect. Is this a future we want? Are we ready for it? What will we give up, and will we give it up easily or will the steering wheel have to be pried from our cold, dead hands?

These are the topics we'll discuss in this mobility-focused issue of **What the Future**, a quarterly series looking at trends in the four main consumer-spending categories. Our first issue focused on housing. In coming months, we will examine food and health.

To get at the human side of transportation, we asked several smart people in the space about the Big Questions they're asking themselves when they think about the near-ish future. Then Ipsos asked those questions of more than 3,000 people in the U.S. and Canada and thousands more around the globe to get at the answers.

The final question is again up to you: What should you and your team be asking when you think **What the Future**?

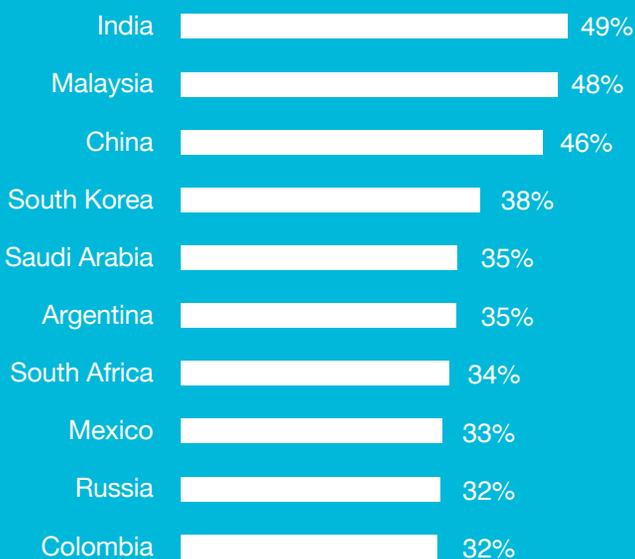


Matt Carmichael is the editor of *GenPop*, a magazine produced by Ipsos where he serves as the Director of Editorial Strategy in North America.

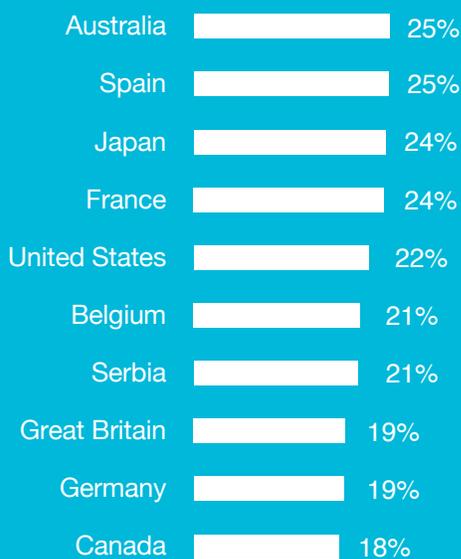
Ready to let go of the wheel?

Percentage of respondents agreeing with the statement:
"I am in favor of self-driving cars and I can't wait to use them."

Who's ready for self-driving cars?



Where do the biggest skeptics live?



30%

of global respondents
are in favor of
driverless cars



Regardless of who's driving, more people prefer **car ownership** over sharing models.



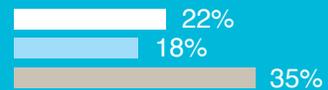
Which of the following would you choose if you wanted to use a self-driving car?

■ Total (28 countries) ■ United States ■ China

Hiring one on a pay-per-use basis to pick me up and take me where I need to go



Leasing one for a monthly fee and having access to it whenever I want, as long as I pay for it



Owning my own



I would not use a self-driving car



Respondents trust manufacturers over authorities to **regulate** self-driving cars.



Which of the following do you trust most to regulate self-driving cars? (global results)

Companies that design and manufacture self-driving cars



The government/public authorities overseeing transportation



Insurance companies



Automobile/motorists' associations/clubs



1 in 5 Americans would **never** let their car do the parking.



Assuming that, in 10 years, all passenger vehicles will be equipped with automation technology so they can be used in "self-driving" mode anytime and anywhere, as desired, how often do you expect that you will use it for parking?

■ Total (28 countries) ■ United States ■ Mexico

Always/Frequently



Rarely/Never



Each chart includes only those who selected a specific option.

Source: Ipsos Global Advisor survey conducted between November 27 and December 8, 2017 among 21,549 adults in 28 nations

For the full dataset including results from 28 countries, please visit www.ipsos.com/en-us



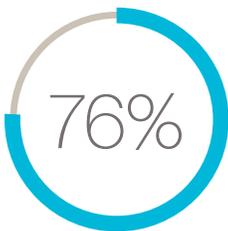
Question: Will a driverless future be heaven or hell?



Robin Chase

**Co-founder of the
car-sharing service
Zipcar and author
of “Peers Inc.”**

Driverless cars could make our lives better – or worse. The better we plan for their impact, the more we improve our prospects. But are we on the right track now?



Percentage of U.S. workers
who commute by car, alone.
(Source: U.S. Census Bureau)

Robin Chase sees two possible driverless futures: a heaven and a hell. In the first, autonomous vehicles make travel inexpensive, simplify commutes and encourage resource-sharing. Through smart planning, congestion is reduced, and we move more efficiently in cities with redefined transit and increased shared spaces. Then there's the darker scenario, where autonomous vehicles degrade public transportation, single-rider trips increase and each of us dispatches our own cars to run our errands. Despite the promise of AVs' increased efficiency, congestion spirals out of control. Now Chase is working with cities and other organizations to push for the more heavenly scenario. However, she fears we'll instead continue along the status quo. When she asks **What the Future**, she sees one simple, central question that will define the fight.

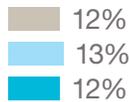
U.S.: How necessary is it for you to have a car to get to work?

■ Total ■ Car people ■ Non-car people

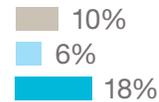
I definitely need to have a vehicle to get to work.



I could probably get to work without a vehicle if I needed to.



I don't need a vehicle at all to get to work.



(Source: Ipsos survey conducted between December 19 and 21, 2017 among 1,100 adults employed full- or part-time)

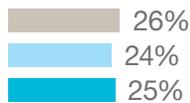
Canada: How necessary is it for you to have a car to get to work?

■ Total ■ Car people ■ Non-car people

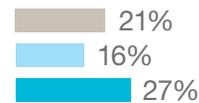
I definitely need to have a vehicle to get to work.



I could probably get to work without a vehicle if I needed to.



I don't need a vehicle at all to get to work.



(Source: Ipsos survey conducted between February 23 and 26, 2018 among 619 adults employed full- or part-time)

GenPop: You asked, "Do you need a vehicle in order to get to work?" Why is that an important question to ask?

Robin Chase: What I learned from Zipcar is that if you need a car to get to work, you will own a car, and you will therefore have all the sunk costs behind you. And for each and every trip you make in your life, which is a huge diversity of trips potentially, your cheapest and most convenient option will be the one sitting in your driveway. So that one decision – the one reality of "I need a car to get to work" – dictates every other transport decision.

GenPop: And if the vast majority needs a car, we'll keep building our cities and suburbs to accommodate those single-person trips, right?

Chase: People are thinking that self-driving cars will just replace private cars. They aren't recognizing that we have this opportunity to completely transform things. We could be using shared vehicles which will be a snap and easy to use. If we make them electric, then we'll also have clean cities. And if we're thoughtful

about it, we will be able to repurpose the public common street space and parking everywhere in ways that will make our cities better and more livable. We need to plan rather than do it piecemeal, without thought, and ruin a one-time opportunity. We're on the edge of a really big transformation.

GenPop: Are ride-sharing services pointing us in that direction?

Chase: I have been totally intrigued by uberPOOL and Lyft Line. They managed to turn some of their taxi service into real shared trips and get people familiar from a behavioral standpoint with [the notion of] "I open an app and I push a button and I buy a seat in a car to go from origin to destination in real time for much less money." [It] is a really interesting behavioral change. In the future we will see more private public transportation.

GenPop: Currently 78 percent say they definitely need a car to get to work. How do you expect that number to change?

Chase: With better solutions available, that number would be trending down. We can realign mixed-use built environments with better public transit, better walking and biking. In the future, for cities it might be 6 percent of the people who definitely need a car to get to work. In some suburbs maybe it's going to be 15 percent of people.

GenPop: We split our U.S. sample into "car people" and "non-car people." Eighty-one percent of the "car people" said they definitely need a car to get to work, compared with 70 percent of the "non-car people."

Chase: Interpreting this feels like a chicken vs. egg problem. If I'm a non-car person, I choose to live in a city near a subway stop. But if I like driving my F-150 pickup because I love big cars and big motors, I'm probably going to live someplace farther out. What we really need to know in order to interpret those numbers is whether the respondent lives in an urban, suburban or rural zip code.

GenPop: You clearly see a future where vehicles are autonomous and vehicles are shared. It could create a reduction in overall vehicles although I've heard some people say it might actually lead to an increase in vehicles and congestion.

Chase: I think we're teeing up the "hell" as most likely – unless the groups I'm working with manage the reality which is, "You don't want that to happen, so here are the things you have to work on." But the status quo will definitely lead us toward dramatically increased congestion because we continue to underprice the true costs of air pollution, congestion or curb access.

GenPop: I have been asking a lot of panelists what the odds are of some sort of culture war developing around our right/freedom to drive our own cars.

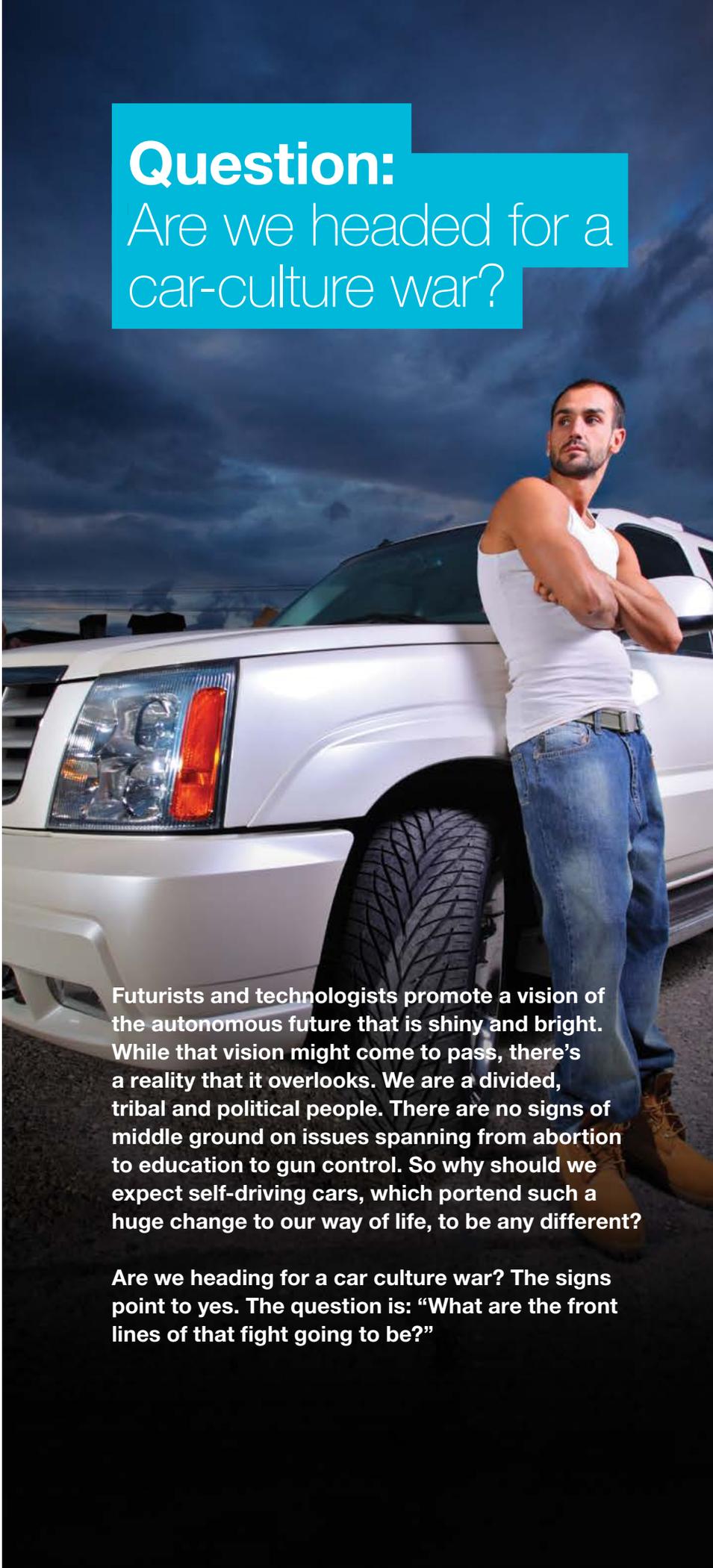
Chase: Here's something I learned from Zipcar and dealing with the naysayers who said this will never work. People are driven by their wallets. They say, "I'll never do that thing." And then it turns out to be cheaper and more convenient and they do it. I believe economics will drive the rapid adoption of self-driving cars. And I believe it will drive the transformation of shared self-driving cars in cities and, likely, suburbs, because buying a seat in a shared car is cheaper than renting the whole car for the trip. I say as many times as I can that our policy around autonomous vehicles needs to be based on population density. The need to curb low value trips during peak times is completely correct for dense urban areas. But in Montana there should be different rules. It might just come down to the addition of congestion pricing wherever congestion exists.

GenPop: Will we wind up outlawing driving ourselves?

Chase: We're not going to outlaw driving cars for so many years. Don't worry about it. You can drive your own car. And by the time laws change and you can't, you will be filled with joy at your cheaper, easier shared-vehicle life, and you won't have a second qualm about.

Question:

Are we headed for a car-culture war?

A man with a beard, wearing a white tank top and blue jeans, stands with his arms crossed leaning against the front of a white SUV. The scene is set at night with a dark, cloudy sky. The car's headlight and front wheel are visible.

Futurists and technologists promote a vision of the autonomous future that is shiny and bright. While that vision might come to pass, there's a reality that it overlooks. We are a divided, tribal and political people. There are no signs of middle ground on issues spanning from abortion to education to gun control. So why should we expect self-driving cars, which portend such a huge change to our way of life, to be any different?

Are we heading for a car culture war? The signs point to yes. The question is: "What are the front lines of that fight going to be?"

Let's examine four potential flashpoints:

First, will the technology itself divide us?

America is perhaps uniquely a car-focused nation. Most Americans identify themselves as "car people." Eight in 10 see their cars as an important part of their identity. When it comes to desire for autonomous vehicles, there is a small but noticeable split along political lines. But new technology is central to America's view of itself. The country that landed on the moon is unlikely to turn up its nose at fancy robot cars. More likely than not, autonomous vehicles will become a new status symbol on both the left and the right.

Second, who pays for this technology?

Infrastructure to support an autonomous vehicle future involves more than just buying new cars. Depending on the particular vision, this future requires an alternate fuel system, vehicles that communicate with each other, or a smart city for vehicles to navigate. These things cost money, and the question of funding is undeniably political. Will statehouses like Illinois', where representatives of rural communities tend to wield significant power, float the development of smart infrastructure for cities like Chicago?

Third, who is displaced by this advancement?

Autonomous vehicles will bring winners: the technology companies that bring AVs to market, the innovators building a new support system around them and (presumably) the lives saved by a safer system. However, there will be losers too, particularly all those people whose livelihoods depend on driving or car culture. They might lose their income, but they'll still vote. How will the planners of this future care for the needs of the people whose careers they are rendering obsolete?

Fourth, who writes the rules and regulations?

Several experts in this issue of **What the Future** talk about how this autonomous future needs to be structured or risk becoming a congested, ad-saturated nightmare. Nothing divides Americans more readily than rules and regulations. The first time someone is denied access to something they have previously taken for granted, we will have a political uprising on our hands.

The safety improvements, potential cost-saving, and increased convenience might well prove a trifecta of benefits that can trump any sort of political discord. Having powerful industries like automotive, tech, and logistics backing the movement will likely help smooth the way. But social change on this scale does not happen without conflict, and those who do not plan for it will be the first to see their plans derailed by our age of uncertainty.

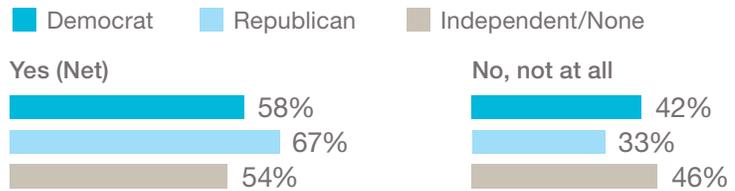
Cliff Young, President, US, Ipsos Public Affairs

Among working adults: How necessary is it for you to have a car to get to work?

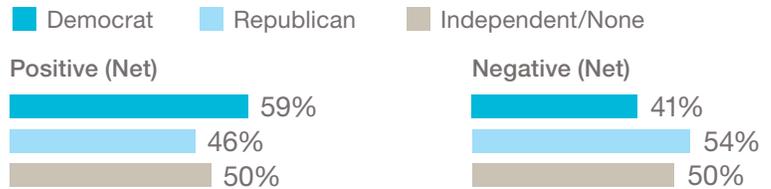
I definitely need to have a vehicle to get to work



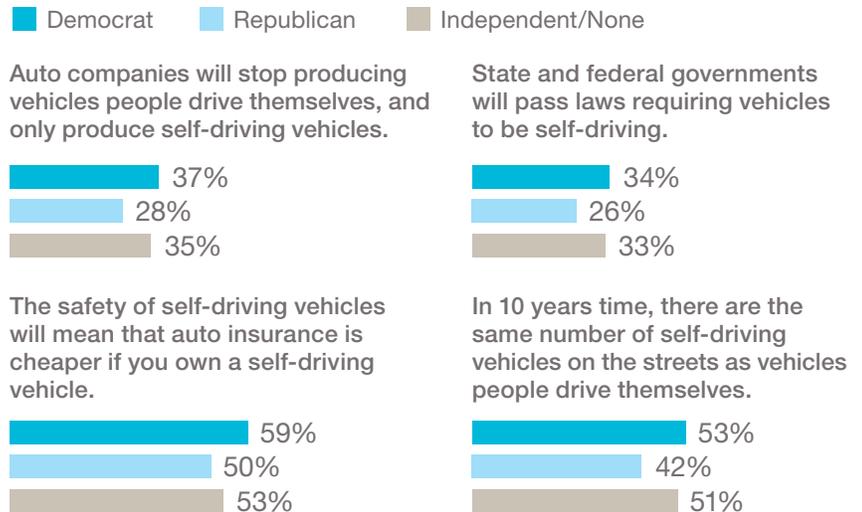
Do you consider yourself a car person or someone who is passionate about cars, trucks, motorcycles or other vehicles you drive yourself?



And what is your view of self-driving cars?



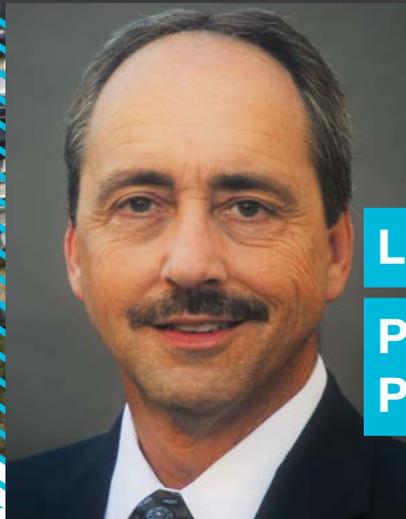
In your opinion, how likely is each of the following scenarios in the near future?



(Source: Ipsos survey conducted between December 19 and 21, 2017 among 2,000 adults)

Question:

What exactly will AVs replace?



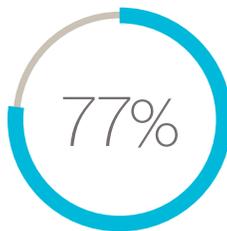
Larry Dominique

President and CEO,
PSA North America Inc.

Most of us own a car and drive it daily. Peugeot is re-entering the U.S. market to broaden our idea of “mobility” and change the relationship we have to our car companies.

Peugeot pulled out of the U.S. market in 1991, before many—if not most—Millennials were born. Yet this will be a key demographic for the French car-maker to target when it makes its return to North America. As president and CEO of North America, Larry Dominique is leading that effort.

Peugeot isn't coming back with a huge network of dealers and a full line of cars. It's coming back as a “mobility partner” starting with an app called Free2Move that lets users access multiple ride-sharing, car-sharing and even bike-sharing providers in one place. It's live in 10 countries, up and running in Seattle and expanding deeper into the U.S. this year. Actual car sales will follow. But as ownership models shift, Peugeot is in an unusual position for a legacy car manufacturer. When Dominique thinks **What the Future**, he's wondering what it will take to get people to give up owning a car.



Percentage of U.S. 20- to 24-year-olds who have a driver's license, down from 92% in 1983

(Source: Federal Highway Administration)

GenPop: Your question was about how different mobility solutions could replace car ownership. How will that answer shape the future?

Larry Dominique: In the United States about 17 percent of vehicles are sold into fleets – leasing, rental cars, commercial fleets and ride-sharing. The other 83 percent are still sold or leased to people. In 2030 or 2040, most vehicles will still be sold, leased or subscribed to private owners, but the percentage of those vehicles that are going to be in fleets will increase.

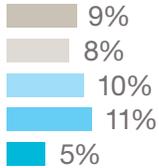
GenPop: We see in the data that people currently have a hard time imagining giving up a vehicle because that future seems so abstract and far off. Those who can imagine this scenario imagine public transportation or another car-free mode of transportation like walking or biking taking the place of a car they own.

Dominique: We're trying to understand how urban dwellers are evolving relative to ownership. When we start actually selling cars, we want to have a diverse business model to satisfy customer mobility – whether they need a car for a minute, an hour, a day, a week, a month or multiple years. The reality, and you saw it through the survey, is that we will never be a mass transit country. Geographically, we're just too big. There must be alternative modes of mobility for people beyond public transit.

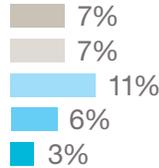
What would have to change about transportation in your area for you to consider not owning a car at all, or owning fewer cars?

■ Total U.S. ■ Total Canada ■ 18-34 (U.S.) ■ 35-54 (U.S.) ■ 55+ (U.S.)

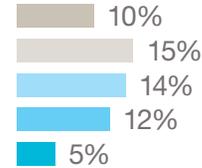
Cheaper car sharing service (such as car2go, Zipcar)



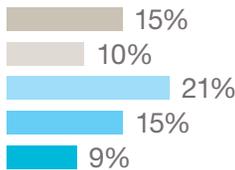
More convenient car sharing service (such as car2go, Zipcar)



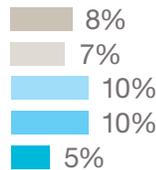
Better bike/scooter lanes



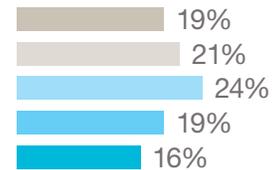
Cheaper shared ride services (such as uberPOOL, Lyft Line)



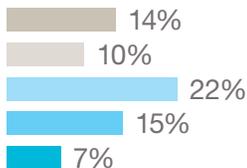
More convenient shared ride services (such as uberPOOL, Lyft Line)



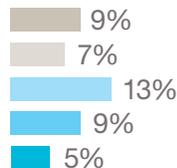
More walking paths, better crosswalks, etc.



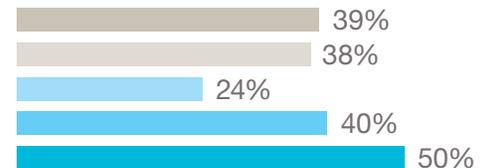
Cheaper ride-hailing apps (such as Uber, Lyft)



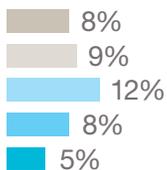
More convenient ride-hailing apps (such as Uber, Lyft)



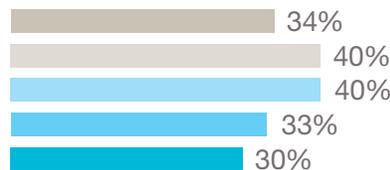
There is nothing that would make me consider owning fewer cars.



Access to self-driving vehicles (used with a subscription service)



More convenient public transportation



(Source: Ipsos surveys conducted between February 16 and 20, 2018 among 1,005 adults in the U.S. and between February 20 and 22, 2018 among 1,002 adults in Canada)

GenPop: In the data, younger respondents are more receptive to alternatives. That's probably partially because younger people are generally more receptive to new technologies, but also perhaps due to their evolving relationship with transportation and mobility.

Dominique: They think of their lives differently than we [Baby Boomers] do. For us, it was about owning the house, owning a car, owning assets. For them it's about "I have a monthly car payment. I have a monthly phone payment. I have a monthly lease payment." For them it's a very different lifestyle.

GenPop: Is there an educational component to how you need to market and grow these services?

Dominique: Yes, especially in urban areas. There's a mindset of "If I spend \$400 a month to own a car plus another \$120 a month for insurance, plus gasoline, plus everything else," all of a sudden people start to realize — and we can educate them — that they're spending \$800 a month for a vehicle that sits still 90 percent of the time. It needs to be put in a lifestyle or life experience context.

GenPop: Millennials' changing idea of ownership in general and for cars in particular seems like a major factor as we look toward shared and autonomous transportation.

Dominique: It's hard for my French friends to understand that Americans buy more than they need. You hear it from consumers all the time: "Well, I got that three-row SUV even though I have one kid because I might have to take my neighbor's kid with me." Or "I bought this pickup truck even though I live in a suburban neighborhood because I might want to tow something one day." Americans are unique that way.

GenPop: For older Americans, the data shows that they're currently less interested in giving up a car. But once they can visualize how it will allow them to lead the active life they're used to, potentially for a longer period of time, you'd think that would become a fairly easy sell.

Dominique: I think it's going to be a huge opportunity. We have to be careful about their income because most Americans end up on a very flat income when they get older. But at the end of the day I can see a huge unserved market. I live in Southern California, and there are lots of senior citizens, and I see the Sprinter vans from the assisted living facilities taking people to doctor appointments and the mall and the park.

GenPop: In some ways, these older Americans are already using a shared-services model. But being able to individualize through autonomous vehicles would yield even more freedom and flexibility.

Dominique: Exactly. Baby Boomers are not quite as digitally savvy as are social media-oriented Millennials. So how do you educate Boomers? How do you inform them of these new services? It's going to be a very different type of marketing and communication than in the digital world of the Millennials and the iGens.

GenPop: Intergenerational health care is a big issue. Uber and Lyft have announced services for health providers to schedule pick-ups to get patients to their appointments. But if an adult child could schedule an autonomous or shared car to make sure their parents get there safely, that would be great too.

Dominique: Or a GenXer or Millennial or iGen can send the service to go get Grandma to come visit if they don't have the time to pick her up.

GenPop: And when Grandma is there, you could have an accessible minivan.

Dominique: Or it could be that the way we look at mobility is that you have a relationship with our brand. Say I sell you a Peugeot 308. It's a four-door hatchback; it's not a car that's going to be easy for Grandma to get in and out of. If you need an SUV for the week because Grandma is in town, maybe we can make that happen as your mobility partner. If you buy one of our cars we'll give you access to mobility.

Question:

How can virtual reality help us prepare for potential realities?



As you sit in traffic today, you're surrounded by other cars, trucks, vans and buses all with one thing in common: They have drivers. Now take those drivers away. It's one thing to daydream about an autonomous future. It's another to imagine the entire autonomous world where you're surrounded by some sort of self-driving pods. Maybe they all have no windows for privacy — after all, the occupants might be working, or working out, or sleeping. On the inside they have virtual “windows” showing what's passing by — a feature already being put into place on airplanes.

What will that future be like? How will that make you feel? What possible future anxieties can carmakers and tech companies head off to make sure that as this future becomes the present, people can make the transition smoothly and comfortably.

One way to answer those questions is through virtual reality testing. Ipsos is already using VR to test car concepts. It can shorten the time and cost of getting an idea to market and allow for real-time feedback on aspects of the car experience that we just can't test with concept boards or prototypes. How does it feel to sit in? Is the size and scale right for you? We can answer a broader range of questions with these new technologies.

We can do even more with the testing of autonomous vehicles by creating rich immersive experiences of different versions of future worlds. You'll be surrounded by augmented reality billboards, self-driving cars or even flying cars. If a client can dream it, we can test it. To take it a step further by measuring biometrics like EEGs and galvanic skin response, we don't even have to ask the questions. We'll know how you are reacting.

Testing virtual worlds is the true power of VR in market research. It allows us to test a tomorrow that we can't otherwise test today.

Narith Panh, VP, US, Ipsos Marketing



Question:
If you build it cheaply,
will they come?



Matt Sweeney

**Former head of product
for Uber's Advanced
Technology Center**

Matt Sweeney was one of the first employees at Uber's Advanced Technology Center and helped build the company's autonomous division, which now numbers in the thousands of employees. It's fair to say he's been watching this space closely and given it more thought than most. When he asks What the Future, he's wondering when autonomous vehicles will take over, especially in ride-sharing. Specifically, how much of a factor will price be in that adoption?



270 MILLION

The approximate number of registered vehicles in the U.S.

(Source: U.S. Department of Transportation)

GenPop: Why do you think price will be an issue in the adoption of autonomous vehicles?

Matt Sweeney: If you run a survey and you ask someone if they want to get a ride from some stranger in a Prius hailed through a smartphone app, they may tell you that there's no way they'd do it. They would prefer a taxi or something else. But if you offer a much better price, we know what they'll say. We've seen the result of that. The adoption of those kinds of services is really, really fast. People will make decisions based on economics.

GenPop: Were you surprised by how quickly people adopted a technology like Uber or ride-hailing in general?

Sweeney: Yeah, everyone was. Uber was one of the fastest-growing companies in the modern era, maybe ever — depending on how you measure it. That was driven by how strong the product offering was both from economic and actual functional perspectives: You get really good tracking and you can see the car coming to you; you get a receipt afterward and payment goes right to your credit card; and you have high reliability. These are better economics than the existing incumbent. There are almost no compromises when you look at that.

GenPop: What will be the tipping point?

Sweeney: I think there's a breaking point where the cost-per-mile of personal ownership around something like a commodity sedan like a Honda Civic or a Toyota Camry — if you get below that with a ride-sharing vehicle, particularly with an autonomous ride-sharing vehicle, you can approach it pretty quickly. The cheaper you make it, the more receptive people are going to be. They're going to get over their anxiety about self-driving vehicles in general because it's cheaper.

GenPop: We see signs of that anxiety in the global data (on page 4).

Sweeney: Intuitively you might think that autonomous vehicles would have a really high barrier to commercial acceptance or to public acceptance because they're new and perhaps scary to some people because they're not sure how the vehicles work. But price is a huge driver of acceptance. Peer-to-peer ride-sharing services are an unorthodox idea, but [it succeeds] because it provides such an obvious value. You've got this one transaction in front of you that you're evaluating, from which you can get surprisingly high receptivity and really surprisingly high adoption of services quickly. You don't have to make this buying decision about a large discretionary chunk of income for a car. You're evaluating a single ride, and a single ride is a very small commitment. If you don't like it, you won't do it again in the future.

GenPop: In our data, people aren't so sure that the switch-over is going to happen quickly, especially the part about replacing human-driven cars entirely. If you had to put a number on it, when do you think we'll be more than halfway there?

Sweeney: [Pauses to run some calculations in his head.] I think it's the half of ride-sharing within five years. For total replacement, I don't think I can make even an educated guess on that. It's going to be driven by the same kind of factors that drive the adoption of ride-sharing in general. The usual fallacy in tech is you think that it's coming way sooner than it is and then you underestimate its overall impact.

GenPop: What were you calculating during that silence?

Sweeney: There's a particular application that is ride-sharing where I do think that in three years or five years there's going to be dramatic contribution of [self-driving] technology. I'm trying to reconcile that with this behemoth that is the personally-owned vehicle industry and the personal vehicle fleets that are out there. Ride-sharing is still, even for its massive growth and rapid adoption, a small segment versus total vehicle miles.



GenPop: A lot of your questions were about future scenarios. On one hand, they're gaining access to what is promised to be this incredible and freeing technology. On the other, it could be spun as "giving up" the "right" to drive. Does this spell trouble?

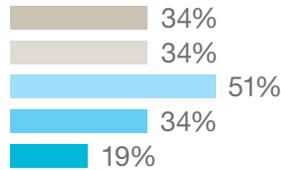
Sweeney: You're seeing that kind of car culture clash. This follows a bunch of demographic trends. The average age in the U.S. for people getting their license has been drifting upward. People are getting their license later or they're not getting it at all. So you're seeing it play out already with ride-sharing and with reduced personal ownership use along generational lines. [Younger Americans] have other means of personal expression that are competing with a vehicle. There are other factors like cost and ride-sharing and public transit and biking and other kinds of non-car transit in the U.S. I think those are going to get exacerbated, and they're going to continue. That will change how we think about these vehicles as totally individualized objects where we choose the color and the detailing and add accessories. It will be more like a transportation-as-a-service sort of model. I need to get from point A to point B.

The real core issues around safety are quite universal, and I hope that we're able to say that this has real potential to make the most substantial reduction in auto fatalities since the seatbelts or the airbags.

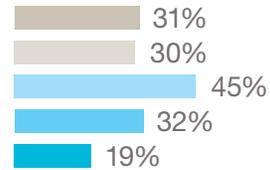
In your opinion, how likely is each of the following scenarios in the near future?

■ Total U.S. ■ Total Canada ■ 18-34 (U.S.) ■ 35-54 (U.S.) ■ 55+ (U.S.)

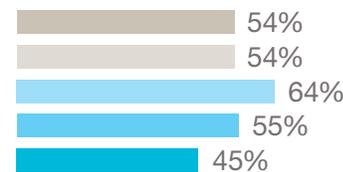
Auto companies will stop producing vehicles people drive themselves and only produce self-driving vehicles.



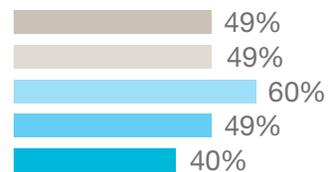
State and federal governments will pass laws requiring vehicles to be self-driving.



The safety of self-driving vehicles will mean that auto insurance is cheaper if you own a self-driving vehicle.



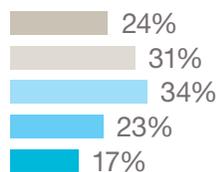
In 10 years time, there are the same number of self-driving vehicles on the streets as vehicles driven by people.



Assuming the cost of self-driving cars is **comparable** to what it costs to your own car now, which would be your preference?

■ Total U.S. ■ Total Canada ■ 18-34 (U.S.) ■ 35-54 (U.S.) ■ 55+ (U.S.)

To switch to using a self-driving vehicle



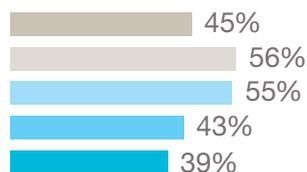
To continue using a vehicle that you personally drive



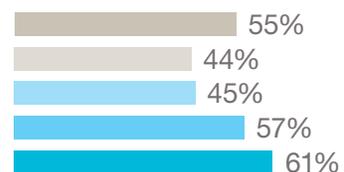
And if self-driving cars cost **much less** to own and maintain than it costs to own and maintain a car today, what would be your preference?

■ Total U.S. ■ Total Canada ■ 18-34 (U.S.) ■ 35-54 (U.S.) ■ 55+ (U.S.)

To switch to using a self-driving vehicle



To continue using a vehicle that you personally drive



(Source: Ipsos surveys conducted between December 19 and 21, 2017 among 2,000 adults in the U.S. and between February 23 and 26, 2018 among 1,000 adults in Canada)



Question:

Will we be overwhelmed by advertising in our autonomous cars?



Alex Salkever

Co-author of “The Driver in the Driverless Car” and the forthcoming “Your Happiness Was Hacked”

\$11 BILLION

Amount spent on out-of-home advertising, including the 368,000 billboards in the U.S.

(Sources: PwC; Outdoor Advertising Association of America)

Combining all the data that marketers already have on consumers with real-time location and automation would open up a new frontier for advertising. Do consumers want to live in that world?

The movie “Minority Report” paints a future where nearly all reality is augmented. In this Tom Cruise world, personalized messages bombard you from every screen and every surface. Author Alex Salkever has some concerns. When he thinks about **What the Future**, he’s thinking about the plusses and minuses for advertising opened up by an autonomous-driven future.

What advertising features would you want in cars in the future?

Imagine that your car could suggest things to you as you are driving around town, based on the places you are passing along your route. How useful would you find the following?

■ U.S. ■ Canada

67%/67%

Reminders about appointments (such as doctor visits)

27%/30%

Notifications that you're passing restaurants you've been to before

29%/31%

Pointing out stores that you've shopped at before

30%/31%

Asking you in the morning if you'd like to stop by a coffee shop you've been to before

42%/38%

Reminding you about services that you do on a regular basis (like dry cleaning or haircuts)

49%/51%

Telling you about specials or sales at stores you've shopped at before

76%/81%

Letting you know you are nearing a gas or charging station if you are low on gas or battery

(Source: Ipsos surveys conducted between December 19 and 21, 2017 among 2,000 adults in the U.S. and between February 23 and 26, 2018 among 1,000 adults in Canada)

GenPop: Why was this an important question to ask?

Alex Salkever: If we move into a world where we're spending so much more time in automated cars, then the advertising will start to work itself into the platform somehow. It'll be different from anything we've dealt with before because it will have so many pieces of information tied together in one place that are intellectually actionable in the moment.

GenPop: How will it be different?

Salkever: To a certain degree it's like mobile advertising, but some things would seem weird on your phone. You're walking downtown and it says, "Oh, why don't you go to this bakery?" whereas in your car, you're already moving and driving. I could totally see that flashing on the screen or something like that.

GenPop: In the data, people were generally supportive of some sorts of in-car communication, especially the functional reminders of appointments and the like. Does that surprise you?

Salkever: I was totally surprised. I thought the responses (against in-car communication) would be a little bit more vehement.

GenPop: It's almost like there's some acceptance that this is just going to happen.

Salkever: When you look at digital billboards, they're in your face now. And people are seeing in movies these billboards that are customized to individuals. The really big risk that we should be talking about is the flipside of advertising that is almost always tracking and personalizing, and that starts to turn into scarier data collection and privacy issues than we've ever seen.

GenPop: I've seen some discussions of how your car could monitor your vital signs.

Salkever: If you die or have a heart attack, you want the car to stop. Makes perfect sense. On the other hand it also could probably tell if you get really amped up as you go past the Krispy Kreme. That's the promise of a lot of these technologies, where we compromise privacy for convenience or safety.

GenPop: The personalization opens up possibilities in location-based advertising. Say you're on a road trip, and roadside attractions like "The world's largest doughnut" can hit you with ads. It's destination marketing but very targeted toward people driving past that destination.

Salkever: Right, because your car knows what you like to do, where you like to stop and what you've done. Your car will not only say, "Hey, here's the largest doughnut," it will also say, "You're going through Pittsburgh. Here are three doughnut shops that we would recommend based on Yelp."

GenPop: That can go too far, right?

Salkever: There's the risk of letting the marketers running amok. Look at your inbox. You probably have some pretty good filtering software. What would you do if you did not have that filtering software to shut off all of the promoters of the things that you don't really want? Left to their own devices the advertisers and the marketers will probably overdo it. It tends to be their bias.

GenPop: If more people move toward a subscription-based car model, as many suggest will happen, riders could have an option to pay extra for the ad-free model or get a discount in exchange for seeing more marketing material while driving.

Salkever: For example Uber lets you stream your Pandora or Spotify in its cars. That's not exactly what we're talking about, but if the car becomes a subscription service, all kinds of personal interaction is possible. Personalization always has some sort of trade-off, like privacy.

Automated vehicle time usage



The average American spends 52 minutes a day commuting, mostly by driving a car by themselves.

Tack on errands, school drop-offs, and all the other driving we do and it adds up to a significant part of our waking day in transit. Imagine, then, having a car that drives itself. Those who commute by public transportation spend much of that time on their devices, reading, or listening to music. But fully autonomous vehicles would open up even more possibilities. In April and May of 2017, Ipsos asked 130,000 car owners in nine countries what they would do with their driving time if they didn't have to actively drive.

How would you spend your time?

	Asia	North America	Europe
 Sleep / Take a nap	10 min	6 min	5 min
 Work, write mail and business communication	5 min	5 min	5 min
 Communicate privately (directly or via phone/email/messenger/video)	15 min	14 min	17 min
 Relax by reading (books/online news feed, etc.)	4 min	5 min	5 min
 Relax by watching movies/videos/TV series/playing games	8 min	6 min	5 min
 Online shopping	2 min	2 min	1 min
 Still pay attention to the road	16 min	22 min	22 min
	60 min		

GenPop: In the data we saw that people who are more positive toward self-driving are also more positive toward every type of advertising that might exist in that world.

Salkever: If you come at it from a mindset that advertising is annoying, you really may not like what's going to happen in cars. The people who buy into self-driving cars seem to buy into the fact that in that world, it's going to be a platform in which people will communicate.

GenPop: In our interview with Marshall Brown (page 25), we talked about the potential to lose the serendipity of travel. Will advertising help or hurt that?

Salkever: You become a hostage to all the data points that are recorded. It's hard to capture serendipitous encounters or experiences. Your car may not know how to recommend [these things] to you. They may be drowned out by the noise.

GenPop: How so?

Salkever: Say I'm passing The Giant Artichoke [restaurant and attraction] in Castroville, California, but I don't see it. I'm looking at the screen. The car may not know I like artichokes, but I might see a sign on the side of the road about this pretty crazy attraction, and I'll take a look. We are in an attention economy, and that's true for serendipity as well.

GenPop: Right, the car can't necessarily know all our tastes or that we like fake roadside artichokes even if we don't like the actual food.

Salkever: A lot of the scientific research shows that preferences change. We think differently of someone the first time we meet them and after we've known them for six months. Our tastes evolve over time. I didn't used to like lobster. If my car had been consistently trying to steer me away from lobster, but somebody else in my life said, "You gotta try this lobster bisque," and I find it's amazing. That's why I'm really kind of cautious and leery. The real problem that I see with this kind of marketing is that it conflicts with our humanness.

Question:

What will drive the future of electric vehicles?



Michelle Krebs

**Executive analyst for
Autotrader, past president
of the Society of
Automotive Analysts**

Electric vehicles have struggled to gain market share in the U.S. and Canada. Will autonomous features propel them into greater acceptance? Or is it the other way? Can autonomous vehicles thrive without being electric?



GenPop: What was the big answer you were trying to get at?

Michelle Krebs: The question that keeps coming up is when will electric vehicles hit a tipping point. And what is clear is we're not even close.

GenPop: While people certainly have some concerns, there is overall positive sentiment in the consumer marketplace about EVs. So why don't more people own them?

Krebs: First of all, electric vehicles tend to be more expensive than gasoline engine vehicles. There is still range anxiety about "How far can I go on a charge?" Also, there are concerns that the infrastructure isn't coast-to-coast and you can't just pop in and top it off — charging takes a long time. The other thing that's happened in the last four years is the Obama administration said we're going to meet the stringent 2025 fuel economy standards and low-emission standards. [In addition to manufacturing EVs,] the automakers have also done a tremendous job of making internal combustion gasoline engines better. They get amazing fuel economy, and they emit ever lower pollutants. Gas prices are low so there's a lot of competition [EVs] are getting from traditional vehicles.

GenPop: If we take away the tax incentives, for instance, or if we take away the emissions goals from Britain, France and California, is there any demand left?

Krebs: China will force it. Now that China has seen that the U.S. is less interested, it wants its automakers to be the center of expertise for EVs. And it's the biggest market in the world by a long shot. China will be the tipping point.

GenPop: Is autonomous driving going to be the "killer app" for EVs? In other words, can EVs thrive without all of the autonomous features that also seem to be coming in parallel?

Krebs: I think it's the opposite. Autonomous will be better if it's electric. GM has said, "We aren't doing autonomous, we're doing electric." They just go hand in hand because probably most autonomous vehicles will be owned by fleets that can charge them in a central location and will be used in ride-sharing kinds of situations. They are ideal to be 1) electrified

How **appealing** are each of the following features of electric cars to you personally?

■ U.S. ■ Canada

Electric vehicles are half the cost of gas-powered vehicles to operate.



Electric vehicles can go 500 miles on a single charge.



Electric vehicles need service less often than gas-powered vehicles do.



Electric vehicle owners receive a large tax benefit from the government.



How **concerning** are each of the following to you about electric cars?

■ U.S. ■ Canada

The ability to find a charging station when out in public



The safety features of electric vehicles



The reliability of electric vehicles



The durability of electric vehicles



The increased electricity bill at my home



Finding a mechanic who knows how to work on electric vehicles



The ability for an electric vehicle to reach highway speeds



(Source: Ipsos surveys conducted between December 19 and 21, 2017 among 2,000 adults in the U.S. and between February 23 and 26, 2018 among 1,000 adults in Canada)

2) connected — to talk to each other and the environment — and 3) to be autonomous. That's the killer app: the trifecta.

vehicles down, and in using different designs and battery technologies and different materials.

GenPop: How will the answers to these questions change in the next five to 10 years?

Krebs: I think that will change to be even more favorable to electric vehicles because there will be more of them out there. There will be more familiarity by dealerships selling them and consumers [looking at them]. There is a growing infrastructure and there's progress being made in getting the cost of electric

GenPop: Earlier you mentioned gas prices. How much of an impact does that have?

Krebs: The last time gas prices spiked, in 2008, we saw an increase in sales of hybrids and really high fuel efficiency cars — and there weren't many choices back then. Prius certainly did better, but it froze up as soon as the price of gas went down and kind of stabilized even though it was at a higher level.

“Now that China has seen that the U.S. is less interested, it wants its automakers to be the center of expertise for EVs”

The other thing that’s kind of interesting is the demographics, because in the U.S. you get Millennials starting to take over as the big buying group. You would think they’re the more environmentally minded, but they’re also the ones driving the sport-utility craze because they’re having families, so they’re not buying EVs as much.

GenPop: There’s a hybrid minivan now, which I’m personally excited about, but the choices overall still aren’t great.

Krebs: One of the reasons Tesla’s been successful, at least in terms of brand (not financially), is that they make beautiful vehicles. You look at the Nissan Leaf and it is really kind of quirky, and the Chevy Bolt isn’t very pretty. And they’re all cars in a market where everybody’s buying sport utility vehicles. Somebody needs to make a really compelling electric sport-utility vehicle.

GenPop: But at least they get tax breaks, HOV lanes and better parking spots.

Krebs: In Atlanta, where Cox Automotive is headquartered, when they had big incentives on electric vehicles, you saw many Nissan Leafs around, and as soon as those incentives were gone [she makes a pffft sort of noise] they went away, and we didn’t see them anymore.



For customers looking to buy EVs, hurdles remain

Market share for electric vehicles in the U.S. hovers around 1 percent. It’s even lower in Canada. Clearly EVs haven’t taken off in North America – yet.

But over a half million people pre-ordered a Model 3, the delayed “mass-market” electric vehicle from Tesla. California, one of the world’s largest economies, is aiming for a zero-emissions future. Other nations, such as Britain and France, have said that they won’t allow fossil-fueled cars by 2040. With gas prices low, demand hasn’t been as strong as forecast, but as gas prices creep back up and regulations ramp up, EVs are a part of our automotive future. As cars gain autonomy in their driving functions that evolution will likely be coupled with an evolution of EVs.

Yet even when consumers want EVs, they face an additional challenge: Getting information and experience with the product.

A recent mystery shopping study conducted by Ipsos RDA found that dealers have a lot to learn about EVs themselves, and that their lack of knowledge is making it harder to sell people on options and benefits of EVs. For instance, dealers are not explaining key features of EVs, or even suggesting test drives which are a key part of the sale process. Customers report having to ask for test drives directly in many cases. Less than half the dealerships had an EV on display and more than half had no signage, brochures or even logos displayed. It’s hard to move a product you don’t have in stock.

The lack of a consistent and positive experience for consumers shopping for an electric vehicle clearly points to the need for OEMs to provide better sales training specific to the nuances of EVs. Equally important, the dealers need availability of these vehicles to effectively position EVs with the U.S. automotive consumer.

Mike VanNieuwkyk, SVP, Ipsos RDA

How do dealers rate on EV sales?



63%

Overall experience



61%

EV availability



71%

Salesperson knowledge of EV/ Innovation



36%

EV featured at dealership

(Source: Ipsos RDA EV Sales Experience and Best Practice Study, 2017)



Question:

What is the future of walkability in an autonomous world?



Jeff Speck

City planner, urban designer and author, “Walkable City,” and the forthcoming “Walkable City Rules!”

Autonomous vehicles should make life safer for pedestrians, but will they hurt demand for walkability?

Recently, there’s been an increased push to make our downtowns and suburbs more walkable. Urban planners and citizens alike have tried to undo some of the car-centric nature of our urban environment. Jeff Speck, who literally wrote the book on the topic, fears we could be headed for a reversal of that pendulum swing as autonomous vehicles usher in a new age of sprawl.

In a recent talk at the Congress for a New Urbanism, Speck said, “Every major transportation advance has brought with it whole new concepts of what the city is. The problem is that all these inventions have turned out to make our lives worse, and we have to come crawling back from them. What works best for humans is the traditional city of blocks, streets and squares... Traditional urbanism was not an invention but evolved naturally as a response to human needs. The adoption of autonomous vehicles should not be allowed to replace it with something different.” When he asks **What the Future**, he’s focused on the ability of cities to meet the demand for walkability whatever the autonomous future may hold.

5.1%

Percent of Americans that take public transportation to work, compared with 12.4% in Canada.

(Source: U.S. Census Bureau and Statistics Canada)



“The bottom line is there’s no encouraging walkability, there’s only providing landscape that makes it great to walk.”

GenPop: We surveyed about what amenities people can walk to, want to walk to and do walk to. What did you think of the data?

Jeff Speck: The first thing I want to say is, I take this data seriously, and I’m not trying to explain it away. But it doesn’t match the data that I’ve seen and repeated. I’m always hearing, “We want walkability,” and of course I’ve built my career on the fact that people want it. I’m flabbergasted that only 39 percent of respondents want to be able to walk to a grocery store. Why do only 34 percent of people want to be able to walk to a public park? Who are these people?

GenPop: Maybe it comes down to what they picture when the question is asked.

Speck: Yes. Say you live among suburban sprawl. So you picture each of these places in the sprawl scale. You picture the restaurants behind the parking lot. You picture the school that’s massive and disconnected. You picture the megachurch. You picture the office park. Those destinations are not attractive things that you would want to walk to because of their site design and the architecture.

GenPop: Refresh our memory: What are the benefits of walkability?

Speck: There are clear health benefits in terms of less inactivity. There are clear economic benefits in terms of money saved on transportation and spent on more productive things locally. There are obvious environmental benefits in terms of reduced greenhouse gases. There are also social benefits in that you can demonstrate that people who know their neighbors better and have broader social networks and are happier in more walkable places, but that, again, is something that people aren’t necessarily thinking about. Finally, there are equity benefits in the sense that among those who can’t drive, the poor and minorities are disproportionately present.

GenPop: What can cities and others do to help promote walkability?

Speck: I’m the last person to advocate for walking campaigns. My opinion, and it’s in no way sullied by this information, is that because we know walkability is better for society – whether or not people say they want it – then a society which values its future economic, health, environment, equity and community will invest in it in the same way that they invest in health care. The bottom line is there’s no encouraging walkability, there’s only providing landscape which makes it great to walk. We try to create places where the walk is useful, comfortable, safe and interesting. The main issue isn’t how many people

want more walkability than they have, it’s that there are a lot of people who want walkability and don’t have it. I hear them every day.

GenPop: Much of this issue of WTF focuses on the rise of autonomous vehicles (AVs). How will the walkable nature of our cities change as people are able to take some form of transit that will automagically transport them someplace?

Speck: A) It’s already happened with Uber and Lyft and B) It’s going to be another 10 or 15 years in terms of the even lower cost that comes with full autonomy. In the meantime we’re just going to see further adoption of Uber and Lyft.

GenPop: When AVs get here, what will change?

Speck: The best thing that can be said about AVs is there will be a lot less drunk driving. That’s great. I’ve been an American long enough to know that a fleet of publicly owned AVs does not constitute freedom. But AVs are clearly very bad for traffic and bad for transit. In New York City, subway ridership has been declining [due to services like Uber and Lyft] since 2016 and the street traffic is measurably worse. According to one study, ride-hailing services are responsible for a 3 to 4 percent jump in citywide traffic in New York.

GenPop: If cars are autonomous, will we need fewer of them and will that be safer for walking?

Speck: I think we have this misconstrued idea that if there are fewer cars, and fewer of us own cars, there will be fewer cars manufactured. Most people haven't thought that through. What determines the number of cars made is actually how many miles are driven. It isn't like switching cars to Uber and Lyft miraculously causes cars to last longer. In fact, the need to have a nice car to be an Uber and Lyft driver may suggest people get rid of older cars sooner. So, again, this 169 miles thing [ed: one study showed that ride-hailing services drive approximately 169 miles per 100 miles of customer travel] rears its ugly head because if vehicle miles traveled (VMT) goes up that also means that more cars will be manufactured.

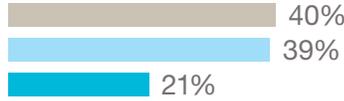
GenPop: Are you worried about a new wave of suburban sprawl?

Speck: If you lower the cost of driving, people will drive more. It's going to be a huge engine for [suburban] sprawl, a huge engine for VMT. It will be like another auto age – an auto age squared. That portends very badly for cities. I'm not one of those people who predicts the future he wants, but I kind of hope it doesn't work.

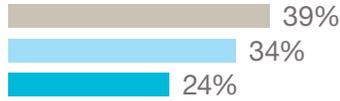
Which of the following [can you, do you want to, do you] walk to?

■ Can walk to ■ Want to walk to ■ Do walk to

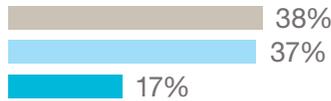
Grocery store



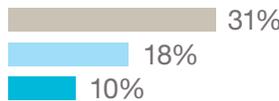
Public park



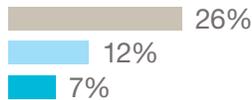
Restaurants



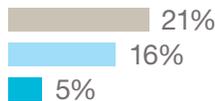
Public transportation (bus stop/rail station, etc.)



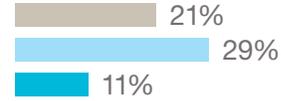
School



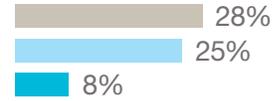
Place of worship



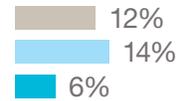
Retail shopping center



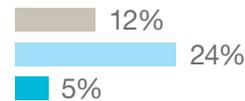
A gym/fitness center



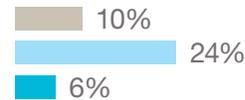
Sports fields/arenas



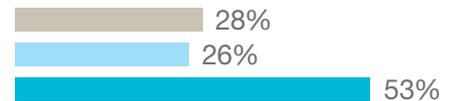
Entertainment centers (movie theaters, concert halls, etc.)



Work / your job



None of these



(Source: Ipsos survey conducted between December 19 and 21, 2017 among 1,100 adults employed full- or part-time)

The urbanized Canadian population is more clustered than in the U.S. — typically with greater access to public transportation. In responding to these questions Canadians generally reported much higher access to walkable amenities, a higher desire to walk to places and a greater occurrence of walking to destinations.



Question:

What is the future of the Great American Road Trip?

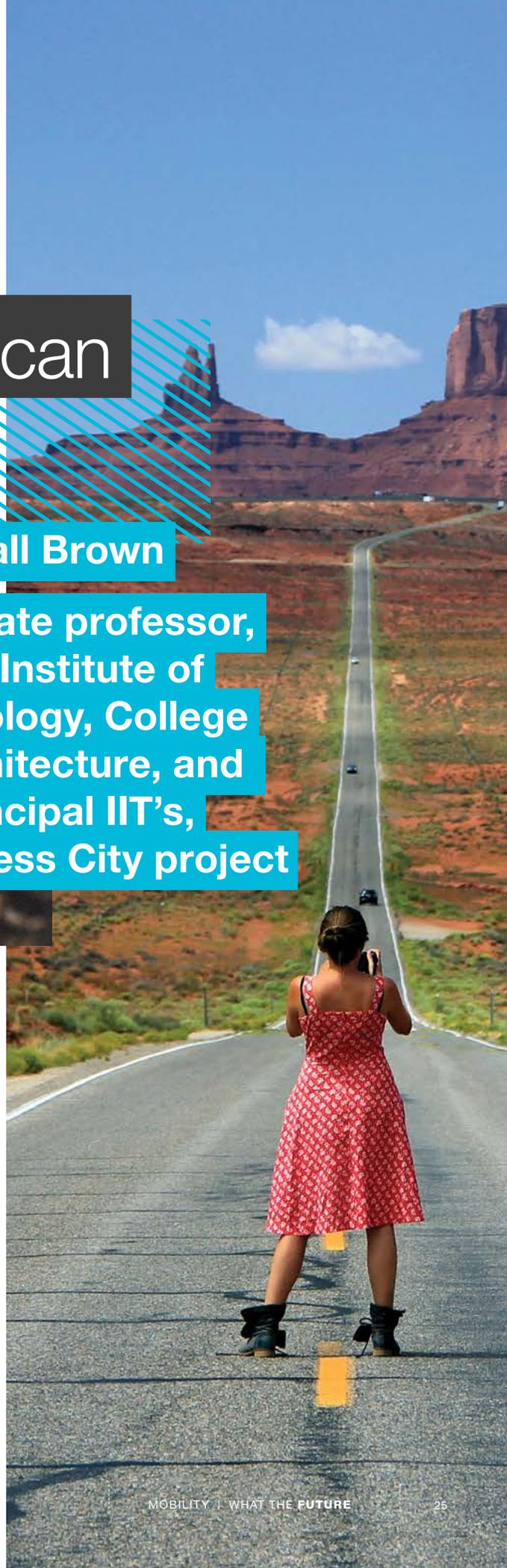
Marshall Brown

Associate professor, Illinois Institute of Technology, College of Architecture, and co-principal IIT's, Driverless City project



In a future where vehicles can help drive us on road trips, Americans — especially younger Americans — would take more, longer and different types of road trips. What would that look like?

Marshall Brown's research at the Illinois Institute of Technology Driverless City project looks at the transformation of 20th century transportation infrastructure into 21st century human infrastructure and how to leverage driverless technology to revitalize or reclaim urban spaces. His team examined four major types of mobility space: parking, delivery, commuting and streets. When he asks **What the Future** he's curious about a fifth space: tourism.



GenPop: Your question basically came down to what is the future of the Great American Road Trip.

Marshall Brown: The automobile has played a great cultural role in America especially with this idea of the Great American Road Trip you see in films from “Smokey and the Bandit” to “National Lampoon’s Vacation.” The car has a great role in that mythology. I think it’s important not only from the standpoint of the technology but also culturally and economically.

GenPop: Are you a big car-person?

Brown: I got rid of my car last year because I don’t like driving, but I can’t wait to take a road trip in an autonomous vehicle. I think it’s going to be a great experience and make road-tripping so much more fun than it ever has been.

GenPop: What sort of things would be different?

Brown: The road trip is all about conquering the challenge of distance,

and ostensibly technology could make that even more possible. Evolutions in transportation technology historically have made places which were far away closer together and more accessible. There is the possibility that cars could move faster more safely if they’re digitally controlled. Human drivers may also be able to travel farther with less stress if the driver doesn’t have to control the vehicle full-time and can sit back and relax. When we start thinking about traveling on longer trips, flying is currently the optimal choice. People might start using their personal vehicle or rented vehicle more often because the trip somehow seems less daunting.

GenPop: According to survey results, most Americans take at least two road trips a year. If they had access to autonomous vehicles, 30 percent of Americans and even higher numbers of Millennials say they would take longer and more frequent road trips. How could that transform our cities and our landscapes?

Brown: I’m skeptical of the notion that cars are going to go away because Millennials don’t like cars. In your younger years you have less need for a car, but once people start having kids or when they get a little bit older, there are plenty of changes in their attitudes. The notion that young people would be early adopters at many levels with regard to the technology is not surprising to me. That’s going to have great cultural value. It’s good when people travel more – when they get out of the place where they live, and they go to places that they don’t know.

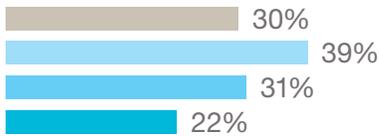
GenPop: What kind of trips are you thinking about?

Brown: From Chicago, for example, I think about the Upper Peninsula of Michigan, which I’ve always heard is a beautiful place. It’s a little too far for a weekend visit. Now if I could leave work on Friday, [sleep on the way] and arrive in the morning or sometime in the middle of the night – no sweat. And then there are all these places that you pass along the way, so we can imagine small towns which maybe are

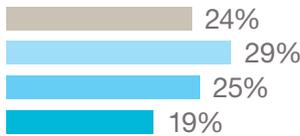
If you had regular access to a self-driving car, rather than having to drive yourself, would you:

■ Total U.S. ■ 18-34 ■ 35-54 ■ 55+

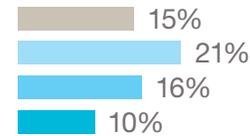
Take more road trips



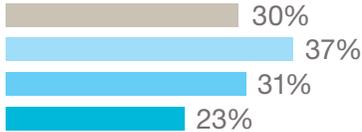
Take a different/more scenic route



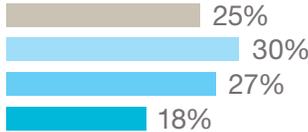
Stop at more places along the way



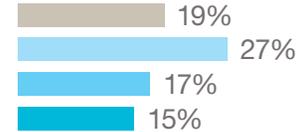
Travel longer distances by vehicle, instead of flying



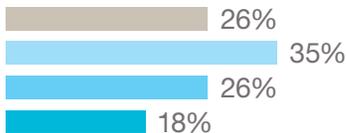
Go to different places than if you had to drive yourself



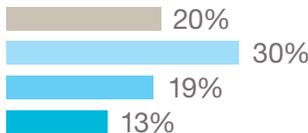
Change what time of day you plan to travel



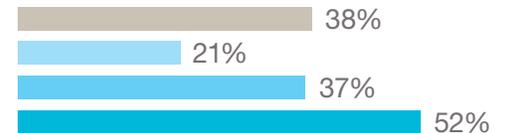
Travel with different types of entertainment other than just the radio



Go to more events/destinations than you do now



None of these



(Source: Ipsos survey conducted between December 19 and 21, 2017 among 2,000 adults)

On the Fringe With Amy Webb



struggling economically now becoming part of the new tourist routes. What if Route 66 came back? Of course it would come back in a different way, but that can be really kind of an incredible thing.

GenPop: It seems like it could go the opposite way too – that you're traveling overnight and sleeping, or the car is doing the driving for you, and you don't need a rest stop or break quite as often.

Brown: All the rest stops and gas stations that we've spent all the time building – we may not need as many of them. The question is how do we start to strategize that and how do we keep those from becoming a blight on the landscape.

GenPop: About one in four people suggest they would visit different places or take more scenic routes. But with GPS as our guide, do we risk losing some of the serendipity that has traditionally been part of the road-trip experience?

Brown: We have a future coming where perhaps the trip becomes the thing not the destination.... Traveling in a vehicle over long distances could become a lot more like taking an evening walk in a park or a walk in the afternoon through the woods... There could now be an analogue to the road trip where basically you set out to wander, always having this confidence that you can find your way.

GenPop: And we're back to the realm of road-side attractions.

Brown: Right. Now you can look out the window. You might choose the slow road, and you're going to choose Route 66 because you can look out the window again, and I think that's the kind of itch it's going to be. I think there's potentially a shift of attention.

GenPop: How do we plan for that?

Brown: There are private interests who are very concerned about their investments in the area. They're reading the writing on the wall. In the public sector it's a little more complicated. A planner from the University of Pennsylvania wrote a paper [where he asked] regional planning associations in the largest metropolitan areas what they were putting in their 20-year plans about autonomous vehicles. And the answer he got back almost consistently was "nothing."

The future of mobility isn't just autonomous vehicles and won't only impact the automotive industry. To think more broadly about the changes coming, it's helpful to step back and look at what's happening on the edges. Those are the areas not necessarily directly related but which will still influence transportation trends. GenPop asked best-selling futurist Amy Webb to give us some ideas of things to watch.

1. Solar highways — Researchers have been working toward creating roads capable of producing their own energy. These smart, modular systems could illuminate lines and markings, keep ice melted, generate electricity for electric vehicle power stations, and even communicate data about whether a road needs repair. In Jinan, China, a new photovoltaic highway has already opened, joining France and the Netherlands. In Poland, city planners are experimenting with solar-powered, glow-in-the-dark bike lanes. Idaho-based Solar Roadways has a number of pilot projects in the works, including a solar sidewalk in Baltimore's Inner Harbor and a portion of the Route 66 highway, as part of Missouri's Road to Tomorrow initiative. Made from luminophores, which are made of small phosphor crystals, these systems absorb sunlight during the day and illuminate a brilliant blue at night.

2. Supersonic flights — Japan Airlines has invested \$10 million in Boom Technology to develop supersonic jets, which will travel at 2.2 times the speed of sound, about twice as fast as a traditional aircraft. (JAL has already pre-ordered 20.) They are not alone in researching supersonic flight. Remember the thunderous sound made by the Concorde? NASA and Lockheed Martin are developing new ways to muffle sonic booms. Flights are already being scheduled for 2023. These flights won't take you deep into space, but they will get passengers — and cargo — around the world in a fraction of the time it takes now.

3. Digital ship captains — Electric-powered ships that don't require a human crew will take their first voyages in 2018. At the moment, it costs far more to build and operate an autonomous ship than a traditional one, but the longer-term benefits are already clear. Electric ships that don't require people would offer a massive cost savings throughout the entire shipping supply chain. They'd be safer, would solve labor shortages and be better for the environment.

Amy Webb is the founder of the Future Today Institute, a professor at NYU Stern School of Business, and author of "The Signals Are Talking."

GEN POP

Measured Perspectives
powered by Ipsos

www.gen-pop.com

 @GenPopMag

 @GenPopMag

Download and share this report at gen-pop.com/wtf
For full results and methodology visit ipsos.com/en-us

