

Self-Driving Cars Are Becoming Fast Track

Advanced transportation technology will change more than just getting around

BY BRENDA WALKER

In the widening world of automation, many instances of humans being replaced by smart machines occur out of sight, such as in manufacturing, where for example 80 percent of automotive assembly is now done by robots.

But in the arena of transportation, the revolution is getting up close and personal. The self-driving car, which long seemed to be possible only in a far-distant future, has recently become a front-burner project for major automotive and technology companies. In January, General Motors announced the formation of a self-driving car team to speed development. Earlier in the month, GM invested \$500 million in Lyft, a ride-hailing company it plans to expand into a network of robotic cars. Other companies making investments in the technology include Mercedes-Benz, Nissan, and Tesla.

As Martin Ford (author of *Rise of the Robots: Technology and the Threat of a Jobless Future*) remarked during a radio interview in March 2016:

To take the example of driverless cars: It's just a few years ago — really, back in 2009 — that I wrote my first book on this topic, and I never imagined at that time that driverless cars would be feasible any time soon. It seemed like an almost impossible task, even to me. Yet now, virtually every auto manufacturer, as well as a whole bunch of companies that haven't traditionally been in the car industry, are working on this, and it's looking like it's going to be feasible within 10, 15 years, at least. So it's pretty amazing how fast things are moving.

This progress in technology is bad news indeed for persons who drive for a living.

Derek Thompson wrote a lengthy piece for *The Atlantic* magazine called “A World Without Work” (July/

August 2015) about automation generally. He remarked during a CNN interview:

Driving is the most common occupation among American men. . . Cab and truck drivers. As you take both those categories, you put them together, that is the single biggest thing that American men do. Now we're already talking right now about Google designing self-driving cars, about Uber taking all of these scientists from Carnegie Mellon to have their own self-driving cars. This is a serious threat to employment in the U.S. if you begin to have self-driving automobiles.

Sergey Brin, the co-founder of Google who has deep pockets for special projects development, pushed the concept of self-driving automobiles as being “far safer” than today's human-steered vehicles and launched the development project in 2009. Proponents point to the 30,000-plus Americans killed every year on the highways and hope that number can be substantially reduced with non-human cars. In 2012, Brin predicted that autonomous vehicles would be available to average consumers within five years, although that date has more recently been pushed back to 2020. Still, the idea that sounded like science fiction a decade ago is now moving forward with top companies investing and making plans.



At this time, however, Google is arguably the top contender, with traditional car makers playing catch-up. One measure is the number of Google cars operating in California — 73 as of March 2016. That's nearly

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as many self-driving cars in the state as the other 10 companies combined. Google's cars have been cruising around Silicon Valley's public streets since June of 2015, and it made news when one crashed into a bus (2/14/16) as it was attempting to navigate some sandbags in the street. The accident was more of a low-speed fender bender, and the car (a Lexis SUV outfitted with Google sensors and driving technology) was not badly damaged.

Still, Delphi got a lot of attention when its (mostly) self-driving car completed a cross-country trip on actual highways in nine days from San Francisco to New York last year. A human driver took control when traveling city streets, though the company noted that the car operated in automated mode for 99 percent of the trip.

While the advent of totally self-driving cars remains in the future, the technology is being introduced incrementally right now. Mercedes-Benz offers a feature called Intelligent Drive in some models, which includes radar sensors that provide awareness all around the car and recognition of pedestrians in potential danger. Cruise control adapts speed to the nearby flow of traffic. There is also a self-parking feature, letting the driver know whether a space is big enough and then the car handles the steering aspect of parallel parking.

Subaru is currently advertising a feature in its 2016 Outbacks called EyeSight, which is a camera-based system of automatic collision avoidance. The car also has adaptive cruise control, keyed to traffic conditions. So self-driving technology is filtering down from high-end vehicles to more average cars.

In addition to standard road-size vehicles, a new concept for delivery is a pint-sized machine that travels on sidewalks and operates on a neighborhood level. Imagine a deluxe ice chest on wheels that shows up with desired merchandise at the specified location and then contacts the customer via smartphone. They make transporting packages and groceries cheaper because there is no driver to be paid.

UBER AND LYFT — PART OF THE GIG ECONOMY

With full-time jobs so hard to find these days, some people have turned to the so-called "gig" economy, which is the cool new word for scrounging any work that can be found. Journalists who explain social trends have made the "gig economy" into a thing, perhaps because it sounds more modern and hip than "part-time workers" or "picking up odd jobs." The term "gig" has its roots in music, meaning a performance date. Another term becoming popular in the nomadic economy is "freelance," which sounds more literary. But whatever it's called, the current jobs economy offers little economic security.

One of the popular new gigs, at least according to

the media in trendy San Francisco, is Uber driver. It's like being a cabbie, except drivers provide their personal car and connect with paying riders through the Internet. How cool is that? Uber Technologies started in 2012 and has an estimated worth of \$62.5 billion. The company has tested food and package delivery in some cities, so expansion beyond taxi service is definitely on the to-do list. Things look rosy for the private owners, but the gig drivers shouldn't feel secure given the company's plans for the near future.

Last year, Uber hired a group of new staff snatched from Carnegie Mellon University's robotics department to set up the company's self-driving car division. In February 2015, Uber and Carnegie announced a partnership that includes the creation of the Uber Advanced Technologies Center in Pittsburgh. For its part, the company will fund faculty chairs and graduate fellowships in Carnegie's National Robotics Engineering Center, signaling a long term commitment.

The agreement shows the company's seriousness about transitioning to a self-driving car business. And why shouldn't they? A Barclays financial analyst estimated a driverless Uber car would cost 58 percent cheaper to operate per mile than the regular kind with a human at the wheel. Interestingly, the same analyst predicted vehicle ownership might plummet by 50 percent over the next 25 years. So fasten your seat belts, it's going to be a bumpy ride. And Uber drivers should be considering a Plan B because they will become obsolete before too long.

SELF-DRIVING TRUCKS

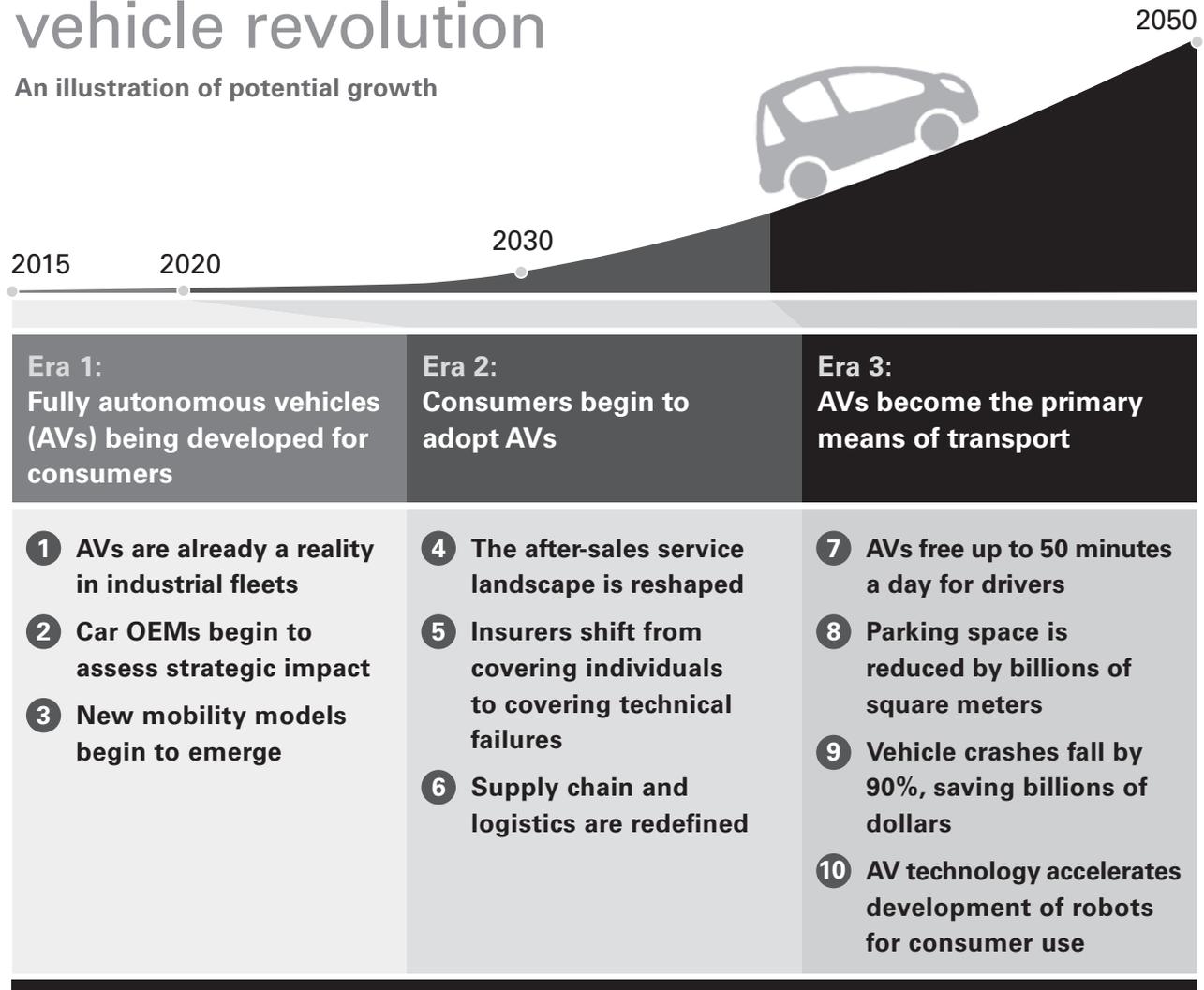
The thought of an 80,000-pound vehicle barreling down the road with no driver in charge might be daunting for many; nevertheless plans are going forward for self-driving 18-wheelers. In May 2015, Daimler sent a self-driving big rig around Hoover Dam to publicize its progress with the project, with a driver on board just in case, as Nevada law requires.

There are an estimated 3.5 million truck drivers in the United States, who operate a range of vehicles from local delivery vans to long-haul trucks. Tech prognosticators opine that self-driving big rigs could be on a highway near you within 10 years. Hopefully, the top transportation brains will have the hacking problem sorted out by then, so Achmed the terrorist won't be able to take remote control of a multi-ton truck on an American roadway.

In addition, communities and businesses have grown up around major highways to serve truck drivers. Robot trucks won't need restaurants, convenience stores, and motels to serve non-existent drivers, so many of those businesses will shrivel and die in a decade or two, assuming the self-driving vehicle revolution proceeds as planned by tech elites.

The self-driving vehicle revolution

An illustration of potential growth



McKinsey & Company



Probably more than any other job group, truck drivers have a culture, one based around being traditional Americans who enjoy a degree of freedom on the open road. Trucker culture shows up in songs and movies, or at least used to. One example was director Sam Peckinpah's "Convoy" (1978), starring Kris Kristofferson, that was popular around the time when CB radios were a fad. There are actually quite a number of trucker films, as evidenced by web postings like "20 Best Trucking Movies of All Time." Who knew? There are plenty of truck driver songs also, like Willie Nelson singing how he wants to get "On the Road Again."

But robotic vehicles mean trucker culture will be mostly nostalgia in future years, if it is remembered at all.

THE BRAVE NEW TRANSPORTATION WORLD: REJIGGERING PUBLIC SPACE AND OWNERSHIP

A part of the autonomous driving future envisioned by tech elites is a revolutionary reordering of society, an aspect that is less discussed than the amazing technology. One feature of modern life seen as needing change is private car ownership, and Google magnate Sergey Brin thinks less would be better. He made the following remarks at a meeting with other tech leaders in 2014:

If you look at the self-driving cars, for example, I hope that that could really transform transportation around the world, and reduce the need for individual car ownership, the need for parking, road congestion, and so forth. If that was successful in its own right, we would be super happy. It's obviously still a big bet. It's got many technical and policy risks.... So much land in our cities, about 30 to 50 percent is parking, which is a tremendous waste. Also, the roads themselves, which are both congested and take a lot of space, are just unpleasant. So with self-driving cars, you don't really need much in the way of parking, because you don't need one car per person. They just come and get you when you need them.

This is a rather utopian view of how the new automated transportation world might work out. Assuming the work week survives in some form after massive workplace automation, there will still be peaks of usage during rush hours. There would have to be enough cars available to provide workers with dependable transport.

Parking will still be needed in urban areas because the fleet of self-driving cars will have to be put somewhere at night and be handy for morning commuters. So the environmentalists who dream of tearing up pavement and greening the cities may be getting carried away. It would be pleasant if urban areas could be made friendlier to nature, but some arguments of romantic

robot enthusiasts seem overblown.

Naturally the idea of greatly reduced automobile demand is making manufacturers nervous. Last year, Barclays analyst Brian Johnson forecast that self-driving cars will eventually cause sales to fall by 40 percent, as families opt to own one car rather than two.

But however the future transportation universe shakes out, the companies are determined to be a part of it. Hence their investments in self-driving technology and tech entrepreneurs. Vehicle manufacturers may envision themselves as leasing massive fleets of their cars to the public: perhaps production would be downsized, but at least there is a plan for survival.

Another business facing a major restructuring is insurance. If self-driving cars reduce accidents by 90 percent (a number cited in various reports), how will the auto insurance industry respond? Presumably the technology will glitch out from time to time, so the insurance model will shift to technology and away from drivers because there won't be any. We will all be passengers.



So the future lies ahead, and it has never been so full of revolutionary change as what the next few decades of automation will bring. It would be reassuring if our political leaders were more engaged with discussions about how we as a society and they as a government might prepare to cope. For the Winter 2016 issue of *The Social Contract*, I wrote an article titled "Presidential Candidates: Why Is Automation's Job Destruction Not Being Discussed?" and since that time the subject has not appeared in numerous debates and interviews.

You would think that expert projections of enormous disappearing employment would get politicians' attention: nearly half of U.S. jobs are susceptible to automation by 2033 according to Oxford University researchers, and one-third of jobs will be done by smart machines by 2025, say the Gartner, Inc. tech consultants. But Washington is on snooze mode regarding automation.

At the very least, the OFF switch for immigration should be located and the influx of foreign workers should be totally ended, period. The mythical worker shortage caused by boomers' retirement is not happening because automation is taking millions of jobs, from bank teller to restaurant worker to accountant.

The correct number of immigrants is *zero*, because automation makes immigration obsolete. ■