

The logo for Dykema Automotive Industry Group, featuring the word "Dykema" in a large, white, serif font, with "Automotive Industry Group" in a smaller, white, sans-serif font below it. The background is a blue and red digital-themed image with binary code and abstract light trails.

Automotive Industry Group

Before Self-Driving Cars: Four Tech Challenges the Auto Industry Faces Today

Self-driving cars are still years away, but technological advances are making vehicles safer and more personalized right now. Here's what that means for the industry.

If you're on the streets of Northern California in the next few months, you might pass a [tiny car that looks like a smiling kid's toy](#). It may be cute or creepy, depending on your perspective, but to some it's a vision of the future: a Google-made, self-driven car.

But even as the idea of a Jetsons-like future dominated by robotic cars enthalls the media, that potential reality is at least a decade away. Meanwhile, the auto industry has undergone a less whimsical but far more sweeping shift, from the business of metal bending to the business of chips and sensors.

This revolution is still young. As technology seeps into every facet of a vehicle's makeup and production, the industry faces new and unprecedented challenges. Today's auto-industry executives must bridge the divide between Silicon Valley and Detroit. They must address entirely new dimensions of safety concerns, such as how to protect their customers' privacy and data.

Detroit moved beyond traditional assembly-line manufacturing a long time ago. GM introduced OnStar, which provides a way to contact the police or fire department in case of an emergency and unlock your car at your request, in 1996. And it's no longer just high-end cars that offer things like collision-avoidance systems, blind-spot warnings and automatic braking. Cars like the 2014 Chevy Malibu and the 2014 Mazda 3S come with high-tech safety features and price tags just under \$30,000. It's rare to see a new car on the market today that doesn't feature Bluetooth technology to let drivers make calls and stream music through vehicle speakers.

The technological revolution has been a boon to the auto industry. The market for smart vehicle systems is [expected to reach \\$22 billion](#) by 2020 as consumers increasingly demand—and expect—their cars to be sophisticated tech hubs.

"About [55 percent of people](#) won't buy a car if it doesn't have the technology they want in it," says Scott McCormick, president of the Connected Vehicle Trade Association. "That's a big change."

As the industry continues to evolve, here are four challenges to watch for:

The Culture Combination

If vehicles are going to integrate the most advanced technologies, car companies need to work with the brightest tech minds. But so far, it hasn't always been a comfortable collaboration. Silicon Valley and Detroit are two very different places. There are the obvious differences, like the weather. But there are also deep cultural differences. The auto industry is a deliberate one, with a focus on safety and quality that requires extensive planning and testing. Thus it can take years to bring a new car to market, and the average U.S. consumer keeps her new car for more than five years. Both the tech industry and its consumers move much faster. New hardware and software products can get to market in a matter of months, consumers expect a steady stream of updates and improvements, and they're willing to abandon a months-old product the moment something better comes along. Tech workers expect to be nimble and make quick changes as technology and consumer demands evolve.

That poses a serious problem for human resources.

"I don't know a single OEM that is not actively trying to find a way to attract talent out of the Valley," says Steve Tupper, the leader of Dykema's Privacy, Security and E-Commerce practice. "They want someone who can come into the OEM world and make things work."



And while the stalwarts of Silicon Valley might not want to move to Detroit, many see the auto industry's potential. [Apple has partnered with](#) Ferrari, Volvo and Mercedes on CarPlay, which will deploy the iOS operating system to let drivers control navigation and entertainment from their iPhones. [Intel is working with Ford](#) on things like an interior camera that will recognize the driver and a system that unlocks cars with smartphones.

The two cultures are slowly learning to work together and understand each other. Ford, Mercedes and BMW all have outposts in Silicon Valley, while companies like Verizon, AT&T and Google have made pilgrimages to Detroit. They're learning they might not be as different as they thought. "Despite their surface differences, in the most important ways, the cultures are actually similar," says Brendan Cahill, Director of Dykema's Auto Industry Group. "Detroit was the original hub of industrial innovation in the early 20th century, and that ethos of constantly looking for new and better ways to create value for consumers is in the auto industry's DNA, just as it is in Silicon Valley's."

The Long Lead Time

On average, it takes three years to design and build a new car, and that car [will stay on the road](#) for roughly 11 years. While no one expects to install technology that will last a decade, car manufacturers do want to make sure that when a car hits the market, it has the most up-to-date technology possible and can interact with systems that will be around for years to come.

The industry needs to find a way to make car technology as intuitive and easy to use as the devices people carry in their pockets — and as reliable as a car that starts every time. In a [2013 survey, Consumer Reports found](#) that 60 percent of respondents had trouble figuring out how their in-car entertainment systems worked, and one-third experienced problems with voice control or touch screens.

If an app was having similar problems, a technology company would quickly develop and push out a patch or update. Right now, that's not possible with most cars. The auto industry has to become more nimble in order to keep up.

"[The industry] needs to think ahead in terms of flexibility and reconfigurations," says Tupper. "They will need the ability to make updates. And they'll need to keep adjusting the terms on which they do business as business requirements change."

Keeping Data Private

In the not too distant future, we'll all be able to take road trips and depend on our cars to tell us when we're near our favorite chain restaurants, how much gas costs at the next exit and whether the sprinkler system has turned on back home.

But in order for all of this to happen, the computers in our cars are going to have to know a lot about us and transmit that information outside of the car's computers.

Although people make privacy trade-offs every day in the name of convenience (services like Gmail are free because they allow Google to collect information about users and share it with advertisers), there's something about that data being collected by a car that makes people nervous. According to a [recent survey from McKinsey & Co.](#), 45 percent of new car buyers in the U.S. say they are reluctant to use connected services because of privacy concerns.

To make buyers feel more comfortable, Tupper says, OEMs are working on ways to let drivers manage what data is being collected and how it is used. "Carmakers can give drivers a very rich experience if drivers allow the use of their data. The critical thing is to help drivers understand and control that data access. The carmaker that does this better than any other will win lots of hearts and minds."

Keeping Data Secure

As technology improves auto safety, the industry must find ways to keep those systems secure. Vehicle-to-vehicle and vehicle-to-infrastructure technology have the potential to vastly reduce collisions, as cars talk to each other and warn drivers when there's an icy patch ahead or another car stopped just around the curve. But this also poses a data-security risk — one that is more immediate and visceral than privacy invasion. According to the McKinsey study, 43 percent of new car buyers say they are worried that hackers will tamper with their brakes or safety systems.

"You can't have vehicles communicating reliably with one another if you don't have a secure network," says Paul Laurenza, a Dykema attorney who focuses on transportation safety.

The National Highway Traffic Safety Administration is working on a set of rules to make connected vehicle technology as secure as possible. Established legal standards dictating who is responsible for what in an accident may be challenged when a crash is caused by the way a car reacts to a communication from another vehicle, or from the road.

All of these challenges will have to be addressed long before we start thinking seriously about self-driving cars. In the meantime, thanks to technology, drivers will see cars that are safer and offer more convenience and entertainment options than ever before.





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