

The Future of Cities and Real Estate in an Autonomous Vehicle World

This is a summary of the February 22, 2018 meeting of the ULI Chicago District Council, which gathered at Jenner & Block in Chicago to explore how autonomous vehicles will impact real estate and urban planning in the future.

The discussion addressed a host of questions, including: What is the current state of autonomous vehicles and when will we see them in the real world? How will autonomous vehicles affect existing real estate properties like parking structures? Where are the future real estate opportunities in an autonomous vehicle world?

The moderator was Ronan Remandaban, *CEO, Liquideed*. Joining him on the panel were J. Marshall Peck, *President, InterPark Holdings LLC*; Matt Preyss, *Product Marketing Manager of Highly Automated Driving, HERE*; and Geoffrey Thun, *Associate Dean for Research and Associate Professor of Architecture, University of Michigan*.

It all depends.

Although there is no doubt that autonomous vehicles (AVs) are on the horizon, that vague three-word phrase serves as the catch-all opening to most any response about the future of this budding societal development.

First, there are many moving parts—some quite literally so. Other elements with an uncertain trajectory include advances in and applications of technology, the extent to which urban densification will take hold, and a long list of other trends taking shape.

The ramifications of AVs on everyday life are abundant. They are also potentially exponential: panelists noted there's no limit to the number, and scope, of unintended consequences emanating from their development. As Geoffrey Thun noted, "In many ways, the technologies are agnostic about how they are adopted."

The Society of Automotive Engineers (SAE) has established six levels of autonomous driving, from SAE Level 0 (no automation, entirely human-controlled) to SAE Level 5 (full automation), with levels 1 through 3 being increasing levels of partial automation and 4 representing a high level of automation, said Matt Preyss.

"In the past, we've been at Level 0, Level 1, today we're seeing Level 2," such as [Tesla Autopilot](#), he added. "When we look at what's next, car manufacturers are starting to look at and roll out Level 3. We're starting to see RFQs, or bids, for Level 4. We'll probably see the start of SAE Level 4 at the start of the 2020s. We won't see mass production probably until the mid- to late 2020s for Level 4."

The timetable for Level 5, he added, "is still a little bit unknown" and "will start to pop up most likely in campuses and certain restricted areas."

"We're seeing some pockets of SAE Level 5 vehicles are being worked on and deployed, especially when you look at campuses," Preyss concluded. "The city of Las Vegas has an automated bus just for the Strip."

There are many miles, and milestones, to go before the technology provides enough statistical confidence to mesh into society on a widespread level. Thun put the astronomically large figure at 8.8 billion miles of testing, roughly equal to making a round-trip between Earth and Pluto.

At Mcity, where Thun serves on the executive board, a range of experiments are under way in a controlled space where vehicles that are SAE Level 4 are being tested through [simulations of real-world conditions](#), said Thun.

“All car manufacturers are currently working on this. That’s why it’s not a question of if but when,” said Preyss. In addition, complementary industries—such as technology companies making high-definition 3D maps—are coming along to provide the entire “ecosystem” that paves the way for autonomous vehicles, he said.

Other players include telecommunication companies (with 5G network development), governments (overseeing regulations), and computer chip manufacturers “because there’s a lot of value here,” said Preyss.

“These are essentially going to become computers on wheels,” he added. “A lot of companies are working on this...a lot of startups, whether it’s a car manufacturer start-up or [Waymo](#),” a subsidiary of Google’s parent company, Alphabet Inc.

Among others that will be significantly affected are the legal and insurance sectors, said Thun, as well as companies involved in any aspect of distribution and logistics.

“I’d say almost any sector where goods or people or even ideas are moving physically in space will be affected, so the most forward-looking groups have an interest in getting out ahead of this,” Thun continued.

Another aspect of autonomous vehicle’s evolution is the impact on real estate, including the value of properties. The length of commutes affects home pricing, and Preyss’ firm is working with the city of Seattle to evaluate the potential effect of AVs on congestion, commute times, and, thereby, property values.

J. Marshall Peck said urban densification is reducing the supply of parking in cities and will “perhaps justify the use of autonomous vehicles.”

“If you look at the urban densification of America—and you just have to look out the window to see there are more cranes in Chicago than I’ve seen in the last 30 years—cities like Chicago are seeing great growth in the urban areas,” said Peck. “That growth is fueling the economy as well as all other aspects of these cities.”

However, he added, the relative lack of street infrastructure to support AVs is a drawback.

Some cities are riper for AVs than others. The percentage of the workforce commuting by cars is much lower in Chicago (35%) than Minneapolis (55%) and particularly Milwaukee (85%), so “the evolution of this technology is going to be much more economically viable in a city like Chicago or Manhattan than it is going to be in a city like Milwaukee,” said Peck. “... I don’t get the economic proposition for someone who lives in Milwaukee to use an AV.”

It remains to be seen whether the development of AVs will prompt increased urbanization, or a greater desire by more people to flock further from urban centers in part because of lower real-estate values, said Thun.

“There’s a question about what the collective societal vision of the desired form of life looks like. The suburbs aren’t produced by market forces alone,” Thun said. “The emergence of suburbs was enabled by the emergence of interstate highways and facilitated by the individual ownership of cars.”

He drew laughter, but had a serious tone, when he speculated that, at least for some, AVs could supplant home ownership.

“Maybe I can sleep in my vehicle, maybe I can eliminate real estate ownership altogether and orbit around the city...the form of the enclosure of the moving envelope isn’t yet determined,” Thun observed. “There will be a whole range of spatial products in the automotive industry. The autonomous vehicle of the future won’t look like my mother’s sedan, that’s for sure.”

Preyss forecast cars could take on an Airbnb model, with AV owners renting out their vehicles for periods of time. In his outlook, Peck pointed to Amazon and Apple’s plans for headquarters in urban settings as a harbinger of an overall trend.

“We’re totally invested in urban America. The future of our business and the future growth in America is going to be in an urban setting,” Peck added. “And as that urban setting increases, we think the supply of parking will decrease. There’s going to be a subset of the marketplace that’s going to require parking or will be willing to pay for parking.”

Prompted by a question from moderator Ronan Remandaban, Peck said that his firm has not explored alternative design models to retrofit their parking garages—as some in the industry are doing in anticipation of changing property-use needs. However, his company has looked at the potential of reducing parking garage size when doing so would help increase an overall development’s profit.

In terms of the infrastructure requirements for the development of AVs, Thun said it is both physical and data-related. For example, “one of the biggest challenges to long-haul trucking is the continuity and reliability of signal across long distances, which doesn’t necessarily exist right now,” he said.

On the other hand, Preyss noted one of the advantages of long-haul trucking, which coincides with why his company’s development of high-definition maps has begun with highways.

“Long-haul trucking has the benefit of ease. Most of their travel is on the highway infrastructure, which is the easiest place to have autonomous vehicles tested,” said Preyss. “Going 0 to 20 is easy, and the 60-plus mile an hour range is easy for driverless vehicles.”

Thun predicted rising demand for data centers, including small-scale local data centers, to accommodate AV computational needs. And the economics of parking will change, with even more of a premium for certain on-street parking spaces, Thun noted.

A key trait, for developers and municipalities alike, is to be as limber as possible for shifts in the marketplace sparked by AVs. “What is the system that allows you the greatest flexibility to face the unknown?” said Thun. “Trying to predict how this net of human and technological interactions is going to behave 20 years out is difficult to do.”

In response to Remandaban's question about which property types would benefit or suffer because of AVs, Peck said his biggest concern is that infrastructure limitations will limit the applications of the technology.

"Until the infrastructure goes vertical, until there's vehicles in the sky, there's going to be a need to put vehicles, at least some vehicles, some place," Peck said. "So I think office space and residential will benefit. Retail, I think, is a net loser... Entertainment, restaurants, things of that sort are going to be a net winner."

When queried on their biggest concerns about AV technology, panelists raised issues of equity and privacy.

"For me, the biggest question in this domain has to be who gets left out, not so much from a geo-spatial perspective...but rather in terms of demographics," Thun said. "Within this whole spectrum of technological innovation, there's a need for access and literacy to utilize the interfaces that allow you to get into the space."

Peck echoed those remarks in expressing worry over "unintended consequences...the things that we can't anticipate. The social issue is a huge issue. You can see it in the segregation of urban America."

Preyss said there is significant ongoing effort to enhance the security of privacy and data, but those concerns are foremost in his mind.

During a question-and-answer segment, the first topic was whether a shared model versus a privatized model of ownership would reign.

Peck replied that a shared model makes "the most sense," largely because of the infrastructure limitations. However, Preyss said, "If your shared model isn't efficient enough, you'll lose consumers—they won't stick. It will depend if your shared model is successful enough."

Thun agreed that a shared model is logical, but "the way we deploy capital isn't always rational... the monetization of products as part of one's self-value and identity—that's a significant question."

Another audience member asked where autonomous vehicles are most likely to first take root.

"Private or public campuses represent a logical location," said Thun. "... where you have a specific group of users in a given entity, whether it's faculty and students on a campus or employees on a corporate campus who have shared cultural values in that group... It's in these lowest of risk environments where we're likely to see some of the earliest deployment."

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