Planning for Cars that Drive Themselves

My relatives and I aren’t the only ones talking about AVs. APA is, too, and has a new PAS report out about it. More on that in a minute, but first: some context.

Planners like me have tended to underestimate the impact of technology on urban development patterns and transportation choices. Who would have foreseen the urban sprawl induced by the auto-freeway system? Homer Hoyt, a renowned economist in the 1930s, was the first to point out that a region’s urban form is largely a product of the dominant transportation system in place during its prevailing period of growth.

Pre-1890, we had the compact walking city. Between 1890 and 1920, we developed into the corridor-oriented streetcar city. Between 1920 and 1945, we filled in the wedges between the corridors in the early auto city. And since 1945, we have sprawled outward to become the auto-freeway city. (My thanks to Peter Muller of the University of Miami for characterizing these stages in the evolution of the American metropolis. See The Geography of Urban Transportation.)

More recently, who would have anticipated the rapid rise of companies like Uber and Lyft, or predicted they could substitute for my drive to the airport or replace a second car for the typical American household? Ride-hailing services are already freeing up parking spaces at airports and downtowns—sometimes affecting important revenue streams—but they also are increasing vehicle miles traveled in the short run.

What will we become with the next transportation revolution, when cars that drive themselves reduce the disutility of driving? Will a 90-minute commute at higher speeds than today encourage us to live in the exurbs and work downtown, or even commute between cities, much as long-distance commuters do where high-speed rail allows them to minimize the value of lost time?

While we can’t yet answer these questions, it’s important we ask and start thinking about them. The most recent entrant to the literature about AVs and planning, APA’s Planning Advisory Service Report, Planning for Autonomous Mobility, drives that effort along.

Down the road

Some startling AV forecasts from the PAS report: 2020 is the earliest year an automaker projects it will have a fully autonomous car available for the public, and 2040 is the estimated year when 50 percent of cars will be AVs. One shared AV could replace between nine and 11 privately owned vehicles. Forty-three percent or more is the expected reduction in the rate of privately owned vehicles, yet 95 percent of the 500 largest cities have no AV policy in place right now.

These factoids all come from Planning for Autonomous Mobility, coauthored by Jeremy Crute; William Riggs, AICP; Timothy S. Chapin; and Lindsay Stevens, AICP. The report provides a balanced treatment of the subject, acknowledging that AVs will allow us to use existing infrastructure more efficiently, which is a good thing—but also raising the specter of greater auto dependence, congestion, and sprawl.

The big “if” on the opportunity side is that AVs may or may not be shared. It’s possible, even likely, that the advent of AVs will not change the current model of individual vehicle ownership. If AVs simply replace existing cars with new technology that makes vehicle travel easier and safer, they could encourage more sprawling development and send the number of vehicles on the road and total VMT skyrocketing. A worst-case scenario, this
treats transportation technology as something done to us, rather than something planners can manage and mitigate. This is consistent with Homer Hoyt, but not with positive trends in planning like new urbanism, transit-oriented development, road diets, and traffic calming.

Cost is the most likely factor that will determine the ownership model for AVs. A reasonable assumption is that AVs will follow a similar development trajectory to the computer, with relatively expensive early generations giving way quickly to more sophisticated and cheaper versions of the technology. (In the 1970s, Gordon Moore famously posited “Moore’s Law,” that computer processors would effectively double in power every two years. The prediction has largely held true.)

The lesson here for planners is that, while we cannot control the development of the technology itself, the decisions we take now can influence the way people can and want to use new technology in the future—particularly when it comes to policy.

The PAS report contains an entire chapter on the potential impacts of AVs on the built environment. Impacts are anticipated primarily in six areas: new designs of rights-of-way with narrower roadways, changes to access management, reconsideration of the form and function of signage and signalization, new models for pedestrian and bicycle networks, reductions in demand and changes to the location of parking, and new redevelopment opportunities in urban and suburban locales. Each of these is explored in detail to develop a potential vision of a future AV world. For instance, “the combination of automated and connected vehicle technology may completely revolutionize how intersections function by removing the need for traffic to stop at intersections. Instead, AVs able to sense and communicate with other vehicles will be able to flow freely through intersections.”

**Stuck in the slow lane**

Another piece on AVs suggests that planners are being slow to react to the technological challenges. Based on a review of regional transportation plans, a survey of metropolitan planning organizations, and interviews with MPO staffs, Erick Guerra of the University of Pennsylvania recently published “Planning for Cars That Drive Themselves: Metropolitan Planning Organizations, Regional Transportation Plans, and Autonomous Vehicles” in the Journal of Planning Education and Research.

According to the report, only one of 25 large MPOs even mentions AVs in its RTP (and none plan for AVs), so Guerra mostly deals with the reasons why not, based on his interviews with MPOs. To inform practice, the article calls for scenario planning for AVs and the modeling of impacts of AVs. It anticipates that planning for AVs will eventually find its way into RTPs.

But for now, to mix metaphors, transportation planners are standing on the railroad tracks, with the train fast approaching. If my son-in-law is correct, AVs will have substantially penetrated the automobile market within the time horizon of all RTPs.

I still intend to be driving my old Subaru in 2027, but either way, I hope it will be under better and safer driving conditions than today, and in areas that are more livable, walkable, and bikeable thanks to the efforts of planners.

—Reid Ewing

Ewing is a distinguished professor of city and metropolitan planning at the University of Utah, an associate editor of the Journal of the American Planning Association, and an editorial board member of the Journal of Planning Education and Research, Landscape and Urban Planning, and Cities. David Proffitt, a visiting assistant professor at the U of U, helped with the research for and writing of this column. More than 60 past Research You Can Use columns are available at mrc.cap.utah.edu/publications/research-you-can-use.