

TECHNOLOGY

# THE ROAD AHEAD

by David Dixon FAIA

A new and disruptive technology is close enough to touch. Autonomous vehicles will be mass produced in two years and in widespread use within five. While this will surely mean more self-driving Teslas, for at least the first decade the real disruption will come in the form of shared autonomous vehicles (SAVs)—five- to 10-passenger electric vehicles that can run on schedule or be called on demand via smart-phones. Thanks to not having to pay a driver, SAVs will cost half of what shared services cost today.

Autonomous transit will not be an equal-opportunity disruptor. These vehicles won't be built to speed along highways but instead to travel through dense urban environments (cities but also compact "urban villages" in the suburbs) where a concentration of people and a diversity of activity generate lots of trips. Here, SAVs will outcompete private cars on the basis of cost, convenience, flexibility, sustainability—and never having to park. "Urban" will increasingly signify places where vehicles are shared, not owned. In most suburbs, this process will take longer.

New mobility technologies have always had a transformational impact. The rise of universal car ownership drained vitality from cities for four decades. The rise of autonomous transit can have the opposite effect, unlocking opportunities for urban places to grow simultaneously denser, more livable, and greener. As one of my Stantec colleagues who is managing a test program for these vehicles in California has put it, the SAV is "the ultimate mobile device."

We could begin to see benefits early on, but we have to start planning now. Today cities host up to eight times as many parking spaces as they do cars. But SAVs drop people off. All these parking spaces take up scarce urban land and push up costs—adding \$50,000–\$100,000 or more to the development

cost of a condominium or 1,000 square feet of office space in Boston. Replacing a significant number of owned vehicles with shared ones will ultimately support new development. Think market-rate and affordable housing, research and innovation space, and other welcome investments.

Autonomous transit will bring density another boost. Public transit authorities are already looking at SAV services to provide critical "last mile" access, connecting people who live more than a 10-minute walk to the nearest transit station. These services will make transit more convenient and enable more distant sites to command the value premiums that transit-oriented development brings.

Planned poorly, this density could mean crowding. Planned well, it will enhance livability and economic opportunity. More households and workers will bring Main Streets to life and jobs to neighborhoods. More investment will produce fiscal benefits to support education, parks, and health. Downtown, improved mobility will attract knowledge workers and the companies that follow them. Citywide, newly obsolescent surface parking lots will become sites for affordable housing, schools, health centers, and other building blocks of livability.

Within a decade, SAVs will unlock unimagined opportunities to green our cities. Redeveloping acres of impermeable parking lots will reduce groundwater pollution. Shared trips will mean reduced emissions. Automated vehicles—shared or not—can travel within inches of one another, requiring far less pavement for vehicles. The resulting opportunity to repurpose one-third to one-half of our existing street pavement will offer a historic opportunity to redefine the fit between urban and nature. Instead of a car in every garage, every street can host a rain garden. Major boulevards will become continuous ribbons of urban trees coursing through the city.

Before we finish painting this picture of urban renaissance, we need to hit pause. Are we planning a next generation of urban development that will be outmoded from day one? Will SAVs exacerbate gentrification, reinforcing trends that have led to an increase in suburban poverty of more than 60 percent since 2000,

according to the Brookings Institution? Should SAV services be operated by private companies or as extensions of public transit, with corresponding public accountability? These are only some of the most obvious questions. The first step should be an in-depth conversation that draws together people from every neighborhood and livelihood.

We need to start planning now to anticipate the revolution that's just around the corner. ■

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Olli, a 3-D printed 12-passenger self-driving vehicle, analyzes and learns transportation data, integrating IBM Watson's computing capabilities. Image: Courtesy Local Motors

