

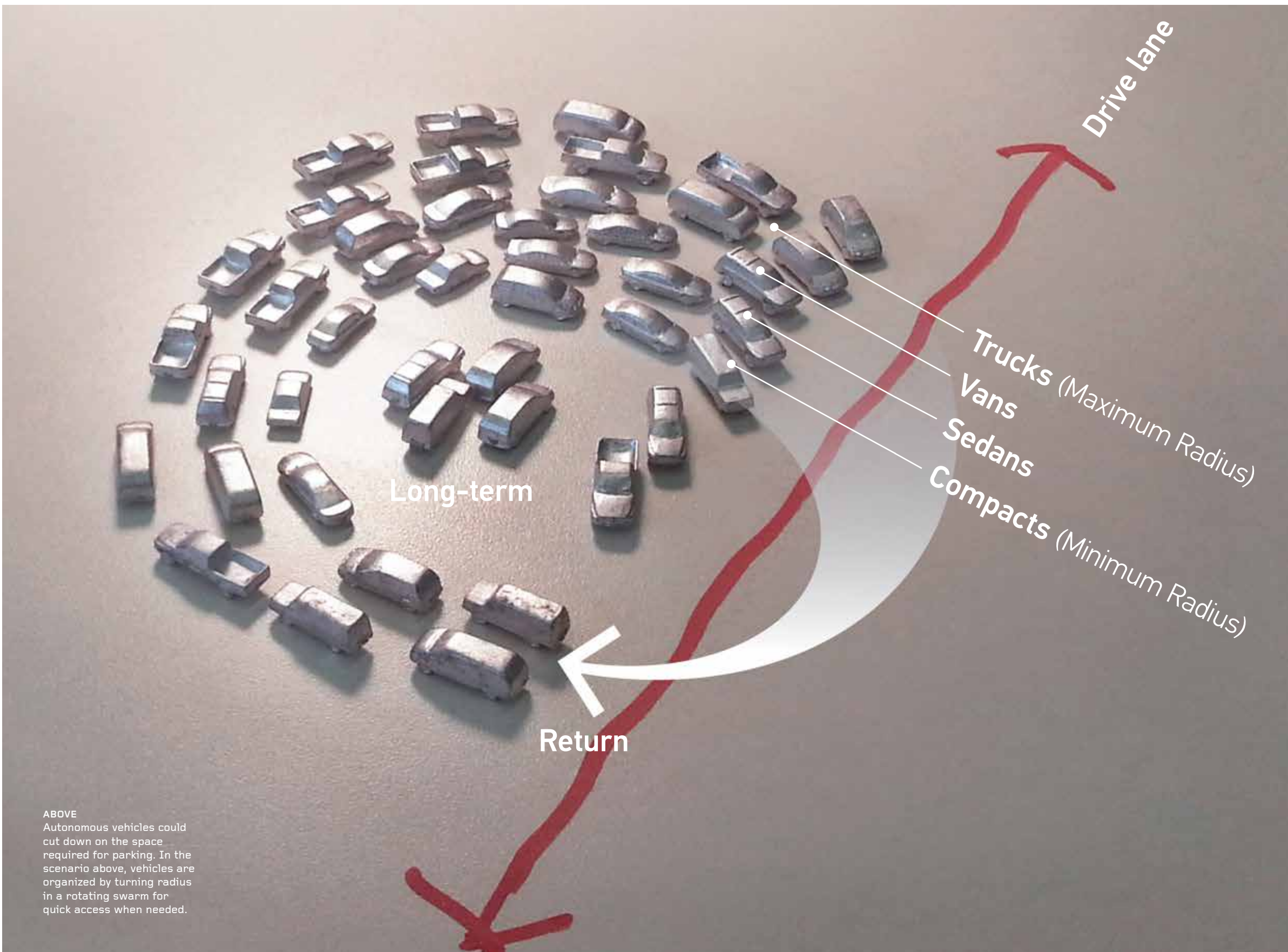
DREAM CARS

BOOSTERS EXPECT AUTONOMOUS VEHICLES TO FREE UP VAST AMOUNTS OF URBAN SPACE. SKEPTICS CALL THAT A FANTASY.

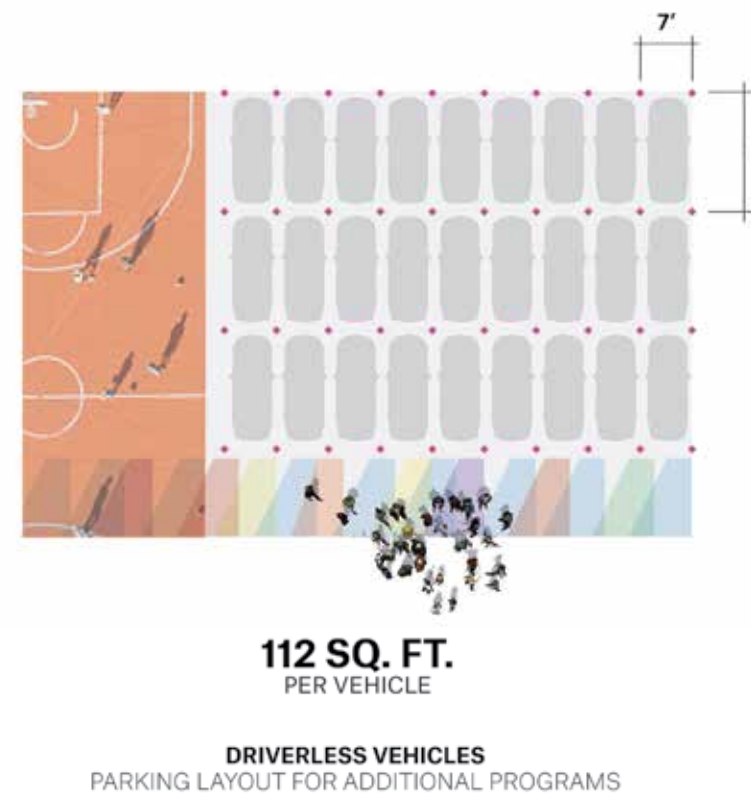
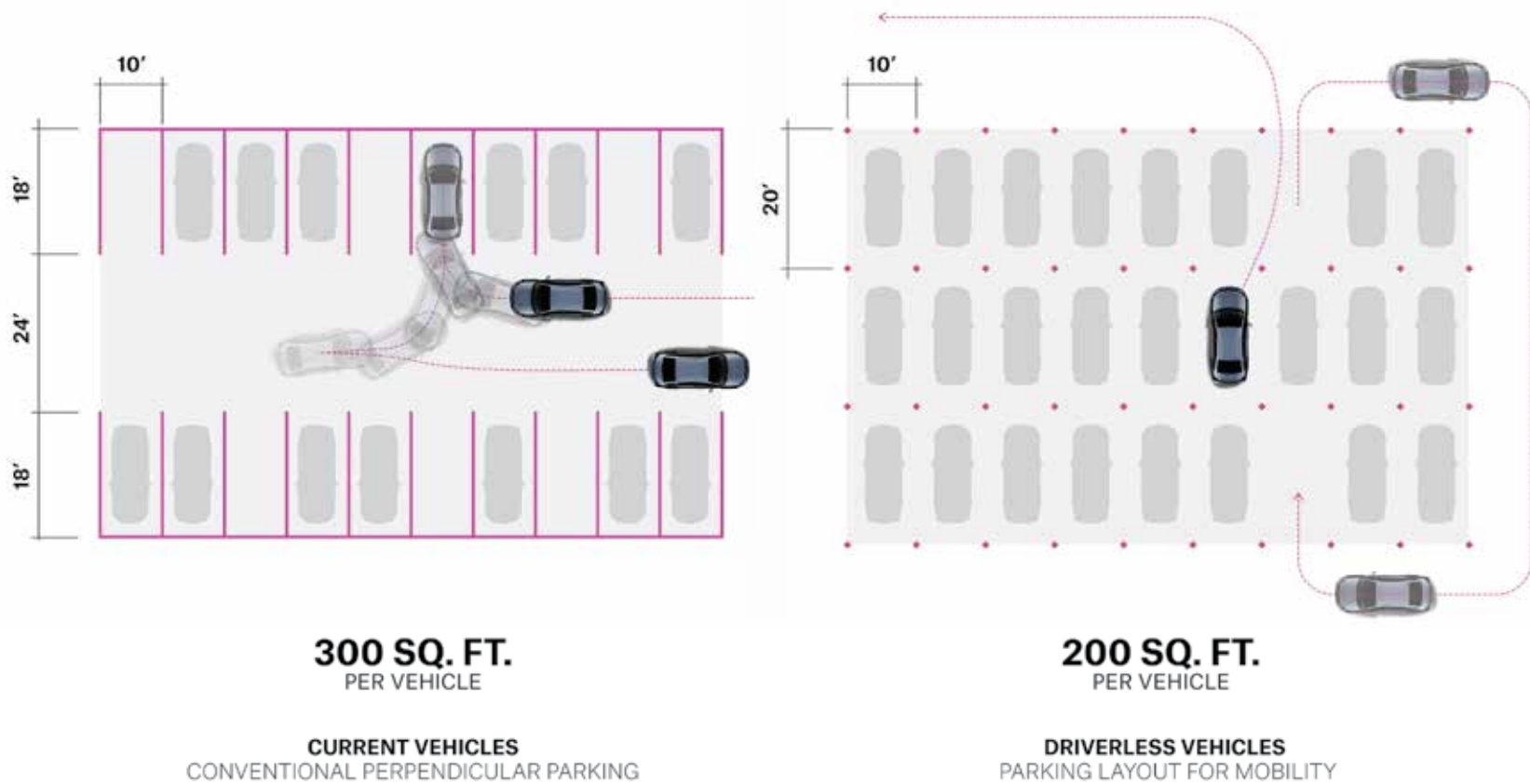
BY BRIAN BARTH

IN MARCH OF 2016, the landscape architect Ron Henderson, FASLA, had the rare opportunity to visit Mcity, the autonomous vehicle research center at the University of Michigan in Ann Arbor. His entourage, which included Nilay Mistry, ASLA, as well as an architect, a transportation engineer, a social scientist, and an attorney, signed in at a gatehouse worthy of a military facility. They were then relieved of all cameras and recording devices—"It's like a top-secret corporate espionage kind of place," Henderson says—before being escorted on a brief tour of a 16-acre test track composed of every road condition imaginable: bridges, tunnels, gravel roads, bike lanes, railroad crossings, roundabouts, graffiti-defaced road signs, faded lane markings, a main street with parallel parking, and a short stretch of freeway. "They even have a little Potemkin village of fake storefronts," Henderson says.

ILLINOIS INSTITUTE OF TECHNOLOGY



ABOVE
Autonomous vehicles could cut down on the space required for parking. In the scenario above, vehicles are organized by turning radius in a rotating swarm for quick access when needed.



OPPOSITE, LEFT TO RIGHT
In scenarios for the Driverless City Project, layout of parking areas (left) is reduced if parked autonomous vehicles are organized in a valet system that eliminates the need for drive aisles (center). When access to parked vehicles is not required, they can move even closer together (right), allowing other, temporary uses of parking areas.

AUTONOMOUS PROPONENTS CLAIM DRIVING WILL BECOME VASTLY CHEAPER.

At Mcity, a consortium of academic researchers, government agencies, and corporate entities are sorting out how to make autonomous transportation a reality. Henderson was surprised to learn that trees may not be part of the equation. “We learned that vegetation interferes with the signals between the cars,” he says. “So they cut down the trees at the test track. One of the engineers jokingly said to us, ‘If we had our druthers, we would just cut down all the trees.’ The landscape architects in the group all kind of gulped.”

Six months earlier, Henderson and his colleagues, all of whom are faculty at the Illinois Institute of Technology, had been selected as finalists for the \$1 million Nayar Prize for their Driverless City Project, which aims to “develop social scenarios, technical solutions, infrastructure prototypes, and model urban codes” for the era of autonomous vehicles that Tesla, Uber, Google, and virtually all of the major car manufacturers assure us is on the way. So far, the Driverless City Project has produced a series of scenario-building workshops, conceptual designs, and a 168-page book (yet to be published). It is perhaps the most in-depth investigation to date of the implications of autonomous vehicles (AVs) for urban life.

But it is far from the first attempt to parse what future driverless cities might look like. Carlo Ratti, an architect and the director of the Senseable City Lab at MIT, predicts that vehicle automation may result in 80 percent fewer cars on the road. Other urban futurists have suggested that up to 90 percent of parking surfaces could be eliminated. Carbon emissions? They’ll drop up to 60 percent once we’ve made the switch to cars that are fully autonomous, according to McKinsey & Company. Autonomous proponents claim driving will become vastly cheaper as well, helping to right inequities in urban mobility. A Columbia University study, for example, claims Uber fares will go down by 80 percent once there are no more Uber drivers. Kids, the elderly, disabled people, drunks, and others who can’t (or shouldn’t) drive—even pets—will have a new, omnipresent mobility option.

Designers have produced reams of renderings depicting this future driverless utopia: rain gardens instead of parking lanes, swimming pools in unexpected places, urban farms blanketing former parking lots, and parking garages repurposed as yoga studios, maker spaces, and microcondos for the twentysomethings of the future.

People won’t own cars so much as subscribe to a ride-sharing service, the thinking goes, eliminating the need for residential parking. Driverless cars will drop you off wherever you need to go, and then speed off to pick up the next passenger—so say sayonara to commercial parking as well. At night, driverless cars will sleep in vacant lots outside the city, cuddled close together like bees in a hive. They’ll drive in a swarm-like fashion, too, aligning themselves in groups on the highway according to their destination. With the risk of collisions eliminated, lane widths will shrink, and groups of cars will drive nearly bumper to bumper, train-like, saving even more asphalt-covered ground for better uses.

It’s the stuff of landscape architects’ dreams. The Driverless City project book is full of such imagery, but Henderson cautions that the new technology isn’t going to magically create these desired outcomes, unless planners, designers, and policy makers steer it that way. The companies invested in AV technology certainly don’t mind the PR buzz of all those renderings and infographics, but they are in the business of selling technology, not fixing everything that ails our cities.

One poorly thought-through scenario Henderson points to is the repurposing of parking lanes as gardens or expanded pedestrian zones. He agrees with the notion that curbside parking will eventually become obsolete, but he thinks the space will be needed to accommodate an increase in deliveries instead, of both goods and people. “We are already seeing more curbside obstructions from Uber and delivery trucks, which are going to continue to rise as everything starts to be delivered by an on-demand driverless car. So, streets may actually get more congested.”

Design modifications could help, he offers. “Maybe there needs to be a designated delivery pullover space on every block, so the rest can be freed up for other things. But policy is going to need to take the lead on that.”

As of this writing, 21 states plus the District of Columbia have enacted legislation regulating autonomous vehicles. In July, the House Energy and Commerce Committee unanimously approved a bill that would give the U.S. National Highway Traffic Safety Administration broad latitude to regulate the AV industry. The House of Representatives passed the legislation in early September,



LEFT AND OPPOSITE
At the Illinois Institute of Technology, existing parking areas (left) are reimagined as an integrated multiuse space (opposite) where AVs cluster. The pink surfaces are accessible to both pedestrians and vehicles, on the premise that the AVs will safely navigate human traffic.



and the Senate was crafting its own version as of early October. But these rules pertain primarily to safety issues and managing the growth of the industry, not to transportation planning or urban design. A survey of the regional transportation plans of the 25 largest metropolitan areas in the United States, published in the *Journal of Planning Education and Research* in June 2016, found that none incorporated plans or policy recommendations for autonomous vehicles.

However, the urban designer Jeff Speck, Honorary ASLA, says many of the municipal policy makers he's spoken with lately are anxious to start the process of planning for autonomous vehicles. Speck, a self-described card-carrying New Urbanist, and the author of *Walkable City: How Downtown Can Save America, One Step at a Time*, was invited to speak on the subject at the winter meeting of the U.S. Conference of Mayors held in January 2017. His message was fairly bleak: The notion that AVs are going to cut down on traffic congestion is an "utter fantasy."

Speck's rationale is grounded in behavioral economics: If AVs make driving easier and cheaper, driving will increase, offsetting any potential efficiencies, he says. "I think

there is going to be a tendency to dedicate parking lanes [as driving lanes], and even start cutting into sidewalks, to provide more room for autonomous vehicles. So, my advice to mayors is to regulate AVs not with laws, but with lanes. No street should have any more lanes provided for moving traffic than currently exist now."

Transportation engineers have a particular ire for utopian notions about AVs. A notable contingent of former commissioners and officials of the New York City Department of Transportation—including Janette Sadik-Khan, Honorary ASLA; Jon Orcutt; and Sam Schwartz (who coined the term "gridlock")—have publicly denounced what they see as misleading information suggesting that AVs will reduce congestion.

Jarrett Walker, a transit policy expert and design consultant based in Portland, Oregon, who is of the same persuasion, says the math just doesn't work: "The central problem of congestion is about moving large numbers of people through small amounts of space. Big vehicles—bus and rail—are the only way to do that efficiently.

Little autonomous cars, even if they come to your door in a demand response system, will never have the same degree of space efficiency."

The concern of Walker and his transportation engineer colleagues is that the seduction of AVs is already starting to undermine public investment in mass transit. Walker says that in recent years whenever he presents a transit plan to a city council or government agency, people ask, "Won't AVs make all of this obsolete?"

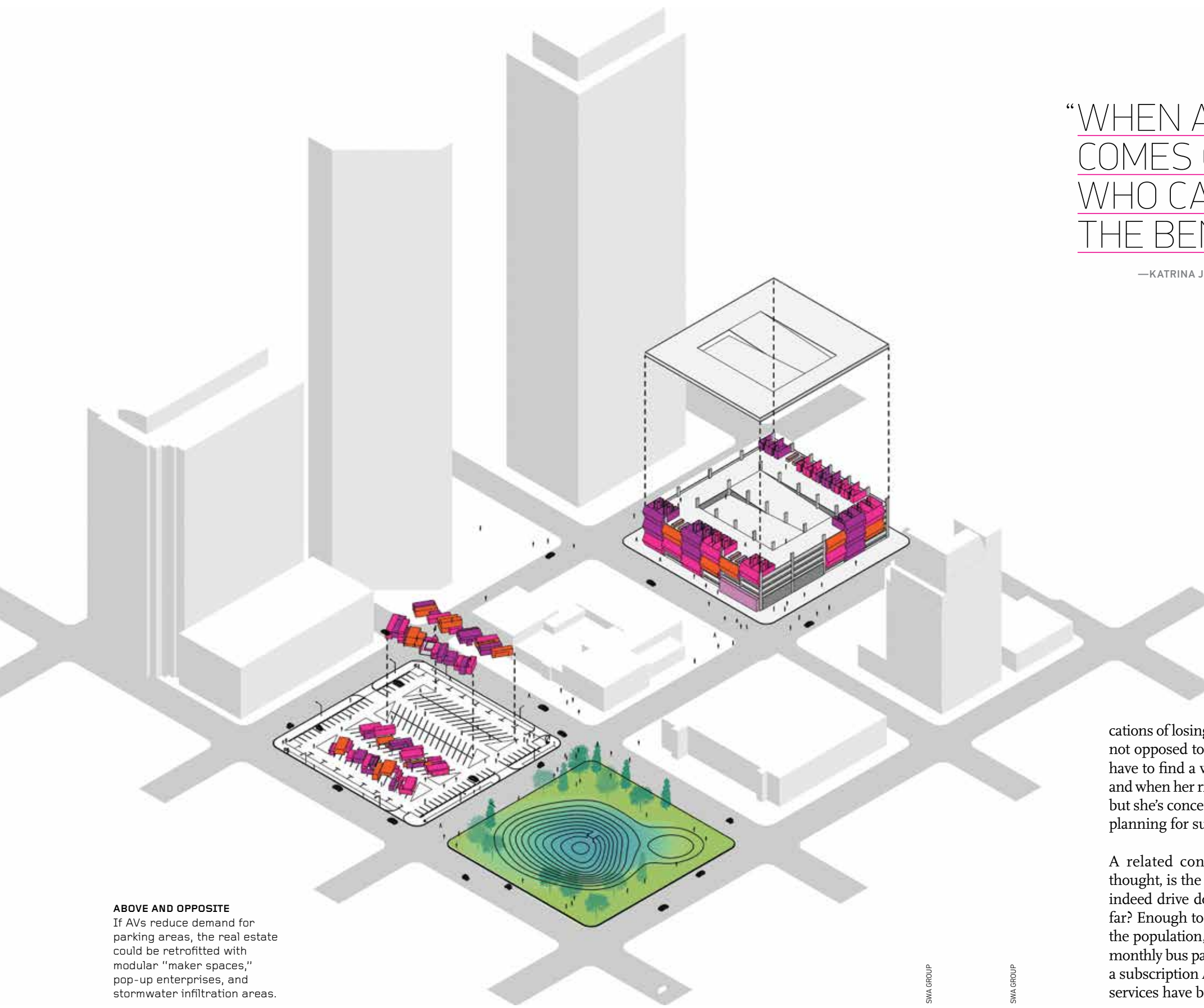
Outside city centers, transportation logic suggests that AVs are likely to encourage suburban sprawl. If passengers can sleep, eat, text their friends, or work on a laptop during their daily commute, they might not mind a longer commute. And if AVs lead to the lifting of speed limits, as is

often suggested—traffic accidents are going to diminish to near zero, so why not?—bedroom communities may soon stretch 200 miles beyond city limits.

Walker has a theory, which he terms "elite projection," for why so many well-educated people have fallen for the many ruses of AV proponents. "It is a common problem in the design and tech fields that relatively fortunate people fall in love with something that is personally convenient to them, or attractive to them, and pursue it without stopping to think whether or not the concept works at scale. That's exactly the mistake that was made with cars 100 years ago. When only the elite had cars they weren't that much of a problem. Then they were sold to everyone. I think there is a similar kind of risk with autonomous vehicles."

“WHEN A NEW [TECHNOLOGICAL] TOY COMES OUT, IT’S THE PEOPLE WHO CAN AFFORD IT WHO ENJOY THE BENEFITS.”

—KATRINA JOHNSTON-ZIMMERMAN



ABOVE AND OPPOSITE
If AVs reduce demand for parking areas, the real estate could be retrofitted with modular “maker spaces,” pop-up enterprises, and stormwater infiltration areas.

Kristen Jeffers, an urban consultant and founder of *The Black Urbanist* blog (and part-time driver for a ride-share service), has a slightly different perspective on the intersection of elite culture and AVs. “Like any industry that becomes automated, there are labor market implications of losing delivery and ride-share providers.” She’s not opposed to the technology, even though she would have to find a way to replace a portion of her income if and when her ride-share employer were to switch to AVs, but she’s concerned that policy makers don’t seem to be planning for such a shift.

A related concern, which echoes Walker’s line of thought, is the privatization of transportation. AVs may indeed drive down the cost of transportation, but how far? Enough to be accessible to vulnerable segments of the population, who might currently be able to afford a monthly bus pass, but perhaps wouldn’t be able to afford a subscription AV service? “Part of why these ride-share services have been able to step in to cities is that transit

options are inadequate because they’ve been defunded,” Jeffers says. “It’s hard to take back the market share once you let your city go to private ownership.”

Katrina Johnston-Zimmerman, an urban anthropologist who cohosts the podcast *Third Wave Urbanism* with Jeffers, also views AVs through the lens of class. “Not every person has a smartphone, or Wi-Fi in their home. When a new [technological] toy comes out, it is the people who can afford it who enjoy the benefits.” With a technological device as revolutionary, and expensive, as an AV, it seems reasonable to expect that the adoption curve will not bend toward those of modest means very quickly. Johnston-Zimmerman envisions potential benefits with targeted applications of the technology, perhaps as a means to augment public transit networks, but says that so far she’s seen little evidence that transit agencies are going to lead the AV revolution.

“It’s a question of what we want our society to be. Do we want to continue encouraging the arrogance of space with these boxes taking up our streets and using all our resources, or do we want to be face-to-face, eye level,

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ABOVE AND RIGHT
In SWA's proposal, in a future where AVs are the main form of transit, cul-de-sacs are community hubs, and wildlife is safe from cars.

OPPOSITE
SWA Group's rendition of a future multiuse parking deck.

human scale, and moving around each other on the actual streetscape? I think that conversation has huge implications for our psychology and our identity as citizens," she says. Maybe planners should focus more on the cycling infrastructure, she suggests: "The technology is simple, affordable, and we're not going to run out of resources to make bikes anytime soon."

Predictions for when AVs will become commonplace vary: 2050 is a date often cited, well within the life span of infrastructure projects currently under design. Others, however, argue that it could take a century, if it happens at all.

Thomas Fisher, the director of the Minnesota Design Center at the University of Minnesota, is confident that the transition to AVs will happen rapidly once it starts, a view formed in part by research he did years ago for the Department of the Interior on the rapid transition from horses to vehicles that occurred between 1900 and 1920. "People back then said they love their horses, they've always had horses, they are never going to give up their horses—but by the 1920s horses had been banned in city

streets," he says. "What I hear from local planners today is that they have no choice but to follow the standard street guidelines. I liken that [attitude] to being 1908 when Ford came out with the Model T and we were still putting in roads assuming that we were always going to have horse-drawn carriages. The longer we wait, the more expensive and difficult it is going to be."

As the 188 communities in the Minneapolis–Saint Paul metro area undertake a mandatory comprehensive plan update this year and next, Fisher is traveling from one city council and planning department to another urging them to consider the implications of autonomous vehicles in the process. He points to the redevelopment of four blocks of 4th Street SE in Minneapolis, which is slated for completion by the end of this year, as an early example of how to design streetscapes in anticipation of AVs. The design by the architect Julie Snow and the landscape architect Tom Oslund, FASLA, incorporates the requisite bike lanes, expanded sidewalks, and bioinfiltration planters of the driverless city vision, but perhaps more important, Fisher says, is a less-obvious feature: a curbless surface,

the key to what he calls switchable streets. "This allows for the boundary between vehicles, bikes, and pedestrians to shift as technology changes. We have to anticipate the possibility that the vehicular section of streets may become narrower and begin designing the public realm for this shift." Curbless roads, a favorite of shared street advocates, bring their own set of problems—mainly the elimination of physical cues for the blind on where it is safe to walk. There are design solutions such as differing surface textures, however, that have the potential to address these issues.

Kinder Baumgardner, ASLA, the president of SWA Group and the managing principal of its Houston office, agrees that it's time to talk phasing. He says that language about AVs is increasingly popping up in requests for proposals fielded by his firm, and a recent client in Silicon Valley asked that driverless vehicles be considered in the design for the parking garage and curbside drop-off areas of a new development. Flexibility, or what some might call resilience, is central to this new paradigm, he says. That, and careful number crunching.

SWA has generated its own share of ooh- and aah-worthy renderings of the coming AV age, though Baumgardner is careful to note that they are steeped in real-world fiscal and spatial constraints. We may not need as many surface parking lots, he says, but don't expect hundreds of acres of new parks—most cities can barely afford to maintain the ones they have, much less afford to build new ones. Earlier this year, Baumgardner ran the numbers on how many residential units are going to be needed in downtown Houston by 2050: The total square footage is small compared to the space he thinks will be freed up in outmoded parking areas.

"I think we're going to have more feral land in cities," he says. "A city like Houston might start looking a little like Detroit because there is all this land that nobody has a use for anymore. So rather than just say, 'Oh, we'll build rain gardens,' it's going to be more about urban nature. I think we're probably going to see a new aesthetic in landscape architectural design." ●

BRIAN BARTH IS A FREELANCE JOURNALIST BASED IN TORONTO. CONTACT HIM AT BRIANJBARTH.COM OR FIND HIM ON TWITTER @BRIANJBARTH.

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