

A chance to transform urban planning

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MODERN CITIES, PARTICULARLY in America, are habitats for cars as much as people, devoting huge amounts of space to roads and parking. “America is a great place to be—if you’re a car,” says Donald Shoup of the University of California at Los Angeles. The expectation that people should be able to drive anywhere, encountering little or no congestion on the way and parking at their destination, led to a splurge of construction in the 20th century. Urban freeways, commuter suburbs and mandatory parking requirements reshaped cities. Now AVs promise to transform them once again, undermining many car-centric assumptions made in the 20th century, opening up new possibilities and turning urban-planning debates upside down. “For the first time in a generation, we can really rethink what suburban development looks like,” says Alan Berger, a professor of urban studies at the Massachusetts Institute of Technology.

Simply put, building cities around cars increases congestion, discourages the use of public transport and encourages sprawl, all of which urban planners generally disapprove of. The odd thing is that AVs could either reverse or accelerate each of these trends. They could reduce or increase traffic; make affordable transport more or less accessible; and lead to denser cities or more sprawl. It all depends on the rules for their use, and in particular the pricing. AVs know exactly where they are at all times, which makes it much easier to introduce fine-grained road tolls and congestion charges based on time of day, traffic levels and so on. That makes them a powerful and flexible policy tool.

Start with congestion. A switch to shared robotaxis could increase vehicle occupancy rates, reducing the number of vehicles needed to move people around and easing congestion. But low-cost robotaxis might also encourage more people to take more trips—the familiar problem of “induced demand” when road travel is cheap and easy. The roads could also fill up with autonomous delivery vehicles with nobody on board. The nightmare scenario, says William Riggs of the University of San Francisco, is that “we create another form of congestion—it just happens to be automated congestion.” But careful pricing of roads and rides should be able to prevent that. Some cities already have congestion-charging schemes of various kinds, or rules to encourage vehicle-sharing, such as dedicated car-sharing lanes. Some are starting to price access to kerb space, for example at airports. AVs would allow far more subtle forms of charging, taking account of time, place, vehicle type, number of riders, traffic levels and so forth, to maximise sharing and minimise congestion. “It will be that interplay that ensures we don’t end up with highly congested roads,” says Justin Erlich of Uber.

What about the impact on public transport? A study by UC Davis found that among Uber and Lyft riders in America, bus use fell by 6% and light-rail use by 3%. AVs would be cheaper, so they could draw even more people away from public transport and onto the roads. This might discourage further investment in public transport, which in turn could create more “transit deserts” where large numbers of people (typically the poor and the elderly) depend on public transport but get an inadequate service. The economics of robotaxis will work best in dense urban centres, says Mr Riggs, so “we could see social-equity implications around the fringes of cities.” But again, there is also a rosier scenario. Using AVs for the “last mile” to move people to and from railway stations could make public transport more viable in less densely populated areas. Some cities might also operate their own robotaxi fleets, or subsidise rides in poor neighbourhoods using toll revenues collected in rich ones.

The emergence of AVs helpfully coincides with a change in the structure of cities, says Shlomo Angel, an urban-studies expert at New York University. He argues that the monocentric model, with a centre surrounded by suburbs, is a thing of the past. In many large American and European cities, jobs are moving from downtown to the periphery, and workers increasingly commute from one suburb to another, rather than to and from the centre. His analysis shows that 75% of jobs in a typical American city are outside the urban centre. In European and Asian cities with dense public-transport networks this decentralisation is easier to cope with, but retrofitting the necessary infrastructure onto American cities would be too expensive. “American cities need door-to-door transport systems to get to work, and driverless cars will play this role beautifully,” says Mr Angel. Robotaxis hailed on demand promise to be a lot more efficient than privately owned vehicles, he says, and are well suited to the spatial structure of both present and future American cities. Mr Berger agrees. “It’s not affordable to build mass transit that goes from suburb to suburb,” he says. “The best solution I’ve seen in my career is the idea of shared autonomous vehicles.”

That raises the question of urban sprawl. On the one hand, a switch to shared AVs by urban dwellers could lead to denser cities as some of the space currently used for parking is reallocated to housing. New high-density housing is already being planned with pick-up and drop-off zones for ride-hailing vehicles, and fewer parking spaces. On the other hand, AVs could also encourage sprawl by making long commutes more acceptable, because riders will be able to work or even sleep on the move. “The biggest negative of suburban living is the driving and the amount of space that has to be devoted to cars,” says Joel Kotkin of Chapman University. By doing away with driving and making city centres easier to access, AVs will increase the appeal of suburban living. So it seems likely that AVs will make cities both denser and more spread out, depending on the road-pricing regime.

AVs could also make possible new kinds of suburbs, updating the 20th-century dream of garden cities. “Over the last 100 years our landscape has been drastically altered by the automobile,” says Mr Berger. With AVs, “all the land we’ve given to the automobile can be put back into landscape and ecological functions.” By doing away with parking and using one-way, single-lane roads that loop through neighbourhoods, the area of paved surface can be reduced by 50%, he calculates. That means more space for plants, more biodiversity and better water retention, reducing the risk of flooding in the urban core. Suburbs will have enough space to generate their own solar power or grow their own food.

City centres will end up looking different, too. In effect, cities have banked a large amount of valuable real estate in the form of parking lots and garages, notes Peter Norton of the University of Virginia, and must decide how to spend their windfall. Housing is one obvious use; parks are another. Some streets could be reconfigured to more imaginative uses than high-volume thoroughfares, he suggests. In particular, some quieter streets could become spaces where pedestrians and slow-moving AVs share the roadway as equals, with neither having priority. This would mark a return to the way streets worked a century ago, before cars took over. “Streets should not just be roads for cars but places for people,” says Mr Shoup.

In retrospect, many drawbacks associated with cars in the 20th century arose from a failure to price their use properly. With appropriate pricing, AVs should be able to avoid many of those problems, giving urban planners and policymakers a much wider range of choices about how cities and transport systems could be structured. The challenge will be to choose wisely.