



## New Mobility Paradigm

# Peering into the crystal ball

By Antonio Gómez-Palacio, RPP



Imagine two opposing scenarios. In one you are walking down a busy street carpeted by cars whizzing by and you slowly realize that you are the only actual human being in sight. In a parallel future scenario, the street is bustling with pedestrians, nobody owns a car anymore, and the few vehicles that exist are carpooling between hubs, mostly out of sight.

What will cities really look like with driverless cars? They have the potential to disrupt urban life in unexpected ways, and soon. But, how? Nobody knows. We can only speculate.

Over the last few decades cities have been striving to reduce car-dependency and create livable, walkable communities—vibrant places where people can live, work and play within comfortable walking distances. Will driverless cars aid or hinder this vision? And, how?

One way or another, we need to start planning our cities and transport systems to adapt, leveraging the potential opportunities and mitigating the impacts. The risk of misdiagnosing those opportunities and impacts is lesser than ignoring the impending changes altogether.

Having spent the better part of the last two decades as an urban planner/designer here is what I would venture to speculate are the key implications and opportunities for cities.

### Induced congestion

There has been much speculation on the potential for driverless vehicles to reduce congestion. I don't think this will happen on its own. When it comes to roads, we tend to use all of the infrastructure available until congestion compels us to change our route, habits or transportation mode – this phenomenon has been termed induced traffic. As long as we build roads, they will be used to full capacity. In fact, by mobilizing people who would not otherwise be able to drive, we will potentially see more vehicles on the road, albeit with less space requirements.

In response: We still need roads. In fact, some transportation planners will argue that we need more roads. But we must resist the temptation to rely on automated vehicles to meet our transportation needs (necessitating more roads) and instead continue to pursue alternative modes of transporting people and goods (reducing vehicle and road dependency).

### Increased shared-economy

The real opportunity with driverless cars is if their arrival can help us leverage the trend in reducing car ownership. Today, choosing not to own a car is

facilitated by the increasing number of options available: I can rent a car for a day or an hour; I can sublet my vehicle to others; take a bike/train/walk for a portion of my trip; etc. Cities like Helsinki are already striving to make car ownership pointless, focusing instead on providing a plural and comprehensive, door-to-door system (targeted for 2025). The trend towards a sharing economy is visible in many other areas: hoteling, office spaces, heavy machinery, etc. And correspondingly, there is an increasing level of comfort by the end-user with the idea of using services rather than owning the things that provide those services.

Some of the opportunities that come with reduced car ownership include: a net decrease in vehicle numbers, as each vehicle has more people using it; a net decrease in parking spots, as vehicles spend less time idle; an increased use of alternative modes of transportation, as people are not anchored to their car for every trip/km; and so on.

In response: Much like what Helsinki is doing, the focus of transportation planning needs to shift away from creating spaces for cars to providing transportation options for users (i.e., inter-modal integration). And priority should be given to Transportation Demand Management strategies that target a reduction in car ownership.

### Complete streets

The term complete streets has been coined to describe the idea that streets should provide for a variety of users and uses, not just cars. Streets around the world are being redesigned to better accommodate pedestrians, cyclists, spill-out retail, an urban tree canopy, and other public realm functions. Driverless cars have the potential to assist these efforts by requiring less overpowering road engineering (e.g., tighter turning radius, smaller lanes, pedestrian-oriented signal timing, etc.). They also have the potential to do the exact opposite, somehow dehumanizing the function of the road (e.g., making a road intersection impossible to walk across). In our designs and engineering, we will be confronted with having to prioritize road users (establishing a modal-hierarchy) and should be wary of the potential impact to the livability of cities.

Consider drop-off and pick-up zones. It is not inconceivable to imagine that office buildings at peak hours will begin to look like school zones. Every user of a driverless car will want to disembark directly on

the red carpet and have their car waiting curbside for when they emerge. Buildings will need to incorporate more robust drop-off and pick-up zones, potentially internalized. I would imagine that many existing underground parking structures could be repurposed to this effect.

In response: We need to remain vigilant in realizing the goal of reprioritizing the function of roads towards multi-modal use. That is, designing roads for people, not for cars. It will be all too easy to be distracted by new technologies and lose perspective of the bigger picture.

#### **A reduction/redistribution of parking needs**

Parking needs, location and design, will probably change drastically as vehicles can now mosey back home, or pick up a different passenger. You will no longer need a parking spot near your destination. In fact, you may not need one at all. And if you do, the size of the parking spot (and ceiling height) could be significantly reduced as the entire process is automated.

In response: This is an interesting one to consider, given that so much of our urban environments are currently dedicated to parking. Those vast surface lots surrounding malls can be repurposed. Parking structures can be redesigned or recycled. Street-side parking can be replaced by sidewalks or extended drop-off zones. Furthermore, eliminating parking as a (physical/economic) barrier to intensification will increasingly enable adaptive reuse and infill development.

#### **Shift towards mass-transit and multi-modal integration**

Public transit systems have typically straddled the objectives of moving significant volumes of people (high ridership) and serving a broad population (high coverage). By reducing barriers to mobility, driverless cars have the potential to appeal to some of the demographics previously served by transit—seniors, youth, mobility-challenged, etc.—because they offer door-to-door service. These riders may choose not to use public transit, instead relying on a driverless car to complete part of their journey. I can predict that transit operators will feel less pressure to cover all parts of the city (e.g., lower-density neighbourhoods) and focus instead on areas where the volume of users makes individual vehicles (with or without a driver) less viable (e.g., intensification nodes and corridors). A senior living in a suburb will now be able to use a driverless car. The inner city office worker commuting to the financial district will still be dependent on the subway.

The inter-modal interface (transferring from a driverless car, to a train, to a shared bike, etc.) will become increasingly important, as people use different modes for different parts of their trip. This interface will need to be accommodated at transit stations, and at all key destinations and cross-roads.

In response: Public transit systems will likely divest

from lower-density areas and will refocus efforts on higher-density mass-transit systems. They will divest from offering services for the financially-challenged, allowing shared ownership systems and driverless technologies to fill the gap. Public transit agencies will, following the trend, require less drivers and be able to diversify their fleets and operations to include driverless transit vehicles that are more bespoke in their size and operations. Expect more rapid-transit systems filled with commuters along busy routes and fewer large buses running empty along suburban streets.

#### **Sprawling commuting time/distances**

With a driverless car, passengers can spend their commuting time sleeping, watching TV or working on their laptops. As a result, people's tolerance for longer commuting times will probably increase, resulting in further urban sprawl. Furthermore, people will be able to reside longer in a suburban residence (aging-in-place) than what they may do otherwise. As a result, we can expect more cars on the road, not less. Much like the widespread introduction of cars post-WWII enabled a wave of suburbanization, driverless cars has the potential to further this (artificially subsidized) paradigm.

In response: There will be increasing pressure to develop bedroom communities, far removed from urban centres. As in the past, many municipalities will find this building boom hard to resist. It will require political will and tenacious policy to resist the impulse to sprawl.

#### **An adjustment of land values**

New technologies, inevitably, alter the viability of developing land and the corresponding land values. Three types of land in particular stand out. One, awkward infill or adaptive reuse sites, which may become developable as parking and access constraints diminish. Two, plots on the urban fringe that become viable as the tolerance for commuting times increases. And three, existing parking lots and structures.

In response: Undoubtedly, we can expect an adjustment of land values to reflect new development opportunities. In the absence of updated policy, speculation will run rampant. It behooves urban planners and policy-makers to set the right framework now, rather than contend with unrealistic expectations later.

#### **Automation of goods movement**

The movement of goods by both larger vehicles transporting goods intra-cities and smaller inner-city delivery vehicles will, in all likelihood, also be significantly transformed with the introduction of driverless trucks, trains, boats, planes, etc. In fact, the transfer of goods from one vehicle to another will probably also be mechanized, transforming warehousing and distribution centres. Overall, this will have social and economic ripple effects, in addition to planning and urban design implications.

In response: Same as the post-industrialization shift

to mechanized manufacturing of goods entailed a rethink of land use (opening up brownfields), causing potential disruptions to trades and employment, cities will need to brace for the broader social and economic impact of the atomization of the movement, warehousing and distribution of goods, in addition to the urban design of streets and buildings.

#### Further automation

Why stop at driverless cars? When the driver becomes redundant, other tasks in transportation and distribution systems will soon follow. Consider garbage pick-ups, pizza deliveries and so on. A slew of complementary technologies will undoubtedly emerge to close the gap between a driverless vehicle and a fully automated transport/delivery service. This is a trend already evident in the shipping industry, where there has been an increase in mechanization of port activities, utterly changing the social and economic dynamics of port cities. Expect driverless cars to be extremely specialized (e.g., an automated arm for garbage pick-up, or a drone for pizza delivery) and architecture to be equally accommodating (e.g., a technological interface on the delivery side).

In response: Buildings will need to include a port for the docking of automated deliveries and pick-ups. These service areas (frequently an eye-sore) can now be hidden from view and operated on more convenient schedules. The automation of delivery systems will probably extend

into the building, all the way to individual units. Just as we now expect services like water and sewer to connect with our units, in the future other services will be automated door-to-door. Docking functions have the potential either to take over the image and function of streets, or to be concealed, allowing streets to be places for people. We will need to decide.

#### Thoughts moving forward...

Nobody knows, truly, what the impact of driverless cars will have on cities. Uncertainty, however, is a poor excuse for inaction. We need to make some informed guesses and begin to design and plan our urban environments to respond to the impending implications. A word of warning though. The one risk we need to be wary of is that we become so distracted by the glamour of the new technology, we end up pandering to it. We cannot allow that to happen, therefore we must keep the bigger picture in mind and ask, not how we accommodate driverless cars, but rather, how driverless cars can help us design better, more livable cities for people.

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