Arjan Harbers, Daniëlle Snellen

A parking guidance system in The Hague, The Netherlands indicating the location of parking and available capacity.

Smart Transportation

How does Smart Mobility affects the city? New innovations like driverless cars, elecric vehicles, new forms of transport and increased information might be a game changer in urban planning. But is it really wise to remodel our cities for vehicles?

In 1992 a new type of bus station was introduced in Eindhoven: a dynamic bus station. Bus platforms were no longer reserved for certain bus lines, but were instead utilised flexibly. Passengers now had to wait in front of the platforms until digital screens indicated at which platform the bus was expected to arrive. Since a bus line no longer had a fixed platform, the platforms could be used more intensively and the concept thus saved a lot of space. Nowadays we would call this an example of smart city technology, as it is based on information technology and affects the use of space.

Actually this type of process is not very new; the spread of new technologies has often had significant spatial consequences. For example, developments in agriculture and food processing, defence systems, transportation and communication have influenced the distribution, size, scale, shape and density of settlements. In the future, new technologies may again have significant impacts. These impacts are nevertheless hard to predict. For instance, in the late 1990s both trend watchers and scientists predicted that urbanity would become obsolete in the near future. Interaction via the Internet would replace the need for proximity and physical encounters. This "Death of Distance" has not really taken place; in fact the need for face-to-face contacts in the Internet era has actually attracted more people and jobs to cities.

Smart Mobility. In this article we narrow the focus to innovations related to travel and transport. We see some fascinating developments in this sector, such as driverless cars, electric vehicles, increased information, new forms of transport, services based on apps and platforms and shared mobility. At the forefront, however, we find the driverless car. This is a potential game changer. Professor Lawrence Burns (University of Michigan), for example, speaks in the journal *Nature* of revolutionising motoring, envisioning the end of private ownership and the arrival of a fully automatic, electricity-based, completely safe and ultimately


CS-New Babylon
130
Muzenplein
100
Grote Markt
80

A parking space with charging in Rotterdam, The Netherlands. The station is used exclusively for electric cars.

convenient mobility service. Driverless cars may substantially change the way travel time is experienced. More people can become "car drivers" (adolescents, the elderly, people with disabilities) and empty cars will drive around on their way to a parking space or to new passengers. This could lead to increased travel and therefore infrastructure demand, maybe somewhat contained by the fact that automated vehicles can use road space more efficiently (higher lane capacity, narrower lanes). Parking would also change substantially, shifting from parking directly at your destinations to automated valet parking – or, as pessimists suggest, driving around endlessly to avoid parking fees. This could free up large amounts of public space in urban areas. Safety may improve enormously as well, possibly making speed limits obsolete. Nevertheless, in urban situations new forms of congestion or danger could be the result of pedestrians randomly crossing streets, knowing the cars will stop anyway. Finally, there may be a large impact on public transport. In more rural areas, traditional bus lines may disappear, being completely replaced by on-demand services. However, in urban areas and between larger cities, the big volume of travellers will most likely still require the provision of collective public transport.

Most of the effects described above will only occur when vehicles can actually drive completely on their own. Expert opinions indicate that we are decades away from that happening on a large scale on all types of roads in a safe, reliable way. So, however substantial the effects may be, it would be unwise to jump the gun and start remodelling our cities for a driverless future just yet.

Electric Propulsion. We do now see an increasing number of electric vehicles on our streets. Especially in urban settings, the advantages of these cars – with their low levels of local emissions – are evident and their limited range is

A battery charging station for electric vehicles in the Netherlands, along a motorway near Utrecht.

less of a problem. However, shifting to electric propulsion leads to no improvement in public space: Electric vehicles continue to take up road and parking space, and dominate the street view. Furthermore, an increase in their usage is relatively slow, due to the high costs of batteries and the low ranges still available. For a genuine transition to electric driving, substantial changes in policy (such as stricter emissions standards) are necessary. The recent climate change agreements that emerged from the 2015 Paris Climate Change Conference may have that result, however, the implementation and time frame is highly uncertain. And even if electric becomes the new standard, the low costs of use could easily lead to more car trips and increased congestion.

In contrast to this slow increase in electric cars, the Netherlands has experienced the enormous success of electric bicycles. In 2014 the e-bike accounted for 12 percent of all bike travel. The e-bike makes cycling accessible for more people and for longer-distance trips and has the potential of replacing cars for trips up to 10-15 kilometres. Since a bike is a very smart form of transport, electric bikes may further increase their role in transport in cities.

Flexible Access. Many seem to believe that flexible access to transport options is the future of travel. Access may trump ownership: Just open the app on your phone, enter your destination and an array of travel options is presented to you. Choose one that fits your preferences – be it an Uber taxi, a Snappcar, a Boris bike or a good old bus – and off you go. It saves space and money and makes travel much more flexible than having to take your own car or bike with you all the way or having to park it somewhere.

Nevertheless, it is highly uncertain whether large numbers of people will actually trade in the privacy of their car or the comfort and familiarity of travel habits for having to make choices over and over again. Why would an increased

An electric freight bicycle, used for transporting children or shopping, reduces the need for a car.

supply of and access to transport options suddenly change this? Many of these options come with the same disadvantages as public transport modes that have been available for years. For example, they lack comfort since they need to be vandalism-proof, you have to wait for them and sometimes you have to share. Thus, for the time being, it seems wise to assume there will be a substantial fleet of privately owned vehicles when planning.

The right Information. And then, as a last example, the amount of transport information available these days is almost overwhelming. Public transport apps, smart ticketing, satnavs, apps and platforms all increase the number of options available to travellers, as discussed above. They also lead – in theory – to a better knowledge of travel patterns. This information is mainly in the hands of the companies bringing new innovations to the market. For them, it is a source of new revenue models. However, if planners are expected to provide the necessary or desired infrastructure, public spaces or urban plans for all these new transport options, they will also need access to the relevant information concerning the travel patterns they are supposed to plan for.

So Information and communication technology (ICT) can thus make our transport smarter. The next questions are what that means for our cities and how planners should deal with the changes. Is it business as usual, since many innovations are just a different version of a car, and transport volumes in many cities will still require an substantial public transport system? Or should planners provide space for all these new smart innovations and new actors?

Human Needs. Maybe we are conservative, but electric, driverless and shared cars are still cars – 19th century technology that requires lots of public space in proportion to the number of people transported. Furthermore, we would like to raise a more fundamental issue: Cities are for people, not for vehicles. The future of our cities should therefore be discussed based on human needs, on

In this dynamic bus station in Leiden, The Netherlands, a screen indicates at which platform buses will arrive.

how we want to live, the goals we aim for, and not focussed on what particular technologies may demand or have to offer. Cities through smart technology, not cities for smart technology.

Furthermore, urbanisation patterns, the lay-out of streets, the allocation of plots and investments in infrastructure cannot easily be reversed. Once such structures are in place, changes are very hard to make and expensive. Thus, locations and urban design both last for centuries and will structure the life of people, including their mobility patterns, for many years to come. The patterns of activities and trips change much faster and are very likely to keep changing over and over again in the future due to fast technological developments.

Robust and Flexible. How ever "smart" new technologies may be, it would be foolish to adapt our cities to every change they generate. Robust and flexible planning that enables many different lifestyles and activity patterns is the smart planning counterpart of smart technology: agile environments for all people now and for many years to come. This requires a reframing of the problem, as it is not the planner's task that is uncertain, but rather that uncertainty is the planner's task. Diverse, compact cities, offering attractive public space for pedestrians and cyclists and good public transport for large numbers of users probably have a much better chance of delivering the required agility than development patterns that make us persistently dependent on cars or very specific technologies. And no, this does not mean we dismiss the advantages and achievements of ICTs. Smart cities should definitely incorporate them and make optimal use of them. ICTs may lead to a more complex, fragmented and unpredictable use of our cities, yet they also make people much more flexible in their activity and travel patterns – increasing the potential of successfully combining the freedom of movement with social and sustainability goals. The success or failure of new technologies is in how they serve the quality of our lives, not in how we serve them.

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