

STATE OF THE MARKET REPORT – PART ONE

Street Smart or Street Fighting

WHY MEGACITIES NEED TO DEFINE
THE VEHICLE OF THE FUTURE



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Smart Cities Driven By Smart Transportation

With the number of smart cities growing, and governments spending more on technology to fuel this evolution, the arrival of smart transportation will drive us even closer to the future.

In late 2017, I interviewed Las Vegas CIO Michael Sherwood to find out how Sin City is transforming itself into a smart city.

During our talk, Sherwood spoke about his vision for a smarter Las Vegas. There still will be plenty of gambling, outsized hotels and must-see shows, but those elements will be combined with big data analytics, connected Internet of Things devices and sensors and, of course, autonomous vehicles on the Strip and downtown.

The city has already started experimenting with “mixed traffic”

uses, where connected and autonomous vehicles are allowed near the downtown area along with regular vehicles and pedestrians. The goal here is to learn how all these different elements interact with and exist alongside one another.

“We’re excited about that in itself, and excited about the mobility options that we’re deploying that we really think will make our community a smart community versus other options,” Sherwood told me at the time.

Las Vegas is one of dozens of cities around the world, developing smart technologies – whether it’s smart parking, smart lighting, autonomous shuttles or connected vehicles – to make transporting people and things easier.

It’s also big business.

By the end of 2018, smart city investments will reach \$81 billion globally, IDC predicts. In four short years – 2022 – that number is expected to reach \$158 billion, with much of that money earmarked for visual surveillance, public transit and smart outdoor lighting.

With cities changing to meet the new needs of its citizens, and transportation poised to play a key role in this smart era, TU-Automotive set out to see how the world is changing and where autonomous vehicle technologies fit within this paradigm.

To help our readers understand the world of smart cities and smart transportation, we look at the history of cities and their development over the last 100 years as they transform from mere metropolises into 21st-Century megacities with specific challenges and opportunities for better transportation led by the autonomous vehicle revolution.

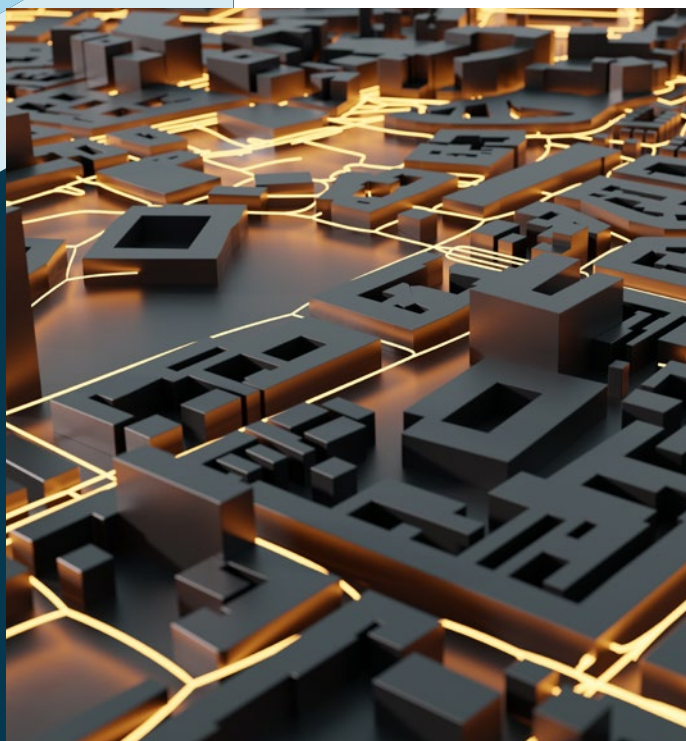
Additionally, we look at China where centralized planning is paving the way for massive building projects that will take advantage of new autonomous technologies. Finally, we explore how Barcelona is looking to take back some of its streets while using mobility to give citizens better ways to get from Point A to Point B.

How far cities will go to embrace new smart technologies is yet to be seen, but the future looks to be connected and we’re all in for the ride.

This is the first of three special reports that TU Automotive is producing that will address the future of transportation and mobility as the world enters an era of autonomous vehicles. Stay tuned for our next two installments. ■



Scott Ferguson is the managing editor for *Light Reading*, *Security Now* and *TU Automotive*.



Autocracy Helps China Top Auto Tech League

The power of authoritarian rule can drive ahead big project innovation, discovers Eric Volkman.

Wouldn't it be nice if the roads you drive on also powered your car? That might soon be the reality in China. At the end of last year, the country opened a stretch of what it calls its Intelligent Highway as a test project. This slick piece of 21st century infrastructure is a motorway packed with photovoltaic (i.e. solar) cells. Eventually, the road will also be home to recharging technology for electric vehicles, plus sensors for assisted/autonomous navigation, and other purposes.

If the project delivers as promised, it will be poised to roll out to the rest of the country. Such a massive expansion would be close to unworkable in the West; China, however, has an autocratic government that has the potential to push through monster projects. The Intelligent Highway is a hugely ambitious undertaking. If it succeeds, it promises not only to be a solution to worsening problems in Chinese transportation but, potentially, a model for the rest of the world to imitate.

A CLEVER ROAD FOR CLEVER CARS

The test stretch of the Intelligent Highway, which comprises two lanes of the six-lane motorway, opened to traffic late last year. The solar cells are embedded below a layer of transparent concrete and, according to the project's developer Qilu Transportation Development Group, they can collectively power around 800 homes in the area. They also power heating elements that melt away snow and ice in the winter months. In future, the charging technology and various types of sensors will be housed in the top layer of the road. This clever piece of motorway spans almost 1.1 kilometres (1,202 yards) in the city of Jinan. The municipality happens to be home to factories operated by domestic auto manufacturers China National Heavy Duty Truck Group (aka Sinotruk) and Zhejiang Geely Holding Group.

Autocracy Helps China Top Auto Tech League

“At the end of last year, the country (China) opened a stretch of what it calls its Intelligent Highway as a test project. This slick piece of 21st century infrastructure is a motorway packed with photovoltaic (i.e. solar) cells. Eventually, the road will also be home to recharging technology for electric vehicles, plus sensors for assisted/autonomous navigation, and other purposes.”



It's estimated that around 45,000 vehicles every day barrel down the stretch and that should provide plenty of data for analysis, so the chunk of road serves as a testing ground for wider adaptation. It's not the only Intelligent Highway stretch in existence (a much longer, 161-kilometre span is being constructed to tie the bustling cities of Hangzhou, Ningbo, and Shaoxing together). The Jinan span is the only one, however, that's gone live.

Potentially the Intelligent Highway can be a vital part of the country's future, since it would help tackle a series of acute transportation problems. These aren't unique

to China, however it's particularly wrestling with "infrastructure challenges amplified by the size of the country, the density of its population in cities, and a rapid rate of development," according to Sandra Retzer, head of sustainable urbanisation, transportation and energy at the Germany-based international development agency GIZ. "In tandem with these developments come structural and sustainability challenges, such as the increasing demand for on-demand deliveries of food and e-commerce, the need for building a charging infrastructure for e-vehicles, as well as environmental challenges like air pollution," she adds.

It remains to be seen, of course, how viable the overall smart highway is, to say nothing of its various components, or the enormous costs. Benjun Huang, of the international non-profit Institute for Transportation and Development Policy, points out that the costs incurred by the pilot project are already somewhat cloudy.

"The detailed cost of the solar expressway is not being made public," he says. "According to the project manager, the cost was half that of similar projects in foreign countries. Even so, that's high for mass application."



Autocracy Helps China Top Auto Tech League

Huang's benchmark is the Wattway solar road in France, which was opened to traffic in 2016. He said that the expense for that initiative came out to €5M (\$5.7m USD) per kilometre. According to Qilu Transportation Development Group, the Jinan project cost around 41 million yuan (\$6.2m USD). Additionally, says Huang of the Jinan project, "the efficiency of the photovoltaic power needs to improve. The conversion ratio is roughly 13% to 17%, so it is difficult to form a high-power generation system."

FROM THE TOP DOWN

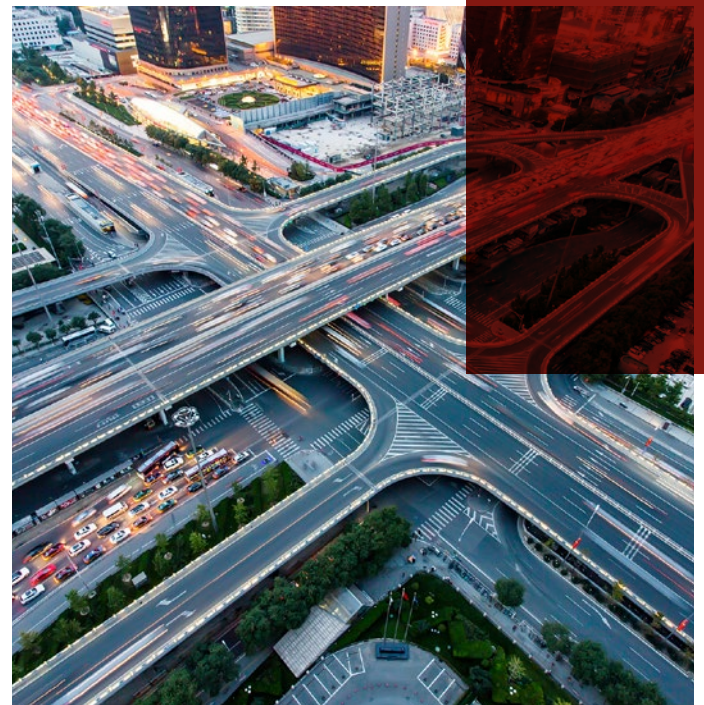
Massive infrastructure projects are, of course, a specialty of China's powers-that-be. In parts of the world like Europe and North America, contentious politics necessitate compromise, so many important projects ultimately get reduced in scale. Both elements are less problematic in China, as the country still takes a lead-from-the-top approach that doesn't need to brook as much opposition. The relationship between the central government and the country's banks is also much cosier than in the West, with bank lending practices often complimentary to the government's aims. These are major reasons why the country was able to nearly triple its highway mileage from just over 45,000 kilometres in 2006, to 131,000 kilometres ten years later. The latter number, by the way, is enough to span the equator three times.

The Intelligent Highway fits snugly into the national government's 'Made in China 2025' policy handed down in mid-2015. The sprawling initiative aims to boost the country's economic competitiveness by

improving domestic high-tech manufacturing. This includes an emphasis on such technologies as assisted/autonomous driving. Beijing has set an ambitious goal for roughly 10% of the vehicles on its roads to be fully autonomous by 2030. Considering that's less than a dozen years away, a serious, government-assisted push on the autonomous technology side is necessary.

Ditto for state-of-the-art infrastructure appropriate for such automobiles. A highway system designed to serve assisted and autonomous vehicles is an obvious compliment to this effort. On top of that, in a wider economic sense, a country needs the most effective road network possible if it wants to get its goods to market with maximum efficiency. Not surprisingly, the pilot stretch of the Intelligent Highway is being developed by a quasi-governmental entity. Qilu Transportation Development Group is a company owned by Shandong Province, the region where Jinan is located. Yet, the heavy involvement of national and regional government doesn't necessarily guarantee speed or success – no matter how lofty the goals for the Intelligent Highway. There are many fingers in the pie of China's high-tech vehicle and infrastructure segments.

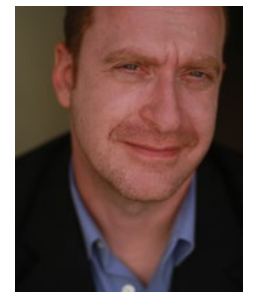
Darrell West, vice-president of governance studies at US think-tank Brookings Institution, points out that: "China has almost a dozen national agencies that regulate various aspects of autonomous vehicles. That makes it difficult to get all the required permissions to engage in road testing and smart transportation development."



There is an enormous amount of coordination required to build out the Intelligent Highway. If the central government is clever and effective enough to achieve this coordination, China stands an excellent chance of leading the world in both autonomous hardware/software, and infrastructure.

MOTORING AHEAD?

Yet even if the 2030 driverless goal isn't quite reached, China's ambitions put it in place to lead the world in the development of autonomy. The country has already got busy companies labouring hard on self-driving vehicle technology. If the government can make the Intelligent Highway work effectively, the rest of the planet might just beat a path to China's door. "Other countries are interested in intelligent highways so that is an innovation that will spread around the world," says Brookings Institution's West. "Every nation needs to upgrade its transportation infrastructure and use technology to improve traffic flows." ■



About the Author

Eric Volkman has been a freelance writer and editor more or less continuously since 1994, following a stint as a radio newscaster in Prague, Czech Republic. Over the course of his career he has written on a great many topics, including automobiles and technology. He very much enjoys being able to report on developments at the crossroads of those two sectors. Eric lives in Los Angeles with his family.

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FASTER FORWARD

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Faster Forward is a new documentary series from TU-Automotive that looks under the hood of emerging auto tech, such as 5G Internet connectivity, vehicle-to-vehicle communications, Lidar and more.

Tune in as we travel around the world with on-location coverage of the carmakers and start-ups making connected vehicles a reality.



[TU-AUTO.COM/VIDEO/FASTER-FORWARD](https://www.tu-auto.com/video/faster-forward)



City slickers – Out of the box thinking for smart cities and vehicles

Comfort Zone - Living with Discomfort

“Today there are 37 megacities with more than 10 million people, and 220 with more than one million inhabitants; of the 220 cities, 90 percent are in emerging markets.”

Love them or hate them, cities are a reality of human existence. For the last 100 years, most of the centuries-old cities around the globe have gradually tried to adapt and accommodate the evolution of the modern car. In the U.S., some of the more modern cities were laid out and planned with the car in mind. Either way, the urban street scape reflects the needs of cars with filling stations and parking lots, interlaced with a network of roads, signage and traffic lights. However, in order to handle the volume of traffic, make public transport as efficient as possible, and life for urban dwellers reasonably safe, speed and traffic congestion mechanisms have had to be introduced, including speed cameras, bus and taxi lanes, congestion and low emissions zones.

This is life in the big city as we know it. The car is not only a major part of modern life, it's also a significant benefactor of city coffers through taxes, fees and fines, as well as the

enforcement of speed limits, parking restrictions and driving behaviors.

This status quo is changing, however, as western world city dwellers, and specifically millennials, opt not to own a car, taking advantage of the rise in mobility-on-demand services such as Lyft, Uber and others. Nonetheless, congestion is still a major issue and set to get worse as urbanization continues. In 1991, the global population was 5.4 billion people, with 2.3 billion living in urban areas. By 2016, the number of people in urban areas had almost doubled to 4 billion, representing 54 percent of the 7.4 billion humans inhabiting the world.

India is forecast to see 35 percent compound average growth in the automotive market through 2025. Since India already accounts for 10 percent of the world's accidents with only 1 percent of the vehicle population, the prospects are gloomy from a safety perspective, according to Geneva based *International Road*

Federation (IRF). Additionally, as was reported last year in the respected U.K. health journal, the *Lancet*, studies show that background exposure to ambient air pollution increases morbidity and mortality, and is a leading contributor to global disease burden. Increasing congestion only makes this worse!

So, despite much discussion about smart cities, the realities of increased urbanization could result in urban global gridlock if we don't do something different.

CITIES ARE GROUND ZERO - OPPORTUNITY ABOUNDS

The term “ground zero” arose during the development of the atomic bomb, and refers to the point on the earth's surface directly at, above, and below where the nuclear explosion occurs; effectively, the central point in an area of fast change or intense activity. What better describes the intersection of smart cars and smart cities?

Street Smart or Street Fighting? Megacities Must Drive the Way Forward



“In 1991, the global population was 5.4 billion people, with 2.3 billion living in urban areas. By 2016, the number of people in urban areas had almost doubled to 4 billion, representing 54 percent of the 7.4 billion humans inhabiting the world.”

mobility requirements in a totally different way; it reinvents the concept of public/ private transit, reduces congestion and restores cities to citizen friendly zones. When this is combined with the growing success of electric vehicles that facilitate a drastic reduction in air pollution, the scene is set for radical change.

AN INCONVENIENT TRUTH - MEGACITY ECONOMICS

It's important to understand the economic impact that cities represent in GDP terms. In the U.K., London accounts for approximately 50 percent of the U.K. GDP. In the US, the Boston-New York-Washington corridor and greater Los Angeles together represent about one-third of America's GDP, Parag Khanna writes in his book, *Connectography*.

Today there are 37 megacities with more than 10 million people, and 220 with more than one million inhabitants; of the 220 cities, 90 percent are in emerging markets. The 13 megacities in India and the 15 in China are all suffering from growth that's become too rapid for normal investment cycles. Consequently, congestion, energy reliability, waste management and pollution are resulting in severe economic and social implications for the inhabitants of these cities.

The inconvenient truth is that not only do cities have a huge impact on global climate change, they also hold the economic key to addressing the solution. It is in the megacity's best

interest that smart cars happen, so that intelligent transport systems can be built. Therefore, the cities themselves need to clearly define the types of vehicles that will operate and support future economic growth and cultural development of their citizens.

Cities first need to recognize that siloed approaches to future smart city transportation is counter-productive and economically disastrous. They also need to recognize that the car industry and national governments are not going to provide harmonized solution because currently standards, regulations and legislation are an assembly of multitudes of different industries, countries, standards bodies and proprietary interests. No one is specifically looking at the holistic needs of global cities.

What is required is to have open, standardized, interoperable, low-cost equipment and systems that can interface and share harmonized data to produce economic and social benefits. This way, public transport, roads and infrastructure can be harmonized, standardized and the cost minimized. A strategic review of permits for parking facilities and gas stations needs to be orchestrated, with smart grid planning for electric vehicle charging and recycling for spent battery cells. This fundamental overhaul of the street scape needs to be seen holistically with plans for new revenue, tax and spending models.



Smart cities will differ by region as each nation embraces them from its own standpoint and mindset. Some will be planned centrally, while others will evolve organically. Smart is not a single solution but a continuous process of merging complex human networks and infrastructures with connected systems.

Smart cities as well as smart cars benefit from the Internet of Things (IoT), which is about the convergence of cloud compute capability, enhanced 4G and 5G communications networks, sensor fusion, big data analytics and the application of artificial intelligence to analyze, control and predict outcomes. When these transformative forces are combined with the developments of connected, autonomous, electric vehicles (CAEV), then opportunity abounds to completely reinvent the notion of the city.

Redefining the role of vehicles in cities creates the possibility to address



Street Smart or Street Fighting? Megacities Must Drive the Way Forward



About the Author

Steve Bell is an accomplished strategy and technology analyst whose coverage at Heavy Reading focuses IoT and related technologies. For the last year he has also been analyst in residence on The Connected Car providing insight on the future of this emerging industry. Steve joined Heavy Reading in 2014 after an extensive executive career in industrial applications and then Telecoms with Motorola in Germany, the U.K. and the U.S. He is also an entrepreneur having founded two companies: one an analysis and advisory firm the other a digital city services platform focused on parking. Steve is a frequent speaker at industry conferences. He can be reached at bell@heavyreading.com.

MEGACITY COUNCIL - A PATH FORWARD

Cities predate principalities and nations, as we now know them. They have transitioned from Roman times, through medieval and renaissance periods to the industrial revolution, and stood the test of civil wars, revolutions and world wars.

Rather than wait for the politically and bureaucratically burdened national and global bodies that are historically focused on preservation of the status quo, the time has come for a new global alliance of megacities. This alliance could create a common set of needs that drives a set of requirements, and provides a seamless environment where CAEVs can become the transformation tools of global mega smart cities.

The creation of economically strong requirements will focus the attention of communication, semiconductor and automotive manufacturers on developing collaborative solutions for large global megacity markets.

This, in turn, could be leveraged by smaller cities to accelerate their transformation programs.

The needs of megacities must drive the process to overcome the embedded bias of the converging worlds of automotive, communications, semiconductor and industrial vendors. This could help breakthrough the standards deadlocks, such as DSRC versus C-V2X, which is delaying deployment of autonomous vehicles.

Autonomous vehicles and mobility-as-a-service are crucial to the economic success and safety of these megacities. A harmonized global approach to the adoption of standards and adaptation of the existing road and infrastructure could accelerate the penetration and success of such solutions and services.

The precedent for this has already been set, with alliances and councils addressing common city actions on climate change. This just

moves these actions from reactive to proactive, and leverages the economic power of the cities to drive a strategic global agenda.

THINKING OUTSIDE OF THE CITY SLICKER BOX

A city slicker is most often thought of as a city dweller who has no experience of living in the countryside, most often typified by the movie *City Slickers* starring Billy Crystal, a middle aged big-city radio ads salesman going through a midlife crisis and learning the meaning of life.

The alliance of megacities not only needs to think about the technical infrastructure of the smart city but also what life in the city will be like. It also needs to take into account life outside and between cities, and how future transport needs of the first and last quarter mile can be most efficiently achieved. The linkage mechanisms need to address life outside of the city, both economically and socially, allowing symbiotic and synchronous access and cohabitation.

There is a real need to think outside of the box about what the vehicle of the future will be. Public transit projects can build on concepts, such as the Toyota "e-palette", to redefine transport and mobility-as-a-service, as well as look at how transport e-palette passageways within cities can be blended with existing transport modes.

As Einstein noted, the thinking that created the current problem is not the thinking that will solve it. So, don't just leave it to the siloed city slickers! Embrace the world, both developed and emerging, including, most importantly, the citizens that live in and around the city. There has never been a better time, or a greater need, to leverage consumer engagement, to help determine citizens' expectations and drive the future! ■



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Barcelona's Smart Mobility Plans Reclaiming Streets for People

In Barcelona, there's a push to reclaim public streets for the people, while bringing better public transportation through mobility.



B ARCELONA – In the 1850s, when Catalan urban planner Ildefons Cerdà i Sunyer designed the Eixample – the expansion of Barcelona outside the old city walls – he envisioned a city based on community living, where people could interact on full streets, with a wealth of public and private gardens, and where transportation of people and goods wouldn't dominate public space.

The Eixample is widely considered one of the best-designed city areas in the world and a case study for urban planners. It is mentioned by leading architects, such as Jan Gehl – a global leader in people-centered urban design – in the same breath as Copenhagen and Lyon, as the epitome of a great European city.

What Cerdà could not foresee in his plan, approved by the city in 1859, was the arrival of the automobile and the resulting transformation of mobility that took place in the middle of the 20th Century.

To accommodate the surge in private car ownership, most of Barcelona's streets became car-oriented during the second half of the 20th century, reducing the space that pedestrians could use, and making it impossible to enjoy other activities on the street.

The only "right" people could exercise on the street was mobility.

Currently, Barcelona has 912 kilometers (567 miles) of roads and streets dedicated to motorized traffic.

"Private vehicles are using 60% to 70% of the streets. If we want to give preference to other modes of transportation, this can only be done by reducing the space for private vehicles," says Mercedes Vidal, Barcelona's Councillor of Mobility, and President of the Metropolitan Transport Authority of Barcelona.

SUSTAINABLE PUBLIC TRANSIT WITH LIGHT RAIL & ELECTRIC BUSES

One of the critical projects of the current city administration, Vidal says, is to join the two tram (light rail) lines that run along different sections of Avenida Diagonal, a major thoroughfare that crosses the city. Streetcars can move many more people than bus lines and will help alleviate current traffic, noise, and pollution problems caused by the volume of cars, trucks and buses along Diagonal.

Another project already underway is replacing Barcelona's entire fleet of public buses with less-polluting hybrid or fully electric units.

Furthermore, the Barcelona Transport Authority, or Transports Metropolitans de Barcelona (TMB), has been piloting different versions of electric buses under the European project ZEUS. Currently, the city has a total of eight electric buses operating in different lines.

Two of those are 18-meter (60-foot) articulated buses equipped with overhead charging by pantograph. That allows TMB to charge up to 80% of the batteries in less than eight minutes at the end of the line. This feature not only makes charging faster and convenient, allowing the buses to run continuously for an entire day of service, but also permits using smaller batteries, reducing cost on the initial capital expenditure, and power usage due to less weight.

After running one of the longest lines in the city for two years with one of the articulated electric buses, TMB has calculated that the total cost of ownership (TCO) over 10 years of those buses, including the cost of initial charging infrastructure, is less than buying a similar diesel unit.

TMB also operates the Barcelona underground, or Metro, which carries

Barcelona's Smart Mobility Plans Reclaiming Streets for People



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more than 2 million passengers per day. Although the length of the network has increased five-fold in the past 25 years, and the number of lines doubled, the staff size has remained basically the same. Investment in automation is the key.

An automatic driving solution was first developed by the Barcelona Metro engineers in 1961 and was running on the then new Line 5. The system used photoelectric sensors to operate the train. Passengers were not confident with a driverless train at that time, so the Metro authority was forced to have a human driver in the cabin to be seen.

These days, most of the trains in operation are fully automatic, and three lines -- L9, L10 and L11 -- are run with driverless units. The rest are fully autonomous, and drivers only operate doors to ensure passengers' safety and are not in the cabins anymore.

CYCLING—THE MOST SUSTAINABLE PUBLIC TRANSIT

The Barcelona government is determined to promote cycling as one of the main mobility options around the city. Barcelona's biking program is one of the oldest and arguably the

“The Eixample is widely considered one of the best-designed city areas in the world and a case study for urban planners.”

most popular bike-sharing initiative in the world, with nearly 100,000 registered users, mostly city residents.

There are other bike-sharing and bike-rental services in Barcelona serving visitors.

Since Ada Colau took office as mayor of Barcelona three years ago, her administration has doubled the network of separated bike lanes around the city, up to more than 450 kilometers (280 miles) of them.

SUPERBLOCKS: THE GAME CHANGER RECLAIMING PUBLIC SPACE & REDUCING TRAFFIC

The Superille (Superblock) is defined by a grid of nine blocks where the main mobility happens on the roads around the outside the Superblock, and the streets within the Superblock are for local transit only. The one-way system inside the Superblock makes it impossible to cut through to the other side of the Superblock. That gives neighbors access to their garages and parking spaces but keeps the Superblock clear of through traffic.

The full implementation of the Barcelona Urban Mobility Plan (PMU), which was approved by the city

council five years ago, will transform city life and the way people use public space. Curbside parking within the Superblocks will disappear (by building off-street garages), and the maximum speed will be 10 kilometers per hour (6 mph), allowing people to use the streets for games, sports and cultural activities such as outdoor cinema.

By then, Barcelona will have cut 355 kilometers (220 miles) of roads dedicated to motorized traffic (a 61% reduction), and pedestrians will enjoy 94% of the space on the inner streets of the Superblocks. Pollution will be reduced dramatically, ensuring that 94% of the population will not be exposed to dangerous levels of particulate matter, and 73.5% will not experience noise levels over 65 decibels, according to the Superblocks plan by the Agència d'Ecologia Urbana de Barcelona.

The plan, however, has been delayed several times, and the current administration has scaled back the implementation to just a handful of Superblocks by 2019.

MOBILITY-AS-A-SERVICE USING TECHNOLOGY

By the end of this year, Barcelona plans to launch the T-Mobilitat, the new contactless public transit payment system that will integrate all forms of mobility into one platform.

The T-Mobilitat has been under development and was announced several years ago, and the system is now ready for deployment. Similar to other contactless solutions currently used in many cities around the world, the T-Mobilitat will not be just a top-up, contactless card. It will be a complete mobility-as-a-service (MaaS) system integrating all forms of public transport, including subway, buses, light rail, shared bikes and taxis.



Barcelona's Smart Mobility Plans Reclaiming Streets for People

“Private vehicles are using 60% to 70% of the streets. If we want to give preference to other modes of transportation, this can only be done by reducing the space for private vehicles.”

The system will allow people to choose between different levels of service, including having several plans associated with each account. While they will be typical, top-up, contactless cards to use the service, most people may use their contactless bank cards, or their smartphones for convenience.

The T-Mobilitat account will automatically adapt to the user and adjust the fares to offer the most advantageous plan for recurring users.

MOBILITY POLICIES FACE INITIAL PUBLIC BACKLASH

The main opposition party in the Barcelona city council, Esquerra Republicana de Catalunya (ERC), wants to use parking regulation as one of the primary policies to tackle pollution in the city. ERC City Councillor Jordi Coronas says he believes that parking rates need to be doubled, especially for more polluting vehicles, and the city needs to start charging motorcycles for the public space they use.

In Barcelona about half of the 140,000 curbside parking spaces are regulated, leaving more than 70,000 free of charge. This is not only an invitation to use those

spaces as long-term storage for rarely used cars but an enormous loss of potential revenue for the city.

“There is no such thing as free parking! Free parking represents lost revenue, squandered land and polluted air. Parking garages are not more than an antisocial car subsidy,” writes Donald Shoup, a distinguished research professor of urban planning at UCLA, in his book, *The High Cost of Free Parking*.

The current administration is planning to ban older, polluting cars from entering or driving within the town during weekdays starting January 2019. ERC is also proposing a congestion charge for other vehicles coming from outside the Barcelona metropolitan area.

Unfortunately, these announced policies have drawn strong public opposition, and political parties are worried about the impact on next year's municipal elections. That's why some parties are either publicly fighting restrictions to motor vehicles or just staying out of the discussion.

Jordi Coronas explains it plainly: “Mobility policies need not be advertised on election campaigns,

and they have to be implemented at the beginning of the mandate. Any restrictions on private vehicle mobility are usually rejected by 70% of the public immediately after being implemented, but they are accepted by 70% of them after three years.”

THE GOOD OLD DAYS OF THE AUTOMOBILE ARE OVER

Cities are faced with the potential impact of having more cars, even electric ones, clogging streets. That will likely result in abandoning sustainability and other benefits that walking, cycling, and public transport bring to residents.

“It's no secret that the good days of the automobile are over,” Gehl told *Fast Company* earlier this year in an interview. “In 2009, we saw the peak of driving in the world, and it's on the way down. The automobile was a good thing in the ‘Wild West’ of Detroit in 1905... The days of the automobile as something for everyone in the world are definitely over... In a denser city, with walking and bicycling you can get anywhere quickly.”

“What we have to address now is making livable, healthy, safe, and sustainable cities,” he concludes. ■



About the Author

Pablo Valerio is a technology writer and consultant working out of his home city of Barcelona, Catalonia.





State of the Market Report Series

Cities and vehicles have had a symbiotic existence for the last 100-plus years. However, transformational forces are impacting both in very drastic and rapid ways.

This three-part State of the Market series from TU-Automotive looks at the forces and their impact, and considers how the symbiotic relationship must evolve.

Coming soon the next 2 installments in this exclusive report series...

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