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Technology Is Monitoring the Urban Landscape.

SAN FRANCISCO — Big City is watching you.

It will do it with camera-equipped drones that inspect municipal power lines and robotic cars that know where people go. Sensor-laden streetlights will change brightness based on danger levels. Technologists and urban planners are working on a major transformation of urban landscapes over the next few decades.

Much of it involves the close monitoring of things and people, thanks to digital technology. To the extent that this makes people's lives easier, the planners say, they will probably like it. But troubling and knotty questions of privacy and control remain.

A White House report published in February identified advances in transportation, energy and manufacturing, among other developments, that will bring on what it termed "a new era of change."

Much of the change will also come from the private sector, which is moving faster to reach city dwellers, and is more skilled in collecting and responding to data. That is leading cities everywhere to work more closely than ever with private companies, which may have different priorities than the government.

One of the biggest changes that will hit a digitally aware city, it is widely agreed, is the seemingly prosaic issue of parking. Space given to parking is expected to shrink by half or more, as self-driving cars and drone deliveries lead an overall shift in connected urban transport. That will change or eliminate acres of urban space occupied by raised and underground parking structures.

Shared vehicles are not parked as much, and with more automation, they will know where parking spaces are available, eliminating the need to drive in search of a space.

"Office complexes won't need parking lots with twice the footprint of their buildings," said Sebastian Thrun, who led Google's self-driving car project in its early days and now runs Udacity, an online learning company. "When we started on self-driving cars, we talked all the time about cutting the number of cars in a city by a factor of three," or a two-thirds reduction.

In addition, police, fire, and even library services will seek greater responsiveness by tracking their own assets, and partly by looking at things like social media. Later, technologies like three-dimensional printing, new materials and robotic construction and demolition will be able to reshape skylines in a matter of weeks.

At least that is the plan. So much change afoot creates confusion.

"We know for sure that there will be a lot of physical changes to our cities," said Timothy Papandreou, the chief innovation officer for the San Francisco Municipal Transportation Agency. "Streets will be redesigned. There will be lots more real-time data. Automation will be everywhere. But it's also crazy: Things are changing so quickly that we can't pretend to have all the answers."

One reason for confidence in a radically changed future is that much of it is already here. The city's Uber and Lyft, the Boston-based auto-sharing company Zipcar and things like corporate shuttle buses have shown new ways for urban dwellers to use vehicles. Skylines in cities like London and Shanghai are full of unusually shaped buildings, thanks in part to computer-assisted design.

Rare robots can build with bricks, or monitor and rebuild the underground water, sewage and electrical pipes that make a city functional. It is hard to find a new municipal vehicle that does not come with a tracking system.

To the planners, innovations like automatic cars that learn people's habits are simply an extension of trends. Mr. Papandreou said 13 companies are testing automated vehicles in the city. "We're inviting start-ups to come in and work on the problems we have," he said.

The city is developing a policy for drone-based deliveries. Emergency medical goods, transported from an airport to a hospital, are likely to be first, he said. But consumer goods may eventually be delivered by air.

Besides drones, the abundance of vehicles now on urban sidewalks, including motorized wheelchairs, scooters and hoverboards, is another intimation of the variety of ways people and things are expected to move, as digital technologies make these modes of transportation cheaper. Likewise, temporary offices and pop-up stores may foreshadow an urban landscape that changes faster than ever.

One danger of the new city may be the age-old faith that technology makes things better, and more tech is best.

"The danger of big dramatic projects is that they become the equivalent of urban renewal or the kind of sweeping things Robert Moses did for cars in New York that created dysfunction," said Paul Saffo, a technology forecaster. "The best thing tech could do now is rescue us from the car-centric cities we built after 1930."

The new techno-optimism is focused on big data and artificial intelligence. "Futurists used to think everyone would have their own plane," said Erick Guerra, a professor of city and regional planning at the University of Pennsylvania. "We never have a good understanding of how things will actually turn out."

He recently surveyed the 25 largest metropolitan planning organizations in the country and found that almost none have solid plans for modernizing their infrastructure. That may be the right way to approach the challenges of cities full of robots, but so far most clues are coming from companies that also sell the technology.

"There's a great deal of uncertainty, and a competition to show they're low on regulation," Mr. Guerra said. "There is too much potential money for new technology to be regulated out."

The big tech companies say they are not interested in imposing the sweeping "smart city" projects they used to push, in part because things are changing too quickly. But they still want to build big, and they view digital surveillance as an essential component.

"Digital infrastructure is like plumbing or electricity. You can't just have point-by-point solutions," said Rick Huijbregts, managing director of the Americas division of the computer networking company Cisco Systems. "Cars have to talk to other transit, to traffic lights, to law enforcement."

Is that creepy? "Our next generation, born after 1995, doesn't know a life without computers," he

said. “They don’t know a way of living without this.”

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