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Everybody talks about smart cities, but few are doing anything about it.

New York City is an exception. It's in the early stages of an [ambitious project to blanket the city with ultrafast Wi-Fi via smart kiosks](#), which will replace obsolete public telephones.

These kiosks are the work of a Google-backed startup called Intersection. The company has already installed around 1,000 kiosks, and aims to install more than 6,000 more, Intersection Chief Innovation Officer Colin O'Donnell said in an interview this week.

Each kiosk is around nine feet high and relatively flat. Each flat side houses a big-screen display that pays for the whole operation with advertising. The screens also show emergency and other public information.

A smaller user terminal on the skinny edge facing away from the street allows one user at a time to access information and make calls. The screen is a locked-down Android tablet with a custom interface offering a few apps to access various services, including one for paying parking tickets and another for voter registration.

Below the screen on the left is a big, red button for a one-press 911 emergency call. Under that is an audio jack, where non-iPhone users can insert their headphones or earbuds for privacy. (The hardware supports standard audio jacks, but not Apple's newer lightning cable configuration.) Next to those options is a numeric keypad for dialing calls. And below all that are two USB ports for charging devices.

Each kiosk provides free, high-speed Wi-Fi for anyone in range. By selecting the Wi-Fi network at one kiosk, and authenticating with an email address, each user will be automatically connected to every other LinkNYC kiosk they get within range of. Eventually, anyone will be able to walk around most of the city without losing the connection to these hotspots.

Wide-angle cameras on each side of the kiosks point up and down the street and sidewalk, approximating a 360-degree view. The company claims it deletes stored videos after 7 days, unless there's a compelling



reason to keep them, according to O'Donnell.

While the built-in kiosk tablet doesn't appear to offer a high-performance user experience, the public Wi-Fi is blistering fast — far faster than the average connection speeds offered by mobile carriers over cell networks. Some New York content creators producing massive amounts of content, such as HD videos, are now hauling their laptops down to the street for faster uploading.



Intersection Chief Innovation Officer Colin O'Donnell

Intersection has already installed 1,000 LinkNYC smart kiosks on New York sidewalks. It's planning more than 6,000 more.

This is possible because LinkNYC kiosks are connected by fiber, courtesy of a network installed by carrier-neutral dark fiber startup ZenFi, which launched in 2014.

It's paid for by the advertising and costs nothing to taxpayers. In fact, the city is expected to earn \$500 million over the 10-year Intersection contract.

[London is the second Intersection city](#), where the project is called InLinkUK and the kiosks are called "InLinks." The London project is more modest, with a goal of around 1,000 kiosks. O'Donnell told me Intersection plans to deploy in 20 more cities after that.

Intersection is tightly conjoined with Alphabet's Sidewalk Labs company, which works to accelerate and guide the creation of smart cities. They even share an office in Manhattan. Other partners in the LinkNYC project include Qualcomm and ZenFi (BT is a partner for the London project).

Smart cities: the immediate impact

LinkNYC is already changing New York; two million people are now using the system — twice as many as in January.

The existence of smart-city implementations like Intersection's LinkNYC means that New Yorkers won't actually need mobile contracts anymore. Most who would otherwise pay for them will no doubt continue to do so for the convenience. But those who could not afford a phone contract in the past will have ubiquitous fast connectivity in the future.

This strongly erodes the digital divide within smart cities. A 2015 study conducted by New York City found that more than a quarter of city households had no internet connectivity at home, and more than half a million people didn't own their own computer.

At the same time, smart city kiosks widen the gap between urban and rural people, where the urban take a big leap forward and the rural stay behind with no solution in sight.

Smart cities are built on citywide fiber networks, which can eventually (as with the case of ZenFi's network) connect 5G wireless antennas on every street corner and every floor of every office building back to the

core network. This densification of the wireless networks is the true hero of the smart cities revolution, enabling not only smart-city kiosks, but capacity for high-speed wireless applications on smartphones and tablets, widespread IoT deployments, mobile augmented reality applications, self-driving cars and more.

It's also amazing that New York is leading the smart city charge. Because if the concept can make it there, it can make it anywhere. Dark-fiber deployments in New York typically cost far more than in just about any other city because of heavy unionization and the scale of any disruption when streets have to be closed for fiber installation.

New York's example in aggressively enabling thousands of high-speed kiosks also puts pressure on other U.S. cities to follow suit. The first step is not only to wire up entire cities with fast fiber, but to architect it in a way that enables flexible deployment, as ZenFi is doing. And this is the best part of the smart cities revolution.

Smart cities: the long-term impact

O'Donnell claims that smart city rollouts happen in three phases, which he says is about "building the city from the internet up."

1. Instrumentation 2. Intelligence 3. Responsiveness.

New York is currently at the beginning of the instrumentation phase, where the immediate benefits are to underserved and under-connected members of the public. Over the next 15 years, the city will go through the other two phases, where sensor data will be processed by artificial intelligence (A.I.) to gain unprecedented insights about traffic, environment and human behavior and eventually use it to intelligently re-direct traffic and shape other city functions.

The two most transformational technologies will be augmented reality (AR) and autonomous cars. AR won't be one specific set of technologies, but many variations that will range from low-bandwidth and even offline applications to ultra HD streaming AR.

New York's LinkNYC kiosks mean everyone in the city will have network support for high-end streaming AR as they move around the city. Enterprises operating in the city can deploy top-of-the-line equipment and applications and rely on 5G connectivity on every block.

And as autonomous cars gradually roll out, New York will be well positioned to be one of the first cities to legalize them, because they'll be safer thanks to 5G, sensors and data from all those kiosks. This will enable a revolution in delivery systems, among other things.

Risks and rewards

Smart kiosks do carry risks, however. One involves privacy. O'Donnell said privacy policies aren't set by Intersection, but are negotiated agreements between the company and the city. So if a city wants to use those cameras and sensors for surveillance, it can.

But the biggest risk revolves around hacking and the theft of data, monitoring of cameras and — a worst-case scenario — eventual control of the "Responsiveness" phase technology, where mayhem is deliberately



caused.

Futurists and tech pundits often assume that if a beneficial set of technologies exists, it will be implemented and widely distributed. But this is obviously not true. Technology revolutions require drivers to realize them.

In this case, New York City and Intersection are the drivers, showing the enormous benefits of ubiquitous high-speed wireless, as well as connected sensor stations all over a city. This will drive huge demand in other cities to replicate the technology, which will create demand for city-wide flexible dark-fiber installation, which will transform how enterprises operate.

For enterprises, the advances change assumptions about what's possible for how offices, warehouses, field service, delivery and, eventually, next-generation technologies will work.

The most important calculation is the question of where: Where should offices, warehouses, factories and other major locations be built? Answer: They'll gravitate to smart cities. Because the benefits to enterprises of ubiquitous and dense high-speed wireless, sensor-based city services and fiber everywhere will prove incalculable.