

Remarks of FCC Commissioner Michael O’Rielly
Partnering with Communities Today to Build Smart Cities of Tomorrow
October 30, 2018

Thank you, Adam, for that very kind introduction and for inviting me to join you all so early in the morning to discuss Smart Cities and what it is going to take to make this conceptual vision more of a reality.

On its face, Smart Cities may appear as an odd or perhaps a misaligned topic for comment by someone from the Federal Communications Commission. I mean, what does the FCC know about cities, or being smart, or partnering with anyone, for that matter? I joke. Upon closer inspection, however, several elements involved in the deployment of Smart Cities rely on Commission activity or involvement. More importantly, success likely will involve entities that are regulated by the Commission in one form or another. Together, this piques my interest and hopefully justifies sharing my insight.

Before I delve into the policy matters, I think it is important to have a framework of what is meant by “Smart Cities.” At the most basic level, experts tend to refer to Smart Cities as the collection, use, and analysis of enormous amounts of data from sensors, other devices, and the like, to improve functionality, cost, and efficiencies of local governments and the surrounding communities. The ultimate beneficiary of these advancements is the American people, who will enjoy more mobility and transportation synergies, greater health care solutions, public safety improvements, superior productivity, and so much more. All told, annual estimates of the potential benefits from Smart Cities range from the hundreds of billions to trillions of dollars.

Despite these positives, the phrase “Smart Cities” must be used in a nuanced and sensitive manner. For instance, there should not be an implication that the term only pertains to the large, urban cores in our nation. Many smaller and mid-size areas may implement new “smart” technologies, although perhaps to a lesser degree depending on their respective population density and needs. Also, I realize “smart” is intended to denote connected, but I would be disappointed if this term was used to delineate between “smart” versus “dumb” communities. It should be used to designate those that adopt advanced technologies into their city planning, but not to dismiss those that may have a different approach. I think we have all had days in which we wished we weren’t as plugged in as we are, so there may not be one right approach.

With that understanding, let’s explore some of the policy issues and discussions that may be necessary to make Smart Cities happen in the near term.

Applicable Technology Advancement

Any conversation about Smart Cities appropriately begins with a discussion of the applicable technology. That’s because a truly Smart City – which is really the premier use case for the Internet of Things – is more than the connections used or coordination of the judicious picking-up of garbage cans or timing of street lights, although no offense intended, as they can be helpful improvements in many cities, including Washington, D.C. To analogize, it’s the difference between a car with sensors or radars to detect lane change obstructions and a truly autonomous vehicle that is constantly and rapidly analyzing its surroundings. Making this larger, more complex vision happen will require technological advancements, the installation and efficient use of billions of sensors and devices, cloud computing, data analytics, and much more. While its architecture may be somewhat simplistic, the raw calculations

and data refinements necessary for many Smart City applications will require enormous and instantaneous cooperation among the moving technological pieces. This means incredibly low-latency and high-capacity networks, along with computing power never seen before. In other words, it will demand the next level of high-tech, scientific capabilities.

If we get things right, not only can Smart Cities be a benefit to local communities, but they can also serve as a catalyst for new technology advancements and problem-solving. Think of it as the dawn of the next microprocessor or fiber-optic cable.

Fiber

Speaking of fiber, it is a near certainty that for Smart Cities to actually work, they will need hundreds of thousands of miles of fiber-optics to carry all of the applicable information back and forth. That is not in any way discounting the valuable contributions that current wireless services make, and the role future advanced services will play in the exchange of such traffic. Instead, it's a recognition that at the heart of a wireless network, even an unlicensed one, there is usually a wire — at least today. While wireless and wired offerings will serve as substitutes on the retail and consumer side, fiber will continue to be a critical component to wireless service, even if it is solely for backhaul purposes. In sum, fiber will be invaluable to meet the overall demand for network capacity.

And, all the facts show that Internet traffic has increased exponentially year after year. Consider a Cisco report that estimates that global Internet traffic will see an almost three-fold increase from approximately 100 exabytes per month in 2016 to 278 in 2021. Further, the connections of billions of sensors and devices from Smart Cities will only accelerate this growth, generating more strain on existing and increasing demand for additional fiber networks.

Ultimately, fiber assets are likely to continue to be in high demand. The recent report commissioned by NCTA provides a compelling argument that cable operators are in a prime position to provide these resources and be a lead participant in Smart Cities. And, the market is reacting accordingly, as fiber networks are receiving increased attention and interest from Wall Street to communications company boardrooms, with cable enterprise plays becoming more of a focus in that analysis.

For our part, the FCC has been centered on ensuring that the proper regulatory framework exists for providers to offer services and expand infrastructure deployments to meet consumer demand. In particular, the Commission has completed numerous items to remove state and local barriers to the deployment of both wired and wireless broadband networks. We have also worked to remove outdated pricing rules, regulatory restrictions that no longer make any sense, and mission creep by over-aggressive regulatory agencies. And, I've been outspoken on the need to reconsider the existing fundamental obligations imposed on cable companies.

Spectrum

Getting back to wireless, as I mentioned, these networks will be used extensively to transport data back and forth from devices to the underlying fiber system. To ensure that the nation's networks can handle the traffic increase expected in a world where everything is wirelessly connected, the Commission has been doing everything it can to ensure the requisite licensed and unlicensed spectrum is available. Different Smart City applications will have different capacity, speed, and latency requirements; therefore, the Commission has provided opportunities in low-, mid-, and high-band spectrum to meet

the needs of a broad array of applications. While I will not bore you with all the specifics today, I would like to mention a few developments.

In approximately two weeks, the Commission will start the 28 GHz auction, which will launch a new era of millimeter wave auctions, with the 24, 37, 39 and 47 GHz band to follow next year. While this is a start, the Commission must also continue its work on other bands, such as 26, 32 and 50 GHz, to ensure there is a future high-band spectrum pipeline. The Commission also recently finished its review of the 3.5 GHz licenses to ensure that the 70 megahertz will attract the needed investment and foster the large-scale deployment to support Smart City technologies and other uses. Further, the 80 megahertz of GAA, or unlicensed portion of the band, should be available later this year. Next up, the Commission must focus on opening up the 3.7-4.2 GHz band and spectrum below the 3.5 GHz band.

Finally, but just as important, Smart Cities will benefit from additional new unlicensed opportunities. While the Commission has opened spectrum for unlicensed uses in the millimeter waves, I am most excited about the 6 GHz notice that we voted on during the last meeting. This spectrum, along with the neighboring 5 GHz, would provide the large swaths of spectrum needed to deploy the next-generation unlicensed systems that will meet the data demands of Smart Cities.

Transportation

One of the sectors that likely will affect and be the most affected by IoT and Smart Cities is the automotive and transportation industry. One study estimated that the connected vehicle market has a potential application revenue of \$253 billion by 2025. The “connected car” is a reality, and fully autonomous cars are on the horizon. The current focus on cellular vehicle to everything technology, or C-V2X, seems to be a game-changer as it leverages existing LTE networks. The advancement makes DSRC in the 5.9 GHz band even more antiquated and questionable. It is time to start a proceeding to holistically review the band and determine the best use for this valuable 75 megahertz of spectrum. Certainly, it should be possible to provide at least 45 megahertz for unlicensed use, while ensuring current automobile safety spectrum use.

Beyond connected and autonomous vehicles, cities are upgrading transportation systems, making them more efficient and saving commuters time and money. For instance, sensors can be used to recognize cars in a parking lot, routing people to available parking spaces, and getting them off the road faster. Congestion can be reduced by informing connected street signs and traffic lights to redirect traffic away from locations where there is a traffic buildup or an accident. Connected networks can also be used to dynamically route citizens quickly through a city using public transportation, such as buses or ride share services like Uber, and inform them when maybe the Metro or subway is the best means to get from point A to point B.

Lastly, localities will be able to remotely monitor infrastructure, such as bridges, in real-time, as opposed to the current model of infrequent visual inspections. Going forward, sensors installed on bridges will monitor for structural integrity and environmental factors, alerting localities that small bridge repairs are needed, as opposed waiting until it is necessary to undertake three to four years of repairs that close down half of, let’s say, Memorial Bridge. Similarly, D.C. commuters can probably get behind monitoring that steers commuters away from particular roads and bridges when they start freezing over, which can lead to extensive winter commutes.

Privacy/Surveillance

A significant concern with so much data being collected, used, and analyzed in Smart Cities is what happens if it is used for mischievous purposes, or worse, to increase the surveillance of innocent Americans. This is not some blind hypothetical, because there are known examples globally of states using advanced technology to keep track of their citizens and take action against unapproved behavior. More concretely, the departure of a high-level, lead consultant to Google's Smart City effort in Toronto due to a lack of privacy protections should cause everyone pause.

Today, many cities maintain networks of cameras and surveillance technology — all used presumably to protect public safety. But with Smart Cities, the level of data available on individual citizens will be astronomical. Moreover, such data would rest in the hands of the government itself or another approved entity, which will necessarily have the means and opportunity to abuse the data for harmful purposes. In the case of Google, the main struggle seems to be over when such data is autonomized, if ever.

It always surprises me when privacy advocates, either domestically or internationally, are willing to take to the streets over a company seeking to use consumer-driven data for commercial purposes. In doing so, they are completely missing the bigger picture. Specifically, even if you believe in some imaginary right to be left alone, real harm doesn't come from some entity trying to sell you a new pair of pants or a book. The real worry for privacy advocates and the public should be the combination of data with police and military powers, and the state's potential to use data for the purpose of controlling or punishing its citizenry. How governments can create a comfort level with the potential privacy implications of Smart Cities remains to be seen and represents an increasingly heavy lift.

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In conclusion, I appreciate the opportunity to share some thoughts about Smart Cities, including some relevant issues being addressed by the Commission. At the same time, hopefully, I have highlighted how much of the Smart Cities work will be done by the private sector and those companies willing to put capital at risk. In the end, companies sitting in the cat bird's seat may be those that already have the technology in place to make this happen in the very near term.