

**STATEMENT OF SHIREEN SANTOSHAM, CHIEF INNOVATION OFFICER,  
SAN JOSE MAYOR'S OFFICE OF TECHNOLOGY AND INNOVATION  
BEFORE THE HOUSE SUBCOMMITTEE ON COMMUNICATIONS & TECHNOLOGY  
THE RACE TO 5G AND ITS POTENTIAL TO REVOLUTIONIZE AMERICAN COMPETITIVENESS  
NOVEMBER 16, 2017 WASHINGTON, DC**

Good morning, Chairman Blackburn, Ranking Member Doyle and members of the Committee. I am pleased to be here to discuss how cities are leading the country in creating an environment to speed deployment of next generation networks. And, how reinforcing local government rights to manage the public rights of way, rather than circumventing these rights, will result in faster, cheaper, and higher quality broadband for all Americans.

**Personal background**

I am Shireen Santosham, Chief Innovation Officer for Mayor Sam Liccardo in San José, California which is the 10<sup>th</sup> largest city in America and the largest city in Silicon Valley. In my role, I lead efforts to make San José the most innovative city in America by embracing technology to improve the lives of our residents. In the past two years, we launched efforts to expand broadband for all of our residents, pilot autonomous vehicles on our streets, deploy an “internet-of-things” network, and activate our start up community to tackle civic challenges. I also currently serve as an alternate representative for Mayor Liccardo on the FCC Broadband Deployment Advisory Committee charged with advising the FCC on how to speed broadband deployment throughout the United States.

Prior to joining the City of San José, I worked for GSMA, the mobile network operator association representing 800 wireless companies globally and an additional 300 companies in the broader mobile ecosystem. While there I conducted primary research in over 20 countries and authored several reports on how to bridge the digital divide for women at the base of the pyramid globally through mobile technology and access to the mobile internet. This research was presented at Mobile World Congress in Barcelona, the United Nations Commission on the Status of Women 59/Beijing +20, and several other forums around the world. In addition, I have worked on several innovative initiatives while working with McKinsey & Company, multiple nonprofit organizations, and as an impact investor for Microsoft co-founder Paul Allen's Vulcan Capital. My background working across sectors, on different sides of the table with the wireless industry, government, and with communities affords me the unique opportunity to look at broadband deployment from a holistic perspective.

I want to thank the Committee for calling attention to the importance of broadband deployment in our communities by holding this hearing and appreciate the opportunity to provide the critical perspective of cities and our role in promoting broadband deployment. I want to particularly thank Congresswomen Eshoo not only for her focus on this issue, but for her excellent service for all Californians – we are truly fortunate to have her represent us.

## **Cities are embracing technology to improve their communities**

No one wants broadband deployment and competitive broadband choices more than local communities. We understand the opportunities that broadband presents for our local communities and our residents in terms of public safety, economic development, healthcare, entertainment, and education. For years, communities of all sizes around the nation have taken innovative steps to increase the deployment of broadband infrastructure, both wired and wireless, while protecting public safety as well as providing a fair approach to use of the public rights-of-way.

We live in an exciting time from a technological perspective. I often say I have the most fun job in the City of San José because I have a front row seat to the latest and greatest technologies Silicon Valley has to offer and get to shape policies to usher in the next generation of the internet.

In San José we welcome technological advancement with open arms. This year, we launched an effort to bring autonomous vehicles to San José – our initial call for proposals garnered 30 submissions from leading companies around the world. We are currently evaluating a short list of companies and will make announcements about pilots early next year. We also launched a civic challenge called “Unleash Your Geek” to crowdsource solutions from our residents to improve our city. The first challenge was to tackle the graffiti problem in the city – an issue that causes us to spend up to \$60,000 every time we have to shut down a highway to clean a freeway overpass. Out of 140 entries, the winner was a husband and wife couple who built a human-controlled, spray-painting drone prototype in their living room for less than \$5,000 that has the potential to save millions while keeping workers safer in the long term. The couple is now working with CalTrans to prove out the solution and scale.

Additionally, we have several experiments underway to bridge the digital divide and get connectivity to our low-income population. Our innovative “demonstration policy” allows us to test and iterate pre-commercial products in partnership with private sector on a temporary basis. Through this program we are collaborating with Facebook to demonstrate and launch their Terragraph network early next year that, if it works, has the potential to provide free, outdoor gigabit-speed internet access to our downtown. We are also partnering with our largest school district, via a public technology bond, to fund the private sector to provide internet access to the children on the east side of our city so they can do their homework at home if they cannot afford to pay for a service themselves.

As the largest city in Silicon Valley, we understand inherently how powerful technology can be to drive economic growth and competitiveness. Broadband infrastructure is foundational to unlocking this potential. Just this past Monday, we released our Broadband and Digital Inclusion Strategy for the city which included recommendations to speed broadband deployment through streamlining our own processes, allowing for companies to work with a single point of contact to deploy small cells, and creating incentives for them to invest in underserved areas of our city through dynamically pricing our infrastructure assets which passed unanimously through our City Council. We know that working together with broadband providers is the only way we will be able to provide high quality service to our residents and bridge the digital divide and are actively looking for ways to streamline our own processes.

We are not alone in our approach to creating a more welcoming environment for the private sector to work with us and to deploy networks more quickly. The City of Boston has already approved or installed 656 small cells with 90% approved within 10 business days, 100% within 28 business days. Their program is based on the following five principles, which are a good example for all cities: 1)

standardized license agreement, 2) cooperative design process, 3) multiple pricing models, 4) community communication, 5) simple, online application system. Many cities have, or are in the process of, developing guidelines for small cell deployment that create a balanced approach that speeds deployment for corporations while allowing cities to retain local management over the public rights-of-way to ensure that public safety and aesthetic needs are being met, ensuring taxpayers are fairly compensated for use of infrastructure they paid for, and incentivizing equitable build out in areas traditionally underserved by the industry.

Given our innovative approach to technology as a city, and the work of cities across the country broadly on finding creative ways to ensure their residents get high quality, affordable broadband, we were surprised when our forward-leaning city was held up as an example by industry of local government bureaucracy and of how cities act as regulatory barriers to broadband deployment—including inaccurate claims around the prices we charge for access to our light poles. Certainly, there are always ways to improve processes to speed deployment, especially since cities often lack the capacity and funding to retool quickly when new technologies like small cells hit the market. But cities and local governments alone are not the root cause of slow broadband deployment – and pre-empting their authority will likely result in unintended consequences that hurt consumers in the long run. Industry players, structural barriers, and competitive dynamics in the American broadband market also contribute to the challenges of broadband deployment and these concerns should be carefully considered when holistically addressing this issue.

### **Incentivizing equitable 5G deployment**

Embracing 5G and similar forms of millimeter wave technology is a part of the approach we are taking in San José to enable this next wave of innovation to occur. Ushering in a gigabit future will no doubt have wide ranging benefits – from enabling new advances like connected and autonomous vehicles, unlocking augmented and virtual reality, and creating other new markets. But, there are two critical issues around the technology that should be considered, first that 5G and millimeter wave technology is in early stages of development, and second, how this technology is deployed and who benefits matters.

Although the promise of 5G is widespread, the standards won't be set until 2019. So we still will need to see proof points around the technology. While it delivers lightning fast speed in labs and early trials, there are real-world problems of scale still to overcome. Generally, as you move to higher frequencies, transmission range gets shorter—hundreds of meters rather than kilometers. And signals are unable to penetrate walls easily, sometimes even windows treated to block UV rays. Further, some experts remain skeptical on the evolution of the technology and the ability to invest at the levels needed to deploy at scale.<sup>1</sup> So, how this technology plays out remains to be seen and we should all be cautious about making drastic changes to how we historically manage the public rights-of-way in order to accommodate one, yet unproven technology that may only serve a narrow portion of our residents.

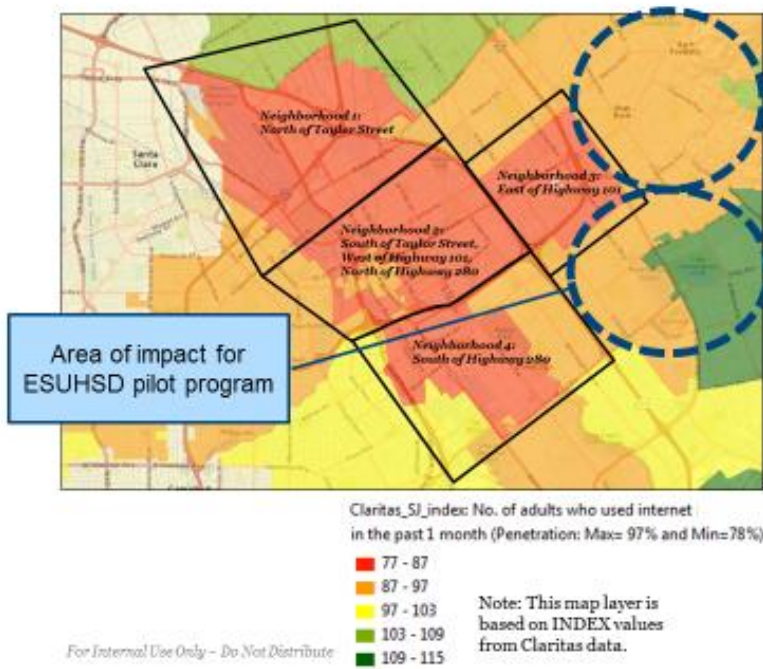
A piecemeal approach where service providers can pick and choose where they service a city also has another unintended consequence – it is likely to result in wealthier, denser, more profitable areas serviced first and more traditionally digitally excluded neighborhoods serviced last (if they are serviced at all). In San José, historically, we took a laissez faire approach to our broadband market, which unfortunately resulted in several neighborhoods underserved by broadband providers mostly in low-

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<sup>1</sup> <https://www.rcrwireless.com/20160616/carriers/5g-bear-case-tag28>

income Latino communities. It also resulted in low fiber-to-the-premises and little competition in the market leading to lower quality of service, consumer choice, and higher prices for our residents. This trend is not unique to San José. According to the Federal Communications Commission, only 22 percent of Americans have more than one option for fast broadband.<sup>2</sup> Americans also tend to pay more for broadband than their counterparts in other developed nations and are less satisfied with their service.<sup>3</sup>

*Current state: San Jose’s primary digitally-excluded group is low-income, Latinos without college degrees living near downtown*



- This analysis examined the **digitally-excluded areas of the City** by zooming in on “hotspots” of digitally-excluded residents
- Our analysis generated **four zoomed-in neighborhoods**, as seen at left
- The area of focus of ESUHSD is indeed a “high” priority area, but appears to **miss an adjoining “very high” area of need**
- Several City buildings (libraries, community centers) exist in these areas that could **anchor City interventions**

<sup>2</sup> <https://arstechnica.com/information-technology/2016/08/us-broadband-still-no-isp-choice-for-many-especially-at-higher-speeds/>

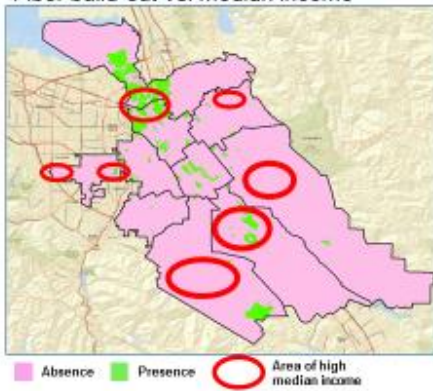
<sup>3</sup> [http://www.slate.com/blogs/future\\_tense/2014/11/21/cost\\_of\\_connectivity\\_study\\_2014\\_americans\\_pay\\_more\\_for\\_slower\\_internet\\_access.html](http://www.slate.com/blogs/future_tense/2014/11/21/cost_of_connectivity_study_2014_americans_pay_more_for_slower_internet_access.html)

<http://www.theacsi.org/news-and-resources/press-releases/press-2017/press-release-telecommunications-2017>

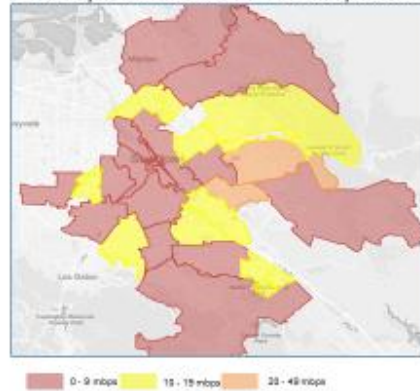
*Current state: Fiber access is limited, and market forces will not solve the problem*

- High-quality fiber access confined to 2.7% of the City's census tracts
- Slow mobile and wireline access is widespread
- Competition is largely limited to two dominant providers
- Few drivers currently forcing providers to offer more
- City is not strongly influencing the market

Fiber build-out vs. median income



User-reported mobile download speeds



Source: FCC 471 (excluding residential and commercial broadband)

**Without City intervention this market dynamic will not change**

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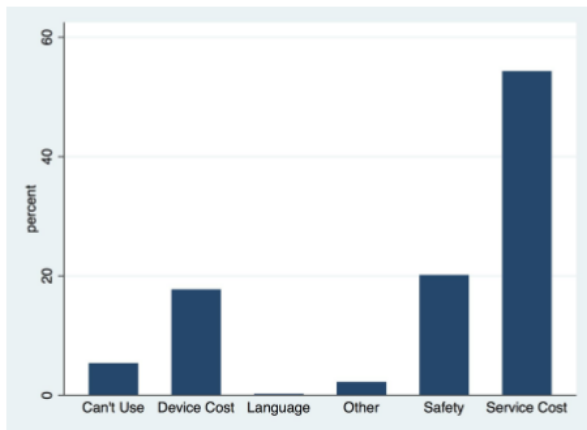
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Source: Price Waterhouse Coopers Broadband Strategy for San José

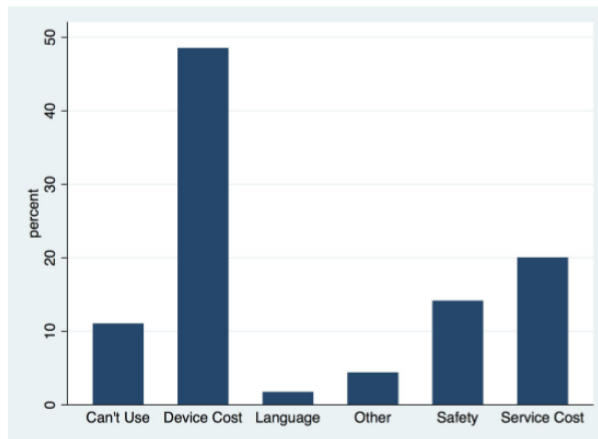
Stories of low-income students with no internet access sitting on the steps of their schools at night trying to access free Wi-Fi to do their homework are unfortunately widespread in San José. The City José is now taking a new approach. We are working with service providers to build out all areas of our city through agreeing to batch processing of permits, network-level planning, and discounts on fees and rates based on digital inclusion provisions that benefit both the companies and our residents.

We take our need to accelerate digital inclusion efforts seriously. We recently completed a survey, in partnership with Stanford University, of close to 700 low-income families with children to understand how to close the “homework gap” and ensure all our residents have an on ramp to opportunity. It shows that the cost of service and cost of devices are the top two barriers to broadband access for low-income populations. And, we have 95,000 residents without broadband access in our city.

## The Top Barrier to Internet Access at Home?



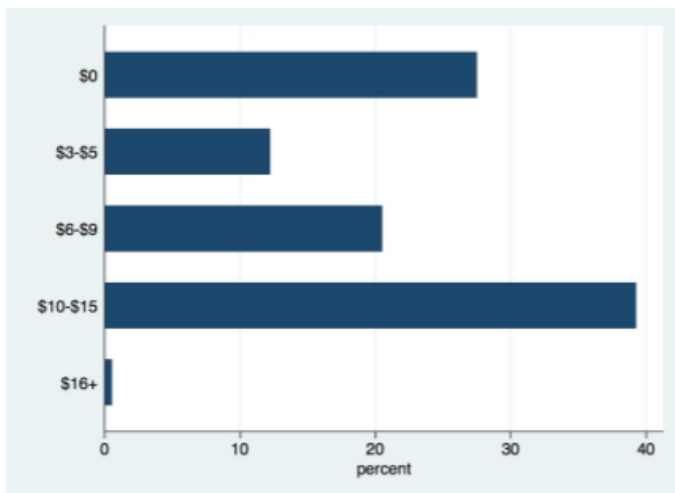
## The Second Barrier to Internet Access at Home



Source: San José Digital Inclusion Report 2017, Stanford University & Great Nonprofits.

Further, of those in our city without broadband access at home, 60% say they cannot afford even \$9/month to pay for access to broadband. This means that low-cost plans offered by most service providers are still out of reach for a large proportion of our unconnected population.

## Understanding Willingness to Pay



Source: San José Digital Inclusion Report 2017, Stanford University & Great Nonprofits.

Taken together, what this means as we look to 5G is that local communities and local governments have a role to play to make sure that equitable deployments happen. And, if we are to give breaks to corporations on use of public assets, we need to make sure that those benefits go back to the public in

terms of lower prices coupled with access in traditionally excluded neighborhoods. Unfortunately, much of the current regulation introduced in states across the country strips away local input over the public rights of way and is fundamentally flawed as it does not ensure that the benefits of broadband reach everyone. And, there are no guarantees that the public, not shareholders alone, will benefit.

### **What we learned from SB 649**

There is currently legislation sponsored by CTIA introduced in 20 states around the country, approved in over a dozen, that aim to streamline permitting processes for small cells and, often, pre-empt local control over the public rights of way by giving companies “by-right” access to public infrastructure. One such bill, SB 649 was introduced in California in this last legislative cycle.

Fortunately, Governor Jerry Brown vetoed the bill. In his veto message, he stated “There is something of real value in having a process that results in extending this innovative technology rapidly and efficiently. Nevertheless, I believe that the interest which localities have in managing rights of way requires a more balanced solution than the one achieved in this bill.”

We believe the governor hit the right chord with this message – although we actively embrace new technology, the rights of local governments and communities to manage the rights of way must be preserved to benefit the public broadly. Below I will highlight issues with the bill.

#### *Cost-recovery fees don't cover costs & can widen digital divides*

In SB 649, the cap on annual pole fee was \$250. The flawed legislation also proposed an additional cost recovery based pole attachment rate that failed to consider many of the actual costs involved with installation attachments to poles such as structural and electrical remediation. The independent California Department of Finance assessed that even in totality these rates were, in fact, below cost and would result in the state having to reimburse cities for the difference under California law.<sup>4</sup> Their analysis also highlighted the concerns that digital divides could widen under this bill stating, “The bill gives telecommunications providers the power to determine where they deploy small cell technologies, which can be highly localized. Providers may cover high-demand neighborhoods first, while low-income neighborhoods may be left underserved. This arrangement follows in the path of high-speed internet service, which has led to uneven access for rural and lower-income areas. Under current law, cities and counties can require, as part of their permitting process, that small cell providers incorporate rural and lower-income areas into their service networks. By pre-empting local government authority, this bill also limits city and county tools to address those equity issues.”

#### *Small cells are not well-suited for rural areas*

Small cells are best suited to deploy in dense urban and suburban environments given their shorter, more powerful signals that require greater density than traditional tower infrastructure. 16%, or over 2 million California households, live in rural areas and therefore this legislation did not fully address the needs of this community.

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<sup>4</sup> <http://www.ca4safertech.com/wp-content/uploads/2017/09/CA-Dept-of-Finance-Bill-Analysis.pdf>

### *Small cells are not “small”*

Although the industry describes small cells as the “size of a pizza box,” the actual dimensions listed in SB 649 for a small cell were 21 cubic feet (c.f.) for equipment on the pole plus up to a 6 c.f. antenna. Additionally, ground-mounted equipment could take this number up to 35 c.f. To put this in perspective, below is a screenshot of a refrigerator’s dimensions pulled from the internet. Note that the dimensions of this large refrigerator match that of what could have be mounted on a pole under this bill, not including the additional equipment. Imagine if a telecommunications firm could, by-right, mount refrigerator-sized equipment anywhere in a city. In San José we estimate that demand for small cells will be around 5,000 in the next 1-2 years. Obviously, these dimensions are concerning from an aesthetic point of view in a city for residents. And, equipment of this size mounted on a pole also requires substantive safety review to ensure structural integrity. Local communities must continue to have the ability to control how and when objects of this size are placed in the public rights of way.

Whirlpool - 21.9 Cu. Ft. Bottom-Freezer Refrigerator - Stainless steel

Model: WRB322DMBM SKU: 3928039 ★★★★★ 4.5 (367) 69 Questions, 154 Answers



### *Pre-emption of local governments led to widespread opposition*

Over 300 cities in California came out in opposition of the bill, including the mayors of the largest cities in California. Editorials and op-eds appeared in many of the major newspapers in the state opposing the legislation including in the LA Times, Sacramento Bee San Francisco Chronicle, and the Mercury News as well as the New York Times. Additionally, groups like AARP and the Labor Federation also opposed the bill. This opposition highlights how contentious these bills can be and the potential for litigation in coming years if legislation is not more carefully designed.

In summary, our experience with SB 649, highlights a number areas relevant for federal action that we believe are important to consider. First, pre-emption of the right for local governments to charge for



access to the public rights of way also takes away the ability to incentivize build outs in low-income or otherwise marginalized areas. If the industry would like to be charged rates like a public utility, then they should also be responsible to serve everyone at affordable prices to consumers. Most of the legislation today is unfortunately too one-sided with the industry asking for the benefits of a public utility without the obligations.

Second, aesthetic concerns matter to local communities and bills that are overly permissive in equipment size and scale are shortsighted. No community will want thousands of refrigerator-sized equipment placed throughout their city with no say in the process.

Finally, there is a real public benefit to local governments acting as a “referee” to manage the public right of way. The public right of way is home to water, sewer, electrical infrastructure as well as traffic lights, streetlights, pedestrians, cars, and *telecommunications equipment*. Only local governments understand local needs, preferences, and how best to balance the aesthetic, safety, and wellness needs of their communities against *all* these competing interests. No one company or industry will act in the overall interest of the community in the way a local government can act – and rightfully so. Companies are incentivized to maximize shareholder value, not public value.

### ***The way forward – a “balanced approach”***

So, how can we move forward? Obviously, there is tremendous benefits to local governments and industry working together to speed broadband deployment and bridge digital divides for all Americans.

On the local government level, several common-sense approaches make sense to pursue. Jascha Franklin-Hodge, CIO of Boston, recently laid out several steps that cities should consider when adopting 5G:<sup>5</sup>

1. **Process:** To make 5G economically viable, cities will need base station review and approval processes that are efficient, predictable, and fair. A well-designed process can protect the public interest without subjecting installations to uncertain timelines and excessive negotiation at each individual location.
2. **Design:** To be accepted by residents, ubiquitous wireless infrastructure must blend in, and not undermine accessibility, safety, or historic preservation. With our grounded local knowledge, city government can help providers develop designs that blend into the urban fabric and win the acceptance of residents.
3. **Competition:** Policies that promote a level playing field, and which prevent squatting, exclusive access, and land grabs can ensure that 5G is a competitive market, not just a new monopoly.
4. **Compensation:** While competition is a public good, cities should not give away valuable public assets to private for-profit companies. Companies should provide cities fair market compensation through some combination of payment, in-kind services, and direct community support.

San José is adopting these principles and implementing common sense policies such as dig-once, reorganizing staff to manage our poles in a one-stop-shop to ensure safe, timely, and predictable wireless attachment permitting and installation. As previously mentioned, we are also piloting new millimeter wave technology and community-based free Wi-Fi to our low-

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<sup>5</sup> <http://statescoop.com/will-5g-allow-cities-to-kill-broadband-monopolies>

income families to bridge the digital divide for our residents where the industry is not incentivized to do so.

On the federal level, pre-emption of local governments, either as a result of FCC regulations or new federal legislation, will likely have negative unintended consequences for the public. Below-market fees and rates charged to telecom companies are essentially a public subsidy, without guarantees that these companies build out everywhere and lower prices to consumers. Allowing local governments to continue to charge rational market-based rates and transparently price assets to incentivize build out in traditionally underserved areas would be more productive. Cities can also incentivize designs for deployments that meet the aesthetic needs of their communities and drive innovation over time towards smaller equipment. Federal efforts are better spent educating and building the capacity of local governments to understand how best to manage deployments of these technologies in ways that work for their community. The federal government should work with organizations such as the National League of Cities, The United States Conference of Mayors, the National Association of Counties and others to expand local knowledge and best practices.

Additionally, federal advisory commissions, such as the FCC Broadband Deployment Advisory Committee, of which I am an alternate member on behalf of our Mayor, would greatly benefit from increased local government and community input as pointed out by Congresswomen Eshoo as well as the National League of Cities, National Association of Counties, and the United States Conference of Mayors.<sup>6</sup>

The federal government should also be careful not to pick winners and losers through law or regulation. If Congress or the FCC encourages particular technologies, it will remove incentives to develop better technology. For example, prioritizing the deployment of “small cell” wireless infrastructure, which covers only a small area of service may have negative consequences. Affording these technologies advantages under federal law could limit the deployment of technologies that would provide greater coverage and be less physically impactful on our environments.

### **Closing remarks**

On behalf of Mayor Liccardo and the City of San José I want to thank the Committee for inviting me to participate in this hearing today. I will offer any ongoing assistance of my city as you examine ways to increase broadband deployment responsibly across our nation. I urge you to consider local governments as strong partners in ensuring that broadband services are available to all Americans. Thank you again. I look forward to any questions you might have.

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<sup>6</sup> <https://eshoo.house.gov/issues/telecommunications/eshoo-urges-fcc-chairman-to-include-more-local-government-input-on-broadband-deployment/>

<https://naco.sharefile.com/app?#/share/view/sc363022922a467c9>