



POLITIC365
FROM YOUR POINT OF VIEW

2016

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities
and 21st Century Infrastructure**

By Kristal High Taylor, Esq., Editor in Chief & Publisher, Politic365

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION: Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure

INTRODUCTION

America is at the proverbial crossroads. While the Bureau of Labor Statistics reports that unemployment is at a post-recession low of 4.9%, economic recovery has remained uneven at best, especially for people of color and members of low-income, rural, and tribal communities.¹ After stagnating for more than 10 years, American wages jumped 5.2% last year, and the poverty level decreased 1.2 percentage points to 13.5%, the lowest rate since 1999.² At the same time, “the top 1 percent of income earners continue[d] to outperform the rest of American families, with the richest workers enjoying income gains of 7.7 percent last year.”³

Despite broader societal gains, many Americans are still suffering from low-wage work and lack of access to meaningful economic opportunity. According to a joint report by Oxfam America and the Economic Policy Institute, “the majority of low-wage workers are white,” and “53 percent of African American workers, and 60 percent of Hispanic workers, earn under \$15 per hour.... In 29 states, more than half of working women do.”⁴ In total, “41.7 million workers earn under \$12 an hour and 58.3 million workers earn under \$15 an hour...[and] nearly half of all private sector workers lack a single paid sick day.”⁵ According to University of California – Berkeley economist Emmanuel Saez, “this uneven recovery is unfortunately on par with a long-term widening of inequality since 1980, when the top 1 percent of families began to capture a disproportionate share of economic growth.”⁶

No place was the tension between America’s “haves and have nots,” those with access to meaningful economic opportunities and those without, clearer than along the 2016 presidential campaign trail. With 100 million Americans living at, near, or cycling in and out of poverty,⁷ and one in three U.S. families classified as “working poor,” the economic plight of this nation’s citizenry gave rise to a growing and genuine populist sentiment.⁸ U.S. Senator Bernie Sanders galvanized millions with his talk of economic equity and racial justice.⁹ Secretary Hillary Rodham Clinton gained plaudits by adopting a pledge to raise the federal minimum wage and make higher education and healthcare more affordable.¹⁰

Ultimately, it will be the economic plan of President-elect Donald J. Trump to “Make America Great Again” that will lead the nation over the next four years. While on the campaign trail, albeit in an un-credited manner, Mr. Trump essentially adopted President Bill Clinton’s mantra, “it’s the economy, stupid,” as the substantive basis for a candidacy otherwise plagued by controversy and unrest.¹¹ According to his presidential platform, he has promised to:

Transform America’s crumbling infrastructure into a golden opportunity for accelerated economic growth and more rapid productivity gains with a deficit-neutral plan targeting substantial new infrastructure investments [and] create thousands of new jobs in construction, steel manufacturing, and other sectors to build the transportation, water, telecommunications and energy infrastructure needed to enable new economic development in the U.S., all of which will generate new tax revenues.¹²

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

In the wee hours of the morning on Wednesday, November 9, 2016, registering more than the required 270 Electoral College votes required to solidify his selection as the next leader of the free world, Mr. Trump declared, “We are going to fix our inner cities and rebuild our highways, bridges, tunnels, airports, schools, [and] hospitals. We’re going to rebuild our infrastructure, which will become, by the way, second to none. And we will put millions of our people to work as we rebuild it.”¹³ He continued, “We will build the next generation of roads, bridges, railways, tunnels, seaports and airports that our country deserves.”¹⁴

Many questions have been raised about the impact of a Trump presidency on America, and it remains to be seen whether his economic proposals will place the nation on a better footing than we face currently. There is universal agreement, however, that America’s infrastructure is not what it should be, and that its improvement will yield major social and economic gains to the nation’s citizenry. If, then, we are to take the time to restore and rebuild our infrastructure, our focus should be on modernizing it and paving the way for smart cities.

Establishing the right course for America’s smart cities requires a robust spectrum pipeline, cutting edge application of 5G technologies, and a modernized electric grid to ensure reliability and increased efficiency. Neither the government nor American citizens should have to bear the entire costs of renewing our infrastructure. Thus it is essential that we identify opportunities to incentivize private sector infrastructure investments. At the same time, in view of the vast income and wealth inequalities that have plagued this nation for too long, we ought to foster a policy environment that allows for equitable ownership opportunities so that members of underrepresented populations can take an equity stake in America’s infrastructure and future.

I. REBUILDING AND MODERNIZING AMERICA’S CRUMBLING INFRASTRUCTURE CAN YIELD TREMENDOUS ECONOMIC GAINS TO THE NATION AND ITS DIVERSE CITIZENRY

The condition of our nation’s roads, bridges, schools, water treatment plants, and other physical assets greatly influences the economy’s ability to function and grow.¹⁵ But America’s infrastructure is woefully lacking, with estimates projecting it would take \$3.6 trillion in investment to modernize its roads, bridges, pipelines, and railroads by 2020.¹⁶ An increased focus on infrastructure, therefore, not only improves the physical conditions of our highways and bridges, but it also serves as a catalyst for increased economic opportunity by creating new jobs and facilitating commerce and industry.

A. Infrastructure Spending Creates Jobs, While the Failure to Invest Costs America Money

In 2013, the American Society of Civil Engineers released *Failure to Act: The Impact of Current Infrastructure Investment on America’s Economic Future*, and found that “investing \$157 billion in infrastructure each year until 2020 could protect 3.5 million jobs, \$2.4 trillion in consumer spending, and \$3.1 trillion in GDP.”¹⁷ Further, “\$94 billion in transportation investments alone would protect 877,000 jobs.”¹⁸

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

Likewise, in 2014, the Economic Policy Institute (EPI) issued a briefing paper on *The Short- and Long-Term Impact of Infrastructure Investments on Employment and Economic Activity in the U.S. Economy*.¹⁹ The paper's authors estimated that, depending on the scenario, infrastructure investments would yield anywhere between a \$29 billion to \$400 billion annual increase in GDP along with 216,000 to 3 million net new jobs to the economy by the end of the first year of implementation.²⁰ EPI further posits that "an ambitious effort to increase infrastructure investment by \$250 billion annually over seven years would likely increase productivity growth by 0.3 percent annually – a boost more than half as large as the productivity acceleration in the U.S. economy between 1995 and 2005, one that was attributed to information and communications technology (ICT) advances."²¹

Every state requires infrastructure upgrades and improvements that can result in new private sector investment and job growth.²² In most cases, states are eliminating or seriously reducing infrastructure spending as a share of the economy - the exact opposite of what is needed to help turn the economy around.²³

Municipalities and states have cut capital investments from a high of three percent of the nation's GDP in the late 1960s to less than two percent in 2014.²⁴ Decreases in federal infrastructure spending are not helping the problem either. According to the Center on Budget Policy Priorities, "federal infrastructure investment has fallen by half — from 1 percent to 0.5 percent of GDP — over the last 35 years, leaving more of the task to state and local governments."²⁵

Across the spectrum, there's agreement from labor unions, the U.S. Chamber of Commerce, and groups representing liberal and conservative interests alike that infrastructure investments help individual workers, boost family income, and improve America's overall GDP.²⁶ Currently, the U.S. spends less than three percent of GDP on infrastructure, whereas our European competitors spend almost twice that rate. China's GDP infrastructure investment is triple what we put in play each year.²⁷ In fact, as a percentage of its annual GDP, "China spends more on economic infrastructure annually than North America and Western Europe combined."²⁸

"So," according to Mortimer B. Zuckerman, Chairman and Editor in Chief of U.S. News and World Report, "investment in infrastructure is about jobs and the economy. Infrastructure spending could put more than 13 million Americans to work in decent paying jobs, many of them in sectors of the economy that haven't fully recovered from the recession, like construction. Moreover, infrastructure jobs are jobs that cannot be shipped offshore or outsourced overseas."²⁹

On the flip side, a continued failure to invest in infrastructure is costly and hurts the bottom lines of both individual families and the nation at large. In 2016, ASCE released *Failure to Act: Closing the Infrastructure Investment Gap for America's Economic Future* wherein it declared "continued underinvestment in infrastructure will cost each U.S. family \$3,400 a year over the next decade."³⁰ In total, "the current, dreadful conditions [of our nation's infrastructure] already cost our economy close to \$200 billion a year."³¹

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

B. The Private Sector Plays an Important Role in Infrastructure Investment

Government alone cannot sufficiently address America’s infrastructure challenges, whether at the local, state, or federal levels. Investment from, and partnership with, the private sector is needed as well.³² As noted by the Bipartisan Policy Center Executive Council on Infrastructure,

America faces a \$1 trillion infrastructure-funding crisis. Government alone can’t fully fund all of the roads, bridges, and other critical infrastructure our economy needs – let alone upgrade our airports, shipping hubs and water facilities to meet the challenges of the coming decades. Private investors, working together with government, will have to step up with additional resources in order to bridge the gap.³³

Indeed, a recent report from the Public Policy Institute (PPI) entitled *Investment Heroes* noted that the top 25 leading corporate investors infused the American economy with nearly \$177 billion in 2015.³⁴ The *Investment Heroes* analysis also finds that telecom/cable, energy production/mining, technology/internet, utility/energy distribution, transportation, automotive/industrial, and retail companies are the largest investors in America’s GDP.³⁵

Notably, the PPI report contends that, “government capital spending has fared far worse than its private sector equivalent. In particular, public sector spending on long-lived assets such as highways and streets has declined sharply in real terms.”³⁶ PPI further notes that between 2005 and 2015, when the private sector had increased its investment by 28 percent, “real government investment fell by 5 percent over the same period, including an 11 percent decline at the state and local level.” Even more compelling is the finding that there was a “12 percent decline in state and local real spending on highways and streets,” particularly troubling considering “the average age of highways and streets has skyrocketed from 23.7 years to 28.4 years over the 10-year period.”³⁷

Companies like AT&T, Verizon, Comcast, and Time Warner Cable (now combined with Charter Communications) invest significantly in their networks to increase capacity and network strength, according to PPI.³⁸ Meanwhile, companies like Microsoft and Amazon are increasing their domestic investment to build more data centers, upgrade their network infrastructure, and expand the capacity of their cloud-based operations.³⁹ Similarly, companies like Exelon and Duke Energy have devoted capital spending to new technologies like smart grids and smart meters.⁴⁰ This kind of investment is vital to the continued growth of our economy. More so, it’s critical to the rebuilding of our failing infrastructure.

II. THE PROMISE OF SMART CITIES WILL ONLY BE REALIZED THROUGH A ROBUST SPECTRUM PIPELINE, CUTTING EDGE 5G TECHNOLOGIES, AND A MODERN AND SMART ELECTRIC GRID

According to Business Insider, smart cities are “big investments that are supposed to drive social transformation,” and “are the subject of a major global push to improve how cities function. In part a response to incoherent infrastructure design and urban planning of the past,

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

smart cities promise real-time monitoring, analysis and improvement of city decision-making”... which “will improve efficiency, environmental sustainability and citizen engagement.”⁴¹ The feasibility and success of smart cities, however, depend on a networked infrastructure based on high-speed, robust advanced communications technology and backed by an efficient, reliable energy supply.

A. Implementing Smart Cities First Requires an Understanding of What They Are

While there is no single, universal metric ascribed to “smart cities,” the general idea is that they create a ubiquitous, secure, reliable connection of the physical world to the digital realm.⁴² The United Nations Commission on Science and Technology for Development (UNCAD) employs the following definition:

A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects.⁴³

In America, the Obama Administration defined “smart cities” as:

Communities that are building an infrastructure to continuously improve the collection, aggregation, and use of data to improve the life of their residents – by harnessing the growing data revolution, low-cost sensors, and research collaborations, and doing so securely to protect safety and privacy.⁴⁴

In summary, “smart cities” are municipalities that use information and communications technology to reduce the costs of delivering city services, energy costs, or maintenance costs.⁴⁵ Smart cities also use basic infrastructure to provide a particular quality of life for its residents through the application of technology solutions.⁴⁶ For some jurisdictions, merely inserting a few technology solutions into the delivery of city services qualifies them for recognition as a smart city.⁴⁷

From smart streetlights with LED bulbs containing dimmers and motion sensors, to wireless transmitters and cameras sensors gauging everything from traffic patterns, water flow, electricity usage, to the fullness of a trash receptacle, “smart-city solutions enable city governments to collect and analyze data on infrastructure and public services that could be used to ultimately improve efficiencies that affect the lives of city residents.”⁴⁸ Smart cities are supported by smart infrastructure, which UNCAD contends encompasses both physical and digital components broken down to include: digital infrastructure, smart buildings, smart mobility, smart energy, smart water, smart waste management, and smart health.⁴⁹

Recently, New Cities Foundation Founder and Chairman John Rossant explained that to make smart cities a reality, “\$50 trillion to \$60 trillion will need to be invested globally over the next

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

15 years on upgraded infrastructure...and the industry has to come up with new, innovative models for financing these big infrastructure projects for them to move forward quickly and efficiently.”⁵⁰

B. Ultra High-Speed 5G Networks and A Robust Spectrum Pipeline Undergird Smart Cities

Increasingly, smart cities are applying technology using analytics and software to better manage their operations, and urban development is becoming more and more connected, which is largely attributed to technological integration of the Internet of Things (IoT).⁵¹ IoT or the Internet of Everything (IoE) allows for the hyper-personalization and customization of information, products and services through a “nebulous network that connects anything digital.”⁵² Generally, IoT is thought of as any variety of devices, sensors, and monitored connected to and through the Internet from which data can be extracted and analyzed for an ostensibly value-added purpose.⁵³

While estimates vary, there were roughly 16 billion connected devices in operation last year, with predictions suggesting that there will be 20 to 30 billion such devices on the market by 2020.⁵⁴ Add to that figure that in 2015, there were 3.4 billion smart phone subscriptions in the world, a figure that’s expected to nearly double to 6.4 billion by 2020 and it’s easy to see why all of this extra connectivity requires faster speed, higher capacity networks with additional resiliency.⁵⁵

Currently, 4G LTE networks by and large enable mobile connectivity across a multiplicity of devices. As we look to build the foundation of smarter cities, which employ IoT technologies across entire municipalities, 5G (5th generation wireless networks) technologies become more necessary if the goal is to support connectivity at higher speeds with a faster response.⁵⁶ While 5G has not yet rolled out, policymakers, business leaders, and municipalities alike are anticipating the multitude of ways in which this technology can enhance our communications ability and make for more efficient and reliable connections.

As Federal Communications Commissioner Jessica Rosenworcel aptly noted earlier this year when the Commission decided to make available higher frequency spectrum for more innovative use,

5G services are poised to provide speeds more than 10 times faster than today’s 4G networks. The increased speeds of 5G service will change the way we communicate, multiplying the ways we use video—as images increasingly replace what is done today by text. The reduced latency of 5G service will clear the way for augmented and virtual reality—creating new teaching tools and entertainment experiences. And the lower energy demands of 5G service will lay the groundwork for new efficiency gains from the Internet of Things. The race to 5G is on.⁵⁷

Even as there is growing enthusiasm for 5G and the innovations it may bring, logistically there is a need to streamline deployment of the technology. While 5G networks will be able to manage

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

network density more efficiently than our current 4G LTE options, 5G networks characteristically do not carry signals as far as their network predecessors.⁵⁸ As such, to be effective, deployments of 5G technology will require the deployment of small cells – mini-wireless conductors oftentimes the size of smoke detectors – to transmit signals and data across the network.⁵⁹

Even as plans are being made for the inclusion of 5G technologies in our infrastructure of the future, we must also continue to support and maintain more traditional communications networks. Particularly in the case of smart cities, network infrastructure will continue to accommodate and rely upon a mix of Wi-Fi, cellular, fiber optic, and wire line inputs.⁶⁰ Beyond the “large swaths of high-band spectrum...required to support localized 5G ‘hotspots,’ additional low- and mid-band spectrum is also needed to enable 5G technology to support much higher device density throughout wide coverage areas.”⁶¹ As such, maintaining an open spectrum pipeline is also a priority for development in this space. As The Information Technology & Innovation Foundation (ITIF) noted in its recent Tech Policy Toolbox,

Spectrum is a key input to important general-purpose technologies such as mobile broadband and the Internet of Things. To best leverage their potential, Congress should work with the National Telecommunications and Information Administration to develop a long-term pipeline of spectrum to be repurposed for wireless broadband. This spectrum should include a mix of both licensed and unlicensed use.⁶²

C. Smart Cities Must Be Powered By Resilient, Reliable, Sustainable Energy From Smart Grids

U.S. News and World Report’s *Rebuild America* report concisely describes the dilemma facing the networks and technology that will support smart cities and the infrastructure of the future:

[T]here is the electrical grid and our pipeline distribution systems, some of which originated in the 1880s. Investment has increased since 2005,⁶³ but permitting and siting issues, weather events and subpar maintenance means increasing power failures around the country. We are simply not up to the 21st century. No wonder the World Economic Forum ranks our grid at just 16th in the world in terms of reliability. In broadband access, we rank 13th in the world and we’re 41st in bandwidth. Many people around the world have access to much faster Internet than most of the U.S.⁶⁴

All infrastructure must be modernized to create an ever more connected society, and the electric grid must evolve as well.⁶⁵ Smart cities and communities require smart grids.

According to the Department of Energy,

“Smart grid” generally refers to a class of technology people are using to bring utility electricity delivery systems into the 21st century, using computer-based remote control and automation. These systems are made possible by two-way communication technology and computer processing that has been used for decades in other industries.

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

They are beginning to be used on electricity networks, from the power plants and wind farms all the way to the consumers of electricity in homes and businesses. They offer many benefits to utilities and consumers -- mostly seen in big improvements in energy efficiency on the electricity grid and in the energy users' homes and offices.⁶⁶

As we speak of IoT as the next wave of the future, the 'Grid of Things' (GoT) can ensure that our devices – whether home A/C or refrigeration units, street lights, electric cars, or everything in between – operate in a more resilient, reliable, and sustainable way.⁶⁷ Smart grids did not just become *en vogue* with increasing talk about smart cities. Rather, as the United States has increased the use of alternative or renewable energy sources, notably wind and solar, smarter grids have become an integral part of ensuring a cleaner environment while making the generation, transmission, and distribution of energy increasingly affordable for consumers and producers.⁶⁸

Nationally, modernizing the electricity grid has already demonstrated positive impacts on employment in the United States. For example, smart grid projects, fueled by funding from the American Recovery and Reinvestment Act, have created 50,000 jobs since 2009.⁶⁹ Likewise, the “modern, resilient, dynamic electric grid offers [consumers] more choice, more control and more convenience when it comes to their energy.”⁷⁰

A centralized generation, transmission, and distribution system still dominates the electricity industry, but in view of moves toward the creation of smarter cities, an increasing amount of distributed energy is being added to the system.⁷¹ Coordinating a significant number of nodes generating relatively small amounts of energy and, where allowed, compensating for that generation is a task for state and city regulators.⁷² Public policy must encourage the incorporation of distributed generation without shifting the cost of the grid on the poor, who generally must still rely on the grid for their energy needs.

Smart cities must also accommodate demand side management or other energy efficiency initiatives.⁷³ Smart devices that interconnect with the grid via broadband allow consumers to manage energy usage, making energy more affordable and its use efficient. As such, smart cities ought to promote a regulatory framework that makes it easier to deploy the networks and platforms that interconnected devices must operate over.

In the midst of cultivating smart cities reliant upon smarter grids, electric utilities should be viewed as partners, especially in the area of smart metering, which provides an important tool for properly pricing energy usage among various classes of customers, and ultimately incentivizes the consumer to seek out affordable energy or energy efficient alternatives.⁷⁴

D. With Innovation Front of Mind, We Must Still Guard Against Unintended Consequences

The future for modernized infrastructure and smart cities is truly exciting, especially in view of the jobs they can create and the people they may connect. Even still, as we move toward a more networked society, we must guard against the potential pitfalls of rapid technological

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

transition that lacks adequate thought about the potential unintended consequences created by new products and services.⁷⁵

Take, for instance, the recent controversy over Facebook's authorization of ethnic affinity advertising that could have enabled housing discrimination by marketers by excluding ethnic affinity groups, like African Americans, Hispanics, and Asian Americans.⁷⁶ Fortunately, the company responded quickly to a whirlwind of criticism about the impact of one of its algorithms on people of color, and removed "Ethnic Affinities" from its advertising platform.⁷⁷ The fact remains, however, that the enthusiasm to bring a new product to market, along with – perhaps – a lack of diversity within the company to throw up a red flag at the use of ethnic affinity targeting in the first place, could have further marginalized an already historically disenfranchised group of people.

Similarly, ride sharing services Uber and Lyft have been under fire because their apps help facilitate discrimination against would-be passengers who either wait longer for pick ups depending on their name, race, or ethnicity, or experience ride cancellations at a higher frequency than non-ethnic people.⁷⁸ These are the same companies that are currently experimenting with autonomous cars and driverless technologies, which some prognosticators anticipate will become mainstays in the smart cities of the future.⁷⁹

The promise and potential of innovation and new technologies is most valuable when it can benefit and uplift all people. We have already seen how a digital divide in America threatens to widen the chasm between the "haves and have nots."⁸⁰ It would be a shame if we did not approach any new infrastructure agenda with at least a cautionary recognition that, as much as technology can enhance life, it can also further disadvantage those who are disconnected, or who lack the resources and opportunity to become meaningful participants in our increasingly digital economy.

III. INCENTIVIZING INVESTMENT REQUIRES INNOVATIVE POLICY PROSCRIPTIONS AND MEANINGFUL EQUITY OPPORTUNITIES FOR MEMBERS OF HISTORICALLY UNDERREPRESENTED COMMUNITIES

San Francisco-based Grand View Research estimates that the global smart cities market will hit \$1.4 trillion in 2020 – nearly triple the \$567.4 billion market of 2013.⁸¹ As a sub-market of the smart cities market, the IoT market is expected to grow to an annual amount of \$147.5 billion in 2020. Consider that in 2015, this sub-market amounted to just \$2 billion.⁸²

Supporting smart cities and modernized infrastructure "isn't a one-size-fits-all process," says David Cummins, senior vice president of mobility solutions for Xerox Corp,⁸³ but, with "growing convergence and a recognition that the private sector is filling in for what the public sector used to do," we must be forward-thinking in how we incentivize continued investment in this space.

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

A. The Next Administration Should Build On Recent Investments in Smart Cities

Under the Obama Administration, infrastructure investment was seen as a critical part of our national growth strategy. As Vice President Joe Biden observed, “it’s the oldest story in our history: build, build, build the most modern infrastructure in world...because in the end, this all means economic growth and jobs – jobs that help build the middle class.”⁸⁴ To these ends, the Obama Administration pursued various opportunities for increasing public-private partnerships, including:

- The creation of a Rural Opportunity Investment Initiative at USDA to ensure that “the \$30 billion in existing USDA programs and resources for rural infrastructure projects, including water and wastewater systems, broadband access, and food systems, most effectively leverage private dollars for rural communities;”
- Implementation of the Qualified Public Infrastructure Bond (QPID), “to facilitate greater private-sector involvement in public infrastructure projects through public-private partnerships, lowering the cost of borrowing and attracting new capital;” and
- Advancing “major highway and port projects through the Transportation Investment Center at the Department of Transportation, working with local and state governments to improve project planning, promoting strong labor practices and workforce development, and attracting investors for U.S. projects from around the world through the SelectUSA program.”⁸⁵

Recognizing the value of 21st century infrastructure, in September 2015, the Obama Administration announced a new “Smart Cities” Initiative that pledged to invest more than “\$160 million in federal research and leverage more than 25 new technology collaborations to help local communities tackle key challenges such as reducing traffic congestion, fighting crime, fostering economic growth, managing the effects of a changing climate, and improving the delivery of city services.”⁸⁶ This commitment to modern infrastructure has already begun to bear fruit for the national economy. It should be continued in the years ahead.

B. Proactive Policymaking Can Help Incentivize Continued Infrastructure Developments

Planning smart cities and envisioning the infrastructure of tomorrow requires an understanding that the realm we are entering into involves a rich cross-domain pollination of services and functions, such that industries will continue to converge. We must start to think of energy and transportation, public safety and telecommunications, and any number of combinations, not as diffuse silos, but as complementary parts of a bigger picture.

In its smart cities report, Deloitte raises the issue of cooperation in energy markets, wherein a cooperative environment sees government and corporations working together to develop regulations that support a smart city’s transition to a smart energy environment.⁸⁷ This kind of alignment may be advisable, not just with regard to creating new energy efficiencies, but also with regard to the ways in which policymaking and investing work hand in hand to spur increased build out of modern infrastructure.

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

By the same token, policy positions ought to be broad enough to account for future concerns with sustainability, cost, citizen expectations, technological longevity, security and privacy, reliability and quality of service. But they must also be narrowly tailored enough as not to create greater regulatory uncertainty in the market, or increase the likelihood of consumer harm.

Finally, because financing infrastructure improvements has always been a challenge, policymakers should both strive to implement cutting-edge programs that encourage public-private partnerships, and also hasten tax and rate reform that more equitably apportion the burden of building our cities of tomorrow and close inefficient and wasteful loopholes.

C. Infrastructure Investment Opportunities Should Flow to Ethnic/Racial Minorities & Women

Spectrum is one of the critical, invisible infrastructures of the future – it supports mobile connectivity and enables a range of interactions across wireless devices. It is also very expensive, such that becoming an investor in this space, or building high-impact network architectures is often cost prohibitive for members of our society who, traditionally, have lacked access to capital to be full and meaningful participants in this space. If “full participation in the digital economy means that women and people of color are positioned to become active players in the wireless sector, even beyond traditional roles as consumers and employees,” then it is incumbent that strategies be employed to increase their likelihood of being able to own and manage vital spectrum assets.⁸⁸

The Multicultural Media, Telecom, and Internet Council (MMTC) recently released a white paper entitled *Incentives for Secondary Market Transactions to Facilitate Wireless Entrepreneurship for Minority and Women Owners*.⁸⁹ In it, the 30-year old civil rights and media justice organization advanced the proposition that diverse and inclusive ownership of 21st century infrastructure assets are key to ensuring equitable opportunities within the rich digital ecosystem that smart cities and new technology networks create and support.

To these ends, MMTC finds that “Congress and the FCC can address the persistence of the negligible representation of minority- and women-owned business enterprises (collectively, ‘MWBEs’) in the wireless industry through the development and support of incentives for MWBEs.”⁹⁰ Such incentives include:

1. The development of Congressional legislation that restores and refines the Tax Certificate Policy that once helped increased minority broadcast ownership, with immediate application to secondary markets wherein MWBEs can acquire spectrum assets from large carriers;
2. An initiative by the FCC to include in its wireless competition review and assessment of whether and to what extent large carriers engage in voluntary secondary market transactions with MWBEs;

**BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION:
Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure**

3. An initiative by the FCC to incorporate into the regulatory review of mergers and acquisitions whether and the extent to which the petitioning parties avail themselves of voluntary secondary market transactions; and
4. An initiative by the FCC to award bidding credits in spectrum auctions to companies that voluntarily engage in secondary market transactions with MWBEs.⁹¹

“Despite the FCC’s launch of several profitable and successful spectrum auctions over the last two years, the nominal participation of MWBEs continues at an abysmal pace,” stated MMTC President and CEO and report co-author Kim Keenan.⁹² “We need to find alternatives that break the cycle of exclusion for MWBEs who can actually generate and return greater economic value to our communities. One thing is clear, if we continue on our current path of inaction, we will continue to leave minority and women-owned businesses out of even the chance to innovate and create opportunity in the nation's telecommunications industry.”⁹³

“There is a way to foster minority ownership of commercial wireless assets, and it’s through secondary markets,” stated MMTC President Emeritus and co-author David Honig.⁹⁴ “The FCC made progress on the DE program, but now we need a concerted effort of both the agency and Congress to ensure a more inclusive marketplace of opportunities.”⁹⁵

CONCLUSION

As we prepare for the Trump Administration, we can use the President-elect’s clarion calls for better, faster, more reliable infrastructure to promote a innovative agenda that looks to smart cities as a means of paving the way toward modern, 21st century infrastructure.

Coordinating build out will be no easy task. As Eric Dresselhuys, Co-Founder and EVP of Global Development for Silver Spring Networks observed during a recent Georgetown University Convening on smart cities, “if anyone thinks you can just go down to the Smart Cities store and buy a smart city, you’re wrong.”⁹⁶ He continued,

These are things that are going to evolve over time. You’re going to do the first thing, which is going to make you think about doing the second thing, which will evolve over time to the third thing. So the question becomes, how do you create platforms and solutions that allow you to extend across and evolutionary implementation approach. You cannot sit down and design a smart city. It’s an impossible task.... Every city is unique and very siloed. To assume you can come in and overlay some technology is a bit of a fantasy.⁹⁷

Despite the challenges that will necessarily be involved in planning for the future, the energy it will take to ensure that principles of innovation and equity prevail will be well worth the effort. The infrastructure of tomorrow is a work in progress. If we hew ourselves to the promise of technology, and its potential to improve the lives of our citizens and the functioning and competitiveness of our nation at large, investing in our collective future with 21st century infrastructure and smart cities will no doubt be a investment that truly pays off.

BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION: Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure

-
- ¹ **The Employment Situation - October 2016**, Bureau of Labor Statistics, <http://www.bls.gov/news.release/pdf/empisit.pdf> (Nov. 4, 2016) (last visited Nov. 14, 2016).
- ² **An End to Wage Stagnation: American Incomes Jump 5.2%**, CBS News, <http://www.cbsnews.com/news/an-end-to-stagnation-american-incomes-jump-5-2-percent/> (Sept. 13, 2016) (Nov. 14, 2016).
- ³ **The Rich Get Richer, and the Poor Get...**, CBS News, <http://www.cbsnews.com/news/inequality-1-percent-99-percent-income-growth/> (July 4, 2016) (last visited Nov. 14, 2016).
- ⁴ **Nearly Half of America's Workers Struggle in Low-Wage Jobs with Scant Benefits**, Oxfam America, <https://www.oxfamamerica.org/press/nearly-half-of-americas-workers-struggle-in-low-wage-jobs-with-scant-benefits/> (Jun. 22, 2016) (Nov. 14, 2016).
- ⁵ **Few Rewards: An Agenda to Give America's Working Poor a Raise**, Oxfam America, https://www.oxfamamerica.org/static/media/files/Few_Rewards_Report_2016_web.pdf (Jun. 22, 2016) (Nov. 14, 2016).
- ⁶ **The Rich Get Richer**, *supra*.
- ⁷ **The Female Face of Poverty**, The Atlantic, <http://www.theatlantic.com/business/archive/2014/01/the-female-face-of-poverty/282892/> (Jan. 8, 2014)(last visited Nov. 14, 2016).
- ⁸ **1 in 3 US families classified as 'working poor,' higher for minorities**, RT, <https://www.rt.com/usa/241289-us-minorities-working-poor/> (Mar. 17, 2015) (last visited Nov. 14, 2016).
- ⁹ **For Reeling Democrats, Now What?**, Los Angeles Times, <http://www.latimes.com/politics/la-na-pol-clinton-democrats-20161109-story.html> (Nov. 10, 2016) (last visited Nov. 14, 2016).
- ¹⁰ **We Endorse Hillary Clinton – With Enthusiasm**, The Recorder, <http://www.recorder.com/editorial-clinton-endorsement-5684651> (Oct. 28, 2016) (last visited Nov. 14, 2016).
- ¹¹ **Why Did Trump Win? The Economy, Stupid**, Lost Angeles Times, <http://www.latimes.com/opinion/op-ed/la-oe-schiller-trump-victory-economy-20161109-story.html> (Nov. 9, 2016) (last visited Nov. 14, 2016).
- ¹² **Infrastructure**, Trump, Pence, Make America Great Again 2016, <https://www.donaldjtrump.com/policies/an-americas-infrastructure-first-plan/> (last visited Nov. 14, 2016).
- ¹³ **Trump's Infrastructure Fix: Let Somebody Else Spend \$1 Trillion**, Wired, <https://www.wired.com/2016/11/trumps-plan-american-infrastructure-get-people-spend-trillion-dollars/> (Nov. 10, 2016) (last visited Nov. 14, 2016).
- ¹⁴ **One Mayor's Take: Why America Needs a New Agenda for Cities**, The Hill, <http://thehill.com/blogs/pundits-blog/economy-budget/292162-one-mayors-take-why-america-needs-a-new-agenda-for-cities> (Aug. 22, 2016) (last visited Nov. 14, 2016).
- ¹⁵ **It's Time for States to Invest in Infrastructure**, Center on Budget and Policy Priorities, <http://www.cbpp.org/research/state-budget-and-tax/its-time-for-states-to-invest-in-infrastructure> (Feb. 23, 2016) (last visited Nov. 14, 2016).
- ¹⁶ **Encouraging the Private Sector to Invest in America's Infrastructure**, White House Blog, <https://www.whitehouse.gov/blog/2015/01/16/encouraging-private-sector-invest-americas-infrastructure> (Jan. 16, 2015) (last visited Nov. 14, 2016).
- ¹⁷ *Id.*
- ¹⁸ **Failure to Act: The Impact of Current Infrastructure Investment on America's Economic Future**, American Society of Civil Engineers, http://www.asce.org/uploadedFiles/Issues_and_Advocacy/Our_Initiatives/Infrastructure/Content_Pieces/failure-to-act-economic-impact-summary-report.pdf (Jan. 15, 2013) (last visited Nov. 14, 2016).
- ¹⁹ **The Short- and Long-Term Impact of Infrastructure Investments on Employment and Economic Activity in the U.S. Economy**, Economic Policy Institute, <http://www.epi.org/files/2014/impact-of-infrastructure-investments.pdf> (July 1, 2014) (last visited Nov. 14, 2016).
- ²⁰ *Id.*
- ²¹ *Id.*
- ²² *Id.*
- ²³ *Id.*
- ²⁴ *Id.*
- ²⁵ **It's Time for States to Invest in Infrastructure**, *supra*.
- ²⁶ *Id.*
- ²⁷ *Id.*
- ²⁸ **China Spends More on Infrastructure Than the U.S. and Europe Combined**, Bloomberg Businessweek, <http://www.bloomberg.com/news/articles/2016-06-15/china-spends-more-on-infrastructure-than-the-u-s-and-europe-combined> (Jun. 15, 2016)(last visited Nov. 14, 2016).
- ²⁹ **Rebuild America**, U.S. News and World Report, <http://www.usnews.com/news/the-report/articles/2016-04-01/invest-in-infrastructure-to-boost-jobs-and-the-economy> (Apr 1, 2016) (last visited Nov. 14, 2016).
- ³⁰ **ASCE Report Estimates Failure to Act on Infrastructure Costs Families \$3,400 a Year**, ASCE News, <http://news.asce.org/asce-report-estimates-failure-to-act-on-infrastructure-costs-families-3400-a-year/> (May 10, 2016)(last visited Nov. 14, 2016).
- ³¹ **Rebuild America**, *supra*.
- ³² **Ailing U.S. Infrastructure Needs Public-Private Investment**, The Baltimore Sun, <http://www.baltimoresun.com/news/opinion/oped/bs-ed-infrastructure-20140605-story.html> (Jun. 5, 2014)(last visited Nov. 14, 2016).

BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION: Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure

- ³³ **Business Can Help Bridge the Infrastructure Gap**, Bipartisan Policy Center Executive Council on Infrastructure, <http://bipartisanpolicy.org/wp-content/uploads/2015/05/Business-Can-Help-Bridge-the-Infrastructure-Gap.pdf> (Jan. 15, 2015)(last visited Nov. 14, 2016).
- ³⁴ **Investment Heroes 2016: Fighting Short-termism**, Public Policy Institute, http://www.progressivepolicy.org/wp-content/uploads/2016/10/InvestHeroes_2016.pdf (Oct. 2016) (last visited Nov. 14, 2016).
- ³⁵ *Id.*
- ³⁶ *Id.*
- ³⁷ *Id.*
- ³⁸ *Id.*
- ³⁹ *Id.*
- ⁴⁰ **Investment Heroes 2016: Fighting Short-termism**, *supra*.
- ⁴¹ **Here's How to Ensure Smart Cities Benefit Everyone**, Business Insider, <http://www.businessinsider.com/heres-how-to-ensure-smart-cities-benefit-everyone-2016-11> (Nov. 2, 2016) (last visited Nov. 14, 2016).
- ⁴² **Smart Cities in the Age of 5G: A Technology and Policy Workshop**, Georgetown University McDonough School of Business <http://cbpp.georgetown.edu/events/smart-cities-age-5g-technology-and-policy-workshop> (Oct. 26, 2016) (last visited Nov. 14, 2016).
- ⁴³ **Smart Cities and Infrastructure, Introduction of the Secretary General's Report**, United Nations Commission on Science and Technology for Development http://unctad.org/meetings/en/Presentation/ecn162016p01_Wu_en.pdf (May 9, 2016) (last visited Nov. 14, 2016).
- ⁴⁴ **FACT SHEET: Administration Announced New "Smart Cities" Initiative to Help Communities Tackle Local Challenges and Improve City Services**, White House, <https://www.whitehouse.gov/the-press-office/2015/09/14/fact-sheet-administration-announces-new-smart-cities-initiative-help> (Sep. 14, 2015) (last visited Nov. 14, 2016).
- ⁴⁵ **Just What is a Smart City**, Computerworld, <http://www.computerworld.com/article/2986403/internet-of-things/just-what-is-a-smart-city.html> (Oct. 1, 2015) (last visited Nov. 14, 2016).
- ⁴⁶ **What is a Smart City and How Will It Work**, Times of India, <http://timesofindia.indiatimes.com/What-is-a-smart-city-and-how-it-will-work/listshow/47128930.cms> (May 2, 2015) (last visited Nov. 14, 2016).
- ⁴⁷ **What is a Smart City**, The Pew Charitable Trusts, <http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2016/04/26/what-is-a-smart-city> (April 26, 2016) (last visited Nov. 14, 2016).
- ⁴⁸ **The US is Investing \$165 Million into Smart City Solutions**, Business Insider, <http://www.businessinsider.com/the-us-is-investing-165-million-into-smart-city-solutions-2016-10> (Oct. 15, 2016) (Nov. 14, 2016).
- ⁴⁹ *Id.* at 6.
- ⁵⁰ **Analyst Angle: Smart cities in the age of 5G**, RCR Wireless News, <http://www.rcrwireless.com/20160916/analyst-angle/analyst-angle-smart-cities-age-5g-tag9> (Sep. 16, 2016) (Nov. 14, 2016).
- ⁵¹ **How to Invest in Smart Cities**, U.S. News and World Reports, <http://money.usnews.com/investing/articles/2016-05-25/how-to-invest-in-smart-cities> (May 25, 2016) (last visited Nov. 14, 2016).
- ⁵² **How to Invest in the Internet of Things**, U.S. News & World Reports, <http://money.usnews.com/investing/articles/2016-04-13/how-to-invest-in-the-internet-of-things> (Apr. 13, 2016) (last visited Nov. 14, 2016).
- ⁵³ **A Simple Explanation of 'The Internet of Things'**, Forbes, <http://www.forbes.com/sites/jacobmorgan/2014/05/13/simple-explanation-internet-things-that-anyone-can-understand/#209772396828> (May 13, 2014) (last visited Nov. 14, 2016).
- ⁵⁴ **Prediction: There Won't Be 50B Connected Devices by 2020, Structure Connect**, <http://www.structureconnect.com/prediction-there-wont-be-50b-connected-iot-devices-by-2020/> (Mar. 18, 2016) (last visited Nov. 14, 2016).
- ⁵⁵ *Id.*
- ⁵⁶ **Who Cares About 5G Wireless? – You Will**, Scientific American, <https://www.scientificamerican.com/article/who-cares-about-5g-wireless-you-will/> (Sep. 22, 2016) (last visited Nov. 14, 2016).
- ⁵⁷ **Statement of Commissioner Jessica Rosenworcel**, Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, GN Docket No. 14-177, (Jul. 14, 2016) (last visited Nov. 14, 2016).
- ⁵⁸ **Small Cells: Backhaul Difficulties and A 5G Future**, RCR Wireless, <http://www.rcrwireless.com/20160711/network-infrastructure/small-cells-tag31-tag99> (Jul. 11, 2016)(last visited Nov. 11, 2016).
- ⁵⁹ **Reader Forum: Stepping Stones to 5G – Small Cells and Fiber Simplifying Carrier Densification Efforts**, RCR Wireless, <http://www.rcrwireless.com/20160905/opinion/reader-forum-stepping-stones-5g-small-cells-fiber-simplifying-carrier-densification-efforts-tag10> (Sep. 5, 2016) (last visited Nov. 14, 2016).
- ⁶⁰ **Smart Cities in the Age of 5G: A Technology and Policy Workshop**, *supra*.
- ⁶¹ **High Band Spectrum: The Key To Unlocking the Next Generation of Wireless**, CTIA, <http://www.ctia.org/docs/default-source/default-document-library/5g-high-band-white-paper.pdf> (Jun. 13, 2016) (last visited Nov. 14, 2016).
- ⁶² **Tech Policy Toolbox**, Information Technology & Innovation Foundation, <http://www2.itif.org/2015-tech-toolbox.pdf> (Aug. 1, 2015)(last visited Nov. 14, 2016).
- ⁶³ **2013 Report Card for America's Infrastructure**, American Society of Civil Engineers, <http://www.infrastructurereportcard.org/a/#p/energy/overview> (last visited Nov. 14, 2016).
- ⁶⁴ **Rebuild America**, *supra*.
- ⁶⁵ **Consumer Benefits**, Smart Grid: Where Power is Going, <http://www.whatissmartgrid.org/smart-grid-101/consumer-benefits> (last visited Nov. 14, 2016).

BLUEPRINT FOR UNIVERSAL ECONOMIC INCLUSION: Creating Economic Opportunity with Smarter Cities and 21st Century Infrastructure

- ⁶⁶ **Smart Grid**, Office of Electricity Delivery & Energy Reliability, <http://energy.gov/oe/services/technology-development/smart-grid> (last visited Nov. 14, 2016).
- ⁶⁷ **The Grid of Things**, Electricity Today Magazine, <http://www.electricity-today.com/smart-grid/the-grid-of-things> (last visited Nov. 14, 2016).
- ⁶⁸ **The Future of the Grid: Evolving to Meet America's Needs**, United States Department of Energy GridWise Alliance, <http://energy.gov/sites/prod/files/2014/12/f19/Future%20of%20the%20Grid%20December%202014.pdf> (Dec. 2014) (last visited Nov. 14, 2016).
- ⁶⁹ **Smart Cities Pilot A Revolution for Prosperous Living**, Smart Cities Council, <http://smartcitiescouncil.com/article/washington-post-smart-cities-pilot-revolution-prosperous-living> (Oct. 17, 2016) (last visited Nov. 14, 2016).
- ⁷⁰ **The Grid of Things to Come**, The Energy Times, <http://tdworld.com/news/grid-things-come> (Apr. 20, 2016) (last visited Nov. 14, 2016).
- ⁷¹ **Smart Cities Report**, Deloitte, <https://www2.deloitte.com/content/dam/Deloitte/tr/Documents/public-sector/deloitte-nl-ps-smart-cities-report.pdf> (Nov. 1, 2015) (last visited Nov. 14, 2016).
- ⁷² **ADVANCED ENERGY NOW: Smarter Grid Technologies Make for Smart Cities**, Advanced Energy Economy, <http://blog.aee.net/advanced-energy-now-smarter-grid-technologies-make-for-smart-cities> (Jun. 22, 2015) (last visited Nov. 14, 2016).
- ⁷³ **Demand-Side Management in Smart Micro-Grids: An Optimization Perspective**, ERCIM News, <http://ercim-news.ercim.eu/en98/special/demand-side-management-in-smart-micro-grids-an-optimization-perspective> (Jul. 2014) (last visited Nov. 14, 2016).
- ⁷⁴ **Smart Meters: State of the Industry**, Electric Light & Power, <http://www.elp.com/Electric-Light-Power-Newsletter/articles/2016/11/smart-meters-state-of-the-industry.html> (Nov. 8, 2016) (last visited Nov. 14, 2016).
- ⁷⁵ **Innovative Tools for Diversity, Equity, and Inclusion in Urban Planning**, Julian Agyeman, <http://julianagyeman.com/2016/01/innovative-tools-for-diversity-equity-and-inclusion-in-urban-planning/> (Jan. 4, 2016) (last visited Nov. 14, 2016).
- ⁷⁶ **Facebook Lets Advertisers Exclude Users By Race**, Pro Publica, <https://www.propublica.org/article/facebook-lets-advertisers-exclude-users-by-race> (Oct. 28, 2016) (last visited Nov. 14, 2016).
- ⁷⁷ **Facebook Agrees to Dial Back Racial Affinity Ads**, The Register, http://www.theregister.co.uk/2016/11/11/facebook_racial_affinity_ads/ (Nov. 11, 2016) (last visited Nov. 14, 2016).
- ⁷⁸ **Study Finds Discrimination By Uber and Lyft Drivers**, Bloomberg Technology, <https://www.bloomberg.com/news/articles/2016-10-31/study-finds-racial-discrimination-by-uber-and-lyft-drivers> (Oct. 31, 2016) (last visited Nov. 14, 2016).
- ⁷⁹ **Race, Gender Discrimination Persists with Uber, Lyft – and Cities Need to Know**, Ars Technica, <http://arstechnica.com/cars/2016/11/race-gender-discrimination-persist-with-uber-lyft-and-cities-need-to-know/> (Nov. 7, 2016) (last visited Nov. 14, 2016).
- ⁸⁰ **When Students Can't Go Online**, The Atlantic, <http://www.theatlantic.com/education/archive/2015/03/the-schools-where-kids-cant-go-online/387589/> (Mar. 15, 2015) (last visited Nov. 11, 2016).
- ⁸¹ **How to Invest in Smart Cities**, *supra*.
- ⁸² **IoT and Smart Cities: What Happens Next**, Smart Cities Council, <http://smartcitiescouncil.com/article/iot-and-smart-cities-what-happens-next> (Jun 26, 2016) (last visited Nov. 11, 2016).
- ⁸³ *Id.*
- ⁸⁴ **Encouraging the Private Sector to Invest in America's Infrastructure**, *supra*.
- ⁸⁵ *Id.*
- ⁸⁶ **FACT SHEET**, *supra*.
- ⁸⁷ **Smart Cities Report**, *supra*.
- ⁸⁸ **Blueprint for Universal Economic Inclusion: Streamlining Pipelines to Prosperity in the Digital Age**, Politic365, <http://politic365.uberflip.com/i/595794-2015-politic365-blueprint-report> (Nov. 3, 2015) (last visited Nov. 14, 2016).
- ⁸⁹ **Incentives for Secondary Market Transactions to Facilitate Wireless Entrepreneurship for Minority and Women Owners**, Multicultural Media, Telecom, and Internet Council, http://mmtconline.org/WhitePapers/Incentives_For_Secondary_Market_Transactions_To_Facilitate_Diverse_Entrepreneurship_September2016.pdf (Sep. 24, 2016) (last visited Nov. 14, 2016).
- ⁹⁰ *Id.*
- ⁹¹ *Id.*
- ⁹² **MMTC Releases White Paper Detailing How the FCC Can Engage Minority- and Women-Owned Businesses in Spectrum Acquisition**, Multicultural Media, Telecom and Internet Council, Press Release via email, (Sep. 14, 2016) (last visited Nov. 14, 2016).
- ⁹³ *Id.*
- ⁹⁴ *Id.*
- ⁹⁵ *Id.*
- ⁹⁶ **Smart Cities in the Age of 5G: A Technology and Policy Workshop**, Georgetown University McDonough School of Business, <http://cbpp.georgetown.edu/events/smart-cities-age-5g-technology-and-policy-workshop> (Nov. 4, 2016) (last visited Nov. 14, 2016).
- ⁹⁷ *Id.*