Wireless Snapshot 2017

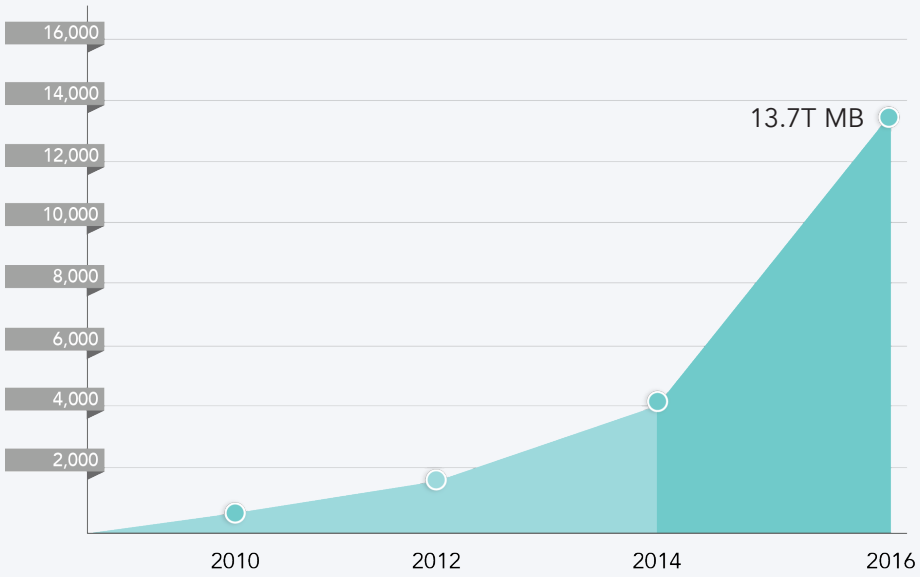
MORE DEVICES, MORE SMARTPHONES, AND MORE APPLICATIONS CONTRIBUTE TO OUR MOBILE-FIRST LIVES.

Since 1985, CTIA has tracked the evolution of the U.S. wireless industry with our Wireless Industry Indices Report. By every metric, wireless is now central to our lives. Last year was no exception, driven by Americans' ever-rising demand for mobile services. Wireless subscribers sent an additional four trillion megabytes over our networks over 2015 levels—and since 2010, data traffic has increased by a factor of 35.

Wireless Data Continues Explosive Growth.

In 2016, wireless data traffic reached yet another record high. In all, traffic totaled 13.72 trillion MBs—the equivalent of 1.58 million years of streaming HD video[1]—an increase of 4.07 trillion megabytes over 2015. Over the past two years, data use has increased 238 percent.

REPORTED WIRELESS DATA TRAFFIC



2016 mobile data use is

35 times

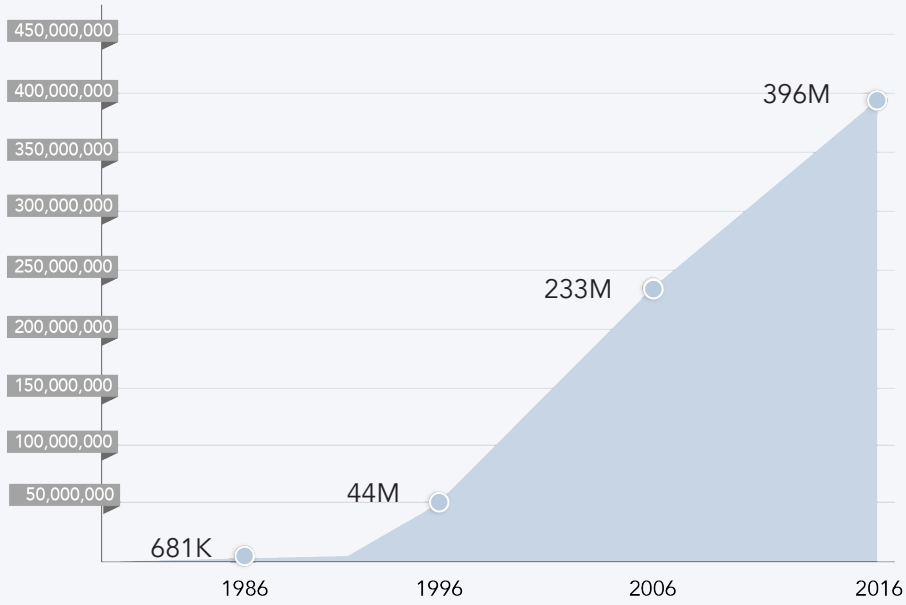
the volume of traffic in 2010.

Driving the Remarkable Increase in Wireless Data Traffic.

Almost every person in America has a mobile phone. The vast majority have a smartphone. Nearly the entire country has been blanketed with high-speed mobile broadband coverage. Speeds are increasing. And consumers view wireless as indispensable to their lives.

MOBILE DEVICE OWNERSHIP CONTINUES TO RISE. Mobile device use continues to increase across all demographics. Roughly 396 million mobile devices are in use today,[2] up 4.7 percent in 2016, continuing a remarkable decades-long growth curve. There are now more wireless devices than Americans, with about 1.2 devices for every person in the country. That makes the wireless platform nearly ubiquitous: 95 percent of U.S. adults own a cellphone.[3] Compare that to the 78 percent of Americans who own a computer[4] and the fact there are enough cars and motorcycles on the road for only 77 percent of Americans.[5]

ESTIMATED SUBSCRIBER CONNECTIONS



Mobile device penetration is up

4.7 percent

in 2016, continuing a remarkable decades long growth curve.

SMARTPHONES ARE NOW PERVASIVE. There are 261.9 million smartphones in use today, representing nearly 80 percent of the U.S. population. With smartphones generating 102 times more data than a current basic mobile device,[6] the continued rise in smartphone ownership is a driving force behind the significant increase in data traffic across wireless networks. On average last year, a smartphone generated 3.87 GB of data every month. This represents an over 1,400 percent increase since 2010, due to the rise of faster networks, more sophisticated phones, and new applications and services.

Millennials lead smartphone adoption, with 92 percent of 18-29 year olds having a smartphone, followed by 88 percent of 30-49 year olds, and 74 percent of 50-64 year olds.[7] With respect to race, smartphone ownership cuts across the board, with approximately 72 percent of African-Americans, 75 percent of Hispanics, and 77 percent of whites in the U.S. having smartphones.[8]

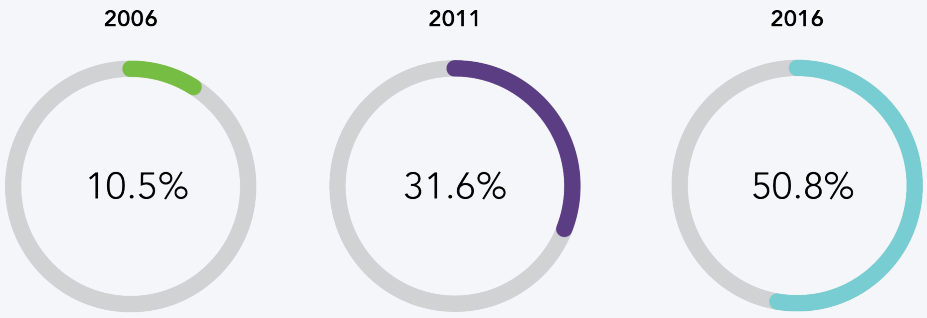
Across income levels, a significant majority of Americans now have smartphones, with 64 percent of people making less than $30,000 a year and 93 percent of people earning more than $75,000 a year owning smartphones.[9] And since 2011, the number of individuals making under $30,000 per year who own a smartphone has grown by 42 percent.[10]

14.7% increase

in smartphones year-over-year.

WIRELESS INCREASINGLY THE ON-RAMP TO THE INTERNET. For some, mobile devices are their sole means of accessing the Internet. Twelve percent of Americans rely on their smartphone as their primary access to the Internet at home—and these individuals are more likely to be younger, non-white, and lower-income.[11] More people are cutting the cord and going wireless-only when it comes to phone service, making their mobile device their only telephone connection.

GROWTH IN WIRELESS-ONLY HOUSEHOLDS[12]

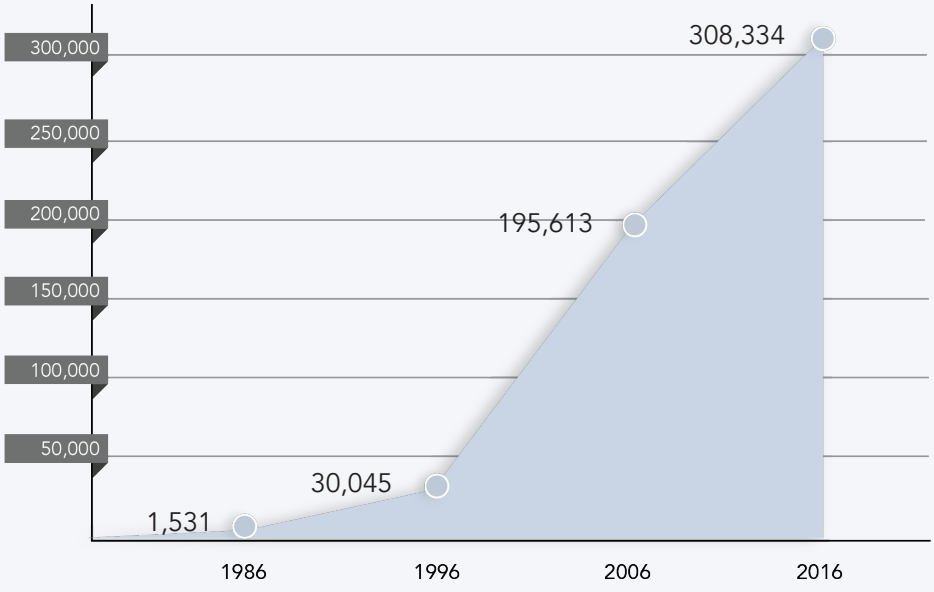


Today, just over half—50.8 percent—of American households only have a mobile voice connection.[13] For Millennials, the number increases to over two-thirds who live in mobile-only households.[14] These data points showcase a dynamic and growing wireless industry.

MORE CELL SITES EXPAND COVERAGE AND SPEEDS. At the end of 2016, a record 308,334 cell sites were in operation, representing growth of over 57 percent in the last ten years. This number is poised to increase dramatically as the wireless industry densifies today's networks and prepares for 5G, the next-generation of wireless, with hundreds of thousands of small cells in the next three to four years.

Thanks in part to the buildout of wireless industry infrastructure, more than 98 percent of the U.S. population is covered by three or more providers of mobile wireless service and more than 95 percent of the population is covered by three or more LTE-based service providers.[15] Consumers win with this level of competition.

CELL SITES IN SERVICE



57% growth

in cell sites over the last 10 years.

Over the life of the wireless industry, wireless carriers have made nearly **$489 billion in capital investments.**

MOBILE SPEEDS CONTINUE TO INCREASE AND DRIVE DATA USE. Today's 4G LTE mobile data speeds increased nearly 40 times since 3G speeds in 2007,[16] and download speeds for all mobile phones have grown by almost 40 percent since 2015.[17] Today, Americans benefit from average 4G LTE speeds of nearly 17 Mbps.[18] Faster speeds allow for quicker downloads, better connections, and more advanced apps, which in turn fuel increased consumption and innovation.

SATISFIED WITH THEIR WIRELESS SERVICE, CONSUMERS SEE WIRELESS AS INDISPENSABLE. With all this mobile use, the vast majority of Americans—four out every five—consider wireless service indispensable.[19] In fact, the average U.S. consumer checks their phone nearly 50 times throughout the day.[20]

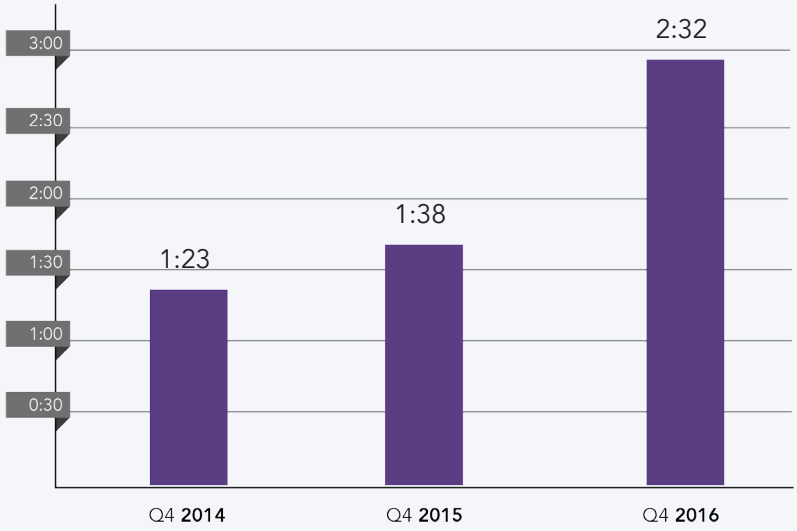
TIME WITH MOBILE DEVICES ALSO INCREASING DRAMATICALLY. Today, Americans spend 2 hours and 32 minutes a day on average, using apps or accessing the web on their smartphones—a figure that has doubled in the past year alone.[21] In addition, 71% of the time people spend online is from a mobile device,[22] mobile minutes exceeded 1 billion for the first month ever in March 2016,[23] and consumers spent twice as many minutes on mobile as desktop for the first month ever in April 2016.[24]

CONTINUED IMPORTANCE OF TEXT AND VOICE. In 2016, wireless consumers spent 2.751 trillion minutes of use (MOU) talking on their mobile devices through traditional voice services.

In addition to voice capabilities, text messaging remains a critically important wireless feature. With SMS's very high engagement rate—90 percent of consumers say they read a message within minutes of receipt[25]—and its high daily use rate—71 percent of consumers use SMS at least once a day[26]—it is no surprise that consumers sent a remarkable 1.939 trillion messages (combined SMS and MMS) in 2016.

These numbers matter because they illustrate the centrality of wireless connectivity to our lives.

AVERAGE TIME SPENT PER ADULT 18+ PER DAY ACCESSING APPS/ WEB ON A SMARTPHONE/ TABLET



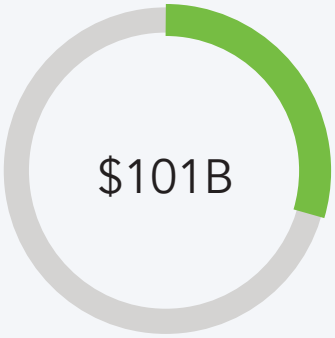
Wireless Impact: Investing in America and Growing our Economy.

WIRELESS INVESTMENT MEANS GLOBAL LEADERSHIP. America's wireless leadership is possible only because of the significant capital investments that wireless carriers make in their networks. Wireless capital expenditures totaled $26.4 billion in 2016, and over $200 billion in the past seven years alone.

SPECTRUM IS A KEY WIRELESS INVESTMENT. In addition to capital expenditures, the wireless industry has also spent billions of dollars on spectrum licenses. Since 1994, FCC spectrum auctions – including the recent 600MHz auction – raised over $100 billion in revenue for the government.[26]

INVESTING IN AMERICA

Reported Wireless Capex Since 1994



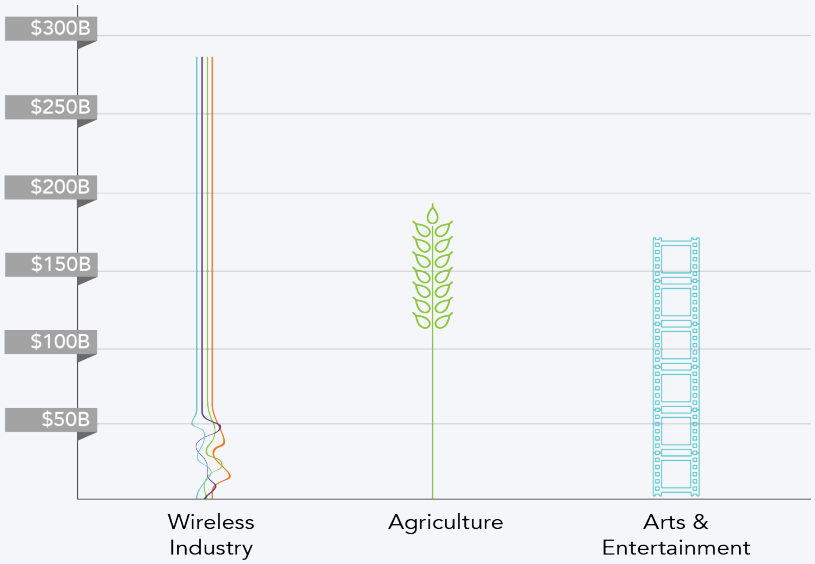
Spectrum Auction Revenue for the Federal Government Since 1994

WIRELESS CREATES JOBS. In 2016, wireless carriers directly employed 216,537 people across the country. Wireless employees also have higher wages—46 percent higher, in fact—than average.[27]

In addition, wireless directly supports more than 4.6 million jobs across ecosystem sectors—device and accessories manufacturers, wireless operators, retailers, network suppliers, app and content stores, mobile advertising networks, advertising, and others.[28]

MOBILE INDUSTRY COMPARED TO OTHER INDUSTRIES

In 2014, the Wireless Industry had a GDP of $282B, almost $100B more than Agriculture, and Arts and Entertainment in the same year.



WIRELESS DRIVES ECONOMIC GROWTH. Licensed wireless service generates more than $400 billion annually[29] in direct and indirect economic activity. This spend in the wireless ecosystem is a result of the use of licensed spectrum and doesn't even account for the economic benefits produced by other industry sectors that rely on the mobile broadband platform.

THE NEXT GENERATION OF WIRELESS: 5G, SMART CITIES, AND THE INTERNET OF THINGS. 5G, the next-generation of wireless, will unlock new cycles of innovation and investment across the mobile ecosystem. Analysts predict 5G networks will be up to 100 times faster than 4G networks, connect 100 times the number of devices, and respond 5 times as quickly. Driving this wireless revolution is a projected $275 billion dollars in investment that will create up to 3 million new 5G jobs and add approximately $500 billion to the U.S. economy.[30]

Wireless-powered smart city solutions could produce $160 billion in benefits and savings from lower energy use, reduced traffic congestion, and decreased fuel costs.[31] Connected devices could create $305 billion in annual savings for the healthcare industry,[32] and self-driving cars could save 21,700 lives and $447 billion per year.[33] The number of IoT devices worldwide will conservatively surpass 20 billion by the year 2020,[34] and this increase in connectivity stands to add roughly $2.7 trillion to U.S. GDP by 2030.[35]

The proliferation of mobile use has transformed our lives, and we're only scratching the surface. Mobile and connected life innovation is exploding as new consumers and commercial applications are brought to market. The future is here and we look forward to seeing where it takes America next.

ENDNOTES |

1. Based on estimates from the U.S. Cellular Monthly Data Usage Estimate tool, available at https://www.uscellular.com/data/data-estimator.html.

2. This number is derived from the number of active devices, including smartphones, feature phones, tablets, etc. on carrier networks. Since users may have more than one wireless device, it is not equal to the number of individual subscribers.

3. Pew Research Center, "Mobile Fact Sheet" (Jan. 12, 2017), available at http://www.pewinternet.org/fact-sheet/mobile/.

4. Id.

5. Based on Bureau of Transportation Statistics for "Number of U.S. Aircraft, Vehicles, Vessels, and Other Conveyances" (2014), available at https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_01_11.html.

6. Cisco, "VNI Mobile Forecast Highlights, 2016-2012" (Feb. 2017), available at http://www.cisco.com/assets/sol/sp/vni/forecast_highlights_mobile/#~Country (United States – Device Growth Traffic Profiles, Smartphones).

7. Pew Research Center, "Mobile Fact Sheet" (Jan. 12, 2017), available at http://www.pewinternet.org/fact-sheet/mobile/

8. Id.

9. Id.

10. Pew Research Center, "Mobile Fact Sheet" (Jan. 12, 2017), available at http://www.pewinternet.org/fact-sheet/mobile/ and Pew Research Center, "Smartphone Adoption and Usage" (Jul. 11, 2011), available at http://www.pewinternet.org/2011/07/11/smartphone-adoption-and-usage/."

11. Id.

12. Stephen J. Blumberg, Ph.D and Julian V. Luke, Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, June 2016 - December 2016 (May 2017), available at https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201705.pdf.

13. Id.

14. FCC, Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Nineteenth Report, DA 16-1061 (Sep. 23, 2016), FCC and Mosaik data https://www.fcc.gov/document/19th-mobile-wireless-competition-report

15. Compare FCC, 13th CMRS Competition Report (2007), https://apps.fcc.gov/edocs_public/attachmatch/DA-09-54A1.pdf ("During 2006 and 2007, wireless providers have continued to deploy mobile broadband networks, such as CDMA EV-DO and WCDMA/HSDPA, which allow typical downstream data transfer speeds of 400-800 kbps.") with PCMag," Fastest Mobile Networks 2016" (June 2016), http://www.pcmag.com/article/345123/fastest-mobile-networks-2016/2 (recording the average speed of 4G in 2016 to range from 19.01 Mbps to 26.98 Mbps).

16. Compare Cisco VNI Mobile Forecast Highlights, 2015-2020, United States available at http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html# with Cisco VNI Mobile Forecast Highlights, 2016-2021, United States – Accelerating Network Speeds available at http://www.cisco.com/assets/sol/sp/vni/forecast_highlights_mobile/#~Country

17. Cisco, Cisco VNI Mobile Forecast Highlights, 2016-2021, United States – Accelerating Network Speeds available at http://www.cisco.com/assets/sol/sp/vni/forecast_highlights_mobile/#~Country

18. Morning Consult Survey (December 2016).

19. Deloitte, "2016 Global Mobile Consumer Survey: US Edition", (2016) available at https://www2.deloitte.com/us/en/pages/technology-media-and-telecommunications/articles/global-mobile-consumer-survey-us-edition.html

20. Nielsen, The Nielsen Total Audience Report Q4 2016 (April 3, 2017), available at http://www.nielsen.com/us/en/insights/reports/2017/the-nielsen-total-audience-report-q4-2016.html.

21. comScore, Mobile's Hierarchy of Needs (April 5. 2017), available at https://www.comscore.com/Insights/Presentations-and-Whitepapers/2017/Mobiles-Hierarchy-of-Needs.

22. Id.

23. Id.

24 Genia Stevens, Business.com, "Text Savvy: 6 Reasons Brands Should Start Using SMS Marketing" (Feb. 22, 2017), available at https://www.business.com/articles/6-reasons-brands-should-start-using-sms-marketing/.

25 2016 Morning Consult survey

26 FCC, Fiscal Year 2017 Budget Estimates to Congress (February 9, 2016), available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-337668A2.pdf; FCC Auction 1000, Incentive Auction, https://auctiondata.fcc.gov/public/projects/1000.

27. U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, available at http://www.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables.

28. Roger Entner, The Wireless Industry: Revisiting Spectrum, The Essential Engine of US Economic Growth (April 2016) available at http://www.ctia.org/docs/default-source/default-document-library/entner-revisiting-spectrum-final.pdf.

29. Coleman Bazelon & Giulia McHenry, The Brattle Group, Mobile Broadband Spectrum: A Vital Resource for the American Economy (May 11, 2015), available at http://www.brattle.com/news-and-knowledge/news/brattle-prepares-report-on-economic-activity-generated-by-spectrum-licensed-to-u-s-wireless-carriers.

30. Accenture, Smart Cities: How 5G Can Help Municipalities Become Vibrant Smart Cities (January 2017) available at https://www.accenture.com/us-en/insight-smart-cities.

31. Id.

32. David H. Roman and Kyle D. Conlee, The Digital Revolution Comes to US Healthcare: Technology, Incentives Align to Shake Up the Status Quo, Goldman Sachs Equity Report, Internet of Things Volume 5 (June 29, 2015) available at http://massdigitalhealth.org/digital-revolution-comes-us-healthcare.

33. Daniel J. Fagnant and Kara Kockelman, "Preparing a Nation for Autonomous Vehicles: Opportunities, Barriers and Policy Recommendations for Capitalizing on Self-Driven Vehicles," Eno Center for Transportation (2013), available at https://www.enotrans.org/etl-material/preparing-a-nation-for-autonomous-vehicles-opportunities-barriers-and-policy-recommendations/.

34. Gartner Inc., Gartner Says 8.4 Billion Connected "Things" Will Be in Use in 2017, Up 31 Percent From 2016 (Feb. 7, 2017) available at http://www.gartner.com/newsroom/id/3598917.

35. Dr. Michael Mandel, Progressive Policy Institute, Long Term U.S. Productivity Growth and Mobile Broadband: The Road Ahead (March 2016) available at http://www.progressivepolicy.org/wp-content/uploads/2016/03/2016.03-Mandel_Long-term-US-Productivity-Growth-and-Mobile-Broadband_The-Road-Ahead.pdf