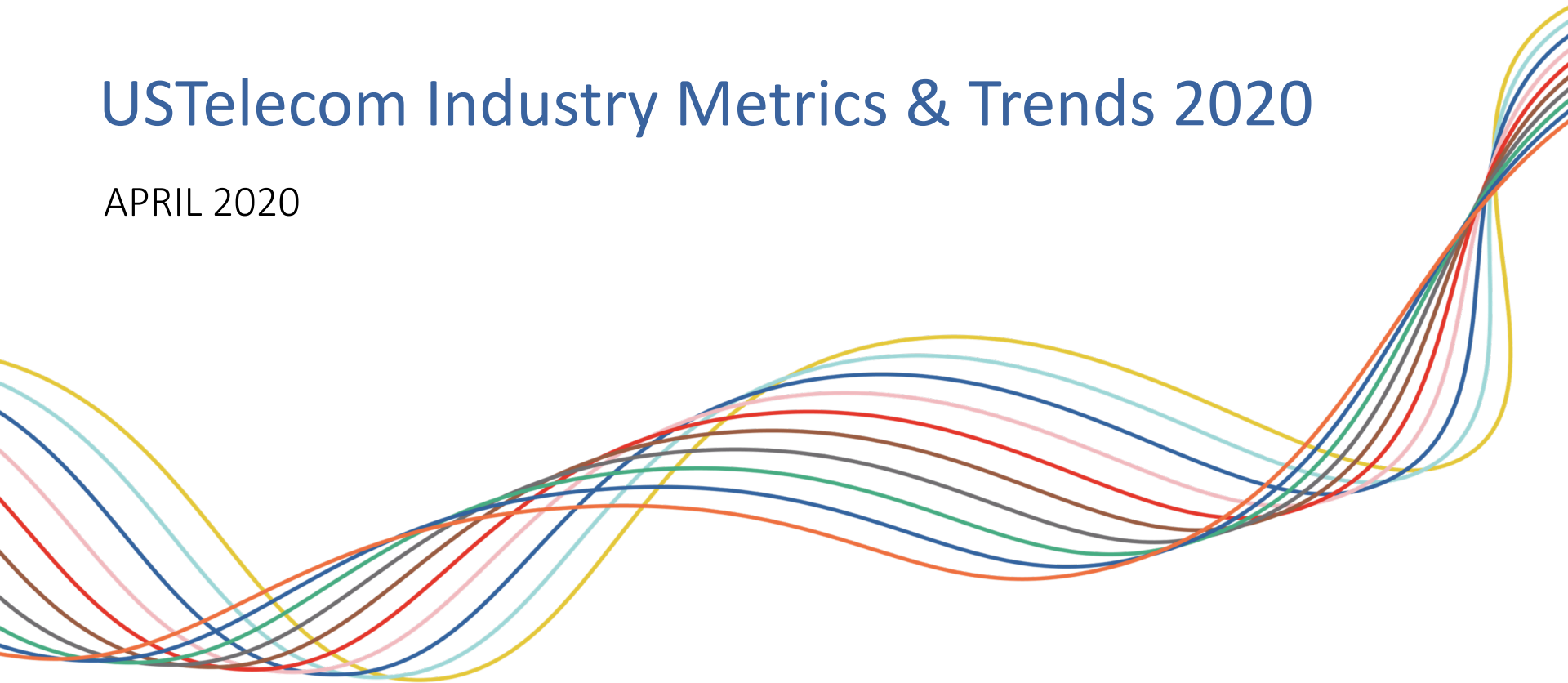


# USTelecom Industry Metrics & Trends 2020

APRIL 2020



# Contents and Summary

## **1. Investment drives competition in broadband deployment, adoption, and innovation**

- A light-touch regulatory policy environment, and targeted government financial support for broadband has encouraged more than \$1.7 trillion in investment since 1996.
- The result has been near-nationwide broadband deployment, widespread adoption of innovative services, and significant progress in narrowing the digital divide.

## **2. Internet data traffic continues to rise rapidly, and the U.S. remains a global leader**

- However, accommodating data traffic growth and maintaining U.S. International leadership will require policies that address our greatest communications and technology challenges while at the same time encouraging ongoing network investment.
- Wireline infrastructure is essential to next generation broadband and 5G wireless networks.

## **3. Competition and technological innovation define the communications industry today**

- Consumers are choosing among a wide array of new internet-based and wireless communications services.
- Legacy regulatory structures must adapt to the new competitive dynamic.

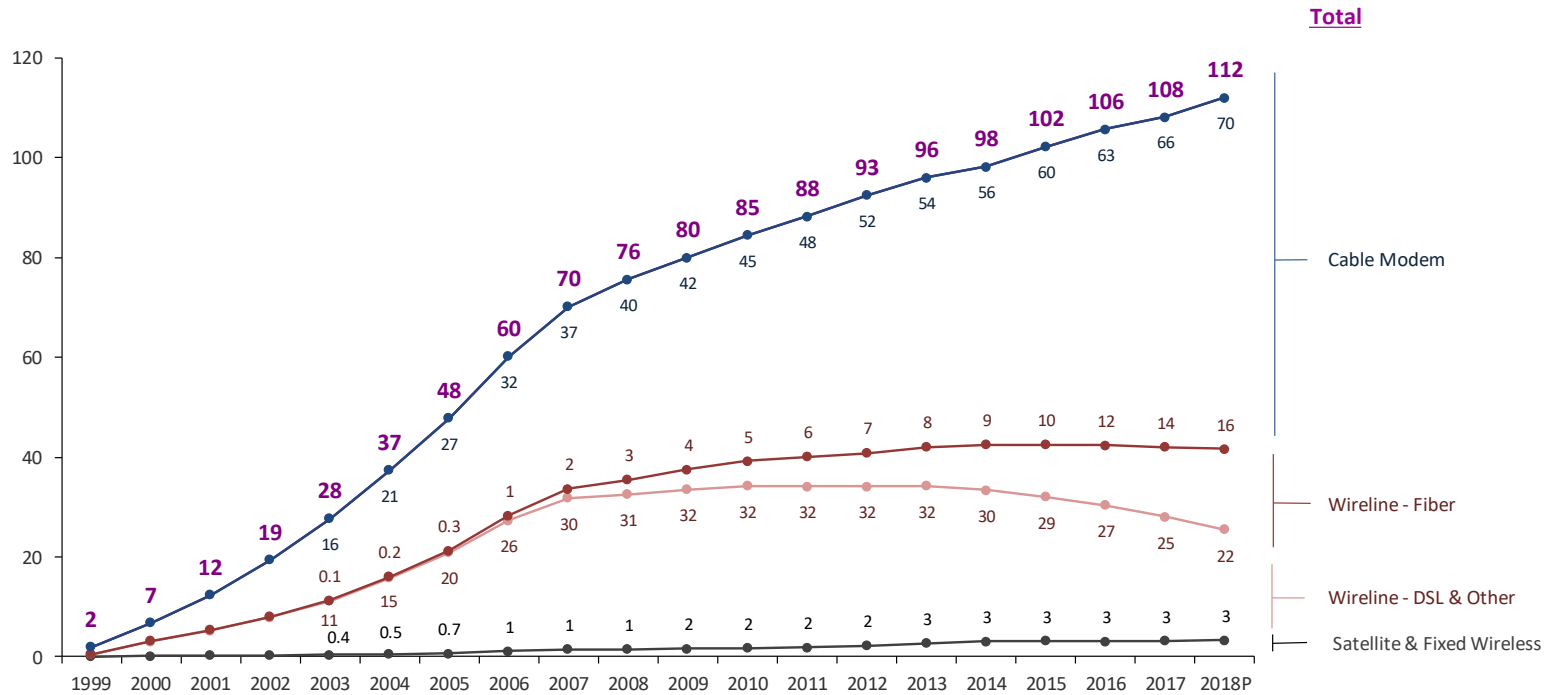


## 1. Investment Drives Competition in Broadband Deployment, Adoption and Innovation

*A light-touch regulatory policy environment along with targeted government financial support for broadband has encouraged trillions of dollars in investment leading to near-nationwide deployment, widespread adoption of innovative services, and significant progress in narrowing the digital divide.*

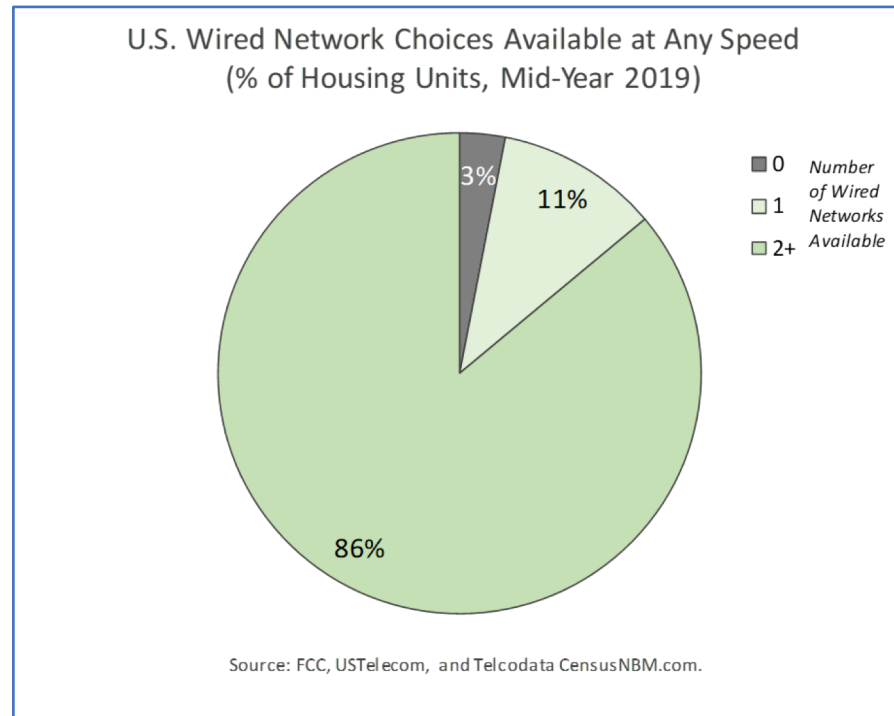
# Broadband Has Been a Competitive Industry from Its Inception

U.S. Fixed Broadband Connections by Technology  
(Millions of "High Speed" Connections)



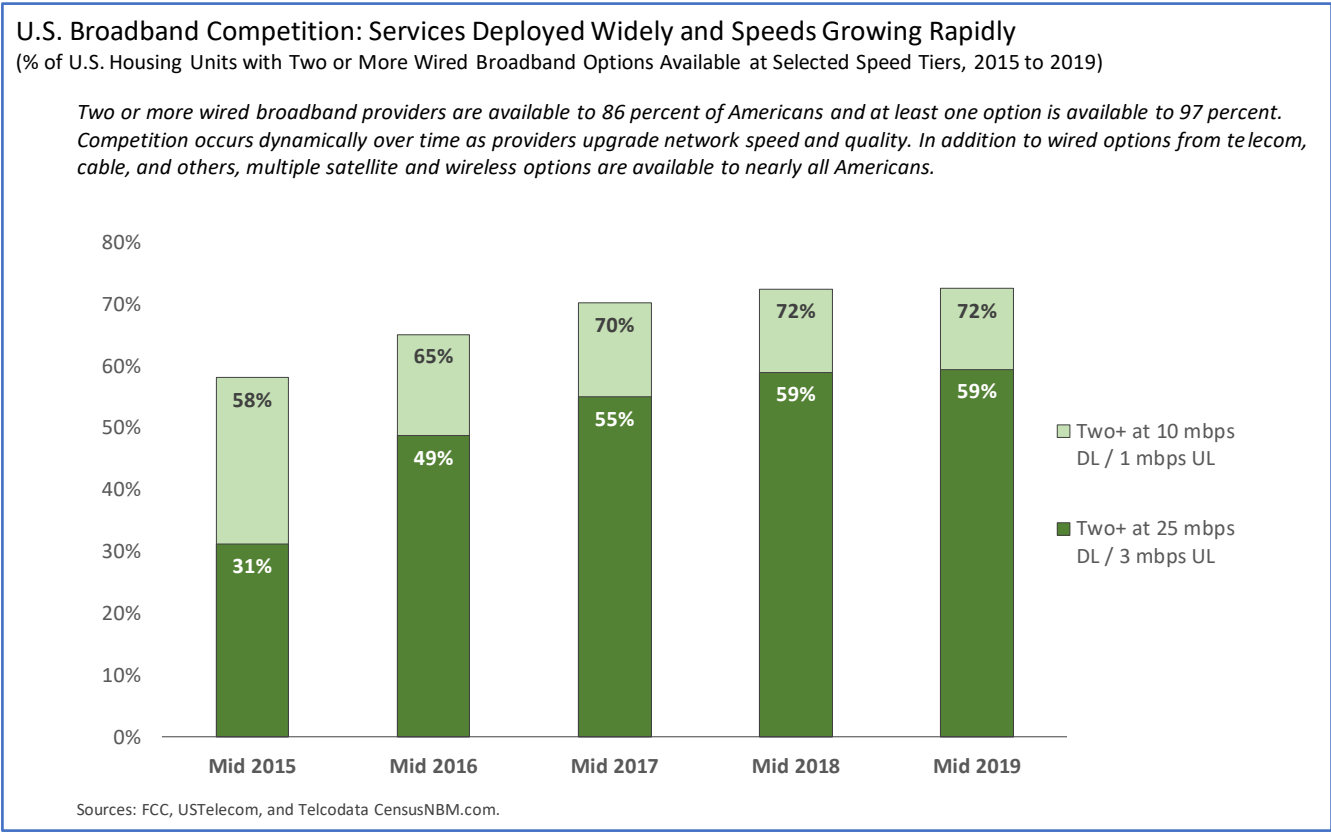
Source: FCC. Based on "high-speed services" > 200 kbps downstream. Connections are stacked by technology in each period. Projections are based on straight-line 6-month trend.

# Competitive Network Infrastructure Is Widely Available



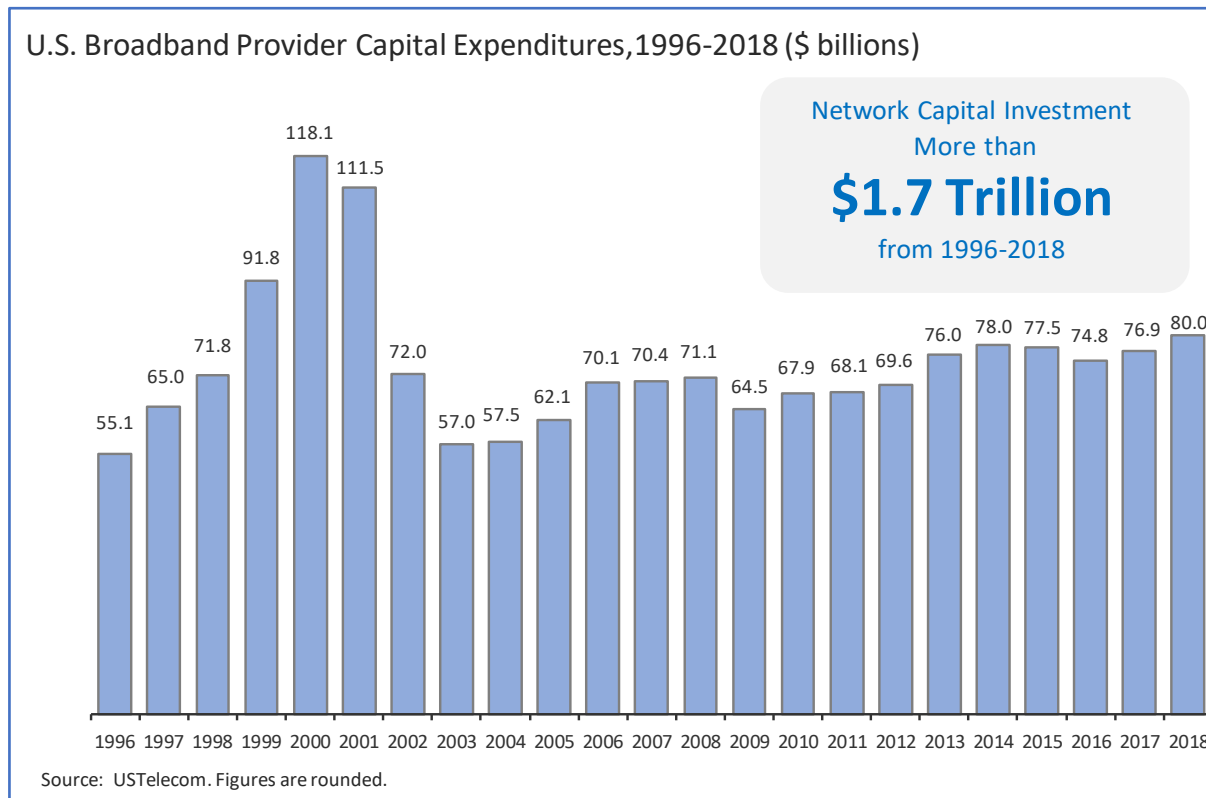
*This chart focuses narrowly on wired broadband competition for comparison with historical wired broadband data on page 17. Fixed broadband, which includes fixed wireless services, is shown on page 12 and has even greater competitive overlap among technologies.*

# Competition at Higher Speed Tiers Is Continually Growing As Providers Invest in Network Upgrades



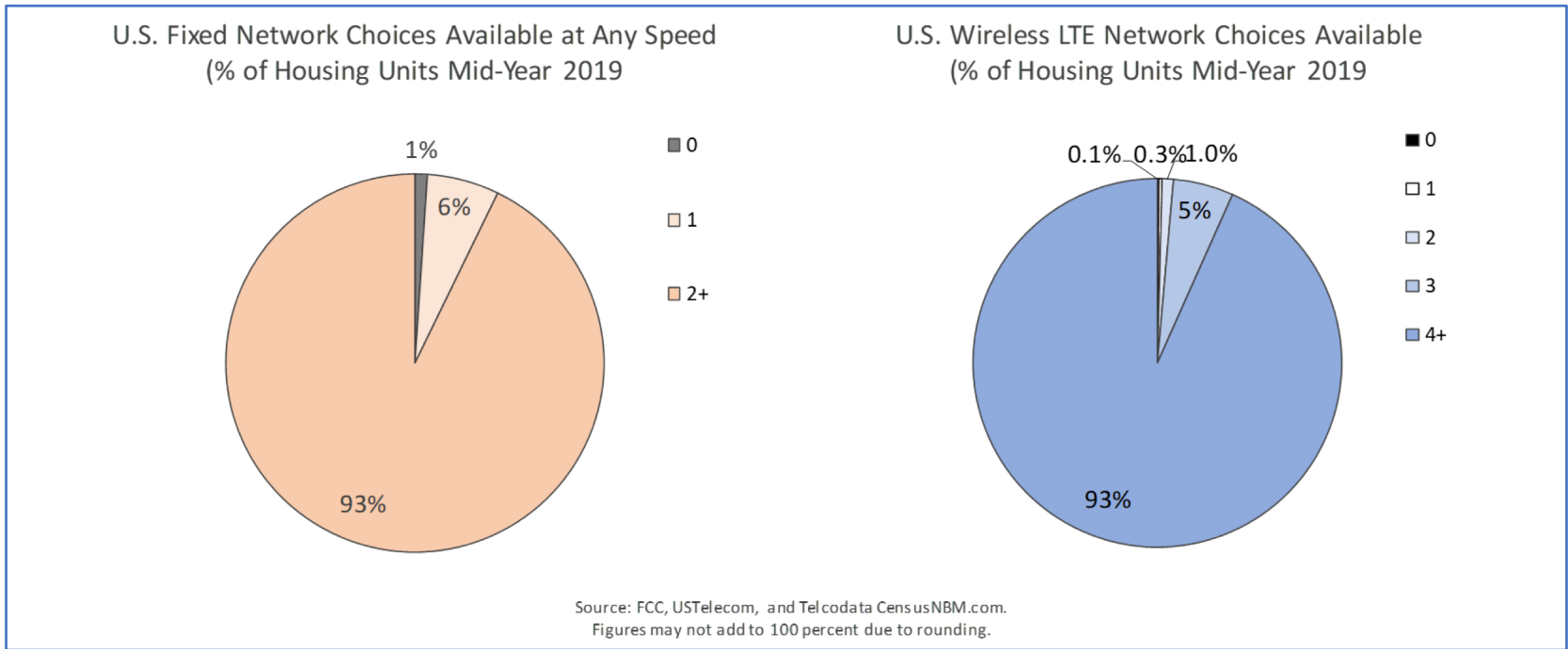
*This chart focuses narrowly on wired broadband competition due to historical data limitations. Fixed broadband, which includes fixed wireless services, would show even greater competitive overlap.*

# Broadband Providers Have Invested More Than \$1.7 Trillion in Capital since 1996



*Data includes wireline, wireless, and cable providers.*

# Network Investment by Competitive Providers Has Brought Near-Nationwide Deployment

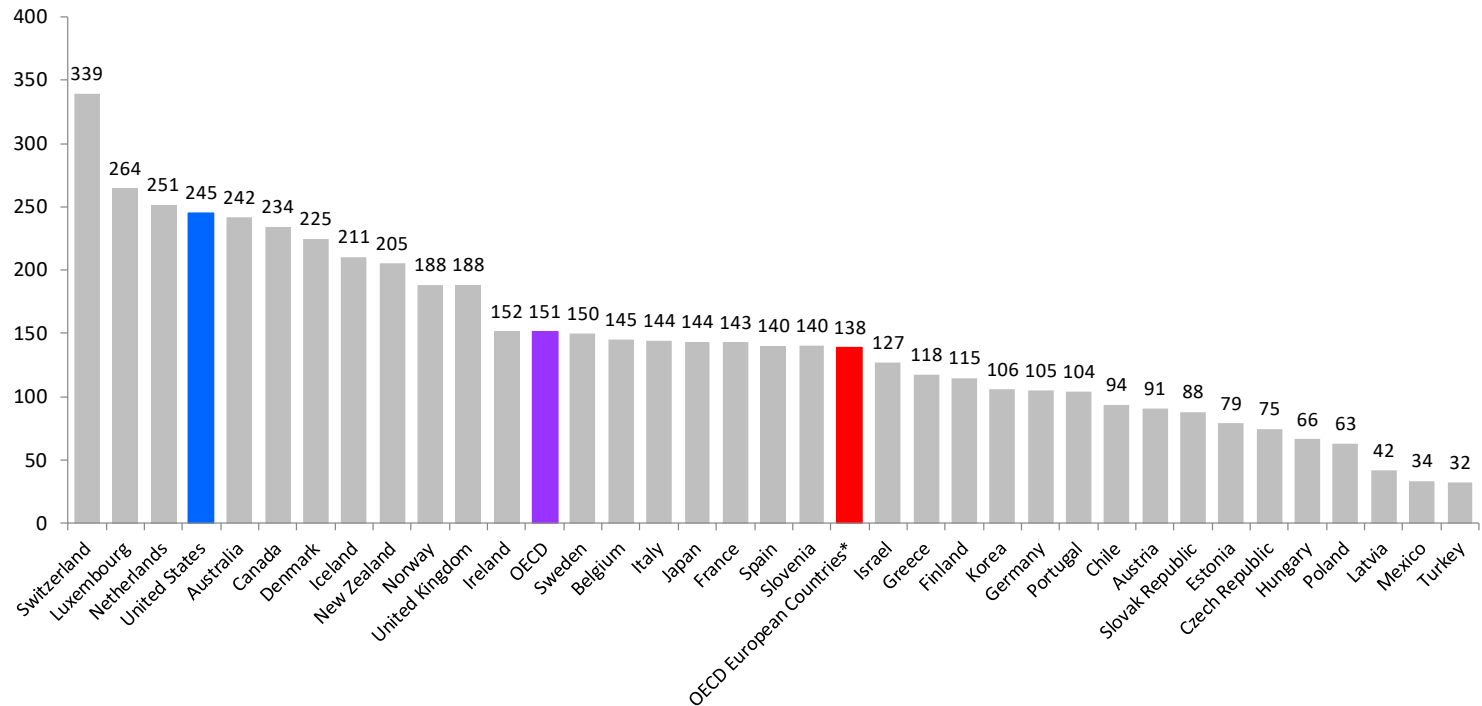


*Fixed broadband includes wired broadband and fixed wireless services, but excludes satellite. Wired broadband, excluding fixed wireless, is shown on page 6.*



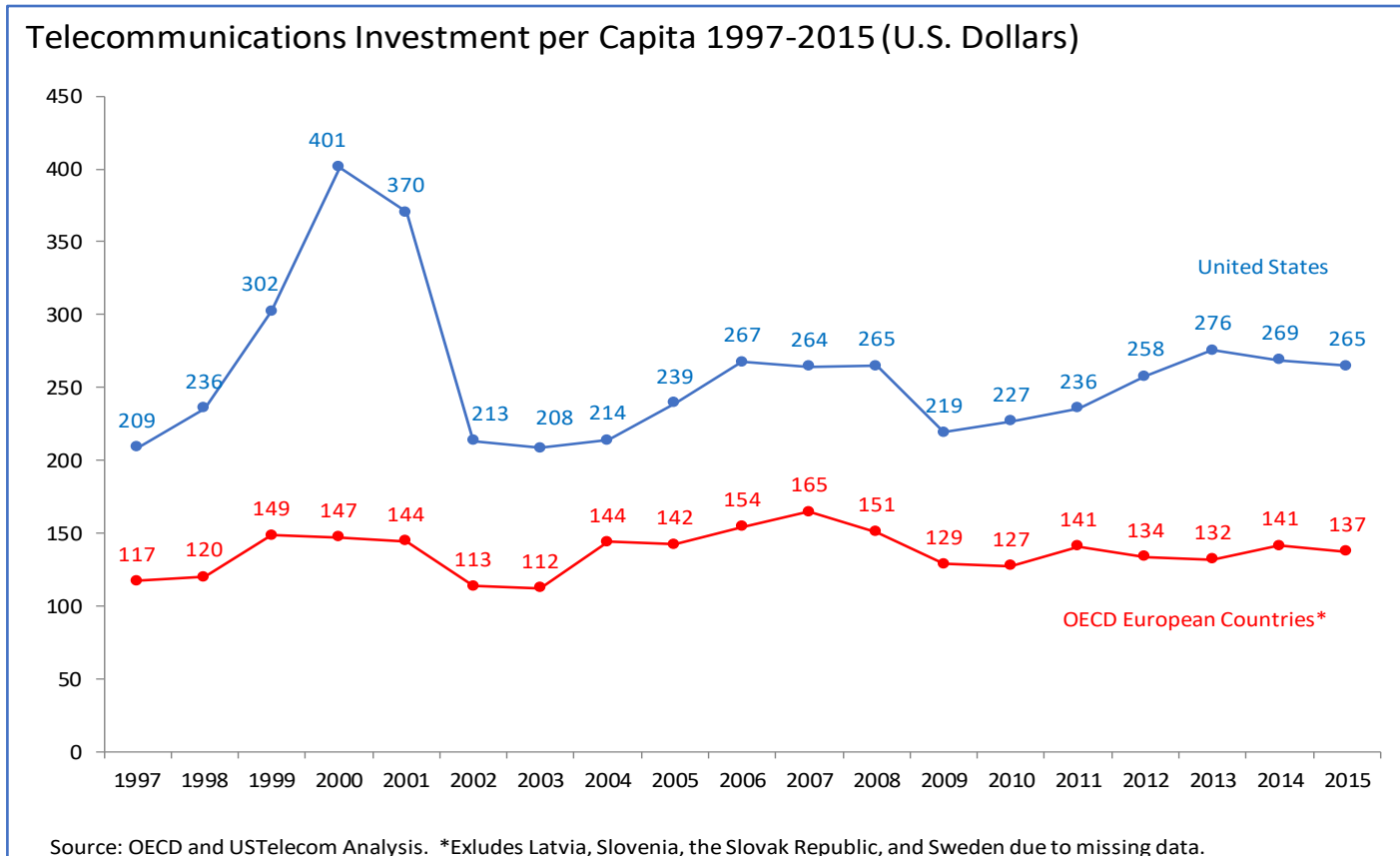
# U.S. Invests More in Broadband than Most Industrialized Nations

Average Annual Telecommunications Capital Investment Per Capita 2003-2015 (US Dollars)



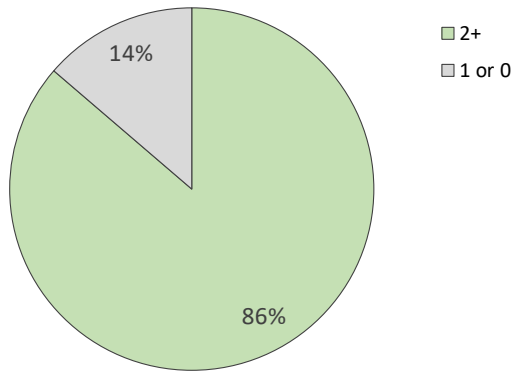
Source: OECD and USTelecom Analysis. \*Excludes Latvia, Slovenia, the Slovak Republic, and Sweden due to missing data.

# U.S. Invests More per Capita in Broadband than Europe



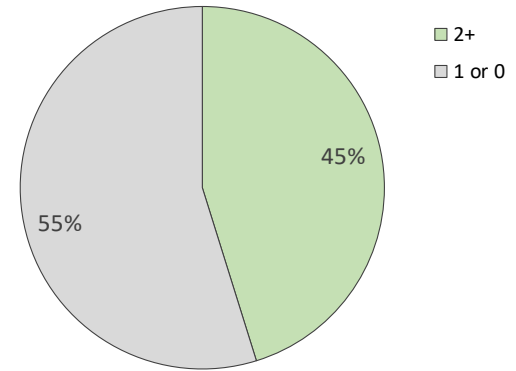
# U.S. Investment in Facilities-Based Competition Has Yielded More Real Competitive Choice than Europe

U.S. Wired Network Choices  
Facilities-Based Options Available at Any Speed  
(% of Housing Units, Mid-Year 2018)



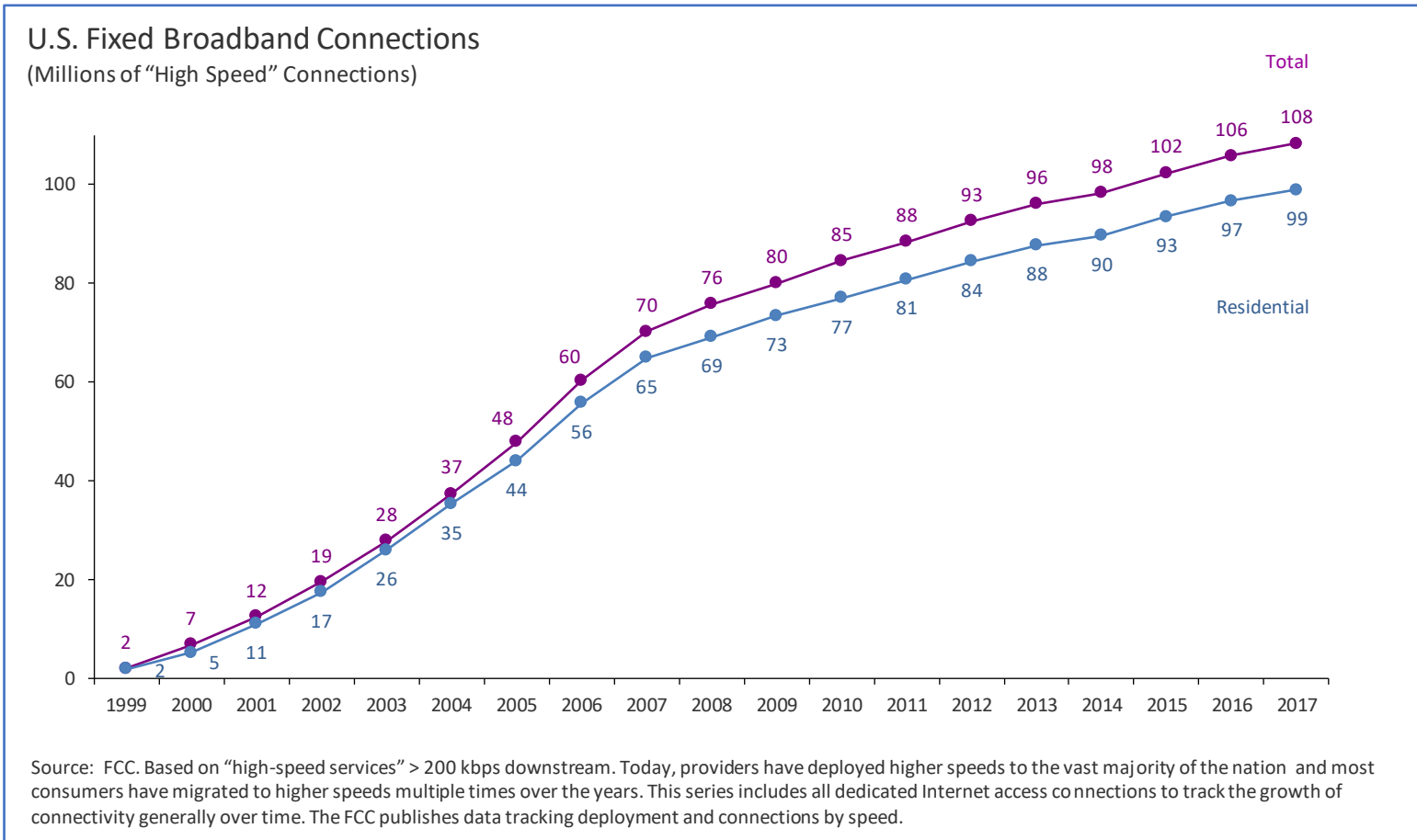
Source: FCC, USTelecom, and Telcodata CensusNBM.com.

EU28 Wired Network Choices  
Facilities-Based Options Available at Any Speed  
(% of Households, Mid-Year 2018)

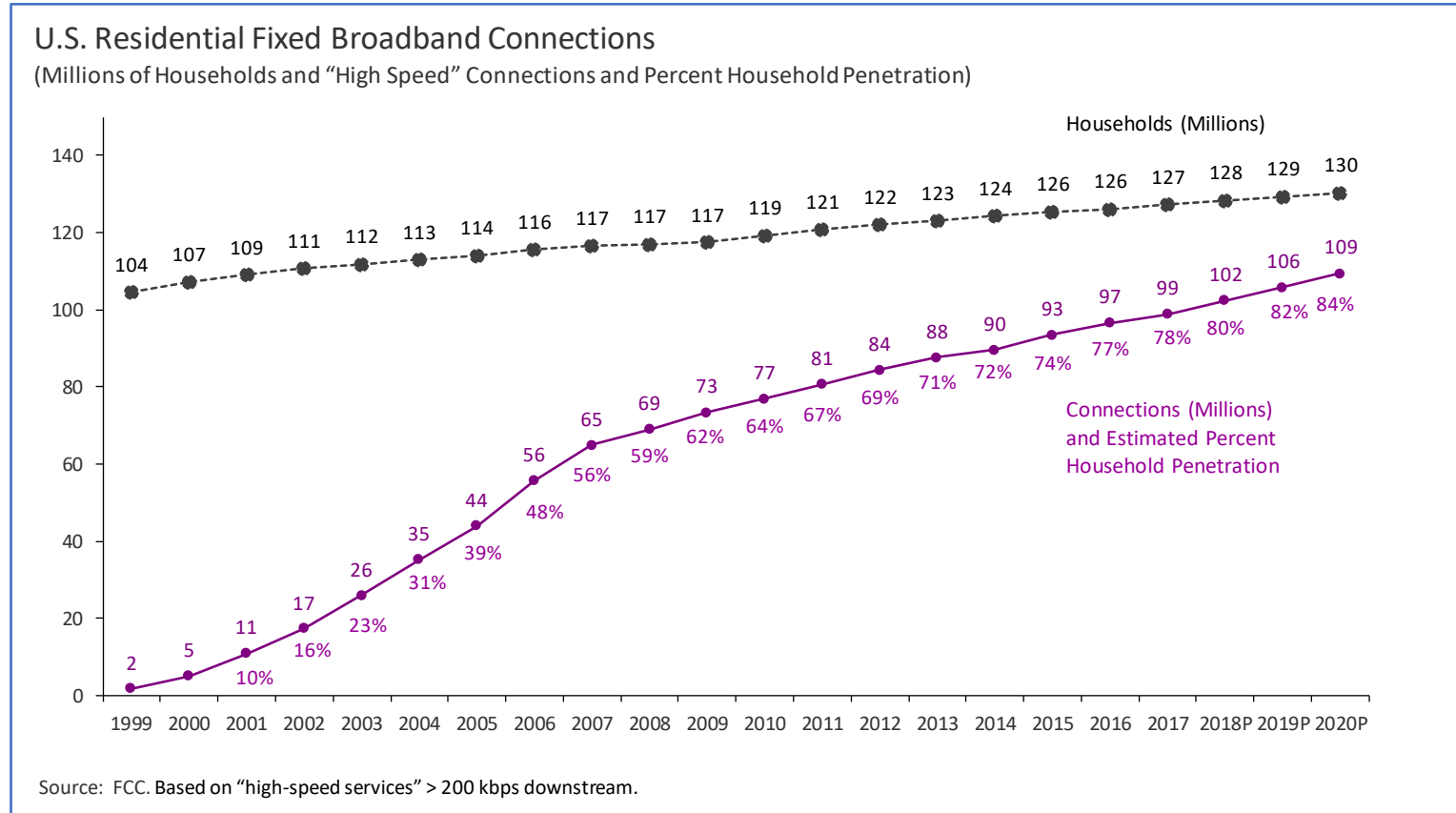


Source: European Union, USTelecom, and IHS Markit./Point Topic

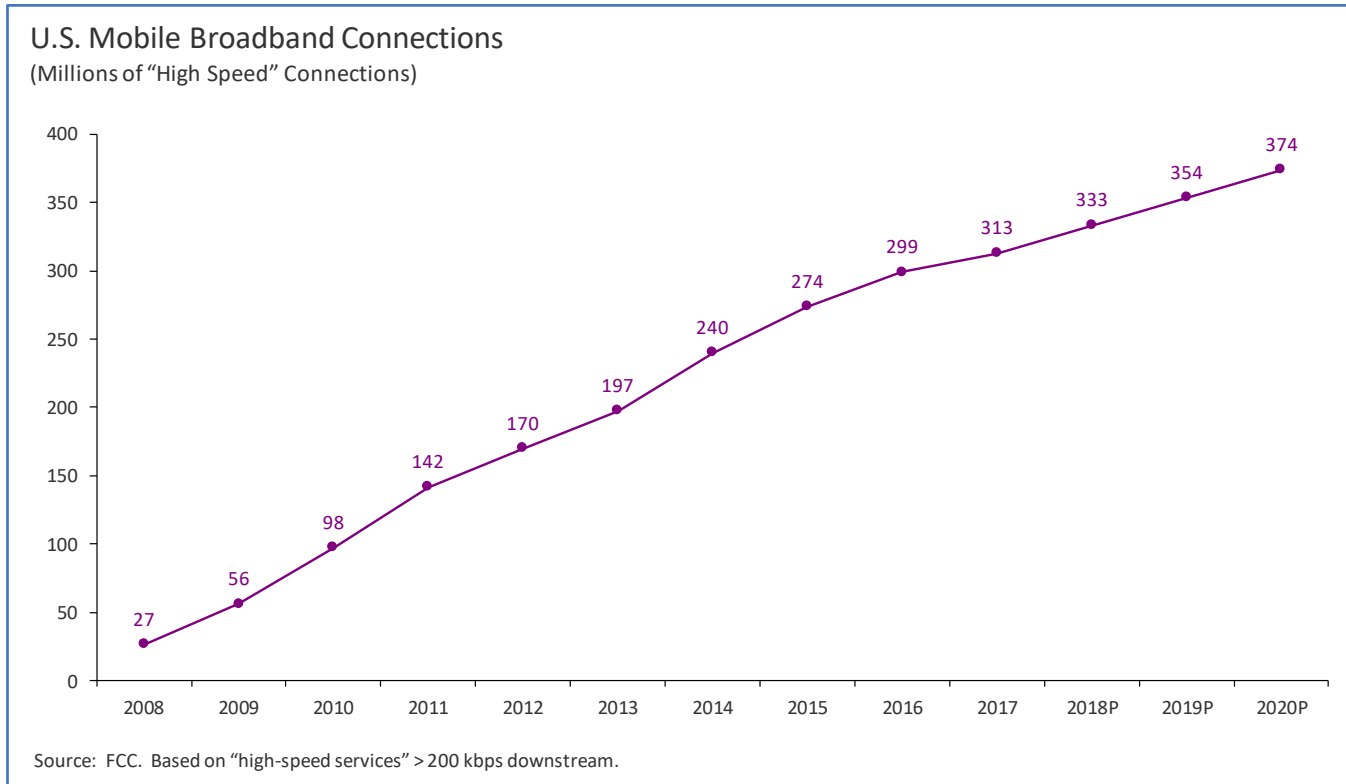
# Investment Has Enabled Widespread and Ongoing Broadband Adoption



# Fixed Broadband Is Still Outpacing Household Growth and Approaching 85 Percent Penetration

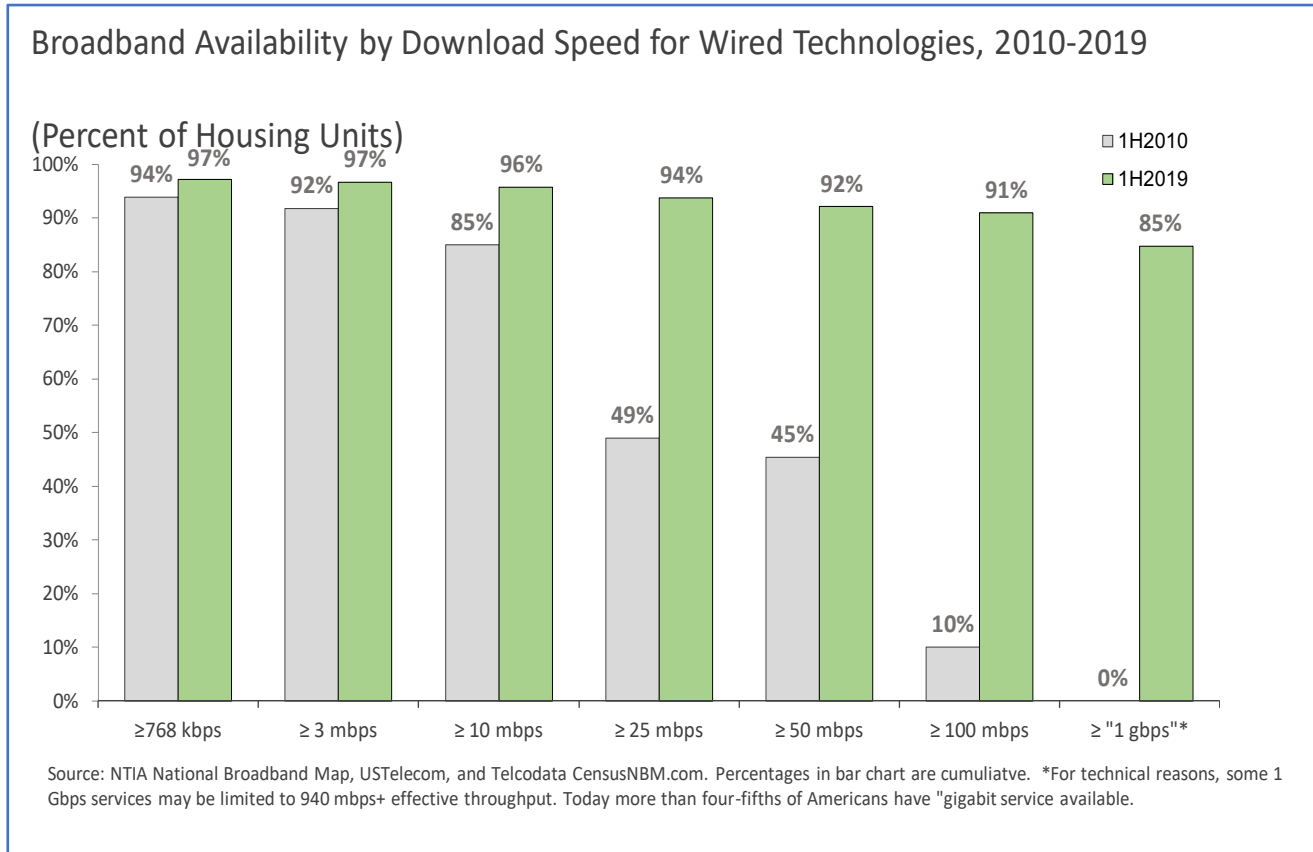


# Mobile Broadband is Growing Rapidly



*U.S. smartphone adoption estimates range from 81% of adults (Pew Internet, June 2019) to 83% of households (Consumer Technology Association, First Quarter 2019)*

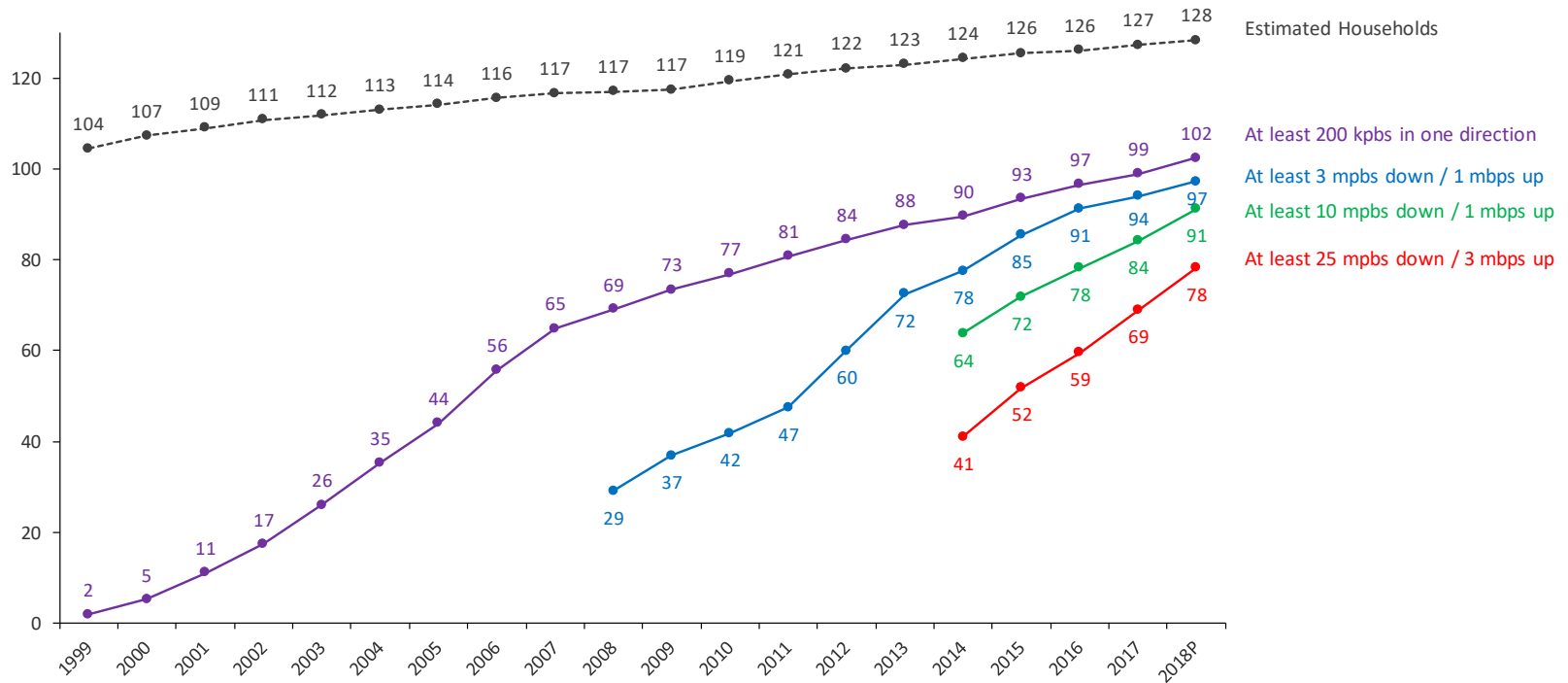
# Providers Are Deploying Networks Capable of Providing Higher Speeds



*In addition to wired broadband, 4G mobile broadband grew from availability of less than 1% of Americans in 2010 to 99.8% in 2018. 4G Download speeds are in excess of 20 Mbps (opensignal.com) and 5G deployment is underway.*

# Consumers Are Choosing Services with Higher Speeds

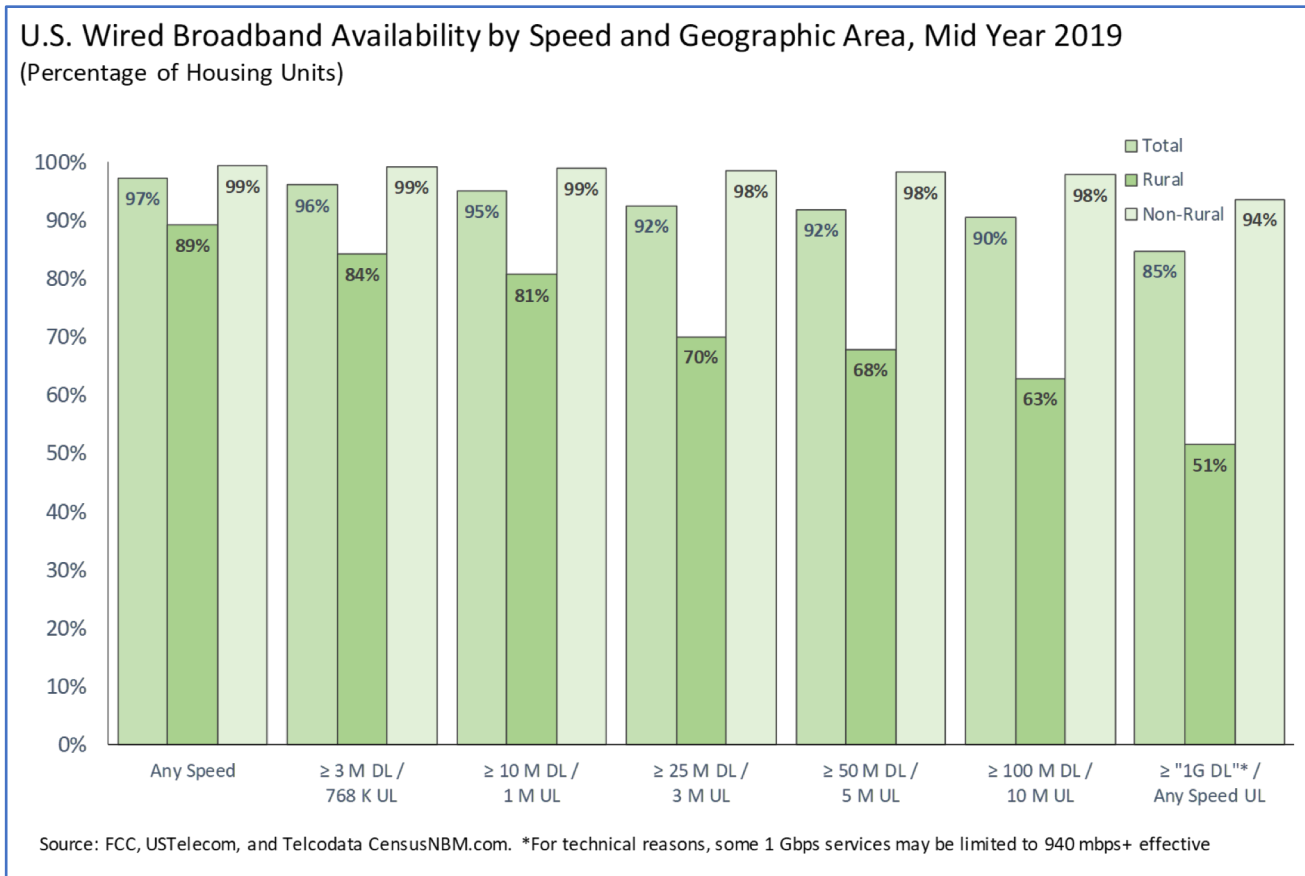
U.S. Residential Fixed Broadband Connections by Speed and Households  
(Millions of Connections)



Source: FCC, Census, USTelecom. "At least" lower-speed categories are inclusive of higher-speed categories. Projections are straight-line based on most recent 6-month trend.

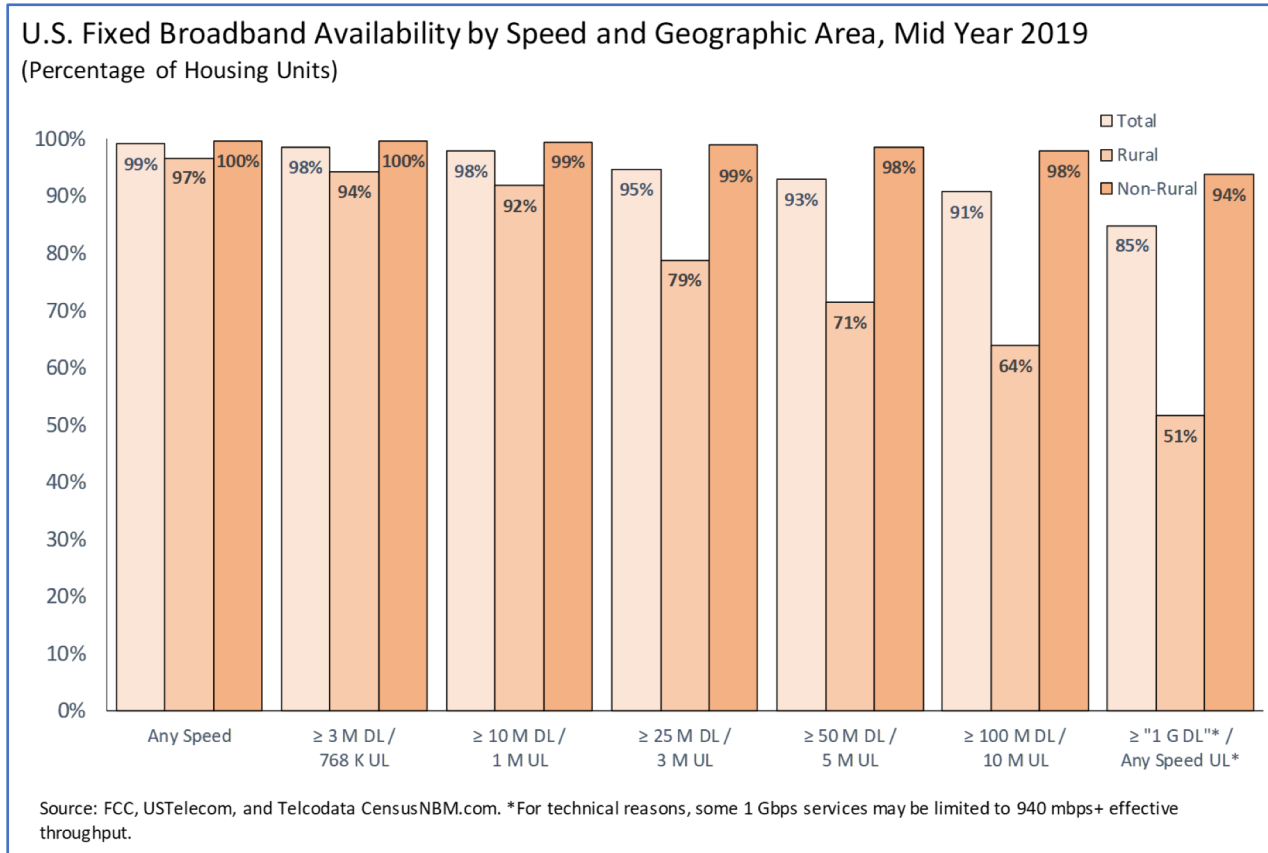


# Broadband Gaps Remain in High-Cost Rural Areas



*USTelecom supports direct, non-duplicative government support to broadband providers as the most economically and administratively efficient way to close broadband gaps*

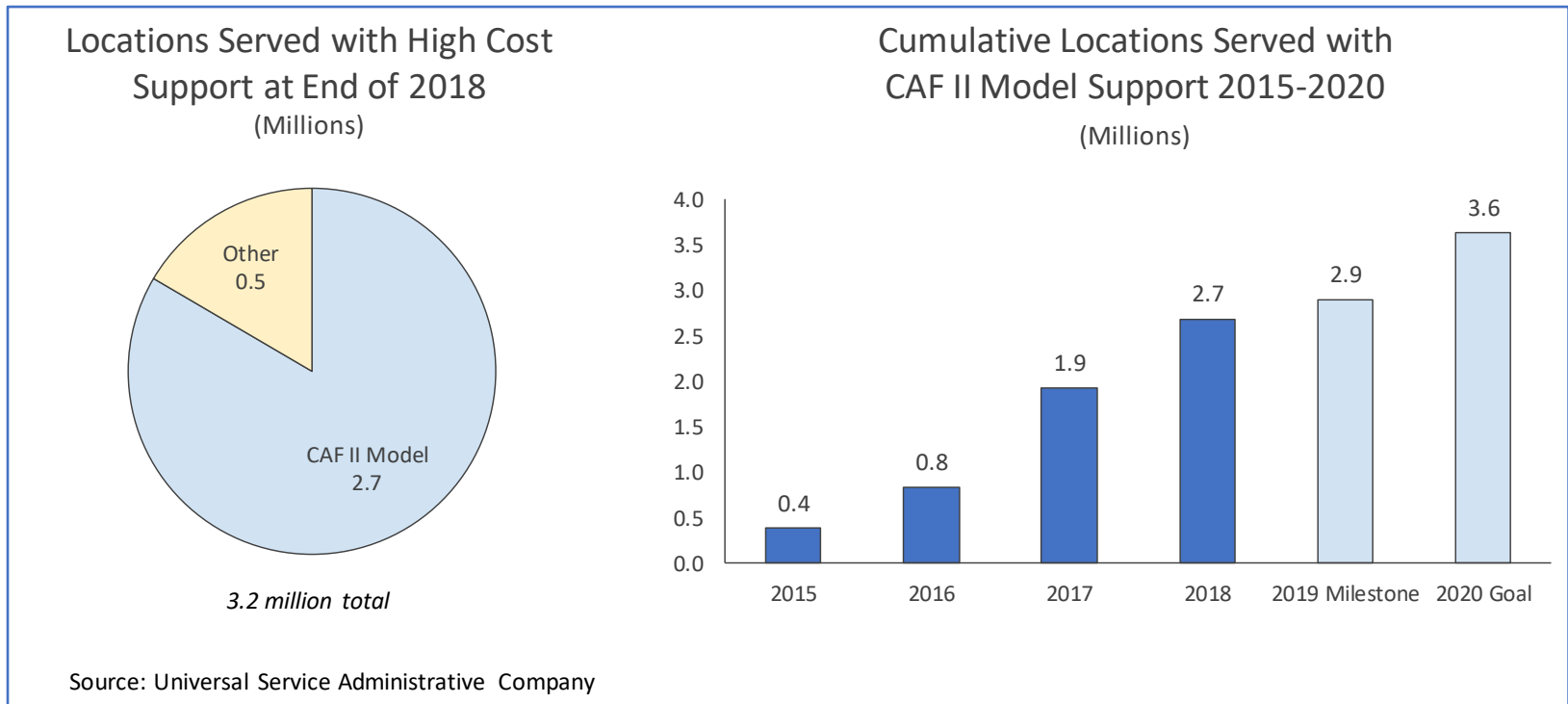
# Fixed Wireless Eliminates Some Rural Coverage Gaps



*These data include fixed terrestrial wireless*

*USTelecom supports flexible, cost-effective policies that do not impose rigid technology and speed requirements*

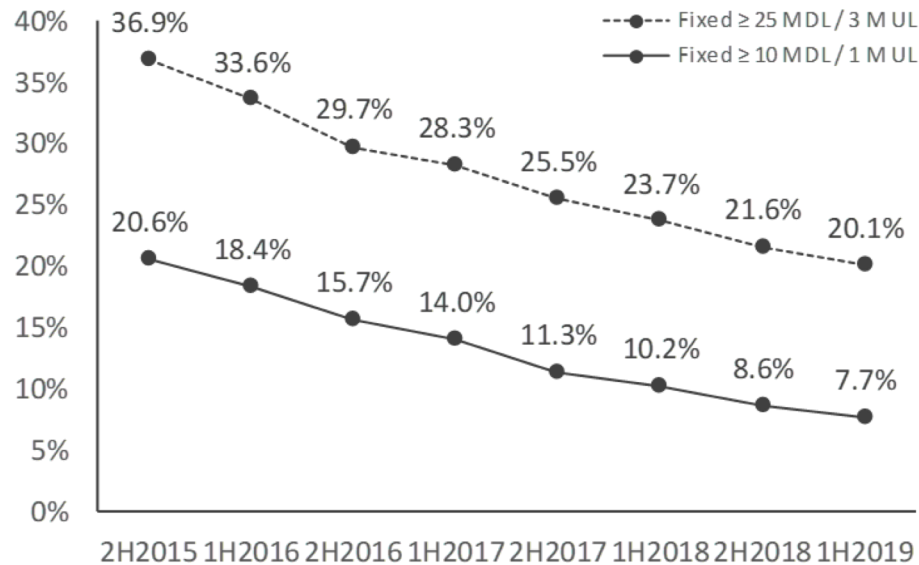
# Federal Universal Service Programs Are Connecting Millions of Rural Americans to Broadband



*The federal high cost program was \$4.684b in 2018 compared to \$4.673b in 2017. Many states have universal service programs that supplement federal funding. According to the National Regulatory Research Institute, in 2017 there were 22 states with high cost funds (\$451m) and 8 with broadband funds (\$122m).*

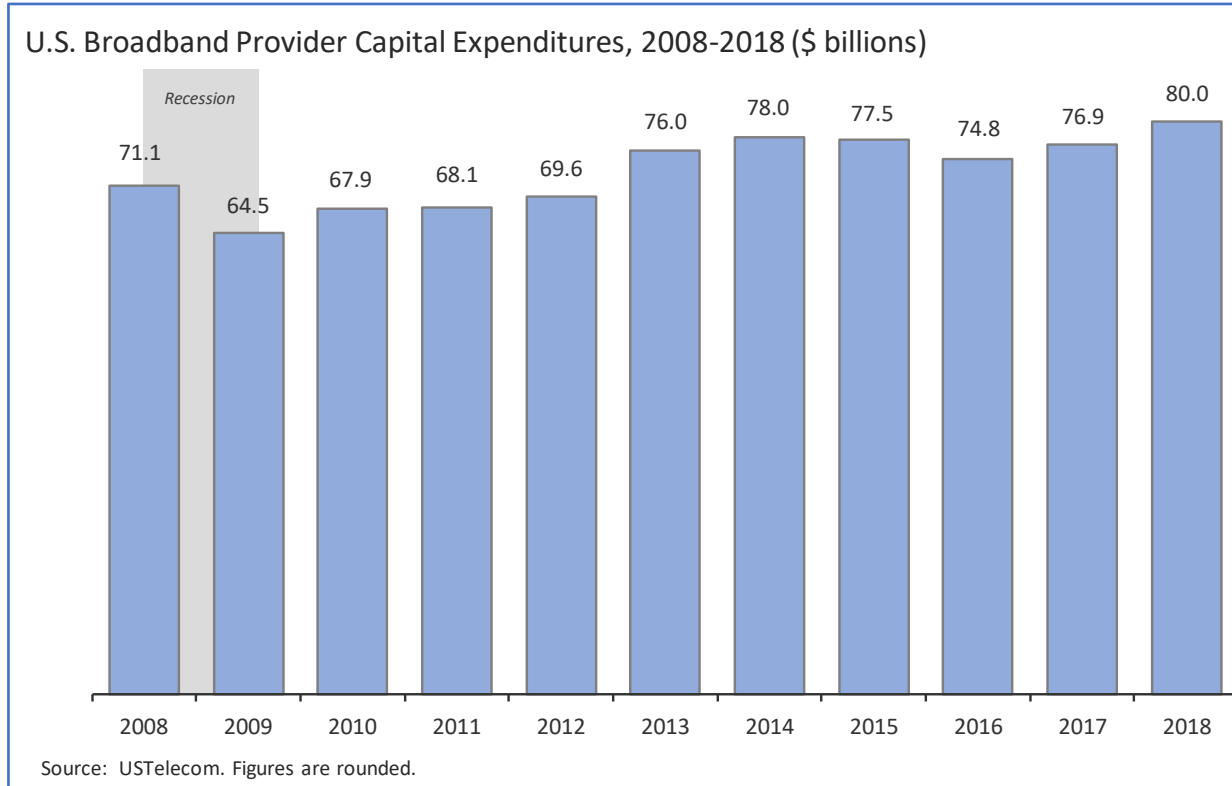
# Rural Broadband Gaps Are Narrowing Due to Private Investment and Government Support

Fixed Broadband Rural-Urban Gap at 10/1 and 25/3 Speeds  
(Difference in % Availability by Housing Units between Urban and Rural Areas )



Sources: FCC, CensusNBM.com, USTelecom

# Broadband Capex Fell in 2015 and Resumed Growth in 2017 with Return to Light Touch Regulation



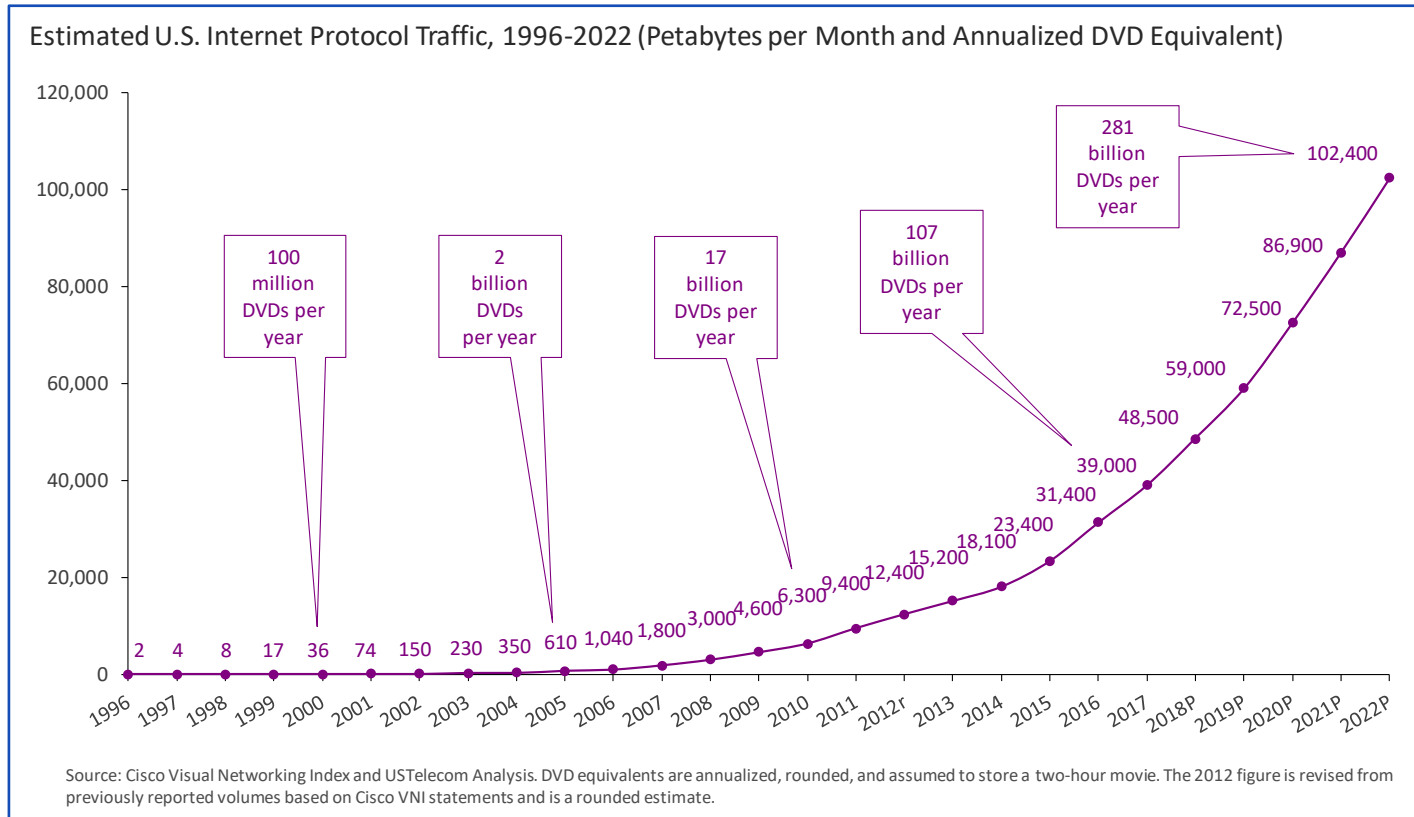
*Addressing rural broadband gaps and maintaining international leadership will require increased broadband investment under an even-handed, light-touch regulatory framework.*



## 2. The U.S. Is a Global Leader as Internet Data Traffic Continues to Rise Rapidly

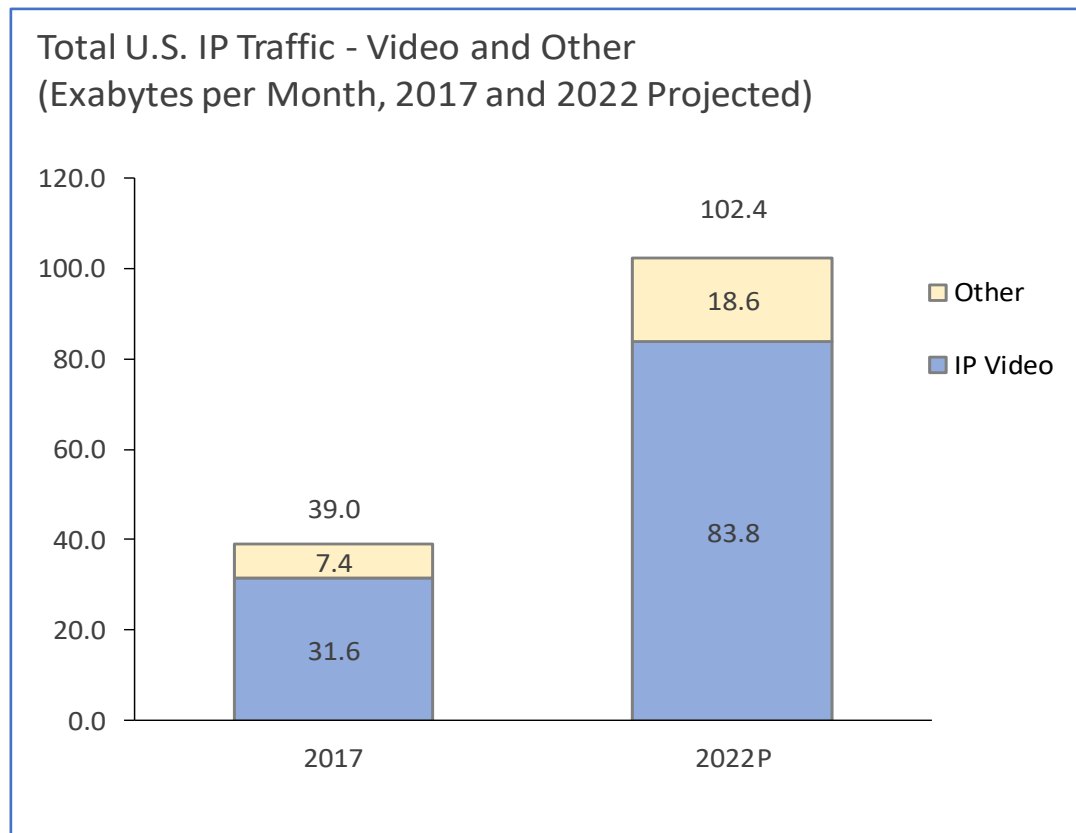
*Accommodating data traffic growth and maintaining U.S. international leadership will require policies that address our greatest digital challenges while at the same time encouraging ongoing network investment, including the wireline infrastructure that is essential to next generation broadband and 5G wireless networks*

# Internet Protocol Traffic Continues Rapid Growth



*U.S. IP traffic is projected to grow 2.6x or an average annual growth rate of 21 percent in the next five years.*

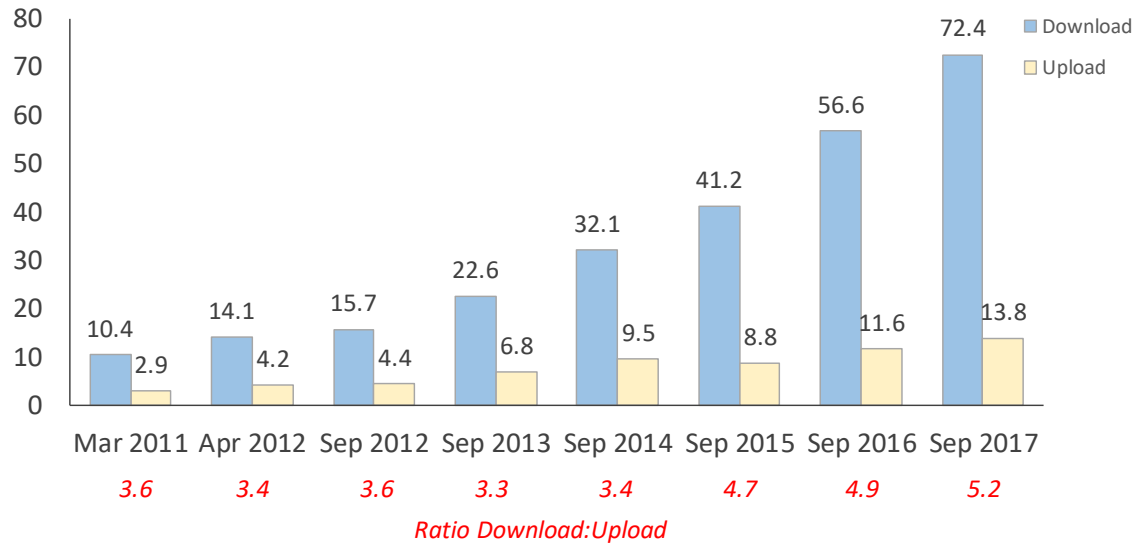
# Video is the Largest Driver of IP Traffic





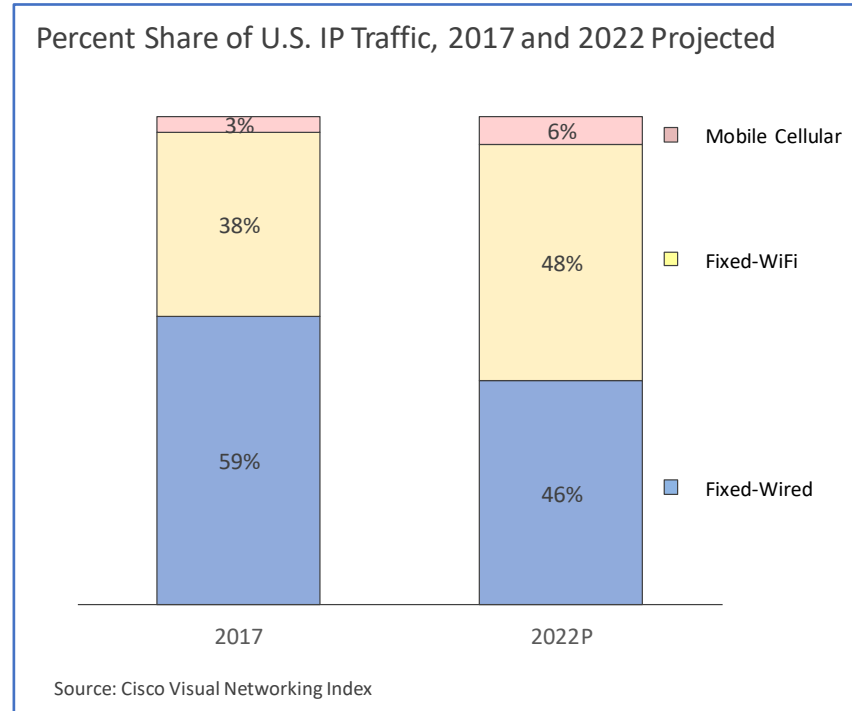
# Downstream Traffic Represents a Large and Growing Share of Traffic

Median Download and Upload Speeds for Major U.S. ISPs  
(Megabits per Second)



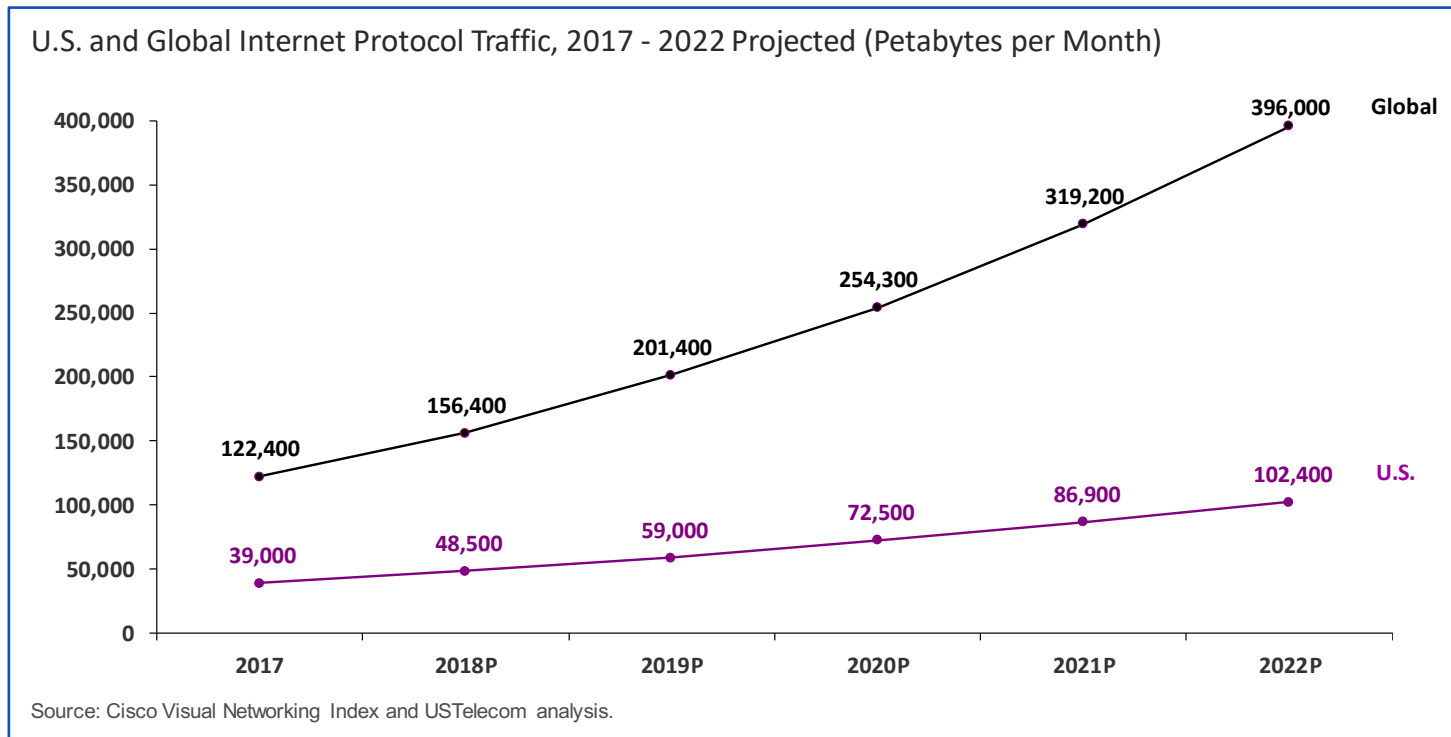
Source: FCC

# Mobile and Wi-Fi Are Growing but Fixed Networks Remain Essential for All Traffic



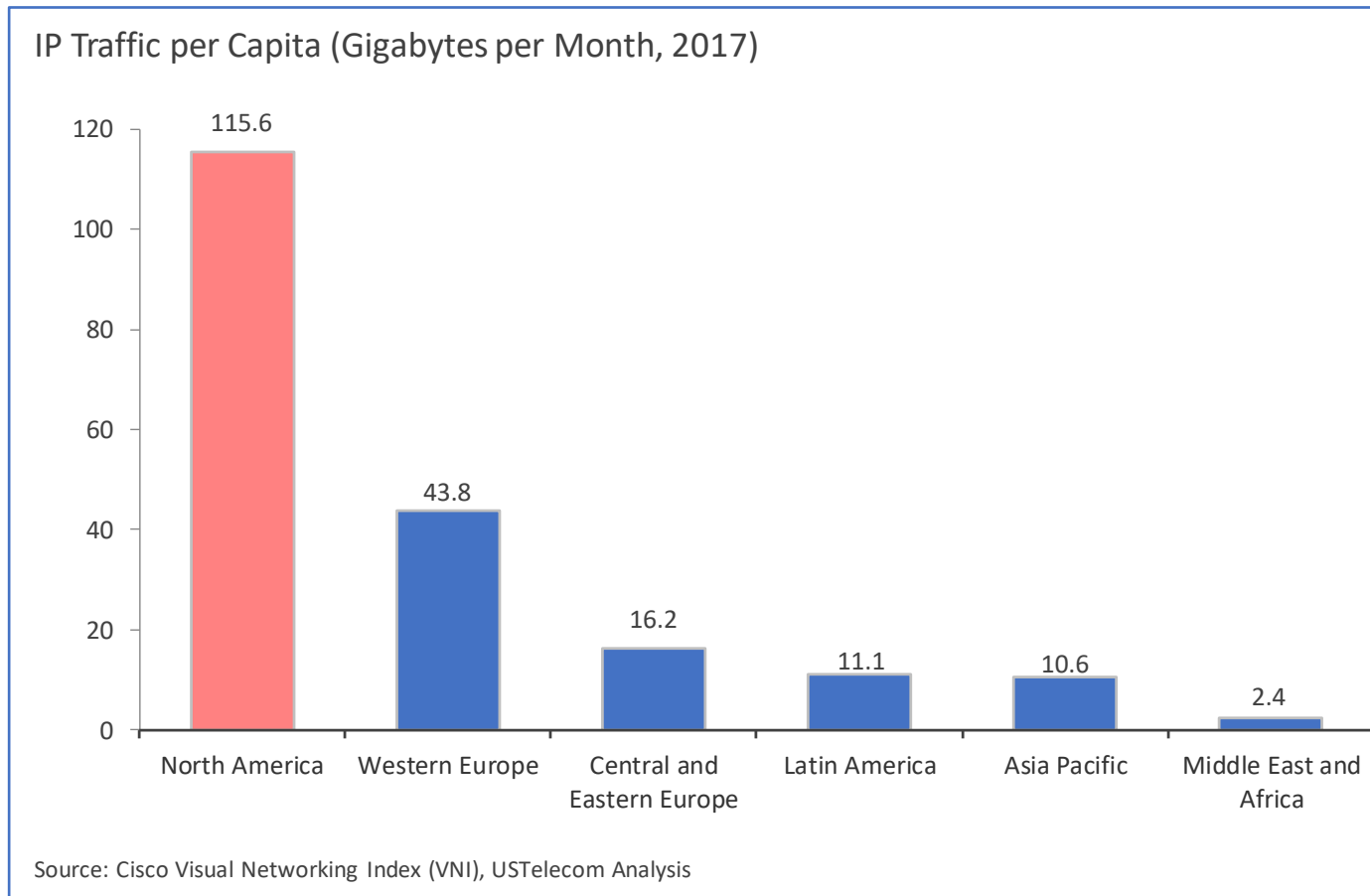
*Wired networks are essential for nearly all traffic, including fixed and mobile, whether providing last mile access, backhaul for mobile cell sites or fixed wireless equipment, metro and backbone transport, or connectivity to data centers and content distribution networks; and Wi-Fi is merely a short-range extension of a fixed network.*

# The U.S. Is a Global Leader in IP Traffic

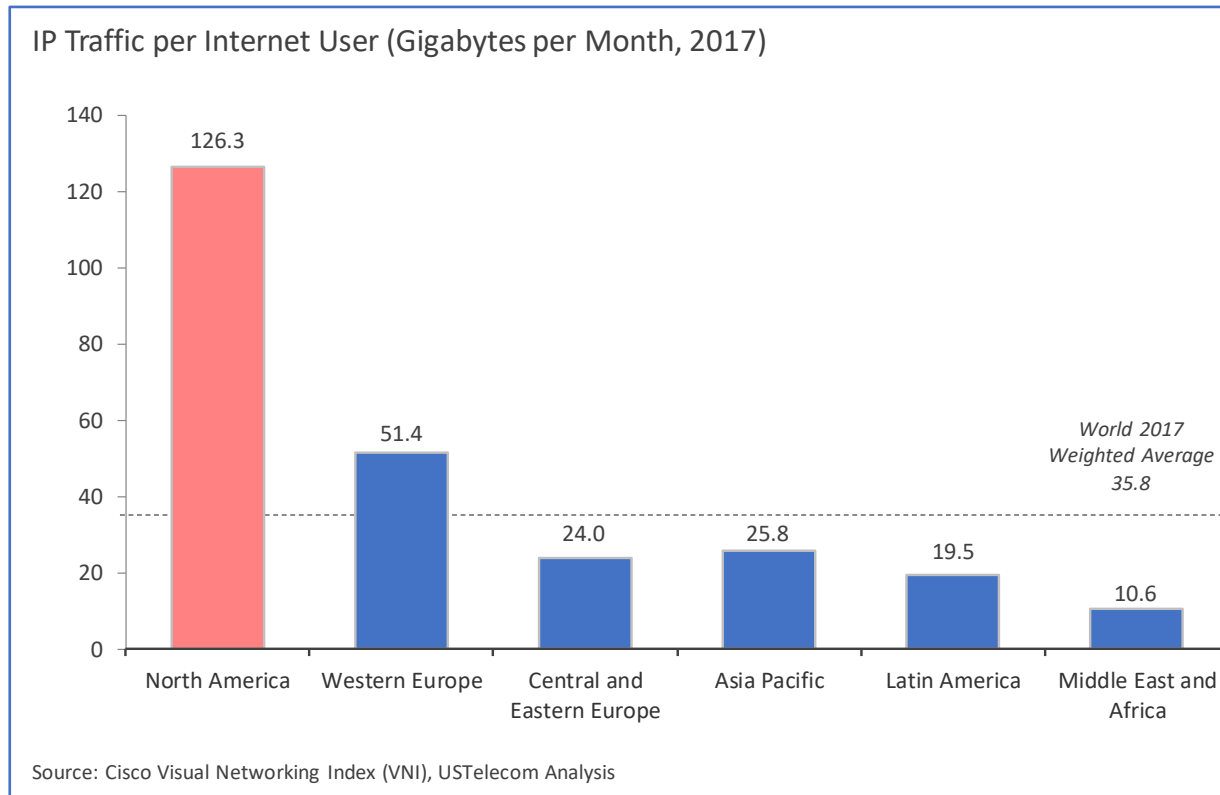


*The U.S. is home to 4.3% of the world's population, but it generates nearly one-third of global IP traffic.*

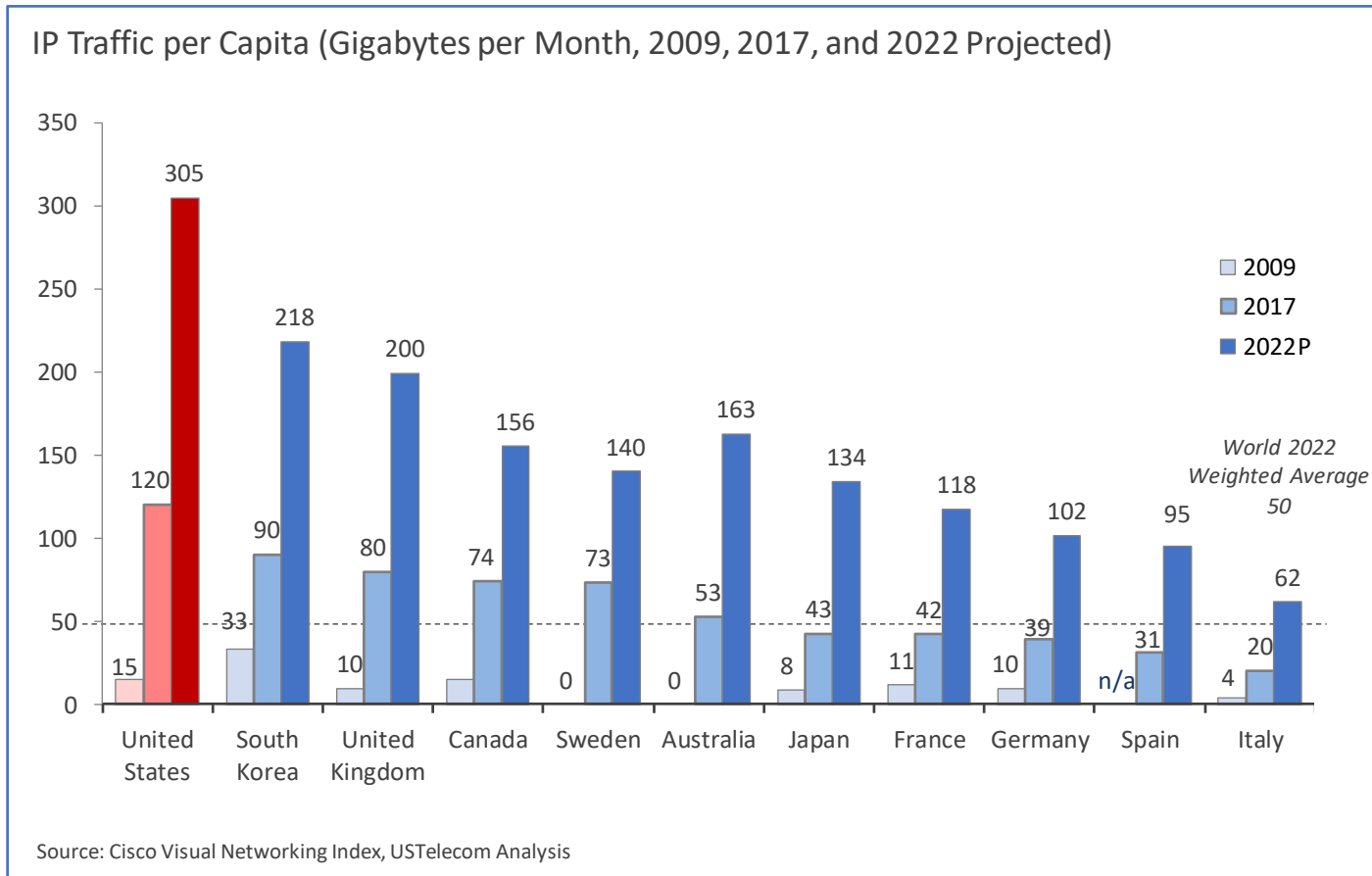
# North America Leads the World in IP Traffic per Capita



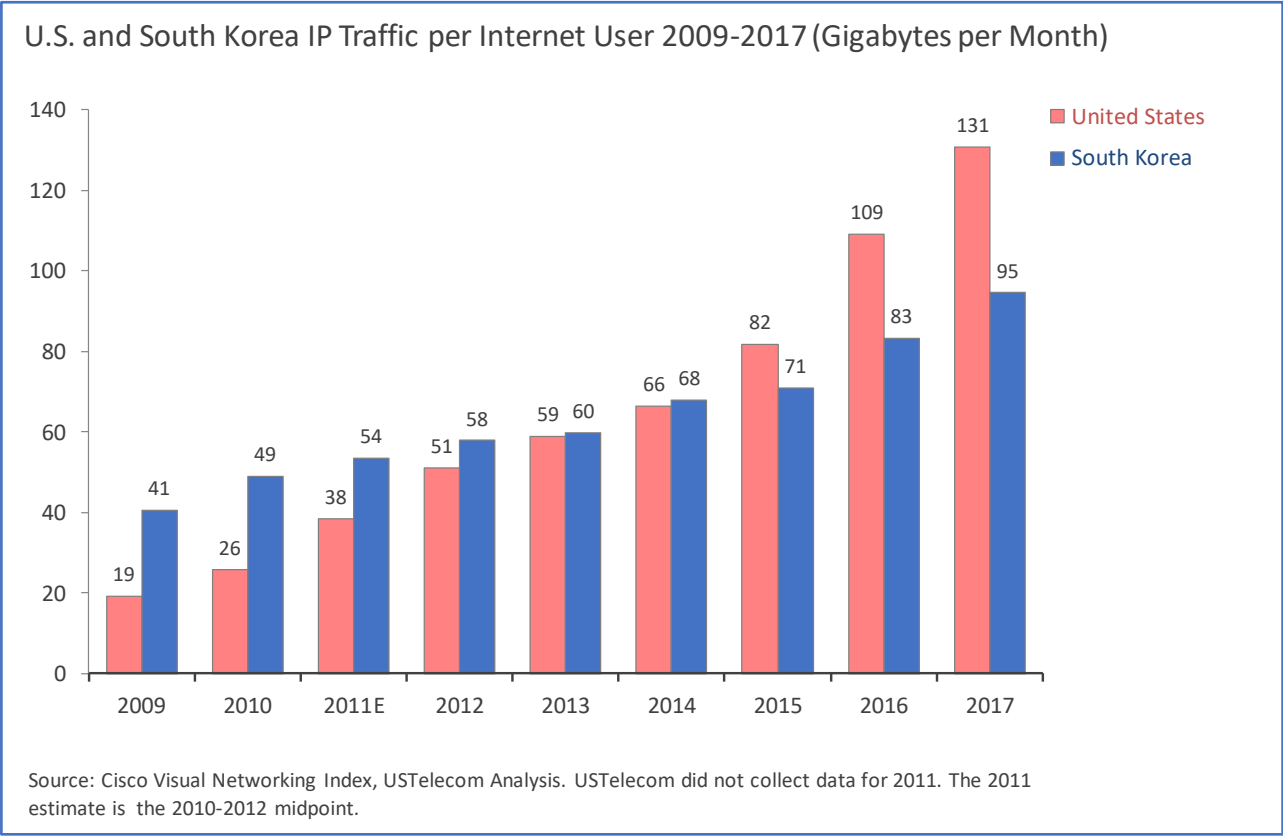
# North America Leads the World in IP Traffic per User




# The U.S. Leads Other Industrialized Nations in IP Traffic per Capita



# The U.S. Has Surpassed Former Leader South Korea and Now Leads the World in Internet Traffic per User





### 3. Competition and Technological Innovation Define Today's Communications Industry as Traditional Systems Wain

*While consumers choose among a wide array of new Internet-based and wireless communications services, legacy regulatory structures must adapt to reflect the new competitive dynamic*



# Even as the Economy Grows, Wired Voice Is Declining As a Result of Competition and Technological Change

*Since 2000, the U.S. has added 24 million households and 22 million jobs*

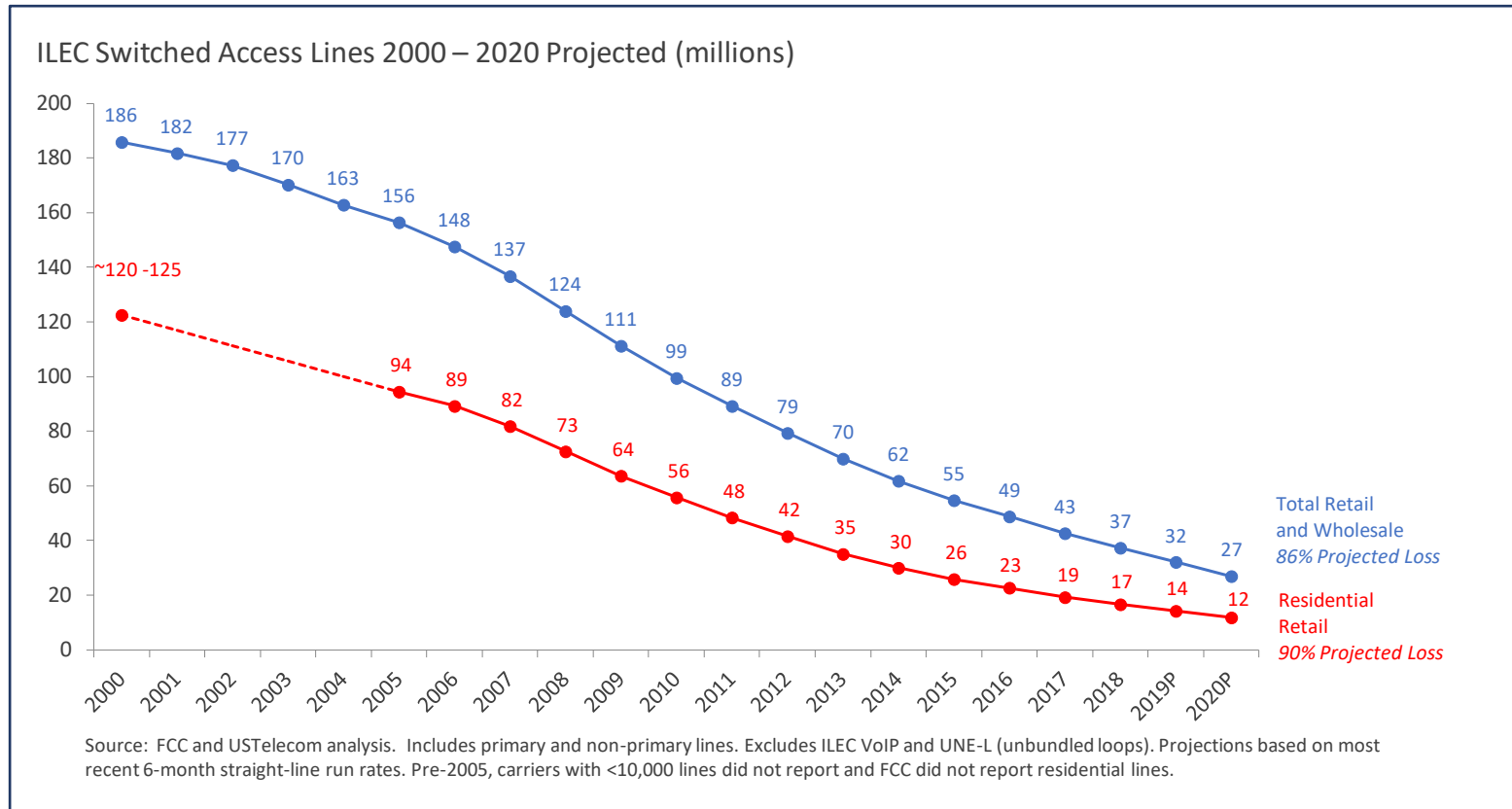
*Yet, dedicated wired voice lines have fallen by 89 million during the same period*

*Legacy landlines have been hit the hardest, falling by 157 million, as consumers switch from traditional phone service to competitive wireless and Internet-based alternatives*



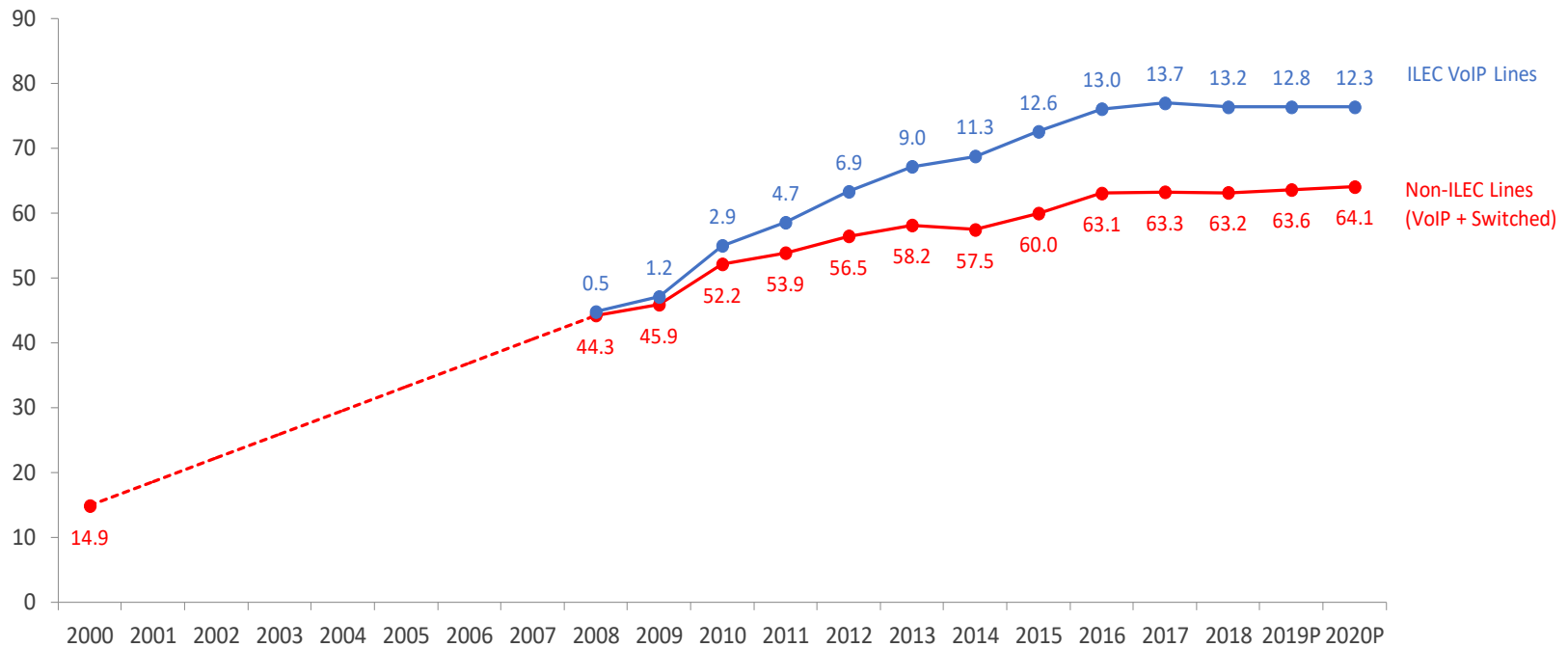
Source: FCC, Census, Bureau of Labor Statistics, USTelecom Analysis. Charts include mid-year voice and household data to match available jobs data.

# Legacy Landline Voice Connections Are In Steep Decline



# Wired Voice Customers Are Leaving Legacy Landlines for Competitive and Internet-Based Alternatives

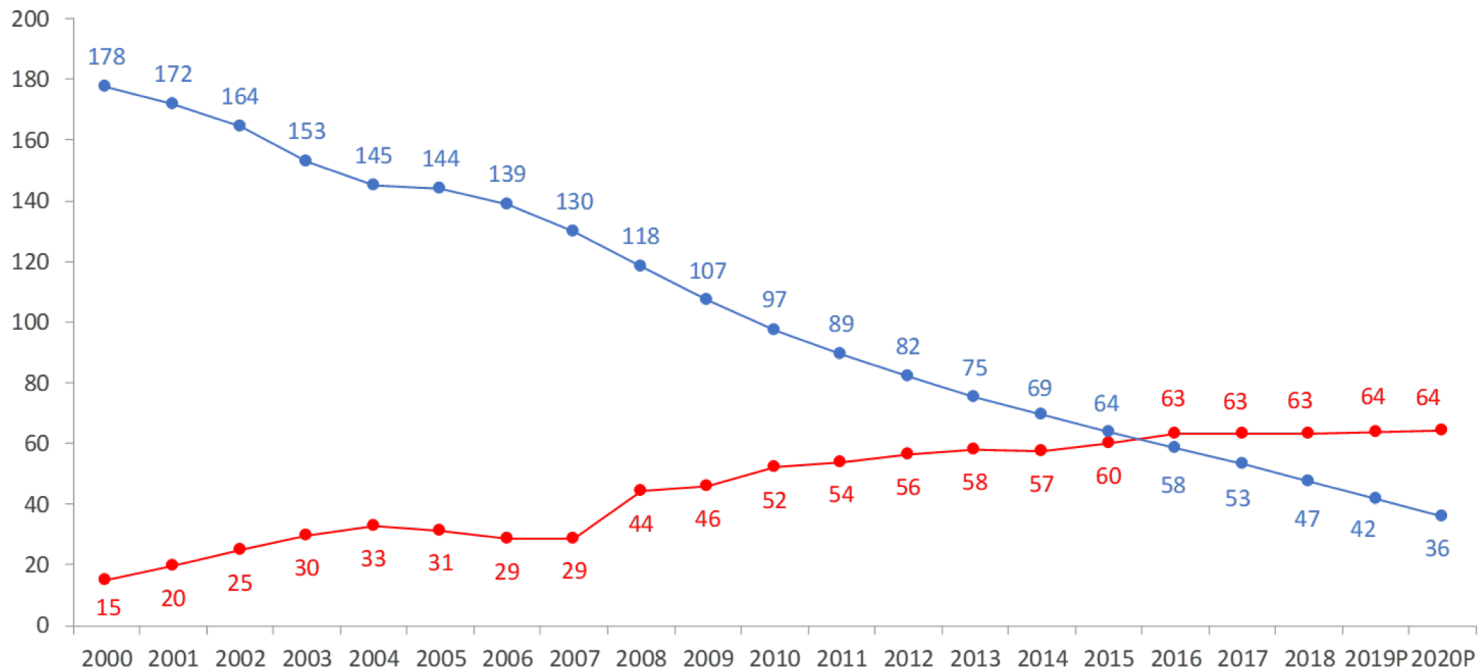
Non-ILEC Lines and ILEC VoIP 2000 – 2020 Projected (millions)



Source: FCC and USTelecom analysis. Includes primary and non-primary lines. Includes non-ILEC lines using ILEC wholesale lines. Pre-2005, carriers with <10,000 lines did not report and FCC did not report residential lines. Projections are straight-line based on most recent 6-month trend. Pre-2008 Non-ILEC data excluded due to data reliability issues.

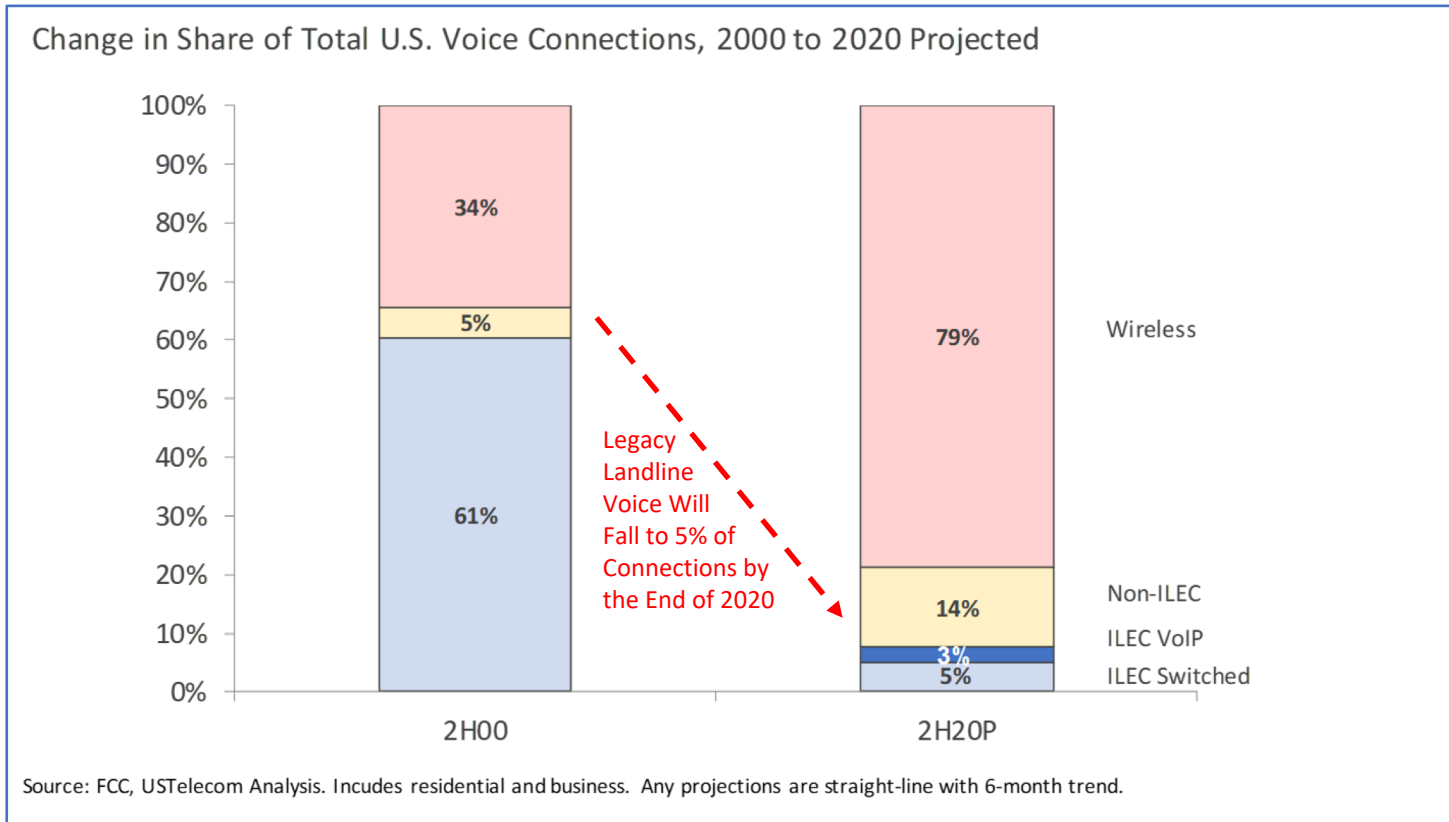
# Non-ILECs Surpassed ILECs in Wired Voice Nearly Five Years Ago

ILEC and Non-ILEC Retail Switched and VoIP Lines 2000 – 2020 Projected (millions)



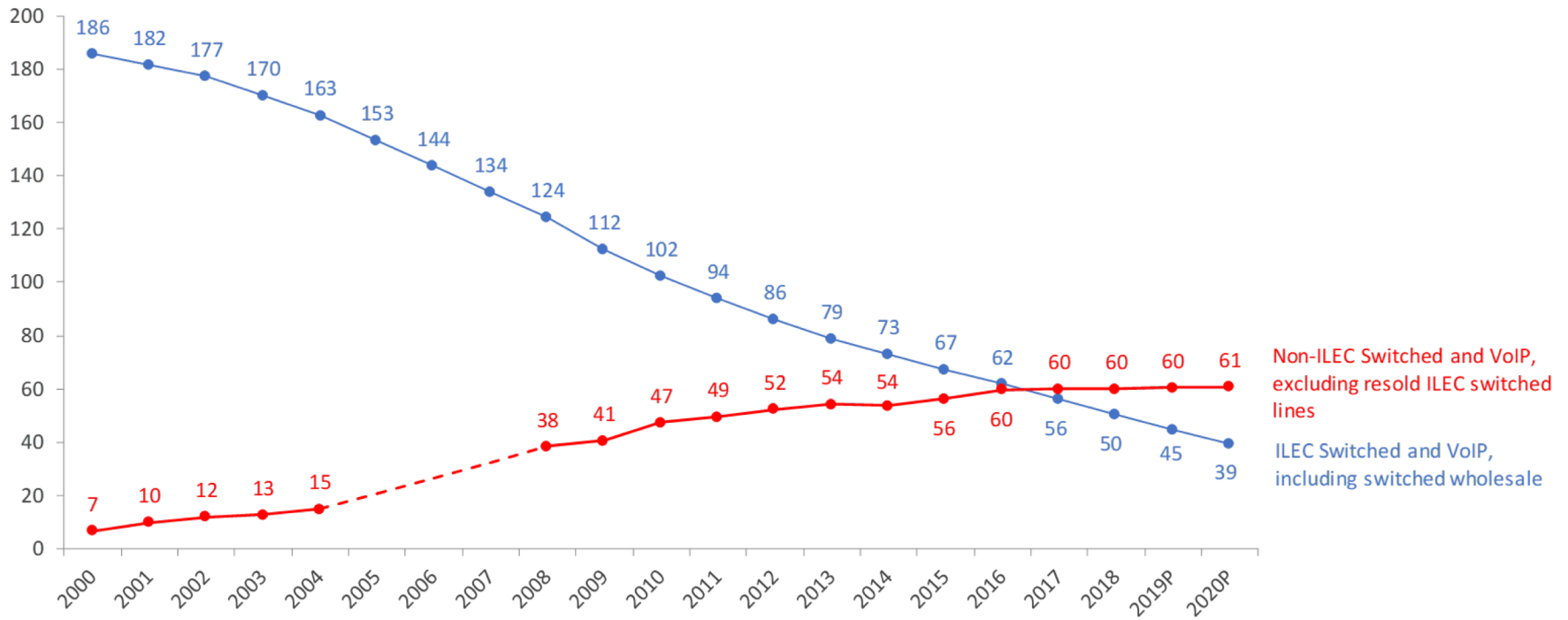
Source: FCC and USTelecom analysis. Pre-2005, carriers with <10,000 lines did not report. Pre-2008 data exclude VoIP. ILEC lines exclude wholesale. Projections are straight-line based on most recent 6-month trend.

# Nearly Four-Fifths of U.S. Voice Connections Are Wireless



# Non-ILECs Have Surpassed ILECs in Wired Voice Even When Attributing Wholesale Lines to the ILEC

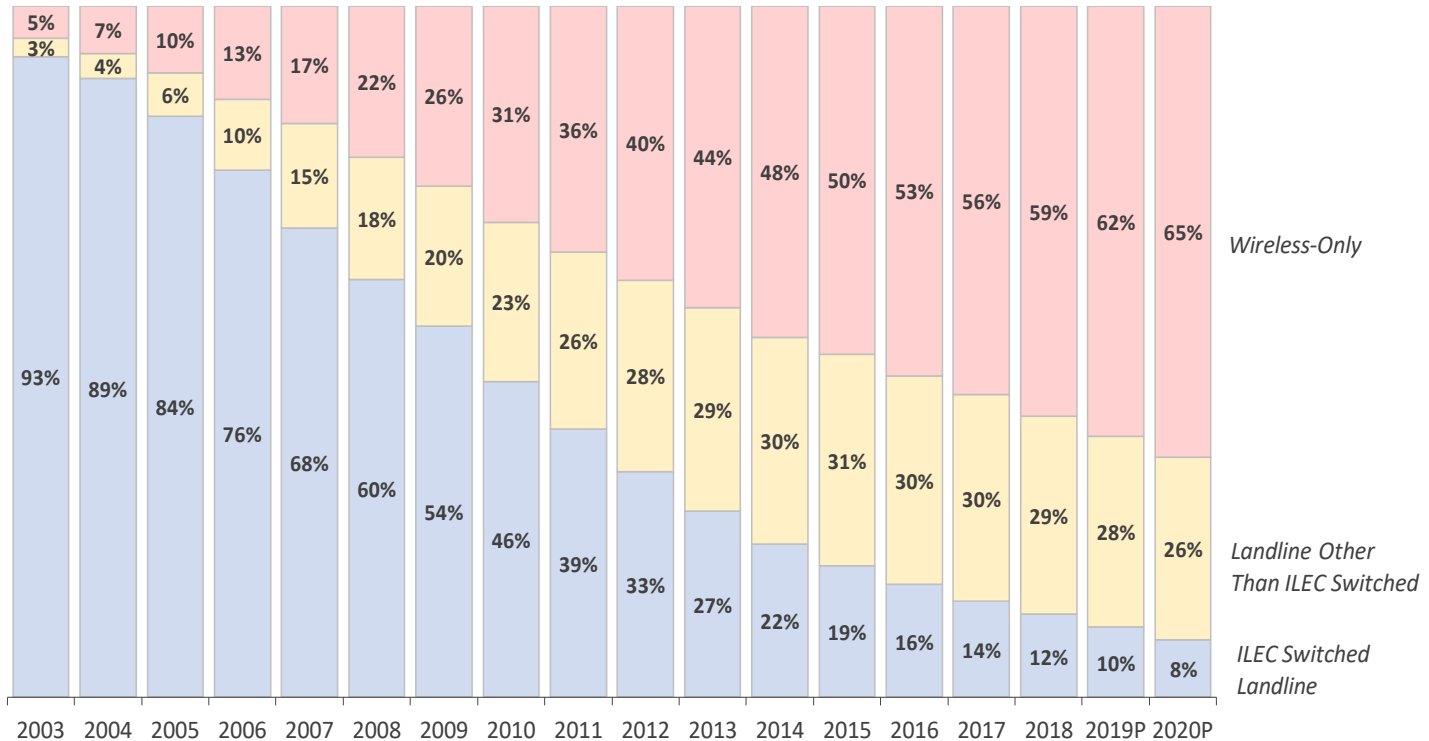
ILEC and Non-ILEC Switched and VoIP Lines 2000 – 2020 Projected (millions)



Source: FCC and USTelecom analysis. Pre-2005, carriers with <10,000 lines did not report. Pre-2008 data exclude VoIP. ILEC lines exclude wholesale. 2005-7 Non-ILEC data excluded due to data reliability issues. Projections are straight-line based on most recent 6-month trend.

# The Vast Majority of U.S. Households Have Moved from Legacy Landlines to Wireless or IP Voice

U.S. Household Voice Service Penetration and Projections 2003-2020 Projected  
(Percent of Telephone Households)



Sources: FCC, CDC, Census, USTelecom Analysis (2008-Present); and FCC, CDC, NCTA, Financial Reports, USTelecom Analysis (2003-7)

# Notes on Data and Sources

*Data and projections: Unless otherwise noted, the data in this presentation are based on sources that are current through mid-year 2019 for broadband deployment, year-end 2018 for voice connections, and year-end 2017 for broadband connections and Internet traffic . Projections are denoted with a “P”. In the first and third sections, projections through 2020 are USTelecom straight-line estimates based on the most recent 6-month trends. Accuracy of projections is not guaranteed and may depend on factors such as level of aggregation, technological maturity, seasonality, and adoption curves. In the second section, Internet traffic projections are provided directly by our source.*

*Terminology: As used in this presentation, broadband includes fixed and mobile services. Mobile broadband is provided over cellular wireless networks. Wired broadband is a subset of fixed broadband and predominantly includes services using fiber, DSL, and cable technologies. Fixed broadband includes wired broadband plus fixed wireless and, sometimes, satellite. The broadband deployment data below exclude satellite from fixed broadband while the broadband connections data include satellite in fixed broadband.*



# Additional USTelecom Research Resources

- USTelecom Research Brief: [\*U.S. Broadband Availability Mid-Year 2018\*](#) (November 14, 2019)
- USTelecom Research Brief: [\*U.S. Broadband Availability Year-End 2017\*](#) (July 31, 2019)
- USTelecom Research Brief: [\*Broadband Investment 2018\*](#) (July 31, 2019)
- USTelecom Research Brief: [\*U.S. Internet Usage and Global Leadership Are Expanding\*](#) (November 27, 2017)
- Tony Clark and Monica Martinez: [\*Redefining Legacy Obligations: The More Things Change, the More Things Need to Change\*](#) (September 20, 2019)