

VERIZON COMMUNICATIONS INC  
Form 10-K  
February 21, 2017  
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**UNITED STATES**  
**SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

**FORM 10-K**

(Mark one)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d)  
OF THE SECURITIES EXCHANGE ACT OF 1934  
For the fiscal year ended December 31, 2016

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d)  
OF THE SECURITIES EXCHANGE ACT OF 1934  
For the transition period from to  
Commission file number: 1-8606

**Verizon Communications Inc.**

(Exact name of registrant as specified in its charter)

**Delaware**  
(State or other jurisdiction  
of incorporation or organization)

**23-2259884**  
(I.R.S. Employer Identification No.)

**1095 Avenue of the Americas**

**New York, New York**  
(Address of principal executive offices)

**10036**  
(Zip Code)

**Registrant's telephone number, including area code: (212) 395-1000**

Securities registered pursuant to Section 12(b) of the Act:

| <b>Title of each class</b>    | <b>Name of each exchange</b> |
|-------------------------------|------------------------------|
| Common Stock, \$.10 par value | on which registered          |

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New York Stock Exchange  
The NASDAQ Global Select Market

**Securities registered pursuant to Section 12(g) of the Act:**

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes  No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes  No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes  No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes  No

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Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. .

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See the definitions of large accelerated filer, accelerated filer and smaller reporting company in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer  Accelerated filer  Non-accelerated filer  Smaller reporting company   
Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes  No .

At June 30, 2016, the aggregate market value of the registrant's voting stock held by non-affiliates was approximately \$227,584,340,225.

At January 31, 2017, 4,076,731,752 shares of the registrant's common stock were outstanding, after deducting 165,642,488 shares held in treasury.

### **Documents Incorporated By Reference:**

Portions of the registrant's Annual Report to Shareowners for the year ended December 31, 2016 (Parts I and II).

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**PART I**

*Item 1. Business*

**General**

Verizon Communications Inc. (Verizon, or the Company) is a holding company that, acting through its subsidiaries, is one of the world's leading providers of communications, information and entertainment products and services to consumers, businesses and governmental agencies. With a presence around the world, we offer voice, data and video services and solutions on our wireless and wireline networks that are designed to meet customers' demand for mobility, reliable network connectivity, security and control. Formerly known as Bell Atlantic Corporation (Bell Atlantic), we were incorporated in 1983 under the laws of the State of Delaware. We began doing business as Verizon on June 30, 2000 following our merger with GTE Corporation. We have a highly diverse workforce of approximately 160,900 employees.

Our principal executive offices are located at 1095 Avenue of the Americas, New York, New York 10036 (telephone number 212-395-1000).

We have two reportable segments, Wireless and Wireline, which we operate and manage as strategic business segments and organize by products and services.

**Wireless**                      Wireless communications products and services include wireless voice and data services and equipment sales, which are provided to consumer, business and government customers across the United States.

**Wireline**                      Wireline's voice, data and video communications products and enhanced services include broadband video and data, corporate networking solutions, data center and cloud services, security and managed network services and local and long distance voice services. We provide these products and services to consumers in the United States, as well as to carriers, businesses and government customers both in the United States and around the world.

Additional discussion of our reportable segments is included in the 2016 Verizon Annual Report to Shareowners under the headings Management's Discussion and Analysis of Financial Condition and Results of Operations - Overview and - Segment Results of Operations and in Note 12 to the consolidated financial statements of Verizon Communications Inc. and Subsidiaries, which are incorporated by reference into this report.

**Wireless  
Background**

Our Wireless segment, doing business as Verizon Wireless, provides wireless communications services and products across one of the most extensive wireless networks in the United States (U.S.). Verizon Wireless is the largest wireless service provider in the United States as measured by retail connections and revenue. At December 31, 2016, Verizon Wireless had 114.2 million retail connections and 2016 revenues of approximately \$89.2 billion, representing approximately 71% of Verizon's aggregate revenues.

Cellco Partnership (Cellco), which originally held the wireless assets of Bell Atlantic, began operating as Verizon Wireless in April 2000 with both Vodafone Group Plc (Vodafone) and Bell Atlantic as partners, following Vodafone's contribution of its U.S. wireless assets into Cellco. On September 2, 2013, Verizon entered into a stock purchase agreement with Vodafone and Vodafone 4 Limited, pursuant to which Verizon agreed to acquire all of Vodafone's indirect 45% interest in Verizon Wireless for aggregate consideration of approximately \$130 billion (the Wireless Transaction). We completed the Wireless Transaction on February 21, 2014 and, as a result, we acquired 100% ownership of Verizon Wireless. The consideration paid was primarily comprised of cash and Verizon common stock.

We have the largest fourth-generation (4G) Long-Term Evolution (LTE) technology and third-generation (3G) Evolution - Data Optimized (EV-DO) networks of any U.S. wireless service provider. Our 4G LTE network is available to over 98% of the U.S. population in more than 500 markets covering approximately 314 million people, including those in areas served by our LTE in Rural America partners. Under this program, we are working with wireless carriers in rural areas to collaboratively build and operate a 4G LTE network using each carrier's network assets and our core 4G LTE equipment and 700 MHz C Block and Advanced Wireless Services (AWS) spectrum.

We are adding capacity and density to our 4G LTE network. We are committed to developing and deploying fifth-generation (5G) wireless technology and are working with key partners to ensure the aggressive pace of innovation, standards development and appropriate requirements

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for this next generation of wireless technology. Based on the outcome of our ongoing pre-commercial trials, we intend to be the first company to deploy a 5G fixed wireless broadband network in the United States. We expect to launch a fixed commercial wireless service supported by this network in 2018.

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### **Wireless Service and Product Offerings**

Our wireless services are available to our customers receiving service under the Verizon Wireless brand. In addition, customers can obtain wireless products and services that operate on our network from resellers that purchase network access from us on a wholesale basis.

#### *Wireless Services*

We offer our wireless services on a postpaid and prepaid basis. Retail (non-wholesale) postpaid accounts primarily represent retail customers with Verizon Wireless that are directly served and managed by Verizon Wireless and use its branded services. A single account may include monthly wireless services for a variety of connected devices. A postpaid retail connection represents an individual line of service for a wireless device for which a customer is billed in advance a monthly access charge in return for a monthly network service allowance, and usage beyond the allowance is billed in arrears. Approximately 95% of our total retail connections were postpaid retail connections as of December 31, 2016. Our prepaid service enables individuals to obtain wireless services without credit verification by paying for all services in advance.

We offer various postpaid account service plans, including shared data plans, single connection plans and other plans tailored to the needs of our customers. Our shared data plans typically feature domestic unlimited voice minutes, unlimited domestic and international text, video and picture messaging, and a single data allowance that can be shared among the wireless devices on a customer's account. These allowances will vary from time to time as part of promotional offers or in response to market circumstances. On February 12, 2017, we announced an introductory plan, our new Verizon Unlimited plan, available to our consumer and small business customers, which offers among other things, unlimited domestic voice, data and texting. Both our shared data plans and the Verizon Unlimited plan include our HD (High Definition) Voice, Video Calling and Mobile Hotspot services on compatible devices. HD Voice is a suite of services enabled by Voice over LTE (VoLTE), which delivers calls over our 4G LTE network, and our Video Calling service combines an HD Voice call with real-time video. Our Mobile Hotspot service enables a customer to activate a personal Wi-Fi hotspot via their smartphone that can provide Internet access to multiple Wi-Fi enabled devices. We also offer various voice and shared data plans for small and large businesses.

Our simplified shared data plan, the new Verizon Plan, offers customers various sizes of data packages that can be shared among up to 10 devices on a consumer account or 25 devices on a business account. The plan features Carryover Data, which allows customers to carry over unused data to the next month, and Safety Mode, which enables customers to avoid data overage fees by allowing them to continue using data at a reduced data speed after using their data allowance. Certain plans, with higher account access amounts also include calling to and voice, text and data roaming in Mexico and Canada. Customers who wish to participate in this new plan can do so by purchasing a device from Verizon either under our device payment program or at full retail, or by using their own compatible device.

Customers on our fixed-term service plans have historically paid higher access fees for their wireless service in exchange for the ability to purchase their wireless devices at subsidized prices. We have largely discontinued this form of device subsidy. Under the Verizon device payment program, our eligible wireless customers purchase wireless devices under a device payment plan agreement. Customers that activate service on devices purchased under the device payment program or on a compatible device that they already own pay lower access fees (unsubsidized service pricing) as compared to those under our fixed-term service plans. Generally, customers entering into device payment plan agreements on or after June 1, 2015 are required to repay all amounts due under their device payment plan agreement before being eligible to upgrade their device. However, certain devices are subject to promotions that allow customers to upgrade to a new device after paying down a specified percentage of the balance on their device payment plan and trading in their device in good working condition.

We also offer prepaid single connection service plans that feature domestic unlimited voice minutes and unlimited domestic and international text. On compatible devices, certain of our prepaid plans also feature video and picture messaging, Carryover Data and Always-On Data, which allows a customer to stay online at reduced data speeds after using their data allowance. HD Voice, Video Calling and Mobile Hotspot service are available on compatible devices. Customers can manage their prepaid services on the device using their My Verizon Mobile application or logging in to the My Verizon website.

We offer our customers a wide variety of wireless services accessible on a broad range of devices. Access to the Internet is available on all smartphones and nearly all basic phones. We also offer service that enables our customers to access the Internet wirelessly at broadband speeds on notebook computers and tablets that either have embedded 4G LTE or 3G EV-DO modules or that are used in conjunction with separate devices that enable access to this service, such as USB modems, Jetpacks™ and other dedicated devices that provide a mobile Wi-Fi connection.

Our customers can access multimedia offerings, provided by Verizon and by third parties, consisting of applications providing music, video, gaming, news and other content. Our business-focused offerings, which are designed to increase productivity, include solutions that enable customers to access the Internet, their corporate intranets and e-mail across our diverse portfolio of wireless devices. Our location-based services provide our customers with directions to their destination and enable our business customers to locate, monitor and communicate with their



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mobile field workers. Our global data services allow our customers to access data services and the Internet on all smartphones and many tablets and basic phones from hundreds of international destinations that we sell. A majority of the wireless devices used by our customers can run applications and services offered by Google (a subsidiary of Alphabet Inc.) via Google Play or Apple Inc. (Apple) via iTunes.

Our customers can also make and receive calls on their home phone handsets using our wireless network through our Home Phone Connect service or Verizon 4G LTE Broadband Router with Voice service. We also offer LTE Internet (Installed), a high-speed Internet service that provides customers with Internet connections in their homes using our 4G LTE network.

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We provide network access and, in some cases, enhanced value-added services to support wireless connections for the Internet of Things (IoT). Our IoT services offer end-to-end solutions for various IoT vertical markets, such as:

**Fleet management and telematics** We provide in-vehicle solutions that enable vehicle navigation, GPS tracking, engine diagnostic monitoring and maintenance alerts;

**Energy** We offer solutions targeted to providing the energy sector with greater visibility into energy usage and the ability to remotely monitor devices used to track energy usage;

**Agricultural technology** We provide solutions that give farmers critical data they need to improve yields and save costs; and

**Smart Communities** Our solutions enable localities to collect data from IoT and connected machine technologies with the goal of improving public safety, managing traffic, reducing pollution, identifying revenue generation opportunities, making efficient use of limited resources and attracting businesses, residents and workers.

We also work with various companies that purchase network access from us to connect their Open Development certified devices, bundled together with their own solutions, which they sell to end-users.

### ***Wireless Devices***

We offer several categories of wireless devices, including smartphones and basic phones, tablets and other Internet access devices.

**Smartphones and Basic Phones.** All of the smartphones we offer are enabled to utilize our 4G LTE and 3G EV-DO high-speed data services. These devices run on various operating platforms, primarily Apple iOS and Google Android. The basic phones we offer are 3G EV-DO-enabled and have HTML-browsing capability.

**Tablets and Other Internet Devices.** We offer tablets from multiple manufacturers, all of which can access the Internet via our 4G LTE network or a Wi-Fi connection. The tablets run primarily on the Apple iOS and Google Android operating systems. In addition, we offer dedicated devices, which we refer to as Jetpacks that provide a mobile Wi-Fi 4G LTE and/or 3G EV-DO connection and are capable of connecting multiple Wi-Fi enabled devices to the Internet at one time. Our customers can also access the Internet wirelessly at broadband speeds on their computers via data cards, USB modems or through the use of certain laptop computers and netbooks enabled to access our wireless network.

We purchase a substantial majority of our wireless devices and accessories from Apple, Samsung, Motorola Mobility, Google, LG Electronics and HTC.

A key component of all wireless devices is the chipset, which contains the intelligence of the device. The LTE chipsets used in our 4G LTE-enabled devices are manufactured by various companies, each using its own 4G LTE chipset technology. To support Code Division Multiple Access (CDMA)-1XRTT and EV-DO technologies (with and without 4G LTE), most of our wireless device suppliers currently rely on Qualcomm Incorporated for the manufacture and supply of chipsets. In addition, there are a number of other components common to wireless devices provided by various electronic component manufacturers that we do not deal with directly.

### ***Network***

We have the largest 4G LTE and 3G EV-DO networks of any service provider in the United States, with licensed and operational coverage in all of the 100 most populous U.S. metropolitan areas. As of December 31, 2016, our 4G LTE network covered approximately 314 million people in the United States, including those in areas served by our LTE in Rural America partners. We currently have 21 LTE in Rural America partners that provide 4G LTE coverage to an area covering approximately three million people.

The reliability of our wireless network is a key factor for our continued success, and we strive to provide our customers with the highest network reliability for their wireless services. We believe that steady and consistent network and platform investments provide the foundation for

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innovative products and services that will fuel profitable growth. The depth and breadth of our network provides our fundamental strength and is the basis for our competitive advantage.

We design and deploy our network in an efficient manner that we believe maximizes the number of successful data sessions, including video, permitting the completion of large file downloads and uploads while delivering on our advertised throughput speeds, and maximizes the number of calls that are connected on the first attempt and completed without being dropped. We plan to continue to upgrade our network, primarily to increase its capacity and density, by utilizing small cell technology, in-building solutions and distributed antennae systems in addition to deploying existing AWS spectrum. We are also exploring strategic opportunities to increase our network capacity and efficiency through selective acquisitions of spectrum licenses.

Our network includes various elements of redundancy designed to enhance the reliability of our service. To mitigate the impact of power disruptions on our operations, we have battery backup at every switch and every macrocell in our network. We also utilize backup generators at a majority of our macrocells and at every switch location. In addition, we have a fleet of portable backup generators that can be deployed, if needed. We further enhance reliability by using a fully redundant Multiprotocol Label Switching backbone network in critical locations.

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In addition to our own network coverage, we have roaming agreements with a number of wireless service providers to enable our customers to receive wireless service in nearly all other areas in the United States where wireless service is available. We also offer a variety of international wireless voice and data services to our customers through roaming arrangements with wireless service providers outside of the United States. Certain of our roaming agreements can be terminated at will by either party upon several months' notice; however, we do not believe that the termination of any of these at-will agreements would have a material adverse effect on our business.

## **Technology**

Our primary network technology platforms are 4G LTE and 3G CDMA. 4G LTE provides higher data throughput performance for data services at a lower cost compared to that offered by 3G technologies.

In 2014, we commercially launched our mobile VoLTE service. HD Calling, enabled by VoLTE, is now being used, in addition to CDMA technology, to provide voice calling services to our customers.

We are committed to developing and deploying 5G wireless technology. We are densifying our 4G LTE network to add capacity and pre-position us for 5G technology. We launched the Verizon 5G Technology Forum with key industry partners to develop 5G requirements and standards and conduct testing to accelerate the introduction of 5G technologies. We believe that 5G technology will provide higher throughput than the current 4G LTE technology, lower latency and the ability to handle more network traffic as the number of Internet-connected devices grows. Based on the outcome of our ongoing pre-commercial trials, we intend to be the first company to deploy a 5G fixed wireless broadband network in the United States. We expect to launch a fixed commercial wireless service supported by this network in 2018.

## **Spectrum**

The spectrum licenses we hold can be used for mobile wireless voice and data communications services. We have licenses to provide these wireless services on portions of the 800 MHz band, also known as cellular spectrum, the 1800-1900 MHz band, also known as Personal Communication Services (PCS) spectrum, portions of the 700 MHz upper C band and AWS spectrum in the 1700 and 2100 MHz bands, in areas that, collectively, cover nearly all of the population of the United States.

In January 2015, the Federal Communications Commission (FCC) completed an auction of 65 MHz of spectrum in the AWS-3 band. We participated in that auction and were the high bidder on 181 spectrum licenses, for which we paid cash of approximately \$10.4 billion. The FCC granted us these spectrum licenses in April 2015.

We anticipate we will need additional spectrum to meet future demand. This increasing demand is driven by growth in customer connections and the increased usage of wireless broadband services, that use more bandwidth and require ever faster rates of speed. Additional spectrum may also allow us to offer new products enabled by advances in technology, including emerging 5G and IoT services. We can meet our future spectrum needs by acquiring licenses or leasing spectrum from other licensees, or by acquiring new spectrum licenses from the FCC, if and when future FCC spectrum auctions occur. In March 2016, the FCC commenced a voluntary incentive auction of television broadcast spectrum in the 600 MHz frequency range. The auction has finished the reverse and forward clock phases. Any results will be disclosed by the FCC after the completion of the assignment phase and after the FCC announces the close of the auction by public notice.

Since we and competing wireless service providers have experienced spectrum shortages in certain markets and may have spectrum surpluses in others, from time to time we have exchanged spectrum licenses with other service providers through secondary market swap transactions. We expect to continue to pursue similar opportunities to trade spectrum licenses in order to meet certain of our capacity and expansion needs in the future. In other cases, we have entered into intra-market spectrum swaps designed to increase the amount of contiguous spectrum within frequency bands in a specific market. Contiguous spectrum improves network performance and efficiency. These swaps as well as any spectrum purchases are subject to obtaining governmental approvals for the transfer of spectrum licenses in each instance.

Additional information regarding spectrum license transactions is included in the 2016 Verizon Annual Report to Shareowners in Note 2 to the consolidated financial statements of Verizon Communications Inc. and Subsidiaries, which is incorporated by reference into this report.

## **Network Equipment and Build-out**

Nokia and Ericsson are currently our primary network vendors for our LTE network deployments for macro sites as well as small cells. Our primary CDMA cell site equipment infrastructure vendors are Nokia, which provides more than half of our CDMA cell site equipment, and Ericsson, which provides nearly all of our remaining cell site equipment. We also rely on Nokia and Ericsson for our switching equipment.

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As we continue to build and upgrade our existing network, we must complete a variety of steps, including securing rights to a large number of sites as well as obtaining zoning and other governmental approvals and fiber facilities for both our macro and small cells. As we densify our network, we follow a similar process for small cells, in-building systems and antennas and related radio equipment that comprise distributed antenna systems. We utilize tower site management firms, such as Crown Castle International Corp. and American Tower Corporation (American Tower), as lessors or managers of a portion of our existing tower sites.

During March 2015, we completed a transaction with American Tower pursuant to which American Tower acquired the exclusive rights to lease and operate approximately 11,300 of our wireless towers for an upfront payment of \$5.0 billion. Under the terms of the lease agreements, American

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Tower has exclusive rights to lease and operate towers over an average term of approximately 28 years. As the leases expire, American Tower has fixed-price purchase options to acquire these towers based on their anticipated fair market values at the end of the lease terms. As part of this transaction, we also sold 162 towers for \$0.1 billion. We have subleased capacity on the towers from American Tower for a minimum of 10 years at current market rates, with options to renew.

## **Marketing and Distribution**

Our marketing strategy is focused on offering solutions tailored to the needs of our various customer market groups; promoting our brand; leveraging our extensive distribution network; and jointly marketing our products and services to large business and government customers with Verizon's Wireline business units through the Wireless Business Group, a sales and marketing organization that encompasses all of Verizon Wireless solutions for medium and large business and government customers. Our marketing plan includes a coordinated program of television, print, radio, outdoor signage, Internet and point-of-sale media promotions designed to present our corporate message consistently across all of our markets. We use a combination of direct, indirect and alternative distribution channels in order to increase customer growth while reducing customer acquisition costs.

Company-operated stores are a core component of our distribution strategy. We have Verizon Destination Stores in various major metropolitan areas, which focus on the mobile lifestyle and highlight the many ways consumers can use wireless technology in their daily lives. These stores are part of a broader initiative that includes the redesign of our retail stores nationwide into Smart Stores, which showcase the same mobile lifestyle zones on a smaller scale. In addition, our direct channel includes our business-to-business sales operations and systems organization and is focused on supporting the wireless communications needs of consumers and local, regional and national business customers. In addition, we have a telemarketing sales force dedicated to handling incoming calls from customers, and we offer fully-automated, end-to-end web-based sales of wireless devices, accessories and service plans.

Our indirect channel includes agents that sell our postpaid and prepaid wireless products and services at retail locations throughout the United States, as well as through the Internet. The majority of these agents sell both our postpaid and prepaid products and services, and do so under exclusive selling arrangements with us. We also have relationships with high-profile national retailers, such as Best Buy, Wal-Mart and Target, to sell our postpaid and prepaid wireless products and services. Stores such as Dollar General and various drugstore chains sell our prepaid products and services.

## **Competition**

We operate in a highly competitive industry. We compete against other national wireless service providers, including AT&T Inc., Sprint Corporation and T-Mobile USA, Inc., as well as various regional wireless service providers. We also compete for retail activations with resellers that buy bulk wholesale service from facilities-based wireless service providers for resale, including resellers that buy from us. Competition is intense as a result of continuing increases in wireless market penetration levels, network investment by our competitors, the development and deployment of new technologies, the introduction of new products and services, new market entrants, the availability of additional spectrum, both licensed and unlicensed, and regulatory changes. Competition may also increase as smaller, stand-alone wireless service providers merge or transfer licenses to larger, better capitalized wireless service providers.

The wireless industry also faces competition from other communications and technology companies seeking to increase their brand recognition and capture customer revenue with respect to the provision of wireless products and services, in addition to non-traditional offerings in mobile data. For example, Microsoft, Google, Apple and others are offering alternative means for making wireless voice calls that, in certain cases, can be used in lieu of the wireless provider's voice service, as well as alternative means of accessing video content.

We believe that the following are the most important competitive factors in our industry:

*Network reliability, capacity and coverage.* We believe that a wireless network that consistently provides high-quality and reliable service is a key differentiator in the U.S. market and driver of customer satisfaction. Lower prices, improved service quality and new wireless service offerings, which in many cases include video content, have led to increased customer usage of wireless services, which, in turn, puts pressure on network capacity. In order to compete effectively, wireless service providers must keep pace with network capacity needs and offer highly reliable national coverage through their networks. We believe that our investments in our 4G LTE network to increase network capacity will enable us to meet consumer demand.

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*Pricing.* Service and equipment pricing play an important role in the wireless competitive landscape. As the demand for wireless services continues to grow, we and other wireless service providers are offering service plans at competitive prices that include unlimited voice minutes and text messages and a specific amount of data access in varying megabyte or gigabyte sizes or, in some cases, on an unlimited basis subject to certain restrictions. These allowances will vary from time to time as part of promotional offers or in response to market circumstances. We and many other wireless service providers also allow customers on certain plans to carry over unused data allowances to the next billing period, or to stay online at a reduced data speed after using all of a data allowance for a billing period. In addition, some wireless service providers have bundled wireless service offerings with other products while others offer promotional pricing and incentives targeted specifically to customers of Verizon Wireless.

We and other wireless service providers, as well as equipment manufacturers, offer device payment options that distinguish service pricing from equipment pricing and blur the traditional boundary between prepaid and postpaid plans. These payment options include device payment plans,

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which provide customers with the ability to pay for their device over a period of time, and device leasing arrangements. Historically, wireless service providers offered customers wireless plans whereby, in exchange for the customer entering into a fixed-term service agreement, the wireless service provider significantly, and in some cases fully, subsidized the customer's device purchase. Wireless providers recovered those subsidies through higher service fees as compared to those paid by customers on device payment plans. We and many other wireless providers have limited or discontinued this form of device subsidy.

*Customer service.* We believe that high-quality customer service is a key factor in retaining customers and attracting new customers, including those of other wireless providers. Our customer service, retention and satisfaction programs are based on providing customers with convenient and easy-to-use products and services and focusing on their needs in order to promote long-term relationships and minimize churn. Our competitors also recognize the importance of customer service and are also focused on improving in this area. As part of our efforts to transform and simplify the customer experience, we launched a new My Verizon app, which allows customers to manage their price plan, data usage, account and billing from their device. As part of our efforts to promote long-term relationships with our customers, we offer Verizon Smart Rewards, which is a program that offers a wide variety of rewards to customers in exchange for points they earn in connection with their account-related interactions with Verizon Wireless. The program offers customers discounts and savings on merchandise from well-known brands, as well as discounts and other offers at local shopping and dining venues.

*Product and service development.* As wireless technologies develop and wireless broadband networks proliferate, continued customer and revenue growth will be increasingly dependent on the development of new and enhanced data products and services. We continue to pursue the development and rapid deployment of new and innovative wireless products and services both independently and in collaboration with application and content providers. We also collaborate with various device manufacturers in the development of distinctive smartphones and other wireless devices that can access the growing array of data applications and content available over the Internet. We continue to focus on increasing the penetration of smartphones, tablets and other connected devices throughout our customer base.

*Sales and distribution.* The key to achieving sales success in the wireless industry is the reach and quality of sales channels and distribution points. We believe that attaining the optimal combination of varying distribution channels is important to achieving industry-leading profitability, as measured by operating income. We endeavor to increase sales through our company-operated stores, outside sales teams and telemarketing, web-based sales and fulfillment capabilities, our extensive indirect distribution network of retail outlets and prepaid replenishment locations, and through manufacturers of laptops and netbooks with embedded 4G LTE and 3G modules that can access the Internet on our network at broadband speeds. In addition, we sell network access to both traditional resellers, which resell network services to their end-users, and to various companies to enable wireless communications for their IoT devices or services.

*Capital resources.* In order to expand the capacity and coverage of their networks and introduce new products and services, wireless service providers require significant capital resources. We generate significant cash flow from operations, as do some of our competitors.

Our success will depend on our ability to anticipate and respond to various factors affecting the wireless industry, including the factors described above, as well as new technologies, new business models, changes in customer preferences, regulatory changes, demographic trends, economic conditions and pricing strategies of competitors.

## **Wireline Background**

Our Wireline segment provides voice, data and video communications products and enhanced services. We provide these products and services to consumers in the United States, as well as to carriers, businesses and government customers both in the United States and around the world. In 2016, Wireline revenues were \$31.3 billion, representing approximately 25% of Verizon's aggregate revenues.

## ***Strategic Transactions***



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On February 5, 2015, we entered into a definitive agreement with Frontier Communications Corporation (Frontier) pursuant to which Verizon sold its local exchange business and related landline activities in California, Florida and Texas, including Fios Internet and video customers, switched and special access lines and high-speed Internet service and long distance voice accounts in these three states, for approximately \$10.5 billion (approximately \$7.3 billion net of income taxes), subject to certain adjustments and including the assumption of \$0.6 billion of indebtedness from Verizon by Frontier. The transaction, which included the acquisition by Frontier of the equity interests of Verizon's incumbent local exchange carriers (ILECs) in California, Florida and Texas, did not involve any assets or liabilities of Verizon Wireless. The transaction closed on April 1, 2016.

The transaction resulted in Frontier acquiring approximately 3.3 million voice connections, 1.6 million Fios Internet subscribers, 1.2 million Fios video subscribers and the related ILEC businesses from Verizon. Approximately 9,300 Verizon employees who served customers in California, Florida and Texas continued employment with Frontier. The operating results of these businesses are excluded from our Wireline segment for all periods presented to reflect comparable segment operating results consistent with the information regularly reviewed by our chief operating decision maker.

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On February 20, 2016, we entered into a purchase agreement to acquire XO Holdings' wireline business, which owns and operates one of the largest fiber-based IP and Ethernet networks, for approximately \$1.8 billion, subject to adjustment. We completed the acquisition on February 1, 2017. Separately, we entered into an agreement to lease certain wireless spectrum from a wholly-owned subsidiary of XO Holdings that holds its wireless spectrum. Verizon has an option, exercisable under certain circumstances, to buy that subsidiary.

We are reinventing our network architecture around a common fiber platform that will support both our wireless and wireline technologies. We expect that this new One Fiber architecture will improve our 4G LTE coverage, speed the deployment of 5G, deliver high-speed Fios broadband to homes and businesses and create new opportunities in the small and medium business market. In April 2016, we announced our One Fiber strategy for the city of Boston. We launched One Fiber for consumer and business services to customers in Boston late in 2016.

On December 6, 2016, we entered into a definitive agreement with Equinix, Inc. pursuant to which Verizon will sell 24 customer-facing data center sites in the United States and Latin America for approximately \$3.6 billion, subject to certain adjustments. The sale does not affect Verizon's data center services delivered from 27 sites in Europe, Asia-Pacific and Canada, or its managed hosting and cloud offerings. The transaction is subject to customary regulatory approvals and closing conditions, and is expected to close during the first half of 2017.

### **Wireline Service and Product Offerings**

We organize our service and product offerings by the primary customers targeted by these offerings—mass markets, global enterprise and global wholesale.

#### ***Mass Markets***

Mass Markets operations provide broadband Internet and video services (including high-speed Internet, Fios Internet and Fios video services), and local exchange (basic service and end-user access) and long distance (including regional toll) voice services to residential and small business subscribers. In 2016, Mass Markets revenues were \$14.4 billion, representing approximately 46% of Wireline's aggregate revenues.

*Internet services.* We offer Fios Internet and high-speed Internet services with varying throughput speeds. We believe that as consumers connect more devices and stream more video, they will require increased broadband speeds. With our Fios Quantum broadband service and certain other data services, our customers can achieve symmetrical upload and download speeds of up to 500 Mbps, and we recently launched our Instant Internet service, which allows customers in certain markets to achieve symmetrical upload and download speeds of 750 Mbps and higher. As more data storage and, in some cases, processing is moved to the cloud, we believe that customers will place an increasing value on upstream performance that matches what they already receive for downloads.

*Video services.* We offer video service over our fiber-optic network. As of December 31, 2016, Fios video services were available to approximately 14 million homes across 9 states, as well as the District of Columbia. We have several offerings available to our Fios TV customers, including:

*Fios Quantum TV*, which provides customers the ability to record up to 12 shows at once and control live TV from any room in their home;

*Fios Custom TV*, which provides customers local versions of the Fox, CBS, NBCU, and ABC broadcast stations and other similar local content and offers customers the option of purchasing an Essentials plan that includes a base set of lifestyle, entertainment, pop culture and content for children and national news networks, or a Sports and More plan that includes national and regional sports networks as well as non-sports national networks. Customers can add more sets of categorized channels to their Custom TV package for an additional monthly fee; and

*Fios on Demand*, which gives Fios customers the ability to watch content virtually anytime and anywhere, on any compatible device. Customers who subscribe to Fios Internet and video service also have the ability to upload their photos, music and videos to their personal Fios on Demand Library, which gives them access to this content via various data-capable devices. With the Fios Mobile App, programming, such as ESPN, TNT, Nickelodeon, HBO and TBS, can be streamed to a customer's tablet or other mobile device.

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We continue to partner with major corporations to offer further interoperability with various products such as video game consoles, smart televisions and tablets. This technology further expands our initiative to provide customers with the ability to watch content anytime and anywhere on any data-capable device.

*Voice services.* We offer voice services that include local exchange, regional and long distance calling and voice messaging services, as well as Voice over Internet protocol (VoIP) services, which use the Internet or private broadband networks to transmit voice communications.

*Global Enterprise*

Global Enterprise offers strategic services and other core communications services to medium and large business customers, including multinational corporations, as well as state and federal government customers. Global Enterprise markets these services through Verizon Enterprise Solutions. In 2016, Global Enterprise revenues were \$11.6 billion, representing approximately 37% of Wireline s aggregate revenues.

Verizon Enterprise Solutions offers an array of advanced information and communication technology services, including Global Internet Protocol (IP) network, cloud and IT solutions, and business communications, IoT, data, security and mobility services.

*Network products and solutions* These products and solutions primarily include our Private IP, Public Internet, Ethernet and optical networking services. Our Private IP service enables customers around the world to communicate over a virtual private network using a variety of access methods, including Ethernet and Verizon Wireless 4G LTE. Our Public Internet services provide Internet connectivity through a variety of low and high-speed options. Our Ethernet portfolio includes access services that allow customers to connect network environments around the world and enable applications and technologies to work seamlessly and with little disruption, as well as local and long distance layer 2 services that include Metro local area network (LAN), long distance switched and dedicated architectures. Optical networking services include technologies that help customers handle bandwidth demands and control their costs.

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*IT solutions and cloud services* Our IT solutions and cloud services are built to help our enterprise customers drive innovation and business growth. We offer IT infrastructure services that include colocation and managed hosting in data centers around the globe. Our cloud services include computing, storage, backup, recovery and application platforms our customers rely on to run their business operations.

*Business communications services* Business communications services primarily include IP communications services, which simplify network management and drive operational efficiencies by enabling the convergence of voice and data traffic on the same access connection; dedicated Internet access, which provides enterprise customers with high-bandwidth dedicated access to Verizon's global network; unified communications and collaboration capabilities, which enable customers to communicate in real-time through VoIP and IP conferencing, and emergency communication services, which allow customers to respond effectively to emergencies while maintaining business continuity.

*Security services* We offer a suite of data security services to help companies secure their networks, data, applications and infrastructure from security threats while building customer trust and confidence.

*Core services* Core services include core voice and data services, which consist of a comprehensive portfolio of global solutions utilizing traditional telecommunications technology, such as conferencing and contact center solutions, and private line and data access networks. Core services also include providing customer premise equipment, and installation, maintenance and site services. We are continuing to transition customers out of copper-based legacy voice and data services to fiber services, including IP and Ethernet.

### ***Global Wholesale***

Global Wholesale provides communications services, including data, voice, local dial tone and broadband services, primarily to local, long distance, wireless and other carriers that use our facilities to provide services to their customers. In 2016, Global Wholesale revenues were \$5.0 billion, representing approximately 16% of Wireline's aggregate revenues. A portion of Global Wholesale revenues are generated by a few large telecommunications companies, most of which compete directly with us.

Global Wholesale provides the following services, which it jointly markets with Verizon's other business units through Verizon Enterprise Solutions:

*Data services.* We offer a robust portfolio of data services with varying speeds and options to enhance our wholesale customers networks and provide connections to their end-users and subscribers. Our data services include high-speed digital data offerings, such as Ethernet and Wavelength services, as well as core data circuits, such as DS1s and DS3s. In addition, we receive revenue from data services that is generated from carriers that buy dedicated local exchange capacity to support their private networks.

Data services also include certain value-added business services, which leverage many of the same offerings available in the Global Enterprise portfolio, including:

*Managed services,* which offer wholesale customers security, remote access, web applications and the opportunity to outsource the management of their networks to Verizon;

*Mobility offerings,* which enable wholesale customers to enhance their portfolio to triple-play or quad-play capability by leveraging wireless devices and services offered through Verizon Wireless that can be packaged and resold under their own carrier brand; and

*Security services,* which provide wholesale customers integrated solutions to help their enterprise end-users secure their networks and data.

*Voice services.* We provide switched access services that allow carriers to complete their end-user calls that originate or terminate within our territory. In addition, we provide originating and terminating voice services throughout the United States and globally utilizing our time-division multiplexing (TDM) and VoIP networks.

*Local services.* We offer an array of local dial tone and broadband services to competitive local exchange carriers, some of which are offered to comply with telecommunications regulations. In addition, we offer services such as colocation, resale and unbundled network elements in compliance with applicable regulations.

#### **Network**

Verizon operates a large and advanced telecommunications network in the United States and around the world to provide services and solutions to its customers.

*Fios.* Our fiber-to-the-home network through which we provide our Fios residential broadband service has passed over 16.9 million premises in the United States as of December 31, 2016. Residential broadband service has seen significant growth in bandwidth demand over the past several years, and we believe that demand will continue to grow. The continued emergence of new video services, new data applications and the proliferation of IP devices in the home will continue to drive new network requirements for increased data speeds and throughput. We believe that the Passive Optical Network (PON) technology underpinning Fios makes us well positioned to meet these demands in a cost effective and efficient manner. Our PON technology provides the flexibility to adapt our network to deliver increased data speeds and new services without major overhauls or replacements to the fiber-optic infrastructure.

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While deployed initially as a consumer broadband network, the PON infrastructure is also finding more widespread application in the enterprise sector, especially as businesses increasingly migrate to Ethernet-based access services.

*Global IP.* Verizon owns and operates one of the largest global fiber networks in the world, providing connectivity to business customers in more than 150 countries. Our global IP network includes long haul, metro and submarine assets that span over 800,000 route miles and enable and support far reaching international operations.

Global business is rapidly evolving to an everything-as-a-service model in which business customers seek cloud-based, converged enterprise solutions delivered securely via managed and professional services. With the continued deployment of packet optical transport strategy, Verizon is creating a single, high-capacity global network platform that combines optical transport with advanced packet switching technology. The result is a global IP network that can offer powerful solutions to these service demands.

We believe that our continued focus on enhancing our domestic and global fiber-based networks, and achieving cost efficient solutions through new technology deployments, will help Verizon advance its position as a provider of choice to residential and enterprise customers.

## **Competition**

The wireline telecommunications industry is highly competitive. We expect competition to intensify further with traditional, non-traditional and emerging players seeking increased market share. Current and potential competitors include cable companies, wireless service providers, domestic and foreign telecommunications providers, satellite television companies, Internet service providers and other companies that offer network services and managed enterprise solutions.

In addition, companies with a global presence increasingly compete with our wireline businesses. A relatively small number of telecommunications and integrated service providers with global operations serve customers in the global enterprise and, to a lesser extent, the global wholesale markets. We compete with these providers for large contracts to provide integrated services to global enterprises. Many of these companies have strong market presence, brand recognition and existing customer relationships, all of which contribute to intensifying competition that may affect our future revenue growth.

We believe the following are the most important competitive factors and trends in the wireline industry:

*Bandwidth (speed) and network reliability:* Consumers and small business customers are seeking to leverage high-speed connections for entertainment, communications and productivity. As online and online-enabled activities increase, so will bandwidth requirements, both downstream and upstream. To succeed, we and other network-based providers must ensure that our networks can meet these increasing bandwidth requirements. In addition, network reliability and security are increasingly important competitive factors in the global enterprise market. We continue to invest in our network to be able to meet growing bandwidth demand and provide the most reliable and secure network.

*Pricing:* Cable operators, telecommunications companies and integrated service providers use pricing to capture market share from incumbents. Pricing is also a significant factor as non-traditional modes of providing communication services emerge and new entrants compete for customers. For example, VoIP and portal-based calling is free or nearly free to customers and is often supported by advertising revenues.

*Customer service:* Customers expect industry-leading service from their service providers. As technologies and services evolve, the ability to excel in this area is important for customer acquisition and retention. In Mass Markets, we compete in this area through our service representatives and online support. In Global Enterprise, we provide our customers with ready access to their system and performance information, and we conduct proactive testing of our network to identify issues before they affect customers. In the Global Wholesale business, we believe service improvement can be achieved through continued system automation initiatives.

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*Product differentiation:* As a result of pricing pressures, providers need to differentiate their products and services. Customers are shifting their focus from access to applications and are seeking ways to leverage their broadband and video connections. Converged features, such as integrated wireless and wireline functionality, are becoming similarly important, driven by both customer demand and technological advancement.

*Innovation:* The delivery of new and innovative products and services has been accelerating. To compete effectively, providers need to continuously review, improve and refine their product portfolio and develop and rapidly deploy new products and services tailored to the needs of the customer.



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In the Mass Markets business, cable operators are significant competitors. Cable operators have increased the size and capacity of their networks in order to offer digital products and services. We continue to market competitive bundled offerings that include high-speed Internet access, digital television and voice services. Several major cable operators also offer bundles with wireless services through strategic relationships.

We expect customer migration from traditional voice services to wireless services to continue as a growing number of customers place greater value on mobility and wireless companies position their service as a landline alternative. We also face increasing competition from cable companies and other providers of VoIP services as well as Internet portal providers. In addition, customers have more choices for obtaining video content from various online services and that content can be accessed on a TV, computer, tablet or mobile phone.

In the global enterprise market, the customer's need to reduce technical complexity coupled with the growth opportunity created by technology convergence is driving the expansion of the competitive landscape. Major competitors include system integrators, carriers and hardware and software providers. Some of the biggest companies in IT services are making strategic acquisitions, divesting non-strategic assets or forging new alliances to be better positioned for a rebound in technology spending. Many new alliances and acquisitions have focused on emerging fields such as cloud computing, software delivery, communication applications and other computing tasks via the network, rather than on in-house machines. Carriers have also utilized acquisitions to make significant inroads into enterprise outsourcing markets that have long been dominated by the major IT outsourcers.

Global Wholesale competes with traditional carriers for long-haul, voice and IP services. In addition, mobile video and data needs are driving a greater need for wireless backhaul. Network providers, cable companies and niche players are competitors for this new revenue opportunity.

We also compete with competitive local exchange carriers (CLECs). Our telephone operations generally have been required to sell their services to CLECs at significant discounts from the prices our telephone operations charge their retail customers.

## **New Product Development and Strategic Initiatives**

Technology developments, interconnected markets, shifting consumer needs and converging industry ecosystems are creating innovative opportunities for Verizon. We are transforming around the capabilities of our high-performing networks, with a goal of future growth based on delivering what customers want and need in the new digital world. Our three tier strategy is to lead at the network connectivity level in the markets we serve, develop new business models through global platforms in digital media and IoT and deliver solutions to key industry segments for incremental monetization. To execute this strategy, we have created an organization devoted to the development of new products and the cultivation of new businesses. This organization is focused on leveraging all of our assets to create innovative products and services that can provide our customers with integrated solutions that address their needs. Several strategic initiatives have been undertaken by this organization in the areas of digital media, interactive entertainment and IoT and telematics products and services.

As a market leader in offering differentiated solutions to our connected customers across their devices at home, at work and on the go, Verizon will continue to focus on strategic partnerships as an important pillar of our future strategy. Strategic partnerships are aimed at complementing and augmenting our strengths, expanding our addressable market, accelerating our pace of innovation, enabling faster delivery of solutions such as media and IoT to the marketplace and, where possible, lowering our market and execution risk. Strong partnerships are expected to further our efforts to offer comprehensive solutions for our customers. We look to formulate strategic partnerships and alliances with a global orientation, which we believe will benefit us in terms of technology sourcing, content acquisition, consumer insights and application ecosystems.

We believe these investments will assist us in bringing innovative next generation products and services to market and uncovering new sources of revenue, increasing revenue from existing projects and leveraging our strengths across the company.

## **Digital Media and Interactive Entertainment**

Verizon has been investing in emerging technology that taps into the market shift to digital content and advertising. We have been investing in video assets and capabilities with a goal of building a global platform and developing new business models for reaching the digital video customer. We believe the growth in video consumption using mobile devices provides us with an opportunity for revenue growth. Through various acquisitions and investments and the launch of video streaming products and services, we are expanding the ways in which we can deliver content to our customers, including the following:

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In June 2015, we completed our acquisition of AOL Inc. (AOL), a leader in digital content and advertising. AOL's business model aligns with our approach, and we believe that its combination of owned and operated content properties plus a digital advertising platform enhances our ability to further develop future revenue streams. During 2015, we also acquired Millennial Media, an advertising technology business.

In July 2016, we entered into a stock purchase agreement (the Purchase Agreement) with Yahoo! Inc. (Yahoo). Pursuant to the Purchase Agreement, upon the terms and subject to the conditions thereof, we agreed to acquire the stock of one or more subsidiaries of Yahoo holding all of Yahoo's operating business, for approximately \$4.83 billion in cash, subject to certain adjustments (the Transaction). On February 20, 2017, we entered into an amendment to the Purchase Agreement, pursuant to which, among other things, the Transaction purchase price will be reduced by \$350 million to approximately \$4.48 billion in cash, subject to certain adjustments. The Transaction is expected to provide us with a valuable portfolio of online properties and mobile applications, including market leading content in sports, finance, news and email services, which have attracted over one billion monthly active consumer views. The Transaction is expected to also expand our analytics and ad tech capabilities and enhance our competitive position and value proposition to advertisers. Additional discussion of the Transaction is included in the 2016 Verizon Annual Report to Shareowners in Note 2 to the consolidated financial statements of Verizon Communications Inc. and Subsidiaries, which is incorporated by reference into this report.

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In 2015, we launched go90, a mobile-first social entertainment platform that provides the opportunity for ad-supported mobile video streaming as well as subscription-based services. Digital content available on the go90 platform includes live events, popular web and television content and original content. In 2016, we introduced StreamPass, which offers streaming of live sports through go90 free of data charges to Verizon Wireless customers on certain data plans. We also introduced FreeBee Data, a sponsored data service that enables content providers to provide our customers with access to some or all of the provider's mobile content or to sponsor specific consumer actions on a per-click basis, free of data charges to the customer.

We have made investments in converging technologies and services involving content delivery networks (CDNs), video streaming and related consumer hardware to leverage new content models. Our wireless network enables us to move towards a unified video strategy that positions us to take advantage of this growth opportunity. We began using Multimedia Broadcast Multicast Service technology to develop our LTE Multicast service, which we use to deliver live events in go90. This service has the potential to enhance our network efficiency and provide our customers with access to live streaming video content with virtually no buffering, regardless of the number of devices using the service. We also believe it is important to have rights to deliver content over a wireless network that do not require an authentication back to a subscription agreement. For example, our NFL agreement allows our customers to access certain games live on our 4G LTE network without authenticating back to any subscription.

We continue to invest in Verizon Digital Media Services, which offers a scalable platform for delivering content, including live broadcasts, video on demand, games, software and websites, to our customers on their devices at any time. As the digital platform reshapes the delivery of media and entertainment content, there is an increasing need for a stable, high-quality video delivery platform. We are focused on providing a simple end-to-end global platform for the delivery of media to customers, which we believe will be superior to that offered by the existing and highly fragmented media delivery ecosystem. This platform is targeted at media and entertainment companies and other businesses focused on delivering their digital products and services through the Internet. We also expect, through this platform, to further integrate our Fios and wireless offerings.

During 2016, we established Verizon Hearst Media Partners, LLC, a content joint venture with Hearst Entertainment & Syndication (Hearst), to build new multiplatform digital video channels targeted to the mobile millennial audience. In partnership with Hearst, we have also invested in two media companies, AwesomenessTV Holdings, LLC and Complex Media, Inc. & CM Partners, LLC, which are leaders in producing content targeted at key demographics, in order to further diversify our content and distribution businesses within our digital media portfolio.

## **Internet of Things and Telematics**

The adoption of IoT technology continues to grow as companies across a wide range of industries are leveraging IoT technologies to increase efficiency, gain better customer insights, facilitate compliance with regulations and build new business models. Although IoT growth is expanding broadly, adoption is particularly strong in the telematics and transportation industries, as well as the fields of smart communities, healthcare, utilities and energy management. We are building our growth capabilities in the IoT market by developing business models that monetize usage on our network at the connectivity, platform and solution layers. For example, we have developed IoT solutions that address key market needs for electric and other utilities, farms and other purveyors of food and agriculture, drug companies and others with complex supply chains. In addition, our IoT customers can turn the data that our solutions provide into actionable opportunities to develop new services and create revenue growth.

Our strategy to simplify IoT technology and accelerate its adoption also includes ThingSpace, an IoT platform. ThingSpace is designed to help developers create, test, manage and market IoT-based solutions aimed at major vertical markets, such as energy, health care and connected cities. ThingSpace comes with a portal that includes immediate access to dedicated application programming interfaces and partner development kits. In October 2016, we acquired Sensity Systems, Inc., a leading provider of IoT solutions for smart communities, in order to add a leading comprehensive suite of smart city solutions.

Through Verizon Telematics, we provide connectivity and telematics services and applications to manufacturers such as Mercedes-Benz and help businesses manage large vehicle fleets more efficiently. Our suite of real-time vehicle communications services and applications connects automobiles with content services and call centers. Our platform enables factory and aftermarket-installed automotive safety and security features as well as location-based services and vehicle diagnostics. We provide usage-based data services to new vehicles in the United States, China and Europe. Our Verizon Telematics solution provides commercial fleet managers throughout North America with real-time access to data that yields operational efficiencies, increased vehicle reliability and improved driver safety. We also provide this service to over 23,000 vehicles operated by Verizon.

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In 2015, we introduced Hum, an aftermarket vehicle technology and subscription service. This subscription-based service provides consumers with diagnostic technology in their vehicles, access to live assistance and roadside assistance with GPS accuracy when needed. Our Hum service also offers the ability to connect with a certified mechanic to diagnose potential problems and offer solutions.

In 2016, we acquired Fleetmatics Group PLC, a global provider of fleet and mobile workforce management solutions, and Telogis, Inc., a global, cloud-based mobile enterprise management software company. We expect these acquisitions to advance our fleet telematics solutions, expand our distribution relationships and position our telematics business as a leading provider of fleet and mobile workforce management solutions globally.

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### **Patents, Trademarks and Licenses**

We own or have licenses to various patents, copyrights, trademarks, domain names and other intellectual property rights necessary to conduct our business. We actively pursue the filing and registration of patents, copyrights, domain names, trademarks and service marks to protect our intellectual property rights within the United States and abroad. We also actively grant licenses, in exchange for appropriate fees or other consideration and subject to appropriate safeguards and restrictions, to other companies that enable them to utilize certain of our intellectual property rights and proprietary technology as part of their products and services. Such licenses enable the licensees to take advantage of the results of Verizon's research and development efforts. While these licenses result in valuable consideration being paid to us, we do not believe that the loss of such consideration, or the expiration of any of our intellectual property rights, would have a material effect on our results of operations.

We periodically receive offers from third parties to purchase or obtain licenses for patents and other intellectual property rights in exchange for royalties or other payments. We also periodically receive notices alleging that our products or services infringe on third-party patents or other intellectual property rights. These claims, whether against us directly or against third-party suppliers of products or services that we, in turn, sell to our customers, if successful, could require us to pay damages or royalties, or cease offering the relevant products or services.

### **Acquisitions and Divestitures**

Information about our acquisitions and divestitures is included in the 2016 Verizon Annual Report to Shareowners under the heading "Management's Discussion and Analysis of Financial Condition and Results of Operations - Acquisitions and Divestitures", which is incorporated by reference into this report.

### **Regulatory and Competitive Trends**

#### **Regulatory and Competitive Landscape**

Verizon operates in a regulated and highly competitive market. Current and potential competitors include other voice and data service providers such as other wireless companies, traditional telephone companies, cable companies, Internet service providers, software and application providers, and other non-traditional companies. Many of these companies have strong market presence, brand recognition and existing customer relationships, all of which contribute to intensifying competition that may affect our future revenue growth. Some of our competitors also are subject to fewer regulatory constraints than Verizon. For many services offered by Verizon, the FCC is our primary regulator. The FCC has jurisdiction over interstate telecommunications services and other matters under the Communications Act of 1934, as amended (Communications Act or Act). Other Verizon services are subject to state and local regulation.

### **Federal Regulation**

#### *Wireless Services*

The FCC regulates several aspects of our wireless operations. Generally, the FCC has jurisdiction over the construction, operation, acquisition and transfer of wireless communications systems. All wireless services require use of radio frequency spectrum, the assignment and distribution of which is subject to FCC oversight. Verizon anticipates that it will need additional spectrum to meet future demand. We can meet our needs for licensed spectrum by purchasing licenses or leasing spectrum from others, or by participating in a competitive bidding process to acquire new spectrum from the FCC. Those processes are subject to certain reviews, approvals and potential conditions.

Today, Verizon holds FCC spectrum licenses that allow it to provide a wide range of mobile and fixed communications services, including both voice and data services. FCC spectrum licenses typically have a term of 10 years, at which time they are subject to renewal. While the FCC has routinely renewed all of Verizon's wireless licenses, challenges could be raised in the future. If a wireless license was revoked or not renewed, Verizon would not be permitted to provide services on the spectrum covered by that license. Some of our licenses require us to comply with so-called "open access" FCC regulations, which generally require licensees of particular spectrum to allow customers to use devices and applications of their choice, subject to certain technical limitations. The FCC has also imposed certain specific mandates on wireless carriers, including construction and geographic coverage requirements, technical operating standards, provision of enhanced 911 services, roaming obligations and requirements for wireless tower and antenna facilities.

#### *Broadband*

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Verizon offers many different broadband services. Traditionally, the FCC recognized that broadband Internet access services as information services subject to a light touch regulatory approach rather than to the traditional, utilities-style regulations. In 2015, the FCC reversed course and declared that broadband Internet access services are telecommunications services subject to common carriage regulation under Title II of the Communications Act. This decision created uncertainty concerning the level of regulation that will apply to broadband services. It created a risk that such regulation would limit the ways that broadband Internet access service providers structure their business arrangements and manage their networks and could spur additional restrictions, including rate regulation, that could adversely affect broadband investment and innovation. The FCC's decision was affirmed by the United States Court of Appeals, but may be subject to further challenge in the courts. In addition, Congress and the FCC are likely to continue to debate the proper scope of such regulations. Regardless of regulation, Verizon remains committed to the open Internet which provides consumers with competitive choices and unblocked access to lawful websites and content when, where, and how they want, and our commitment to our customers can be found on our website at <http://responsibility.verizon.com/broadband-commitment>.

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### *Wireline Voice*

Verizon offers many different wireline voice services, including traditional telephone service and other services that rely on technologies such as VoIP. For regulatory purposes, legacy telephone services are generally considered to be common carrier services. Common carrier services are subject to heightened regulatory oversight with respect to rates, terms and conditions and other aspects of the services. The FCC has not decided the regulatory classification of VoIP but has said VoIP service providers must comply with certain rules, such as 911 capabilities and law enforcement assistance requirements.

### *Video*

Verizon offers a multichannel video service that is regulated like traditional cable service. The FCC has a body of rules that apply to cable operators, and these rules also generally apply to Verizon. In areas where Verizon offers its facilities-based multichannel video services, Verizon has typically been required to obtain a franchise from local authorities.

### *Privacy and Data Security*

We are subject to federal, state and international laws and regulations relating to privacy and data security that impact all parts of our business, including voice, wireless, broadband and the development and roll out of new products, such as those in the IoT space. At the federal level, much of our business is subject to the FCC's privacy and data security requirements. In November 2016, the FCC released new privacy and data security rules that will apply to all telecommunications services, including our fixed and mobile voice and broadband services. Other parts of our business are subject to the privacy and data security oversight of other federal regulators, including the Federal Trade Commission. Generally, attention to privacy and data security requirements is increasing at both the state and federal level. In addition, a new data protection regulation will go into effect in Europe in May 2018 that includes significant penalties for non-compliance.

### *Public Safety and Cybersecurity*

The FCC has played a role in addressing public safety concerns by regulating emergency communications services and mandating widespread availability of both media (broadcast/cable) and wireless emergency alerting services. In response to recent cyber attacks, however, the FCC or other regulators may attempt to increase regulation of the cybersecurity practices of providers.

### *Intercarrier Compensation and Network Access*

The FCC regulates some of the rates that carriers pay each other for the exchange of voice traffic (particularly traditional wireline traffic) over different networks and other aspects of interconnection for some voice services. The FCC also regulates some of the rates and terms and conditions for certain wireline business data services and other services and network facilities. Verizon is both a seller and a buyer of these services, and both makes and receives interconnection payments. The FCC has focused in recent years on whether changes in the rates, terms and conditions for both the exchange of traffic and for business data services may be appropriate.

## **State Regulation and Local Regulation**

### *Wireless Services*

The Act generally preempts regulation by state and local governments of the entry of, or the rates charged by, wireless carriers. The Act does not prohibit states from regulating the other terms and conditions of wireless service. For example, some states attempt to regulate wireless customer billing matters and impose reporting requirements. Several states also have laws or regulations that address safety issues (e.g., use of wireless handsets while driving) and taxation matters. In addition, wireless tower and antenna facilities are often subject to state and local zoning and land use regulation, and securing approvals for new or modified facilities is often a lengthy and expensive process.

### *Wireline Services*

State public utility commissions regulate Verizon's telephone operations with respect to certain telecommunications intrastate matters. Verizon operates as an incumbent local exchange carrier in nine states and the District of Columbia. These incumbent operations are subject to various levels of pricing flexibility and other state oversight and requirements. Verizon also has other wireline operations that are more lightly regulated. In addition, as a video services operator in many states, Verizon has been required to obtain a cable franchise from local government entities, or in some cases a state-wide franchise, and comply with certain one-time and ongoing obligations, as a result.





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### **Environmental Matters**

Reserves have been established to cover environmental matters relating to discontinued businesses and past telecommunications activities. These reserves include funds to address contamination at the site of a former Sylvania facility in Hicksville, NY, which had processed nuclear fuel rods in the 1950s and 1960s. In September 2005, the Army Corps of Engineers (ACE) accepted the site into its Formerly Utilized Sites Remedial Action Program. As a result, the ACE has taken primary responsibility for addressing the contamination at the site. An adjustment to the reserves may be made after a cost allocation is conducted with respect to the past and future expenses of all of the parties. Adjustments to the environmental reserve may also be made based upon the actual conditions found at other sites requiring remediation.

### **Executive Officers**

See Part III, Item 10. Directors, Executive Officers and Corporate Governance of this Annual Report on Form 10-K for information about our executive officers.

### **Employees**

As of December 31, 2016, Verizon and its subsidiaries had approximately 160,900 employees. Unions represent approximately 23% of our employees.

### **Information on Our Internet Website**

We make available, free of charge on our website, our annual reports on Form 10-K and Form SD, quarterly reports on Form 10-Q, current reports on Form 8-K, and all amendments to those reports at <http://www.verizon.com/about/investors>.

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**Cautionary Statement Concerning Forward-Looking Statements**

In this report we have made forward-looking statements. These statements are based on our estimates and assumptions and are subject to risks and uncertainties. Forward-looking statements include the information concerning our possible or assumed future results of operations. Forward-looking statements also include those preceded or followed by the words anticipates, believes, estimates, hopes or similar expressions. For those statements, we claim the protection of the safe harbor for forward-looking statements contained in the Private Securities Litigation Reform Act of 1995.

The following important factors, along with those discussed elsewhere in this report and in other filings with the Securities and Exchange Commission (SEC), could affect future results and could cause those results to differ materially from those expressed in the forward-looking statements:

adverse conditions in the U.S. and international economies;

the effects of competition in the markets in which we operate;

material changes in technology or technology substitution;

disruption of our key suppliers' provisioning of products or services;

changes in the regulatory environment in which we operate, including any increase in restrictions on our ability to operate our networks;

breaches of network or information technology security, natural disasters, terrorist attacks or acts of war or significant litigation and any resulting financial impact not covered by insurance;

our high level of indebtedness;

an adverse change in the ratings afforded our debt securities by nationally accredited ratings organizations or adverse conditions in the credit markets affecting the cost, including interest rates, and/or availability of further financing;

material adverse changes in labor matters, including labor negotiations, and any resulting financial and/or operational impact;

significant increases in benefit plan costs or lower investment returns on plan assets;

changes in tax laws or treaties, or in their interpretation;

changes in accounting assumptions that regulatory agencies, including the SEC, may require or that result from changes in the accounting rules or their application, which could result in an impact on earnings;

the inability to implement our business strategies; and

the inability to realize the expected benefits of strategic transactions.

**Table of Contents****Item 1A. Risk Factors**

*The following discussion of Risk Factors identifies the most significant factors that may adversely affect our business, operations, financial condition or future performance. This information should be read in conjunction with Management's Discussion and Analysis of Financial Condition and Result of Operations and the consolidated financial statements and related notes. The following discussion of risks is not all-inclusive but is designed to highlight what we believe are important factors to consider when evaluating our business and expectations. These factors could cause our future results to differ materially from our historical results and from expectations reflected in forward-looking statements.*

***Adverse conditions in the U.S. and international economies could impact our results of operations.***

Unfavorable economic conditions, such as a recession or economic slowdown in the United States or elsewhere, could negatively affect the affordability of and demand for some of our products and services. In difficult economic conditions, consumers may seek to reduce discretionary spending by forgoing purchases of our products, electing to use fewer higher margin services or obtaining lower-cost products and services offered by other companies. Similarly, under these conditions, the business customers that we serve may delay purchasing decisions, delay full implementation of service offerings or reduce their use of services. In addition, adverse economic conditions may lead to an increased number of our consumer and business customers that are unable to pay for services. If these events were to occur, it could have a material adverse effect on our results of operations.

***We face significant competition that may reduce our profits.***

We face significant competition in our industry. The rapid development of new technologies, services and products has eliminated many of the traditional distinctions among wireless, cable, Internet, local and long distance communication services and brought new competitors to our markets, including other telephone companies, cable companies, wireless service providers, satellite providers, application and device providers and providers of VoIP services. While these changes have enabled us to offer new types of products and services, they have also allowed other providers to broaden the scope of their own competitive offerings. In addition, wireless service providers are significantly altering the financial relationships with their customers through commercial offers that vary service and device pricing, promotions, incentives and levels of service provided in some cases specifically targeting Verizon Wireless customers. Our ability to compete effectively will depend on, among other things, our network quality, capacity and coverage, the pricing of our products and services, the quality of our customer service, our development of new and enhanced products and services, the reach and quality of our sales and distribution channels and our capital resources. It will also depend on how successfully we anticipate and respond to various factors affecting our industry, including new technologies and business models, changes in consumer preferences and demand for existing services, demographic trends and economic conditions. If we are not able to respond successfully to these competitive challenges, we could experience reduced profits.

***If we are not able to adapt to changes and disruptions in technology and address changing consumer demand on a timely basis, we may experience a decline in the demand for our services, be unable to implement our business strategy and experience reduced profits.***

Our industry is rapidly changing as new technologies are developed that offer consumers an array of choices for their communications needs and allow new entrants into the markets we serve. In order to grow and remain competitive, we will need to adapt to future changes in technology, enhance our existing offerings and introduce new offerings to address our customers' changing demands. If we are unable to meet future challenges from competing technologies on a timely basis or at an acceptable cost, we could lose customers to our competitors. We may not be able to accurately predict technological trends or the success of new services in the market. In addition, there could be legal or regulatory restraints on our introduction of new services. If our services fail to gain acceptance in the marketplace, or if costs associated with the implementation and introduction of these services materially increase, our ability to retain and attract customers could be adversely affected.

In addition to introducing new technologies and offerings, we must phase out outdated and unprofitable technologies and services. If we are unable to do so on a cost-effective basis, we could experience reduced profits. In addition, there could be legal or regulatory restraints on our ability to phase out current services.

***We depend on key suppliers and vendors to provide equipment that we need to operate our business.***

We depend on various key suppliers and vendors to provide us, directly or through other suppliers, with equipment and services, such as switch and network equipment, smartphones and other wireless devices, that we need in order to operate our business and provide products to our customers. For example, our smartphone and other device suppliers often rely on one vendor for the manufacture and supply of critical components, such as chipsets, used in their devices. If these suppliers or vendors fail to provide equipment or service on a timely basis or fail to meet our performance expectations, we may be unable to provide products and services as and when requested by our customers. We also may be unable to continue to maintain or upgrade our networks. Because of the cost and time lag that can be associated with transitioning from one

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supplier to another, our business could be substantially disrupted if we were required to, or chose to, replace the products or services of one or more major suppliers with products or services from another source, especially if the replacement became necessary on short notice. Any such disruption could increase our costs, decrease our operating efficiencies and have a material adverse effect on our business, results of operations and financial condition.

The suppliers and vendors on which we rely may also be subject to litigation with respect to technology on which we depend, including litigation involving claims of patent infringement. Such claims are frequently made in the communications industry. We are unable to predict whether our business will be affected by any such litigation. We expect our dependence on key suppliers to continue as we develop and introduce more advanced generations of technology.

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***Changes in the regulatory framework under which we operate could adversely affect our business prospects or results of operations.***

Our domestic operations are subject to regulation by the FCC and other federal, state and local agencies, and our international operations are regulated by various foreign governments and international bodies. These regulatory regimes frequently restrict or impose conditions on our ability to operate in designated areas and provide specified products or services. We are frequently required to maintain licenses for our operations and conduct our operations in accordance with prescribed standards. We are often involved in regulatory and other governmental proceedings or inquiries related to the application of these requirements. It is impossible to predict with any certainty the outcome of pending federal and state regulatory proceedings relating to our operations, or the reviews by federal or state courts of regulatory rulings. Without relief, existing laws and regulations may inhibit our ability to expand our business and introduce new products and services. Similarly, we cannot guarantee that we will be successful in obtaining the licenses needed to carry out our business plan or in maintaining our existing licenses. For example, the FCC grants wireless licenses for terms generally lasting 10 years, subject to renewal. The loss of, or a material limitation on, certain of our licenses could have a material adverse effect on our business, results of operations and financial condition.

New laws or regulations or changes to the existing regulatory framework at the federal, state and local, or international level could restrict the ways in which we manage our wireline and wireless networks, impose additional costs, impair revenue opportunities and potentially impede our ability to provide services in a manner that would be attractive to us and our customers. For example, we are subject to federal, state and international laws related to privacy and data protection. A new data protection regulation will go into effect in Europe in May 2018 that includes significant penalties for non-compliance. In addition, in its order imposing so-called network neutrality regulations, the FCC reversed course in 2015 on the longstanding light touch approach and reclassified broadband Internet access services as telecommunications services subject to utilities-style common carriage regulation. While the full scope and effect of this new regulatory approach is uncertain, these rules limit the ways that a broadband Internet access service provider can structure business arrangements, manage its network and open the door to additional restrictions, including rate regulation that could adversely affect broadband investment and innovation. These rules may be subject to further challenge in the courts and the proper scope of such regulations is being debated in Congress and the FCC, but the outcome and timing of those challenges and debates remain uncertain. As another example, we hold certain wireless licenses that require us to comply with so-called open access FCC regulations, which generally require licensees of particular spectrum to allow customers to use devices and applications of their choice. Moreover, certain services could be subject to conflicting regulation by the FCC and/or various state and local authorities, which could significantly increase the cost of implementing and introducing new services. The further regulation of broadband, wireless and our other activities and any related court decisions could restrict our ability to compete in the marketplace and limit the return we can expect to achieve on past and future investments in our networks.

***Cyber attacks impacting our networks or systems could have an adverse effect on our business.***

Cyber attacks, including through the use of malware, computer viruses, dedicated denial of services attacks, credential harvesting and other means for obtaining unauthorized access to or disrupting the operation of our networks and systems and those of our suppliers, vendors and other service providers, could have an adverse effect on our business. Cyber attacks may cause equipment failures, loss of information, including sensitive personal information of customers or employees or valuable technical and marketing information, as well as disruptions to our or our customers' operations. Cyber attacks against companies, including Verizon, have increased in frequency, scope and potential harm in recent years. Further, the perpetrators of cyber attacks are not restricted to particular groups or persons. These attacks may be committed by company employees or external actors operating in any geography, including jurisdictions where law enforcement measures to address such attacks are unavailable or ineffective, and may even be launched by or at the behest of nation states. While, to date, we have not been subject to cyber attacks which, individually or in the aggregate, have been material to our operations or financial condition, the preventive actions we take to reduce the risks associated with cyber attacks, including protection of our systems and networks, may be insufficient to repel or mitigate the effects of a major cyber attack in the future.

The inability to operate our networks and systems or those of our suppliers, vendors and other service providers as a result of cyber attacks, even for a limited period of time, may result in significant expenses to Verizon and/or a loss of market share to other communications providers. The costs associated with a major cyber attack on Verizon could include expensive incentives offered to existing customers and business partners to retain their business, increased expenditures on cybersecurity measures and the use of alternate resources, lost revenues from business interruption and litigation. The potential costs associated with these attacks could exceed the insurance coverage we maintain. Further, certain of Verizon's businesses, such as those offering security solutions and infrastructure and cloud services to business customers, could be negatively affected if our ability to protect our own networks and systems is called into question as a result of a cyber attack. Moreover, our increasing presence in the IoT industry with offerings of telematics products and services, including vehicle telematics, could also increase our exposure to potential costs and expenses and reputational harm in the event of cyber attacks impacting these products or services. In addition, a compromise of security or a theft or other compromise of valuable information, such as financial data and sensitive or private personal information, could result in lawsuits and government claims, investigations or proceedings. Any of these occurrences could damage our reputation, adversely impact customer and investor confidence, and could further result in a material adverse effect on Verizon's results of operation or financial condition.

*Natural disasters, terrorist acts or acts of war could cause damage to our infrastructure and result in significant disruptions to our operations.*

Our business operations are subject to interruption by natural disasters, power outages, terrorist attacks, other hostile acts and events beyond our control. Such events could cause significant damage to our infrastructure upon which our business operations rely, resulting in degradation or disruption of service to our customers. While we maintain insurance coverage for some of these events, the potential liabilities associated with these events could exceed the insurance coverage we maintain. Our system redundancy may be ineffective or inadequate, and our disaster recovery

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planning may not be sufficient for all eventualities. These events could also damage the infrastructure of the suppliers that provide us with the equipment and services that we need to operate our business and provide products to our customers. A natural disaster or other event causing significant physical damage could cause us to experience substantial losses resulting in significant recovery time and expenditures to resume operations. In addition, these occurrences could result in lost revenues from business interruption as well as damage to our reputation.

***Verizon has significant debt, which could increase further if Verizon incurs additional debt in the future and does not retire existing debt.***

As of December 31, 2016, Verizon had approximately \$108.1 billion of outstanding indebtedness, as well as approximately \$8.9 billion of unused borrowing capacity under its existing credit facility. Verizon's debt level and related debt service obligations could have negative consequences, including:

requiring Verizon to dedicate significant cash flow from operations to the payment of principal, interest and other amounts payable on its debt and the preferred stock issued by an entity acquired in a transaction with Vodafone, which would reduce the funds Verizon has available for other purposes, such as working capital, capital expenditures and acquisitions;

making it more difficult or expensive for Verizon to obtain any necessary future financing for working capital, capital expenditures, debt service requirements, debt refinancing, acquisitions or other purposes;

reducing Verizon's flexibility in planning for or reacting to changes in its industry and market conditions;

making Verizon more vulnerable in the event of a downturn in its business; and

exposing Verizon to increased interest rate risk to the extent that its debt obligations are at variable interest rates.

In addition, our term loan agreements require Verizon to maintain a certain leverage ratio unless Verizon's credit ratings are at or above a certain level, which could limit Verizon's ability to obtain additional financing in the future.

***Adverse changes in the credit markets could increase our borrowing costs and the availability of financing.***

We require a significant amount of capital to operate and grow our business. We fund our capital needs in part through borrowings in the public and private credit markets. Adverse changes in the credit markets, including increases in interest rates, could increase our cost of borrowing and/or make it more difficult for us to obtain financing for our operations or refinance existing indebtedness. In addition, our borrowing costs can be affected by short- and long-term debt ratings assigned by independent rating agencies, which are based, in significant part, on our performance as measured by customary credit metrics. A decrease in these ratings would likely increase our cost of borrowing and/or make it more difficult for us to obtain financing. A severe disruption in the global financial markets could impact some of the financial institutions with which we do business, and such instability could also affect our access to financing.

***Increases in costs for pension benefits and active and retiree healthcare benefits may reduce our profitability and increase our funding commitments.***

With approximately 160,900 employees and approximately 201,000 retirees as of December 31, 2016 eligible to participate in Verizon's benefit plans, the costs of pension benefits and active and retiree healthcare benefits have a significant impact on our profitability. Our costs of maintaining these plans, and the future funding requirements for these plans, are affected by several factors, including the legislative and regulatory uncertainty regarding the potential repeal and replacement or modification of the Patient Protection and Affordable Care Act, increases in healthcare costs, decreases in investment returns on funds held by our pension and other benefit plan trusts and changes in the discount rate and mortality assumptions used to calculate pension and other postretirement expenses. If we are unable to limit future increases in the costs of our benefit plans, those costs could reduce our profitability and increase our funding commitments.



*A significant portion of our workforce is represented by labor unions, and we could incur additional costs or experience work stoppages as a result of the renegotiation of our labor contracts.*

As of December 31, 2016, approximately 23% of our workforce was represented by labor unions. While less than 1% of the workforce of our wireless and other businesses outside of wireline are represented by unions, we cannot predict what level of success unions may have in organizing these workforces or the potentially negative impact it would have on our costs.

*We are subject to a significant amount of litigation, which could require us to pay significant damages or settlements.*

We are subject to a substantial amount of litigation, including, from time to time, shareholder derivative suits, patent infringement lawsuits, antitrust class actions, wage and hour class actions, personal injury claims and lawsuits relating to our advertising, sales, billing and collection practices. In addition, our wireless business also faces personal injury and consumer class action lawsuits relating to alleged health effects of wireless phones or radio frequency transmitters, and class action lawsuits that challenge marketing practices and disclosures relating to alleged adverse health effects of handheld wireless phones. We may incur significant expenses in defending these lawsuits. In addition, we may be required to pay significant awards or settlements.

**Table of Contents****Item 1B. Unresolved Staff Comments**

None.

**Item 2. Properties**

Our principal properties do not lend themselves to simple description by character and location. Our total investment in plant, property and equipment was approximately \$232 billion at December 31, 2016 and \$220 billion at December 31, 2015, including the effect of retirements, but before deducting accumulated depreciation. Our gross investment in plant, property and equipment consisted of the following:

| At December 31,                        | 2016   | 2015   |
|--|--------|--------|
| Network equipment                      | 78.5%  | 78.8%  |
| Land, buildings and building equipment | 12.0%  | 11.9%  |
| Furniture and other                    | 9.5%   | 9.3%   |
|  | 100.0% | 100.0% |

Our properties as a percentage of total properties are as follows:

| At December 31, | 2016   | 2015   |
|-----------------|--------|--------|
| Wireline        | 51.7%  | 53.2%  |
| Wireless        | 46.8%  | 45.4%  |
| Other           | 1.5%   | 1.4%   |
|                 | 100.0% | 100.0% |

Network equipment consists primarily of cable (aerial, buried, underground or undersea) and the related support structures of poles and conduit, wireless plant, switching equipment, network software, transmission equipment and related facilities. Land, buildings and building equipment consists of land and land improvements, central office buildings or any other buildings that house network equipment, and buildings that are used for administrative and other purposes. Substantially all the switching centers are located on land and in buildings we own due to their critical role in the network and high set-up relocation costs. We also maintain facilities throughout the United States comprised of administrative and sales offices, customer care centers, retail sales locations, garage work centers, switching centers, cell sites and data centers. Furniture and other consists of telephone equipment, furniture, data processing equipment, office equipment, motor vehicles, plant under construction and leasehold improvements.

**Item 3. Legal Proceedings**

In October 2013, the California Attorney General's Office notified Verizon California Inc. and other Verizon companies of potential violations of California state hazardous waste statutes primarily arising from the disposal of electronic components, batteries and aerosol cans at certain California facilities. We are cooperating with this investigation and continue to review our operations relating to the management of hazardous waste. While penalties relating to the alleged violations could exceed \$100,000, we do not expect that any penalties ultimately incurred will be material. On April 1, 2016, we completed the sale to Frontier of our landline business operated by Verizon California Inc. and certain other Verizon landline companies. As a result of this transaction, Frontier now owns and operates Verizon California Inc. and has assumed the liabilities of Verizon California Inc. that may arise as a result of these alleged violations.

**Item 4. Mine Safety Disclosures**

None.

**Table of Contents****PART II****Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities**

The principal market for trading in the common stock of Verizon is the New York Stock Exchange. As of December 31, 2016, there were 690,741 shareowners of record.

High and low stock prices, as reported on the New York Stock Exchange composite tape of transactions, and dividend data are as follows:

|      |                | Market Price |          | Cash Dividend |
|------|----------------|--------------|----------|---------------|
|      |                | High         | Low      | Declared      |
| 2016 | Fourth Quarter | \$ 53.90     | \$ 46.01 | \$ .5775      |
|      | Third Quarter  | 56.95        | 51.02    | .5775         |
|      | Second Quarter | 55.92        | 49.05    | .5650         |
|      | First Quarter  | 54.37        | 43.79    | .5650         |
| 2015 | Fourth Quarter | \$ 47.23     | \$ 42.20 | \$ .5650      |
|      | Third Quarter  | 48.26        | 38.06    | .5650         |
|      | Second Quarter | 50.86        | 46.60    | .5500         |
|      | First Quarter  | 49.99        | 45.37    | .5500         |

**Stock Repurchases**

In March 2014, the Verizon Board of Directors authorized a three-year share buyback program to repurchase up to 100 million shares of the Company's common stock. Under the program, shares may be repurchased in privately negotiated transactions and on the open market, including through plans complying with Rule 10b5-1(c) under the Exchange Act. The timing and number of shares purchased under the program, if any, will depend on market conditions and the Company's capital allocation priorities.

During the fourth quarter of 2016, Verizon did not repurchase any shares of Verizon common stock. At December 31, 2016, the maximum number of shares that could be purchased by or on behalf of Verizon under our share buyback program was 97.2 million.

For other information required by this item, see the section entitled "Stock Performance Graph" in the 2016 Verizon Annual Report to Shareowners, which is incorporated herein by reference.

**Item 6. Selected Financial Data**

Information required by this item is included in the 2016 Verizon Annual Report to Shareowners under the heading "Selected Financial Data", which is incorporated herein by reference.

**Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations**

Information required by this item is included in the 2016 Verizon Annual Report to Shareowners under the heading "Management's Discussion and Analysis of Financial Condition and Results of Operations", which is incorporated herein by reference.

**Item 7A. Quantitative and Qualitative Disclosures About Market Risk**

Information required by this item is included in the 2016 Verizon Annual Report to Shareowners under the heading "Management's Discussion and Analysis of Financial Condition and Results of Operations - Market Risk", which is incorporated herein by reference.

*Item 8. Financial Statements and Supplementary Data*

Information required by this item is included in the consolidated financial statements and related notes of Verizon Communications Inc. and Subsidiaries in the 2016 Verizon Annual Report to Shareowners, which is incorporated herein by reference.

*Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure*

None.

**Table of Contents****Item 9A. Controls and Procedures**

Our chief executive officer and chief financial officer have evaluated the effectiveness of the registrant's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934), as of the end of the period covered by this Annual Report, that ensure that information relating to the registrant which is required to be disclosed in this report is recorded, processed, summarized and reported within required time periods using the criteria for effective internal control established in Internal Control Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013. Based on this evaluation, our chief executive officer and chief financial officer have concluded that the registrant's disclosure controls and procedures were effective as of December 31, 2016.

In the ordinary course of business, we routinely review our system of internal control over financial reporting and make changes to our systems and processes that are intended to ensure an effective internal control environment. There were no changes in the Company's internal control over financial reporting during the fourth quarter of 2016 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Management's report on internal control over financial reporting and the attestation report of Verizon's independent registered public accounting firm are included in the 2016 Verizon Annual Report to Shareowners and are incorporated herein by reference.

**Item 9B. Other Information**

None.

**PART III****Item 10. Directors, Executive Officers and Corporate Governance**

Set forth below is information with respect to our executive officers.

| Name               | Age | Office  | Held Since |
|--------------------|-----|---|------------|
| Lowell C. McAdam   | 62  | Chairman and Chief Executive Officer  | 2011       |
| Matthew D. Ellis   | 45  | Executive Vice President and Chief Financial Officer                            | 2016       |
| Roger Gurnani      | 56  | Executive Vice President and Chief Information and Technology Architect         | 2015       |
| Marc C. Reed       | 58  | Executive Vice President and Chief Administrative Officer                       | 2012       |
| Diego Scotti       | 44  | Executive Vice President and Chief Marketing Officer                            | 2014       |
| Craig L. Silliman  | 49  | Executive Vice President of Public Policy and General Counsel                   | 2015       |
| Anthony T. Skiadas | 48  | Senior Vice President and Controller  | 2013       |
| John G. Stratton   | 55  | Executive Vice President and President of Operations                            | 2015       |
| Marni M. Walden    | 49  | Executive Vice President and President of Product Innovation and New Businesses | 2015       |

Prior to serving as an executive officer, each of the above officers has held high-level managerial positions with the Company or one of its subsidiaries for at least five years, with the exception of Mr. Ellis, who has been with the Company since 2013 and Mr. Scotti, who has been with the Company since 2014. Officers are not elected for a fixed term of office and may be removed from office at any time at the discretion of the Board of Directors.

Matthew D. Ellis is the Executive Vice President and Chief Financial Officer for Verizon. Mr. Ellis served as Senior Vice President and CFO of Operations - Finance of the Company from February 2015 until the appointment to his current role in November 2016 and as Senior Vice President and Treasurer of the Company from the time he joined the Company in 2013 until February 2015. Prior to joining Verizon, Mr. Ellis served in leadership positions at Tyson Foods, Inc. for 15 years, most recently as Vice President and Treasurer responsible for financing, cash management, insurance and credit.

Diego Scotti is Executive Vice President and Chief Marketing Officer for Verizon. Mr. Scotti joined the company in October 2014. Prior to joining Verizon, Mr. Scotti served as Chief Marketing Officer of J. Crew from 2011 to 2014 and as Executive Director of Marketing at Conde Nast Publications, where he oversaw 20 print and digital media brands, from 2008 to 2011. Mr. Scotti also previously served as the head of global advertising and brand management at American Express.



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For other information required by this item, see the sections entitled Governance Where to find more information on governance at Verizon and Business conduct and ethics, Item 1: Election of Directors Director nominations, Board and Committees Board committees and Ownership Section 16(a) Beneficial Ownership Reporting Compliance in our definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to shareholders in connection with our 2017 Annual Meeting of Shareholders, which are incorporated herein by reference.

***Item 11. Executive Compensation***

For information with respect to executive compensation, see the sections entitled Executive Compensation Compensation Discussion and Analysis, Compensation Committee Report and Compensation Tables in our definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to shareholders in connection with our 2017 Annual Meeting of Shareholders, which is incorporated by reference. There were no relationships to be disclosed under paragraph (e)(4) of Item 407 of Regulation S-K.

***Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters***

For information with respect to the security ownership of the Directors and executive officers and for information with respect to securities authorized for issuance under Verizon's equity compensation plan, see the sections entitled Stock Ownership Security Ownership of Certain Beneficial Owners and Management and Item 5: Approval of Verizon's 2017 Long-Term Incentive Plan, respectively, in our definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to shareholders in connection with our 2017 Annual Meeting of Shareholders, which is incorporated herein by reference.

***Item 13. Certain Relationships and Related Transactions, and Director Independence***

For information with respect to certain relationships and related transactions and Director independence, see the sections entitled Governance Related person transactions and Item 1: Election of Directors Independence in our definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to shareholders in connection with our 2017 Annual Meeting of Shareholders, which are incorporated by reference.

***Item 14. Principal Accounting Fees and Services***

For information with respect to principal accounting fees and services, see the section entitled Audit Matters Item 2: Ratification of Appointment of Independent Registered Public Accounting Firm in our definitive Proxy Statement to be filed with the Securities and Exchange Commission and delivered to shareholders in connection with our 2017 Annual Meeting of Shareholders, which are incorporated by reference.



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**PART IV**

*Item 15. Exhibits, Financial Statement Schedules*

(a) Documents filed as part of this report:

|   | Page |
|---|------|
| (1) Report of Management on Internal Control Over Financial Reporting   | *    |
| (2) Report of Independent Registered Public Accounting Firm on Internal Control Over Financial Reporting  | *    |
| (3) Report of Independent Registered Public Accounting Firm on Financial Statements   | *    |
| Financial Statements covered by Report of Independent Registered Public Accounting Firm:  |      |
| Consolidated Statements of Income   | *    |
| Consolidated Statements of Comprehensive Income   | *    |
| Consolidated Balance Sheets   | *    |
| Consolidated Statements of Cash Flows   | *    |
| Consolidated Statements of Changes in Equity  | *    |
| Notes to Consolidated Financial Statements  | *    |
| * Incorporated herein by reference to the appropriate portions of the registrant's Annual Report to Shareowners for the fiscal year ended December 31, 2016. (See Part II.) |      |
| (4) Financial Statement Schedule  |      |
| <u>II Valuation and Qualifying Accounts</u>   | 29   |
| (5) Exhibits  |      |

Exhibits identified in parentheses below, on file with the SEC, are incorporated herein by reference as exhibits hereto. Unless otherwise indicated, all exhibits so incorporated are from File No. 1-8606.

**Table of Contents****Exhibit****Number Description**

- 3a Restated Certificate of Incorporation of Verizon Communications Inc. (Verizon) (filed as Exhibit 3a to Form 10-Q for the period ended June 30, 2014 and incorporated herein by reference).
- 3b Bylaws of Verizon, as amended and restated, effective as of November 3, 2016 (filed as Exhibit 3b to Form 8-K filed on November 4, 2016 and incorporated herein by reference).
- 4a Indenture between Verizon, both individually and as successor in interest to Verizon Global Funding Corp., and U.S. Bank National Association, as successor trustee to Wachovia Bank, National Association, formerly known as First Union National Bank, as Trustee, dated as of December 1, 2000 (incorporated by reference to Verizon Global Funding Corp.'s Registration Statement on Form S-4, Registration No. 333-64792, Exhibit 4.1).
- 4b First Supplemental Indenture between Verizon, both individually and as successor in interest to Verizon Global Funding Corp., and U.S. Bank National Association, as successor trustee to Wachovia Bank, National Association, formerly known as First Union National Bank, as Trustee, dated as of May 15, 2001 (incorporated by reference to Verizon Global Funding Corp.'s Registration Statement on Form S-3, Registration No. 333-67412, Exhibit 4.2).
- 4c Second Supplemental Indenture between Verizon, both individually and as successor in interest to Verizon Global Funding Corp., and U.S. Bank National Association, as successor trustee to Wachovia Bank, National Association, formerly known as First Union National Bank, as Trustee, dated as of September 29, 2004 (incorporated by reference to Form 8-K filed on February 9, 2006, Exhibit 4.1).
- 4d Third Supplemental Indenture between Verizon, both individually and as successor in interest to Verizon Global Funding Corp., and U.S. Bank National Association, as successor trustee to Wachovia Bank, National Association, formerly known as First Union National Bank, as Trustee, dated as of February 1, 2006 (incorporated by reference to Form 8-K filed on February 9, 2006, Exhibit 4.2).
- 4e Fourth Supplemental Indenture between Verizon, both individually and as successor in interest to Verizon Global Funding Corp., and U.S. Bank National Association, as successor trustee to Wachovia Bank, National Association, formerly known as First Union National Bank, as Trustee, dated as of April 4, 2016 (incorporated by reference to Verizon Communications Inc.'s Registration Statement on Form S-4, Registration No. 333-212307, Exhibit 4.5).

Except for Exhibits 4a-4e above, no other instrument which defines the rights of holders of long-term debt of Verizon and its consolidated subsidiaries is filed herewith pursuant to Regulation S-K, Item 601(b)(4)(iii)(A). Pursuant to this regulation, Verizon hereby agrees to furnish a copy of any such instrument to the SEC upon request.

- 10a NYNEX Directors' Charitable Award Program (filed as Exhibit 10i to Form 10-K for the year ended December 31, 2000 and incorporated herein by reference).\*\*
- 10b 2009 Verizon Long-Term Incentive Plan, As Amended and Restated (incorporated by reference to Appendix D of the Registrant's Proxy Statement included in Schedule 14A filed on March 18, 2013).\*\*
- 10b(i) Form of 2011 Special Performance Stock Unit Agreement (filed as Exhibit 10 to Form 10-Q for the period ended September 30, 2011 and incorporated by reference).\*\*
- 10b(ii) Performance Stock Unit Agreement 2014-2016 Award Cycle (filed as Exhibit 10a to Form 10-Q for the period ended March 31, 2014 and incorporated herein by reference).\*\*
- 10b(iii) Restricted Stock Unit Agreement 2014-2016 Award Cycle (filed as Exhibit 10b to Form 10-Q for the period ended March 31, 2014 and incorporated herein by reference).\*\*

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- 10b(iv) Performance Stock Unit Agreement 2015-2017 Award Cycle (filed as Exhibit 10a to Form 10-Q for the period ended March 31, 2015 and incorporated herein by reference).\*\*
- 10b(v) Restricted Stock Unit Agreement 2015-2017 Award Cycle (filed as Exhibit 10b to Form 10-Q for the period ended March 31, 2015 and incorporated herein by reference).\*\*
- 10b(vi) Performance Stock Unit Agreement 2016-2018 Award Cycle (filed as Exhibit 10a to Form 10-Q for the period ended March 31, 2016 and incorporated herein by reference).\*\*
- 10b(vii) Restricted Stock Unit Agreement 2016-2018 Award Cycle (filed as Exhibit 10b to Form 10-Q for the period ended March 31, 2016 and incorporated herein by reference).\*\*
- 10c Verizon Short-Term Incentive Plan, As Amended and Restated (incorporated by reference to Appendix C of the Registrant's Proxy Statement included in Schedule 14A filed on March 23, 2009).\*\*
- 10d Verizon Income Deferral Plan (filed as Exhibit 10f to Form 10-Q for the period ended June 30, 2002 and incorporated herein by reference).\*\*
  - 10d(i) Description of Amendment to Plan (filed as Exhibit 10o(i) to Form 10-K for the year ended December 31, 2004 and incorporated herein by reference).\*\*
- 10e Verizon Excess Pension Plan (filed as Exhibit 10p to Form 10-K for the year ended December 31, 2004 and incorporated herein by reference).\*\*
  - 10e(i) Description of Amendment to Plan (filed as Exhibit 10p(i) to Form 10-K for the year ended December 31, 2004 and incorporated herein by reference).\*\*
- 10f GTE's Executive Salary Deferral Plan, as amended (filed as Exhibit 10.10 to GTE's Form 10-K for the year ended December 31, 1998, File No. 1-2755 and incorporated herein by reference).\*\*
- 10g Bell Atlantic Senior Management Long-Term Disability and Survivor Protection Plan, as amended (filed as Exhibit 10h to Form SE filed on March 27, 1986 and Exhibit 10b(ii) to Form 10-K for the year ended December 31, 1997 and incorporated herein by reference).\*\*
- 10h fGTE Executive Retiree Life Insurance Plan (filed as Exhibit 10q to Form 10-K for the year ended December 31, 2010 and incorporated herein by reference).\*\*
- 10i Verizon Executive Life Insurance Plan, As Amended and Restated September 2009 (filed as Exhibit 10s to Form 10-K for the year ended December 31, 2010 and incorporated herein by reference).\*\*
- 10j Verizon Executive Deferral Plan (filed as Exhibit 10e to Form 10-Q for the period ended June 30, 2009 and incorporated herein by reference).\*\*
- 10k Form of Aircraft Time Sharing Agreement (filed as Exhibit 10v to Form 10-K for the year ended December 31, 2010 and incorporated herein by reference).\*\*
- 10l NYNEX Deferred Compensation Plan for Non-Employee Directors (filed as Exhibit 10gg to NYNEX's Registration Statement No. 2-87850, File No. 1-8608 and incorporated herein by reference).\*\*
- 10m Amendment to NYNEX Deferred Compensation Plan for Non-Employee Directors (filed as Exhibit 10iii 5a to NYNEX's Quarterly Report on Form 10-Q for the period ended June 30, 1996, File No. 1-8608 and incorporated herein by reference).\*\*
- 10n Verizon Senior Manager Severance Plan (filed as Exhibit 10d to Form 10-Q for the period ended March 31, 2010 and incorporated herein by reference).\*\*

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|---------|--|
| 10o     | Securities Purchase Agreement, dated as of February 5, 2015, by and between Frontier Communications Corporation and Verizon Communications Inc. (filed as Exhibit 10q to Form 10-K for the year ended December 31, 2014 and incorporated herein by reference). |
| 12      | Computation of Ratio of Earnings to Fixed Charges filed herewith.  |
| 13      | Portions of Verizon's Annual Report to Shareowners for the fiscal year ended December 31, 2016 filed herewith. Only the information incorporated by reference into this Form 10-K is included in the exhibit.  |
| 21      | List of principal subsidiaries of Verizon filed herewith.  |
| 23      | Consent of Ernst & Young LLP filed herewith.   |
| 31.1    | Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 filed herewith.   |
| 31.2    | Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 filed herewith.   |
| 32.1    | Certification of Chief Executive Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 filed herewith.   |
| 32.2    | Certification of Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 filed herewith.   |
| 101.INS | XBRL Instance Document.  |
| 101.SCH | XBRL Taxonomy Extension Schema Document.   |
| 101.PRE | XBRL Taxonomy Presentation Linkbase Document.  |
| 101.CAL | XBRL Taxonomy Calculation Linkbase Document.   |
| 101.LAB | XBRL Taxonomy Label Linkbase Document.   |
| 101.DEF | XBRL Taxonomy Extension Definition Linkbase Document.  |
| **      | Indicates management contract or compensatory plan or arrangement.   |

**Table of Contents****Schedule II - Valuation and Qualifying Accounts****Verizon Communications Inc. and Subsidiaries**

For the Years Ended December 31, 2016, 2015 and 2014

(dollars in millions)

| Description   | Balance at<br>Beginning of<br>Period | Charged to<br>Expenses | Additions                                   |  | Deductions<br>Note<br>(c)(d) | Balance at<br>End of Period |
|---|--------------------------------------|------------------------|---|--|------------------------------|-----------------------------|
|   |                                      |                        | Charged to<br>Other Accounts<br>Note (a)(b) |  |                              |                             |
| <b>Allowance for Uncollectible Accounts Receivable:</b> |                                      |                        |   |  |                              |                             |
| <b>Year 2016 (e)</b>                                    | \$ 1,037                             | \$ 1,420               | \$ 204                                      |  | \$ 1,515                     | \$ 1,146                    |
| Year 2015 (e)   | 739                                  | 1,610                  | 200   |  | 1,512                        | 1,037                       |
| Year 2014   | 645                                  | 1,095                  | 141   |  | 1,142                        | 739                         |
| <b>Valuation Allowance for Deferred Tax Assets:</b>     |                                      |                        |   |  |                              |                             |
| <b>Year 2016</b>  | \$ 3,414                             | \$ 146                 | \$ 47                                       |  | \$ 1,134                     | \$ 2,473                    |
| Year 2015   | 1,841                                | 237                    | 1,701                                       |  | 365                          | 3,414                       |
| Year 2014   | 1,685                                | 505                    | 5   |  | 354                          | 1,841                       |

- (a) Allowance for Uncollectible Accounts Receivable primarily includes amounts previously written off which were credited directly to this account when recovered.
- (b) Valuation Allowance for Deferred Tax Assets includes an increase to the valuation allowance as a result of the acquisition of AOL in 2015 and amounts charged to equity and reclassifications from other balance sheet accounts.
- (c) Amounts written off as uncollectible or transferred to other accounts or utilized.
- (d) Reductions to valuation allowances related to deferred tax assets.
- (e) Allowance for Uncollectible Accounts Receivable includes approximately \$301 million and \$155 million at December 31, 2016 and 2015, respectively, related to long-term device payment plan receivables.

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**Signatures**

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

VERIZON COMMUNICATIONS INC.

By: /s/ Anthony T. Skiadas  
Anthony T. Skiadas

Date: February 21, 2017

Senior Vice President and Controller

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Principal Executive Officer:

|                      |   |                   |
|----------------------|---|-------------------|
| /s/ Lowell C. McAdam | Chairman and Chief<br>Executive Officer | February 21, 2017 |
| Lowell C. McAdam     |   |                   |

Principal Financial Officer:

|                      |   |                   |
|----------------------|---|-------------------|
| /s/ Matthew D. Ellis | Executive Vice President and Chief<br>Financial Officer | February 21, 2017 |
| Matthew D. Ellis     |   |                   |

Principal Accounting Officer:

|                        |   |                   |
|------------------------|---|-------------------|
| /s/ Anthony T. Skiadas | Senior Vice President and<br>Controller | February 21, 2017 |
| Anthony T. Skiadas     |   |                   |

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|                           |          |                   |
|---------------------------|----------|-------------------|
| /s/ Lowell C. McAdam      | Director | February 21, 2017 |
| Lowell C. McAdam          |          |                   |
| /s/ Shellye L. Archambeau | Director | February 21, 2017 |
| Shellye L. Archambeau     |          |                   |
| /s/ Mark T. Bertolini     | Director | February 21, 2017 |
| Mark T. Bertolini         |          |                   |
| /s/ Richard L. Carrión    | Director | February 21, 2017 |
| Richard L. Carrión        |          |                   |
| /s/ Melanie L. Healey     | Director | February 21, 2017 |
| Melanie L. Healey         |          |                   |
| /s/ M. Frances Keeth      | Director | February 21, 2017 |
| M. Frances Keeth          |          |                   |
| /s/ Karl-Ludwig Kley      | Director | February 21, 2017 |
| Karl-Ludwig Kley          |          |                   |
| /s/ Clarence Otis, Jr.    | Director | February 21, 2017 |
| Clarence Otis, Jr.        |          |                   |
| /s/ Rodney E. Slater      | Director | February 21, 2017 |
| Rodney E. Slater          |          |                   |
| /s/ Kathryn A. Tesija     | Director | February 21, 2017 |
| Kathryn A. Tesija         |          |                   |
| /s/ Gregory D. Wasson     | Director | February 21, 2017 |
| Gregory D. Wasson         |          |                   |
| /s/ Gregory G. Weaver     | Director | February 21, 2017 |
| Gregory G. Weaver         |          |                   |