



2019 Annual Report
www.tdsinc.com



Dear Shareholders,

In these uncertain times, The TDS Family of Businesses is taking appropriate steps to advise and to protect associates, their families, our customers and the communities we serve. We are providing critical communications and data services that customers and communities depend on. This responsibility means that we must keep our networks and data centers strong. We are prepared for data volumes quickly increasing and for sustaining higher volumes for months ahead.

Through all of this, we are providing outstanding communications services to our customers. We are investing in the TDS Family of Businesses to bring our customers ever higher-quality wireless and broadband services that position the company for long-term sustainability and growth.

U.S. Cellular In 2019, U.S. Cellular executed on our customer-centric strategy by increasing smartphone subscribers and revenues. We launched our “Bringing Fairness to Wireless” branding campaign rooted in values and strengths that have been core to U.S. Cellular and our customers since the Company’s beginning. We continued to enhance our network with the initiation of a multi-year network modernization plan which will ready our network for 5G initiatives and the exciting opportunities this technology will bring.

U.S. Cellular is building on this momentum by focusing on key objectives for 2020. Our number one priority remains to elevate brand relevance and focus on customer engagement. We are working to drive subscriber growth and strengthen current customer experience through continuing simplicity and transparency in pricing and promotions. We’ll continue to raise brand relevance and positioning through our new branding platform “We’re Bringing Fairness to Wireless.” Secondly, we will focus on expanding new and emerging revenue streams. We aim to increase average revenue per user as customers migrate to service plans with higher data allotments and increase their purchases of additional services like device protection. We will continue to seek to increase the penetration of smartphones in our base.

Network performance remains a key driver of customer satisfaction and a hallmark of U.S. Cellular’s strategic positioning. This year we will execute the commercial launch of 5G in Wisconsin and Iowa and work toward readying the network for additional markets in 2021. Finally, we will continue our multi-year initiative focused on managing costs. As data usage continues to increase significantly on our network, we will continue to execute initiatives to mitigate the impact of this increase on system operations expense. The simplicity of unlimited plans and transparency of pricing have reduced billing questions, resulting in lower customer care costs.

TDS Telecom In 2019, TDS Telecom concentrated on investments in broadband to bring high-speed service to our customers. We expanded our fiber footprint both inside and outside of our current markets, and 30% of our wireline service addresses are now served by fiber. Cable connections also grew, led by strong increases in broadband connections and the acquisition of the cable company, Continuum, a growing company located near Charlotte, North Carolina.

TDS Telecom’s strategic initiatives for 2020 include focusing on expanding our fiber footprint both in and out of our current markets while we continue to analyze additional out-of-territory fiber opportunities with attractive economics. We are committed to meeting the regulatory requirements of our broadband buildouts under the Alternative Connect America Cost Model and working with state legislatures to enhance broadband services in underserved areas.

Increasing cable broadband penetration remains a top priority. We are focused on organic cable growth through upgrades across our network to further increase our broadband advantages. We continue to evaluate cable acquisitions in markets that have attractive demographics and little fiber competition.

We are complementing our broadband service in both Wireline and Cable segments with our next generation cloud TV platform TDS TV+, further strengthening our broadband position.

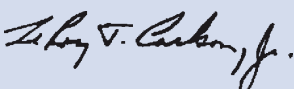
OneNeck IT Solutions OneNeck IT Solutions had a strong finish to 2019 showing revenue growth while driving operational improvements in its cost structure. We are well positioned going into 2020 as we continue to leverage a multi-cloud strategy with plans to roll out our next generation ReliaCloud platform, and plans to expand upon our hybrid private-public cloud by offering additional platform-based services via both ReliaCloud and Azure.

Creating long-term shareholder value At TDS corporate, we maintain a financially sound foundation so that all our businesses can take advantage of growth opportunities to enhance their competitive positions.

We continue to return value to our shareholders primarily through our cash dividends, which have increased every year for the past 46 years.

Thank you We are grateful to the associates and employees of the TDS Family of Businesses for their dedication and innovation in providing outstanding experiences for our customers. Thank you to our shareholders and debt holders for your continuing support of our long-term plans and strategies.

Very truly yours,



LeRoy T. Carlson, Jr.
President and Chief Executive Officer



Walter C. D. Carlson
Chairman of the Board

TELEPHONE AND DATA SYSTEMS, INC.

ANNUAL REPORT TO SHAREHOLDERS FOR THE YEAR ENDED DECEMBER 31, 2019

Pursuant to SEC Rule 14a-3

The following audited financial statements and certain other financial information for the year ended December 31, 2019, represent Telephone and Data Systems' annual report to shareholders as required by the rules and regulations of the Security and Exchange Commission (SEC).

The following information was filed with the SEC on February 25, 2020, as Exhibit 13 to Telephone and Data Systems' Annual Report on Form 10-K for the year ended December 31, 2019. Such information has not been updated or revised since the date it was originally filed with the SEC. Accordingly, you are encouraged to review such information together with any subsequent information that we have filed with the SEC and other publicly available information.

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Telephone and Data Systems, Inc.

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Telephone and Data Systems, Inc. Management’s Discussion and Analysis of Financial Condition and Results of Operations

Executive Overview

The following Management’s Discussion and Analysis (MD&A) should be read in conjunction with the audited consolidated financial statements and notes of Telephone and Data Systems, Inc. (TDS) for the year ended December 31, 2019, and with the description of TDS’ business included herein. Certain numbers included herein are rounded to millions for ease of presentation; however, certain calculated amounts and percentages are determined using the unrounded numbers.

This report contains statements that are not based on historical facts, including the words “believes,” “anticipates,” “estimates,” “expects,” “plans,” “intends,” “projects” and similar expressions. These statements constitute and represent “forward looking statements” as this term is defined in the Private Securities Litigation Reform Act of 1995. Such forward looking statements involve known and unknown risks, uncertainties and other factors that may cause actual results, events or developments to be significantly different from any future results, events or developments expressed or implied by such forward looking statements. See Private Securities Litigation Reform Act of 1995 Safe Harbor Cautionary Statement for additional information.

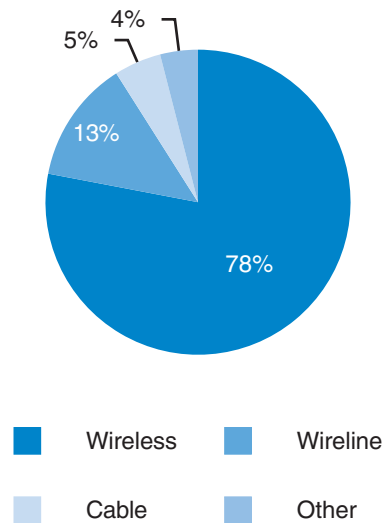
TDS uses certain “non-GAAP financial measures” and each such measure is identified in the MD&A. A discussion of the reason TDS determines these metrics to be useful and a reconciliation of these measures to their most directly comparable measures determined in accordance with accounting principles generally accepted in the United States of America (GAAP) are included in the Supplemental Information Relating to Non-GAAP Financial Measures section within the MD&A of this Form 10-K Report.

The following MD&A omits discussion of 2018 compared to 2017. Refer to Management’s Discussion and Analysis of Financial Condition and Results of Operations in TDS’ Annual Report on Form 10-K for the year ended December 31, 2018, filed with the SEC on February 22, 2019, for that discussion.

General

TDS is a diversified telecommunications company that provides high-quality communications services to approximately 6 million connections nationwide. TDS provides wireless services through its 82%-owned subsidiary, United States Cellular Corporation (U.S. Cellular). TDS also provides wireline and cable services, through its wholly-owned subsidiary, TDS Telecommunications LLC (TDS Telecom). TDS’ segments operate entirely in the United States. See Note 20 — Business Segment Information in the Notes to Consolidated Financial Statements for additional information about TDS’ segments.

2019 Operating Revenues by Segment



TDS Mission and Strategy

TDS’ mission is to provide outstanding communications services to its customers and meet the needs of its shareholders, its people, and its communities. In pursuing this mission, TDS seeks to grow its businesses, create opportunities for its associates and employees, and build value over the long-term for its shareholders. Across all of its businesses, TDS is focused on providing exceptional customer experiences through best-in-class services and products and superior customer service.

TDS’ long-term strategy calls for the majority of its capital to be reinvested in its operating businesses to strengthen their competitive positions and financial performance, while also returning value to TDS shareholders primarily through the payment of a regular quarterly cash dividend.

In 2019, TDS continued to focus on investing in the networks that are the backbone of its commitment to provide outstanding communications services to its customers. TDS believes these investments strengthen its competitive position and improve operating performance. TDS expects to continue to execute on its strategies to build strong, competitive businesses providing high-quality, data-focused services and products.

Invest in the business to improve returns and pursue initiatives that align with long-term strategies

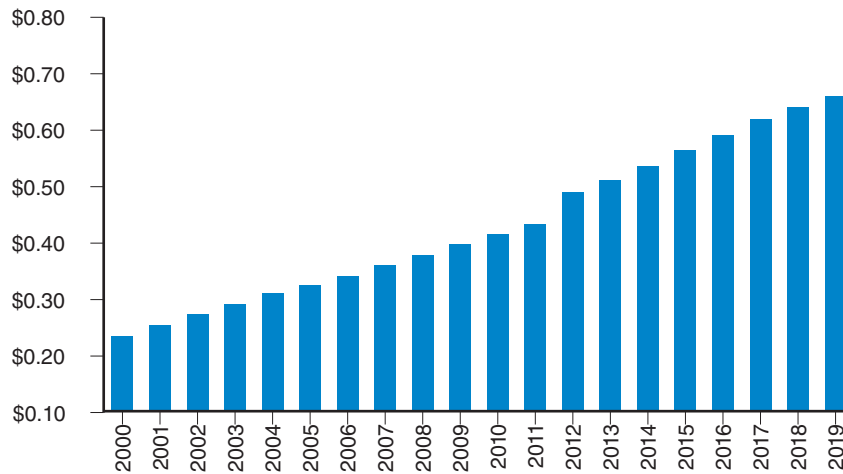
Consistent with its strategy, TDS made significant investments in 2019 to improve the performance of its networks.

- U.S. Cellular continues to devote efforts to enhance its network capabilities. VoLTE technology is now available to nearly 70% of U.S. Cellular's subscribers, and deployments in additional operating markets are expected in 2020 and 2021. VoLTE technology allows customers to utilize a 4G LTE network for both voice and data services and offers enhanced services such as high definition voice and simultaneous voice and data sessions.
- U.S. Cellular has begun to deploy 5G technology in its network and expects to launch commercial 5G services in selected markets in 2020. 5G technology is expected to help address customers' growing demand for data services as well as create opportunities for new services requiring high speed, reliability and low latency. U.S. Cellular is working with leading companies in the wireless infrastructure and handset ecosystem to provide rich 5G experiences for customers, initially focused on mobility services and using its low band spectrum. At the same time, as discussed below, U.S. Cellular has begun acquiring high band spectrum to enable the delivery of additional 5G services in the future. In addition to the deployment of 5G technology, U.S. Cellular is also modernizing its 4G LTE network to further enhance 4G LTE speeds.
- U.S. Cellular assesses its existing wireless interests on an ongoing basis with a goal of improving the competitiveness of its operations and maximizing its long-term return on capital. As part of this strategy, U.S. Cellular actively seeks attractive opportunities to acquire wireless spectrum, including pursuant to FCC auctions. In June 2019, the FCC announced that U.S. Cellular was the provisional winning bidder for 408 wireless spectrum licenses in its 28 GHz auction (Auction 101) and 282 wireless spectrum licenses in its 24 GHz auction (Auction 102) for an aggregate purchase price of \$256 million. The wireless spectrum licenses from Auction 101 were granted by the FCC on October 2, 2019, and the wireless spectrum licenses from Auction 102 were granted by the FCC on December 11, 2019. On July 11, 2019, the FCC released a Public Notice establishing procedures for an auction offering wireless spectrum licenses in the 37, 39 and 47 GHz bands (Auction 103). Auction 103 is offering 34 100 MHz blocks in the Upper 37 GHz, 39 GHz, and 47 GHz bands in all Partial Economic Areas. On September 9, 2019, U.S. Cellular filed an application to participate in Auction 103 and was announced as a qualified bidder on October 31, 2019. Bidding in this auction commenced on December 10, 2019. The initial phase of this auction closed on January 30, 2020 and the assignment phase commenced on February 18, 2020.
- TDS Telecom's Wireline business continues to focus on driving growth in its broadband and video services by investing in fiber deployment in new out-of-territory markets and in existing markets. Construction has begun in two new out-of-territory clusters, mid-central Wisconsin and Idaho. With support from the FCC's A-CAM program and state broadband grants, Wireline is also deploying higher speed broadband to unserved and under-served service addresses in rural areas within its current markets.
- On December 31, 2019, TDS acquired substantially all of the assets of MI Connection Communications System, dba Continuum, for \$80 million in cash, subject to working capital adjustments. Continuum is a cable company that passes approximately 40,000 service addresses in North Carolina and offers broadband, video and voice services, which complement the TDS Telecom portfolio of products.
- TDS Telecom's Cable business continues to increase its broadband penetration by making network capacity investments and by offering more advanced services in its markets.
- TDS Telecom's Wireline and Cable businesses also are investing in a next generation video platform called TDS TV+ to enhance video services.

Return value to shareholders

During 2019, TDS paid \$75 million in regular quarterly cash dividends. TDS increased the dividend per share paid to its investors by 3% in 2019 which marks the 45th consecutive year of dividend increases and in February 2020, TDS increased its quarterly dividend per share from \$0.165 to \$0.170. During 2019, U.S. Cellular repurchased 590,300 Common Shares for \$21 million at an average cost per share of \$35.45. At December 31, 2019, the total cumulative amount of U.S. Cellular Common Shares authorized to be purchased is 5,311,000. There were no TDS share repurchases in 2019. As of December 31, 2019, the maximum dollar value of TDS Common Shares that may yet be purchased under TDS' program was \$199 million. There is no assurance that TDS will continue to increase the dividend rate or pay dividends and no assurance that TDS or U.S. Cellular will make any significant amount of share repurchases in the future.

Annual Dividends Per TDS Share



Terms Used by TDS

The following is a list of definitions of certain industry terms that are used throughout this document:

- **4G LTE** – fourth generation Long-Term Evolution, which is a wireless technology that enables more network capacity for more data per user as well as faster access to data compared to third generation (3G) technology.
- **5G** – fifth generation wireless technology that is expected to help address customers' growing demand for data services as well as create opportunities for new services requiring high speed and reliability as well as low latency.
- **Account** – represents an individual or business financially responsible for one or multiple associated connections. An account may include a variety of types of connections such as handsets and connected devices.
- **Alternative Connect America Cost Model (A-CAM)** – a USF support mechanism for rate-of-return carriers, which provides revenue support through 2028. This support comes with an obligation to build defined broadband speeds to a certain number of locations.
- **Auctions 101, 102, and 103** – Auction 101 was an FCC auction of 28 GHz wireless spectrum licenses that started in November 2018 and concluded in January 2019. Auction 102 was an FCC auction of 24 GHz wireless spectrum licenses that started in March 2019 and concluded in May 2019. Auction 103 is an FCC auction of 37, 39, and 47 GHz wireless spectrum licenses that started in December 2019. The spectrum auctioned in each of these auctions, referred to as Millimeter Wave spectrum, is expected to be used primarily to deliver 5G technology.
- **Broadband Connections** – refers to the number of Wireline customers provided high-capacity data circuits via various technologies, including DSL and dedicated internet circuit technologies or the Cable billable number of lines into a building for high-speed data services.
- **Churn Rate** – represents the percentage of the connections that disconnect service each month. These rates represent the average monthly churn rate for each respective period.
- **Connected Devices** – non-handset devices that connect directly to the U.S. Cellular network. Connected devices include products such as tablets, wearables, modems, and hotspots.
- **DOCSIS** – Data Over Cable Service Interface Specification is an international telecommunications standard that permits the addition of high-bandwidth data transfer to an existing cable TV (CATV) system. DOCSIS 3.1 is a system specification that increases data transmission rates.
- **EBITDA** – refers to earnings before interest, taxes, depreciation, amortization and accretion and is used in the non-GAAP metric Adjusted EBITDA throughout this document. See Supplemental Information Relating to Non-GAAP Financial Measures within this MD&A for additional information.
- **Eligible Telecommunications Carrier (ETC)** – designation by states for providing specified services in “high cost” areas which enables participation in universal service support mechanisms.
- **Free Cash Flow** – non-GAAP metric defined as Cash flows from operating activities less Cash paid for additions to property, plant and equipment. See Supplemental Information Relating to Non-GAAP Financial Measures within this MD&A for additional information.
- **Gross Additions** – represents the total number of new connections added during the period, without regard to connections that were terminated during that period.
- **IPTV Connections** – represents the number of Wireline customers provided video services using IP networking technology.
- **ManagedIP Connections** – refers to the number of telephone handsets, data lines and IP trunks providing communications using IP networking technology.
- **Net Additions (Losses)** – represents the total number of new connections added during the period, net of connections that were terminated during that period.
- **OIBDA** – refers to operating income before depreciation, amortization and accretion and is used in the non-GAAP metric Adjusted OIBDA throughout this document. See Supplemental Information Relating to Non-GAAP Financial Measures within this MD&A for additional information.
- **Out-of-Territory Fiber Builds** – represents construction of facilities-based market expansions outside of TDS' ILEC and CLEC footprint.
- **Partial Economic Areas** – service areas of certain FCC wireless spectrum licenses based on geography.
- **Postpaid Average Revenue per Account (Postpaid ARPA)** – metric which is calculated by dividing total postpaid service revenues by the average number of postpaid accounts and by the number of months in the period.
- **Postpaid Average Revenue per User (Postpaid ARPU)** – metric which is calculated by dividing total postpaid service revenues by the average number of postpaid connections and by the number of months in the period.
- **Retail Connections** – the sum of U.S. Cellular postpaid connections and U.S. Cellular prepaid connections.
- **Tax Act** – refers to comprehensive federal tax legislation enacted on December 22, 2017, which made broad changes to the U.S. tax code. Now titled H.R. 1, the Tax Act was originally identified as the Tax Cuts and Jobs Act of 2017.
- **Universal Service Fund (USF)** – a system of telecommunications collected fees and support payments managed by the FCC intended to promote universal access to telecommunications services in the United States.
- **U.S. Cellular Connections** – individual lines of service associated with each device activated by a customer. Connections include all types of devices that connect directly to the U.S. Cellular network.
- **Video Connections** – generally, a home or business receiving video programming counts as one video connection. In counting bulk residential or commercial connections, such as an apartment building or a hotel, connections are counted based on the number of units/rooms within the building receiving service.
- **Voice Connections** – refers to the individual circuits connecting a customer to Wireline's central office facilities that provide voice services or the Cable billable number of lines into a building for voice services.
- **VoLTE** – Voice over Long-Term Evolution is a technology specification that defines the standards and procedures for delivering voice communications and related services over 4G LTE networks.

- **Wireline Residential Revenue per Connection** – is calculated by dividing total Wireline residential revenue by the average number of Wireline residential connections and by the number of months in the period.

Results of Operations — TDS Consolidated

Year Ended December 31,	2019	2018	2019 vs. 2018
(Dollars in millions)			
Operating revenues			
U.S. Cellular	\$ 4,022	\$ 3,967	1 %
TDS Telecom	930	927	—
All other ¹	224	215	4 %
Total operating revenues	<u>5,176</u>	<u>5,109</u>	1 %
Operating expenses			
U.S. Cellular	3,910	3,809	3 %
TDS Telecom	823	834	(1)%
All other ¹	264	261	1 %
Total operating expenses	<u>4,997</u>	<u>4,904</u>	2 %
Operating income (loss)			
U.S. Cellular	112	158	(29)%
TDS Telecom	107	93	15 %
All other ¹	(40)	(46)	12 %
Total operating income	<u>179</u>	<u>205</u>	(13)%
Investment and other income (expense)			
Equity in earnings of unconsolidated entities	168	160	5 %
Interest and dividend income	29	26	15 %
Interest expense	(165)	(172)	4 %
Other, net	—	2	N/M
Total investment and other income	<u>32</u>	<u>16</u>	92 %
Income before income taxes			
	211	221	(5)%
Income tax expense	<u>64</u>	<u>46</u>	37 %
Net income			
	147	175	(16)%
Less: Net income attributable to noncontrolling interests, net of tax	<u>26</u>	<u>40</u>	(36)%
Net income attributable to TDS shareholders	<u>\$ 121</u>	<u>\$ 135</u>	(10)%
Adjusted OIBDA (Non-GAAP) ²	<u>\$ 1,122</u>	<u>\$ 1,079</u>	4 %
Adjusted EBITDA (Non-GAAP) ²	<u>\$ 1,319</u>	<u>\$ 1,267</u>	4 %
Capital expenditures ³	<u>\$ 1,032</u>	<u>\$ 767</u>	35 %

N/M - Percentage change not meaningful

¹ Consists of corporate and other operations and intercompany eliminations.

² Refer to Supplemental Information Relating to Non-GAAP Financial Measures within this MD&A for a reconciliation of this measure.

³ Refer to Liquidity and Capital Resources within this MD&A for additional information on Capital expenditures.

Refer to individual segment discussions in this MD&A for additional details on operating revenues and expenses at the segment level.

Equity in earnings of unconsolidated entities

Equity in earnings of unconsolidated entities represents TDS' share of net income from entities in which it has a noncontrolling interest and that are accounted for using the equity method. TDS' investment in the Los Angeles SMSA Limited Partnership (LA Partnership) contributed \$78 million and \$77 million in 2019 and 2018, respectively.

Income tax expense

The effective tax rate on Income before income taxes for 2019 was 30.3%. The effective tax rate includes the impact of federal and state tax, as well as other increases due primarily to nondeductible interest expenses.

TDS' effective tax rate on Income before income taxes for 2018 was 21.0%. The effective tax rate was lower than a normalized rate inclusive of federal and state tax, due primarily to an income tax accounting method change that accelerated depreciation of certain assets for the 2017 tax year, resulting in discrete tax benefit recorded in 2018.

See Note 5 — Income Taxes in the Notes to Consolidated Financial Statements for additional information.

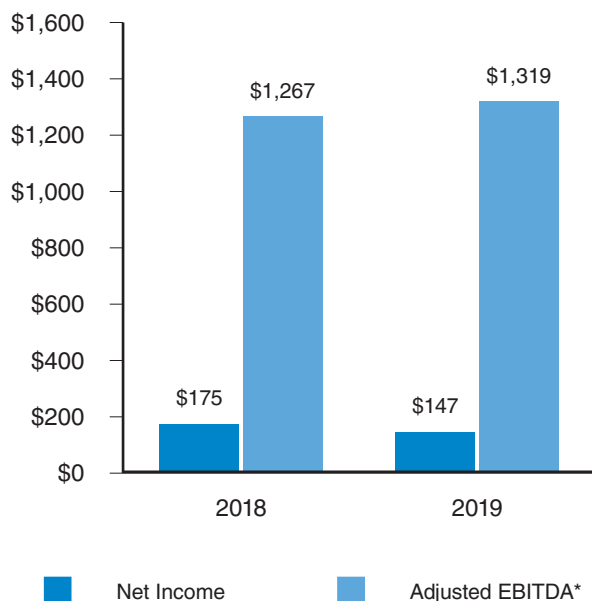
Net income attributable to noncontrolling interests, net of tax

Year Ended December 31,	2019	2018
(Dollars in millions)		
U.S. Cellular noncontrolling public shareholders'	\$ 23	\$ 26
Noncontrolling shareholders' or partners'	<u>3</u>	<u>14</u>
Net income attributable to noncontrolling interests, net of tax	<u>\$ 26</u>	<u>\$ 40</u>

Net income attributable to noncontrolling interests, net of tax includes the noncontrolling public shareholders' share of U.S. Cellular's net income, the noncontrolling shareholders' or partners' share of certain U.S. Cellular subsidiaries' net income and other TDS noncontrolling interests.

Earnings

(Dollars in millions)



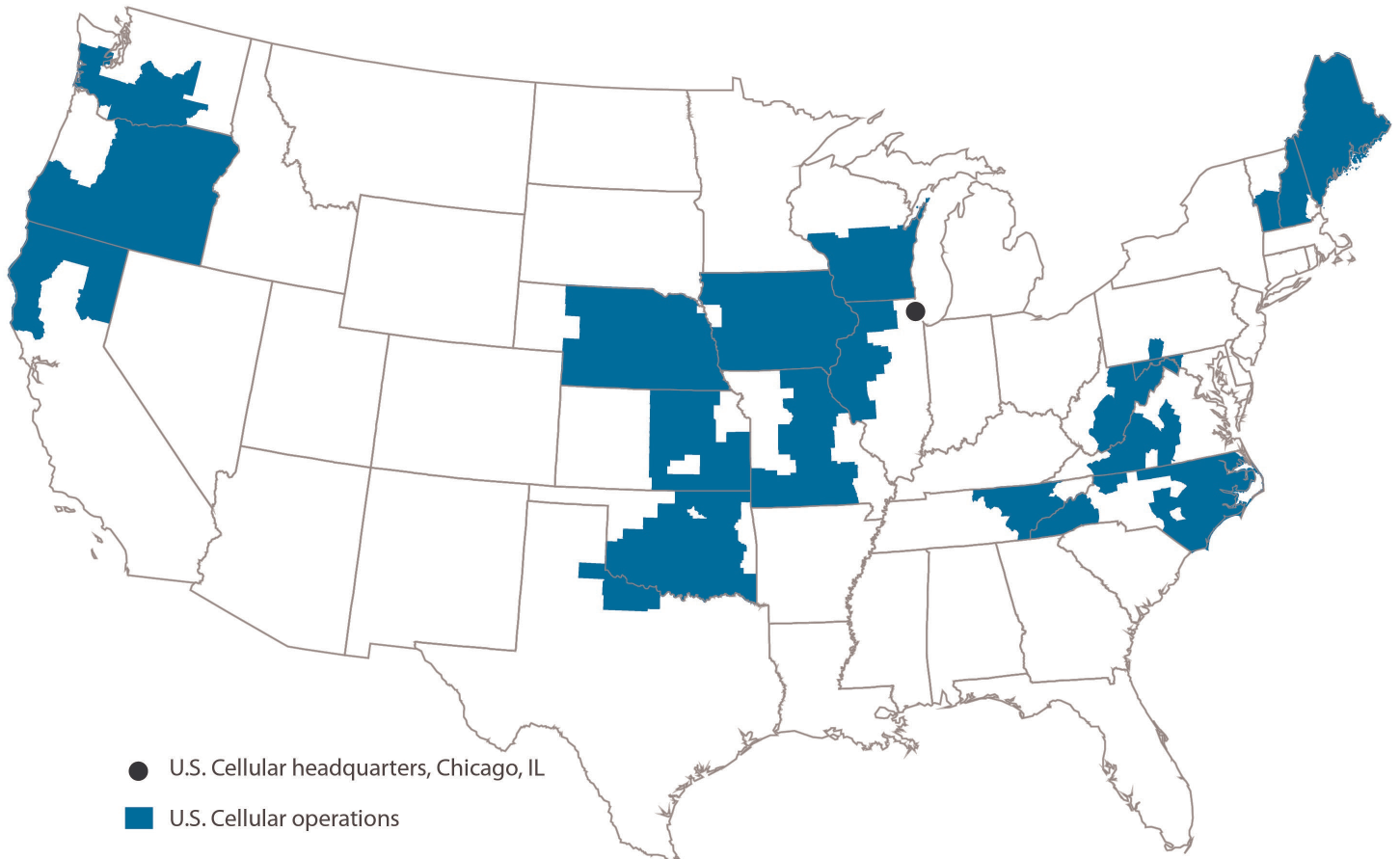
Net income decreased in 2019 due primarily to increased depreciation and other operating expenses, as well as higher income taxes and less gains recorded in 2019, partially offset by higher revenues. Adjusted EBITDA increased in 2019 due primarily to higher revenues, partially offset by higher selling, general and administrative expenses.

*Represents a non-GAAP financial measure. Refer to Supplemental Information Relating to Non-GAAP Financial Measures within this MD&A for a reconciliation of this measure.

Business Overview

U.S. Cellular owns, operates, and invests in wireless markets throughout the United States. U.S. Cellular is an 82%-owned subsidiary of TDS. U.S. Cellular's strategy is to attract and retain wireless customers through a value proposition comprised of a high-quality network, outstanding customer service, and competitive devices, plans, and pricing, all provided with a local focus.

OPERATIONS



- Serves customers with 4.9 million connections including 4.4 million postpaid, 0.5 million prepaid and 0.1 million reseller and other connections
- Operates in 20 states
- Employs approximately 5,500 associates
- 4,166 owned towers
- 6,578 cell sites in service

U.S. Cellular Mission and Strategy

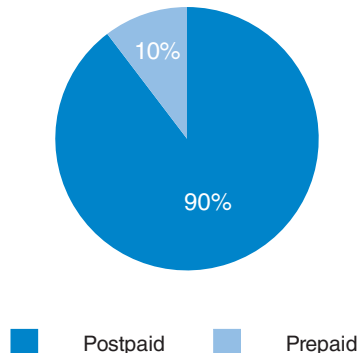
U.S. Cellular's mission is to provide exceptional wireless communication services which enhance consumers' lives, increase the competitiveness of local businesses, and improve the efficiency of government operations in the mid-sized and rural markets served.

U.S. Cellular continues to execute on its strategies to grow and protect its customer base, grow revenues, drive improvements in the overall cost structure, and invest in its network and system capabilities. Strategic efforts include:

- U.S. Cellular offers economical and competitively priced service plans and devices to its customers and is focused on increasing revenues from sales of related products such as accessories and device protection plans and from new services such as LTE home internet. In addition, U.S. Cellular is focused on expanding its solutions available to business and government customers, including a growing suite of connected machine-to-machine solutions and software applications across various categories.
- U.S. Cellular continues to devote efforts to enhance its network capabilities. VoLTE technology is now available to nearly 70% of U.S. Cellular's subscribers, and deployments in additional operating markets are expected in 2020 and 2021. VoLTE technology allows customers to utilize a 4G LTE network for both voice and data services and offers enhanced services such as high definition voice and simultaneous voice and data sessions.
- U.S. Cellular has begun to deploy 5G technology in its network and expects to launch commercial 5G services in selected markets in 2020. 5G technology is expected to help address customers' growing demand for data services as well as create opportunities for new services requiring high speed, reliability and low latency. U.S. Cellular is working with leading companies in the wireless infrastructure and handset ecosystem to provide rich 5G experiences for customers, initially focused on mobility services and using its low band spectrum. At the same time, as discussed below, U.S. Cellular has begun acquiring high band spectrum to enable the delivery of additional 5G services in the future. In addition to the deployment of 5G technology, U.S. Cellular is also modernizing its 4G LTE network to further enhance 4G LTE speeds.
- U.S. Cellular assesses its existing wireless interests on an ongoing basis with a goal of improving the competitiveness of its operations and maximizing its long-term return on capital. As part of this strategy, U.S. Cellular actively seeks attractive opportunities to acquire wireless spectrum, including pursuant to FCC auctions. In June 2019, the FCC announced that U.S. Cellular was the provisional winning bidder for 408 wireless spectrum licenses in its 28 GHz auction (Auction 101) and 282 wireless spectrum licenses in its 24 GHz auction (Auction 102) for an aggregate purchase price of \$256 million. The wireless spectrum licenses from Auction 101 were granted by the FCC on October 2, 2019, and the wireless spectrum licenses from Auction 102 were granted by the FCC on December 11, 2019. On July 11, 2019, the FCC released a Public Notice establishing procedures for an auction offering wireless spectrum licenses in the 37, 39 and 47 GHz bands (Auction 103). Auction 103 is offering 34 100 MHz blocks in the Upper 37 GHz, 39 GHz, and 47 GHz bands in all Partial Economic Areas. On September 9, 2019, U.S. Cellular filed an application to participate in Auction 103 and was announced as a qualified bidder on October 31, 2019. Bidding in this auction commenced on December 10, 2019. The initial phase of this auction closed on January 30, 2020 and the assignment phase commenced on February 18, 2020.

Operational Overview

Retail Connections Composition As of December 31, 2019



As of December 31,	2019	2018
Retail Connections – End of Period		
Postpaid	4,383,000	4,472,000
Prepaid	506,000	516,000
Total	4,889,000	4,988,000

Year Ended December 31,	2019	2018	2019 vs. 2018
Postpaid Activity and Churn			
Gross Additions			
Handsets	458,000	475,000	(4)%
Connected Devices	148,000	150,000	(1)%
Total Gross Additions	606,000	625,000	(3)%
Net Additions (Losses)			
Handsets	(24,000)	23,000	N/M
Connected Devices	(65,000)	(69,000)	6%
Total Net Additions (Losses)	(89,000)	(46,000)	(93)%
Churn			
Handsets	1.04%	0.98%	
Connected Devices	3.24%	2.96%	
Total Churn	1.31%	1.25%	

Postpaid net losses increased in 2019 due to lower handset gross additions and higher handset defections, which are due primarily to aggressive industry-wide competition on both service plans and devices.

Total postpaid churn increased in 2019 due primarily to higher handset defections.

Postpaid Revenue

Year Ended December 31,	2019	2018	2019 vs. 2018
Average Revenue Per User (ARPU)	\$ 46.01	\$ 44.98	2%
Average Revenue Per Account (ARPA)	\$ 119.80	\$ 118.93	1%

Postpaid ARPU and Postpaid ARPA increased in 2019 due primarily to (i) having proportionately more handset connections, which on a per-unit basis contribute more revenue than connected devices, (ii) a shift to higher priced service plans, and (iii) an increase in device protection plan revenue. Such factors were partially offset by an increase in sales promotion costs.

Financial Overview — U.S. Cellular

Year Ended December 31,	2019	2018	2019 vs. 2018
(Dollars in millions)			
Retail service	\$ 2,650	\$ 2,623	1 %
Inbound roaming	174	154	13 %
Other	211	201	5 %
Service revenues	<u>3,035</u>	<u>2,978</u>	2 %
Equipment sales	987	989	—
Total operating revenues	<u>4,022</u>	<u>3,967</u>	1 %
System operations (excluding Depreciation, amortization and accretion reported below)	756	758	—
Cost of equipment sold	1,028	1,031	—
Selling, general and administrative	1,406	1,388	1 %
Depreciation, amortization and accretion	702	640	10 %
(Gain) loss on asset disposals, net	19	10	80 %
(Gain) loss on sale of business and other exit costs, net	(1)	—	N/M
(Gain) loss on license sales and exchanges, net	—	(18)	98 %
Total operating expenses	<u>3,910</u>	<u>3,809</u>	3 %
Operating income	<u>\$ 112</u>	<u>\$ 158</u>	(29)%
Net income	<u>\$ 133</u>	<u>\$ 164</u>	(19)%
Adjusted OIBDA (Non-GAAP) ¹	<u>\$ 832</u>	<u>\$ 790</u>	5 %
Adjusted EBITDA (Non-GAAP) ¹	<u>\$ 1,015</u>	<u>\$ 963</u>	5 %
Capital expenditures ²	<u>\$ 710</u>	<u>\$ 515</u>	38 %

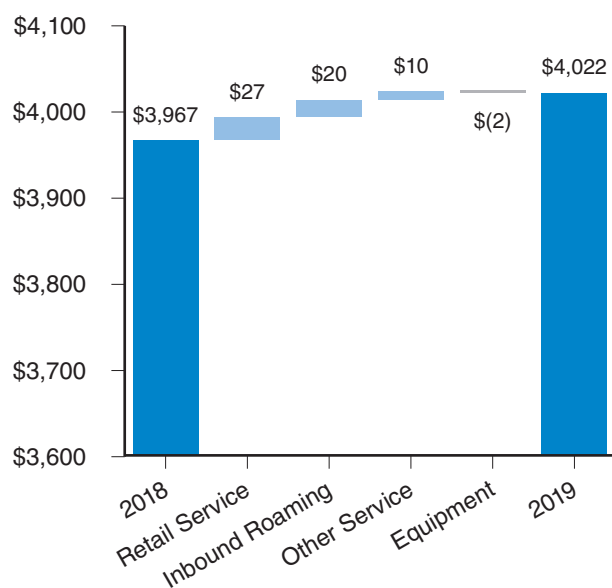
N/M - Percentage change not meaningful

¹ Refer to Supplemental Information Relating to Non-GAAP Financial Measures within this MD&A for a reconciliation of this measure.

² Refer to Liquidity and Capital Resources within this MD&A for additional information on Capital expenditures.

Operating Revenues

(Dollars in millions)



Service revenues consist of:

- Retail Service – Charges for voice, data and value added services and recovery of regulatory costs
- Inbound Roaming – Charges to other wireless carriers whose customers use U.S. Cellular’s wireless systems when roaming
- Other Service – Amounts received from the Federal USF, tower rental revenues, and miscellaneous other service revenues

Equipment revenues consist of:

- Sales of wireless devices and related accessories to new and existing customers, agents, and third-party distributors

Key components of changes in the statement of operations line items were as follows:

Total operating revenues

Retail service revenues increased in 2019 primarily as a result of the increase in Postpaid ARPU as previously discussed in the Operational Overview section.

Inbound roaming revenues increased in 2019 primarily driven by data revenues, with significantly higher usage partially offset by lower rates.

Other service revenues increased in 2019, due primarily to an increase in tower rental revenues resulting from (i) an increase in new agreements and increases in rental rates and (ii) an out-of-period adjustment recorded in the third quarter of 2019. See Note 11 — Leases in the Notes to Consolidated Financial Statements for additional information.

Selling, general and administrative expenses

Selling, general and administrative expenses increased in 2019 due primarily to an increase in costs driven by information system initiatives, as well as an increase in bad debts expense.

Depreciation, amortization and accretion

Depreciation, amortization, and accretion increased in 2019 due to (i) additional network assets being placed into service and (ii) accelerated depreciation of certain assets due to changes in network technology, which will continue in 2020 and beyond.

(Gain) loss on asset disposals, net

Loss on asset disposals, net increased in 2019 due primarily to the disposal of technologically obsolete equipment.

(Gain) loss on license sales and exchanges, net

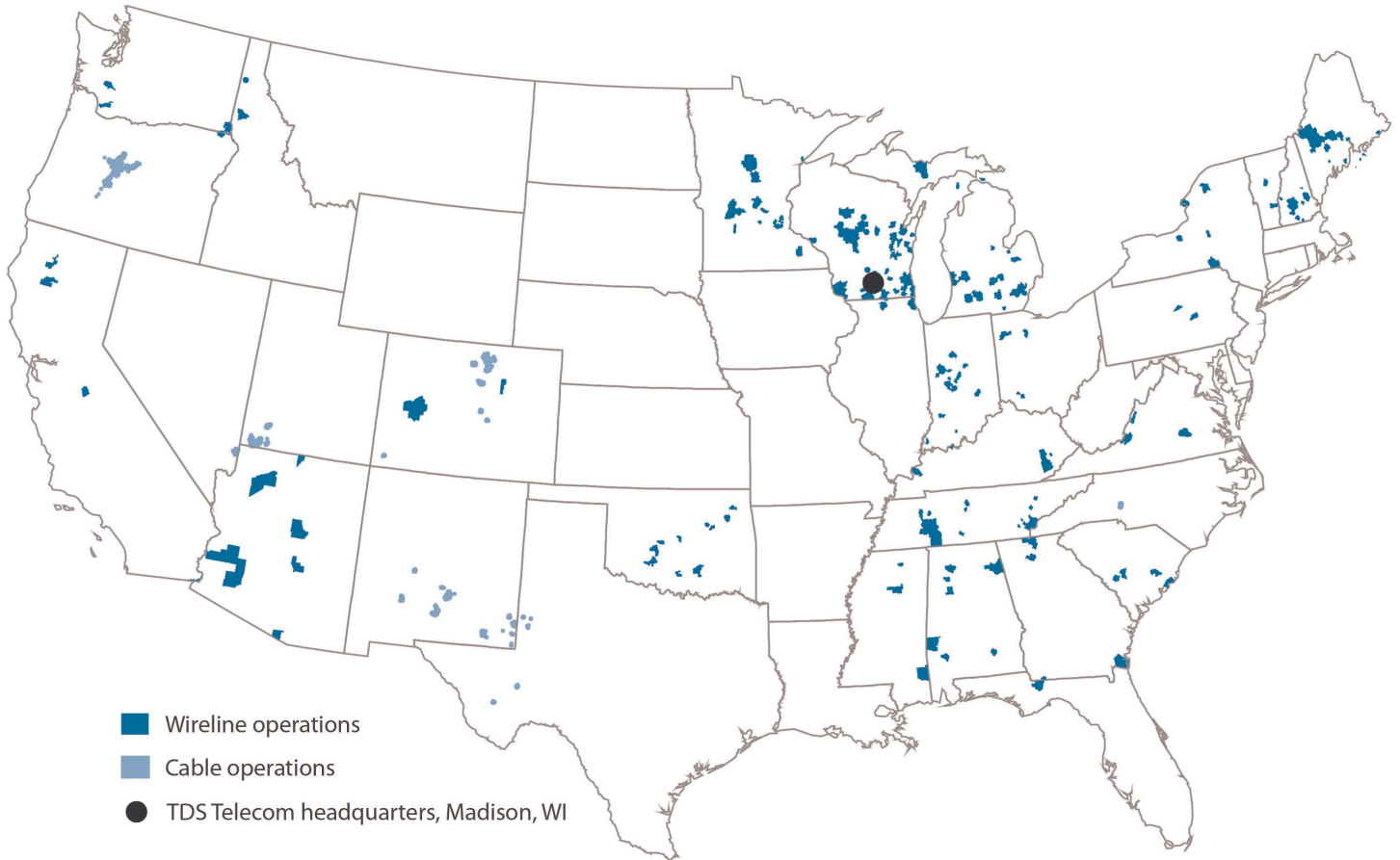
Net gains in 2018 were due to license sale and exchange transactions with various third parties.



Business Overview

TDS Telecom provides a wide range of communications services to residential and commercial customers. TDS Telecom operates in two segments: Wireline, which includes fiber out-of-territory builds, and Cable.

OPERATIONS



- Serves 1.2 million connections in 32 states.
- Employs approximately 2,900 employees.
- Wireline operates incumbent local exchange carriers (ILEC), competitive local exchange carriers (CLEC) and out-of-territory builds in 27 states.
- Cable operates primarily in Colorado, New Mexico, North Carolina, Oregon, Texas and Utah.

Trends and Developments

Growth Initiatives:

- In 2017, TDS Telecom acquired and built an advanced fiber network in Sun Prairie, Wisconsin. Several additional locations are currently being built with fiber to expand its footprint into attractive markets that are underserved today. TDS Telecom's Madison, Wisconsin cluster will include an additional 27,000 service addresses, its Central Wisconsin cluster will include 36,000 service addresses, and its new Coeur d'Alene, Idaho cluster will include 42,000 service addresses. At the end of 2019, TDS Telecom has installed fiber to approximately 33,000 service addresses in these out-of-territory markets.
- TDS Telecom is also pursuing a strategy to invest in fiber in markets within its current footprint. Increased fiber deployment provides the opportunity to deliver more robust residential and consumer products which drives growth. At the end of 2019, TDS Telecom has installed fiber to approximately 207,000 service addresses within its existing footprint.
- On December 31, 2019, TDS acquired substantially all of the assets of MI Connection Communications System, dba Continuum, for \$80 million in cash, subject to working capital adjustments. Continuum is a cable company that passes approximately 40,000 service addresses in North Carolina and offers broadband, video and voice services, which complement the TDS Telecom portfolio of products. TDS Telecom will continue to pursue acquisitions that meet its criteria of having favorable competitive environments, attractive market demographics and the ability to grow broadband penetration.

Technology & Support Systems:

- TDS Telecom's Wireline segment continues to upgrade and expand its network to respond to the needs of its customers for greater bandwidth and advanced technologies. At December 31, 2019, fiber has been deployed to approximately 30% of service addresses. Fiber technology allows broadband speeds of up to 1 Gigabit per second (Gbps). In non-fiber markets, TDS Telecom has deployed advanced technologies to increase data speeds up to 100 Megabits per second (Mbps) to reach approximately 38% of service addresses. TDS Telecom continues to utilize federal and state funding mechanisms in order to extend broadband service to unserved and underserved markets.
- TDS Telecom's Cable segment continues to make capacity investments in line with its strategy to increase broadband penetration in its markets. DOCSIS 3.0 technology is deployed to nearly all of Cable's service addresses which allows it to offer enhanced transmission speeds and TDS Telecom has begun to enable a next generation DOCSIS 3.1 broadband network that will offer significant higher speeds of up to 1 Gbps. TDS Telecom's Cable segment is also offering up to 1 Gbps service through fiber investments in new construction in its largest markets.

Services and Products:

- TDS Telecom's Wireline segment strives to be the preferred broadband provider in its markets with the ability to provide value-added bundling services with video and voice service options. TDS Telecom continues to invest in its network to offer higher speed data service and to expand its fiber footprint. At December 31, 2019, 67% of residential broadband connections had 10 Mbps or faster service and 30% had 100 Mbps or faster service.
- TDS Telecom's Wireline segment offers IPTV, branded as TDS TV, in order to leverage its high-speed network. TDS TV provides customers with connected-home DVRs, video-on-demand and TV Everywhere. TDS Telecom offers TDS TV in 40 markets, enabling 267,000 or roughly 34% of its service addresses. Where TDS TV is not available, TDS Telecom partners with a satellite TV provider to allow for triple or double play bundling.
- TDS Telecom's commercial operations lead with a broadband service bundled with voice and TDS TV for small- to medium-sized businesses.
- TDS Telecom's Cable segment seeks to expand broadband services and leverage that growth by bundling with video and voice services. In addition to providing enhanced broadband speeds through DOCSIS 3.1 technology, TDS Telecom also provides customers with a whole home entertainment solution branded as CatchTV.

Financial Overview — TDS Telecom

Year Ended December 31,	2019	2018	2019 vs. 2018
(Dollars in millions)			
Operating revenues			
Wireline	\$ 683	\$ 699	(2)%
Cable	247	230	8 %
TDS Telecom operating revenues ¹	<u>930</u>	<u>927</u>	—
Operating expenses			
Wireline	587	604	(3)%
Cable	236	231	2 %
TDS Telecom operating expenses ¹	<u>823</u>	<u>834</u>	(1)%
TDS Telecom operating income	<u>\$ 107</u>	<u>\$ 93</u>	15 %
Net income	<u>\$ 92</u>	<u>\$ 89</u>	4 %
Adjusted OIBDA (Non-GAAP) ²	<u>\$ 300</u>	<u>\$ 303</u>	(1)%
Adjusted EBITDA (Non-GAAP) ²	<u>\$ 313</u>	<u>\$ 313</u>	—
Capital expenditures ³	<u>\$ 316</u>	<u>\$ 232</u>	36 %

Numbers may not foot due to rounding.

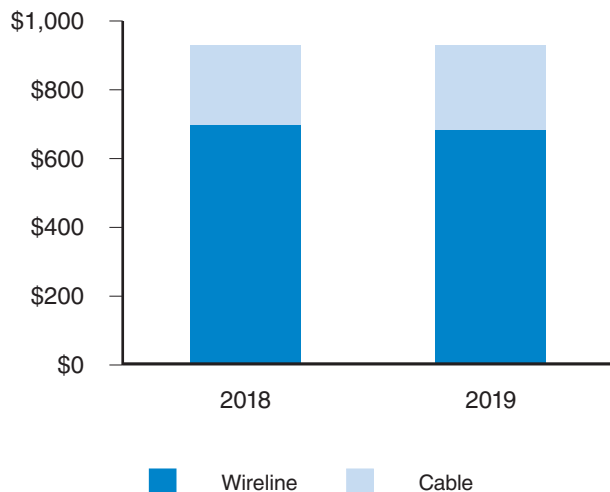
N/M - Percentage change not meaningful

¹ Includes eliminations between the Wireline and Cable segments.

² Refer to Supplemental Information Relating to Non-GAAP Financial Measures within this MD&A for a reconciliation of this measure.

³ Refer to Liquidity and Capital Resources within this MD&A for additional information on Capital expenditures.

Operating Revenues (Dollars in millions)



Operating revenues were flat in 2019 as Wireline and Cable broadband growth and Wireline video connection growth were offset by declines in Wireline wholesale access revenue and voice and commercial revenues.

Total operating expenses

Operating expenses decreased in 2019 due primarily to decreases in employee-related expenses and depreciation expense and an increase in gain on the sale of assets.



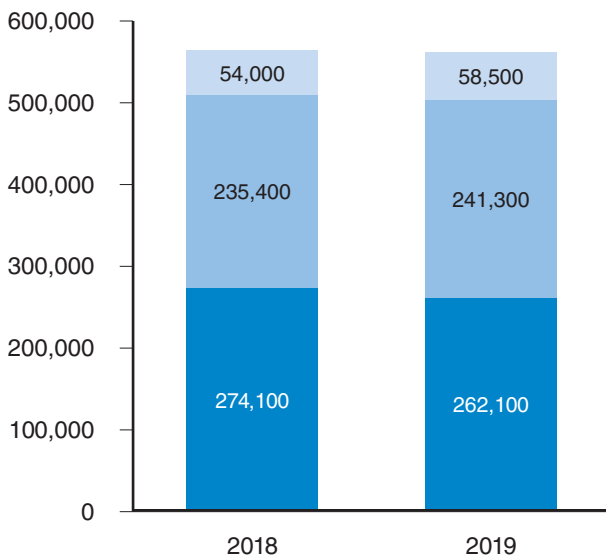
WIRELINE OPERATIONS

Business Overview

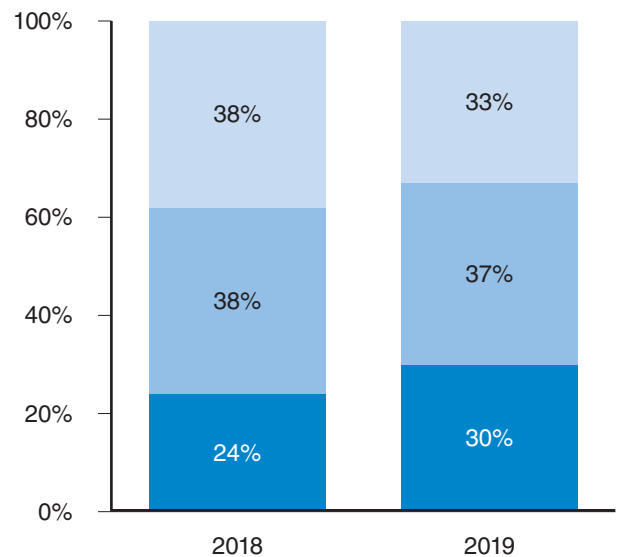
TDS Telecom's Wireline business provides broadband, video and voice services. These services are provided to residential, commercial, and wholesale customers in a mix of rural, small town and suburban markets, with the largest concentration of its customers in the Upper Midwest and the Southeast. TDS Telecom's residential strategy is to focus on broadband bundled with video and voice services. In its commercial business, TDS Telecom's focus is on small- to medium-sized businesses and its sales efforts emphasize providing broadband with an array of voice services.

Operational Overview

Residential Connections



Residential Broadband Connections by Speeds¹

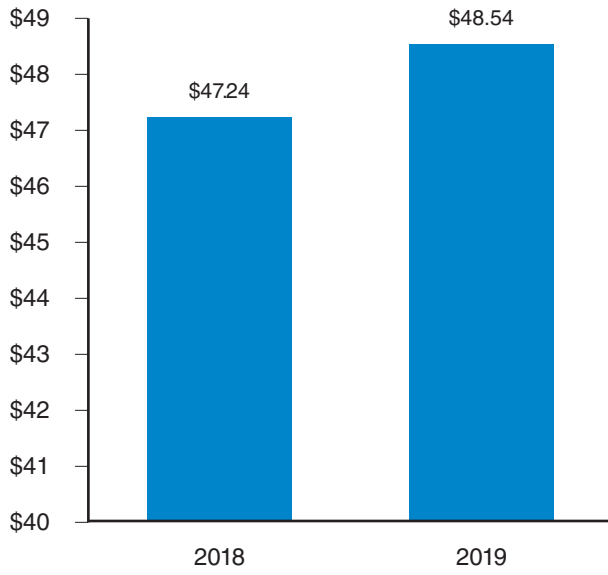


Total residential connections were relatively flat as growth in broadband and video connections were offset by the decline in voice connections.

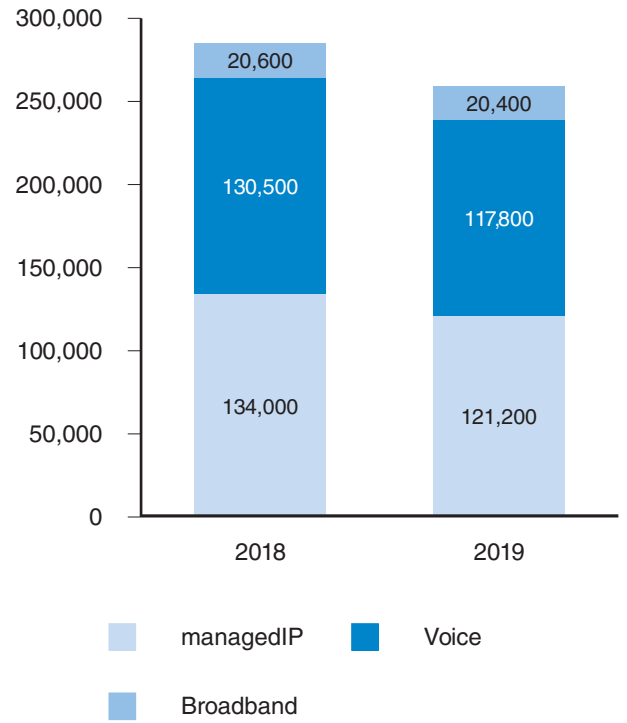
Residential broadband customers continue to choose higher speeds with 67% taking speeds of 10 Mbps or greater and 30% choosing speeds of 100 Mbps or greater.

¹ Includes ILEC and out-of-territory

Residential Revenue per Connection



Commercial Connections



Residential revenue per connection increased 3% due to video and broadband connection growth as well as an increase in broadband speeds.

Total commercial connections decreased by 9% due primarily to declines in connections in CLEC markets.

Financial Overview — Wireline

Year Ended December 31,	2019	2018	2019 vs. 2018
(Dollars in millions)			
Residential	\$ 328	\$ 321	2 %
Commercial	168	184	(9)%
Wholesale	186	191	(2)%
Service revenues	682	697	(2)%
Equipment and product sales	1	2	(26)%
Total operating revenues	683	699	(2)%
Cost of services (excluding Depreciation, amortization and accretion reported below)	263	266	(1)%
Cost of equipment and products	1	1	(24)%
Selling, general and administrative	199	197	1 %
Depreciation, amortization and accretion	132	142	(7)%
(Gain) loss on asset disposals, net	(8)	(3)	N/M
Total operating expenses	587	604	(3)%
Operating income	\$ 96	\$ 95	1 %
Income before income taxes	\$ 110	\$ 106	3 %
Adjusted OIBDA (Non-GAAP) ¹	\$ 220	\$ 234	(6)%
Adjusted EBITDA (Non-GAAP) ¹	\$ 231	\$ 243	(5)%
Capital expenditures ²	\$ 243	\$ 176	38 %

Numbers may not foot due to rounding.

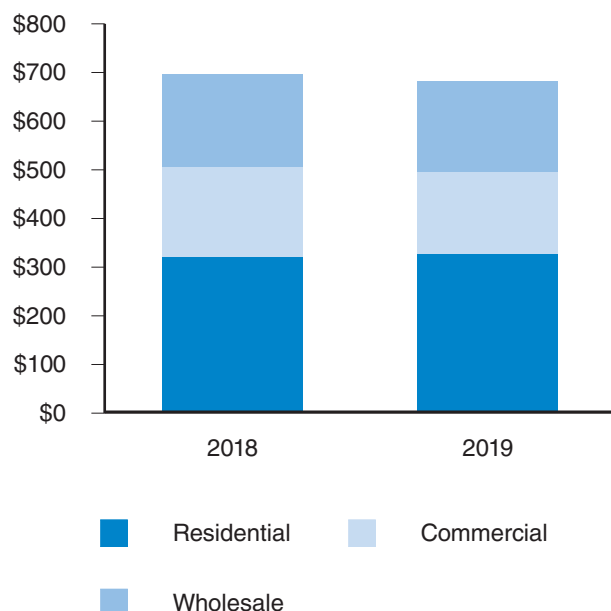
N/M - Percentage change not meaningful

¹ Refer to Supplemental Information Relating to Non-GAAP Financial Measures within this MD&A for a reconciliation of this measure.

² Refer to Liquidity and Capital Resources within this MD&A for additional information on Capital expenditures.

Operating Revenues

(Dollars in millions)



Residential revenues consist of:

- Broadband services, including fiber- and copper-based high-speed internet, security and support services
- Video services, including IPTV and satellite offerings
- Voice services

Commercial revenues consist of:

- High-speed and dedicated business internet services
- Voice services

Wholesale revenues consist of:

- Network access services primarily to interexchange and wireless carriers for carrying data and voice traffic on TDS Telecom's network
- Federal and state USF support, including A-CAM

Key components of changes in the statement of operations items were as follows:

Total operating revenues

Residential revenues increased in 2019 due primarily to growth in broadband and video connections, as well as price increases, partially offset by a decline in voice connections. Broadband and video connections grew 3% and 8%, respectively, while voice connections declined 4%.

Commercial revenues decreased in 2019 due primarily to declining connections in CLEC markets.

Wholesale revenues decreased in 2019 due to decreases in legacy transport services, primarily for special access.

Cost of services

Cost of services decreased in 2019 due to lower employee-related expenses and decreases in the costs of provisioning legacy services, partially offset by increases in video programming charges and plant and maintenance expense.

Selling, general and administrative

Selling, general and administrative expenses increased in 2019 due primarily to increased legal and advertising expenses, offset by lower employee-related costs.

Depreciation, amortization and accretion

Depreciation, amortization and accretion decreased in 2019 as certain assets became fully depreciated, partially offset by depreciation on new fiber assets.

(Gain) loss on asset disposals, net

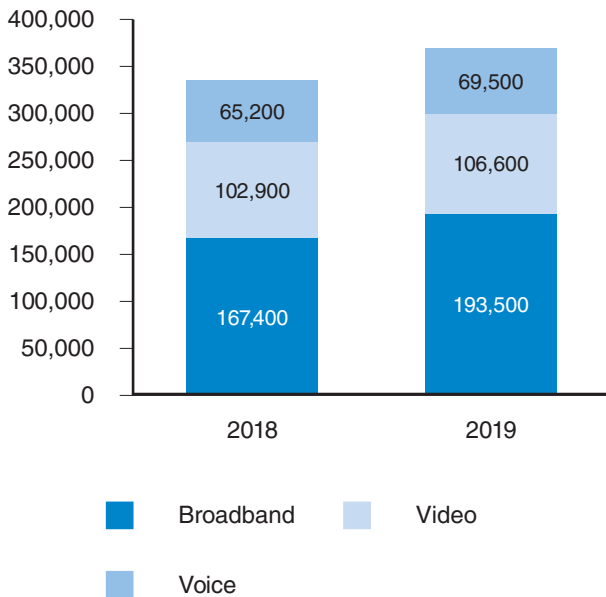
Gain on asset disposals increased due to the sale of fiber assets in certain CLEC markets.

Business Overview

TDS Telecom’s Cable strategy is to expand its broadband services and leverage that growth by bundling with video and voice services. TDS Telecom seeks to be the leading provider of broadband services in its targeted markets by leveraging its core competencies in network management and customer focus.

Operational Overview

Cable Connections



Cable connections grew 10% in 2019 due to an increase in broadband connections and the acquisition of Continuum, which included 15,800 broadband connections, 9,400 video connections and 5,800 voice connections.

Financial Overview — Cable

Year Ended December 31,	2019	2018	2019 vs. 2018
(Dollars in millions)			
Residential	\$ 205	\$ 188	9 %
Commercial	43	42	3 %
Total operating revenues	<u>247</u>	<u>230</u>	8 %
Cost of services (excluding Depreciation, amortization and accretion reported below)	105	104	2 %
Selling, general and administrative	62	57	8 %
Depreciation, amortization and accretion	68	69	(2)%
(Gain) loss on asset disposals, net	1	1	(48)%
Total operating expenses	<u>236</u>	<u>231</u>	2 %
Operating income (loss)	<u>\$ 11</u>	<u>\$ (2)</u>	N/M
Income (loss) before income taxes	\$ 13	\$ (1)	N/M
Adjusted OIBDA (Non-GAAP) ¹	<u>\$ 80</u>	<u>\$ 69</u>	16 %
Adjusted EBITDA (Non-GAAP) ¹	<u>\$ 82</u>	<u>\$ 70</u>	17 %
Capital expenditures ²	<u>\$ 73</u>	<u>\$ 56</u>	31 %

Numbers may not foot due to rounding.

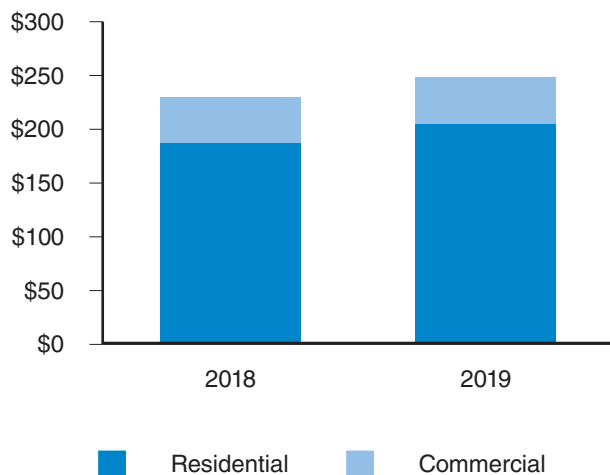
N/M - Percentage change not meaningful

¹ Refer to Supplemental Information Relating to Non-GAAP Financial Measures within this MD&A for a reconciliation of this measure.

² Refer to Liquidity and Capital Resources within this MD&A for additional information on Capital expenditures.

Operating Revenues

(Dollars in millions)



Residential and Commercial revenues consist of:

- Broadband services, including high-speed internet, security and support services
- Video services including premium programming in HD, multi-room and TV Everywhere offerings
- Voice services

Key components of changes in the statement of operations items were as follows:

Total operating revenues

Residential and commercial revenues increased 8% in 2019 due to price increases and growth in broadband connections.

Cost of services

Cost of services increased 2% in 2019 due primarily to increases in maintenance activities.

Selling, general and administrative

Selling, general and administrative expenses increased in 2019 due primarily to higher employee-related expenses and closing costs related to the acquisition of Continuum.

Depreciation, amortization and accretion

Depreciation, amortization and accretion decreased in 2019 as certain assets became fully depreciated.

Liquidity and Capital Resources

Sources of Liquidity

TDS and its subsidiaries operate capital-intensive businesses. Historically, TDS has used internally-generated funds and also has obtained substantial funds from external sources for general corporate purposes. In the past, TDS' existing cash and investment balances, funds available under its revolving credit and receivables securitization agreements, funds from other financing sources, including undrawn term loans and other long-term debt, and cash flows from operating and certain investing and financing activities, including sales of assets or businesses, provided sufficient liquidity and financial flexibility for TDS to meet its normal day-to-day operating needs and debt service requirements, to finance the build-out and enhancement of markets and to fund acquisitions. There is no assurance that this will be the case in the future. See Market Risk for additional information regarding maturities of long-term debt.

TDS has incurred negative free cash flow at times in the past and this could occur in the future. However, TDS believes that existing cash and investment balances, funds available under its revolving credit, term loan and receivables securitization agreements, and expected cash flows from operating and investing activities will provide sufficient liquidity for TDS to meet its normal day-to-day operating needs and debt service requirements for the coming year.

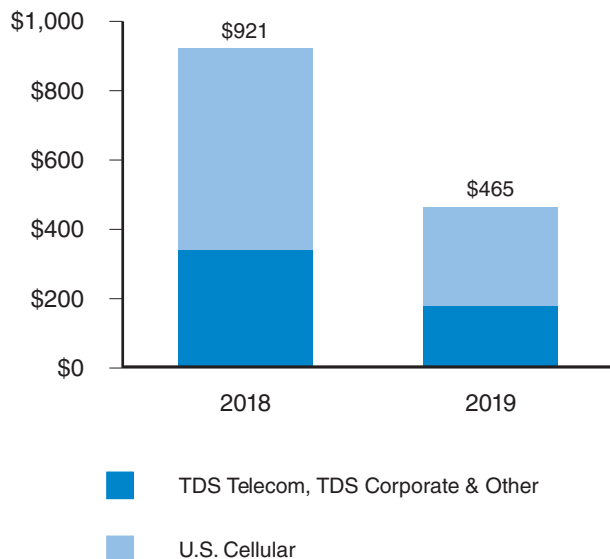
TDS may require substantial additional capital for, among other uses, funding day-to-day operating needs including working capital, acquisitions of providers of cable, wireless or wireline telecommunications services, IT services or other businesses, wireless spectrum license or system acquisitions, capital expenditures, debt service requirements, the repurchase of shares, the payment of dividends, or making additional investments, including new technologies and out of territory builds. It may be necessary from time to time to increase the size of the existing revolving credit agreements, to put in place new credit agreements, or to obtain other forms of financing in order to fund potential expenditures. TDS, through U.S. Cellular, expects to participate in a wireless spectrum auction in 2020 (see Regulatory Matters - Millimeter Wave Spectrum Auctions) and also expects capital expenditures in 2020 to be higher than in 2019, due primarily to investments at U.S. Cellular to enhance network speed and capacity and to continue deploying VoLTE and 5G technology on its network, and at TDS Telecom to increase levels of fiber investment. TDS' liquidity would be adversely affected if, among other things, TDS is unable to obtain financing on acceptable terms, TDS makes significant wireless spectrum license purchases, TDS makes significant business acquisitions, the LA Partnership discontinues or significantly reduces distributions compared to historical levels, or Federal USF and/or other regulatory support payments decline.

TDS' credit rating currently is sub-investment grade. There can be no assurance that sufficient funds will continue to be available to TDS or its subsidiaries on terms or at prices acceptable to TDS. Insufficient cash flows from operating activities, changes in TDS' credit ratings, defaults of the terms of debt or credit agreements, uncertainty of access to capital, deterioration in the capital markets, reduced regulatory capital at banks which in turn limits their ability to borrow and lend, other changes in the performance of TDS or in market conditions or other factors could limit or restrict the availability of financing on terms and prices acceptable to TDS, which could require TDS to reduce its acquisition, capital expenditure and business development programs, reduce the acquisition of wireless spectrum licenses, and/or reduce or cease share repurchases and/or the payment of dividends. Any of the foregoing developments would have an adverse impact on TDS' businesses, financial condition or results of operations. TDS cannot provide assurance that circumstances that could have a material adverse effect on its liquidity or capital resources will not occur.

Cash and Cash Equivalents

Cash and cash equivalents include cash and money market investments. The primary objective of TDS' Cash and cash equivalents investment activities is to preserve principal. Cash held by U.S. Cellular is for use in its operations and acquisition, capital expenditure and business development programs. TDS does not have direct access to U.S. Cellular cash unless U.S. Cellular pays a dividend on its common stock. U.S. Cellular has no current intention to pay a dividend to its shareholders.

Cash and Cash Equivalents (Dollars in millions)



At December 31, 2019, TDS' consolidated Cash and cash equivalents totaled \$465 million compared to \$921 million at December 31, 2018.

The majority of TDS' Cash and cash equivalents are held in bank deposit accounts and in money market funds that purchase only debt issued by the U.S. Treasury or U.S. government agencies across a range of eligible money market investments that may include, but are not limited to, government agency repurchase agreements, government agency debt, U.S. Treasury repurchase agreements, U.S. Treasury debt, and other securities collateralized by U.S. government obligations. TDS monitors the financial viability of the money market funds and the financial institutions with which TDS has deposits and believes that the credit risk associated with these funds and institutions is low.

Financing

Revolving Credit Agreements

TDS and U.S. Cellular have unsecured revolving credit agreements available for general corporate purposes including acquisitions, wireless spectrum license purchases and capital expenditures. In May 2018, TDS entered into a \$400 million revolving credit agreement with certain lenders and other parties and U.S. Cellular entered into a \$300 million revolving credit agreement with certain lenders and other parties. Amounts under the revolving credit agreements may be borrowed, repaid and reborrowed from time to time until maturity in May 2023. As of December 31, 2019, there were no outstanding borrowings under the revolving credit agreements, except for letters of credit, and TDS and U.S. Cellular's unused capacity under their revolving credit agreements was \$399 million and \$298 million, respectively.

See Note 13 — Debt in the Notes to Consolidated Financial Statements for additional information regarding the revolving credit agreements.

Term Loans

On January 6, 2020, TDS entered into an unsecured \$200 million senior term loan credit agreement. The term loan is available for general corporate purposes, including working capital and capital expenditures. As of February 25, 2020, no borrowings have been made under the agreement. The term loan may be drawn in one or more advances by the one-year anniversary of the date of the agreement; amounts not drawn by that time will cease to be available. The maturity date of the term loan is January 6, 2027 and would accelerate in the event of a change in control.

In January 2015, U.S. Cellular entered into an unsecured senior term loan credit agreement. This agreement was entered into for general corporate purposes, including working capital, spectrum purchases and capital expenditures. In July 2015, U.S. Cellular borrowed the full amount of \$225 million available under this agreement in two separate draws. This term loan credit agreement was amended and restated in June 2016, and further amended in May 2018 and March 2019. In October 2019, U.S. Cellular made a \$100 million principal prepayment on the outstanding balance of the loan. The remaining unpaid balance will be due and payable in January 2022.

See Note 13 — Debt in the Notes to Consolidated Financial Statements for additional information regarding the U.S. Cellular term loan.

Receivables Securitization Agreement

In December 2017, U.S. Cellular, through its subsidiaries, entered into a \$200 million credit agreement to permit securitized borrowings using its equipment installment receivables for general corporate purposes. In September 2019, U.S. Cellular amended this agreement extending the expiration date of the agreement to December 15, 2021. There were no significant changes to other key terms of the agreement. U.S. Cellular entered into a performance guaranty whereby U.S. Cellular guarantees the performance of certain wholly-owned subsidiaries of U.S. Cellular under the agreement. Amounts under the receivables securitization agreement may be borrowed, repaid and reborrowed from time to time until maturity in December 2021, which may be extended from time to time as specified therein. As of December 31, 2019, there were no outstanding borrowings under the receivables securitization agreement, and the entire unused capacity of \$200 million was available, subject to sufficient collateral to satisfy the asset borrowing base provisions of the agreement.

See Note 13 — Debt in the Notes to Consolidated Financial Statements for additional information regarding the receivables securitization agreement.

Financial Covenants

The TDS and U.S. Cellular revolving credit agreements, senior term loan agreements and the U.S. Cellular receivables securitization agreement require TDS or U.S. Cellular, as applicable, to comply with certain affirmative and negative covenants, which include certain financial covenants. In particular, under these agreements, TDS and U.S. Cellular are required to maintain the Consolidated Interest Coverage Ratio at a level not lower than 3.00 to 1.00 as of the end of any fiscal quarter. TDS and U.S. Cellular also were required to maintain the Consolidated Leverage Ratio at a level not to exceed 3.25 to 1.00 as of the end of any fiscal quarter through June 30, 2019. From July 1, 2019 and thereafter, the Consolidated Leverage Ratio is not to exceed 3.00 to 1.00 as of the end of any fiscal quarter. TDS and U.S. Cellular believe they were in compliance as of December 31, 2019, with all such financial covenants.

Other Long-Term Financing

TDS and U.S. Cellular each have an effective shelf registration statement on Form S-3 to issue senior or subordinated debt securities. The proceeds from any such issuances may be used for general corporate purposes, including: the possible reduction of other short-term or long-term debt; spectrum purchases; capital expenditures; acquisition, construction and development programs; working capital; additional investments in subsidiaries; or the repurchase of shares. The TDS shelf registration permits TDS to issue at any time and from time to time senior or subordinated debt securities in one or more offerings in an indeterminate amount. The U.S. Cellular shelf registration statement permits U.S. Cellular to issue at any time and from time to time senior or subordinated debt securities in one or more offerings, up to the amount registered, which is currently \$500 million. The ability of TDS or U.S. Cellular to complete an offering pursuant to such shelf registration statements is subject to market conditions and other factors at the time.

TDS believes that it and/or its subsidiaries were in compliance as of December 31, 2019, with all covenants and other requirements set forth in the TDS and U.S. Cellular long-term debt indentures. The TDS and U.S. Cellular long-term debt indentures do not include any financial covenants. TDS and U.S. Cellular have not failed to make nor do they expect to fail to make any scheduled payment of principal or interest under such indentures.

Refer to Market Risk — Long-Term Debt for additional information regarding required principal payments and the weighted average interest rates related to TDS' Long-term debt.

TDS and U.S. Cellular, at their discretion, may from time to time seek to retire or purchase their outstanding debt through cash purchases and/or exchanges for other securities, in open market purchases, privately negotiated transactions, tender offers, exchange offers or otherwise. Such repurchases or exchanges, if any, will depend on prevailing market conditions, liquidity requirements, contractual restrictions and other factors. The amounts involved may be material.

See Note 13 — Debt in the Notes to Consolidated Financial Statements for additional information on long-term financing.

Credit Ratings

In certain circumstances, TDS' and U.S. Cellular's interest cost on their various agreements may be subject to increase if their current credit ratings from nationally recognized credit rating agencies are lowered, and may be subject to decrease if the ratings are raised. The agreements do not cease to be available nor do the maturity dates accelerate solely as a result of a downgrade in TDS' or U.S. Cellular's credit rating. However, downgrades in TDS' or U.S. Cellular's credit rating could adversely affect their ability to renew the agreements or obtain access to other credit agreements in the future.

TDS and U.S. Cellular are rated at sub-investment grade. TDS and U.S. Cellular's credit ratings as of December 31, 2019, and the dates such ratings were re-affirmed were as follows:

Rating Agency	Rating	Outlook
Moody's (TDS) (re-affirmed September 2019)	Ba2	stable outlook
Moody's (U.S. Cellular) (re-affirmed September 2019)	Ba1	stable outlook
Standard & Poor's (re-affirmed October 2019)	BB	stable outlook
Fitch Ratings (re-affirmed June 2019)	BB+	stable outlook

Capital Requirements

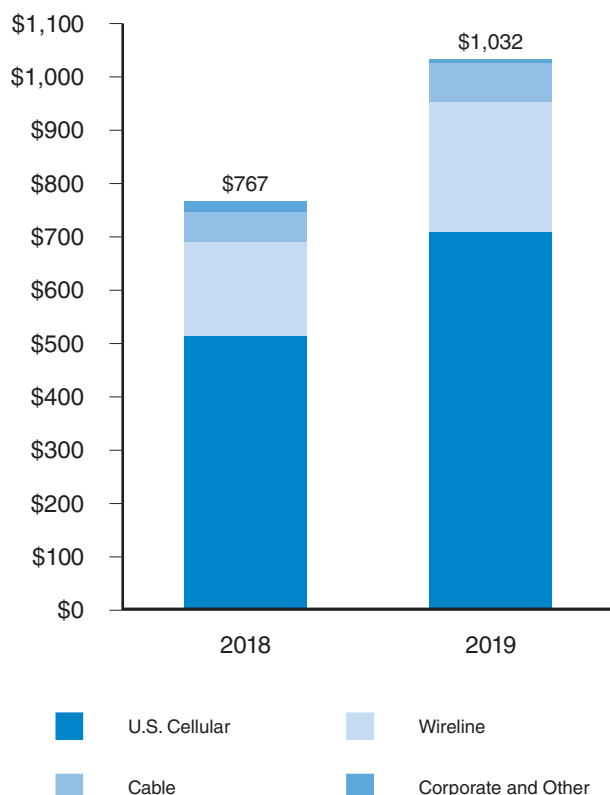
The discussion below is intended to highlight some of the significant cash outlays expected during 2020 and beyond and to highlight the spending incurred in prior years for these items. This discussion does not include cash required to fund normal operations, and is not a comprehensive list of capital requirements. Significant cash requirements that are not routine or in the normal course of business could arise from time to time.

Capital Expenditures

TDS makes substantial investments to acquire, construct and upgrade telecommunications networks and facilities to remain competitive and as a basis for creating long-term value for shareholders. In recent years, rapid changes in technology and new opportunities (such as 5G and VoLTE technology in the Wireless business and fiber in the Wireline business) have required substantial investments in potentially revenue-enhancing and cost-saving upgrades to TDS' networks to remain competitive; this is expected to continue in 2020 and future years with the continued deployment of 5G technology and VoLTE in the Wireless business, and the continued deployment of fiber in the Wireline business.

Capital expenditures (i.e., additions to property, plant and equipment and system development expenditures; excludes wireless spectrum license additions), which include the effects of accruals and capitalized interest, in 2019 and 2018 were as follows:

Capital Expenditures (Dollars in millions)



U.S. Cellular's capital expenditures in 2019 were \$710 million compared to \$515 million in 2018. In 2019, these capital expenditures were used for the following purposes:

- Enhance and maintain U.S. Cellular's network coverage, including continuing to deploy VoLTE technology in certain markets and providing additional speed and capacity to accommodate increased data usage by current customers;
- Begin deploying 5G technology on its network; and
- Invest in information technology to support existing and new services and products.

Capital expenditures for 2020 are expected to be between \$850 million and \$950 million. These expenditures are expected to be used for similar purposes as those listed above.

TDS Telecom's capital expenditures in 2019 were \$316 million compared to \$232 million in 2018. In 2019, these capital expenditures were used for the following purposes:

- Expand fiber deployment inside and outside of current footprint;
- Maintain and enhance existing infrastructure including build-out requirements to meet state broadband and A-CAM programs;
- Upgrade broadband capacity and speeds;
- Support success-based spending for broadband and video growth; and
- Build TDS TV+, a cloud-based video platform.

Capital expenditures in 2020 are expected to be between \$300 million and \$350 million. These expenditures are expected to be used for similar purposes as those listed above.

TDS intends to finance its capital expenditures for 2020 using primarily Cash flows from operating activities, existing cash balances and, if required, its receivables securitization, term loan and/or revolving credit agreements.

Acquisitions, Divestitures and Exchanges

TDS may be engaged from time to time in negotiations (subject to all applicable regulations) relating to the acquisition, divestiture or exchange of companies, properties, wireless spectrum licenses and other possible businesses. In general, TDS may not disclose such transactions until there is a definitive agreement. TDS assesses its business interests on an ongoing basis with a goal of improving the competitiveness of its operations and increasing its long-term return on capital. As part of this strategy, TDS reviews attractive opportunities to acquire additional wireless operating markets and wireless spectrum licenses, including pursuant to FCC auctions; and telecommunications, cable or other possible businesses.

In June 2019, the FCC announced by way of public notice that U.S. Cellular was the provisional winning bidder for 408 wireless spectrum licenses in its 28 GHz auction (Auction 101) and 282 wireless spectrum licenses in its 24 GHz auction (Auction 102) for an aggregate purchase price of \$256 million. U.S. Cellular paid substantially all of the \$256 million in the first half of 2019. The wireless spectrum licenses from Auction 101 were granted by the FCC on October 2, 2019, and the wireless spectrum licenses from Auction 102 were granted by the FCC on December 11, 2019.

On December 31, 2019, TDS acquired substantially all of the assets of MI Connection Communications System, dba Continuum, for \$80 million in cash, subject to working capital adjustments. Continuum is a cable company that passes approximately 40,000 service addresses in North Carolina and offers broadband, video and voice services, which complement the TDS Telecom portfolio of products.

Total Cash paid for acquisitions and licenses was \$346 million and \$16 million in 2019 and 2018 respectively. Total Cash received from divestitures and exchanges was \$41 million and \$29 million in 2019 and 2018 respectively.

Subsequent to December 31, 2019, TDS committed to purchase assets in the amount of \$146 million, subject to regulatory approval.

Variable Interest Entities

TDS consolidates certain “variable interest entities” as defined under GAAP. See Note 16 — Variable Interest Entities in the Notes to Consolidated Financial Statements for additional information related to these variable interest entities. TDS may elect to make additional capital contributions and/or advances to these variable interest entities in future periods in order to fund their operations.

Common Share Repurchase Programs

As of December 31, 2019, the maximum dollar value of TDS Common Shares that may yet be purchased under TDS' program was \$199 million.

During 2019, U.S. Cellular repurchased 590,300 Common Shares for \$21 million at an average cost per share of \$35.45. At December 31, 2019, the total cumulative amount of U.S. Cellular Common Shares authorized to be purchased is 5,311,000.

Depending on its future financial performance, construction, development and acquisition programs, and available sources of financing, TDS and U.S. Cellular may not have sufficient liquidity or capital resources to make significant share repurchases. Therefore, there is no assurance that TDS and U.S. Cellular will make any significant share repurchases in the future.

For additional information related to the current TDS and U.S. Cellular repurchase authorizations, see Note 18 — Common Shareholders' Equity in the Notes to Consolidated Financial Statements.

Off-Balance Sheet Arrangements

TDS had no transactions, agreements or other contractual arrangements with unconsolidated entities involving “off-balance sheet arrangements,” as defined by SEC rules, that had or are reasonably likely to have a material current or future effect on its financial condition, results of operations, liquidity, capital expenditures or capital resources.

Dividends

TDS paid quarterly dividends per outstanding share of \$0.165 in 2019 and \$0.160 in 2018. TDS increased the dividend per share to \$0.170 in the first quarter of 2020. TDS has no current plans to change its policy of paying dividends.

Contractual and Other Obligations

At December 31, 2019, the resources required for contractual obligations were as follows:

	Total	Payments Due by Period			
		Less Than 1 Year	1 - 3 Years	3 - 5 Years	More Than 5 Years
(Dollars in millions)					
Long-term debt obligations ¹	\$ 2,390	\$ 9	\$ 84	\$ —	\$ 2,297
Interest payments on long-term debt obligations	5,473	161	318	315	4,679
Operating leases ^{2, 3}	1,434	159	304	236	735
Finance leases ^{2, 4}	22	1	2	2	17
Purchase obligations ⁵	2,408	1,065	1,203	103	37
	<u>\$ 11,727</u>	<u>\$ 1,395</u>	<u>\$ 1,911</u>	<u>\$ 656</u>	<u>\$ 7,765</u>

¹ Includes current and long-term portions of debt obligations. The total long-term debt obligation differs from Total long-term debt, net due to finance leases, debt issuance costs and unamortized discounts. See Note 13 — Debt in the Notes to Consolidated Financial Statements for additional information.

² Includes future lease costs related to telecommunications plant facilities, office space, retail sites, cell sites, data centers and equipment. See Note 11 — Leases in the Notes to Consolidated Financial Statements for additional information.

³ Includes \$7 million of legally binding lease payments for leases signed but not yet commenced and excludes \$20 million of legally binding lease payments for leases signed but not yet commenced for which the payment timing is unknown.

⁴ Includes \$2 million of legally binding lease payments for leases signed but not yet commenced.

⁵ Includes obligations payable under non-cancellable contracts, commitments for device purchases, network facilities and transport services, agreements for software licensing, long-term marketing programs, as well as certain agreements to purchase goods or services. For certain contracts, TDS calculates its obligation based on termination fees that can be paid to exit the contract.

The table above excludes potential liabilities related to “unrecognized tax benefits” as defined by GAAP because TDS is unable to predict the outcome or period of settlement of such liabilities. Such unrecognized tax benefits were \$49 million at December 31, 2019. See Note 5 — Income Taxes in the Notes to Consolidated Financial Statements for additional information.

See Note 15 — Commitments and Contingencies in the Notes to Consolidated Financial Statements for additional information.

Consolidated Cash Flow Analysis

TDS operates a capital- and marketing-intensive business. TDS makes substantial investments to acquire wireless spectrum licenses and properties and to construct and upgrade communications networks and facilities as a basis for creating long-term value for shareholders. In recent years, rapid changes in technology and new opportunities have required substantial investments in potentially revenue-enhancing and cost-saving upgrades to TDS' networks. TDS utilizes cash on hand, cash from operating activities, cash proceeds from divestitures and dispositions of investments, and short-term and long-term debt financing to fund its acquisitions (including wireless spectrum licenses), construction costs, operating expenses and share repurchases. Cash flows may fluctuate from quarter to quarter and year to year due to seasonality, the timing of acquisitions and divestitures, capital expenditures and other factors. The following discussion summarizes TDS' cash flow activities in 2019 and 2018.

2019 Commentary

TDS' Cash, cash equivalents and restricted cash decreased \$453 million. Net cash provided by operating activities was \$1,016 million due to net income of \$147 million plus non-cash items of \$984 million and distributions received from unconsolidated entities of \$162 million, including \$75 million in distributions from the LA Partnership. This was offset by changes in working capital items which decreased net cash by \$277 million. The more significant working capital changes were increases in accounts receivables and equipment installment plan receivables and a decrease in accounts payable.

Cash flows used for investing activities were \$1,249 million. Cash paid for additions to property, plant and equipment totaled \$957 million and Cash paid for acquisitions and licenses totaled \$346 million. This was partially offset by cash received from the redemption of short-term Treasury bills of \$29 million and Cash received from divestitures and exchanges of \$41 million.

Cash flows used for financing activities were \$220 million, reflecting a \$100 million principal prepayment on the U.S. Cellular senior term loan, the repurchase of \$21 million of U.S. Cellular Common Shares and ordinary activity such as the payment of dividends and the scheduled repayments of debt.

2018 Commentary

TDS' Cash, cash equivalents and restricted cash increased \$305 million. Net cash provided by operating activities was \$1,017 million due to net income of \$175 million plus non-cash items of \$906 million and distributions received from unconsolidated entities of \$153 million, including \$68 million in distributions from the LA Partnership. This was partially offset by changes in working capital items which decreased net cash by \$217 million. The working capital changes were influenced primarily by a \$149 million increase in equipment installment plan receivables.

Cash flows used for investing activities were \$680 million. Cash paid for additions to property, plant and equipment totaled \$776 million. This was partially offset by cash received from the redemption of shorter-term Treasury bills of \$100 million.

Cash flows used for financing activities were \$32 million, reflecting ordinary activity such as the payment of dividends and the scheduled repayments of debt, partially offset by cash proceeds from reissuance of Common Shares pursuant to stock-based compensation plans.

Consolidated Balance Sheet Analysis

The following discussion addresses certain captions in the consolidated balance sheet and changes therein. This discussion is intended to highlight the significant changes and is not intended to fully reconcile the changes. Changes in financial condition during 2019 were as follows:

Cash and cash equivalents

See the Consolidated Cash Flow Analysis above for a discussion of cash and cash equivalents.

Income taxes receivable

Income taxes receivable increased \$24 million due to estimated tax payments made in excess of the tax liability for the year. See Note 5 — Income Taxes in the Notes to Consolidated Financial Statements for additional information.

Assets held for sale

Assets held for sale decreased \$54 million. Certain sale and exchange agreements that U.S. Cellular entered into in 2018 closed in the first quarter of 2019.

Licenses

Licenses increased \$285 million due primarily to wireless spectrum licenses acquired through FCC auctions. See Note 8 — Intangible Assets in the Notes to Consolidated Financial Statements for additional information.

Operating lease right-of-use assets

Operating lease right-of-use assets increased \$972 million due to the adoption of Accounting Standards Codification (ASC) 842. See Note 11 — Leases in the Notes to Consolidated Financial Statements for additional information.

Short-term operating lease liabilities

Short-term operating lease liabilities increased \$116 million due to the adoption of ASC 842. See Note 11 — Leases in the Notes to Consolidated Financial Statements for additional information.

Long-term operating lease liabilities

Long-term operating lease liabilities increased \$931 million due to the adoption of ASC 842. See Note 11 — Leases in the Notes to Consolidated Financial Statements for additional information.

Other deferred liabilities and credits

Other deferred liabilities and credits decreased \$60 million due primarily to the adoption of ASC 842. See Note 11 — Leases in the Notes to Consolidated Financial Statements for additional information.

Application of Critical Accounting Policies and Estimates

TDS prepares its consolidated financial statements in accordance with GAAP. TDS' significant accounting policies are discussed in detail in Note 1 — Summary of Significant Accounting Policies and Recent Accounting Pronouncements, Note 2 — Revenue Recognition and Note 11 — Leases in the Notes to Consolidated Financial Statements.

Management believes the application of the following critical accounting policies and the estimates required by such application reflect its most significant judgments and estimates used in the preparation of TDS' consolidated financial statements.

Intangible Asset Impairment

Licenses and Goodwill represent a significant component of TDS' consolidated assets. These assets are considered to be indefinite-lived assets and, therefore, are not amortized but rather are tested at least annually for impairment. TDS performs annual impairment testing of Licenses and Goodwill as of November 1 of each year, or more frequently if triggering events occur. Significant negative events, such as changes in any of the assumptions described below or decreases in forecasted cash flows, could result in an impairment in future periods. Licenses are tested for impairment at the level of reporting referred to as a unit of accounting. Goodwill is tested for impairment at the level of reporting referred to as a reporting unit.

See Note 8 — Intangible Assets in the Notes to Consolidated Financial Statements for information related to Licenses and Goodwill activity in 2019 and 2018.

Wireless Spectrum Licenses – U.S. Cellular

U.S. Cellular performs its annual impairment assessment of wireless spectrum licenses as of November 1 of each year, or more frequently if there are events or circumstances that cause U.S. Cellular to believe it is more likely than not that the carrying value of wireless spectrum licenses exceeds fair value. For purposes of its impairment testing, U.S. Cellular separated its FCC wireless spectrum licenses into eight units of accounting, which consisted of one unit of accounting for developed operating market wireless spectrum licenses (built wireless spectrum licenses) and seven geographic non-operating market wireless spectrum licenses (unbuilt wireless spectrum licenses). U.S. Cellular performed a quantitative impairment assessment in 2019, and a qualitative impairment assessment in 2018, to determine whether an impairment existed.

In 2019, a market approach was used to value the wireless spectrum license portfolio. Within each unit of accounting, the wireless spectrum licenses were pooled by type and by geographic area. The market approach calculates estimated market values using observable pricing multiples from wireless spectrum license purchase and auction transactions to estimate fair value for each pool of wireless spectrum licenses. The sum of the fair values of each of the pools represents the estimated fair value of U.S. Cellular's wireless spectrum licenses. The most significant assumption made in this process was the pricing multiples, which are units of value expressed in relation to the bandwidth and population covered by a wireless spectrum license. Based on the assessment, the fair values of the wireless spectrum license units of accounting exceeded their respective carrying values by amounts ranging from 39% to greater than 100%. It was determined that the carrying value of wireless spectrum licenses acquired through Auction 101 and 102 approximated fair value based on the recency of the auctions. Therefore, no impairment of wireless spectrum licenses existed.

In 2018, U.S. Cellular considered several qualitative factors, including analysts' estimates of wireless spectrum license values which contemplated recent spectrum auction results, recent U.S. Cellular and other market participant transactions and other industry and market factors. Based on this assessment, U.S. Cellular concluded that it was more likely than not that the fair value of the wireless spectrum licenses in each unit of accounting exceeded their respective carrying values. Therefore, no impairment of wireless spectrum licenses existed and no Step 1 quantitative impairment evaluation was completed.

Goodwill – TDS Telecom

TDS Telecom has recorded Goodwill as a result of the past acquisitions of wireline and cable businesses. For purposes of the 2019 and 2018 Goodwill impairment tests, TDS Telecom had two reporting units: Wireline and Cable.

Based on the results of the TDS Telecom annual Goodwill impairment assessment performed as of November 1, 2019, the fair values of the Wireline and Cable reporting units exceeded their carrying values. Therefore, no impairment of Goodwill was recorded for these reporting units.

The discounted cash flow approach and guideline public company method were used to value the Wireline and Cable reporting units. The discounted cash flow approach develops an indication of fair value using various inputs and considers current economic factors as well as risks specific to the industry and the reporting unit. The most significant assumptions made in this process were the revenue growth rate (shown as a compound annual growth rate in the table below), the terminal revenue growth rate and the discount rate. The guideline public company method develops an indication of fair value by calculating average market pricing multiples for selected publicly-traded companies. The developed multiples were applied to applicable financial measures of the respective reporting unit to determine fair value. The discounted cash flow approach and guideline public company method were weighted to arrive at the total fair value used for impairment testing. The weighting of methods was consistently applied in both 2019 and 2018.

For purposes of the discounted cash flow approach, the following table represents key assumptions used in estimating the fair value of the Wireline and Cable reporting units as of November 1, 2019. There are uncertainties associated with these key assumptions and potential events and/or circumstances that could have a negative effect on the key assumptions described below.

Key Assumptions	Wireline	Cable
Revenue growth rate ¹	(2.2)%	6.5%
Terminal revenue growth rate ¹	— %	2.0%
Discount rate ²	6.0 %	8.0%

¹ There are risks that could negatively impact the projected revenue growth rate, including but not limited to macroeconomic and industry factors.

² The discount rate is derived based on a set of guideline public companies and is an indicator of the cost of capital for a market participant in TDS Telecom's industries. The discount rate may increase if borrowing costs rise, market participants weight more of their capital structure towards equity vs. debt, long-term risk free interest rates increase, Wireline's or Cable's risk in relation to its peers increases, or other elements affecting the estimated cost of equity or debt increase.

Provided all other assumptions remained the same, the Wireline and Cable discount rates would have to increase to 9.6% and 13.3%, respectively, to yield estimated fair values equal to their respective carrying values at November 1, 2019. Further, provided all other assumptions remained the same, the Wireline and Cable terminal revenue growth rate assumptions would need to decrease to negative 5.5% and negative 6.2%, respectively, to yield an estimate of fair value equal to the carrying value of the respective reporting units at November 1, 2019.

The Goodwill balances of the reporting units tested for impairment as of November 1, 2019, and the percentage by which the estimated fair value of the corresponding reporting units exceeded their carrying values, as a percentage of carrying value, was as follows:

Reporting unit	Goodwill balance	Excess of estimated Fair Value over Carrying Value
(Dollars in millions)		
Wireline	\$ 409	31.0%
Cable	\$ 100	54.4%

Income Taxes

The amounts of income tax assets and liabilities, the related income tax provision and the amount of unrecognized tax benefits are critical accounting estimates because such amounts are significant to TDS' financial condition and results of operations.

The preparation of the consolidated financial statements requires TDS to calculate a provision for income taxes. This process involves estimating the actual current income tax liability together with assessing temporary differences resulting from the different treatment of items for tax purposes. These temporary differences result in deferred income tax assets and liabilities, which are included in TDS' Consolidated Balance Sheet. TDS must then assess the likelihood that deferred income tax assets will be realized based on future taxable income and, to the extent management believes that realization is not likely, establish a valuation allowance. Management's judgment is required in determining the provision for income taxes, deferred income tax assets and liabilities and any valuation allowance that is established for deferred income tax assets.

TDS recognizes the tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by the taxing authorities based on the technical merits of the position. The tax benefits recognized in the financial statements from such a position are measured based on management's judgment as to the possible outcome that has a greater than 50% cumulative likelihood of being realized upon ultimate resolution.

See Note 5 — Income Taxes in the Notes to Consolidated Financial Statements for additional information.

Other Items

Inflation

Management believes that inflation affects TDS' business to no greater or lesser extent than the general economy.

Seasonality

TDS' profitability historically has been lower in the fourth quarter as a result of U.S. Cellular's significant marketing and promotional activity during the holiday season.

Recently Issued Accounting Pronouncements

See Note 1 — Summary of Significant Accounting Policies and Recent Accounting Pronouncements and Note 11 — Leases in the Notes to Consolidated Financial Statements for information on recently issued accounting pronouncements.

Certain Relationships and Related Transactions

See Note 22 — Certain Relationships and Related Transactions in the Notes to Consolidated Financial Statements.

Regulatory Matters

FCC Mobility Fund/5G Fund

In October 2011, the FCC adopted its USF/Intercarrier Compensation Transformation Order (USF Order). Pursuant to this order, U.S. Cellular's then current Federal USF support was to be phased down at the rate of 20% per year beginning July 1, 2012. The USF Order contemplated the establishment of a new mobile USF program (i.e., the Phase II Connect America Mobility Fund or "MF2") and provided for a pause in the phase down if that program was not timely implemented by July 2014. MF2 was not operational as of July 2014 and, therefore, as provided by the USF Order, the phase down was suspended at 60% of the baseline amount until such time as the FCC had taken steps to establish the MF2. In February 2017, the FCC adopted the MF2 Order addressing the framework for MF2 and the resumption of the phase down. The MF2 Order establishes a support fund of \$453 million annually for ten years to be distributed through a market-based, multi-round reverse auction. For areas that receive support under MF2, legacy support to MF2 Auction winners will terminate and be replaced with MF2 support effective the first day of the month following release of the public notice closing the auction. Legacy support in areas where the legacy support recipient is not an MF2 winner will be subject to phase down over two years unless there is no winner in a particular census block, in which case it will be continued for one legacy support recipient only. The MF2 Order further states that the phase down of legacy support for areas that were not eligible for support under MF2 will commence on the first day of the month following the completion of the auction and will conclude two years later.

In August 2017, the FCC adopted the MF2 Challenge Process Order, which laid out procedures for establishing areas that would be eligible for support under the MF2 program. This included a collection process to be followed by a challenge window, a challenge response window, and finally adjudication of any coverage disputes. In September 2017, the FCC issued a public notice initiating the collection of 4G LTE coverage data. Responses submitting the collected data were due on January 4, 2018.

On February 27, 2018, the FCC issued public notices providing detailed challenge procedures and a schedule for the challenge process. Pursuant to these notices, the challenge window began on March 29, 2018, and closed on November 26, 2018. Under the MF2 Challenge Process Order, no earlier than thirty days after the FCC processes the challenges, the FCC would open a thirty-day challenge response window. Following the challenge response window, the FCC would then adjudicate any disputes. This entire process must be completed before an auction can be commenced.

On December 7, 2018, the FCC announced that it was investigating whether one or more carriers had submitted inaccurate maps. Pending the outcome of this investigation, the FCC suspended the challenge process. On December 4, 2019, the FCC released a staff report concluding that the maps submitted by carriers were too inaccurate to provide the basis for the MF2 auction. Contemporaneously with the release of this staff report, the Chairman of the FCC announced that he intended to propose the creation of a new fund for 5G deployment in rural areas with \$9 billion in available funding. This new 5G fund would replace the MF2 fund. No further details are available but in a letter to Members of Congress dated January 24, 2020, the Chairman of the FCC stated that he planned to circulate a Notice of Proposed Rulemaking in the coming months for the Commission's consideration.

U.S. Cellular cannot predict at this time when the 5G fund auction will occur, if ever, when the phase down period for its existing legacy support from the Federal USF will commence, or whether the 5G fund auction will provide opportunities to U.S. Cellular to offset any loss in existing support.

FCC Connect America Fund

In 2017, TDS began receiving \$75 million per year for 10 years (with incremental funding for transition in the early years for certain states) for operating and maintaining its network along with the obligation to provide broadband service at various speeds to about 160,000 locations. In May 2018, TDS Telecom accepted an offer issued by the FCC to receive an additional \$3 million of support per year for ten years retroactive to January 2017 along with corresponding build-out obligations. In December 2018, the FCC authorized additional funding for companies that elected Alternative Connect America Model (A-CAM) support. On February 25, 2019, as directed within the order, the Wireline Competition Bureau (the Bureau) released a public notice offering TDS Telecom an additional \$198 million in funding along with additional buildout obligations and extended the term of the revised offer by two years until December 31, 2028, which TDS Telecom accepted. On April 29, 2019, the Bureau authorized and directed the Universal Service Administrative Company (USAC) to obligate and disburse this revised support to those carriers that accept this revised offer. The offer provides A-CAM support up to \$200 per location which increases annual support under the program to \$82 million excluding transitional amounts, retroactive to January 1, 2019, and extending through 2028.

FCC Rulemaking – Restoring Internet Freedom

In December 2017, the FCC approved rules reversing or revising decisions made in the FCC's 2015 Open Internet and Title II Order (Restoring Internet Freedom). The 2017 action reversed the FCC's 2015 decision to reclassify Broadband Internet Access Services as telecommunications services subject to regulation under Title II of the Telecommunications Act. The 2017 action also reversed the FCC's 2015 restrictions on blocking, throttling and paid prioritization, and modified transparency rules relating to such practices. Several parties filed suit in federal court challenging the 2017 actions. On October 1, 2019, the Court of Appeals for the D.C. Circuit issued an order reaffirming the FCC in most respects, but limiting the FCC's ability to preempt state and local net neutrality laws.

A number of states, including certain states in which TDS operates, have adopted or considered laws intended to reinstate aspects of the foregoing net neutrality regulations that were reversed or revised by the FCC in 2017. To the extent such laws are enacted, it is expected that legal proceedings will be pursued challenging such laws, subject now to the DC Circuit ruling limiting the FCC's preemptive authority in this matter. TDS cannot predict the outcome of these proceedings or the impact on its business.

Millimeter Wave Spectrum Auctions

During 2018 and 2019, the FCC conducted two auctions of wireless spectrum licenses in the 28 GHz and 24 GHz bands. The 28 GHz auction (Auction 101) commenced on November 14, 2018 and closed on January 24, 2019. Auction 101 offered two 425 MHz wireless spectrum licenses in the 28 GHz band over portions of the United States that do not have incumbent licensees. The 24 GHz auction (Auction 102) commenced on March 14, 2019 and closed on May 28, 2019. Auction 102 offered up to seven 100 MHz wireless spectrum licenses in the 24 GHz band in Partial Economic Areas covering most of the United States. On June 3, 2019, the FCC announced by way of public notice that U.S. Cellular was the provisional winning bidder for 408 wireless spectrum licenses in Auction 101 and 282 wireless spectrum licenses in Auction 102 for an aggregate purchase price of \$256 million. The wireless spectrum licenses from Auction 101 were granted by the FCC on October 2, 2019, and the wireless spectrum licenses from Auction 102 were granted by the FCC on December 11, 2019.

On July 11, 2019, the FCC released a Public Notice establishing procedures for an auction offering wireless spectrum licenses in the 37, 39 and 47 GHz bands (Auction 103). On August 21, 2019, the FCC released a Public Notice announcing that all 39 GHz incumbents have agreed to relinquish their wireless spectrum licenses in return for incentive payments. Consequently, Auction 103 is offering 34 100 MHz blocks in the Upper 37 GHz, 39 GHz, and 47 GHz bands in all Partial Economic Areas. On September 9, 2019, U.S. Cellular filed an application to participate in Auction 103 and was announced as a qualified bidder on October 31, 2019. Bidding in this auction commenced on December 10, 2019. The initial phase of this auction closed on January 30, 2020 and the assignment phase commenced on February 18, 2020.

USTelecom Forbearance Petition

In response to the USTelecom Forbearance Petition, the FCC took a series of actions to provide relief from rules adopted pursuant to the Telecommunications Act of 1996. On July 12, 2019, the FCC issued an Order granting partial forbearance relief from rules that require ILECs to provide dedicated transport facilities between wire centers to their competitors on an unbundled basis at regulated rates. On August 2, 2019, the FCC granted ILECs relief from adopted rules (i) a requirement they offer competitors "analog voice-grade copper loops" on an unbundled basis at regulated rates and (ii) a requirement they offer legacy services for resale at regulated rates. To enable CLECs and their customers to make alternative service arrangements following forbearance, the Order provides a three-year transition period during which time ILECs and CLECs may negotiate commercial agreements. As a result of these orders, CLECs could potentially see a change in prices for the use of facilities currently purchased from other ILECs. TDS Telecom is exploring the options available to it brought forward by these decisions.

Private Securities Litigation Reform Act of 1995

Safe Harbor Cautionary Statement

This Management's Discussion and Analysis of Financial Condition and Results of Operations and other sections of this Annual Report contain statements that are not based on historical facts and represent forward-looking statements, as this term is defined in the Private Securities Litigation Reform Act of 1995. All statements, other than statements of historical facts, that address activities, events or developments that TDS intends, expects, projects, believes, estimates, plans or anticipates will or may occur in the future are forward-looking statements. The words "believes," "anticipates," "estimates," "expects," "plans," "intends," "projects" and similar expressions are intended to identify these forward-looking statements, but are not the exclusive means of identifying them. Such forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause actual results, events or developments to be significantly different from any future results, events or developments expressed or implied by such forward-looking statements. Such risks, uncertainties and other factors include, but are not limited to, those set forth below. See "Risk Factors" in TDS' Annual Report on Form 10-K for the year ended December 31, 2019, for a further discussion of these risks. Each of the following risks could have a material adverse effect on TDS' business, financial condition or results of operations. However, such factors are not necessarily all of the important factors that could cause actual results, performance or achievements to differ materially from those expressed in, or implied by, the forward-looking statements contained in this document. Other unknown or unpredictable factors also could have material adverse effects on future results, performance or achievements. TDS undertakes no obligation to update publicly any forward-looking statements whether as a result of new information, future events or otherwise. Readers should evaluate any statements in light of these important factors.

- *Intense competition in the markets in which TDS operates could adversely affect TDS' revenues or increase its costs to compete.*
- *A failure by TDS to successfully execute its business strategy (including planned acquisitions, spectrum acquisitions, fiber builds, divestitures and exchanges) or allocate resources or capital effectively could have an adverse effect on TDS' business, financial condition or results of operations.*
- *Uncertainty in TDS' future cash flow and liquidity or the inability to access capital, deterioration in the capital markets, other changes in TDS' performance or market conditions, changes in TDS' credit ratings or other factors could limit or restrict the availability of financing on terms and prices acceptable to TDS, which could require TDS to reduce its construction, development or acquisition programs, reduce the amount of wireless spectrum licenses acquired, and/or reduce or cease share repurchases and/or the payment of dividends.*
- *TDS has a significant amount of indebtedness which could adversely affect its financial performance and in turn adversely affect its ability to make payments on its indebtedness, comply with terms of debt covenants and incur additional debt.*
- *Changes in roaming practices or other factors could cause TDS' roaming revenues to decline from current levels, roaming expenses to increase from current levels and/or impact TDS' ability to service its customers in geographic areas where TDS does not have its own network, which could have an adverse effect on TDS' business, financial condition or results of operations.*
- *A failure by TDS to obtain access to adequate radio spectrum to meet current or anticipated future needs and/or to accurately predict future needs for radio spectrum could have an adverse effect on TDS' business, financial condition or results of operations.*
- *To the extent conducted by the FCC, TDS may participate in FCC auctions for additional spectrum or for funding in certain Universal Service programs in the future directly or indirectly and, during certain periods, will be subject to the FCC's anti-collusion rules, which could have an adverse effect on TDS.*
- *Failure by TDS to timely or fully comply with any existing applicable legislative and/or regulatory requirements or changes thereto could adversely affect TDS' business, financial condition or results of operations.*
- *An inability to attract people of outstanding talent throughout all levels of the organization, to develop their potential through education and assignments, and to retain them by keeping them engaged, challenged and properly rewarded could have an adverse effect on TDS' business, financial condition or results of operations.*
- *TDS' assets and revenue are concentrated primarily in the U.S. telecommunications industry. Consequently, its operating results may fluctuate based on factors related primarily to conditions in this industry.*
- *TDS' smaller scale relative to larger competitors that may have greater financial and other resources than TDS could cause TDS to be unable to compete successfully, which could adversely affect its business, financial condition or results of operations.*
- *Changes in various business factors, including changes in demand, consumer preferences and perceptions, price competition, churn from customer switching activity and other factors, could have an adverse effect on TDS' business, financial condition or results of operations.*

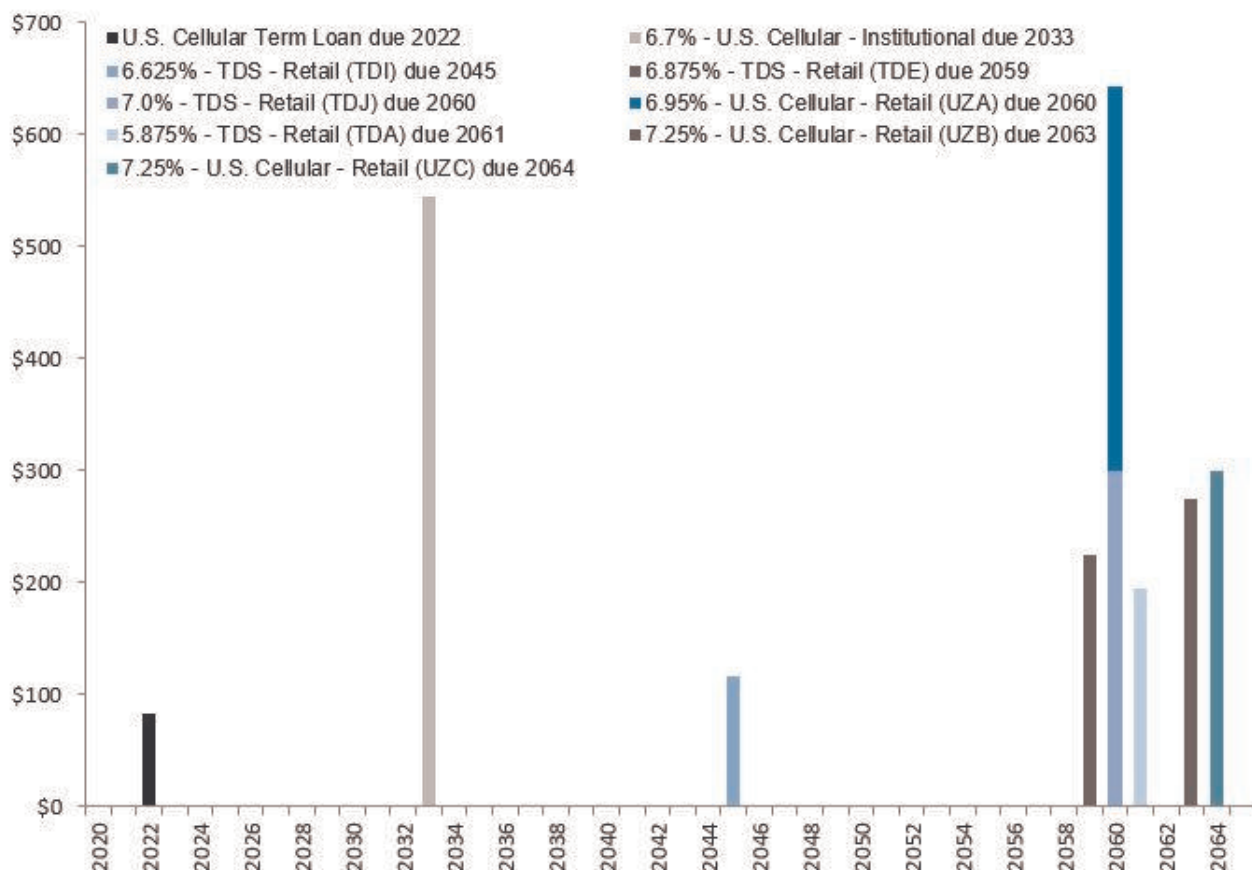
- *Advances or changes in technology could render certain technologies used by TDS obsolete, could put TDS at a competitive disadvantage, could reduce TDS' revenues or could increase its costs of doing business.*
- *Complexities associated with deploying new technologies present substantial risk and TDS' investments in unproven technologies may not produce the benefits that TDS expects.*
- *TDS receives regulatory support and is subject to numerous surcharges and fees from federal, state and local governments, and the applicability and the amount of the support and fees are subject to great uncertainty, which could have an adverse effect on TDS' business, financial condition or results of operations.*
- *Changes in TDS' enterprise value, changes in the market supply or demand for wireless spectrum licenses, wireline or cable markets or IT service providers, adverse developments in the businesses or the industries in which TDS is involved and/or other factors could require TDS to recognize impairments in the carrying value of its wireless spectrum licenses, goodwill, franchise rights and/or physical assets or require re-evaluation of the indefinite-lived nature of such assets.*
- *Costs, integration problems or other factors associated with acquisitions, divestitures or exchanges of properties or wireless spectrum licenses and/or expansion of TDS' businesses could have an adverse effect on TDS' business, financial condition or results of operations.*
- *A failure by TDS to complete significant network construction and systems implementation activities as part of its plans to improve the quality, coverage, capabilities and capacity of its network, support and other systems and infrastructure could have an adverse effect on its operations.*
- *Difficulties involving third parties with which TDS does business, including changes in TDS' relationships with or financial or operational difficulties of key suppliers or independent agents and third party national retailers who market TDS' services, could adversely affect TDS' business, financial condition or results of operations.*
- *TDS has significant investments in entities that it does not control. Losses in the value of such investments could have an adverse effect on TDS' financial condition or results of operations.*
- *A failure by TDS to maintain flexible and capable telecommunication networks or information technology, or a material disruption thereof, could have an adverse effect on TDS' business, financial condition or results of operations.*
- *TDS has experienced, and in the future expects to experience, cyber-attacks or other breaches of network or information technology security of varying degrees on a regular basis, which could have an adverse effect on TDS' business, financial condition or results of operations.*
- *Changes in facts or circumstances, including new or additional information, could require TDS to record adjustments to amounts reflected in the financial statements, which could have an adverse effect on TDS' business, financial condition or results of operations.*
- *Disruption in credit or other financial markets, a deterioration of U.S. or global economic conditions or other events could, among other things, impede TDS' access to or increase the cost of financing its operating and investment activities and/or result in reduced revenues and lower operating income and cash flows, which would have an adverse effect on TDS' business, financial condition or results of operations.*
- *Settlements, judgments, restraints on its current or future manner of doing business and/or legal costs resulting from pending and future litigation could have an adverse effect on TDS' business, financial condition or results of operations.*
- *The possible development of adverse precedent in litigation or conclusions in professional studies to the effect that radio frequency emissions from wireless devices and/or cell sites cause harmful health consequences, including cancer or tumors, or may interfere with various electronic medical devices such as pacemakers, could have an adverse effect on TDS' wireless business, financial condition or results of operations.*
- *Claims of infringement of intellectual property and proprietary rights of others, primarily involving patent infringement claims, could prevent TDS from using necessary technology to provide products or services or subject TDS to expensive intellectual property litigation or monetary penalties, which could have an adverse effect on TDS' business, financial condition or results of operations.*
- *Certain matters, such as control by the TDS Voting Trust and provisions in the TDS Restated Certificate of Incorporation, may serve to discourage or make more difficult a change in control of TDS or have other consequences.*
- *The market price of TDS' Common Shares is subject to fluctuations due to a variety of factors.*
- *Any of the foregoing events or other events could cause revenues, earnings, capital expenditures and/or any other financial or statistical information to vary from TDS' forward-looking estimates by a material amount.*

Market Risk

Long-Term Debt

As of December 31, 2019, the majority of TDS' long-term debt was in the form of fixed-rate notes with remaining maturities ranging up to 45 years. Fluctuations in market interest rates can lead to significant fluctuations in the fair value of these fixed-rate notes.

The following chart presents the scheduled principal payments on long-term debt by maturity dates at December 31, 2019:



The following table presents the scheduled principal payments on long-term debt, finance lease obligations, and other installment arrangements, and the related weighted average interest rates by maturity dates at December 31, 2019:

	Principal Payments Due by Period	
	Long-Term Debt Obligations ¹	Weighted-Avg. Interest Rates on Long-Term Debt Obligations ²
(Dollars in millions)		
2020	\$ 10	1.0%
2021	2	4.0%
2022	83	3.6%
2023	—	6.5%
2024	—	6.5%
Thereafter	2,303	6.9%
Total	\$ 2,398	6.7%

¹ The total long-term debt obligation differs from Long-term debt in the Consolidated Balance Sheet due to unamortized debt issuance costs on all non-revolving debt instruments, unamortized discounts related to U.S. Cellular's 6.7% Senior Notes, and unamortized discounts related to the Installment payment agreement. See Note 13 — Debt in the Notes to Consolidated Financial Statements for additional information.

² Represents the weighted average stated interest rates at December 31, 2019, for debt maturing in the respective periods.

Fair Value of Long-Term Debt

At December 31, 2019 and 2018, the estimated fair value of long-term debt obligations, excluding finance lease obligations, other installment arrangements, the current portion of such long-term debt and debt financing costs, was \$2,474 million and \$2,309 million, respectively. See Note 3 — Fair Value Measurements in the Notes to Consolidated Financial Statements for additional information.

Other Market Risk Sensitive Instruments

The substantial majority of TDS' other market risk sensitive instruments (as defined in Item 305 of SEC Regulation S-K) are short-term, including Cash and cash equivalents. Accordingly, TDS believes that a significant change in interest rates would not have a material effect on such other market risk sensitive instruments.

Supplemental Information Relating to Non-GAAP Financial Measures

TDS sometimes uses information derived from consolidated financial information but not presented in its financial statements prepared in accordance with U.S. GAAP to evaluate the performance of its business. Certain of these measures are considered “non-GAAP financial measures” under U.S. Securities and Exchange Commission Rules. Specifically, TDS has referred to the following measures in this Form 10-K Report:

- EBITDA
- Adjusted EBITDA
- Adjusted OIBDA
- Free cash flow

Following are explanations of each of these measures:

EBITDA, Adjusted EBITDA and Adjusted OIBDA

EBITDA, Adjusted EBITDA and Adjusted OIBDA are defined as net income adjusted for the items set forth in the reconciliation below. EBITDA, Adjusted EBITDA and Adjusted OIBDA are not measures of financial performance under GAAP and should not be considered as alternatives to Net income or Cash flows from operating activities, as indicators of cash flows or as measures of liquidity. TDS does not intend to imply that any such items set forth in the reconciliation below are non-recurring, infrequent or unusual; such items may occur in the future.

Adjusted EBITDA is a segment measure reported to the chief operating decision maker for purposes of making decisions about allocating resources to the segments and assessing their performance. See Note 20 — Business Segment Information in the Notes to Consolidated Financial Statements for additional information.

Management uses Adjusted EBITDA and Adjusted OIBDA as measurements of profitability and, therefore, reconciliations to applicable GAAP income measures are deemed appropriate. Management believes Adjusted EBITDA and Adjusted OIBDA are useful measures of TDS’ operating results before significant recurring non-cash charges, gains and losses, and other items as presented below as they provide additional relevant and useful information to investors and other users of TDS’ financial data in evaluating the effectiveness of its operations and underlying business trends in a manner that is consistent with management’s evaluation of business performance. Adjusted EBITDA shows adjusted earnings before interest, taxes, depreciation, amortization and accretion, and gains and losses, while Adjusted OIBDA reduces this measure further to exclude Equity in earnings of unconsolidated entities and Interest and dividend income in order to more effectively show the performance of operating activities excluding investment activities. The following tables reconcile EBITDA, Adjusted EBITDA and Adjusted OIBDA to the corresponding GAAP measures, Net income or Income (loss) before income taxes and Operating income (loss). Income tax expense is not provided at the individual segment level for Wireline and Cable. TDS calculates income tax expense for TDS Telecom in total.

TDS - CONSOLIDATED	2019	2018
(Dollars in millions)		
Net income (GAAP)	\$ 147	\$ 175
Add back or deduct:		
Income tax expense	64	46
Interest expense	165	172
Depreciation, amortization and accretion	932	883
EBITDA (Non-GAAP)	1,308	1,276
Add back or deduct:		
(Gain) loss on asset disposals, net	12	9
(Gain) loss on sale of business and other exit costs, net	(1)	—
(Gain) loss on license sales and exchanges, net	—	(18)
Adjusted EBITDA (Non-GAAP)	1,319	1,267
Deduct:		
Equity in earnings of unconsolidated entities	168	160
Interest and dividend income	29	26
Other, net	—	2
Adjusted OIBDA (Non-GAAP)	1,122	1,079
Deduct:		
Depreciation, amortization and accretion	932	883
(Gain) loss on asset disposals, net	12	9
(Gain) loss on sale of business and other exit costs, net	(1)	—
(Gain) loss on license sales and exchanges, net	—	(18)
Operating income (GAAP)	\$ 179	\$ 205

U.S. CELLULAR	2019	2018
(Dollars in millions)		
Net income (GAAP)	\$ 133	\$ 164
Add back or deduct:		
Income tax expense	52	51
Interest expense	110	116
Depreciation, amortization and accretion	702	640
EBITDA (Non-GAAP)	997	971
Add back or deduct:		
(Gain) loss on asset disposals, net	19	10
(Gain) loss on sale of business and other exit costs, net	(1)	—
(Gain) loss on license sales and exchanges, net	—	(18)
Adjusted EBITDA (Non-GAAP)	1,015	963
Deduct:		
Equity in earnings of unconsolidated entities	166	159
Interest and dividend income	17	15
Other, net	—	(1)
Adjusted OIBDA (Non-GAAP)	832	790
Deduct:		
Depreciation, amortization and accretion	702	640
(Gain) loss on asset disposals, net	19	10
(Gain) loss on sale of business and other exit costs, net	(1)	—
(Gain) loss on license sales and exchanges, net	—	(18)
Operating income (GAAP)	\$ 112	\$ 158

TDS TELECOM	2019	2018
(Dollars in millions)		
Net income (GAAP)	\$ 92	\$ 89
Add back or deduct:		
Income tax expense	30	16
Interest expense	(3)	(2)
Depreciation, amortization and accretion	200	212
EBITDA (Non-GAAP)	320	315
Add back or deduct:		
(Gain) loss on asset disposals, net	(7)	(2)
Adjusted EBITDA (Non-GAAP)	313	313
Deduct:		
Interest and dividend income	12	8
Other, net	—	2
Adjusted OIBDA (Non-GAAP)	300	303
Deduct:		
Depreciation, amortization and accretion	200	212
(Gain) loss on asset disposals, net	(7)	(2)
Operating income (GAAP)	\$ 107	\$ 93

Numbers may not foot due to rounding.

WIRESLINE

2019

2018

(Dollars in millions)

Income before income taxes (GAAP)	\$ 110	\$ 106
Add back or deduct:		
Interest expense	(3)	(2)
Depreciation, amortization and accretion	132	142
EBITDA (Non-GAAP)	239	247
Add back or deduct:		
(Gain) loss on asset disposals, net	(8)	(3)
Adjusted EBITDA (Non-GAAP)	231	243
Deduct:		
Interest and dividend income	10	7
Other, net	—	3
Adjusted OIBDA (Non-GAAP)	220	234
Deduct:		
Depreciation, amortization and accretion	132	142
(Gain) loss on asset disposals, net	(8)	(3)
Operating income (GAAP)	\$ 96	\$ 95

Numbers may not foot due to rounding.

CABLE

2019

2018

(Dollars in millions)

Income (loss) before income taxes (GAAP)	\$ 13	\$ (1)
Add back:		
Depreciation, amortization and accretion	68	69
EBITDA (Non-GAAP)	81	69
Add back or deduct:		
(Gain) loss on asset disposals, net	1	1
Adjusted EBITDA (Non-GAAP)	82	70
Deduct:		
Interest and dividend income	2	1
Adjusted OIBDA (Non-GAAP)	80	69
Deduct:		
Depreciation, amortization and accretion	68	69
(Gain) loss on asset disposals, net	1	1
Operating income (loss) (GAAP)	\$ 11	\$ (2)

Numbers may not foot due to rounding.

Free Cash Flow

The following table presents Free cash flow, which is defined as Cash flow from operating activities less Cash paid for additions to property, plant and equipment. Free cash flow is a non-GAAP financial measure which TDS believes may be useful to investors and other users of its financial information in evaluating liquidity, specifically, the amount of net cash generated by business operations after deducting Cash paid for additions to property, plant and equipment.

	2019	2018
(Dollars in millions)		
Cash flows from operating activities (GAAP)	\$ 1,016	\$ 1,017
Less: Cash paid for additions to property, plant and equipment	957	776
Free cash flow (Non-GAAP)	\$ 59	\$ 241

Financial Statements

Telephone and Data Systems, Inc. Consolidated Statement of Operations

Year Ended December 31,	2019	2018	2017
(Dollars and shares in millions, except per share amounts)			
Operating revenues			
Service	\$ 4,059	\$ 3,999	\$ 3,979
Equipment and product sales	1,117	1,110	1,065
Total operating revenues	<u>5,176</u>	<u>5,109</u>	<u>5,044</u>
Operating expenses			
Cost of services (excluding Depreciation, amortization and accretion reported below)	1,202	1,206	1,164
Cost of equipment and products	1,135	1,130	1,195
Selling, general and administrative	1,717	1,694	1,689
Depreciation, amortization and accretion	932	883	844
Loss on impairment of goodwill	—	—	262
(Gain) loss on asset disposals, net	12	9	21
(Gain) loss on sale of business and other exit costs, net	(1)	—	(1)
(Gain) loss on license sales and exchanges, net	—	(18)	(22)
Total operating expenses	<u>4,997</u>	<u>4,904</u>	<u>5,152</u>
Operating income (loss)	179	205	(108)
Investment and other income (expense)			
Equity in earnings of unconsolidated entities	168	160	137
Interest and dividend income	29	26	15
Interest expense	(165)	(172)	(170)
Other, net	—	2	4
Total investment and other income (expense)	<u>32</u>	<u>16</u>	<u>(14)</u>
Income (loss) before income taxes	211	221	(122)
Income tax expense (benefit)	64	46	(279)
Net income	147	175	157
Less: Net income attributable to noncontrolling interests, net of tax	26	40	4
Net income attributable to TDS shareholders	<u>\$ 121</u>	<u>\$ 135</u>	<u>\$ 153</u>
Basic weighted average shares outstanding	114	112	111
Basic earnings per share attributable to TDS shareholders	<u>\$ 1.06</u>	<u>\$ 1.20</u>	<u>\$ 1.39</u>
Diluted weighted average shares outstanding	116	114	112
Diluted earnings per share attributable to TDS shareholders	<u>\$ 1.03</u>	<u>\$ 1.17</u>	<u>\$ 1.37</u>

The accompanying notes are an integral part of these consolidated financial statements.

Telephone and Data Systems, Inc.
Consolidated Statement of Comprehensive Income

Year Ended December 31,	2019	2018	2017
(Dollars in millions)			
Net income	\$ 147	\$ 175	\$ 157
Net change in accumulated other comprehensive income			
Change related to retirement plan			
Amounts included in net periodic benefit cost for the period			
Net actuarial gains	1	—	2
Prior service cost	—	(10)	(3)
Amortization of prior service cost	1	(1)	(2)
	<u>2</u>	<u>(11)</u>	<u>(3)</u>
Change in deferred income taxes	(1)	3	1
Change related to retirement plan, net of tax	<u>1</u>	<u>(8)</u>	<u>(2)</u>
Net change in accumulated other comprehensive income	<u>1</u>	<u>(8)</u>	<u>(2)</u>
Comprehensive income	148	167	155
Less: Net income attributable to noncontrolling interests, net of tax	26	40	4
Comprehensive income attributable to TDS shareholders	\$ 122	\$ 127	\$ 151

The accompanying notes are an integral part of these consolidated financial statements.

Telephone and Data Systems, Inc.
Consolidated Statement of Cash Flows

Year Ended December 31,	2019	2018	2017
(Dollars in millions)			
Cash flows from operating activities			
Net income	\$ 147	\$ 175	\$ 157
Add (deduct) adjustments to reconcile net income to net cash flows from operating activities			
Depreciation, amortization and accretion	932	883	844
Bad debts expense	112	101	95
Stock-based compensation expense	59	54	46
Deferred income taxes, net	34	33	(369)
Equity in earnings of unconsolidated entities	(168)	(160)	(137)
Distributions from unconsolidated entities	162	153	136
Loss on impairment of goodwill	—	—	262
(Gain) loss on asset disposals, net	12	9	21
(Gain) loss on sale of business and other exit costs, net	(1)	—	(1)
(Gain) loss on license sales and exchanges, net	—	(18)	(22)
Other operating activities	4	4	3
Changes in assets and liabilities from operations			
Accounts receivable	(49)	(39)	(61)
Equipment installment plans receivable	(97)	(149)	(261)
Inventory	(19)	(5)	6
Accounts payable	(60)	2	(7)
Customer deposits and deferred revenues	(9)	8	(4)
Accrued taxes	(17)	(29)	37
Other assets and liabilities	(26)	(5)	31
Net cash provided by operating activities	<u>1,016</u>	<u>1,017</u>	<u>776</u>
Cash flows from investing activities			
Cash paid for additions to property, plant and equipment	(957)	(776)	(685)
Cash paid for acquisitions and licenses	(346)	(16)	(218)
Cash received from investments	29	100	—
Cash paid for investments	(11)	(17)	(100)
Cash received from divestitures and exchanges	41	29	21
Other investing activities	(5)	—	1
Net cash used in investing activities	<u>(1,249)</u>	<u>(680)</u>	<u>(981)</u>
Cash flows from financing activities			
Repayment of long-term debt	(118)	(20)	(17)
TDS Common Shares reissued for benefit plans, net of tax payments	(6)	42	4
U.S. Cellular Common Shares reissued for benefit plans, net of tax payments	(9)	18	1
Repurchase of U.S. Cellular Common Shares	(21)	—	—
Dividends paid to TDS shareholders	(75)	(72)	(69)
Distributions to noncontrolling interests	(4)	(6)	(4)
Other financing activities	13	6	8
Net cash used in financing activities	<u>(220)</u>	<u>(32)</u>	<u>(77)</u>
Net increase (decrease) in cash, cash equivalents and restricted cash	(453)	305	(282)
Cash, cash equivalents and restricted cash			
Beginning of period	<u>927</u>	<u>622</u>	<u>904</u>
End of period	<u>\$ 474</u>	<u>\$ 927</u>	<u>\$ 622</u>

The accompanying notes are an integral part of these consolidated financial statements.

Telephone and Data Systems, Inc.
Consolidated Balance Sheet — Assets

December 31,	2019	2018
(Dollars in millions)		
Current assets		
Cash and cash equivalents	\$ 465	\$ 921
Short-term investments	—	17
Accounts receivable		
Customers and agents, less allowances of \$74 and \$71, respectively	1,005	992
Other, less allowances of \$2 and \$2, respectively	119	107
Inventory, net	169	150
Prepaid expenses	98	103
Income taxes receivable	36	12
Other current assets	29	28
Total current assets	1,921	2,330
 Assets held for sale		
	—	54
 Licenses		
	2,480	2,195
 Goodwill		
	547	509
 Other intangible assets, net of accumulated amortization of \$167 and \$168, respectively		
	239	253
 Investments in unconsolidated entities		
	488	480
 Property, plant and equipment		
In service and under construction	12,864	12,074
Less: Accumulated depreciation and amortization	9,337	8,728
Property, plant and equipment, net	3,527	3,346
 Operating lease right-of-use assets		
	972	—
 Other assets and deferred charges		
	607	616
 Total assets¹		
	\$ 10,781	\$ 9,783

The accompanying notes are an integral part of these consolidated financial statements.

Telephone and Data Systems, Inc.
Consolidated Balance Sheet — Liabilities and Equity

December 31,	2019	2018
(Dollars and shares in millions, except per share amounts)		
Current liabilities		
Current portion of long-term debt	\$ 10	\$ 21
Accounts payable	374	365
Customer deposits and deferred revenues	189	197
Accrued interest	11	11
Accrued taxes	41	44
Accrued compensation	121	127
Short-term operating lease liabilities	116	—
Other current liabilities	100	114
Total current liabilities	962	879
Liabilities held for sale	—	1
Deferred liabilities and credits		
Deferred income tax liability, net	676	640
Long-term operating lease liabilities	931	—
Other deferred liabilities and credits	481	541
Long-term debt, net	2,316	2,418
Commitments and contingencies		
Noncontrolling interests with redemption features	11	11
Equity		
TDS shareholders' equity		
Series A Common and Common Shares		
Authorized 290 shares (25 Series A Common and 265 Common Shares)		
Issued 133 shares (7 Series A Common and 126 Common Shares)		
Outstanding 115 shares (7 Series A Common and 108 Common Shares) and 114 shares (7 Series A Common and 107 Common Shares), respectively		
Par Value (\$.01 per share)	1	1
Capital in excess of par value	2,468	2,432
Treasury shares, at cost, 18 and 19 Common Shares, respectively	(479)	(519)
Accumulated other comprehensive loss	(9)	(10)
Retained earnings	2,672	2,656
Total TDS shareholders' equity	4,653	4,560
Noncontrolling interests	751	733
Total equity	5,404	5,293
Total liabilities and equity¹	\$ 10,781	\$ 9,783

The accompanying notes are an integral part of these consolidated financial statements.

¹ The consolidated total assets as of December 31, 2019 and 2018, include assets held by consolidated variable interest entities (VIEs) of \$915 million and \$848 million, respectively, which are not available to be used to settle the obligations of TDS. The consolidated total liabilities as of December 31, 2019 and 2018, include certain liabilities of consolidated VIEs of \$20 million and \$21 million, respectively, for which the creditors of the VIEs have no recourse to the general credit of TDS. See Note 16 — Variable Interest Entities for additional information.

Telephone and Data Systems, Inc.
Consolidated Statement of Changes in Equity

	TDS Shareholders							Total equity
	Series A Common and Common shares	Capital in excess of par value	Treasury shares	Accumulated other comprehensive income (loss)	Retained earnings	Total TDS shareholders' equity	Noncontrolling interests	
(Dollars in millions, except per share amounts)								
December 31, 2018	\$ 1	\$ 2,432	\$ (519)	\$ (10)	\$ 2,656	\$ 4,560	\$ 733	\$ 5,293
Cumulative effect of accounting changes	—	—	—	—	2	2	—	2
Net income attributable to TDS shareholders	—	—	—	—	121	121	—	121
Net income attributable to noncontrolling interests classified as equity	—	—	—	—	—	—	26	26
Other comprehensive income	—	—	—	1	—	1	—	1
TDS Common and Series A Common share dividends (\$0.66 per share)	—	—	—	—	(75)	(75)	—	(75)
Dividend reinvestment plan	—	1	20	—	(6)	15	—	15
Incentive and compensation plans	—	—	20	—	(26)	(6)	—	(6)
Adjust investment in subsidiaries for repurchases, issuances and other compensation plans	—	17	—	—	—	17	(5)	12
Stock-based compensation awards	—	18	—	—	—	18	—	18
Distributions to noncontrolling interests	—	—	—	—	—	—	(3)	(3)
December 31, 2019	\$ 1	\$ 2,468	\$ (479)	\$ (9)	\$ 2,672	\$ 4,653	\$ 751	\$ 5,404

The accompanying notes are an integral part of these consolidated financial statements.

Telephone and Data Systems, Inc.
Consolidated Statement of Changes in Equity

	TDS Shareholders							
	Series A Common and Common shares	Capital in excess of par value	Treasury shares	Accumulated other comprehensive income (loss)	Retained earnings	Total TDS shareholders' equity	Noncontrolling interests	Total equity
(Dollars in millions, except per share amounts)								
December 31, 2017	\$ 1	\$ 2,413	\$ (669)	\$ (1)	\$ 2,525	\$ 4,269	\$ 623	\$ 4,892
Cumulative effect of accounting changes	—	—	—	(1)	165	164	31	195
Net income attributable to TDS shareholders	—	—	—	—	135	135	—	135
Net income attributable to noncontrolling interests classified as equity	—	—	—	—	—	—	28	28
Other comprehensive loss	—	—	—	(8)	—	(8)	—	(8)
TDS Common and Series A Common Share dividends (\$0.64 per share)	—	—	—	—	(72)	(72)	—	(72)
Dividend reinvestment plan	—	1	25	—	(14)	12	—	12
Incentive and compensation plans	—	—	125	—	(83)	42	—	42
Adjust investment in subsidiaries for repurchases, issuances and other compensation plans	—	1	—	—	—	1	54	55
Stock-based compensation awards	—	17	—	—	—	17	—	17
Distributions to noncontrolling interests	—	—	—	—	—	—	(3)	(3)
December 31, 2018	\$ 1	\$ 2,432	\$ (519)	\$ (10)	\$ 2,656	\$ 4,560	\$ 733	\$ 5,293

The accompanying notes are an integral part of these consolidated financial statements.

Telephone and Data Systems, Inc.
Consolidated Statement of Changes in Equity

	TDS Shareholders								
	Series A Common and Common shares	Capital in excess of par value	Treasury shares	Accumulated other comprehensive income	Retained earnings	Total TDS shareholders' equity	Preferred shares	Noncontrolling interests	Total equity
	\$	\$	\$	\$	\$	\$	\$	\$	\$
December 31, 2016	1	2,386	(698)	1	2,454	4,144	1	605	4,750
Net income attributable to TDS shareholders	—	—	—	—	153	153	—	—	153
Net income attributable to noncontrolling interests classified as equity	—	—	—	—	—	—	—	4	4
Other comprehensive loss	—	—	—	(2)	—	(2)	—	—	(2)
TDS Common and Series A Common Share dividends (\$0.62 per share)	—	—	—	—	(69)	(69)	—	—	(69)
Redemption of Preferred shares	—	—	—	—	—	—	(1)	—	(1)
Dividend reinvestment plan	—	—	13	—	(1)	12	—	—	12
Incentive and compensation plans	—	—	16	—	(12)	4	—	—	4
Adjust investment in subsidiaries for repurchases, issuances and other compensation plans	—	13	—	—	—	13	—	18	31
Stock-based compensation awards	—	14	—	—	—	14	—	—	14
Distributions to noncontrolling interests	—	—	—	—	—	—	—	(4)	(4)
December 31, 2017	1	2,413	(669)	(1)	2,525	4,269	—	623	4,892

(Dollars in millions, except per share amounts)

The accompanying notes are an integral part of these consolidated financial statements.

Telephone and Data Systems, Inc.
Notes to Consolidated Financial Statements

Note 1 Summary of Significant Accounting Policies and Recent Accounting Pronouncements

Nature of Operations

Telephone and Data Systems, Inc. (TDS) is a diversified telecommunications company providing high-quality communications services to customers with 4.9 million wireless connections and 1.2 million wireline and cable connections at December 31, 2019. TDS conducts all of its wireless operations through its 82%-owned subsidiary, United States Cellular Corporation (U.S. Cellular). TDS provides wireline and cable services through its wholly-owned subsidiary, TDS Telecommunications LLC (TDS Telecom).

TDS has the following reportable segments: U.S. Cellular, Wireline, and Cable. TDS' non-reportable other business activities are presented as "Corporate, Eliminations and Other," which includes the operations of TDS' wholly-owned hosted and managed services (HMS) subsidiary, which operates under the OneNeck IT Solutions brand, and its wholly-owned printing subsidiary Suttle-Straus, Inc. (Suttle-Straus). HMS' and Suttle-Straus' financial results were not significant to TDS' operations. All of TDS' segments operate only in the United States. See Note 20 — Business Segment Information for summary financial information on each business segment.

Principles of Consolidation

The accounting policies of TDS conform to accounting principles generally accepted in the United States of America (GAAP) as set forth in the Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC). Unless otherwise specified, references to accounting provisions and GAAP in these notes refer to the requirements of the FASB ASC. The consolidated financial statements include the accounts of TDS and subsidiaries in which it has a controlling financial interest, including U.S. Cellular and TDS Telecom. In addition, the consolidated financial statements include certain entities in which TDS has a variable interest that requires consolidation under GAAP. See Note 16 — Variable Interest Entities for additional information relating to TDS' VIEs. All material intercompany accounts and transactions have been eliminated.

Use of Estimates

The preparation of consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect (a) the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and (b) the reported amounts of revenues and expenses during the reported period. Actual results could differ from those estimates. Significant estimates are involved in accounting for goodwill, indefinite-lived intangible assets and income taxes.

Cash, Cash Equivalents and Restricted Cash

Cash and cash equivalents include cash and highly liquid investments with original maturities of three months or less. Cash and cash equivalents subject to contractual restrictions are classified as restricted cash. The following table provides a reconciliation of Cash and cash equivalents and restricted cash reported in the Consolidated Balance Sheet to the total of the amounts in the Consolidated Statement of Cash Flows.

December 31,	2019	2018
(Dollars in millions)		
Cash and cash equivalents	\$ 465	\$ 921
Restricted cash included in Other current assets	9	6
Cash, cash equivalents and restricted cash in the statement of cash flows	<u>\$ 474</u>	<u>\$ 927</u>

Accounts Receivable and Allowance for Doubtful Accounts

U.S. Cellular's accounts receivable consist primarily of amounts owed by customers for wireless services and equipment sales, including sales of certain devices and accessories under installment plans, by agents for sales of equipment to them and by other wireless carriers whose customers have used U.S. Cellular's wireless systems.

TDS Telecom's accounts receivable primarily consist of amounts owed by customers for services and products provided, by state and federal governments for grants and support funds, and by interexchange carriers for long-distance traffic, which TDS Telecom carries on its network.

The allowance for doubtful accounts is the best estimate of the amount of probable credit losses related to existing billed and unbilled accounts receivable. The allowance is estimated based on historical experience, account aging and other factors that could affect collectability. Accounts receivable balances are reviewed on either an aggregate or individual basis for collectability depending on the type of receivable. When it is probable that an account balance will not be collected, the account balance is charged against the allowance for doubtful accounts. TDS does not have any off-balance sheet credit exposure related to its customers.

Inventory

Inventory consists primarily of wireless devices stated at the lower of cost, which approximates cost determined on the first-in first-out basis, or net realizable value. Net realizable value is determined by reference to the stand-alone selling price.

Licenses

Licenses consist of direct and incremental costs incurred in acquiring Federal Communications Commission (FCC) wireless spectrum licenses that provide TDS with the exclusive right to utilize designated radio spectrum within specific geographic service areas to provide wireless service. Although wireless spectrum licenses are issued for a fixed period of time, generally ten years, or in some cases twelve or fifteen years, the FCC has granted license renewals routinely and at a nominal cost. The wireless spectrum licenses held by TDS expire at various dates. TDS believes that it is probable that its future wireless spectrum license renewal applications will be granted. TDS determined that there are currently no legal, regulatory, contractual, competitive, economic or other factors that limit the useful lives of the wireless spectrum licenses. Therefore, TDS has determined that wireless spectrum licenses are indefinite-lived intangible assets.

U.S. Cellular performs its annual impairment assessment of wireless spectrum licenses as of November 1 of each year or more frequently if there are events or circumstances that cause U.S. Cellular to believe it is more likely than not that the carrying value of wireless spectrum licenses exceeds fair value. For purposes of its impairment testing, U.S. Cellular separated its FCC wireless spectrum licenses into eight units of accounting. The eight units of accounting consisted of one unit of accounting for developed operating market wireless spectrum licenses (built wireless spectrum licenses) and seven geographic non-operating market wireless spectrum licenses (unbuilt wireless spectrum licenses).

U.S. Cellular performed a quantitative impairment assessment in 2019 and a qualitative impairment assessment in 2018 to determine whether the wireless spectrum licenses were impaired. Based on the impairment assessments performed, U.S. Cellular did not have an impairment of its wireless spectrum licenses in 2019 or 2018. See Note 8 — Intangible Assets for additional details related to wireless spectrum licenses.

Goodwill

TDS has Goodwill as a result of its acquisition of wireline and cable companies. TDS performs its annual impairment assessment of Goodwill as of November 1 of each year or more frequently if there are events or circumstances that cause TDS to believe it is more likely than not that the carrying value of individual reporting units exceeds their respective fair values. Goodwill impairment loss will be measured as the amount by which a reporting unit's carrying amount exceeds its fair value. The loss recognized should not exceed the total amount of goodwill allocated to that reporting unit.

For purposes of conducting its Goodwill impairment tests, TDS Telecom identified two reporting units: Wireline and Cable. The discounted cash flow approach and guideline public company method were used to value the Wireline and Cable reporting units for the annual impairment tests. Based on the annual impairment assessments performed, Wireline and Cable did not have an impairment of their Goodwill in 2019 or 2018.

In 2017, TDS recorded goodwill impairments related to its U.S. Cellular and HMS reporting units, which reduced the carrying value of their respective Goodwill to zero.

See Note 8 — Intangible Assets for additional details related to Goodwill.

Franchise Rights

TDS Telecom has franchise rights as a result of acquisitions of cable businesses. Franchise rights are intangible assets that provide their holder with the right to operate a business in a certain geographical location as sanctioned by the franchiser, usually a government agency. Franchise rights are generally granted for ten years and may be renewed for additional terms upon approval by the granting authority. TDS anticipates that future renewals of its franchise rights will be granted. Effective January 1, 2018, TDS prospectively changed its estimated useful life for franchise rights from indefinite-lived to fifteen years, due primarily to the effects of increasing competition and advancements in technology for delivering and consuming video programming. Commensurate with this change, TDS reviewed its franchise rights for impairment, and noted there was no impairment as of January 1, 2018. As a result, Depreciation, amortization and accretion increased \$17 million, calculated on a straight-line basis, and Net income decreased \$13 million or \$0.11 per share (Basic and Diluted) for the year ended December 31, 2018. TDS reviews franchise rights for impairment whenever events or changes in circumstances indicate that the assets might be impaired. TDS re-evaluates the useful life of franchise rights each year to determine if changes in technology or other business changes would warrant a revision of its remaining useful life.

See Note 8 — Intangible Assets for additional details related to franchise rights.

Investments in Unconsolidated Entities

For its equity method investments for which financial information is readily available, TDS records its equity in the earnings of the entity in the current period. For its equity method investments for which financial information is not readily available, TDS records its equity in the earnings of the entity on a one quarter lag basis.

Property, Plant and Equipment

Property, plant and equipment is stated at the original cost of construction or purchase including capitalized costs of certain taxes, payroll-related expenses, interest and estimated costs to remove the assets.

Expenditures that enhance the productive capacity of assets in service or extend their useful lives are capitalized and depreciated. Expenditures for maintenance and repairs of assets in service are charged to Cost of services or Selling, general and administrative expense, as applicable. Retirements and disposals of assets are recorded by removing the original cost of the asset (along with the related accumulated depreciation) from plant in service and recording it, together with proceeds, if any, and net removal costs (removal costs less an applicable accrued asset retirement obligation and salvage value realized), as a gain or loss, as appropriate. Certain Wireline segment assets use the group depreciation method. Accordingly, when a group method asset is retired in the ordinary course of business, the original cost of the asset and accumulated depreciation in the same amount are removed, with no gain or loss recognized on the disposition.

TDS capitalizes certain costs of developing new information systems. Software licenses that qualify for capitalization as an asset are accounted for as the acquisition of an intangible asset and the incurrence of a liability to the extent that the license fees are not fully paid at acquisition.

Depreciation and Amortization

Depreciation is provided using the straight-line method over the estimated useful life of the related asset, except for certain Wireline segment assets, which use the group depreciation method. The group depreciation method develops a depreciation rate based on the average useful life of a specific group of assets, rather than each asset individually. TDS depreciates leasehold improvement assets over periods ranging from one year to thirty years; such periods approximate the shorter of the assets' economic lives or the specific lease terms.

Useful lives of specific assets are reviewed throughout the year to determine if changes in technology or other business changes would warrant accelerating the depreciation of those specific assets. There were no material changes to the assigned useful lives of the various categories of property, plant and equipment in 2019, 2018 or 2017. However, depreciation for certain specific assets was accelerated due to changes in technology. See Note 10 — Property, Plant and Equipment for additional details related to useful lives.

Impairment of Long-Lived Assets

TDS reviews long-lived assets for impairment whenever events or changes in circumstances indicate that the assets might be impaired. U.S. Cellular has one asset group and TDS Telecom has two asset groups for purposes of assessing property, plant and equipment for impairment based on the integrated nature of its network, assets and operations. The cash flows generated by each of these groups is the lowest level for which identifiable cash flows are largely independent of the cash flows of other groups of assets and liabilities.

Leases

A lease is generally present in a contract if the lessee controls the use of identified property, plant or equipment for a period of time in exchange for consideration. See Note 11 — Leases for additional details related to leases.

Agent Liabilities

U.S. Cellular has relationships with agents, which are independent businesses that obtain customers for U.S. Cellular. At December 31, 2019 and 2018, U.S. Cellular had accrued \$59 million and \$63 million, respectively, in agent related liabilities. These amounts are included in Other current liabilities in the Consolidated Balance Sheet.

Debt Issuance Costs

Debt issuance costs include underwriters' and legal fees and other charges related to issuing and renewing various borrowing instruments and other long-term agreements, and are amortized over the respective term of each instrument. Debt issuance costs related to TDS' and U.S. Cellular's revolving credit agreements and U.S. Cellular's receivables securitization agreement are recorded in Other assets and deferred charges in the Consolidated Balance Sheet. All other debt issuance costs are presented as an offset to the related debt obligation in the Consolidated Balance Sheet.

Asset Retirement Obligations

TDS records asset retirement obligations for the fair value of legal obligations associated with asset retirements and a corresponding increase in the carrying amount of the related long-lived asset in the period in which the obligations are incurred. In periods subsequent to initial measurement, TDS recognizes changes in the liability resulting from the passage of time and updates to the timing or the amount of the original estimates. The liability is accreted to its estimated settlement date value over the period to the estimated settlement date. The change in the carrying amount of the long-lived asset is depreciated over the average remaining life of the related asset. See Note 12 — Asset Retirement Obligations for additional information.

Treasury Shares

Common Shares repurchased by TDS are recorded at cost as treasury shares and result in a reduction of equity. When treasury shares are reissued, TDS determines the cost using the first-in, first-out cost method. The difference between the cost of the treasury shares and reissuance price is included in Capital in excess of par value or Retained earnings.

Revenue Recognition

Revenues from sales of equipment and products are recognized when control has transferred to the customer, agent or third-party distributor. Service revenues are recognized as the related service is provided. See Note 2 — Revenue Recognition for additional information on TDS' policies related to Revenues.

Advertising Costs

TDS expenses advertising costs as incurred. Advertising costs totaled \$227 million, \$230 million and \$228 million in 2019, 2018 and 2017, respectively.

Income Taxes

TDS files a consolidated federal income tax return. Deferred taxes are computed using the liability method, whereby deferred tax assets are recognized for future deductible temporary differences and operating loss carryforwards, and deferred tax liabilities are recognized for future taxable temporary differences. Both deferred tax assets and liabilities are measured using the enacted tax rates in effect when the temporary differences are expected to reverse. Temporary differences are the differences between the reported amounts of assets and liabilities and their tax bases. Deferred tax assets and liabilities are adjusted for the effects of changes in tax laws and rates on the date of enactment. Deferred tax assets are reduced by a valuation allowance when it is more likely than not that some portion or all of the deferred tax assets will not be realized. TDS evaluates income tax uncertainties, assesses the probability of the ultimate settlement with the applicable taxing authority and records an amount based on that assessment. Deferred taxes are reported as a net non-current asset or liability by jurisdiction. Any corresponding valuation allowance to reduce the amount of deferred tax assets is also recorded as non-current. See Note 5 — Income Taxes for additional information.

Stock-Based Compensation and Other Plans

TDS has established long-term incentive plans, dividend reinvestment plans, and a non-employee director compensation plan. The dividend reinvestment plan of TDS is not considered a compensatory plan and, therefore, recognition of compensation costs for grants made under this plan is not required. All other plans are considered compensatory plans; therefore, recognition of costs for grants made under these plans is required.

TDS recognizes stock compensation expense based upon the fair value of the specific awards granted using established valuation methodologies. The amount of stock compensation cost recognized on either a straight-line basis or graded attribution method is based on the portion of the award that is expected to vest over the requisite service period, which generally represents the vesting period. Stock-based compensation cost recognized has been reduced for estimated forfeitures. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. See Note 19 — Stock-Based Compensation for additional information.

Recently Issued Accounting Pronouncements

In June 2016, the FASB issued Accounting Standards Update 2016-13, *Financial Instruments - Credit Losses: Measurement of Credit Losses on Financial Instruments* (ASU 2016-13). ASU 2016-13 requires entities to use a new forward-looking, expected loss model to estimate credit losses. It also requires additional disclosure relating to the credit quality of trade and other receivables, including information relating to management's estimate of credit allowances. TDS is required to adopt ASU 2016-13 on January 1, 2020, using the modified retrospective approach. The adoption of ASU 2016-13 is not expected to have a significant impact on TDS' financial position or results of operations.

In August 2018, the FASB issued Accounting Standards Update 2018-15, *Intangibles - Goodwill and Other - Internal-Use Software: Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract* (ASU 2018-15). ASU 2018-15 aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the existing guidance for capitalizing implementation costs for an arrangement that has a software license. The service element of a hosting arrangement will continue to be expensed as incurred. Any capitalized implementation costs will be amortized over the period of the service contract. TDS is required to adopt ASU 2018-15 on January 1, 2020, either retrospectively or prospectively to eligible costs incurred on or after the date that this guidance is first applied. The adoption of ASU 2018-15 is not expected to have a significant impact on TDS' financial position or results of operations.

Note 2 Revenue Recognition

Change in Accounting Policy

In May 2014, the FASB issued Accounting Standards Update 2014-09, *Revenue from Contracts with Customers* and subsequently amended the standard with several Accounting Standards Updates, collectively referred to as ASC 606. TDS adopted and applied the provisions of ASC 606 as of January 1, 2018, using a modified retrospective method. Under this method, the new accounting standard is applied only to the most recent period presented, recognizing the cumulative effect of the accounting change as an adjustment to the beginning balance of retained earnings. Accordingly, prior periods have not been recast to reflect the new accounting standard. The cumulative effect of applying the provisions of ASC 606 was an increase of \$164 million to retained earnings as of January 1, 2018.

As a practical expedient, TDS groups similar contracts or similar performance obligations together into portfolios of contracts or performance obligations if doing so does not result in a significant difference from accounting for the individual contracts discretely. TDS applies this grouping method for the following types of transactions: device activation fees, contract acquisition costs, contract fulfillment costs, and certain customer promotions. Contract portfolios are recognized over the respective expected customer lives or terms of the contracts.

Nature of goods and services

The following is a description of principal activities from which TDS generates its revenues.

Services and products	Nature, timing of satisfaction of performance obligations, and significant payment terms
Wireless services	Wireless service includes voice, messaging and data services. Revenue is recognized in Service revenues as wireless service is provided to the customer. Wireless services generally are billed and paid in advance on a monthly basis.
Wireless devices and accessories	U.S. Cellular offers a comprehensive range of wireless devices such as handsets, tablets, mobile hotspots, home phones and routers for use by its customers, as well as accessories. U.S. Cellular also sells wireless devices to agents and other third-party distributors for resale. U.S. Cellular frequently discounts wireless devices sold to new and current customers. U.S. Cellular also offers customers the option to purchase certain devices and accessories under installment contracts over a specified time period. For certain equipment installment plans, after a specified period of time, the customer may have the right to upgrade to a new device. Such upgrades require the customer to enter into an equipment installment contract for the new device, and transfer the existing device to U.S. Cellular. U.S. Cellular recognizes revenue in Equipment and product sales revenues when control of the device or accessory is transferred to the customer, agent or third-party distributor, which is generally upon delivery.
Wireless roaming	U.S. Cellular receives roaming revenues when other wireless carriers' customers use U.S. Cellular's wireless systems. U.S. Cellular recognizes revenue in Service revenues when the roaming service is provided.
Wireless Eligible Telecommunications Carrier (ETC) Revenues	Telecommunications companies may be designated by states, or in some cases by the FCC, as an ETC to receive support payments from the Universal Service Fund if they provide specified services in "high cost" areas. ETC revenues recognized in the reporting period represent the amounts which U.S. Cellular is entitled to receive for such period, as determined and approved in connection with U.S. Cellular's designation as an ETC in various states.
Wireless tower rents	U.S. Cellular receives tower rental revenues when another carrier leases tower space on a U.S. Cellular owned tower. U.S. Cellular recognizes revenue in Service revenues in the period during which the services are provided.
Wireline services	Wireline services include broadband, video and voice services. Revenue is recognized in Service revenues as service is provided to the customer. Wireline services are generally billed and paid in advance on a monthly basis.
Wireline wholesale revenues	Wholesale revenues include network access services primarily to interexchange and wireless carriers for carrying data and voice traffic on TDS Telecom's network, special access services and state and federal support payments, including A-CAM. Wholesale revenues are recorded as the related service is provided.
Cable services	Cable services include broadband, video and voice services. Revenue is recognized in Service revenues as service is provided to the customer. Cable services are generally billed and paid in advance on a monthly basis.
IT hardware sales	TDS recognizes equipment revenue when it no longer has any requirements to perform, when title has passed and when the products are accepted by the customer.
Hosted and managed services	HMS Service revenues consist of cloud and hosting solutions, managed services, Enterprise Resource Planning (ERP) application management, colocation services, and IT hardware related maintenance and professional services. Revenues related to these services are recognized as services are provided.

Significant Judgments

Revenues from sales of equipment and products are recognized when control has transferred to the customer, agent or third-party distributor. Service revenues are recognized as the related service is provided. Services are deemed to be highly interrelated when the method and timing of transfer and performance risk are the same. Highly interrelated services that are determined to not be distinct have been grouped into a single performance obligation. Each month of services promised is a performance obligation. The series of monthly service performance obligations promised over the course of the contract are combined into a single performance obligation for purposes of the allocation.

TDS has made judgments regarding transaction price, including but not limited to issues relating to variable consideration, time value of money and returns. When determined to be significant in the context of the contract, these items are considered in the valuation of transaction price at contract inception or modification, as appropriate.

Multiple Performance Obligations

U.S. Cellular and TDS Telecom sell bundled service and equipment offerings. In these instances, TDS recognizes its revenue based on the relative standalone selling prices for each distinct service or equipment performance obligation, or bundles thereof. TDS estimates the standalone selling price of the device or accessory to be its retail price excluding discounts. TDS estimates the standalone selling price of wireless service to be the price offered to customers on month-to-month contracts.

Equipment Installment Plans

U.S. Cellular equipment revenue under equipment installment plan contracts is recognized at the time the device is delivered to the customer for the amount allocated to the equipment.

Incentives

Discounts, incentives, and rebates to agents and end customers that are deemed cash are recognized as a reduction of Operating revenues concurrently with the associated revenue.

From time to time, U.S. Cellular may offer certain promotions to incentivize customers to switch to, or to purchase additional services from, U.S. Cellular. Under these types of promotions, an eligible customer may receive an incentive in the form of a discount off additional services purchased shown as a credit to the customer's monthly bill. U.S. Cellular accounts for the future discounts as material rights at the time of the initial transaction by allocating and deferring revenue based on the relative proportion of the future discounts in comparison to the aggregate initial purchase. The deferred revenue will be recognized as service revenue in future periods.

Amounts Collected from Customers and Remitted to Governmental Authorities

TDS records amounts collected from customers and remitted to governmental authorities on a net basis within a liability account if the amount is assessed upon the customer and TDS merely acts as an agent in collecting the amount on behalf of the imposing governmental authority. If the amount is assessed upon TDS, then amounts collected from customers are recorded in Service revenues and amounts remitted to governmental authorities are recorded in Selling, general and administrative expenses in the Consolidated Statement of Operations. The amounts recorded gross in revenues that are billed to customers and remitted to governmental authorities totaled \$78 million, \$90 million and \$80 million for 2019, 2018 and 2017, respectively.

Disaggregation of Revenue

In the following table, TDS' revenues are disaggregated by type of service, which represents the relevant categorization of revenues for TDS' reportable segments, and timing of recognition. Service revenues are recognized over time and Equipment sales are point in time.

Year Ended December 31, 2019	TDS Telecom				Corporate, Eliminations and Other	Total
	U.S. Cellular	Wireline	Cable	TDS Telecom Total ¹		
(Dollars in millions)						
Revenues from contracts with customers:						
Type of service:						
Retail service	\$ 2,650	\$ —	\$ —	\$ —	\$ —	\$ 2,650
Inbound roaming	174	—	—	—	—	174
Residential	—	328	205	533	—	533
Commercial	—	168	41	209	—	209
Wholesale	—	185	—	185	—	185
Other service	137	—	—	(1)	72	208
Service revenues from contracts with customers	2,961	681	246	926	72	3,959
Equipment and product sales	987	1	—	1	129	1,117
Total revenues from contracts with customers²	\$ 3,948	\$ 682	\$ 246	\$ 927	\$ 201	\$ 5,076

Year Ended December 31, 2018	TDS Telecom				Corporate, Eliminations and Other	Total
	U.S. Cellular	Wireline	Cable	TDS Telecom Total ¹		
(Dollars in millions)						
Revenues from contracts with customers:						
Type of service:						
Retail service	\$ 2,623	\$ —	\$ —	\$ —	\$ —	\$ 2,623
Inbound roaming	154	—	—	—	—	154
Residential	—	321	188	509	—	509
Commercial	—	184	42	226	—	226
Wholesale	—	191	—	191	—	191
Other service	135	—	—	(1)	72	206
Service revenues from contracts with customers	2,912	696	230	925	72	3,909
Equipment and product sales	989	2	—	2	119	1,110
Total revenues from contracts with customers²	\$ 3,901	\$ 698	\$ 230	\$ 927	\$ 191	\$ 5,019

Numbers may not foot due to rounding.

¹ TDS Telecom Total includes eliminations between the Wireline and Cable segments.

² Revenue line items in this table will not agree to amounts presented in the Consolidated Statement of Operations as the amounts in this table only include revenue resulting from contracts with customers.

Contract Balances

For contracts that involve multiple element service and equipment offerings, the transaction price is allocated to each performance obligation based on its relative standalone selling price. When payment is collected in advance of delivery of goods or services, a contract liability is recorded. A contract asset is recorded when revenue is recognized in advance of TDS' right to receive consideration. Once there is an unconditional right to receive the consideration, TDS bills the customer under the terms of the respective contract and the amounts are recorded as receivables.

TDS recognizes Equipment and product sales revenue when the equipment is delivered to the customer and a corresponding contract asset or liability is recorded for the difference between the amount of revenue recognized and the amount billed to the customer in cases where discounts are offered. The contract asset or liability is reduced over the contract term as service is provided and billed to the customer.

The following table provides balances for contract assets from contracts with customers, which are recorded in Other current assets and Other assets and deferred charges in the Consolidated Balance Sheet, and contract liabilities from contracts with customers, which are recorded in Customer deposits and deferred revenues and Other deferred liabilities and credits in the Consolidated Balance Sheet.

	December 31, 2019	December 31, 2018
(Dollars in millions)		
Contract assets	\$ 10	\$ 11
Contract liabilities ¹	\$ 197	\$ 187

¹ The contract liability balance at December 31, 2018 differs from the amount reported in Note 2 — Revenue Recognition of the 2018 Form 10-K, as the previously reported amount included certain lease-related balances that did not result from contracts with customers.

Revenue recognized related to contract liabilities existing at January 1, 2019 was \$164 million for the year ended December 31, 2019.

Transaction price allocated to the remaining performance obligations

The following table includes estimated service revenues expected to be recognized related to performance obligations that are unsatisfied (or partially unsatisfied) at the end of the reporting period. These estimates represent service revenues to be recognized when services are delivered to customers pursuant to service plan contracts and under certain roaming agreements with other carriers. These estimates are based on contracts in place as of December 31, 2019, and may vary from actual results. As practical expedients, revenue related to contracts of less than one year, generally month-to-month contracts, and contracts with a fixed per-unit price and variable quantity, are excluded from these estimates.

	Service Revenues
(Dollars in millions)	
2020	\$ 367
2021	167
Thereafter	202
Total	<u><u>\$ 736</u></u>

Contract Cost Assets

TDS expects that commission fees paid as a result of obtaining contracts are recoverable and therefore TDS capitalizes these costs. As a practical expedient, costs with an amortization period of one year or less are not capitalized. TDS also incurs fulfillment costs, such as installation costs, where there is an expectation that a future benefit will be realized. Capitalized commission fees and fulfillment costs are amortized based on the timing of transfer of the goods or services to which the assets relate, typically the contract term. Contract cost asset balances, which are recorded in Other assets and deferred charges in the Consolidated Balance Sheet, were as follows:

	December 31, 2019	December 31, 2018
(Dollars in millions)		
Costs to obtain contracts		
Sales commissions	\$ 146	\$ 154
Fulfillment costs		
Installation costs	11	10
Total contract cost assets	<u>\$ 157</u>	<u>\$ 164</u>

Amortization of contract cost assets was \$126 million and \$124 million for the year ended December 31, 2019 and December 31, 2018, respectively, and was included in Selling, general and administrative expenses and Cost of service expenses.

Note 3 Fair Value Measurements

As of December 31, 2019 and 2018, TDS did not have any material financial or nonfinancial assets or liabilities that were required to be recorded at fair value in its Consolidated Balance Sheet in accordance with GAAP.

The provisions of GAAP establish a fair value hierarchy that contains three levels for inputs used in fair value measurements. Level 1 inputs include quoted market prices for identical assets or liabilities in active markets. Level 2 inputs include quoted market prices for similar assets and liabilities in active markets or quoted market prices for identical assets and liabilities in inactive markets. Level 3 inputs are unobservable. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. A financial instrument's level within the fair value hierarchy is not representative of its expected performance or its overall risk profile and, therefore, Level 3 assets are not necessarily higher risk than Level 2 assets or Level 1 assets.

TDS has applied the provisions of fair value accounting for purposes of computing the fair value of financial instruments for disclosure purposes as displayed below.

	Level within the Fair Value Hierarchy	December 31, 2019		December 31, 2018	
		Book Value	Fair Value	Book Value	Fair Value
(Dollars in millions)					
Cash and cash equivalents	1	\$ 465	\$ 465	\$ 921	\$ 921
Short-term investments	1	—	—	17	17
Long-term debt					
Retail	2	1,753	1,796	1,753	1,596
Institutional	2	534	594	534	531
Other	2	84	84	182	182

The fair values of Cash and cash equivalents and Short-term investments approximate their book values due to the short-term nature of these financial instruments. Long-term debt excludes lease obligations, other installment arrangements, the current portion of Long-term debt and debt financing costs. The fair value of "Retail" Long-term debt was estimated using market prices for TDS' 7.0% Senior Notes, 6.875% Senior Notes, 6.625% Senior Notes and 5.875% Senior Notes, and U.S. Cellular's 7.25% 2063 Senior Notes, 7.25% 2064 Senior Notes and 6.95% Senior Notes. TDS' "Institutional" debt consists of U.S. Cellular's 6.7% Senior Notes which are traded over the counter. TDS' "Other" debt consists of a senior term loan credit agreement and other borrowings with financial institutions. TDS estimated the fair value of its Institutional and Other debt through a discounted cash flow analysis using the interest rates or estimated yield to maturity for each borrowing, which ranged from 3.55% to 6.25% and 5.03% to 8.00% at December 31, 2019 and 2018, respectively.

Note 4 Equipment Installment Plans

TDS sells devices to customers under equipment installment plans over a specified time period. For certain equipment installment plans, after a specified period of time or amount of payments, the customer may have the right to upgrade to a new device and have the remaining unpaid equipment installment contract balance waived, subject to certain conditions, including trading in the original device in good working condition and signing a new equipment installment contract.

The following table summarizes equipment installment plan receivables as of December 31, 2019 and 2018.

December 31,	2019	2018
(Dollars in millions)		
Equipment installment plan receivables, gross	\$ 1,008	\$ 974
Allowance for credit losses	(84)	(77)
Equipment installment plan receivables, net	<u>\$ 924</u>	<u>\$ 897</u>
Net balance presented in the Consolidated Balance Sheet as:		
Accounts receivable — Customers and agents (Current portion)	\$ 587	\$ 560
Other assets and deferred charges (Non-current portion)	337	337
Equipment installment plan receivables, net	<u>\$ 924</u>	<u>\$ 897</u>

TDS uses various inputs, including internal data, information from credit bureaus and other sources, to evaluate the credit profiles of its customers. From this evaluation, a credit class is assigned to the customer that determines the number of eligible lines, the amount of credit available, and the down payment requirement, if any. Customers assigned to credit classes requiring no down payment represent a lower risk category, whereas those assigned to credit classes requiring a down payment represent a higher risk category. A customer's assigned credit class is reviewed periodically and a change is made, if appropriate. The balance and aging of the equipment installment plan receivables on a gross basis by current credit category were as follows:

	December 31, 2019			December 31, 2018		
	Lower Risk	Higher Risk	Total	Lower Risk	Higher Risk	Total
(Dollars in millions)						
Unbilled	\$ 931	\$ 11	\$ 942	\$ 904	\$ 17	\$ 921
Billed — current	44	1	45	35	1	36
Billed — past due	20	1	21	15	2	17
Equipment installment plan receivables, gross	<u>\$ 995</u>	<u>\$ 13</u>	<u>\$ 1,008</u>	<u>\$ 954</u>	<u>\$ 20</u>	<u>\$ 974</u>

The activity in the allowance for credit losses for equipment installment plan receivables was as follows:

	2019	2018
(Dollars in millions)		
Allowance for credit losses, beginning of year	\$ 77	\$ 65
Bad debts expense	82	71
Write-offs, net of recoveries	(75)	(59)
Allowance for credit losses, end of year	<u>\$ 84</u>	<u>\$ 77</u>

Note 5 Income Taxes

TDS' current income taxes balances at December 31, 2019 and 2018, were as follows:

December 31,	2019		2018	
(Dollars in millions)				
Federal income taxes receivable	\$	31	\$	6
Net state income taxes receivable		5		6

Income tax expense (benefit) is summarized as follows:

Year Ended December 31,	2019		2018		2017	
(Dollars in millions)						
Current						
Federal	\$	15	\$	10	\$	77
State		15		3		13
Deferred						
Federal		36		24		(366)
State		(2)		9		(3)
Total income tax expense (benefit)	\$	<u>64</u>	\$	<u>46</u>	\$	<u>(279)</u>

In December 2017, the Tax Act was signed into law. Following the guidance of FASB Accounting Standards Update 2018-05, *Income Taxes: Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118*, Income tax expense (benefit) for the year ended December 31, 2017, included a provisional estimate for the impact of the Tax Act on TDS' 2017 depreciation expense deduction. During 2018, TDS completed a full analysis of depreciation expense deductions related to fixed assets placed in service during 2017 and Income tax expense (benefit) for 2018 included a benefit of \$4 million related to this adjustment.

A reconciliation of TDS' income tax expense computed at the statutory rate to the reported income tax expense, and the statutory federal income tax rate to TDS' effective income tax rate is as follows:

Year Ended December 31,	2019		2018		2017	
	Amount	Rate	Amount	Rate	Amount	Rate
(Dollars in millions)						
Statutory federal income tax expense and rate	\$	44	21.0%	\$	46	21.0%
State income taxes, net of federal benefit ¹	12	5.5	11	4.9	6	(5.2)
Effect of noncontrolling interests	—	(0.1)	(1)	(0.4)	(2)	1.6
Federal income tax rate change ²	—	—	(16)	(7.1)	(314)	257.5
Change in federal valuation allowance ³	7	3.1	(1)	(0.3)	(5)	4.3
Goodwill impairment ⁴	—	—	—	—	71	(58.2)
Nondeductible compensation	4	1.9	9	4.1	10	(8.1)
Tax credits	(4)	(1.9)	(1)	(0.6)	(1)	0.8
Other differences, net	1	0.8	(1)	(0.6)	(1)	1.4
Total income tax expense (benefit) and rate	\$	<u>64</u>	<u>30.3%</u>	\$	<u>46</u>	<u>21.0%</u>
			\$	<u>46</u>	\$	<u>(279)</u>
				<u>21.0%</u>	\$	<u>(279)</u>
						<u>229.1%</u>

¹ State income taxes, net of federal benefit, include changes in unrecognized tax benefits as well as adjustments to the valuation allowance.

² Federal income tax rate change due to the Tax Act reducing the federal income tax rate from 35% to 21% resulting in a tax benefit in 2018 due primarily to an income tax accounting method change that accelerated tax depreciation on certain assets for the 2017 tax year. The \$314 million tax benefit in 2017 related to adjusting the deferred tax liability to the lower tax rate upon enactment of the Tax Act.

³ Change in federal valuation allowance in 2019 is due primarily to interest expense carryforwards not expected to be realized. The 2018 change also includes a change in judgment related to net operating loss carryforwards that are now realizable due to an internal restructuring.

⁴ Goodwill impairment reflects an adjustment to increase 2017 income tax expense by \$71 million related to a portion of the impaired goodwill that is not amortizable for income tax purposes. See Note 8 — Intangible Assets for additional information related to the goodwill impairment.

Significant components of TDS' deferred income tax assets and liabilities at December 31, 2019 and 2018, were as follows¹:

December 31,	2019	2018
(Dollars in millions)		
Deferred tax assets		
Net operating loss (NOL) carryforwards	\$ 168	\$ 159
Lease liabilities	251	—
Asset retirement obligation	74	67
Other	106	151
Total deferred tax assets	<u>599</u>	<u>377</u>
Less valuation allowance	<u>(152)</u>	<u>(135)</u>
Net deferred tax assets	<u>447</u>	<u>242</u>
Deferred tax liabilities		
Property, plant and equipment	481	458
Licenses/intangibles	261	237
Partnership investments	132	134
Lease assets	226	—
Other	22	53
Total deferred tax liabilities	<u>1,122</u>	<u>882</u>
Net deferred income tax liability	<u>\$ 675</u>	<u>\$ 640</u>

¹ Certain prior year deferred tax assets and liabilities have been reclassified to align with the current year presentation.

At December 31, 2019, TDS and certain subsidiaries had \$2,861 million of state NOL carryforwards (generating a \$151 million deferred tax asset) available to offset future taxable income. The state NOL carryforwards expire between 2020 and 2039. Certain subsidiaries had federal NOL carryforwards (generating a \$17 million deferred tax asset) available to offset their future taxable income. The federal NOL carryforwards generally expire between 2020 and 2037, with the exception of federal NOLs generated after 2017, which do not expire. A valuation allowance was established for certain state NOL carryforwards and federal NOL carryforwards since it is more likely than not that a portion of such carryforwards will expire before they can be utilized.

A summary of TDS' deferred tax asset valuation allowance is as follows:

	2019	2018	2017
(Dollars in millions)			
Balance at beginning of year	\$ 135	\$ 147	\$ 122
Charged to income tax expense	17	(5)	25
Charged to Retained earnings	—	(7)	—
Balance at end of year	<u>\$ 152</u>	<u>\$ 135</u>	<u>\$ 147</u>

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

	2019	2018	2017
(Dollars in millions)			
Unrecognized tax benefits balance at beginning of year	\$ 49	\$ 46	\$ 42
Additions for tax positions of current year	8	8	6
Additions for tax positions of prior years	—	2	1
Reductions for tax positions of prior years	(7)	(1)	(1)
Reductions for settlements of tax positions	(1)	—	—
Reductions for lapses in statutes of limitations	—	(6)	(2)
Unrecognized tax benefits balance at end of year	<u>\$ 49</u>	<u>\$ 49</u>	<u>\$ 46</u>

Unrecognized tax benefits are included in Accrued taxes and Other deferred liabilities and credits in the Consolidated Balance Sheet. If these benefits were recognized, they would have reduced income tax expense in 2019, 2018 and 2017 by \$39 million, \$39 million and \$37 million, respectively, net of the federal benefit from state income taxes.

TDS recognizes accrued interest and penalties related to unrecognized tax benefits in Income tax expense (benefit). The amounts charged to income tax expense related to interest and penalties resulted in an expense of \$3 million, less than \$1 million and \$3 million in 2019, 2018 and 2017, respectively. Net accrued liabilities for interest and penalties were \$21 million and \$19 million at December 31, 2019 and 2018, respectively, and are included in Other deferred liabilities and credits in the Consolidated Balance Sheet.

TDS and its subsidiaries file federal and state income tax returns. With limited exceptions, TDS is no longer subject to federal and state income tax audits for the years prior to 2016.

Note 6 Earnings Per Share

Basic earnings per share attributable to TDS shareholders is computed by dividing Net income attributable to TDS shareholders by the weighted average number of Common Shares outstanding during the period. Diluted earnings per share attributable to TDS shareholders is computed by dividing Net income attributable to TDS shareholders by the weighted average number of Common Shares outstanding during the period adjusted to include the effects of potentially dilutive securities. Potentially dilutive securities primarily include incremental shares issuable upon the exercise of outstanding stock options and the vesting of performance and restricted stock units.

The amounts used in computing basic and diluted earnings per share attributable to TDS shareholders were as follows:

Year Ended December 31,	2019	2018	2017
(Dollars and shares in millions, except per share amounts)			
Net income attributable to TDS shareholders used in basic earnings per share	\$ 121	\$ 135	\$ 153
Adjustments to compute diluted earnings:			
Noncontrolling interest adjustment	(1)	(2)	—
Net income attributable to TDS shareholders used in diluted earnings per share	<u>\$ 120</u>	<u>\$ 133</u>	<u>\$ 153</u>
Weighted average number of shares used in basic earnings per share:			
Common Shares	107	105	104
Series A Common Shares	7	7	7
Total	<u>114</u>	<u>112</u>	<u>111</u>
Effects of dilutive securities	2	2	1
Weighted average number of shares used in diluted earnings per share	<u>116</u>	<u>114</u>	<u>112</u>
Basic earnings per share attributable to TDS shareholders	<u>\$ 1.06</u>	<u>\$ 1.20</u>	<u>\$ 1.39</u>
Diluted earnings per share attributable to TDS shareholders	<u>\$ 1.03</u>	<u>\$ 1.17</u>	<u>\$ 1.37</u>

Certain Common Shares issuable upon the exercise of stock options or vesting of performance and restricted stock units were not included in weighted average diluted shares outstanding for the calculation of Diluted earnings per share attributable to TDS shareholders because their effects were antidilutive. The number of such Common Shares excluded was 2 million shares, 3 million shares and 4 million shares for 2019, 2018 and 2017, respectively.

Note 7 Acquisitions, Divestitures and Exchanges

On December 31, 2019, TDS acquired substantially all of the assets of MI Connection Communications System, dba Continuum, for \$80 million in cash, subject to working capital adjustments. Continuum is a cable company that passes approximately 40,000 service addresses in North Carolina and offers broadband, video and voice services, which complement the TDS Telecom portfolio of products. The operations of Continuum will be included in the Cable segment for reporting purposes. The goodwill recorded represents future economic benefits expected to be generated by the acquisition. The allocation of the purchase price was as follows:

	Allocation of Purchase Price			
	Purchase Price	Goodwill ¹	Intangible Assets Subject to Amortization ²	Net Tangible Assets (Liabilities)
(Dollars in millions)				
Continuum	\$ 80	\$ 38	\$ 9	\$ 33

¹ The entire amount of Goodwill acquired in 2019 is amortizable for income tax purposes.

² In 2019, at the date of acquisition, the weighted average amortization period for Intangible Assets Subject to Amortization acquired was approximately four years.

Note 8 Intangible Assets

Licenses

TDS reviews attractive opportunities to acquire additional wireless spectrum, including pursuant to FCC auctions. TDS also may seek to divest outright or include in exchanges wireless spectrum that is not strategic to its long-term success. Prior to 2009, TDS accounted for U.S. Cellular's share repurchases as step acquisitions, allocating a portion of the share repurchase value to TDS' Licenses. Consequently, U.S. Cellular's Licenses on a stand-alone basis do not equal the TDS consolidated Licenses related to U.S. Cellular. Activity related to TDS' Licenses is presented below.

	U.S. Cellular	Wireline	Cable	Total
(Dollars in millions)				
Balance at December 31, 2017	\$ 2,227	\$ 2	\$ 3	\$ 2,232
Acquisitions	8	—	—	8
Transferred to Assets held for sale	(51)	—	—	(51)
Divestitures	(11)	—	—	(11)
Exchanges - Licenses received	18	—	—	18
Exchanges - Licenses surrendered	(1)	—	—	(1)
Balance at December 31, 2018	2,190	2	3	2,195
Acquisitions	267	—	—	267
Divestitures	(10)	—	—	(10)
Exchanges - Licenses received	26	—	—	26
Exchanges - Licenses surrendered	—	—	—	—
Capitalized interest	2	—	—	2
Balance at December 31, 2019	\$ 2,475	\$ 2	\$ 3	\$ 2,480

Auctions 101 and 102

In June 2019, the FCC announced by way of public notice that U.S. Cellular was the provisional winning bidder for 408 wireless spectrum licenses in its 28 GHz auction (Auction 101) and 282 wireless spectrum licenses in its 24 GHz auction (Auction 102) for an aggregate purchase price of \$256 million. U.S. Cellular paid substantially all of the \$256 million in the first half of 2019. The wireless spectrum licenses from Auction 101 were granted by the FCC on October 2, 2019, and the wireless spectrum licenses from Auction 102 were granted by the FCC on December 11, 2019.

Goodwill

Activity related to TDS' Goodwill is presented below.

	Wireline ¹	Cable	Total
(Dollars in millions)			
Balance at December 31, 2017	\$ 409	\$ 100	\$ 509
Other	—	—	—
Balance at December 31, 2018	409	100	509
Acquisitions	—	38	38
Balance at December 31, 2019	\$ 409	\$ 138	\$ 547

¹ Accumulated impairment losses in prior periods were \$29 million for Wireline.

Goodwill — Interim Impairment Assessment in 2017

U.S. Cellular

Based on 2017 developments, including wireless expansion plans announced by other companies and the results of the FCC's forward auction of 600 MHz wireless spectrum licenses and other FCC actions, U.S. Cellular anticipated increased competition for customers in its primary operating markets from new and existing market participants over the long term. In addition, the widening adoption of unlimited data plans and other data pricing constructs across the industry, including U.S. Cellular's introduction of unlimited plans in 2017, may limit the industry's ability to monetize future growth in data usage. These factors when assessed and considered as part of U.S. Cellular's annual planning process conducted in the third quarter of each year caused management to revise its long-range financial forecast in the third quarter of 2017. Based on the factors noted above, management identified a triggering event and performed a quantitative goodwill impairment test during the third quarter of 2017.

The results of the interim goodwill impairment test indicated that the carrying value of the U.S. Cellular reporting unit exceeded its fair value. Therefore, TDS recognized a loss on impairment of goodwill of \$227 million to reduce the carrying value of goodwill for the U.S. Cellular reporting unit to zero in the third quarter of 2017.

Other

During the third quarter of 2017, due to slower than expected service revenue growth and revenue mix trending towards a higher proportion of lower margin revenue streams, management identified a triggering event related to its HMS operations and performed a quantitative goodwill impairment test.

TDS used a one-step quantitative approach that compared the fair value of its HMS operations to the carrying value. TDS weighted the discounted cash flow approach and guideline public company method to value the HMS operations. The discounted cash flow approach uses value drivers and considers risks specific to the industry as well as current economic factors. The guideline public company method develops an indication of fair value by calculating average market pricing multiples for selected publicly-traded companies. The developed multiples were applied to applicable financial measures of the HMS operations to determine fair value.

The results of the interim goodwill impairment test indicated that the carrying value of the HMS operations exceeded its fair value. Therefore, TDS recognized a loss on impairment of goodwill of \$35 million to reduce the carrying value of goodwill for the HMS operations to zero in the third quarter of 2017.

Other intangible assets

Activity related to TDS' Other intangible assets is presented below.

	December 31, 2019			December 31, 2018		
	Gross Amount	Accumulated Amortization	Net Amount	Gross Amount	Accumulated Amortization	Net Amount
(Dollars in millions)						
Franchise rights	\$ 255	\$ (34)	\$ 221	\$ 255	\$ (17)	\$ 238
Customer lists and Trade name	151	(133)	18	166	(151)	15
Total	<u>\$ 406</u>	<u>\$ (167)</u>	<u>\$ 239</u>	<u>\$ 421</u>	<u>\$ (168)</u>	<u>\$ 253</u>

As discussed in Note 1 — Summary of Significant Accounting Policies and Recent Accounting Pronouncements, effective January 1, 2018, TDS prospectively changed its assessment of useful life for its franchise rights from indefinite-lived to 15 years. Amortization expense for intangible assets was \$24 million, \$26 million and \$11 million for the years ended December 31, 2019, 2018 and 2017, respectively. Based on the current balance of finite-lived intangible assets, the estimated amortization expense is \$25 million, \$21 million, \$20 million, \$19 million and \$17 million for the years 2020 through 2024, respectively.

Note 9 Investments in Unconsolidated Entities

Investments in unconsolidated entities consist of amounts invested in entities in which TDS holds a noncontrolling interest. TDS' Investments in unconsolidated entities are accounted for using either the equity method or measurement alternative method as shown in the table below. The carrying value of measurement alternative method investments represents cost minus any impairments plus or minus any observable price changes.

December 31,	2019	2018
(Dollars in millions)		
Equity method investments:		
Capital contributions, loans, advances and adjustments	\$ 116	\$ 116
Cumulative share of income	2,099	1,930
Cumulative share of distributions	(1,748)	(1,587)
Total equity method investments	<u>467</u>	<u>459</u>
Measurement alternative method investments	21	21
Total investments in unconsolidated entities	<u>\$ 488</u>	<u>\$ 480</u>

The following tables, which are based on information provided in part by third parties, summarize the combined assets, liabilities and equity, and results of operations of TDS' equity method investments:

December 31,	2019	2018
(Dollars in millions)		
Assets		
Current	\$ 1,516	\$ 1,299
Noncurrent	5,776	5,010
Total assets	<u>\$ 7,292</u>	<u>\$ 6,309</u>
Liabilities and Equity		
Current liabilities	\$ 626	\$ 436
Noncurrent liabilities	1,132	405
Partners' capital and shareholders' equity	5,534	5,468
Total liabilities and equity	<u>\$ 7,292</u>	<u>\$ 6,309</u>

Year Ended December 31,	2019	2018	2017
(Dollars in millions)			
Results of Operations			
Revenues	\$ 6,929	\$ 6,801	\$ 6,585
Operating expenses	5,043	4,985	4,985
Operating income	<u>1,886</u>	<u>1,816</u>	<u>1,600</u>
Other income (expense), net	(24)	9	(3)
Net income	<u>\$ 1,862</u>	<u>\$ 1,825</u>	<u>\$ 1,597</u>

Note 10 Property, Plant and Equipment

TDS' Property, plant and equipment in service and under construction, and related accumulated depreciation and amortization, as of December 31, 2019 and 2018, were as follows:

December 31,	Useful Lives (Years)	2019	2018
(Dollars in millions)			
Land	N/A	\$ 57	\$ 55
Buildings	5-40	527	523
Leasehold and land improvements	1-30	1,314	1,245
Cable and wire	15-35	1,996	1,884
Network and switching equipment	3-13	2,507	2,423
Cell site equipment	7-25	3,708	3,460
Office furniture and equipment	3-10	387	378
Other operating assets and equipment	3-12	174	193
System development	1-7	1,604	1,486
Work in process	N/A	590	427
Total property, plant and equipment, gross		<u>12,864</u>	<u>12,074</u>
Accumulated depreciation and amortization		<u>(9,337)</u>	<u>(8,728)</u>
Total property, plant and equipment, net		<u>\$ 3,527</u>	<u>\$ 3,346</u>

Depreciation and amortization expense totaled \$890 million, \$839 million and \$817 million in 2019, 2018 and 2017, respectively. In 2019, 2018 and 2017, (Gain) loss on asset disposals, net included charges of \$12 million, \$9 million and \$21 million, respectively, related to disposals of assets, trade-ins of older assets for replacement assets and other retirements of assets from service in the normal course of business.

Note 11 Leases

Change in Accounting Policy

In February 2016, the FASB issued Accounting Standards Update 2016-02, *Leases* and subsequently amended the standard with several Accounting Standards Updates, collectively referred to as ASC 842. This standard replaces the previous lease accounting standard under ASC 840 - *Leases* and requires lessees to record a right-of-use (ROU) asset and lease liability for the majority of leases. TDS adopted the provisions of ASC 842 on January 1, 2019, using a modified retrospective method. Under this method, TDS elected to apply the new accounting standard only to the most recent period presented, recognizing the cumulative effect of the accounting change, if any, as an adjustment to the beginning balance of retained earnings. Accordingly, prior periods have not been recast to reflect the new accounting standard. The cumulative effect of applying the provisions of ASC 842 had no material impact on retained earnings.

TDS elected transitional practical expedients for existing leases which eliminated the requirements to reassess existing lease classification, initial direct costs, and whether contracts contain leases. TDS also elected the practical expedient related to land easements that allows it to carry forward the accounting treatment for pre-existing land easement agreements.

The cumulative effect of the adoption of ASC 842 on TDS' Consolidated Balance Sheet as of January 1, 2019 is presented below.

	December 31, 2018	ASC 842 Adjustment	January 1, 2019
(Dollars in millions)			
Prepaid expenses	\$ 103	\$ (13)	\$ 90
Operating lease right-of-use assets	—	975	975
Other assets and deferred charges	616	(12)	604
Short-term operating lease liabilities	—	112	112
Other current liabilities	114	(8)	106
Long-term operating lease liabilities	—	949	949
Other deferred liabilities and credits	541	(103)	438

In connection with the adoption of ASC 842, TDS recorded ROU assets and lease liabilities for its operating leases in its Consolidated Balance Sheet as of January 1, 2019. The amounts for ROU assets and lease liabilities initially were calculated as the discounted value of future lease payments. The difference between the ROU assets and the corresponding lease liabilities at January 1, 2019 as shown in the table above resulted from adjustments to ROU assets to account for various lease prepayments and straight-line expense recognition deferral balances which existed as of December 31, 2018. Finance leases are included in Property, plant and equipment and Long-term debt, net consistent with the presentation under prior accounting standards.

Lessee Agreements

A lease is generally present in a contract if the lessee controls the use of identified property, plant or equipment for a period of time in exchange for consideration. Nearly all of TDS' leases are classified as operating leases, although it does have a small number of finance leases. TDS' most significant leases are for land and tower spaces, network facilities, retail spaces, and offices.

TDS has agreements with both lease and nonlease components, which are accounted for separately. As part of the present value calculation for the lease liabilities, TDS uses an incremental borrowing rate as the rates implicit in the leases are not readily determinable. The incremental borrowing rates used for lease accounting are based on TDS' unsecured rates, adjusted to approximate the rates at which TDS would be required to borrow on a collateralized basis over a term similar to the recognized lease term. TDS applies the incremental borrowing rates to lease components using a portfolio approach based upon the length of the lease term and the reporting entity in which the lease resides. The cost of nonlease components in TDS' lease portfolio (e.g., utilities and common area maintenance) are not typically predetermined at lease commencement and are expensed as incurred at their relative standalone price.

Variable lease expense occurs when, subsequent to the lease commencement, lease payments are made that were not originally included in the lease liability calculation. TDS' variable lease payments are primarily a result of leases with escalations that are tied to an index. The incremental changes due to the index changes are recorded as variable lease expense and are not included in the ROU assets or lease liabilities.

The identified lease term determines the periods to which expense is allocated and also has a significant impact on the ROU asset and lease liability calculations. Many of TDS' leases include renewal and early termination options. At lease commencement, the lease terms include options to extend the lease when TDS is reasonably certain that it will exercise the options. The lease terms do not include early termination options unless TDS is reasonably certain to exercise the options. Certain asset classes have similar lease characteristics; therefore, TDS has applied the portfolio approach for lease term recognition for its tower space, retail, and certain ground lease asset classes.

The following table shows the components of lease cost included in the Consolidated Statement of Operations:

	Year Ended December 31, 2019
(Dollars in millions)	
Operating lease cost	\$ 177
Financing lease cost:	
Amortization of ROU assets	2
Interest on lease liabilities	1
Variable lease cost	8
Total lease cost	<u>\$ 188</u>

The following table shows supplemental cash flow information related to lease activities:

	Year Ended December 31, 2019
(Dollars in millions)	
Cash paid for amounts included in the measurement of lease liabilities:	
Operating cash flows from operating leases	\$ 172
Operating cash flows from finance leases	1
ROU assets obtained in exchange for lease obligations:	
Operating leases	\$ 132
Finance leases	10

The following table shows the classification of TDS' finance leases in its Consolidated Balance Sheet:

	December 31, 2019
(Dollars in millions)	
Finance Leases	
Property, plant and equipment	\$ 20
Less: Accumulated depreciation and amortization	5
Property, plant and equipment, net	<u>\$ 15</u>
Current portion of long-term debt	1
Long-term debt, net	<u>\$ 7</u>
Total finance lease liabilities	<u>\$ 8</u>

The table below shows a weighted-average analysis for lease terms and discount rates for all leases:

	December 31, 2019
Weighted Average Remaining Lease Term	
Operating leases	12 years
Finance leases	24 years
Weighted Average Discount Rate	
Operating leases	4.4%
Finance leases	6.3%

The maturities of lease liabilities are as follows:

	Operating Leases	Finance Leases
(Dollars in millions)		
2020	\$ 159	\$ 1
2021	159	—
2022	143	1
2023	127	1
2024	109	1
Thereafter	730	16
Total lease payments ¹	<u>\$ 1,427</u>	<u>\$ 20</u>
Less: Imputed interest	380	12
Present value of lease liabilities	<u>\$ 1,047</u>	<u>\$ 8</u>

¹ Lease payments exclude \$29 million of legally binding lease payments for leases signed but not yet commenced.

Lessor Agreements

TDS' most significant lessor leases are for tower space and colocation space. All of TDS' lessor leases are classified as operating leases. A lease is generally present in a contract if the lessee controls the use of identified property, plant, or equipment for a period of time in exchange for consideration. TDS' lessor agreements with lease and nonlease components are generally accounted for separately; however, certain service agreements with insignificant lease components are accounted for as nonlease transactions.

The identified lease term determines the periods to which revenue is allocated over the term of the lease. Many of TDS' leases include renewal and early termination options. At lease commencement, lease terms include options to extend the lease when TDS is reasonably certain that lessees will exercise the options. Lease terms would not include periods after the date of a termination option that lessees are reasonably certain to exercise.

Variable lease income occurs when, subsequent to the lease commencement, lease payments are received that were not originally included in the lease receivable calculation. TDS' variable lease income is primarily a result of leases with escalations that are tied to an index. The incremental increases due to the index changes are recorded as variable lease income.

The following table shows the components of lease income which are included in Service revenues in the Consolidated Statement of Operations:

	Year Ended December 31, 2019
(Dollars in millions)	
Operating lease income ¹	\$ 100

¹ During the third quarter of 2019, TDS recorded an out-of-period adjustment attributable to 2009 through the second quarter of 2019 due to errors in the timing of recognition of revenue for certain tower leases. This out-of-period adjustment had the impact of increasing operating lease income by \$5 million for the year ended December 31, 2019. TDS determined that this adjustment was not material to any of the periods impacted.

The maturities of expected lease payments to be received are as follows:

	Operating Leases
(Dollars in millions)	
2020	\$ 87
2021	70
2022	44
2023	32
2024	16
Thereafter	17
Total future lease maturities	<u>\$ 266</u>

Disclosures under ASC 840

As of December 31, 2018, future minimum rental payments required under operating leases and rental receipts expected under operating leases that had noncancellable lease terms in excess of one year were as follows:

	Operating Leases Future Minimum Rental Payments	Operating Leases Future Minimum Rental Receipts
(Dollars in millions)		
2019	\$ 170	\$ 59
2020	158	48
2021	142	35
2022	126	23
2023	110	10
Thereafter	784	7
Total	<u>\$ 1,490</u>	<u>\$ 182</u>

For 2018 and 2017, rent expense for noncancellable long-term leases was \$189 million and \$183 million, respectively; and rent expense under cancellable short-term leases was \$12 million in each respective year.

Note 12 Asset Retirement Obligations

U.S. Cellular is subject to asset retirement obligations associated with its leased cell sites, switching office sites, retail store sites and office locations. Asset retirement obligations generally include obligations to restore leased land, towers, retail store and office premises to their pre-lease conditions.

TDS Telecom owns poles, cable and wire and certain buildings and also leases office space and property used for housing central office switching equipment and fiber cable. These assets and leases often have removal or remediation requirements associated with them. For example, TDS Telecom's poles, cable and wire are often located on property that is not owned by TDS Telecom and may be subject to the provisions of easements, permits, or leasing arrangements. Pursuant to the terms of the permits, easements, or leasing arrangements, TDS Telecom is often required to remove these assets and return the property to its original condition at some defined date in the future.

Asset retirement obligations are included in Other deferred liabilities and credits in the Consolidated Balance Sheet.

In 2019 and 2018, U.S. Cellular and TDS Telecom performed a review of the assumptions and estimated costs related to asset retirement obligations. The results of the reviews (identified as Revisions in estimated cash outflows) and other changes in asset retirement obligations during 2019 and 2018, were as follows:

	2019	2018
(Dollars in millions)		
Balance at beginning of year	\$ 307	\$ 283
Additional liabilities accrued	13	2
Revisions in estimated cash outflows	2	6
Acquisition of assets	1	—
Disposition of assets	(1)	(1)
Accretion expense	20	18
Transferred to Liabilities held for sale	—	(1)
Balance at end of year	<u>\$ 342</u>	<u>\$ 307</u>

Note 13 Debt

Revolving Credit Agreements

At December 31, 2019, TDS and U.S. Cellular had revolving credit agreements available for general corporate purposes including acquisitions, spectrum purchases and capital expenditures. Amounts under the revolving credit agreements may be borrowed, repaid and reborrowed from time to time until maturity in May 2023. As of December 31, 2019, there were no outstanding borrowings under the revolving credit agreements, except for letters of credit. Interest expense representing commitment fees on the unused portion of the revolving lines of credit was \$2 million in each of 2019, 2018 and 2017. The commitment fees are based on the unsecured senior debt ratings assigned to TDS and U.S. Cellular by certain ratings agencies.

The following table summarizes the revolving credit agreements as of December 31, 2019:

	TDS		U.S. Cellular	
(Dollars in millions)				
Maximum borrowing capacity	\$	400	\$	300
Letters of credit outstanding	\$	1	\$	2
Amount borrowed	\$	—	\$	—
Amount available for use	\$	399	\$	298

Borrowings under the revolving credit agreements bear interest either at a London Inter-bank Offered Rate (LIBOR) plus 1.75% or at an alternative Base Rate as defined in the revolving credit agreement plus 0.75%, at TDS' or U.S. Cellular's option. TDS and U.S. Cellular may select a borrowing period of either one, two, three or six months (or other period of twelve months or less if requested by TDS or U.S. Cellular and approved by the lenders). TDS' and U.S. Cellular's credit spread and commitment fees on their revolving credit agreements may be subject to increase if their current credit ratings from nationally recognized credit rating agencies are lowered, and may be subject to decrease if the ratings are raised.

In connection with U.S. Cellular's revolving credit agreement, TDS and U.S. Cellular entered into a subordination agreement dated May 10, 2018, together with the administrative agent for the lenders under U.S. Cellular's revolving credit agreement. Pursuant to this subordination agreement, (a) any consolidated funded indebtedness from U.S. Cellular to TDS will be unsecured and (b) any (i) consolidated funded indebtedness from U.S. Cellular to TDS (other than "refinancing indebtedness" as defined in the subordination agreement) in excess of \$105 million and (ii) refinancing indebtedness in excess of \$250 million will be subordinated and made junior in right of payment to the prior payment in full of obligations to the lenders under U.S. Cellular's revolving credit agreement. As of December 31, 2019, U.S. Cellular had no outstanding consolidated funded indebtedness or refinancing indebtedness that was subordinated to the revolving credit agreement pursuant to the subordination agreement.

The continued availability of the revolving credit agreements requires TDS and U.S. Cellular to comply with certain negative and affirmative covenants, maintain certain financial ratios and make representations regarding certain matters at the time of each borrowing.

The revolving credit agreements include the following financial covenants:

- Consolidated Interest Coverage Ratio may not be less than 3.00 to 1.00 as of the end of any fiscal quarter.
- Consolidated Leverage Ratio may not be greater than the ratios indicated as of the end of any fiscal quarter for each period specified below:

Period	Ratios
From the agreement date of May 10, 2018 through June 30, 2019	3.25 to 1.00
From July 1, 2019 and thereafter	3.00 to 1.00

Certain TDS and U.S. Cellular wholly-owned subsidiaries have jointly and severally unconditionally guaranteed the payment and performance of the obligations of TDS and U.S. Cellular under the revolving credit agreements pursuant to a guaranty dated May 10, 2018. Other subsidiaries that meet certain criteria will be required to provide a similar guaranty in the future. TDS and U.S. Cellular believe that they were in compliance with all of the financial and other covenants and requirements set forth in their revolving credit agreements as of December 31, 2019.

Term Loan

In July 2015, U.S. Cellular borrowed \$225 million on a senior term loan credit agreement in two separate draws. This agreement was entered into for general corporate purposes, including working capital, spectrum purchases and capital expenditures. This agreement was entered into in January 2015, amended and restated in June 2016, and further amended in May 2018 and March 2019. The interest rate on outstanding borrowings is reset at one, three or six month intervals at a rate of LIBOR plus 175 basis points. This credit agreement provides for the draws to be continued on a long-term basis under terms that are readily determinable. In October 2019, U.S. Cellular made a \$100 million principal prepayment on the senior term loan. The remaining unpaid balance will be due and payable in January 2022. The senior term loan credit agreement contains financial covenants and subsidiary guarantees that are consistent with the revolving credit agreements described above. U.S. Cellular believes that it was in compliance with all of the financial and other covenants and requirements set forth in its term loan credit agreement as of December 31, 2019.

In connection with U.S. Cellular's term loan credit agreement, TDS and U.S. Cellular entered into a subordination agreement in June 2016 together with the administrative agent for the lenders under U.S. Cellular's term loan credit agreement, which is substantially the same as the subordination agreement for U.S. Cellular as described above under the "Revolving Credit Agreements." As of December 31, 2019, U.S. Cellular had no outstanding consolidated funded indebtedness or refinancing indebtedness that was subordinated to the term loan agreement pursuant to this subordination agreement.

Receivables Securitization Agreement

In December 2017, U.S. Cellular, through its subsidiaries, entered into a \$200 million credit agreement to permit securitized borrowings using its equipment installment receivables for general corporate purposes, including acquisitions, spectrum purchases and capital expenditures. In connection with the receivables securitization agreement, U.S. Cellular formed a wholly-owned subsidiary, USCC Master Note Trust (Trust), which qualifies as a bankruptcy remote entity. Under the terms of the agreement, U.S. Cellular, through its subsidiaries, transfers eligible equipment installment receivables to the Trust. The Trust then utilizes the transferred assets as collateral for notes payables issued to third party financial institutions. Since U.S. Cellular retains effective control of the transferred assets in the Trust, any activity associated with this receivables securitization agreement will be treated as a secured borrowing. Therefore, TDS will continue to report equipment installment receivables and any related balances on the Consolidated Balance Sheet. Cash received from borrowings under the receivables securitization agreement will be reported as Debt. Refer to Note 16 — Variable Interest Entities for additional information.

U.S. Cellular entered into a performance guaranty whereby U.S. Cellular guarantees the performance of certain wholly-owned subsidiaries of U.S. Cellular under the receivables securitization agreement. Amounts under the receivables securitization agreement may be borrowed, repaid and reborrowed from time to time until maturity in December 2021, which may be extended from time to time as specified therein. As of December 31, 2019, there were no outstanding borrowings under the receivables securitization agreement, and the entire unused capacity of \$200 million was available, subject to sufficient collateral to satisfy the asset borrowing base provisions of the agreement. Interest expense representing commitment fees on the unused portion of the agreement was \$1 million, \$1 million and zero for the years 2019, 2018 and 2017, respectively.

The continued availability of the receivables securitization agreement requires U.S. Cellular to comply with certain negative and affirmative covenants, maintain certain financial ratios and provide representations on certain matters at the time of each borrowing. The covenants include the same financial covenants for U.S. Cellular as described above under the "Revolving Credit Agreements." TDS believes that U.S. Cellular was in compliance as of December 31, 2019, with all of the financial covenants and requirements set forth in its receivables securitization agreement.

Other Long-Term Debt

Long-term debt as of December 31, 2019 and 2018, was as follows:

	Issuance date	Maturity date	Call date (any time on or after)	December 31, 2019			December 31, 2018		
				Principal Amount	Less Unamortized discounts and debt issuance costs	Total	Principal Amount	Less Unamortized discount and debt issuance costs	Total
(Dollars in millions)									
TDS Unsecured Senior Notes									
6.625%	Mar 2005	Mar 2045	Mar 2010	\$ 116	\$ 3	\$ 113	\$ 116	\$ 3	\$ 113
6.875%	Nov 2010	Nov 2059	Nov 2015	225	7	218	225	7	218
7.000%	Mar 2011	Mar 2060	Mar 2016	300	9	291	300	9	291
5.875%	Dec 2012	Dec 2061	Dec 2017	195	7	188	195	7	188
U.S. Cellular Unsecured Senior Notes									
6.700%	Dec 2003 and June 2004	Dec 2033	Dec 2003 and June 2004	\$ 544	\$ 13	\$ 531	\$ 544	\$ 14	\$ 530
6.950%	May 2011	May 2060	May 2016	342	11	331	342	11	331
7.250%	Dec 2014	Dec 2063	Dec 2019	275	10	265	275	10	265
7.250%	Nov 2015	Dec 2064	Dec 2020	300	10	290	300	10	290
Term Loan	Jul 2015	Jan 2022		83	1	82	191	1	190
Finance lease obligations				8	—	8	6	—	6
Installment payment agreement				8	1	7	15	1	14
Other long-term notes		Through 2021		2	—	2	3	—	3
Total long-term debt				\$ 2,398	\$ 72	\$ 2,326	\$ 2,512	\$ 73	\$ 2,439
Long-term debt, current						\$ 10			\$ 21
Long-term debt, noncurrent						\$ 2,316			\$ 2,418

TDS may redeem its callable notes and U.S. Cellular may redeem its 6.95% Senior Notes, 7.25% 2063 Senior Notes and 7.25% 2064 Senior Notes, in whole or in part at any time after the respective call date, at a redemption price equal to 100% of the principal amount redeemed plus accrued and unpaid interest. U.S. Cellular may redeem the 6.7% Senior Notes, in whole or in part, at any time prior to maturity at a redemption price equal to the greater of (a) 100% of the principal amount of such notes, plus accrued and unpaid interest, or (b) the sum of the present values of the remaining scheduled payments of principal and interest thereon discounted to the redemption date on a semi-annual basis at the Treasury Rate plus 30 basis points.

Interest on the Senior Notes outstanding at December 31, 2019, is payable quarterly, with the exception of U.S. Cellular's 6.7% Senior Notes for which interest is payable semi-annually.

The annual requirements for principal payments on long-term debt are approximately \$10 million, \$2 million, \$83 million, less than \$1 million and less than \$1 million for the years 2020 through 2024, respectively.

The covenants associated with TDS and its subsidiaries' long-term debt obligations, among other things, restrict TDS' ability, subject to certain exclusions, to incur additional liens, enter into sale and leaseback transactions, and sell, consolidate or merge assets.

TDS' and U.S. Cellular's long-term debt notes do not contain any provisions resulting in acceleration of the maturities of outstanding debt in the event of a change in TDS' or U.S. Cellular's credit rating.

Note 14 Employee Benefit Plans

Defined Contribution Plans

TDS sponsors a qualified noncontributory defined contribution pension plan. The plan provides benefits for certain employees of TDS Corporate, TDS Telecom and U.S. Cellular. Under this plan, pension costs are calculated separately for each participant and are funded annually. Total pension costs were \$17 million in 2019 and \$16 million in 2018 and 2017. In addition, TDS sponsors a defined contribution retirement savings plan (401(k) plan). Total costs incurred from TDS' contributions to the 401(k) plan were \$25 million in 2019, \$28 million in 2018 and \$27 million in 2017.

TDS also sponsors an unfunded nonqualified deferred supplemental executive retirement plan for certain employees to offset the reduction of benefits caused by the limitation on annual employee compensation under the tax laws.

Other Post-Retirement Benefits

TDS sponsors a defined benefit post-retirement plan that provides medical benefits to retirees and that covers certain employees of TDS Corporate and TDS Telecom, which is not significant to TDS' financial position or operating results. The plan is contributory, with retiree contributions adjusted annually. TDS recognizes the funded status of the plan as a component of Other assets and deferred charges in the Consolidated Balance Sheet as of December 31, 2019 and 2018. Changes in the funded status are included in Accumulated other comprehensive income (loss) in the Consolidated Balance Sheet before affecting such amounts for income taxes to the extent that such changes are not recognized in earnings as a component of net periodic benefit cost.

The post-retirement benefit fund invests mainly in mutual funds that hold U.S. equities, international equities, and debt securities. The post-retirement benefit fund does not hold any debt or equity securities issued by TDS, U.S. Cellular or any related parties. The fair value of the plan assets of the post-retirement benefit fund was \$63 million and \$55 million as of December 31, 2019 and 2018, respectively. The total plan benefit obligations were \$55 million and \$49 million as of December 31, 2019 and 2018, respectively. Therefore, the total funded status was an asset of \$8 million and \$6 million as of December 31, 2019 and 2018, respectively.

TDS is not required to set aside current funds for its future retiree health insurance benefits. The decision to contribute to the plan assets is based upon several factors, including the funded status of the plan, market conditions, alternative investment opportunities, tax benefits and other circumstances. In accordance with applicable income tax regulations, annual contributions to fund the costs of future retiree medical benefits may not exceed certain thresholds. TDS has not determined whether it will make a contribution to the plan in 2020.

Note 15 Commitments and Contingencies

Purchase Obligations

TDS has obligations payable under non-cancellable contracts, commitments for device purchases, network facilities and transport services, agreements for software licensing, long-term marketing programs, as well as certain agreements to purchase goods or services. For certain contracts, TDS calculates its obligation based on termination fees that can be paid to exit the contract. Future minimum payments required under these commitments as of December 31, 2019 are as follows:

	Purchase Obligations
(Dollars in millions)	
2020	\$ 1,065
2021	448
2022	755
2023	63
2024	40
Thereafter	37
Total	<u>\$ 2,408</u>

Subsequent to December 31, 2019, TDS committed to purchase assets in the amount of \$146 million, subject to regulatory approval. This amount is not included in the 2020 purchase obligations above, which are stated as of December 31, 2019.

Indemnifications

TDS enters into agreements in the normal course of business that provide for indemnification of counterparties. The terms of the indemnifications vary by agreement. The events or circumstances that would require TDS to perform under these indemnities are transaction specific; however, these agreements may require TDS to indemnify the counterparty for costs and losses incurred from litigation or claims arising from the underlying transaction. TDS is unable to estimate the maximum potential liability for these types of indemnifications as the amounts are dependent on the outcome of future events, the nature and likelihood of which cannot be determined at this time. Historically, TDS has not made any significant indemnification payments under such agreements.

Legal Proceedings

TDS is involved or may be involved from time to time in legal proceedings before the FCC, other regulatory authorities, and/or various state and federal courts. If TDS believes that a loss arising from such legal proceedings is probable and can be reasonably estimated, an amount is accrued in the financial statements for the estimated loss. If only a range of loss can be determined, the best estimate within that range is accrued; if none of the estimates within that range is better than another, the low end of the range is accrued. The assessment of the expected outcomes of legal proceedings is a highly subjective process that requires judgments about future events. The legal proceedings are reviewed at least quarterly to determine the adequacy of accruals and related financial statement disclosures. The ultimate outcomes of legal proceedings could differ materially from amounts accrued in the financial statements.

TDS has accrued \$2 million and less than \$1 million with respect to legal proceedings and unasserted claims as of December 31, 2019 and 2018, respectively. TDS is unable to estimate any contingent loss in excess of the amounts accrued.

In April 2018, the United States Department of Justice (DOJ) notified TDS that it was conducting inquiries of U.S. Cellular and TDS under the federal False Claims Act relating to U.S. Cellular's participation in wireless spectrum license auctions 58, 66, 73 and 97 conducted by the FCC. U.S. Cellular is/was a limited partner in several limited partnerships which qualified for the 25% bid credit in each auction. The investigation arose from civil actions under the Federal False Claims Act brought by private parties in the U.S. District Court for the Western District of Oklahoma. In November and December 2019, following the DOJ's investigation, the DOJ informed TDS and U.S. Cellular that it would not intervene in the above referenced actions. In addition, on December 5, 2019, the District Court unsealed the complaints. The private party plaintiffs have advised TDS and U.S. Cellular of their intent to pursue the matter and intent to serve the complaint on TDS and U.S. Cellular within the required 90 days of the Court's unsealing of the complaint. TDS and U.S. Cellular believe that U.S. Cellular's arrangements with the limited partnerships and the limited partnerships' participation in the FCC auctions complied with applicable law and FCC rules. At this time, TDS cannot predict the outcome of any proceeding.

Note 16 Variable Interest Entities

Consolidated VIEs

TDS consolidates VIEs in which it has a controlling financial interest as defined by GAAP and is therefore deemed the primary beneficiary. A controlling financial interest will have both of the following characteristics: (a) the power to direct the VIE activities that most significantly impact economic performance; and (b) the obligation to absorb the VIE losses and the right to receive benefits that are significant to the VIE. TDS reviews these criteria initially at the time it enters into agreements and subsequently when events warranting reconsideration occur. These VIEs have risks similar to those described in the "Risk Factors" in TDS' Form 10-K for the year ended December 31, 2019.

During 2017, U.S. Cellular formed USCC EIP LLC (Seller/Sub-Servicer), USCC Receivables Funding LLC (Transferor) and the Trust, collectively the special purpose entities (SPEs), to facilitate a securitized borrowing using its equipment installment plan receivables. Under a Receivables Sale Agreement, U.S. Cellular wholly-owned, majority-owned and unconsolidated entities, collectively referred to as "affiliated entities," transfer device equipment installment plan contracts to the Seller/Sub-Servicer. The Seller/Sub-Servicer aggregates device equipment installment plan contracts, and performs servicing, collection and all other administrative activities related to accounting for the equipment installment plan contracts. The Seller/Sub-Servicer sells the eligible equipment installment plan receivables to the Transferor, a bankruptcy remote entity, which subsequently sells the receivables to the Trust. The Trust, which is bankruptcy remote and isolated from the creditors of U.S. Cellular, will be responsible for issuing asset-backed variable funding notes (Notes), which are collateralized by the equipment installment plan receivables owned by the Trust. Given that U.S. Cellular has the power to direct the activities of these SPEs, and that these SPEs lack sufficient equity to finance their activities, U.S. Cellular is deemed to have a controlling financial interest in the SPEs and, therefore, consolidates them. All transactions with third parties (e.g., issuance of the asset-backed variable funding notes) will be accounted for as a secured borrowing due to the pledging of equipment installment plan contracts as collateral, significant continuing involvement in the transferred assets, subordinated interests of the cash flows, and continued evidence of control of the receivables. Refer to Note 13 — Debt, Receivables Securitization Agreement for additional details regarding the securitization agreement for which these entities were established.

The following VIEs were formed to participate in FCC auctions of wireless spectrum licenses and to fund, establish, and provide wireless service with respect to any FCC wireless spectrum licenses won in the auctions:

- Advantage Spectrum, L.P. (Advantage Spectrum) and Sunshine Spectrum, Inc., the general partner of Advantage Spectrum; and
- King Street Wireless, L.P. (King Street Wireless) and King Street Wireless, Inc., the general partner of King Street Wireless.

These particular VIEs are collectively referred to as designated entities. The power to direct the activities that most significantly impact the economic performance of these VIEs is shared. Specifically, the general partner of these VIEs has the exclusive right to manage, operate and control the limited partnerships and make all decisions to carry on the business of the partnerships. The general partner of each partnership needs the consent of the limited partner, an indirect TDS subsidiary, to sell or lease certain wireless spectrum licenses, to make certain large expenditures, admit other partners or liquidate the limited partnerships. Although the power to direct the activities of these VIEs is shared, TDS has the most significant level of exposure to the variability associated with the economic performance of the VIEs, indicating that TDS is the primary beneficiary of the VIEs. Therefore, in accordance with GAAP, these VIEs are consolidated.

TDS also consolidates other VIEs that are limited partnerships that provide wireless service. A limited partnership is a variable interest entity unless the limited partners hold substantive participating rights or kick-out rights over the general partner. For certain limited partnerships, U.S. Cellular is the general partner and manages the operations. In these partnerships, the limited partners do not have substantive kick-out or participating rights and, further, such limited partners do not have the authority to remove the general partner. Therefore, these limited partnerships are also recognized as VIEs and are consolidated under the variable interest model.

The following table presents the classification and balances of the consolidated VIEs' assets and liabilities in TDS' Consolidated Balance Sheet.

December 31,	2019	2018
(Dollars in millions)		
Assets		
Cash and cash equivalents	\$ 19	\$ 9
Short-term investments	—	17
Accounts receivable	637	609
Inventory, net	5	5
Other current assets	7	5
Licenses	647	647
Property, plant and equipment, net	95	88
Operating lease right-of-use assets	42	—
Other assets and deferred charges	347	347
Total assets	<u>\$ 1,799</u>	<u>\$ 1,727</u>
Liabilities		
Current liabilities	\$ 30	\$ 31
Long-term operating lease liabilities	39	—
Other deferred liabilities and credits	13	15
Total liabilities	<u>\$ 82</u>	<u>\$ 46</u>

Unconsolidated VIEs

TDS manages the operations of and holds a variable interest in certain other limited partnerships, but is not the primary beneficiary of these entities and, therefore, does not consolidate them under the variable interest model.

TDS' total investment in these unconsolidated entities was \$5 million and \$4 million at December 31, 2019 and 2018, respectively, and is included in Investments in unconsolidated entities in TDS' Consolidated Balance Sheet. The maximum exposure from unconsolidated VIEs is limited to the investment held by TDS in those entities.

Other Related Matters

TDS made contributions, loans and/or advances to its VIEs totaling \$255 million, \$152 million and \$821 million during 2019, 2018 and 2017, respectively; of which \$214 million in 2019, \$116 million in 2018 and \$790 million in 2017 are related to USCC EIP LLC as discussed above. TDS may agree to make additional capital contributions and/or advances to these or other VIEs and/or to their general partners to provide additional funding for operations or the development of wireless spectrum licenses granted in various auctions. TDS may finance such amounts with a combination of cash on hand, borrowings under its revolving credit agreement and/or other long-term debt. There is no assurance that TDS will be able to obtain additional financing on commercially reasonable terms or at all to provide such financial support.

The limited partnership agreements of Advantage Spectrum and King Street Wireless also provide the general partner with a put option whereby the general partner may require the limited partner, a subsidiary of U.S. Cellular, to purchase its interest in the limited partnership. The general partner's put options related to its interests in King Street Wireless became exercisable in 2019. The general partner's put options related to its interest in Advantage Spectrum will become exercisable in 2021 and 2022. The greater of the carrying value of the general partner's investment or the value of the put option, net of any borrowings due to TDS, is recorded as Noncontrolling interests with redemption features in TDS' Consolidated Balance Sheet. Also in accordance with GAAP, minority share of income or changes in the redemption value of the put options, net of interest accrued on the loans, are recorded as a component of Net income attributable to noncontrolling interests, net of tax, in TDS' Consolidated Statement of Operations.

During the first quarter of 2018, TDS recorded an out-of-period adjustment attributable to 2016 and 2017 due to errors in the application of accounting guidance applicable to the calculation of Noncontrolling interests with redemption features related to King Street Wireless, Inc. This out-of-period adjustment had the impact of increasing Net income attributable to noncontrolling interests, net of tax, by \$6 million and decreasing Net income attributable to TDS shareholders by \$6 million in 2018. TDS determined that this adjustment was not material to any of the periods impacted.

Note 17 Noncontrolling Interests

The following schedule discloses the effects of Net income attributable to TDS shareholders and changes in TDS' ownership interest in U.S. Cellular on TDS' equity for 2019, 2018 and 2017:

Year Ended December 31,	2019	2018	2017
(Dollars in millions)			
Net income attributable to TDS shareholders	\$ 121	\$ 135	\$ 153
Transfers (to) from the noncontrolling interests			
Change in TDS' Capital in excess of par value from U.S. Cellular's issuance of U.S. Cellular shares	(23)	(30)	(12)
Change in TDS' Capital in excess of par value from U.S. Cellular's repurchase of U.S. Cellular shares	6	—	—
Net transfers (to) from noncontrolling interests	(17)	(30)	(12)
Change from net income attributable to TDS shareholders and transfers (to) from noncontrolling interests	\$ 104	\$ 105	\$ 141

Mandatorily Redeemable Noncontrolling Interests in Finite-Lived Subsidiaries

TDS' consolidated financial statements include certain noncontrolling interests that meet the GAAP definition of mandatorily redeemable financial instruments. These mandatorily redeemable noncontrolling interests represent interests held by third parties in consolidated partnerships, where the terms of the underlying partnership agreement provide for a defined termination date at which time the assets of the subsidiary are to be sold, the liabilities are to be extinguished and the remaining net proceeds are to be distributed to the noncontrolling interest holders and TDS in accordance with the respective partnership agreements. The termination dates of these mandatorily redeemable noncontrolling interests range from 2085 to 2092.

The estimated aggregate amount that would be due and payable to settle all of these noncontrolling interests, assuming an orderly liquidation of the finite-lived consolidated partnerships on December 31, 2019, net of estimated liquidation costs, is \$20 million. This amount excludes redemption amounts recorded in Noncontrolling interests with redemption features in the Consolidated Balance Sheet. The estimate of settlement value was based on certain factors and assumptions which are subjective in nature. Changes in those factors and assumptions could result in a materially larger or smaller settlement amount. The corresponding carrying value of the mandatorily redeemable noncontrolling interests in finite-lived consolidated partnerships at December 31, 2019, was \$5 million, and is included in Noncontrolling interests in the Consolidated Balance Sheet. The excess of the aggregate settlement value over the aggregate carrying value of these mandatorily redeemable noncontrolling interests is due primarily to the unrecognized appreciation of the noncontrolling interest holders' share of the underlying net assets in the consolidated partnerships. Neither the noncontrolling interest holders' share, nor TDS' share, of the appreciation of the underlying net assets of these subsidiaries is reflected in the consolidated financial statements.

Note 18 Common Shareholders' Equity

Common Stock

Series A Common Shares are convertible on a share-for-share basis into Common Shares. In matters other than the election of directors, each Series A Common Share is entitled to ten votes per share, compared to one vote for each Common Share. The Series A Common Shares are entitled to elect eight directors, and the Common Shares elect four. TDS has reserved 7,234,000 Common Shares at December 31, 2019, for possible issuance upon conversion of Series A Common Shares.

The following table summarizes the number of Common and Series A Common Shares issued.

	Common Shares	Series A Common Shares	Common Treasury Shares
(Shares in millions)			
Balance at December 31, 2016	126	7	23
Dividend reinvestment, incentive and compensation plans	—	—	(1)
Balance at December 31, 2017	126	7	22
Dividend reinvestment, incentive and compensation plans	—	—	(3)
Balance at December 31, 2018	126	7	19
Dividend reinvestment, incentive and compensation plans	—	—	(1)
Balance at December 31, 2019	126	7	18

On August 2, 2013, the Board of Directors of TDS authorized a \$250 million stock repurchase program for the purchase of TDS Common Shares from time to time pursuant to open market purchases, block transactions, private purchases or otherwise, depending on market conditions. This authorization does not have an expiration date. As of December 31, 2019, the maximum dollar value of TDS Common Shares that may yet be purchased under TDS' program was \$199 million.

In November 2009, U.S. Cellular announced by Form 8-K that the Board of Directors of U.S. Cellular authorized the repurchase of up to 1,300,000 Common Shares on an annual basis beginning in 2009 and continuing each year thereafter, on a cumulative basis. In December 2016, the U.S. Cellular Board amended this authorization to provide that, beginning on January 1, 2017, the authorized repurchase amount with respect to a particular year will be any amount from zero to 1,300,000 Common Shares, as determined by the Pricing Committee of the Board of Directors, and that if the Pricing Committee did not specify an amount for any year, such amount would be zero for such year. The Pricing Committee has not specified any increase in the authorization since that time. The Pricing Committee also was authorized to decrease the cumulative amount of the authorization at any time, but has not taken any action to do so at this time. As of December 31, 2019, the total cumulative amount of Common Shares authorized to be purchased is 5,311,000. The authorization provides that share repurchases will be made pursuant to open market purchases, block purchases, private purchases, or otherwise, depending on market prices and other conditions. This authorization does not have an expiration date.

Tax-Deferred Savings Plan

At December 31, 2019, TDS has reserved 90,000 Common Shares for issuance under the TDS Tax-Deferred Savings Plan, a qualified profit-sharing plan pursuant to Sections 401(a) and 401(k) of the Internal Revenue Code. Participating employees have the option of investing their contributions and TDS' contributions in a TDS Common Share fund, a U.S. Cellular Common Share fund or certain unaffiliated funds.

Note 19 Stock-Based Compensation

TDS Consolidated

The following table summarizes stock-based compensation expense recognized during 2019, 2018 and 2017:

Year Ended December 31,	2019	2018	2017
(Dollars in millions)			
Stock option awards	\$ 3	\$ 5	\$ 10
Restricted stock unit awards	33	30	29
Performance share unit awards	21	17	5
Deferred compensation bonus and matching stock unit awards	—	—	1
Awards under Non-Employee Director compensation plan	2	2	1
Total stock-based compensation, before income taxes	59	54	46
Income tax benefit	(15)	(14)	(17)
Total stock-based compensation expense, net of income taxes	\$ 44	\$ 40	\$ 29

At December 31, 2019, unrecognized compensation cost for all stock-based compensation awards was \$49 million and is expected to be recognized over a weighted average period of 1.8 years.

The following table provides a summary of the classification of stock-based compensation expense included in the Consolidated Statement of Operations for the years ended:

December 31,	2019	2018	2017
(Dollars in millions)			
Selling, general and administrative expense	\$ 54	\$ 49	\$ 42
Cost of services expense	5	5	4
Total stock-based compensation	\$ 59	\$ 54	\$ 46

TDS' tax benefits realized from the exercise of stock options and the vesting of other awards totaled \$13 million in 2019.

TDS (Excluding U.S. Cellular)

The information in this section relates to stock-based compensation plans using the equity instruments of TDS. Participants in these plans are employees of TDS Corporate and TDS Telecom and Non-employee Directors of TDS. Information related to plans using the equity instruments of U.S. Cellular are shown in the U.S. Cellular section following the TDS section.

Under the TDS Long-Term Incentive Plans, TDS may grant fixed and performance based incentive and non-qualified stock options, restricted stock, restricted stock units, and deferred compensation stock unit awards to key employees.

TDS had reserved 12,475,000 Common Shares at December 31, 2019, for equity awards granted and to be granted under the TDS Long-Term Incentive Plans in effect. At December 31, 2019, the only types of awards outstanding are fixed non-qualified stock option awards, restricted stock unit awards, performance share awards and deferred compensation stock unit awards.

TDS has also established a Non-Employee Directors' compensation plan under which it has reserved 225,000 TDS Common Shares at December 31, 2019, for issuance as compensation to members of the Board of Directors who are not employees of TDS.

TDS uses treasury stock to satisfy requirements for shares issued pursuant to its various stock-based compensation plans.

Long-Term Incentive Plan – Stock Options

Stock options granted to key employees are exercisable over a specified period not in excess of ten years. Stock options generally vest over periods up to three years from the date of grant. Stock options outstanding at December 31, 2019, expire between 2020 and 2029. However, vested stock options typically expire 30 days after the effective date of an employee's termination of employment for reasons other than retirement. Employees who leave at the age of retirement have 90 days (or one year if they satisfy certain requirements) within which to exercise their vested stock options. The exercise price of options equals the market value of TDS common stock on the date of grant.

TDS estimated the fair value of stock options granted in 2019, 2018 and 2017 using the Black-Scholes valuation model and the assumptions shown in the table below:

	2019	2018	2017
Expected life	6.2 years	6.3 years	6.4 years
Expected annual volatility rate	29.0%	28.6%	30.4%
Dividend yield	2.1%	2.5%	2.2%
Risk-free interest rate	2.4%	2.9%	2.0%
Estimated annual forfeiture rate	3.8%	3.3%	2.5%

Pre-vesting forfeitures and expected life are estimated based on historical experience related to similar awards, giving considerations to the contractual terms of the stock-based awards, vesting schedules and expectations of future employee behavior. TDS believes that its historical experience provides the best estimates of future pre-vesting forfeitures and future expected life. The expected volatility assumption is based on historical volatility of TDS' common stock over a period commensurate with the expected life. The dividend yield assumption is equal to the dividends declared in the most recent year as a percentage of the share price on the date of grant. The risk-free interest rate assumption is determined using the U.S. Treasury Yield Curve Rate with a term length that approximates the expected life of the stock options.

A summary of TDS stock options (total and portion exercisable) and changes during 2019 is presented in the tables and narrative below.

Common Share Options	Number of Options	Weighted Average Exercise Prices	Aggregate Intrinsic Value (in millions)	Weighted Average Remaining Contractual Life (in years)
Outstanding at December 31, 2018 (3,270,000 exercisable)	4,763,000	\$ 26.57		
Granted	208,000	\$ 30.72		
Exercised	(826,000)	\$ 27.25		
Forfeited	(54,000)	\$ 27.70		
Outstanding at December 31, 2019 (2,896,000 exercisable)	4,091,000	\$ 26.63	\$ 4	5.0
		\$ 26.32	\$ 4	3.7

The weighted average grant date fair value per share of the TDS stock options granted in 2019, 2018 and 2017 was \$7.70, \$6.33 and \$7.06, respectively. The aggregate intrinsic value of TDS stock options exercised in 2019, 2018 and 2017 was \$7 million, \$14 million and \$1 million, respectively. The aggregate intrinsic value at December 31, 2019, presented in the table above represents the total pre-tax intrinsic value (the difference between TDS' closing stock prices and the exercise price, multiplied by the number of in-the-money options) that would have been received by option holders had all options been exercised on December 31, 2019.

Long-Term Incentive Plans – Restricted Stock Units

TDS also grants restricted stock unit awards to key employees. Each outstanding restricted stock unit is convertible into one Common Share Award. The restricted stock unit awards currently outstanding were granted in 2017, 2018 and 2019 and will vest in 2020, 2021 and 2022, respectively.

TDS estimates the fair value of restricted stock units by reducing the grant-date price of TDS' shares by the present value of the dividends expected to be paid on the underlying shares during the requisite service period, discounted at the appropriate risk-free interest rate, since employees are not entitled to dividends declared on the underlying shares while the restricted stock is unvested. The fair value is then recognized as compensation cost on a straight-line basis over the requisite service periods of the awards, which is generally the vesting period.

A summary of TDS nonvested restricted stock units and changes during 2019 is presented in the table below:

Common Restricted Stock Units	Number	Weighted Average Grant Date Fair Value
Nonvested at December 31, 2018	1,212,000	\$ 25.73
Granted	425,000	\$ 28.81
Vested	(355,000)	\$ 27.87
Forfeited	(49,000)	\$ 26.11
Nonvested at December 31, 2019	1,233,000	\$ 26.16

The total fair values as of the respective vesting dates of restricted stock units vested during 2019, 2018 and 2017 were \$11 million, \$9 million and \$9 million, respectively. The weighted average grant date fair value per share of the restricted stock units granted in 2019, 2018 and 2017 was \$28.81, \$23.87 and \$25.97, respectively.

Long-Term Incentive Plans – Performance Share Units

Beginning in 2016, TDS granted performance share units to certain TDS executive officers, and beginning in 2019, to certain key TDS Corporate and TDS Telecom employees. Each recipient may be entitled to shares of TDS common stock equal to 0% to 200% of a communicated target award depending on the achievement of predetermined performance-based and market-based operating targets over three years. Performance-based operating targets for the TDS awards include Total Revenue and Return on Capital. Market-based operating targets are measured against TDS' total shareholder return relative to a defined peer group. Performance-based operating targets for the TDS Telecom employees' awards include Total Revenue, Return on Capital and Adjusted EBITDA Margin Percent. Performance shares accumulate dividend equivalents, which are forfeitable if the performance metrics are not achieved. If the predetermined performance-based and market-based operating targets are met, the TDS units granted in 2017, 2018 and 2019 will vest in 2020, 2021 and 2022, respectively, and the TDS Telecom employees' units granted in 2019 will vest in 2022.

TDS estimates fair value of performance-based operating targets using TDS' closing stock price on the date of grant. An estimate of the number of performance units expected to vest based upon achieving the performance-based operating targets is made and the fair value is expensed on a straight-line basis over the requisite service period. Each reporting period these estimates are reviewed and stock compensation expense is adjusted accordingly to reflect the new estimates of total units expected to vest. If any part of the performance share units do not vest as a result of the established performance-based operating targets not being achieved, the related stock compensation expense is reversed.

TDS estimates the market-based operating target's fair value using an internally developed valuation model. This estimated fair value approximated TDS' closing stock price at the date of grant for market-based share units granted in 2019, 2018 and 2017. This market-based operating target value determined at the date of grant is expensed on a straight-line basis over the requisite service period and the stock compensation expense is not adjusted during the performance period for the subsequent changes in the value of the market-based unit awards and will not be reversed even if the market-based operating target is not achieved.

A summary of TDS nonvested performance share units and changes during 2019 is presented in the table below:

Common Performance Share Units	Number	Weighted Average Grant Date Fair Value
Nonvested at December 31, 2018	350,000	\$ 27.38
Granted	229,000	\$ 30.72
Vested	(99,000)	\$ 29.45
Change in units based on approved performance factors	6,000	\$ 29.45
Forfeited	(7,000)	\$ 30.33
Accumulated dividend equivalents	10,000	\$ 28.26
Nonvested at December 31, 2019	<u>489,000</u>	<u>\$ 28.53</u>

The total fair value of performance share units that vested during 2019 was \$4 million. No performance share units vested during 2018 or 2017. The weighted average grant date fair value per share of the performance share units granted in 2019, 2018 and 2017 was \$30.72, \$25.70 and \$27.79, respectively.

Long-Term Incentive Plans – Deferred Compensation Stock Units

Certain TDS employees may elect to defer receipt of all or a portion of their annual bonuses and to receive a company matching contribution on the amount deferred. All bonus compensation that is deferred by employees electing to participate is immediately vested and is deemed to be invested in TDS Common Share units. The amount of TDS' matching contribution depends on the portion of the annual bonus that is deferred. Participants receive a 25% stock unit match for amounts deferred up to 50% of their total annual bonus and a 33% match for amounts that exceed 50% of their total annual bonus; such matching contributions also are deemed to be invested in TDS Common Share units and vest over three years.

The total fair values of deferred compensation stock units that vested during 2019, 2018 and 2017 were less than \$1 million in each respective year. The weighted average grant date fair value per share of the deferred compensation stock units granted in 2019, 2018 and 2017 was \$31.05, \$28.96 and \$27.13, respectively. As of December 31, 2019, there were 96,000 vested but unissued deferred compensation stock units valued at \$2 million.

Compensation of Non-Employee Directors

TDS issued 28,000, 32,000 and 27,000 Common Shares under its Non-Employee Director plan in 2019, 2018 and 2017, respectively.

Dividend Reinvestment Plans

TDS had reserved 464,000 Common Shares at December 31, 2019, for issuance under Automatic Dividend Reinvestment and Stock Purchase Plans and 183,000 Series A Common Shares for issuance under the Series A Common Share Automatic Dividend Reinvestment Plan. These plans enabled holders of TDS' Common Shares to reinvest cash dividends in Common Shares and holders of Series A Common Shares to reinvest cash dividends in Series A Common Shares. The purchase price of the shares is 95% of the market value, based on the average of the daily high and low sales prices for TDS' Common Shares on the New York Stock Exchange for the ten trading days preceding the date on which the purchase is made. These plans are considered non-compensatory plans; therefore, no compensation expense is recognized for stock issued under these plans.

U.S. Cellular

The information in this section relates to stock-based compensation plans using the equity instruments of U.S. Cellular. Participants in these plans are employees of U.S. Cellular and Non-employee Directors of U.S. Cellular. Information related to plans using the equity instruments of TDS are shown in the previous section.

U.S. Cellular has established the following stock-based compensation plans: Long-Term Incentive Plans and a Non-Employee Director compensation plan.

Under the U.S. Cellular Long-Term Incentive Plans, U.S. Cellular may grant fixed and performance based incentive and non-qualified stock options, restricted stock, restricted stock units, and deferred compensation stock unit awards to key employees. At December 31, 2019, the only types of awards outstanding are fixed non-qualified stock option awards, restricted stock unit awards, performance share awards and deferred compensation stock unit awards.

Under the Non-Employee Director compensation plan, U.S. Cellular may grant Common Shares to members of the Board of Directors who are not employees of U.S. Cellular or TDS.

At December 31, 2019, U.S. Cellular had reserved 12,867,000 Common Shares for equity awards granted and to be granted under the Long-Term Incentive Plans and 123,000 Common Shares for issuance under the Non-Employee Director compensation plan.

U.S. Cellular uses treasury stock to satisfy requirements for Common Shares issued pursuant to its various stock-based compensation plans.

Long-Term Incentive Plans – Stock Options

Stock options granted to key employees are exercisable over a specified period not in excess of ten years. Stock options generally vest over a period of three years from the date of grant. Stock options outstanding at December 31, 2019, expire between 2020 and 2026. However, vested stock options typically expire 30 days after the effective date of an employee's termination of employment for reasons other than retirement. Employees who leave at the age of retirement have 90 days (or one year if they satisfy certain requirements) within which to exercise their vested stock options. The exercise price of options equals the market value of U.S. Cellular Common Shares on the date of grant.

U.S. Cellular did not grant stock option awards in 2019, 2018 or 2017.

A summary of U.S. Cellular stock options outstanding (total and portion exercisable) and changes during 2019 is presented in the table below:

Common Share Options	Number of Options	Weighted Average Exercise Price	Aggregate Intrinsic Value (in millions)	Weighted Average Remaining Contractual Life (in years)
Outstanding at December 31, 2018	806,000	\$ 43.10		
(420,000 exercisable)		\$ 42.39		
Exercised	(339,000)	\$ 44.27		
Expired	(7,000)	\$ 45.87		
Outstanding at December 31, 2019	460,000	\$ 42.20	\$ —	4.9
(460,000 exercisable)		\$ 42.20	\$ —	4.9

The aggregate intrinsic value of U.S. Cellular stock options exercised in 2019, 2018 and 2017 was \$3 million, \$19 million and \$1 million, respectively. The aggregate intrinsic value at December 31, 2019, presented in the table above represents the total pre-tax intrinsic value (the difference between U.S. Cellular's closing stock price and the exercise price multiplied by the number of in-the-money options) that would have been received by option holders had all options been exercised on December 31, 2019.

Long-Term Incentive Plans – Restricted Stock Units

Restricted stock unit awards granted to key employees generally vest after three years. The restricted stock unit awards currently outstanding were granted in 2017, 2018 and 2019 and will vest in 2020, 2021 and 2022, respectively.

U.S. Cellular estimates the fair value of restricted stock units based on the closing market price of U.S. Cellular shares on the date of grant. The fair value is then recognized as compensation cost on a straight-line basis over the requisite service periods of the awards, which is generally the vesting period.

A summary of U.S. Cellular nonvested restricted stock units at December 31, 2019, and changes during the year then ended is presented in the table below:

Common Restricted Stock Units	Number	Weighted Average Grant Date Fair Value
Nonvested at December 31, 2018	1,569,000	\$ 39.74
Granted	478,000	\$ 46.81
Vested	(525,000)	\$ 42.99
Forfeited	(61,000)	\$ 39.38
Nonvested at December 31, 2019	<u>1,461,000</u>	<u>\$ 40.90</u>

The total fair value of restricted stock units that vested during 2019, 2018 and 2017 was \$25 million, \$16 million and \$11 million, respectively. The weighted average grant date fair value per share of the restricted stock units granted in 2019, 2018 and 2017 was \$46.81, \$38.19 and \$38.04, respectively.

Long-Term Incentive Plans – Performance Share Units

Beginning in 2017, U.S. Cellular granted performance share units to key employees. The performance share units vest after three years. Each recipient may be entitled to shares of U.S. Cellular common stock equal to 50% to 200% of a communicated target award depending on the achievement of predetermined performance-based operating targets over the performance period, which is a one-year period beginning on January 1 in the year of grant to December 31 in the year of grant. The remaining time through the end of the vesting period is considered the “time-based period.” Performance-based operating targets include Simple Free Cash Flow, Consolidated Total Operating Revenues and Postpaid Handset Voluntary Defections. Subject to vesting during the time-based period, the performance share unit award agreement provides that in no event shall the award be less than 50% of the target opportunity as of the grant date. The performance share units currently outstanding were granted in 2017, 2018 and 2019 and will vest in 2020, 2021 and 2022, respectively.

U.S. Cellular estimates the fair value of performance share units using U.S. Cellular’s closing stock price on the date of grant. An estimate of the number of performance share units expected to vest based upon achieving the performance-based operating targets is made and the aggregate fair value is expensed on a straight-line basis over the requisite service period. Each reporting period, during the performance period, the estimate of the number of performance share units expected to vest is reviewed and stock compensation expense is adjusted as appropriate to reflect the revised estimate of the aggregate fair value of the performance share units expected to vest.

A summary of U.S. Cellular’s nonvested performance share units and changes during 2019 is presented in the table below:

Common Performance Share Units	Number	Weighted Average Grant Date Fair Value
Nonvested at December 31, 2018	768,000	\$ 37.78
Granted	323,000	\$ 46.43
Vested	(5,000)	\$ 37.92
Change in units based on approved performance factors	188,000	\$ 38.81
Forfeited	(29,000)	\$ 38.55
Nonvested at December 31, 2019	<u>1,245,000</u>	<u>\$ 40.16</u>

The total fair value of performance share units that vested during 2019 was less than \$1 million. No performance share units vested during 2018 or 2017. The weighted average grant date fair value per share of the performance share units granted in 2019, 2018 and 2017 was \$46.43, \$38.81 and \$36.92, respectively.

Long-Term Incentive Plans – Deferred Compensation Stock Units

Certain U.S. Cellular employees may elect to defer receipt of all or a portion of their annual bonuses and to receive a company matching contribution on the amount deferred. All bonus compensation that is deferred by employees electing to participate is immediately vested and is deemed to be invested in U.S. Cellular Common Share stock units. The amount of U.S. Cellular's matching contribution depends on the portion of the annual bonus that is deferred. Participants receive a 25% match for amounts deferred up to 50% of their total annual bonus and a 33% match for amounts that exceed 50% of their total annual bonus; such matching contributions also are deemed to be invested in U.S. Cellular Common Share stock units and vest over three years.

The total fair value of deferred compensation stock units that vested during 2019, 2018 and 2017 was less than \$1 million in each respective year. The weighted average grant date fair value per share of the deferred compensation stock units granted in 2018 and 2017 was \$40.72 and \$36.02, respectively. There were no deferred compensation stock units granted during 2019. As of December 31, 2019, there were 34,000 vested but unissued deferred compensation stock units valued at \$1 million.

Compensation of Non-Employee Directors

U.S. Cellular issued 13,000, 18,000 and 15,000 Common Shares in 2019, 2018 and 2017, respectively, under its Non-Employee Director compensation plan.

Note 20 Business Segment Information

U.S. Cellular and TDS Telecom are billed for services they receive from TDS, consisting primarily of information processing, accounting and finance, and general management services. Such billings are based on expenses specifically identified to U.S. Cellular and TDS Telecom and on allocations of common expenses. Management believes the method used to allocate common expenses is reasonable and that all expenses and costs applicable to U.S. Cellular and TDS Telecom are reflected in the accompanying business segment information on a basis that is representative of what they would have been if U.S. Cellular and TDS Telecom operated on a stand-alone basis. TDS has re-evaluated internal reporting roles with regard to its HMS business unit and, as a result, has changed its reportable segments. Effective January 1, 2018, HMS is no longer reported under TDS Telecom, but is reported as a part of Corporate, Eliminations and Other. Prior periods have been recast to conform to the revised presentation.

Financial data for TDS' reportable segments for 2019, 2018 and 2017, is as follows. See Note 1 — Summary of Significant Accounting Policies and Recent Accounting Pronouncements for additional information.

Year ended or as of December 31, 2019	TDS Telecom				Corporate, Eliminations and Other	Total
	U.S. Cellular	Wireline	Cable	TDS Telecom Total ¹		
(Dollars in millions)						
Operating revenues						
Service	\$ 3,035	\$ 682	\$ 247	\$ 928	\$ 96	\$ 4,059
Equipment and product sales	987	1	—	1	129	1,117
Total operating revenues	4,022	683	247	930	224	5,176
Cost of services (excluding Depreciation, amortization and accretion expense reported below)	756	263	105	368	78	1,202
Cost of equipment and products	1,028	1	—	1	106	1,135
Selling, general and administrative	1,406	199	62	260	51	1,717
Depreciation, amortization and accretion	702	132	68	200	30	932
(Gain) loss on asset disposals, net	19	(8)	1	(7)	—	12
(Gain) loss on sale of business and other exit costs, net	(1)	—	—	—	—	(1)
Operating income (loss)	112	96	11	107	(40)	179
Equity in earnings of unconsolidated entities	166	—	—	—	2	168
Interest and dividend income	17	10	2	12	—	29
Interest expense	(110)	3	—	3	(58)	(165)
Income (loss) before income taxes	185	110	13	122	(96)	211
Income tax expense (benefit) ²	52	—	—	30	(18)	64
Net income	133	—	—	92	(78)	147
Add back:						
Depreciation, amortization and accretion	702	132	68	200	30	932
(Gain) loss on asset disposals, net	19	(8)	1	(7)	—	12
(Gain) loss on sale of business and other exit costs, net	(1)	—	—	—	—	(1)
Interest expense	110	(3)	—	(3)	58	165
Income tax expense (benefit) ²	52	—	—	30	(18)	64
Adjusted EBITDA³	\$ 1,015	\$ 231	\$ 82	\$ 313	\$ (9)	\$ 1,319
Investments in unconsolidated entities	\$ 447	\$ 4	\$ —	\$ 4	\$ 37	\$ 488
Total assets ⁴	\$ 8,164	\$ 1,471	\$ 734	\$ 2,196	\$ 421	\$ 10,781
Capital expenditures	\$ 710	\$ 243	\$ 73	\$ 316	\$ 6	\$ 1,032

Year ended or as of December 31, 2018 ⁵	TDS Telecom			TDS Telecom Total ¹	Corporate, Eliminations and Other	Total
	U.S. Cellular	Wireline	Cable			
(Dollars in millions)						
Operating revenues						
Service	\$ 2,978	\$ 697	\$ 230	\$ 925	\$ 96	\$ 3,999
Equipment and product sales	989	2	—	2	119	1,110
Total operating revenues	3,967	699	230	927	215	5,109
Cost of services (excluding Depreciation, amortization and accretion expense reported below)	758	266	104	369	79	1,206
Cost of equipment and products	1,031	1	—	1	98	1,130
Selling, general and administrative	1,388	197	57	254	52	1,694
Depreciation, amortization and accretion	640	142	69	212	31	883
(Gain) loss on asset disposals, net	10	(3)	1	(2)	1	9
(Gain) loss on license sales and exchanges, net	(18)	—	—	—	—	(18)
Operating income (loss)	158	95	(2)	93	(46)	205
Equity in earnings of unconsolidated entities	159	—	—	—	1	160
Interest and dividend income	15	7	1	8	3	26
Interest expense	(116)	2	—	2	(58)	(172)
Other, net	(1)	3	—	2	1	2
Income (loss) before income taxes	215	106	(1)	105	(99)	221
Income tax expense (benefit) ²	51	—	—	16	(21)	46
Net income (loss)	164	—	—	89	(78)	175
Add back:						
Depreciation, amortization and accretion	640	142	69	212	31	883
(Gain) loss on asset disposals, net	10	(3)	1	(2)	1	9
(Gain) loss on license sales and exchanges, net	(18)	—	—	—	—	(18)
Interest expense	116	(2)	—	(2)	58	172
Income tax expense (benefit) ²	51	—	—	16	(21)	46
Adjusted EBITDA³	\$ 963	\$ 243	\$ 70	\$ 313	\$ (9)	\$ 1,267
Investments in unconsolidated entities	\$ 441	\$ 4	\$ —	\$ 4	\$ 35	\$ 480
Total assets	\$ 7,274	\$ 1,304	\$ 639	\$ 1,934	\$ 575	\$ 9,783
Capital expenditures	\$ 515	\$ 176	\$ 56	\$ 232	\$ 20	\$ 767

Year ended or as of December 31, 2017	TDS Telecom				Corporate, Eliminations and Other	Total
	U.S. Cellular	Wireline	Cable	TDS Telecom Total ¹		
(Dollars in millions)						
Operating revenues						
Service	\$ 2,978	\$ 713	\$ 206	\$ 917	\$ 84	\$ 3,979
Equipment and product sales	912	1	—	1	152	1,065
Total operating revenues	3,890	714	206	919	235	5,044
Cost of services (excluding Depreciation, amortization and accretion expense reported below)	732	258	98	355	77	1,164
Cost of equipment and products	1,071	2	—	2	122	1,195
Selling, general and administrative ⁶	1,412	194	54	248	29	1,689
Depreciation, amortization and accretion	615	151	44	195	34	844
Loss on impairment of goodwill ⁷	370	—	—	—	(108)	262
(Gain) loss on asset disposals, net	17	1	2	3	1	21
(Gain) loss on sale of business and other exit costs, net	(1)	—	—	—	—	(1)
(Gain) loss on license sales and exchanges, net	(22)	—	—	—	—	(22)
Operating income (loss)	(304)	108	8	116	80	(108)
Equity in earnings of unconsolidated entities	137	—	—	—	—	137
Interest and dividend income	8	5	—	5	2	15
Interest expense	(113)	—	—	—	(57)	(170)
Other, net ⁶	—	3	—	3	1	4
Income (loss) before income taxes	(272)	117	8	125	25	(122)
Income tax expense (benefit) ²	(287)	—	—	(13)	21	(279)
Net income (loss)	15	—	—	138	4	157
Add back:						
Depreciation, amortization and accretion	615	151	44	195	34	844
Loss on impairment of goodwill ⁷	370	—	—	—	(108)	262
(Gain) loss on asset disposals, net	17	1	2	3	1	21
(Gain) loss on sale of business and other exit costs, net	(1)	—	—	—	—	(1)
(Gain) loss on license sales and exchanges, net	(22)	—	—	—	—	(22)
Interest expense	113	—	—	—	57	170
Income tax expense (benefit) ²	(287)	—	—	(13)	21	(279)
Adjusted EBITDA³	\$ 820	\$ 269	\$ 54	\$ 323	\$ 9	\$ 1,152
Investments in unconsolidated entities	\$ 415	\$ 4	\$ —	\$ 4	\$ 34	\$ 453
Total assets	\$ 6,841	\$ 1,260	\$ 644	\$ 1,897	\$ 557	\$ 9,295
Capital expenditures	\$ 469	\$ 146	\$ 55	\$ 201	\$ 24	\$ 694

Numbers may not foot due to rounding.

¹ TDS Telecom Total includes eliminations between the Wireline and Cable segments.

² Income tax expense (benefit) is not provided at the individual segment level for Wireline and Cable. TDS calculates income tax expense for "TDS Telecom Total".

³ Adjusted earnings before interest, taxes, depreciation, amortization and accretion (Adjusted EBITDA) is a segment measure reported to the chief operating decision maker for purposes of making decisions about allocating resources to the segments and assessing their performance. Adjusted EBITDA is defined as net income, adjusted for the items set forth in the reconciliation above. TDS believes Adjusted EBITDA is a useful measure of TDS' operating results before significant recurring non-cash charges, gains and losses, and other items as presented above as they provide additional relevant and useful information to investors and other users of TDS' financial data in evaluating the effectiveness of its operations and underlying business trends in a manner that is consistent with management's evaluation of business performance.

⁴ As of January 1, 2019, U.S. Cellular adopted ASC 842 using a modified retrospective method. Under this method, the new accounting standard is applied only to the most recent period presented. As a result, 2019 includes the impacts of ASC 842, but prior periods remain as previously reported. See Note 11 — Leases for additional information.

⁵ As of January 1, 2018, TDS adopted the new revenue recognition accounting standard, ASC 606, using a modified retrospective approach. Under this method, the new accounting standard is applied only to the most recent period presented. As a result, 2018 amounts include the impacts of ASC 606, but prior periods remain as previously reported.

⁶ ASU 2017-07, regarding net periodic pension cost and net periodic postretirement benefit cost was adopted as of January 1, 2018, and applied retrospectively. All prior year numbers have been recast to conform to this standard.

⁷ During 2017, U.S. Cellular recorded a goodwill impairment of \$370 million while TDS recorded a goodwill impairment of the U.S. Cellular reporting unit of \$227 million. Prior to 2009, TDS accounted for U.S. Cellular's share repurchases as step acquisitions, allocating a portion of the share repurchase value to TDS' Goodwill. Further, goodwill of the U.S. Cellular reporting unit was impaired at the TDS level in 2003 but not at U.S. Cellular. Consequently, U.S. Cellular's goodwill on a stand-alone basis and any resulting impairments of goodwill does not equal the TDS consolidated goodwill related to U.S. Cellular. The TDS adjustment of \$143 million is included in "Corporate, Eliminations and Other." During 2017, TDS also recorded a goodwill impairment of \$35 million related to its HMS operations included in "Corporate, Eliminations and Other." For further information on the goodwill impairment see Note 8 — Intangible Assets.

Note 21 Supplemental Cash Flow Disclosures

Following are supplemental cash flow disclosures regarding interest paid and income taxes paid.

Year Ended December 31,	2019	2018	2017
(Dollars in millions)			
Interest paid	\$ 162	\$ 168	\$ 167
Income taxes paid, net of refunds received	44	40	56

Following are supplemental cash flow disclosures regarding transactions related to stock-based compensation awards. In certain situations, TDS and U.S. Cellular withhold shares that are issuable upon the exercise of stock options or the vesting of restricted shares to cover, and with a value equivalent to, the exercise price and/or the amount of taxes required to be withheld from the stock award holder at the time of the exercise or vesting. TDS and U.S. Cellular then pay the amount of the required tax withholdings to the taxing authorities in cash.

TDS:

Year Ended December 31,	2019	2018	2017
(Dollars in millions)			
Common Shares withheld	814,000	676,000	121,000
Aggregate value of Common Shares withheld	\$ 29	\$ 21	\$ 3
Cash receipts upon exercise of stock options	2	48	7
Cash disbursements for payment of taxes	(8)	(6)	(3)
Net cash receipts (disbursements) from exercise of stock options and vesting of other stock awards	\$ (6)	\$ 42	\$ 4

U.S. Cellular:

Year Ended December 31,	2019	2018	2017
(Dollars in millions)			
Common Shares withheld	452,000	1,550,000	145,000
Aggregate value of Common Shares withheld	\$ 23	\$ 73	\$ 6
Cash receipts upon exercise of stock options	1	29	5
Cash disbursements for payment of taxes	(10)	(11)	(4)
Net cash receipts (disbursements) from exercise of stock options and vesting of other stock awards	\$ (9)	\$ 18	\$ 1

Note 22 Certain Relationships and Related Transactions

The following persons are partners of Sidley Austin LLP, the principal law firm of TDS and its subsidiaries: Walter C.D. Carlson, a trustee and beneficiary of a voting trust that controls TDS, the non-executive Chairman of the Board and member of the Board of Directors of TDS and a director of U.S. Cellular, a subsidiary of TDS and certain subsidiaries of TDS; and Stephen P. Fitzell, the General Counsel and/or an Assistant Secretary of TDS and U.S. Cellular and certain other subsidiaries of TDS. Walter C.D. Carlson does not provide legal services to TDS or its subsidiaries. TDS, U.S. Cellular and their subsidiaries incurred legal costs from Sidley Austin LLP of \$10 million, \$10 million and \$11 million in 2019, 2018 and 2017, respectively.

The Audit Committee of the Board of Directors of TDS is responsible for the review and evaluation of all related-party transactions as such term is defined by the rules of the New York Stock Exchange.

Note 23 Subsequent Events

On January 6, 2020, TDS entered into an unsecured \$200 million senior term loan credit agreement. As of February 25, 2020, no borrowings have been made under the agreement. The term loan may be drawn in one or more advances by the one-year anniversary of the date of the agreement; amounts not drawn by that time will cease to be available. The maturity date of the term loan is January 6, 2027 and would accelerate in the event of a change in control.

The term loan is available for general corporate purposes, including working capital and capital expenditures. The continued availability of the term loan facility requires TDS to comply with certain negative and affirmative covenants, maintain certain financial ratios and make representations regarding certain matters at the time of each borrowing.

Reports of Management

Management's Responsibility for Financial Statements

Management of Telephone and Data Systems, Inc. has the responsibility for preparing the accompanying consolidated financial statements and for their integrity and objectivity. The statements were prepared in accordance with accounting principles generally accepted in the United States of America and, in management's opinion, were fairly presented. The financial statements included amounts that were based on management's best estimates and judgments. Management also prepared the other information in the annual report and is responsible for its accuracy and consistency with the financial statements.

PricewaterhouseCoopers LLP, an independent registered public accounting firm, has audited these consolidated financial statements in accordance with the standards of the Public Company Accounting Oversight Board (United States) and has expressed herein its unqualified opinion on these financial statements.

/s/ LeRoy T. Carlson, Jr.

LeRoy T. Carlson, Jr.
President and Chief Executive Officer
(principal executive officer)

/s/ Peter L. Sereda

Peter L. Sereda
Executive Vice President and Chief Financial Officer
(principal financial officer)

/s/ Anita J. Kroll

Anita J. Kroll
Vice President - Controller and Chief Accounting Officer
(principal accounting officer)

Management's Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. TDS' internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America (GAAP). TDS' internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the issuer; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that receipts and expenditures of the issuer are being made only in accordance with authorizations of management and, where required, the Board of Directors of the issuer; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the issuer's assets that could have a material effect on the interim or annual consolidated financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Under the supervision and with the participation of TDS' management, including its principal executive officer and principal financial officer, TDS conducted an evaluation of the effectiveness of its internal control over financial reporting as of December 31, 2019, based on the criteria established in the 2013 version of *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Management has concluded that TDS maintained effective internal control over financial reporting as of December 31, 2019, based on criteria established in the 2013 version of *Internal Control — Integrated Framework* issued by the COSO.

The effectiveness of TDS' internal control over financial reporting as of December 31, 2019, has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in the firm's report included herein.

/s/ LeRoy T. Carlson, Jr.

LeRoy T. Carlson, Jr.

President and Chief Executive Officer
(principal executive officer)

/s/ Peter L. Sereda

Peter L. Sereda

Executive Vice President and Chief Financial Officer
(principal financial officer)

/s/ Anita J. Kroll

Anita J. Kroll

Vice President - Controller and Chief Accounting Officer
(principal accounting officer)

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Telephone and Data Systems, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheet of Telephone and Data Systems, Inc. and its subsidiaries (“the Company”) as of December 31, 2019 and 2018, and the related consolidated statements of operations, comprehensive income, changes in equity, and cash flows for each of the three years in the period ended December 31, 2019, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Company’s internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, based on our audits and the report of other auditors, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the COSO.

We did not audit the financial statements of Los Angeles SMSA Limited Partnership, a 5.5% equity investment of the Company, which is reflected in the consolidated financial statements of the Company as an equity method investment of \$265,200,000 and \$262,100,000 as of December 31, 2019 and 2018, respectively, and income from equity investments of \$77,800,000, \$76,900,000 and \$66,200,000 for each of the three years in the period ended December 31, 2019. The financial statements of Los Angeles SMSA Limited Partnership were audited by other auditors whose report thereon has been furnished to us, and our opinion on the financial statements expressed herein, insofar as it relates to the amounts included for Los Angeles SMSA Limited Partnership, is based solely on the report of the other auditors.

Changes in Accounting Principles

As discussed in Notes 11 and 2 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019 and the manner in which it accounts for revenue from contracts with customers in 2018.

Basis for Opinions

The Company’s management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on the Company’s consolidated financial statements and on the Company’s internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits and the report of other auditors provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Intangible Asset Impairment Assessment - U.S. Cellular Licenses

As described in Notes 1 and 8 to the consolidated financial statements, the Company's consolidated licenses balance was \$2,480 million as of December 31, 2019, of which \$2,475 million relates to the U.S. Cellular licenses. Management performs its annual impairment assessment of licenses as of November 1 of each year or more frequently if there are events or circumstances that cause management to believe it is more likely than not that the carrying value of licenses exceeds fair value. For purposes of its impairment testing of licenses, management separated its FCC licenses into eight units of accounting, which consisted of one unit of accounting for developed operating market wireless spectrum licenses (built wireless spectrum licenses) and seven geographic non-operating market wireless spectrum licenses (unbuilt wireless spectrum licenses). As disclosed by management, a market approach was used to estimate the fair value of each pool of wireless spectrum licenses. The key assumption utilized in estimating the fair value of each pool of wireless spectrum licenses was the pricing multiples, which are units of value expressed in relation to the bandwidth and population covered by a wireless spectrum license.

The principal considerations for our determination that performing procedures relating to the intangible asset impairment assessment for the U.S. Cellular licenses is a critical audit matter are there was significant judgment by management when developing the estimate of fair value for each pool of licenses. This in turn led to a high degree of auditor judgment, effort and subjectivity in performing procedures and evaluating audit evidence related to management's significant assumption relating to the pricing multiples for the wireless spectrum license portfolio used in the fair value estimate. In addition, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's annual intangible asset impairment assessment, including controls over the valuation of the Company's pool of licenses. These procedures also included, among others, testing management's process for developing the fair value estimate, evaluating the appropriateness of the market approach, testing the completeness, accuracy, and relevance of underlying data used in the market approach and evaluating the significant assumption used by management relating to the pricing multiples for the wireless spectrum license portfolio. Evaluating management's assumption related to the pricing multiples involved evaluating whether the assumption used by management was reasonable by considering (i) the current and past performance of each pool of licenses, (ii) consistency with external market and industry data, and (iii) whether the assumption was consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the Company's market approach.

Goodwill Impairment Assessment - TDS Telecom (Wireline and Cable Reporting Units)

As described in Notes 1 and 8 to the consolidated financial statements, the Company's consolidated goodwill balance was \$547 million as of December 31, 2019, of which \$409 million relates to the Wireline reporting unit and \$138 million to the Cable reporting unit. Management performs its annual impairment assessment as of November 1 of each year or more frequently if there are events or circumstances that cause management to believe it is more likely than not that the carrying value of individual reporting units exceeds their respective fair values. Goodwill impairment loss will be measured as the amount by which a reporting unit's carrying amount exceeds its fair value. As disclosed by management, the discounted cash flow approach and guideline public company method was used to value the Wireline and Cable reporting units for the annual impairment tests. The discounted cash flow approach uses various inputs and considers current economic factors as well as risks specific to the industry and the reporting unit. The significant assumptions made by management in this process were the revenue growth rates, the terminal revenue growth rates and the discount rates. The guideline public company method develops an indication of fair value by calculating average market pricing multiples for selected publicly-traded companies. The developed multiples were applied by management to applicable financial measures of the respective reporting unit to determine fair value. The discounted cash flow approach and guideline public company method were weighted to arrive at the total fair value used for impairment testing.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessment of the Wireline and Cable reporting units is a critical audit matter are there was significant judgment by management when developing the fair value of the reporting units. This in turn led to a high degree of auditor judgment, effort and subjectivity in performing procedures and evaluating audit evidence related to management's cash flow projections and significant assumptions, including the revenue growth rates, terminal growth rates and discount rates. In addition, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's annual goodwill impairment assessment, including controls over the valuation of the Company's reporting units. These procedures also included, among others, testing management's process for developing the fair value estimates, evaluating the appropriateness of the discounted cash flow model, testing the completeness, accuracy, and relevance of underlying data used in the model, and evaluating the significant assumptions used by management, including the revenue growth rates, terminal growth rates and discount rates. Evaluating the significant assumption related to the revenue growth rates involved evaluating whether the assumption used was reasonable by considering (i) the current and past performance of the reporting units, (ii) consistency with external market and industry data, and (iii) whether the assumption was consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the discounted cash flow model and certain significant assumptions, including the discount rates and terminal growth rates.

/s/ PricewaterhouseCoopers LLP
Chicago, Illinois
February 25, 2020

We have served as the Company's auditor since 2002.

Telephone and Data Systems, Inc.
Selected Consolidated Financial Data

Year Ended or at December 31,	2019 ¹	2018 ^{2, 3}	2017	2016	2015
(Dollars and shares in millions, except per share amounts)					
Statement of Operations data					
Operating revenues	\$ 5,176	\$ 5,109	\$ 5,044	\$ 5,155	\$ 5,210
Loss on impairment of goodwill	—	—	262	—	—
(Gain) loss on sale of business and other exit costs, net	(1)	—	(1)	(1)	(136)
(Gain) loss on license sales and exchanges, net	—	(18)	(22)	(20)	(147)
Operating income (loss)	179	205	(108)	108	427
Income tax expense (benefit)	64	46	(279)	40	172
Net income	147	175	157	52	263
Net income attributable to noncontrolling interests, net of tax	26	40	4	9	44
Net income attributable to TDS shareholders	121	135	153	43	219
Net income attributable to TDS common shareholders	\$ 121	\$ 135	\$ 153	\$ 43	\$ 218
Basic earnings per share attributable to TDS shareholders	\$ 1.06	\$ 1.20	\$ 1.39	\$ 0.39	\$ 2.02
Diluted earnings per share attributable to TDS shareholders	\$ 1.03	\$ 1.17	\$ 1.37	\$ 0.39	\$ 1.98
Dividends per Common and Series A Common Share	\$ 0.66	\$ 0.64	\$ 0.62	\$ 0.59	\$ 0.56
Balance Sheet data					
Total assets	\$ 10,781	\$ 9,783	\$ 9,295	\$ 9,446	\$ 9,422
Net long-term debt, excluding current portion	2,316	2,418	2,437	2,433	2,440
Total TDS shareholders' equity	\$ 4,653	\$ 4,560	\$ 4,269	\$ 4,144	\$ 4,126

- ¹ As of January 1, 2019, TDS adopted ASC 842 using a modified retrospective method. Under this method, the new accounting standard is applied only to the most recent period presented. As a result, the period after this adoption date includes the impacts of ASC 842, but prior periods remain as previously reported. See Note 11 — Leases for additional information.
- ² As of January 1, 2018, TDS adopted the new revenue recognition accounting standard, ASC 606, using a modified retrospective approach. Under this method, the new accounting standard is applied only to the most recent period presented. As a result, periods after this adoption date include the impacts of ASC 606, but prior periods remain as previously reported.
- ³ ASU 2017-07, regarding net periodic pension cost and net periodic postretirement benefit cost was adopted as of January 1, 2018, and applied retrospectively. All prior year numbers have been recast to conform to this standard.

Telephone and Data Systems, Inc.
Consolidated Quarterly Information (Unaudited)

2019	Quarter Ended			
	March 31	June 30	September 30	December 31
(Dollars in millions, except per share amounts)				
Operating revenues	\$ 1,257	\$ 1,261	\$ 1,321	\$ 1,336
(Gain) loss on asset disposals, net	(5)	5	6	6
(Gain) loss on sale of business and other exit costs, net	(2)	—	—	—
(Gain) loss on license sales and exchanges, net	(2)	—	2	—
Operating income	94	48	29	8
Income tax expense (benefit)	34	16	15	(1)
Net income	70	39	23	15
Net income attributable to TDS shareholders	\$ 59	\$ 33	\$ 18	\$ 12
Basic earnings per share attributable to TDS shareholders	\$ 0.52	\$ 0.29	\$ 0.15	\$ 0.10
Diluted earnings per share attributable to TDS shareholders	\$ 0.50	\$ 0.28	\$ 0.15	\$ 0.10

2018	Quarter Ended			
	March 31	June 30	September 30	December 31
(Dollars in millions, except per share amounts)				
Operating revenues	\$ 1,225	\$ 1,255	\$ 1,297	\$ 1,332
(Gain) loss on asset disposals, net	2	2	—	5
(Gain) loss on license sales and exchanges, net	(7)	(11)	—	—
Operating income	80	61	51	13
Income tax expense (benefit)	24	21	5	(2)
Net income	57	44	53	20
Net income attributable to TDS shareholders	\$ 39	\$ 33	\$ 46	\$ 16
Basic earnings per share attributable to TDS shareholders	\$ 0.35	\$ 0.30	\$ 0.41	\$ 0.14
Diluted earnings per share attributable to TDS shareholders	\$ 0.34	\$ 0.29	\$ 0.41	\$ 0.14

Due to rounding, the sum of quarterly results may not equal the total for the year.

Telephone and Data Systems, Inc. Shareholder Information

Stock and Dividend Information

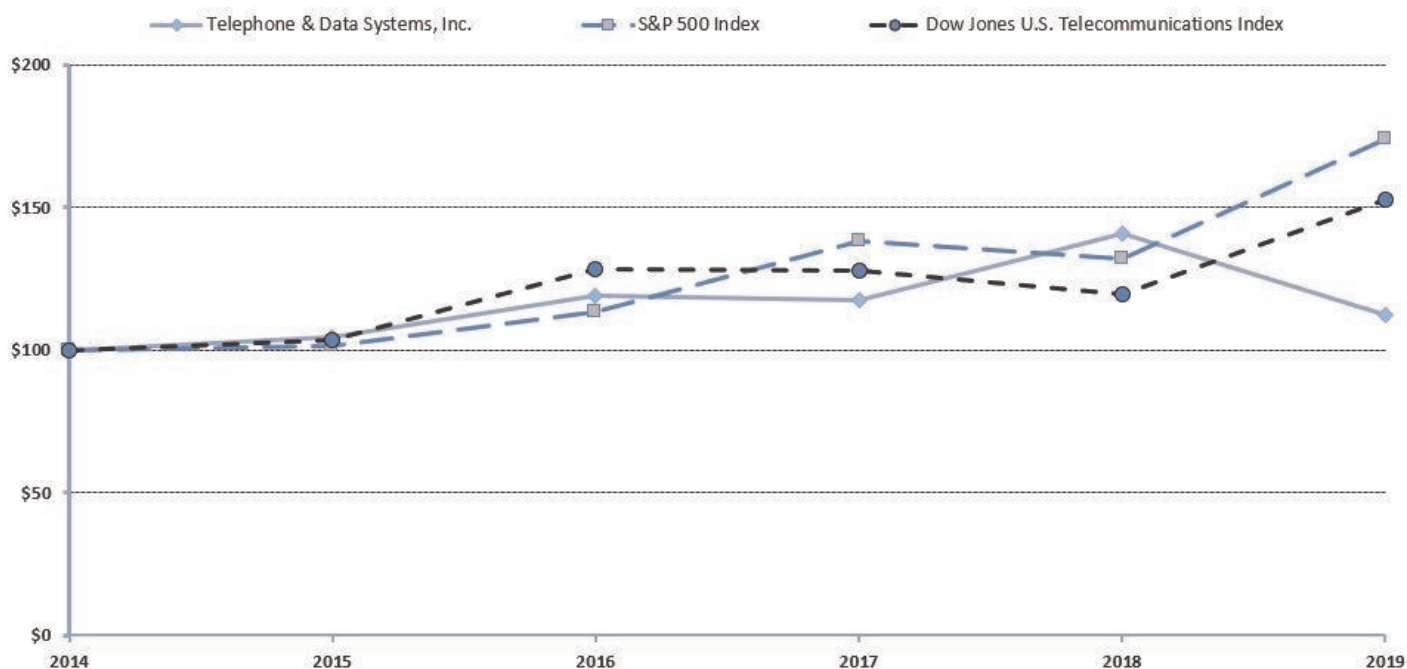
TDS' Common Shares are listed on the New York Stock Exchange under the symbol "TDS." As of January 31, 2020, the last trading day of the month, TDS Common Shares were held by 1,610 record owners, and the Series A Common Shares were held by 67 record owners.

TDS has paid cash dividends on its common stock since 1974, and paid dividends of \$0.66 per Common and Series A Common Share during 2019. During 2018, TDS paid dividends of \$0.64 per Common and Series A Common Share.

The Common Shares of United States Cellular Corporation, an 82%-owned subsidiary of TDS, are listed on the NYSE under the symbol "USM."

Stock Performance Graph

The following chart provides a comparison of TDS' cumulative total return to shareholders (stock price appreciation plus dividends) during the previous five years to the returns of the Standard & Poor's 500 Composite Stock Price Index and the Dow Jones U.S. Telecommunications Index.



Note: Cumulative total return assumes reinvestment of dividends.

	2014	2015	2016	2017	2018	2019
Telephone and Data Systems Common Shares (NYSE: TDS)	\$ 100	\$ 104.68	\$ 119.27	\$ 117.62	\$ 140.65	\$ 112.55
S&P 500 Index	100	101.38	113.51	138.29	132.23	173.86
Dow Jones U.S. Telecommunications Index	100	103.52	128.32	127.96	119.35	152.63

The comparison above assumes \$100.00 invested at the close of trading on the last trading day preceding the first day of 2014, in TDS Common Shares, S&P 500 Index and the Dow Jones U.S. Telecommunications Index.

Dividend Reinvestment Plan

TDS' dividend reinvestment plans provide its common shareholders with a convenient and economical way to participate in the future growth of TDS. Holders of record of ten (10) or more Common Shares may purchase Common Shares with their reinvested dividends at a five percent discount from market price. Common Shares may also be purchased on a monthly basis through optional cash payments by participants in this plan. The initial ten (10) shares cannot be purchased directly from TDS. An authorization card and prospectus will be mailed automatically by the transfer agent to all registered record holders with ten (10) or more shares. Once enrolled in the plan, there are no brokerage commissions or service charges for purchases made under the plan.

Investor relations

TDS' annual report, SEC filings and news releases are available to investors, securities analysts and other members of the investment community. These reports are provided, without charge, upon request to our Investor Relations department at the address below. Investors may also access these and other reports through the Investor Relations portion of the TDS website (www.tdsinc.com).

Questions regarding lost, stolen or destroyed certificates, consolidation of accounts, transferring of shares and name or address changes should be directed to:

Julie Mathews, IRC, Director — Investor Relations
Telephone and Data Systems, Inc.
30 North LaSalle Street, Suite 4000
Chicago, IL 60602
312.592.5341
julie.mathews@tdsinc.com

General inquiries by investors, securities analysts and other members of the investment community should be directed to:

Jane W. McCahon, Senior Vice President — Corporate Relations and Corporate Secretary
Telephone and Data Systems, Inc.
30 North LaSalle Street, Suite 4000
Chicago, IL 60602
312.592.5379
jane.mccahon@tdsinc.com

Directors and executive officers

See “Election of Directors” and “Executive Officers” sections of the Proxy Statement issued in 2020 for the 2020 Annual Meeting.

Principal counsel

Sidley Austin LLP, Chicago, Illinois

Transfer agent

Computershare Trust Company, N.A.
462 South 4th Street, Suite 1600
Louisville, KY 40202
877.337.1575

Independent registered public accounting firm

PricewaterhouseCoopers LLP

Visit TDS' web site at www.tdsinc.com

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Investing in the Future



Speed you need



Expansive coverage



Uninterrupted indoor/outdoor service



Won't keep you waiting

U.S. Cellular is advancing our network to meet the evolving needs of our customers.

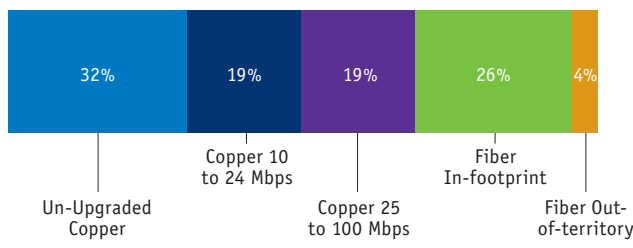
Investing in network-enhancing technology like 5G and Voice Over LTE will enhance the customer experience and increase our ability to capture emerging revenue opportunities.

In 2020 we will launch our first commercial 5G markets covering communities in:



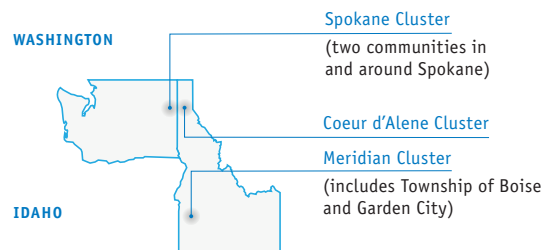
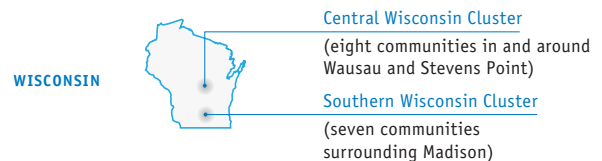
Many years ago we made a strategic shift to deploy fiber in our most attractive markets.

Service Addresses at December 31, 2019*



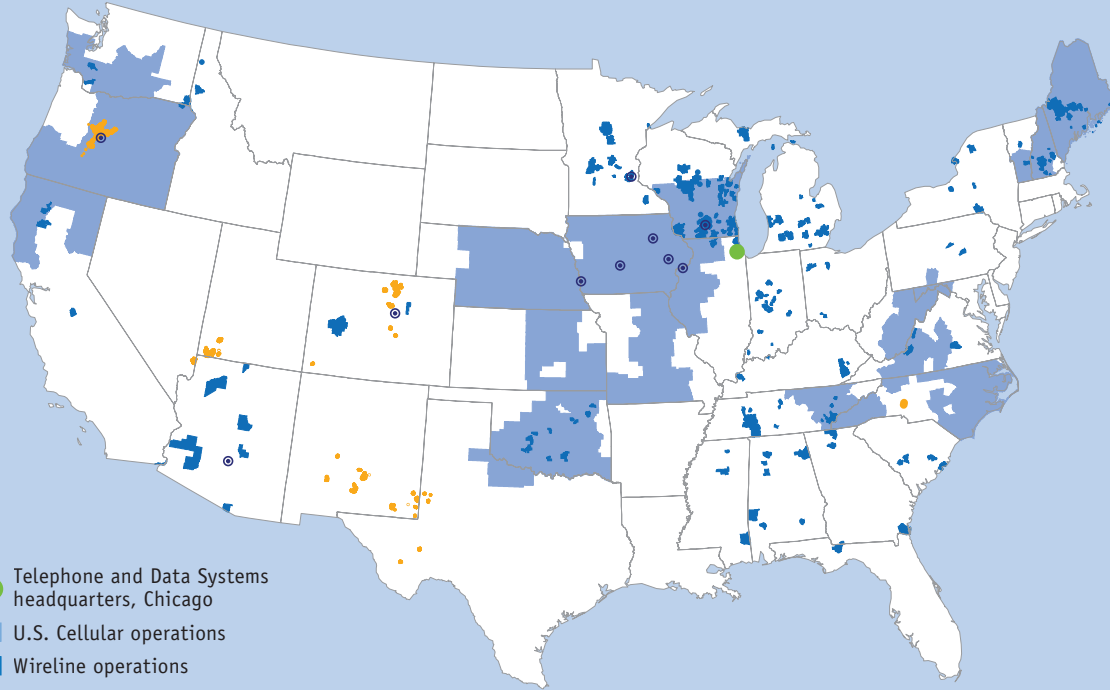
*Includes ILEC and OOT, excludes CLEC

TDS Telecom is rapidly scaling up fiber deployment in attractive markets both in and out of our current footprint. After success in our first new market, Sun Prairie, Wisconsin, we've built a robust model to identify and prioritize the most attractive markets. We are now expanding to new markets in Wisconsin and Idaho, and we will continue to search for out-of-territory markets that will drive scale and fuel future revenue growth.





At TDS, our mission is to provide outstanding communications services to our customers and meet the needs of our shareholders, our people, and our communities.



- Telephone and Data Systems headquarters, Chicago
- U.S. Cellular operations
- Wireline operations
- Cable operations
- ⊙ HMS operations

About Our Businesses



U.S. Cellular is the fifth-largest full-service wireless carrier in the United States, providing national network coverage and industry-leading innovations designed to elevate the customer experience.



TDS Telecom delivers high-speed internet, TV entertainment, and phone services to rural, suburban, and metropolitan communities across the U.S. TDS Telecom also manages the operations of:



BendBroadband offers an extensive range of broadband, fiber connectivity, cable TV, and voice services for residential and commercial customers.



OneNeck IT Solutions delivers hybrid IT solutions, including cloud and hosting solutions, managed services, enterprise application management, professional services, IT hardware, and top tier data centers.

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